

Ryoichi Arai

# Fish Karyotypes

**A CHECK LIST**

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## Introduction

In many vertebrate groups, the study of karyotypes and genome size has contributed along with analyses of mitochondrial and nuclear gene sequences to the resolution of challenges in biology systematics and evolution. However, in fishes—the most diverse of all vertebrate groups—higher taxa traditionally have been classified largely by morphology and paleontology, with a much smaller input of cytogenetic information. In part, this is because karyotypes can be obtained only from living specimens, tissues, or cells, which makes it challenging to study the karyotypes of fishes that are difficult to collect alive (e.g., deep-sea fishes). Of course, even fresh material provides no guarantee that reliable chromosome figures can be obtained easily.

DNA sequence data are exerting an increasingly strong influence in modern fish systematics, for example, by leading to proposed challenges in the classification of numerous higher taxa ranging from genera to orders. However, the most fruitful approach is certain to be one that involves synthetic analyses of morphology, molecular phylogenetics, comparative karyology, and genome size, rather than focusing on only one or a few of these sources of data. For example, although it may be very difficult to establish homology of karyotypes analyzed by Giemsa staining and several banding methods among taxa, the polarity of karyotype states nonetheless can still be inferred by analysis of Robertsonian fusion/fission, tandem fusion, pericentric inversion, paracentric inversion, aneuploidy, or polyploidy in any monophyletic taxon, even when the polarity of DNA sequences is unclear. The role of cytogenetic data is likely to increase further because powerful new methods such as fluorescence in situ hybridization (FISH) (Phillips 2007: P-53) are implemented in fishes beyond model species (e.g., zebrafish, medaka, sticklebacks, and pufferfish). Given their limited scope, FISH data are not included here, but their future importance is clearly acknowledged.

The purpose of this book is to facilitate the implementation of an integrative approach to fish systematics by providing karyotype information for 3,425 species/subspecies of extant jawless, cartilaginous, actinopterygian, and lobe-finned fishes. This presentation fills an important need, as fish karyotypes tend to be published not only in well-known and easily accessible journals, but also in museum journals of more regional significance or in other venues that are difficult to obtain. Several books on fish chromosomes have been published in the past (Denton 1973: D-7; Chiarelli and Capanna 1973: C-1; Ojima 1983: O-73; Vasiliev 1985: V-72; Klinkhardt et al. 1995: K-114), but this volume represents the first in nearly 15 years and is the most comprehensive. Such an update is clearly warranted, given the historical growth in the numbers of karyotyped species/subspecies listed in Table 1.

**Table 1** Historical transition of the numbers of karyotyped species/subspecies

Author(s)	Denton	Park	Ojima et al.	Sola et al.	Ojima	Vasiliev	Klinkhardt et al.	Arai
Year	1973	1974	1976	1981	1983	1985	1995	This
Reference no.	D-7	P-6	O-22	S-88	O-73	V-72	K-114	book
Myxini	4	2	3	0	3	5	0	8
Petromyzontida	7	6	8	0	7	13	14	14
Chondrichthyes								
Holocephali	1	2	0	0	2	2	2	2
Elasmobranchii	15	8	4	0	13	17	52	68
Actinopterygii								
Cladistia	2	2	2	4	7	6	7	7
Chondrostei	1	4	0	5	7	12	12	21
Neopterygii								
Holostei	2	2	2	2	3	1	3	3
Teleostei	446	505	417	798	1,035*	1,258	2,182*	3,296
Sarcopterygii	3	1	0	1	2	5	5	6
<b>Total</b>	<b>481</b>	<b>532</b>	<b>436</b>	<b>810</b>	<b>1,079*</b>	<b>1,318</b>	<b>2,277*</b>	<b>3,425</b>

\*Synonymous species were counted as different species.

Substantial revisions to the species names and higher taxonomy of many fishes in the intervening years also make an updated compendium necessary. In this book, synonymies are circumvented by providing both the name reported in the original karyotype papers and currently recognized names. In particular, the classification of taxa above the species level follows Nelson (2006: N-68), and species names conform to the up-to-date list in the *Catalogue of Fishes* by Eschmeyer (<http://research.calacademy.org/redirect?url=http://researcharchive.calacademy.org/research/ichthyology/catalog/fishcatmain.asp>, E-13). The classification of chromosomes followed Levan et al. (1964: L-25): chromosomes were classified to metacentrics (M), submetacentrics (SM), subtelocentrics (ST), and acrocentrics (A). As shown in Table 1 (Levan et al. 1964), M, m, sm, st, t, and T do not denote chromosomes but rather centromeric position; e.g., acrocentrics is characterized by t. Levan et al. (1964) do not propose abbreviations for chromosomes. Two kinds of abbreviations for chromosomes, M-SM-ST-A and m-sm-st-t(-T), have been adopted in karyotypes. I adopt M-SM-ST-A because chromosome classification can be differentiated from centromeric position by these abbreviations and thus the problematic treatment of T in the other system can be avoided. In addition to providing data for extant fishes, ancestral chromosome numbers (ACN = NAN sensu Arai and Nagaiwa 1976: A-64) are proposed in this book.

To date, karyotype data have been made available for 53 orders (84% of the known total) and 269 families (52% of total). In addition, genome size has been reported in 52 orders (83%) and 264 families (51%), which are available in standardized form as part of the Animal Genome Size Database (<http://www.genomesize.com>, G-85). As a result, it is possible to compare these two characters, at least at the family level (Tables 2, 3).

In some cases, a given karyotype consists of chromosomes that cannot easily be distinguished as either SM or ST, such that different authors may report different information. For example, the arm number (NF<sub>1</sub>) of *Oncorhynchus keta* ( $2n = 74$ ) is reported as 100 in Sasaki et al. (1968: S-14) versus 102 in Ueda (1985: U-72), and the NF<sub>2</sub> of *Alburnus alburnus* ( $2n = 50$ ) is given as 92 in Cataudella et al. (1977: C-34) versus 86 in Hafez et al. (1978: H-3). These different reports on karyotypes between conspecific populations were included in the database (Tables 4–7) without comment, although it should be noted that these differences may derive from artifacts of preparation technique or taxonomic problems, rather than representing real polymorphisms. If so, then it will be important to resolve these discrepancies before meaningful comparisons can be made. Similarly, there may be issues relating to differences in reported karyotypes resulting from different degrees of chromosome condensation, to the lack of a uniform terminology among authors, or even to some miscalculations (number of arms, NOR position, etc.). Some examples of these sources of error were detected when examining the literature; e.g., the same researcher(s) have at times defined M/SM as two-arm chromosomes in some taxa, but M/SM/ST as two-arm chromosomes in other taxa. To prevent such confusion, these two-arm definitions were differentiated in the present book; i.e., NF<sub>1</sub> means M/SM as two-arm chromosomes and NF<sub>2</sub> means M/SM/ST as two-arm chromosomes.

There are several fundamental questions that remain to be answered with regard to phylogenetic karyology in fishes. For example: (1) Why is polyploidy in teleost fishes only observed in freshwater species and not in marine species? (2) What is the phylogenetic significance of differences in the number and location of NORs as shown by different banding methods (especially by the FISH method with 18S rDNA and 5S rDNA probes)? (3) In cases in which both large and small B chromosomes have been reported, are both, neither, or only the large B chromosomes to be counted in the diploid chromosome number? Or should this be considered on a case-by-case basis? (4) What is the biological significance of microchromosomes, and what is their relationship (if any) with B chromosomes? (5) Can sex chromosomes be differentiated in more species by using FISH methods with probes of genes specific to sex chromosomes?

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## Availability of Fish Karyotypes

Karyotypes have been reported for 3,425 species/subspecies of fishes (including jawless, cartilaginous, ray-finned, and lobe-finned fishes) (see Table 1). This total represents a coverage of about 12.2% of extant fish diversity (62 orders, 515 families, and 27,977 species); however, these are not sampled evenly from among fish groups and instead are biased toward freshwater taxa such as the Cypriniformes, Characiformes, Siluriformes, Cyprinodontiformes, and Cichlidae in the Perciformes. Specifically, numbers of karyotyped species/subspecies are 747 (21.8%) in Cypriniformes, 341 (10.0%) in Characiformes, 362 (10.6%) in Siluriformes, 345 (10.1%) in Cyprinodontiformes, and 130 (3.8%) in Cichlidae (Perciformes). On the other hand, 4 orders (Orectolobiformes, Echinorhiniformes, Pristiophoriformes, and Pristiformes) and 30 families in cartilaginous fishes and 5 orders (Albuliformes, Saccopharyngiformes, Ateleopodiformes, Lampriformes, and Polymixiiformes) and 216 families in actinopterygian fishes currently lack any karyotype data. Of course, relative coverage depends on the number of recognized taxa, which has been updated significantly in recent times consequent to molecular analyses that may or may not reflect undue inflation (Nelson 2006: N-68; Kottelat and Freyhof 2007: K-130).

## Fish Vouchering and Identification

To verify the identification of fishes included in karyotype studies, voucher specimens should be deposited in a museum, curated university collection, or another appropriate institute. Unfortunately, vouchered specimens are not available for most species for which karyotypes have been reported, meaning that their initial identification cannot be confirmed. Moreover, there are many papers in which the localities of material fishes purchased from fish dealers were not described, which further increases the prospect of taxonomic errors. This problem is especially relevant when the classification of a taxon in question has been revised, making it difficult to link old and new names. For example, two different karyotypes were reported in a labrid, *Pseudolabrus japonicus* (Arai and Koike 1980: A-75; Ojima and Kashiwagi 1979: O-27). Thereafter, *Pseudolabrus japonicus* was separated to two different species, *P. eosthinus* and *P. sieboldi* by revisional study of *P. japonicus* (Mabuchi and Nakabo 1997: M-1). By examination of *P. japonicus* material deposited at a museum, it was known that the two karyotypes corresponded to these two different species (Mabuchi et al. 2002: M-2).

## Classification of Extant Fishes

Fish systematics has developed greatly during the past 10 years, mainly based on molecular phylogenetic studies. Although results in molecular phylogenetics are not always agreed upon by all researchers, it is necessary that a consistent taxonomic system be used in a database such as this. In this regard, the higher taxonomic classification proposed by Nelson (2006: N-68) has been used with the following updates:

Orders Batrachoidiformes and Lophiiformes were changed from the superorder Paracanthopterygii to the superorder Acanthopterygii (Miya et al. 2003, 2005: M-138, 139).

Although polyphyly of the order Gasterosteiformes and the suborder Labroidei (order Perciformes) has been reported (Kawahara et al. 2008: K-105; Mabuchi et al. 2007: M-17) and



Stylephoriformes (Miya et al. 2007: M-140), close relationship between Alepocephaliformes and Otocephala (Lavoué et al. 2008: L-24), and Gobiiformes (Thacker 2009: T-63) were proposed, these hypotheses were treated as pending problems in this book.

The higher-level classification used here is as follows:

Class Myxini .....	8, 28
Order Myxiniformes .....	8, 28
Class Petromyzontida .....	8, 29
Order Petromyzontiformes .....	8, 29
Class Chondrichthyes .....	9, 30
Subclass Holocephali .....	9
Order Chimaeriformes .....	9, 30
Subclass Elasmobranchii .....	9
Order Heterodontiformes .....	9, 30
Order Orectolobiformes .....	9
Order Lamniformes .....	9, 30
Order Carcharhiniformes .....	9, 31
Order Hexanchiformes .....	9, 32
Order Echinorhiniformes .....	9
Order Squaliformes .....	10, 32
Order Squatiniformes .....	10, 32
Order Pristiophoriformes .....	10
Order Torpediniformes .....	10, 33
Order Pristiformes .....	10
Order Rajiformes .....	10, 33
Order Myliobatiformes .....	10, 34
Class Actinopterygii .....	11, 36
Subclass Cladistia .....	11
Order Polypteriformes .....	11, 36
Subclass Chondrostei .....	11
Order Acipenseriformes .....	11, 37
Subclass Neopterygii .....	11
Division Holostei .....	11
Order Lepisosteiformes .....	11, 38
Order Amiiiformes .....	11, 38
Division Teleostei .....	11
Subdivision Osteoglossomorpha .....	11
Order Hiodontiformes .....	11, 38
Order Osteoglossiformes .....	11, 39
Subdivision Elopomorpha .....	11
Order Elopiformes .....	11, 40
Order Albuliformes .....	11
Order Anguilliformes .....	11, 40
Order Saccopharyngiformes .....	12
Subdivision Otocephala (= Ostarioclupeomorpha) .....	12
Superorder Clupeomorpha	
Order Clupeiformes .....	12, 43
Superorder Ostariophysii	
Order Gonorynchiformes .....	12, 44

Order Cypriniformes .....	12, 45
Order Characiformes .....	13, 78
Order Siluriformes .....	14, 96
Order Gymnotiformes .....	15, 117
Subdivision Euteleostei .....	15
Superorder Protacanthopterygii	
Order Argentiniiformes .....	15, 119
Order Osmeriformes .....	15, 120
Order Salmoniformes .....	15, 121
Order Esociformes .....	15, 128
Superorder Stenopterygii	
Order Stomiiformes .....	15, 128
Superorder Ateleopodomorpha	
Order Ateleopodiformes .....	16
Superorder Cyclosquamata	
Order Aulopiformes .....	16, 129
Superorder Scopelomorpha	
Order Myctophiformes .....	16, 130
Superorder Lampriomorpha	
Order Lampriformes .....	16
Superorder Polymixiomorpha	
Order Polymixiiformes .....	16
Superorder Paracanthopterygii .....	16
Order Percopsiformes .....	16, 131
Order Gadiformes .....	16, 131
Order Ophidiiformes .....	17, 132
Superorder Acanthopterygii .....	17
Series Mugilomorpha	
Order Mugiliformes .....	17, 133
Series Atherinomorpha	
Order Atheriniiformes .....	17, 134
Order Beloniformes .....	17, 135
Order Cyprinodontiformes .....	17, 137
Series Percomorpha	
Order Stephanoberyciformes .....	18, 152
Order Beryciformes .....	18, 152
Order Zeiformes .....	18, 153
Order Gasterosteiformes .....	18, 154
Order Batrachoidiformes .....	18, 155
Order Synbranchiformes .....	18, 155
Order Scorpaeniformes .....	19, 157
Order Perciformes .....	19, 163
Order Pleuronectiformes .....	23, 209
Order Lophiiformes .....	23, 212
Order Tetraodontiformes .....	23, 212
Class Sarcopterygii .....	24, 215
Subclass Coelacanthimorpha .....	24
Order Coelacanthiformes .....	24, 215
Subclass Dipnotetrapodomorpha .....	24
Order Ceratodontiformes .....	24, 215

Genus- and species-level designations given here are those presented by Eschmeyer (2009: E-13). Again, there have been many suggested changes to fish taxonomy at this level as well. For example, in European cyprinid fishes, many species previously placed in *Leuciscus* are now in the genera *Squalius*, *Telestes*, and *Petroleuciscus*, and many species previously placed in *Chondrostoma* are now in the genera *Protochondrostoma*, *Pseudochondrostoma*, *Parachondrostoma*, *Achondrostoma*, and *Iberochondrostoma* (Kottelat and Freyhof 2007: K-130). Changes such as these are noted in the karyotype database (Tables 4–7).

## Historical Transition of Numbers of Karyotyped Species/Subspecies

The number of karyotyped species/subspecies has increased rapidly since the early 1970s. For example, in 1973 karyotypes were available for 481 species/subspecies; in 1985, 1,318 species/subspecies had been karyotyped; and at the time of this writing, data exist for 3,425 species/subspecies (see Table 1). Since the last compendium in 1995 (K-114), the number of karyotyped taxa in Elasmobranchii, Chondrostei, and Teleostei increased but that in Petromyzontida, Holocephali, Cladistia, and Holostei did not increase. In some cases, an increase in the number of karyotyped taxa in Elasmobranchii and Teleostei has been caused by the erection of numerous additional taxa and through revised techniques for chromosome preparation (Klinkhardt 1991: K-79).

## Relationship Between Karyotype and Genome Size

Relationships between karyotypes and genome size in families were also explored (see Tables 2, 3). Sources of karyotypes and genome size were usually different. Data of karyotypes and genome size were extracted from Tables 4–7 and the up-to-date list of Gregory ([www.genomesize.com](http://www.genomesize.com), G-85).

As with karyotype data, there are significant gaps in the fish genome size dataset.

Two orders (Echinorhynchiformes and Pristiophoriformes) and 21 families in cartilaginous fishes and eight orders (Albuliformes, Saccopharyngiformes, Gonorynciformes, Ateleopodiformes, Lampriformes, Polymixiiformes, Percopsiformes, and Stephanoberyciformes) and 230 families in actinopterygian fishes have no information on genome size. Two orders (Echinorhynchiformes and Pristiophoriformes) and 19 families in cartilaginous fishes and five orders (Albuliformes, Saccopharyngiformes, Ateleopodiformes, Lampriformes, Polymixiiformes) and 181 families in actinopterygian fishes have neither information on karyotypes nor information on genome size.

As for jawless fishes, karyotypes and genome size in the Myxiniiformes differ from those in the Petromyzontiformes, i.e.,  $2n \leq 36$  and genome size  $>5.0$  pg/cell in Myxiniiformes versus  $2n = 76$  or  $>140$  and genome size  $<4.3$  pg/cell in Petromyzontiformes. Myxiniiformes exhibits different chromosome numbers and DNA amounts between somatic cells and spermatogonia, i.e.,  $2n = 14–36$  in somatic cells versus  $2n = 16–96$  in spermatogonia. B chromosomes have been reported in spermatogonia in Myxiniiformes (Nakai et al. 1995: N-62; Kojima et al. 2010: K-140).

As for jawed fishes, diploid chromosome numbers and genome size in cartilaginous fishes except Chimaeriformes are larger than those in actinopterygian fishes. The Polypteriformes and the Coelacanthiformes possess about 7.0–9.0 pg/cell. The Ceratodontiformes has extraordinary large genome sizes (more than 80.0 pg/cell).

Acipenseriformes is of special interest among Actinopterygii in their possession of 105 to 372 chromosomes and 2.4 to 13.8 pg/cell. Ploidy levels including diploidy (2X), tetraploidy (4X), and hexaploidy (6X) have been inferred in this order. However, the high number of chromosomes suggests another possible series, i.e., tetraploidy, octaploidy, and dodecaploidy (Fontana et al. 2007: F-61).

Diploid chromosome numbers and genome size in Neopterygii except the Lepisosteiformes, Osteoglossiformes, Characiformes, Siluriformes, Osmeriformes, and Salmoniformes are usually 48 or 50 and lower than 3.0 pg/cell, respectively. However, more than 3.0 pg/cell in Neopterygii has been reported in Anguilliformes, Cypriniformes, Characiformes, Siluriformes, Argentiniformes, Esociformes, Myctophiformes, Gasterosteiformes, Batrachoidiformes, Synbranchiformes, and Perciformes, i.e., Muraenidae, Cyprinidae (Cyprininae, part of Gobioninae, part of Leuciscinae, part of Rasborinae, Schizothoracinae, and polyploid species in Barbinae), polyploid species of Cobitidae, Catostomidae, part of Characidae, Curimatidae, Prochilodontidae, Ariidae, part of Callichthyidae, Doradidae, part of Loricariidae, Plotosidae, Microstomatidae, part of Umbridae, Myctophidae, part of Syngnathidae, Batrachoididae, part of Synbranchidae, Scaridae, Artedidraconidae, and Channichthyidae.

Among taxa described above, freshwater fishes such as part of Cypriniformes (Catostomidae, part of Cyprinidae, part of Cobitidae), and part of Siluriformes (part of Callichthyidae) may be of polyploid origin (Allendorf and Thorgaard 1984: A-16; Ferris 1984: F-23).

Complex relationships between ploidy and genome size have been reported in the Cobitoidea. In one example, the Leptobotiinae-Balitoridae exhibit  $2n = 48-50$  and genome size about 1.0 pg/cell, whereas the Botiinae possess  $2n = 98-100$  and genome size about 2.0 pg/cell. A second example is provided by comparing *Cobitis* species with  $2n = 48-50$  and about 4.0 pg/cell versus those with  $2n = 96-100$  and about 7.0 pg/cell. A third example comes from non-*Cobitis* cobitids with  $2n = 48-50$  with about 2.0 pg/cell versus those with  $2n = 96-100$  and about 4.5 pg/cell (Suzuki 1996: S-143).

The diploid chromosome number in marine neopterygian fishes, which have various genome sizes (0.8–4.4 pg/cell), was generally 46, 48, or 50 with the exception of  $2n = 56$  in Osmeriformes and did not show polyploidy, although triploidy was exceptionally reported in the Zoarcidae (Perciformes) (Morescalchi et al. 1996: M-89). In other words, it is difficult to infer polyploidy in marine fishes from genome size.

In Teleostei, genome size is relatively conserved in families, with the important exception of those including recent or ancient polyploids. Diploid chromosome numbers have been thought to vary across taxa above the family level, but when they were analyzed in terms of Robertsonian translocation and tandem fusion, they were found to be more conservative in each family. On the other hand, there are several problems in karyological analysis. The finding of B chromosomes might cause change of  $2n$ , NF, and ancestral chromosome number (ACN) in taxa that have been reported to possess no B chromosomes. It is likely that many more species, when analyzed with sufficient intensity, will be found to possess B chromosomes (Camacho et al. 2000: C-2). B chromosomes have been studied actively in Characiformes and neotropical Siluriformes (Carvalho et al. 2008: C-98), but there have been very few data on B chromosomes in the other taxa.

**Table 2 Numbers of karyotyped genera and species/subspecies (sp/ssp), diploid chromosome number (2n) and genome size in families of jawless fishes**

FCM = flow cytometry, FD = Feulgen densitometry, BFA = bulk fluorometric assay, SCF = static cell fluorometry.

Order/family/subfamily	No. of genera		No. of sp/ssp		2n	Genome size (pg/cell)				
	total	studied	total	studied		FCM	FD	BFA	SCF	
PHYLUM CHORDATA										
Subphylum Craniata										
Superclass Myxiniomorphi										
Class MYXINI										
MYXINIFORMES										
8										
Myxinidae										
8										
Myxinae	4	2	25	4	14, 28, 34, 36					6.9-9.2
Eptatretinae	3	1	45	4	34, 36	5.4	5.5	5.6		4.6-6.9
Superclass Petromyzontomorphi										
Class PETROMYZONTIDA										
PETROMYZONTIFORMES										
14										
Petromyzontidae	8	5	34	11	142-168	2.6, 4.2	2.6-2.9, 4.2			3.2
Geotriidae	1	1	1	1	ca. 180					3.1
Mordaciidae	1	1	3	2	76					2.8

**Table 3 Numbers of karyotyped genera and species/subspecies (sp/ssp), diploid chromosome number (2n) and genome size in families of jawed fishes**

FCM = flow cytometry, FD = Feulgen densitometry, FIA = Feulgen image analysis densitometry, BFA = bulk fluorometric assay.

**Table 3.1 Class CHONDRICHTHYES**

Order/family/subfamily/genus	No. of genera		No. of sp/ssp		2n	Genome size (pg/cell)			
	total	studied	total	studied		FCM	FD	FIA	BFA
Superclass Gnathostomata									
Grade Chondrichthiomorphi									
Class CHONDRICHTHYES									
Subclass Holocephali									
CHIMAERIFORMES									
Callorhynchidae	1	0	3	0				3.9	
Rhinochimaeridae	3	0	8	0				3.2	
Chimaeridae	2	2	22	2	58, 86		3.0	4.0	3.2
Subclass Elasmobranchii									
Subdivision Selachii									
HETERODONTIFORMES									
Heterodontidae	1	1	8	2	102	17.5	14.5, 29.6		13.6
ORECTOLOBIFORMES									
Brachaeluridae	2	0	2	0					
Ginglymostomatidae	3	0	3	0		7.6, 11.4	10.9	8.5	8.0
Hemiscylliidae	2	0	12	0				9.1–11.0	
Orectolobidae	3	0	6	0				10.1	
Parascylliidae	2	0	7	0					
Rhincodontidae	1	0	1	0					
Stegostomatidae	1	0	1	0					
LAMNIFORMES									
Alopiidae	1	0	3	0					
Cetorhinidae	1	0	1	0					
Lamnidae	1	1	5	1	82	12.9	13.4	10.0	
Megachasmidae	1	0	1	0					
Mitsukurinidae	1	0	1	0					
Odontaspidae	2	1	3	1	ca. 84	10.9			
Pseudocarchariidae	1	0	1	0					
CARCHARHINIFORMES									
Carcharhinidae	12	4	50	7	74–90	6.7–8.3	5.5–13.1	5.7–9.9	6.8–8.6
Hemigaleidae	4	0	7	0					
Leptochariidae	1	0	1	0					
Proscylliidae	3	0	5	0					
Pseudotriakidae	2	0	2	0					
Scyliorhinidae	16	2	113	5	62, 64, 72	18.1	11.3–14.7		15.4
Sphyrnidae	2	1	8	1	78–86	6.6	8.9	6.1	7.0, 7.8
Triakidae				4					
Galeorhininae	6	0	10	0			17.3		
Triakinae	3	2	28	4	68, 72, 80		8.6–9.8		9.0–12.8
HEXANCHIFORMES									
Chlamydoselachidae	1	1	1	1	ca. 100		9.2		
Heptranchiidae	1	1	1	1	72				
Hexanchidae	1	0	2	0			10.7		
Notorynchidae	1	1	1	1	104	8.8			
ECHINORHINIFORMES									
Echinorhinidae	1	0	2	0					

Table 3.1 Class CHONDRICHTHYES (continued)

Order/family/subfamily/genus	No. of genera		No. of sp/spp		2n	Genome size (pg/cell)			
	total	studied	total	studied		FCM	FD	FIA	BFA
<b>SQUALIFORMES</b>				<b>4</b>					
Centrophoridae	2	0	14	0			13.1–14.2	14.5	
Dalatiidae	7	0	10	0			18.2		
Etmopteridae	5	1	41	2	86	16.2	32.3	23.8–25.4	
Oxynotidae	1	1	5	1	62		34.1	25.0	
Somniosidae	7	0	17	0			16.4–26.0	19.5–23.2	
Squalidae	2	1	10	1	58–60, 78	14.0	13.7–14.4	11.6	12.0
<b>SQUATINIFORMES</b>				<b>1</b>					
Squatinae	1	1	15	1	88			32.8	18.6–19.6
<b>PRISTIOPHORIFORMES</b>				<b>0</b>					
Pristiophoridae	2	0	5	0					
<b>Subdivision Batoidea</b>									
<b>TORPEDINIFORMES</b>				<b>6</b>					
Narcinidae	9	2	37	2		14.7, 24.1	21.0–24.0		8.4
<i>Narcine</i>					28				8.4
<i>Narke</i>					54		21.0–24.0		
Torpedinidae	2	1	22	4	66, 82, 86	14.1	14.0–15.0		14.6
<b>PRISTIFORMES</b>				<b>0</b>					
Pristidae	2	0	7	0					5.6
<b>RAJIFORMES</b>				<b>11</b>					
Rajidae	26	3	238	7	58, 96–98	5.8–7.2	5.4–8.1	5.5–6.9	5.6–7.2
Rhinidae	1	0	1	0					
Rhinobatidae	4	1	42	4	59–64, 84, 92	4.9–8.0	5.9–8.3	6.0	8.0
Rhynchobatidae	1	0	4	0					
<b>MYLIOBATIFORMES</b>				<b>22</b>					
<b>Suborder Platyrrhinoidei</b>				<b>1</b>					
Platyrrhinidae	2	1	3	1	64	9.0, 15.5			15.4
<b>Suborder Zanobatoidei</b>				<b>0</b>					
Zanobatidae	1	0	2	0			11.7		
<b>Suborder Myliobatoidei</b>				<b>21</b>					
Dasyatidae	6	2	68	8	58, 64–78	7.8–10.1	8.5–13.7	6.8–13.4	9.4
Gymnuridae	2	1	11	2	56	10.0, 11.4			16.2
Hexatrygonidae	1	0	1	0		10.0			
Myliobatidae				<b>6</b>					
Mobulinae	2	1	10	1	66	9.6–10.2	9.4		
Myliobatinae	4	1	20	4	52–54	10.4–11.9	8.7–10.8		9.8
Rhinopterinae	1	1	7	1	64	10.0–10.2			10.4
Plesiobatidae	1	0	1	0					
Potamotrygonidae	3	2	20	3	66, 90				
Urolophidae	2	1	24	2	52, 72	15.5	13.1		13.0
Urotrygonidae	2	0	16	0					

Table 3.2 Class ACTINOPTERYGII. Part 1 Cladistia and Chondrostei

Order/family	No. of genera		No. of sp/spp		2n	Genome size (pg/cell)			
	total studied		total studied			FCM	FD	FIA	BFA
Grade Teleostomi (OSTEICHTHYES)									
Class ACTINOPTERYGII									
Subclass Cladistia									
POLYPTERIFORMES									
Polypteridae	2	2	16	7	36, 38		9.1–14.5	7.4	9.4–9.8
Subclass Chondrostei									
ACIPENSERIFORMES									
Acipenseridae	4	4	25	20	105–372				
(2X)					105–120	2.4–4.7	3.2–3.6	4.4	
(4X)					240–260	8.8–9.5	6.1–9.1		
(6X)					372	13.1		13.8	
Polyodontidae	2	1	2	1	120	3.2–4.9			

Table 3.3 Class ACTINOPTERYGII. Part 2 Neopterygii

Order/family/subfamily/genus	No. of genera		No. of sp/spp		2n	Genome size (pg/cell)			
	total studied		total studied			FCM	FD	FIA	BFA
Subclass Neopterygii									
Division Holostei									
LEPISOSTEIFORMES									
Lepisosteidae	2	1	7	2	56, ca. 68	2.8	2.9	2.8	2.4
AMIIFORMES									
Amiidae	1	1	1	1	46		2.3–2.5	2.3	
Division Teleostei									
Subdivision Osteoglossomorpha									
HIODONTIFORMES									
Hiodontidae	1	1	2	2	50		1.2		
OSTEOGLOSSIFORMES									
Osteoglossidae	4	4	7	7	40–56			1.6–1.8	2.0
Pantodontidae	1	1	1	1	48				1.5
Mormyridae	18	2	201	2	48				2.0–2.4
Notopteridae	4	4	8	4	34, 42	2.2			2.6
Gymnarchidae	1	0	1	0					
Subdivision Elopomorpha									
ELOPIFORMES									
Elopidae	1	1	6	1	48				2.4
Megalopidae	1	1	2	2	46, 50–52			2.0	
ALBULIFORMES									
Suborder Albuloidei									
Albulidae	1	0	3	0					
Suborder Notacanthoidei									
Halosauridae	3	0	15	0					
Notacanthidae	3	0	10	0					
ANGUILLIFORMES									
Suborder Anguilloidei									
Anguillidae	1	1	15	5	38	2.2		2.0	2.8–3.3
Heterenchelyidae	2	0	4	0					
Moringuidae	2	1	6	1	50				



Table 3.3 Class ACTINOPTERYGII. Part 2 Neopterygii (continued)

Order/family/subfamily/genus	No. of genera		No. of sp/spp		2n	Genome size (pg/cell)			
	total	studied	total	studied		FCM	FD	FIA	BFA
<b>Suborder Muraenoidei</b>				12					
Chlopsidae	8	0	18	0				3.9	
Muraenidae	15	3	185	12	36, 42	4.6		3.8	4.4–5.1
Myrocongridae	1	0	4	0					
<b>Suborder Congroidei</b>				15					
Colocongridae	1	0	5	0					
Congridae	22	2	160	5	34, 38	2.4–3.6			
Derichthyidae	2	0	3	0					
Muraenesocidae	4	1	8	1	38			2.3	
Nemichthyidae	3	0	9	0					
Nettastomatidae	6	0	38	0					
Ophichthidae	52	7	290	8	38–48				
Serrivomeridae	2	0	10	0					
Synaphobranchidae	10	1	32	1	26			3.2	
<b>SACCOPHARYNGIFORMES</b>				0					
<b>Suborder Cyematoidei</b>				0					
Cyematidae	2	0	2	0					
<b>Suborder Saccopharyngoidei</b>				0					
Eurypharyngidae	1	0	1	0					
Monognathidae	1	0	15	0					
Saccopharyngidae	1	0	10	0					
<b>Subdivision Otocephala (= Ostarioclupeomorpha)</b>									
<b>CLUPEIFORMES</b>				30					
<b>Suborder Denticipitoidei</b>				0					
Denticipitidae	1	0	1	0					
<b>Suborder Clupeoidei</b>				30					
Pristigasteridae	9	0	34	0					
Chirocentridae	1	0	2	0				1.6	
<b>Clupeidae</b>				23					
Alosinae	7	3	31	9	46, 48		2.0		2.2–2.8
Clupeinae	16	6	72	9	28, 44–48, 50–54		2.0–2.7	1.8–2.1	1.5
Dorosomatinae	6	4	22	5	48	2.0		1.8	
Pellonulinae	23	0	44	0				2.2	
Engraulidae	16	4	139	7	42, 44, 48	2.9	3.0		3.8
<b>GONORYNCHIFORMES</b>				2					
<b>Suborder Chanoidei</b>				1					
Chanidae	1	1	1	1	32				
<b>Suborder Gonorynchoidei</b>				0					
Gonorynchidae	1	0	5	0					
<b>Suborder Knerioidei</b>				1					
Kneriidae	4	0	30	0					
Phractolaemidae	1	1	1	1	28				
<b>CYPRINIFORMES</b>				747					
<b>Superfamily Cyprinoidea</b>				630					
<b>Cyprinidae</b>	220	180	2420	628					
Acheilognathinae	3	3	50	34	42–48	2.1–2.3	1.8–2.1		
Barbinae	?	30	?	154	48–150				
(2X)		16		75	48–50	1.5–2.2	1.4–2.5		1.9–2.4
(4X)		9		57	96–100	2.7–3.7	3.4–3.5, 4.6		
(6X)		5		22	150				
Cultrinae	?	15	?	30	48	2.6	1.8–2.4		
Cyprininae	6	4	25	22	100–162				
(4X)		4		22	100	3.4–4.5	3.1–3.8, 4.8	3.4	
(6X)		1		3	150–162	5.4	4.6–4.8, 6.1		

Table 3.3 Class ACTINOPTERYGII. Part 2 Neopterygii (continued)

Order/family/subfamily/genus	No. of genera		No. of sp/spp		2n	Genome size (pg/cell)			
	total	studied	total	studied		FCM	FD	FIA	BFA
Gobiobotinae	?	2	?	7	50				
Gobioninae	?	21	?	65	50	2.4-3.7	2.8-3.3		
Hypophthalmichthyinae	2	2	3	2	48		1.9-2.1		
Labeoninae	?	12	?	50	44, 48, 50		2.8	2.2-2.5	2.2-2.6
Leuciscinae	?	68	?	200	48, 50	2.0-3.7	1.8-3.2	2.5-2.8	
Rasborinae (= Danioninae)	?	18	?	46	48-78				
(2X)		16		41	48-52	2.2, 3.4-4.6	1.8-2.9, 4.4	2.8	3.2, 3.6-4.4
(2X)		3		5	70-78	2.3	3.3		
Schizothoracinae	?	12	?	29	90-148, >400				
(4X)		11		22	90-92, 98-100		3.0-3.1, 4.9		
(6X)		1		6	148		6.5-7.0		
(18X)		1		1	417-470		17.2		
Squaliobarbinae	?	3	?	3	48	2.0	2.0-2.2		
Tincinae	1	1	1	1	48	2.3	1.7-2.1		
Xenocyprinae	4	4	?	7	48		2.1-2.8		
Psilorhynchidae	2	1	6	2	50				
<b>Superfamily Cobitoidea</b>				117					
Gyrinocheilidae	1	1	3	1	48	1.2	1.0	1.3	1.3
Catostomidae	13	9	72	15	96-100	3.7-5.5	4.0	4.2-5.1	
Cobitidae	26	19	177	76					
Botiinae	5	5	?	20	98-100	1.6-2.1	1.8-1.9		1.7
Leptobotiinae	2	2	?	11	50-52		1.1		
Cobitinae	19	12	130	45	48-100				
<i>Cobitis</i> (2X)				16	48, 50	2.8-4.0	4.3		
<i>Cobitis</i> (3X)				1	74-75	6.0			
<i>Cobitis</i> (4X)				3	96-98, 100	6.8-7.6	7.2		
non- <i>Cobitis</i> (2X)				27	48, 50		2.0-2.2		2.4-2.8
non- <i>Cobitis</i> (4X)				3	100		4.5-4.6		
Balitoridae	59	13	590	24					
Nemacheilinae	29	8	420	19	44-50, 75		1.0-1.1, 2.2		
Balitorinae	29	5	170	5	48, 50		0.9		
Vaillantellidae	1	1	1	1	50				
<b>CHARACIFORMES</b>				341					
<b>Suborder Citharinoidei</b>				0					
Citharinidae	3	0	8	0					
Distichodontidae	17	0	90	0					
<b>Suborder Characoidei</b>				341					
Acestrorhynchidae	1	1	15	3	50		1.7, 3.1		
Alestiidae (Alestidae)	18	1	110	1	56				2.4
Anostomidae	12	7	137	39	54		2.6-3.5		2.8-3.4
Characidae				194					
Aphyocharacinae	2	2	10	4	50		2.5-2.7		3.4
Bryconinae	3	2	43	12	50		2.4		
Chalceinae	1	1	2	1	52, 54		2.2		2.2
Characinae	12	6	70	13	46, 50, 52		2.2-3.1		3.4
Cheirodontinae	15	9	46	16	32, 42, 50, 52		3.7		
Glandulocaudinae	19	2	50	5	52		2.5, 3.1		
Iguanodectinae	2	1	2	1	50		2.4		
Paragoniatinae	7	1	8	1	52				
Serrasalminae	15	11	80	35	54, 58, 60-64		3.2-3.6	3.0	3.2-3.4
Stethaprioninae	4	3	12	4			3.5		
Tetragonopterinae	?	20	?	91	36, 38, 46-54	2.5-4.0	2.1-4.2		3.2-4.2
Triporthinae	?	1	?	11	50, 52		2.7, 3.5		
Chilodontidae	2	2	7	2	54				
Crenuchidae	12	1	74	9	50				
Ctenoluciidae	2	2	7	2	36				
Curimatidae	8	7	95	37	46, 54, 56, 102		2.8-3.8		
Cynodontidae	4	0	14	0			2.0-2.1		

Table 3.3 Class ACTINOPTERYGII. Part 2 Neopterygii (continued)

Order/family/subfamily/genus	No. of genera		No. of sp/spp		2n	Genome size (pg/cell)			
	total	studied	total	studied		FCM	FD	FIA	BFA
Erythrinidae	3	3	14	11	39–42, 48–54		2.3		2.8
Gasteropelecidae	3	3	9	5	48, 52, 54		2.2–2.6		2.8
Hemiodontidae	6	3	28	7	54				
Hepsetidae	1	0	1	0					
Lebiasinidae	7	4	61	11	22–46		2.0		2.4
Parodontidae	3	2	21	8	54		2.0–2.5		
Prochilodontidae	3	2	21	12	54		3.1–3.7		
SILURIFORMES				362					
Akysidae	4	0	42	0					
Amblycipitidae	3	2	26	9	20–42				
Amphiliidae	2	0	26	0					
Ariidae	21	9	150	15	52–56	4.5		4.9	4.8–5.0
Aspredinidae	12	1	36	1	50				
Astroblepidae	1	0	54	0					
Auchenipteridae	20	4	94	5	56, 58				
Auchenoglanididae	6	0	28	0					
Austroglanidae	1	0	3	0					
Bagridae	18	10	170	33	44, 48–60	1.8	1.9–2.1		1.8–2.2
Callichthyidae				48					
Callichthyinae	5	4	13	7	56–64				
<i>Dianema, Hoplosternum</i>				5	60–62		1.2–1.4		
<i>Callichthys</i>				1	56–58		1.9		3.4
<i>Megalechis</i>				1	64	3.2			
Corydoradinae	4	4	164	41	40–134				
<i>Corydoras</i> (2X)				12	56–62, 74		1.3–3.6	3.2	
<i>Corydoras</i> (2X)				8	40–50, 56		4.5–4.9		4.6–6.0
<i>Corydoras</i> (4X)				5	92, 120–134	8.4	6.3–8.8	6.4	8.4–8.8
Cetopsidae	7	0	23	0					
Chacidae	1	0	3	0					
Clariidae	14	2	90	8	50–56, 100		1.8		2.4
Claroteidae	7	0	59	0					
Cranoglanididae	1	1	3	1	74				
Diplomystidae	2	2	6	3	56		2.6		
Doradidae	30	11	72	13	56, 58, 66		3.5		3.2
Erethistidae	6	1	14	1	50				
Heptapteridae	25	6	175	20	46, 52–58, 87		1.8–2.2		
Heteropneustidae	1	1	3	1	56				
Ictaluridae	7	5	46	33	40–62	2.0	1.9–2.1		2.4
Loricariidae				74					
Ancistrinae	27	5	217	10	38–40, 48–52				3.6
Hypoptopomatinae	16	8	79	12	54, 58, 72		1.8, 2.7		4.2
Hypostominae	?	6	?	23	52–54, 64–80		3.2–4.5	3.2–3.4	4.2
Lithogeneinae	1	0	2	0					
Loricariinae	31	7	209	18	36–74			3.0	3.2
Neoplecostominae	?	5	?	10	54		2.3		
Upsiloninae	?	1	?	1	96				
Malapteruridae	2	0	19	0					2.0
Mochokidae	11	2	179	9	54, 56			1.9, 2.8	2.2–2.4
Nematogenyidae	1	0	1	0					
Pangasiidae	3	2	28	5	58, 60				
Pimelodidae	31	14	85	30	50, 54, 56		1.1, 2.0–2.8		2.4
Plotosidae	10	1	35	2	36–38, 48			3.5	
Pseudopimelodidae	5	5	26	6	54		2.2–2.5		
Schilbeidae	15	4	56	4	58, 66				2.0
Scoloplacidae	1	1	4	1	50				
Siluridae	11	4	97	13	42, 54–60, 86	2.3	1.7–2.9		1.8

Table 3.3 Class ACTINOPTERYGII. Part 2 Neopterygii (continued)

Order/family/subfamily/genus	No. of genera		No. of sp/spp		2n	Genome size (pg/cell)			
	total	studied	total	studied		FCM	FD	FIA	BFA
Sisoridae				9					
Sisorinae	6	2	23	2	42, 46–48				
Glyptosterninae	11	4	89	7	36, 42, 50–56				
Trichomycteridae	41	6	201	18	32, 54, 81		2.3–2.6		
<b>GYMNOTIFORMES</b>				17					
Suborder Gymnotoidei				6					
Gymnotidae	2	2	33	6	40–48, 52–54				2.0
Suborder Sternopygoidei				11					
Apterontidae	13	2	45	3	22, 24, 52				1.4
Hypopomidae	7	3	16	4	36–38, 42, 50				
Rhamphichthyidae	3	1	12	1	52			1.9	
Sternopygidae	5	2	28	3	28–40, 46–48				2.0
Subdivision Euteleostei									
<b>ARGENTINIFORMES</b>				5					
Suborder Argentinoidei				5					
Argentinidae	2	1	23	1	44		1.7		
Microstomatidae	11	4	38	4	36, 54, 60, 62		3.4, 6.3		
Opisthoproctidae	6	0	11	0					
Suborder Alepocephaloidei				0					
Alepocephalidae	23	0	90	0					
Bathylaconidae	2	0	3	0					
Platytroutidae	13	0	37	0					
<b>OSMERIFORMES</b>				19					
Galaxiidae	8	2	52	10	22, 30–44		1.8–2.1		
Osmeridae				9					
Hypomesinae	1	1	6	3	56				
Osmerinae	4	3	8	3	54, 56	1.2	1.5–1.7	1.4	
Plecoglossinae	1	1	1	1	56				
Salanginae	5	2	16	2	56				
Retropinnidae	3	0	5	0					
<b>SALMONIFORMES</b>				85					
Salmonidae				85					
Coregoninae	3	3	32	27	60–64, 72–86	6.0–7.1	5.1–6.9	4.0–4.9	
Thymallinae	1	1	5	3	98–110	4.3		4.0	
Salmoninae	7	7	73	55	52–92				
<i>Brachymystax</i>				1	90–92				
<i>Hucho</i>				2	82–84				
<i>Parahucho</i>				1	62				
<i>Oncorhynchus</i>				21	52, 58–70, 74	4.9–6.4	4.1–6.6	4.7–5.0	6.0–6.6
<i>Salmo</i>				12	54–58, 78–84	5.2–6.4	5.5–5.8	6.5	
<i>Salvelinus</i>				18	78–84	5.7	7.4–7.5	5.8–6.7	7.0
<b>ESOCIFORMES</b>				11					
Esocidae	1	1	6	6	50	2.3	2.2–2.7	1.8–2.3	
Umbridae	3	3	7	5	22, 44, 48, 78				
<i>Dallia</i>				1	78		2.5		
<i>Novumbra</i>				1	48		2.1		
<i>Umbra</i>				3	44, 22		4.8–5.0	5.1	5.4
<b>STOMIIFORMES</b>				7					
Diplophidae	3	0	8	0					
Suborder Gonostomatoidei				7					
Gonostomatidae	5	3	23	3	12, 48				
Sternoptychidae	10	2	67	4	35, 48–52				

Table 3.3 Class ACTINOPTERYGII. Part 2 Neopterygii (continued)

Order/family/subfamily/genus	No. of genera		No. of sp/spp		2n	Genome size (pg/cell)			
	total	studied	total	studied		FCM	FD	FIA	BFA
<b>Suborder Phosichthyoidei</b>									
Phosichthyidae	7	0	20	0					
Stomiidae	28	0	273	0			2.6		
<b>ATELEOPODIFORMES</b>									
Ateleopodidae	4	0	12	0					
<b>AULOPIFORMES</b>									
<b>Suborder Synodontoidei</b>									
Aulopidae	2	0	10	0					
Paraulopidae	1	0	10	0					
Pseudotriconotidae	1	0	1	0					
Synodontidae	4	3	57	7	26–27, 48	2.2–2.9	1.6–2.5	2.7, 3.1	2.4
<b>Suborder Chlorophthalmoidei</b>									
Bathysauriidae	1	0	1	0					
Bathysauropsidae	1	0	3	0					
Chlorophthalmidae	2	1	19	2	24, 36				
Ipnopidae	5	0	29	0					
Notosudidae	3	0	19	0					
<b>Suborder Alepisauriidae</b>									
Alepisauridae	2	0	3	0					
Evermannellidae	3	0	7	0					
Paralepididae	13	0	56	0					
Scopelarchidae	4	0	17	0					
<b>Suborder Giganturoidei</b>									
Bathysauridae	1	0	2	0					
Giganturidae	1	0	2	0					
<b>MYCTOPHIFORMES</b>									
Neoscopelidae	3	1	6	1	48		2.6	5.0	
Myctophidae	32	16	240	27	44, 48		3.8–4.0		
<b>LAMPRIFORMES</b>									
Lampridae (= Lamprididae)	1	0	2	0					
Lophotidae	2	0	3	0					
Radiicephalidae	1	0	1	0					
Regalecidae	2	0	2	0					
Stylephoridae	1	0	1	0					
Trachipteridae	3	0	10	0					
Veliferidae	2	0	2	0					
<b>POLYMIXIIFORMES</b>									
Polymixiidae	1	0	10	0					
<b>Superorder Paracanthopterygii</b>									
<b>PERCOPSIFORMES</b>									
Amblyopsidae	5	0	6	0					
Aphredoderidae	1	1	1	1	48				
Percopsidae	1	0	2	0					
<b>GADIFORMES</b>									
Bregmacerotidae	1	0	15	0					
Euclichthyidae	1	0	1	0					
<b>Gadidae</b>									
Gadinae	12	6	25	10	26, 38–48		1.7–1.9	1.8	
Lotinae	3	1	5	1	48				
Ranicipitinae	1	1	1	1	48				
Macrouridae	27	0	350	0			1.5–1.9		
Melanonidae	1	0	2	0					

Table 3.3 Class ACTINOPTERYGII. Part 2 Neopterygii (continued)

Order/family/subfamily/genus	No. of genera		No. of sp/spp		2n	Genome size (pg/cell)			
	total	studied	total	studied		FCM	FD	FIA	BFA
Merlucciidae	1	0	13	0				1.7–1.9	1.9–2.0
Moridae	18	0	105	0				1.5, 1.9	
Muraenolepididae	1	1	4	1	48				
Phycidae	5	2	25	2	28, 48			1.7	
<b>OPHIDIIFORMES</b>				<b>3</b>					
Suborder Ophidioidei				3					
Carapidae	7	1	31	1	36				
Ophidiidae	48	2	222	2	43, 44			1.2–1.3	1.4, 1.7
Suborder Bythitoidei				0					
Aphyonidae	6	0	22	0					
Bythitidae	16	0	62	0					
Parabrotulidae	2	0	3	0					
<b>Superorder Acanthopterygii</b>									
<b>MUGILIFORMES</b>				<b>18</b>					
Mugilidae	17	8	72	18	24, 28, 48	1.6	1.4	1.6–2.0	2.0
<b>ATHERINIFORMES</b>				<b>21</b>					
Suborder Atherinopsoidei				12					
Atherinopsidae	11	6	108	12	44, 46, 48			1.3	2.2
Suborder Atherinoidei				9					
Atherinidae	12	2	60	2	48			2.1	
Atherionidae	1	1	3	1	48				
Melanoteaniidae	17	3	113	6	46, 48				2.6
Notocheiridae	2	0	6	0					
Phallostethidae	5	0	22	0					
<b>BELONIFORMES</b>				<b>26</b>					
Suborder Adrianichthyoidei				13					
Adrianichthyidae				13					
Adrianichthyinae	2	0	5	0					
Horaichthyinae	1	0	1	0					
Oryziinae	1	1	22	13	28–42, 46, 48	2.1–2.2	1.5–1.9		2.2
Suborder Belonoidei				13					
Belonidae	10	4	34	7	48, 50, 54	2.3	2.2	2.0	2.2–2.4
Exocoetidae	8	1	52	1	48	1.9			
Hemiramphidae	12	4	109	4	40, 46, 48, 52	2.0	1.5	1.9–2.4	1.5–2.2
Scomberesocidae	2	1	4	1	42				
<b>CYPRINODONTIFORMES</b>				<b>346</b>					
Suborder Aplocheiloidei				205					
Aplocheilidae	2	2	7	6	38, 48		1.5	1.5	1.4
Nothobranchiidae	?	10	250	155	16–42, 46–50				2.4
Rivulidae	28	12	236	44	20, 34–48, 54				3.0
Suborder Cyprinodontoidei				141					
Anablepidae	3	1	15	1	46				
Cyprinodontidae	9	6	104	35	48, 50, 52				3.2
Fundulidae	4	2	50	24	32–34, 40–48	2.7–3.0		2.6	2.8–3.0
Goodeidae	16	16	36	36	24–30, 42, 48				
Poeciliidae				44					
Aplocheilichthyinae	1	1	?	2	48				
Procatopodinae	9	3	78	4	48				
Poeciliinae	27	8	225	38	42–48 (69, 72)	1.3–2.0	1.3–2.1	2.8	1.7–1.9
Profundulidae	1	0	5	0					
Valenciidae	1	1	2	1	48				

Table 3.3 Class ACTINOPTERYGII. Part 2 Neopterygii (continued)

Order/family/subfamily/genus	No. of genera		No. of sp/spp		2n	Genome size (pg/cell)			
	total	studied	total	studied		FCM	FD	FIA	BFA
<b>STEPHANOBERYCIFORMES</b>					5				
Barbourisiidae	1	0	1	0					
Cetomimidae	9	0	20	0					
Gibberichthyidae	1	0	2	0					
Hispidoberycidae	1	0	1	0					
Megalomycteridae	4	0	5	0					
Melamphidae	5	4	36	5	42, 46–50, 58				
Mirapinnidae	3	0	5	0					
Rondeletiidae	1	0	2	0					
Stephanoberycidae	3	0	3	0					
<b>BERYCIFORMES</b>					9				
<b>Suborder Trachichthyoidei</b>					5				
Anomalopidae	6	0	8	0					
Anoplogastridae	1	1	2	1	48				
Diretmidae	3	1	4	2	44–46, 70			2.9	
Monocentridae	2	1	4	1	48				
Trachichthyidae	7	1	39	1	48			1.3	
<b>Suborder Berycoidei</b>					1				
Berycidae	2	1	9	1	48	1.7		2.0	
<b>Suborder Holocentroidei</b>					3				
Holocentridae	8	3	78	3	48, 50	2.0	1.3	1.5–1.7	1.8
<b>ZEIFORMES</b>					2				
<b>Suborder Cyttoidei</b>					0				
Cyttidae	1	0	3	0				1.5	
<b>Suborder Zeioidei</b>					2				
Grammicolepididae	3	0	3	0					
Oreosomatidae	4	1	10	1	42			2.5–2.6	
Parazenidae	3	0	4	0					
Zeidae	2	1	5	1	42–44			2.5	
Zeniontidae	3	0	7	0					
<b>GASTEROSTEIFORMES</b>					19				
<b>Suborder Gasterosteoidi</b>					10				
Aulorhynchidae	2	0	2	0					
Gasterosteidae	5	4	10	10	42, 46	1.2		1.3	1.2–1.4
Hypoptychidae	1	0	1	0					
Indostomidae	1	0	3	0					
<b>Suborder Syngnathoidi</b>					9				
Aulostomidae	1	0	3	0			1.4		
Centriscidae	2	0	4	0				0.9–1.1	
Fistulariidae	1	0	4	0		1.5–1.8		1.4	
Macroramphosidae	3	1	11	2	48			1.1	
Pegasidae	2	0	5	0					
Solenostomidae	1	0	5	0					
Syngnathidae	52	4	232	7	36, 44, 48, 58			1.1–2.7	
<i>Hippocampus, Syngnathus</i>				4	44, 48	0.9–1.1		0.9–2.1	1.3
<i>Nerophis</i>				1	58	3.6–3.9			
<b>BATRACHOIDIFORMES</b>					9				
Batrachoididae	22	5	78	9	44, 46, 48				3.4–6.0
<b>SYNBRANCHIFORMES</b>					8				
<b>Suborder Mastacembeloidei</b>					4				
Chaudhuriidae	6	0	9	0					
Mastacembelidae	5	3	73	4	48		1.6		1.5

Table 3.3 Class ACTINOPTERYGII. Part 2 Neopterygii (continued)

Order/family/subfamily/genus	No. of genera		No. of sp/spp		2n	Genome size (pg/cell)			
	total	studied	total	studied		FCM	FD	FIA	BFA
Suborder Synbranchioidei				4					
Synbranchidae	4	3	17	4					
<i>Monopterus</i>				2	24, 42		1.2-1.6		
<i>Synbranchus</i>				1	42-46		5.6-8.5		
SCORPAENIFORMES				101					
Suborder Dactylopteroidei				1					
Dactylopteridae	2	1	7	1	48				
Suborder Scorpaenoidei				36					
Scorpaenidae	56	12	418	36					
Sebastinae	7	4	133	18	46, 48	1.8-1.9		1.9-2.0	1.9-2.2
Scorpaeninae	20	5	185	16	34-48				
<i>Scorpaena</i>				2	34-36, 40-48	2.8	1.8	2.9	2.8
<i>Pterois</i>				1	48			2.0	
Apistinae	3	0	3	0					
Tetraroginae	11	2	38	2	47-48, 50	2.1			
Synanceiinae	9	1	35	1	48	1.2, 1.8			
Caracanthidae	1	0	4	0					
Aploactinidae	17	0	38	0					
Pataecidae	3	0	3	0					
Gnathanacanthidae	1	0	1	0					
Congiopodidae	4	0	9	0					
Suborder Platycephaloidei				9					
Triglidae	10	3	105	3	47-48			1.6	1.6, 2.0
Peristediidae	4	0	36	0					
Bembridae	5	0	10	0					
Platycephalidae	18	4	65	6	48			1.4-1.8	
Hoplichthyidae	1	0	10	0					
Suborder Anoplopomatoidei				1					
Anoplopomatidae	2	1	2	1	30			1.4	1.7
Suorder Hexagrammoidei				5					
Hexagrammidae	5	2	12	5	48	1.7	1.5	1.4-1.9	1.8-1.9
Suborder Normanichthyoidei				0					
Normanichthyidae	1	0	1	0					
Suborder Cottoidei				49					
Rhampocottidae	1	0	1	0					2.2
Ereuniidae	2	0	3	0					
Cottidae	70	16	275	34	32, 37-48, 52		1.5	1.4-1.9	1.8-1.9
Comephoridae	1	1	2	2	48				
Abyssocottidae	7	6	23	10	48				
Hemipteridae	3	1	8	1	46			1.8-2.0	1.9
Agonidae	22	1	47	1	48			1.5	
Psychrolutidae	8	0	35	0				1.8-2.0	
Bathylutichthyidae	1	0	1	0					
Cyclopteridae	6	1	28	1	50			1.7-1.9	
Liparidae	29	0	334	0				1.5-1.8	
PERCIFORMES				867					
Suborder Percoidei				314					
Acropomatidae	8	0	31	0					
Ambassidae	9	3	46	4	40, 44, 48			1.1	
Apodactylidae	1	0	5	0					
Apogonidae	23	4	273	13	34-38, 46	2.9		1.6-2.6	
Arripidae	1	0	4	0				1.4	
Banjosidae	1	0	1	0					
Bathyclupeidae	1	0	5	0					
Bramidae	7	1	22	1	54				
Caesionidae	4	0	20	0				2.2-2.3	
Callanthiidae	2	0	12	0					



Table 3.3 Class ACTINOPTERYGII. Part 2 Neopterygii (continued)

Order/family/subfamily/genus	No. of genera		No. of sp./ssp		2n	Genome size (pg/cell)			
	total	studied	total	studied		FCM	FD	FIA	BFA
Carangidae	32	13	140	26	46–50, 56	1.7	1.2–1.4	1.2–1.8	1.4–1.7
Caristiidae	2	0	5	0					
Centranchidae	2	1	8	1	44–48				
Centrarchidae	8	8	31	23	40, 46, 48	1.9–2.1	1.9–2.2	1.5–2.3	
Centrogeniidae	1	0	1	0					
Centropomidae	1	1	12	1	48				
Cepolidae	4	0	19	0					
Chaetodontidae	11	2	122	11	48	1.5–1.6	1.1	1.4–1.7	1.7
Cheilodactylidae	5	0	22	0				1.3–1.5	
Chironemidae	2	0	5	0					
Cirrhitidae	12	0	33	0		1.5			
Coryphaenidae	1	0	2	0				1.2	
Dichistiidae	1	0	2	0					
Dinolestidae	1	0	1	0					
Dinopercidae	2	0	2	0					
Drepaneidae	1	0	3	0				1.4	
Echeneidae	4	1	8	1	42			1.4	1.4
Emmelichthyidae	3	0	15	0		2.1		1.5	
Enoplosidae	1	0	1	0					
Epigonidae	6	0	25	0					
Gerreidae	8	4	44	8	48	1.4	0.9	1.2	1.6
Glaucosomatidae	1	0	4	0					
Grammatidae	2	0	12	0					
Haemulidae	17	6	145	17	48	1.6	1.2–1.5	1.7	1.7–2.0
Inermiidae	2	0	2	0					
Kuhliidae	1	1	10	2	48				
Kyphosidae	16	4	45	7	48	1.8		1.8, 2.1	1.6, 2.2
Lactariidae	1	0	1	0					
Latidae	2	2	9	2	48			1.4	
Latridae	3	0	8	0					
Leiognathidae	4	3	30	3	48			1.0–1.4	
Leptobramidae	1	0	1	0					
Lethrinidae	5	1	39	2	48	2.8–3.2		2.2–2.5	
Lobotidae	2	1	5	1	48				
Lutjanidae	7	3	105	18	47–48	2.9	2.0–2.2	1.4–2.7	1.9, 2.6
Malacanthidae	5	0	40	0					2.0
Menidae	1	0	1	0					
Monodactylidae	2	1	5	2	48				1.8
Moronidae	3	3	8	6	48	1.6		1.9	1.8
Mullidae	6	4	62	6	44, 48	1.2–1.3	1.0	1.1–1.3	
Nandidae	4	3	21	4	46, 48				
Nematistiidae	1	0	1	0					
Nemipteridae	5	0	64	0		2.2		1.5–1.7	
Notograpidae	1	0	3	0					
Opistognathidae	3	0	78	0				2.1	
Oplegnathidae	1	1	7	2	48	1.9			
Ostracoberycidae	1	0	3	0					
Pempheridae	2	1	26	1	48	1.4			
Pentacerotidae	7	0	12	0		1.6		1.4–1.5	
Percichthyidae	11	2	34	8	48	1.9		1.7	
Percidae	10	8	201	25	48	2.3–2.4		1.8–2.1	2.4
Perciliidae	1	0	2	0					
Plesiopidae	11	1	46	1	48				
Polycentridae	4	1	4	1	46				
Polynemidae	8	1	41	1	48				
Polyprionidae	2	0	5	0				1.5–1.8	
Pomacanthidae	8	3	82	14	48, 52			1.4	
Pomatomidae	1	1	1	1	48			1.6	1.9
Priacanthidae	4	1	18	1	52	1.5		1.7–1.8	2.2

Table 3.3 Class ACTINOPTERYGII. Part 2 Neopterygii (continued)

Order/family/subfamily/genus	No. of genera		No. of sp/spp		2n	Genome size (pg/cell)			
	total	studied	total	studied		FCM	FD	FIA	BFA
Pseudochromidae	20	0	119	0				1.4–1.9	
Rachycentridae	1	0	1	0					1.5
Sciaenidae	70	25	270	38	46, 48	1.3, 1.9	1.2–1.6	1.3–1.5	1.5–2.0
Scombroptidae	1	0	3	0					
Serranidae	64	8	475	29	48	2.1–2.7	1.8–2.2	1.3–2.5	2.4–2.6
Sillaginidae	3	1	31	1	48			1.3	
Sparidae	33	14	115	28	48	1.9	1.0–1.7	1.3–1.5	1.9–2.0
Symphysanodontidae	1	0	6	0					
Terapontidae	16	2	48	4	48	1.7		1.3–1.6	
Toxotidae	1	0	6	0		1.5			
<b>Suborder Elasmatoidei</b>				1					
Elasmomatidae	1	1	6	1	48				
<b>Suborder Labroidei</b>				241					
Cichlidae	112	54	?	130					
American cichlids	?	32	?	82	38–52, 60	2.0–2.5	2.4		2.0–2.4
Asian cichlids	1	1	3	2	46, 48				
African cichlids	?	21	?	46	38–48	1.9	1.6–2.4		2.0–2.4
Embiotocidae	13	3	23	3	48				1.5–2.0
Pomacentridae	28	12	348	46					
Amphiprioninae	1	1	27	3	48	2.3–2.4		1.6–2.1	
Chrominae	5	2	?	10	28–48	2.1	2.6	1.7–2.1	2.2
Lepidozyginae	1	0	1	0					
Pomacentrinae	21	10	?	33	36, 42, 48	2.3–3.4	1.5–1.7	1.4–2.1	
Labridae	68	21	453	58	22, 32–48	1.5–3.5	1.6–2.9	1.3–2.8	1.8–2.0
Odacidae	4	0	12	0					
Scaridae	10	4	88	4	46, 48	4.2	2.5–2.8	2.9–3.2	3.8–4.6
<b>Suborder Zoarcoidei</b>				13					
Bathymasteridae	3	1	7	1	26				1.9
Zoarcidae	46	3	230	4	48, 72		2.9–3.2	1.6–2.2	
Stichaeidae	37	6	76	6	28, 46–48, 56				1.6
Cryptacanthodidae	1	0	4	0					
Pholidae	3	1	15	2	26, 46				
Anarhichadidae	2	0	5	0					
Ptilichthyidae	1	0	1	0					
Zaproridae	1	0	1	0					
Scytalinidae	1	0	1	0					
<b>Suborder Notothenioidei</b>				63					
Artedidraconidae	4	3	25	9	46			4.1	
Bathydraconidae	11	7	16	7	20, 36–38, 44–48			2.8	
Bovichtidae	3	2	11	4	48				
Channichthyidae	11	10	15	13	47–48		3.7–4.4		
Eleginopidae	1	1	1	1	48				
Harpagiferidae	1	1	6	1	48				
Nototheniidae	14	11	50	27	22–32, 46–50, 58			2.0–3.6	
Pseudaphritidae	1	1	1	1	48				
<b>Suborder Trachinoidei</b>				8					
Ammodytidae	8	1	23	1	46				
Champsodontidae	1	0	13	0					
Cheimarrhichthyidae	1	0	1	0					
Chiasmodontidae	4	0	15	0					
Creediidae	7	0	16	0					
Leptoscopidae	3	0	5	0					
Percophidae	11	0	44	0					
Pinguipedidae	5	1	54	3	26, 42, 48			1.1–1.2	
Trachinidae	2	2	6	2	48				
Trichodontidae	2	1	2	1	48				
Trichonotidae	1	0	8	0					
Uranoscopidae	8	1	50	1	26–32	1.5		1.4	

Table 3.3 Class ACTINOPTERYGII. Part 2 Neopterygii (continued)

Order/family/subfamily/genus	No. of genera		No. of sp/spp		2n	Genome size (pg/cell)			
	total	studied	total	studied		FCM	FD	FIA	BFA
<b>Suborder Pholidichthyoidei</b>				0					
Pholidichthyidae	1	0	2	0					
<b>Suborder Blennioidei</b>				27					
Blenniidae	56	13	360	25	40–48	1.6	1.2–2.4	1.0–1.7	1.7–1.9
Chaenopsidae	13	0	86	0					
Clinidae	4	1	12	1	48				
Dactyloscopidae	9	0	43	0					
Labrisomidae	15	1	105	1	48				2.0
Tripterygiidae	23	0	150	0		1.7–2.6		1.7	
<b>Suborder Icosteoidi</b>				0					
Icosteidae	1	0	1	0					
<b>Suborder Gobiesocoidei</b>				5					
Gobiesocidae	36	4	140	5	42, 46, 48				
<b>Suborder Callionymoidei</b>				5					
Callionymidae	13	2	182	5	32, 36–38, 42	1.2, 1.6		1.4, 2.0	
Draconettidae	2	0	12	0					
<b>Suborder Gobioidi</b>				125					
Rhyacichthyidae	1	0	2	0					
Odontobutidae	5	3	15	4	44	2.2–2.4	2.5		
Eleotridae	35	10	155	14					
Butinae	13	3	?	5	46, 48			2.5	
Eleotrinae	22	5	?	9	46, 48				
Ptereleotridae	5	1	36	1	46			1.2	
Xenisthmidae	6	0	12	0					
Kraemeriidae	2	0	8	0					
Gobiidae	210	49	1950	106					
Gobiinae	130	21	?	52	30, 38–50, 52		0.8–2.0	1.7–3.4	
Gobionellinae	56	15	?	37	34, 40–48, 52	2.4–3.0		2.5	2.4–2.8
Sicydiinae	7	1	?	1	44				
Oxudercinae	10	8	?	14	38, 42–48			1.9	
Amblyopinae	10	2	?	2	38, 44, 46				
Microdesmidae (= Cerdalidae)	5	0	30	0					
Schindleriidae	1	0	3	0					
<b>Suborder Kurtoidei</b>				1					
Kurtidae	1	1	2	1	44				
<b>Suborder Acanthuroidei</b>				12					
Acanthuridae	6	3	80	6	34, 36, 48	1.6–1.7	1.4	1.3–2.0	
Ephippidae	8	1	16	1	48			1.5–1.6	1.9
Luvaridae	1	0	1	0					
Scatophagidae	2	2	4	2	48			1.4	1.5
Siganidae	1	1	27	3	42, 48	1.2–1.4		1.2–1.4	
Zanclidae	1	0	1	0					
<b>Suborder Scombrobracoidei</b>				0					
Scombrobracidae	1	0	1	0					
<b>Suborder Scombroidei</b>				10					
Sphyaenidae	1	1	21	1	48	1.2	1.4	1.1–1.3	1.7, 2.4
Gempylidae	16	0	24	0				1.6	
Trichiuridae	10	0	39	0				1.8	
Scombridae	15	4	51	9	48	1.7		1.6–1.8	1.8–2.2
Xiphiidae	1	0	1	0				1.3	1.8
Istiophoridae	3	0	11	0				1.3	
<b>Suborder Stromateoidi</b>				0					
Amarsipidae	1	0	1	0					
Centrolophidae	7	0	28	0				1.4–1.6	
Nomeidae	3	0	16	0					
Ariommatidae	1	0	7	0					
Tetragonuridae	1	0	3	0					
Stromateidae	3	0	15	0					1.6
<b>Suborder Anabantoidei (Labyrinthici, in part)</b>				30					

Table 3.3 Class ACTINOPTERYGII. Part 2 Neopterygii (continued)

Order/family/subfamily/genus	No. of genera		No. of sp/spp		2n	Genome size (pg/cell)			
	total	studied	total	studied		FCM	FD	FIA	BFA
Anabantidae	4	3	33	9	46, 48				
Helostomatidae	1	1	1	1	48				1.8
Osphronemidae	14	8	86	20	16, 42, 46, 48	1.1-1.9		1.3	1.2-1.6
Suborder Channoidei				11					
Channidae	2	2	29	11	32-48, 66, 104		1.3-1.9		2
Suborder Caproidei				1					
Caproidae	2	1	11	1	42-46				
<b>PLEURONECTIFORMES</b>				<b>62</b>					
Suborder Psettoidae				0					
Psettodidae	1	0	3	0				1.4	
Suborder Pleuronectoidei				62					
Citharidae	5	0	6	0					
Scophthalmidae	4	2	8	3	40, 44			1.3, 1.7	
Paralichthyidae	16	6	105	14	28, 38, 46, 48	1.4	1.6	1.0-1.1	1.5-2.0
Pleuronectidae	23	12	60	21	44, 46, 48	1.2-1.3	1.3-1.5	1.1-1.7	1.3-1.9
Bothidae	20	2	140	3	38, 44	1.2			
Paralichthodidae	1	0	1	0					
Poecilopsettidae	3	0	20	0					
Rhombosoleidae	9	0	19	0					
Achiropsettidae	4	0	6	0					
Samaridae	3	0	20	0					
Achiridae	7	5	33	7	34-42				1.3
Soleidae	35	5	130	7	30, 42, 46-48	1.5		1.5-2.1	
Cynoglossidae	3	3	127	7	34, 38-42, 46	1.5		1.2	2.2
<b>LOPHIIFORMES</b>				<b>4</b>					
Antennariidae	12	2	42	3	46, 48				1.6
Lophiidae	4	1	25	1	46			2.1	2.0
Tetrabrachiidae	1	0	1	0				1.5	
Lophichthyidae	1	0	1	0					
Brachionichthyidae	1	0	4	0					
Chaunacidae	2	0	14	0					
Ogcocephalidae	10	0	68	0					1.5
Caulophryniidae	2	0	5	0					
Neoceratiidae	1	0	1	0					
Melanocetidae	1	0	5	0					
Himantolophidae	1	0	18	0					
Diceratiidae	2	0	6	0					
Oneirodidae	16	0	62	0			2.0		
Thaumatichthyidae	2	0	7	0					
Centrophryniidae	1	0	1	0					
Ceratiidae	2	0	4	0					
Gigantactinidae	2	0	22	0					
Linophryniidae	5	0	27	0					
<b>TETRAODONTIFORMES</b>				<b>65</b>					
Suborder Triacanthoidei				0					
Triacanthodidae	11	0	21	0					
Suborder Balistoidei				31					
Triacanthidae	4	2	7	2	48			1.0	
Balistidae	11	8	40	14	40-46	1.4-1.5	1.1	1.2-1.3	1.4
Monacanthidae	32	7	102	10	33-40	1.1-1.2		0.9-1.3, 1.6	1.3-1.4
Ostraciidae	14	2	33	5	34-36, 48-50	2.0-2.2	1.9		1.7, 2.2
Suborder Tetraodontoidei				34					
Triodontidae	1	0	1	0					
Tetraodontidae	19	7	130	29	28, 34-46	0.8-0.9		0.8-1.0	0.8-1.0
Diodontidae	6	2	19	4	46, 52	1.6-1.7			1.8
Molidae	3	1	4	1	46	1.7-1.9			

Table 3.4 Class SARCOPTERYGII

Order/family/species	No. of genera		No. of sp./ssp		2n	Genome size (pg/cell)			
	total	studied	total	studied		FCM	FD	FIA	BFA
Class SARCOPTERYGII									
Subclass Coelacanthimorpha									
COELACANTHIFORMES									
Latimeriidae	1	1	2	1	48=32+16MC		7.2		
Subclass Dipnotetrapodomorpha									
CERATODONTIFORMES									
Suborder Ceratodontoidei									
Ceratodontidae	1	1	1	1	54=34+20MC	106.0	150.0	109.0	
Suborder Lepidosirenoidei									
Lepidosirenidae	1	1	1	1	38	161.0	226.0–248.0		
Protopteridae	1	1	4	3	34, 68	125.0–131.0	80.0–266.0		
<i>Protopterus annectens</i>					34		81.0		
<i>Protopterus dolloi</i>					68		163.0		

## Cytogenetic Approach to Fish Systematics

To clarify interrelationships of fishes cytogenetically, genome size has been studied in fishes (Hingardner and Rosen 1972: H-13; Ojima and Yamamoto 1990: O-48; Hardie and Hebert 2004: H-40; Pie et al. 2007: P-61; Smith and Gregory 2009: S-191). However, the question of the C-value enigma has been a puzzle for almost half a century, which suggests that a simple comparison of taxa and their genome size may be insufficient for the study of genome evolution in fishes. Concerning genome size, the transposable elements, the spectrum of size and frequency of small spontaneous nucleotide insertions and deletions, and genome duplication are the important parameters in the long-term evolution of genome size (Petrov 2001: P-5; Gregory 2005: G-22).

As inferred by gene mapping analysis, inter- and intra-chromosomal rearrangements by Robertsonian translocation, tandem fusion, pericentric- and paracentric-inversion have occurred in fishes and a higher rate of chromosomal rearrangements in teleosts compared to other vertebrates has been hypothesized based on a comparison of the medaka genome with the zebrafish, pufferfish, and human genomes (Ravi and Venkatesh 2008: R-117). Therefore, synthetic analyses of karyotypes, genome sizes, and DNA sequences, and stepwise study inferring the karyotype and genome size of the latest common ancestor in monophyly from lower to higher taxa, may be necessary to clarify fish systematics.

Recently, the early fish proto-karyotype has been studied (Jaillon et al. 2004: J-21; Naruse et al. 2004: N-77; Woods et al. 2005: W-37; Kohn et al. 2006: K-141; Nakatani et al. 2007: N-75). According to Sato and Nishida (2010: S-205), whole-genome duplication (WGD), which generates many thousands of duplicate genes, is believed to be one of the major evolutionary events that shaped the genomes of vertebrates including fishes and tetrapods. Interestingly, the analysis of teleost fish genomes has revealed that teleosts experienced an additional WGD (3R-WGD), whereas tetrapods experienced only 1R- and 2R-WGD; exceptionally, some lineages of amphibians and reptiles have experienced an additional WGD. The chromosomal distribution of the homologous genes can be compared between tetrapods and teleosts by whole-genome sequence analysis, and this information can then be used to infer the karyotype of the osteichthyan ancestor. Nakatani et al. (2007: N-75) hypothesized the following karyotype evolution model in fishes based on reconstruction of the vertebrate ancestral genome. Before the first round of WGD, the vertebrate ancestor karyotype was  $2n = 20-26$ , and the subsequent 2R-WGD and some genome rearrangements yielded the jawed vertebrate ancestor of  $2n = 80$ . After the divergence of Osteichthyes and Chondrichthyes, genome rearrangements reduced the number of chromosomes in the osteichthyan ancestor to  $2n = 62$ . After the divergence of ray-finned and lobe-finned fishes, in the lineage of ray-finned fishes (Actinopterygii), chromosome fusions reduced the number of chromosomes and produced the teleost ancestor with  $2n = 26$ . Subsequently, the whole-genome duplication (3R-WGD) in the teleost ancestor doubled the number of chromosomes to  $2n = 52$ . The number of chromosomes in the teleost lineage has remained nearly unchanged during evolution, and the chromosome numbers of extant teleost species peak at  $2n = 48$  or 50.

## Database of Karyotypes: How to Use the Database

The database of fish karyotypes (Tables 4–7) is organized in the form of tables subdivided into 12 columns (A to L) as follows.

1. Column **A** contains current scientific names of karyotyped taxon. Classification of species, as a rule, followed Eschmeyer's *Catalogue of Fishes* (E-13). Classification of higher taxa than species, as a rule, followed Nelson (N-68). Hybrids were not included. Synonymy of species/subspecies followed, as a rule, Eschmeyer (E-13).
2. Column **B** includes the names used in the original karyotype papers in cases in which these differ from currently accepted classification.
3. Column **C** shows the sex of fishes studied. The majority of fishes reproduce bisexually. However, sex chromosome systems unequivocally identified by karyotypes are known only in a limited number of species. Datasets for such heterosomes were given separately for both sexes and were marked with 'F' for females and 'M' for males. For possible further items, see also column **J**.
4. Column **D** contains diploid chromosome number ( $2n$ ), marked with an asterisk when inferred from a haploid number. B chromosomes, as a rule, were excluded from diploid chromosome number.
5. Column **E** includes the karyotype. Classification of chromosomes followed Levan et al. (L-25): M, metacentrics, SM, submetacentrics, ST, subtelocentrics, A, acrocentrics. When these could not be clearly derived from source publications, classification was as follows: meta- and/or submetacentric (M/SM), submeta- and/or subtelocentric (SM/ST), and subtelo- and/or acrocentric (ST/A). Difference in the karyotype could be attributed to different degrees of chromosome condensation, leading to differences in chromosome classification among authors. In karyotypes of cartilaginous fishes and ancient fishes such as lobe-finned, acipenseriform, and lepisosteiform fishes, small dot-like microchromosomes (MC) have been observed. They are so small that they could not be identified to any type of chromosomes defined by Levan et al. (1964: L-25) at present. It is unknown whether MC is different from M, SM, ST, and A. In this book, MC was added as an additional type to M, SM, ST, and A. As for papers in which the description of karyotype disagrees with the figures, karyotypes based on the figures, as a rule, were adopted.
6. Column **F** ( $NF_1$ ) shows fundamental arm number, when M and SM are counted as two-armed.
7. Column **G** ( $NF_2$ ) contains fundamental arm number, when M, SM, and ST are counted as two-armed. The arm number by Scheel (1972: S-24) differs from  $NF_2$ . As Scheel counted all chromosomes with a short arm as two-arms, acrocentrics with short arms were counted as two-arms, i.e.,  $NF$  sensu Scheel  $\geq NF_2$ . Therefore, Scheel's arm number is shown in parentheses.
8. Column **H** includes the number of Ag-NORs. The number and position of NORs can differ by different methods such as chromomycin  $A_3$  and silver staining. Silver staining is the method specific to NORs and studied widely. The number of Ag-NORs in the embryo tends to be larger than that of adults. Recently, 18S rDNA and 5S rDNA, which are components of NORs, have been examined by fluorescence in situ hybridization (FISH). However, the number of species for which NORs have been studied by FISH is limited.
9. Column **I** shows genome size (pg/cell). Following Gregory (G-85), the methods used to estimate genome size were listed in five categories: flow cytometry (FCM), Feulgen densitometry (FD), Feulgen image analysis densitometry (FIA), bulk fluorometric assay (BFA), and static cell fluorometry (SCF). To facilitate comparison of genome size (pg/cell), the genome sizes of standard species were updated according to Gregory (G-85): *Acipenser ruthenus* (3.8 pg), *Carassius auratus* (3.5 pg), *Cyprinus carpio* (3.4 pg), *Gallus domesticus*

(2.5 pg), *Homo sapiens* (7.0 pg), *Myxine garmani* (9.2 pg), *Mus musculus* (6.5 pg), *Oncorhynchus mykiss* (5.2 pg), *Salmo salar* (6.0 pg), *Scyliorhinus canicula* (11.4 pg), *Thymallus thymallus* (4.3 pg), and *Tinca tinca* (2.0 pg). Therefore, genome size by Ojima and Yamamoto (O-48) was revised to be 76% of their genome size in this book. The revised genome size was marked with an asterisk. Genome size, which is difficult to specify to one of different karyotypes in a given species, was shown in parentheses.

10. Column J contains cytogenetic information on sex chromosomes, ploidy, B chromosomes, and diploid chromosome number of the latest common ancestor (ACN, ancestral chromosome number) and others: B, B chromosomes; ploidy, 2X, 3X, 6X. ACN was inferred based on  $2n$  and the number of large chromosomes (LC), which were inferred to be formed by Robertsonian fusion, being  $2n +$  number of LC. The definition of ACN is the same as NAN sensu Arai and Nagaiwa (1976: A-64).
11. Column K includes the locality of fish analyzed in the karyotype papers. If the locality was not provided in the original source, known distributions for the species appear in parentheses.
12. Column L shows references numbered as provided in the References.



Table 4 Jawless fishes

Table 4.1 Class MYXINI. Order MYXINIFORMES

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
Family/subfamily/species	karyotype paper										
<b>Myxiniidae</b>											
<b>Eptatretinae</b>											
<i>Eptatretus burgeri</i>		F, M	36	(spermatogonia 2n=52)	36	36		6.0 SCF	B in spermatogonia	Japan (Kanagawa, Ibaraki) N-6, N-62	
<i>Eptatretus burgeri</i>	<i>burgeriare</i>	F	36	36A						Japan (Kanagawa)	K-66, K-67
<i>Eptatretus cirrhatus</i>	Type A	F, M	34	(spermatogonia 2n=72)				4.6 SCF	B in spermatogonia	New Zealand	N-62
<i>Eptatretus cirrhatus</i>	Type B	M	34	(spermatogonia 2n=80)					B in spermatogonia	New Zealand	N-62
<i>Eptatretus okinoseanus</i>		F, M	34	(spermatogonia 2n=54)				5.4 SCF	B in spermatogonia	Japan (Kanagawa, Ibaraki) N-6, N-62	
<i>Eptatretus stoutii</i>		M	34	(spermatogonia 2n=48-54)				5.6 SCF, (5.5 FD)	B in spermatogonia	Canada (off Bamfield)	N-62, A-106
<i>Eptatretus stoutii</i>								5.4 FCM, (5.6 BFA)		N. Pacific	T-28, T-73, H-37
<b>Myxiniinae</b>											
<i>Myxine garmani</i>		F, M	14	(spermatogonia 2n=16)				9.2 SCF		Japan (Kanagawa, Ibaraki) N-6, N-62	
<i>Myxine glutinosa</i>		F, M	28	(germ cells 2n=42-44)	28	28				Sweden (Gullmaren Fjord) N-47	
<i>Myxine glutinosa</i>		F, M	28	(spermatogonia 2n=44)				8.6 SCF		Sweden (Baltic)	N-62
<i>Paramyxine atami</i>		F, M	34	(spermatogonia 2n=48)				6.9 SCF	B in spermatogonia	Japan (Kanagawa, Ibaraki) N-6, N-62	
<i>Paramyxine atami</i>		F	36	36A	36	36				Japan (Kanagawa)	K-66, K-67
<i>Paramyxine atami</i>		F	34	34A	34	34				Japan (Kanagawa)	K-66, K-67
<i>Paramyxine sheni</i>		M	34	(spermatogonia 2n=66-96)					B in spermatogonia	Taiwan (Taitung)	S-68, K-140

Table 4.2 Class PETROMYZONTIDA. Order PETROMYZONTIFORMES

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup> NORS	Genome size (pg/cell)	Comments	Locality	Reference
Family/species	karyotype paper										
<b>Petromyzontidae</b>											
<i>Eudontomyzon</i>	<i>mariae</i>		168							Europe	H-44
<i>Ichthyomyzon</i>	<i>fossor</i>		166 (mode)					2.7* FD		USA (Great lakes)	R-85, R-116
<i>Ichthyomyzon</i>	<i>gagei</i>		164 (mode)	164 ST/A	164			2.6* FD		USA (AL)	H-35, R-116
<i>Lampetra</i>	<i>aepyptera</i>		161-168	all ST/A	161-168				ammocoetes	USA (AL)	H-25
<i>Lampetra</i>	<i>fluvialilis</i>		164 (mode)					2.6 FCM, 2.9* FD		UK	R-85, R-116, V-86
<i>Lampetra</i>	<i>lamottei</i>		166 (mode)					2.8* FD		USA (Great lakes)	R-85, R-116
<i>Lampetra</i>	<i>planeri</i>		164 (mode)					2.7, 2.8* FD		UK	R-85, R-116, A-106
<i>Lampetra</i>	<i>zanandreae</i>		142							Europe	Z-40
<i>Lethenteron</i>	<i>camtschatica</i>		144-162							Japan (Hokkaido)	K-67
<i>Lethenteron</i>	<i>reissneri</i>		165-174							Japan (Hokkaido)	S-13
<i>Petromyzon</i>	<i>marinus</i>	F, M	168	168 M/SM/ST/A				4.2 FCM, 4.2* FD		UK (England)	P-80, T-73, R-116
<i>Petromyzon</i>	<i>marinus</i>							3.2 BFA			H-37
<b>Geotriidae</b>											
<i>Geotria</i>	<i>australis</i>		180					3.1* FD		S. W. Australia	R-86, R-116
<b>Mordaciidae</b>											
<i>Mordacia</i>	<i>mordax</i>		76	numerous M/SM				2.8* FD		S. E. Australia	P-59, R-116
<i>Mordacia</i>	<i>praecox</i>	M	76							Australia (N.S.W.)	R-84

Table 5 Class CHONDRICHTHYES

Table 5.1 Order CHIMAERIFORMES

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup> NORs	Genome size (pg/cell)	Comments	Locality	Reference
Family/species	karyotype paper										
<b>Chimaeridae</b>											
<i>Chimaera monstrosa</i>			86	86 ST/A/MC	86					Sweden	N-46
<i>Hydrolagus collettei</i>		F	ca. 58	all A/MC	ca. 58		3.0 FD, 3.2 BFA			USA (Los Angeles)	O-7, H-37

Table 5.2 Order HETERODONTIFORMES

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup> NORs	Genome size (pg/cell)	Comments	Locality	Reference
Family/species	karyotype paper										
<b>Heterodontidae</b>											
<i>Heterodontus francisci</i>		F	102	26 non-A + 76A		128		17.5 FCM, 14.5 FD, 13.6 BFA		(E. Pacific)	S-40, S-185, H-37
<i>Heterodontus japonicus</i>		M	102	10 M/SM + 92 ST/A	112		27.2, 31.9 FD			Japan (Sagami Bay)	I-6

Table 5.3 Order LAMNIFORMES

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup> NORs	Genome size (pg/cell)	Comments	Locality	Reference
Family/species	karyotype paper										
<b>Lamnidae</b>											
<i>Carcharodon carcharias</i>		M	82	48 non-A + 34A		130		12.9 FCM	XY?	Atlantic	S-40, M-114
<b>Odontaspidae</b>											
<i>Carcharias taurus</i>			ca. 84					10.9 FCM		(global)	S-41

Table 5.4 Order CARCHARHINIFORMES

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup> NORS	Genome size (pg./cell)	Comments	Locality	Reference
Family/species	karyotype paper										
<b>Carcharhinidae</b>											
<i>Carcharhinus acronotus</i>		M	84	32 non-A + 52A		116		6.7 FCM, 6.8 BFA		USA (NC)	S-41, H-37
<i>Carcharhinus limbatus</i>		M	ca. 86	ca. 50 A and others		ca. 120		7.8 FCM, 7.4 BFA		USA (NC)	S-41, H-37
<i>Carcharhinus limbatus</i>			86	33 M/SM + 53A	119			8.2 FD		Mediterranean	S-115
<i>Carcharhinus obscurus</i>			ca. 78	ca. 20 M/SM + others	ca. 98			5.5, 6.0 FD		Japan (Chiba)	A-105, M-133
<i>Carcharhinus plumbeus</i>			ca. 74	ca. 18 M/SM + others	ca. 92			6.0 FD		Japan (Ogasawara)	A-105
<i>Galeocerdo cuvieri</i>		F, M	86	38 non-A + 48A		124		8.3 FCM		USA (NC)	S-40, M-114
<i>Galeocerdo cuvieri</i>			86	40 M/SM + 46A	126	126		(7.6* FCM)		Mediterranean	S-115, O-48
<i>Prionace glauca</i>		F, M	86	30 M/SM + 56 ST/A	116			8.6 FD		Japan (off Sanriku)	A-105
<i>Prionace glauca</i>			78	28 M/SM + 50 ST/A	106			8.6 FD		(global)	A-102
<i>Prionace glauca</i>		M	78	4M + 6SM + 20 ST/A and others				(8.6 BFA)		N. Pacific	Y-4, H-37
<i>Rhizoprionodon terraenovae</i>		M	80	44 non-A + 36A		124		7.2 FCM	sex chrom?	USA (NC)	S-40, M-114
<i>Rhizoprionodon terraenovae</i>			90	32 M/SM + 58A	122	122					S-115
<b>Scyliorhinidae</b>											
<i>Cephaloscyllium umbratile</i>		M	64	34 M/SM + 30 ST/A	98			14.7 FD		Japan (Suruga Bay)	A-101
<i>Cephaloscyllium ventriosum</i>			64	46 non-A + 18A		110		18.1 FCM, 15.4 BFA		(E. Pacific)	S-40, H-37
<i>Scyliorhinus canicula</i>			62	18M + 24SM + 20 A/MC	104		2	11.3 FD		Italy	S-111, R-87
<i>Scyliorhinus stellaris</i>			72	30M + 20SM + 22 MC	122		2	12.3 FD		Italy	S-111, R-87
<i>Scyliorhinus torazame</i>		M	64	26 M/SM + 38 ST/A	90			13.2 FD		Japan (Shimokita)	A-101
<b>Sphyrnidae</b>											
<i>Sphyrna lewini</i>		F	86	20 M/SM + 66 ST/A	106			(6.1 F/A)		Japan (Ogasawara)	A-105, H-40
<i>Sphyrna lewini</i>			78	18 non-A + 60A		96		6.6 FCM, (7.0 BFA)		(global)	S-40, H-37
<b>Triakidae</b>											
<i>Mustelus canis</i>			80	44 M/SM + 36A	124	124		9.6 FD, 9.2 BFA		(W. Atlantic)	S-115, H-37
<i>Mustelus manazo</i>		F	68	44 M/SM + 24 ST/A	112			9.3 FD		Japan (Chiba)	A-102
<i>Triakis scyllia</i>		M	72	36 M/SM + 36 ST/A	108			9.8 FD		Japan, Pacific	A-102
<i>Triakis semifasciata</i>			72	52 non-A + 20 A		124		9.6 BFA	XY?	(E. Pacific)	S-40, M-114, H-37

Table 5.5 Order HEXANCHIFORMES

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Family/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup> NORs	Genome size (pg/cell)	Comments	Locality	Reference
<b>Chlamydoselachidae</b>											
<i>Chlamydoselachus anguineus</i>		M	100	12 M/SM + 88 ST/A	112			9.2 FD		Japan (Suruga Bay)	I-6
<b>Heptanchiidae</b>											
<i>Heptanchias perlo</i>		ca. 72		6M + 66 ST/A	78					(global)	I-3
<b>Notorynchidae</b>											
<i>Notorynchus cepedianus</i>	<i>maculatus</i>	F	104	4 non-A + 100A	108			8.8 FCM		(global)	S-40, M-114

Table 5.6 Order SQUALIFORMES

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Family/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup> NORs	Genome size (pg/cell)	Comments	Locality	Reference
<b>Etmopteridae</b>											
<i>Etmopterus pusillus</i>			86					16.1* FCM		(global)	O-48
<i>Etmopterus spinax</i>	Squalidae	M	86	86 A/MC	86			32.3 FD		Atlantic	N-46, S-112
<b>Oxynotidae</b>											
<i>Oxynotus centrina</i>			62	56 M/SM + 6A	118	118		34.0 FD		(Mediterranean)	S-113, S-185, O-74
<b>Squalidae</b>											
<i>Squalus acanthias</i>		M	78	38 M/SM + 40 ST/A	116					Sweden	N-46
<i>Squalus acanthias</i>		M	60	60 non-A		120		12.0 BFA		USA (off NC)	S-40, H-37
<i>Squalus acanthias</i>		F	64	32 M/SM + 32 ST/A	96			14.0 FCM	ACN=66	USA (off NC)	M-114
<i>Squalus acanthias</i>			58	56 M/SM + 2A	114	114		(11.6 FIA)			P-50, H-40

Table 5.7 Order SQUATINIFORMES

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Family/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup> NORs	Genome size (pg/cell)	Comments	Locality	Reference
<b>Squatinae</b>											
<i>Squatina californica</i>			88	26 non-A + 62A	114	114		18.6 BFA	XY/XX	(E. Pacific)	S-40, M-114, H-37

Table 5.8 Order TORPEDINIFORMES

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Family/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg./cell)	Comments	Locality	Reference
<b>Narcinidae</b>											
<i>Narcine brasiliensis</i>	Rajiformes	F, M	28	18M + 4SM + 6ST	50	56	8.4 BFA			Gulf of Mexico	D-17, H-37
<i>Narke japonica</i>		F	54	28 M/SM + 26 ST/A	82		24.0 FD			Japan (Izu)	I-5
<b>Torpedinidae</b>											
<i>Torpedo californica</i>		F	82	4 M/SM + 78 ST/A	86		14.6 BFA			Japan (Iwate)	I-5, H-37
<i>Torpedo marmorata</i>			86	86 ST/A	86		14.0 FD			Italy	O-74, S-111
<i>Torpedo marmorata</i>		F, M	86	66A + 20 MC	86		3			Italy (Tyrrhenian Sea)	S-114
<i>Torpedo tokionis</i>		M	86	86A	86	86				Japan (Suruga Bay)	A-103
<i>Torpedo torpedo</i>	<i>ocellata</i>	F, M	66	12 M/SM + 14A + 40 MC	78		3	15.0 FD		Italy (Tyrrhenian Sea)	O-74, S-111, S-114

Table 5.9 Order RAJIFORMES

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Family/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg./cell)	Comments	Locality	Reference
<b>Rajidae</b>											
<i>Amblyraja radiata</i>	<i>Raja</i>		98							Sweden	N-43
<i>Dipturus batis</i>	<i>Raja</i>	M	98	6 M/SM + 92A	104		6.2 FD			Sweden	N-43, N-46, S-111
<i>Raja asterias</i>			98	6 M/SM + 92A	104		7.0 FD			Italy	O-74, R-118, S-113
<i>Raja clavata</i>		M	98	4 M/SM + 94 ST/A/MC	102		6.3 FD			Sweden	N-43, N-46, S-112
<i>Raja eglanteria</i>		F, M	58	30 non-A + 28A		88	6.5 FCM		ACN=60	USA (NC)	S-40, M-114
<i>Raja montagui</i>		M	96	18 M/SM + 16ST + 62A	114	130	12	6.9 FD		Italy (near Naples)	R-88, R-118, S-111
<i>Raja polystigma</i>		F, M	96	18 M/SM + 16ST + 62A	114	130				Italy (near Naples)	R-112
<b>Rhinobatidae</b>											
<i>Rhinobatos hymnincephalus</i>		F	60	26M + 25SM + 6ST + 3A	111	117	4	7.6* FCM		Japan (Osaka)	K-49, O-48
<i>Rhinobatos hymnincephalus</i>		M	59	26M + 24SM + 6ST + 3A	109	115	4			Japan (Osaka)	K-49
<i>Rhinobatos lentiginosus</i>		F	84							Gulf of Mexico	D-17
<i>Rhinobatos productus</i>		F, M	92	44 non-A + 48A		136	8.0 FCM, 8.0 BFA		XY/XX	(E. Pacific)	S-40, M-114, H-37
<i>Rhinobatos schlegelii</i>		F	64	55 M/SM + 9 ST/A	119		5.9 FD		ACN=70	Japan	A-110
<i>Rhinobatos schlegelii</i>		M	63	54 M/SM + 9 ST/A	117		4.9 FCM, 5.9 FD		ACN=69	Japan	A-110, C-100



Table 5.10 Order MYLIOBATIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup> NORs	Genome size (pg/cell)	Comments	Locality	Reference
Suborder/family/subfamily/specie	karyotype paper										
<b>Myliobatidae</b>											
<b>Mobulinae</b>											
<i>Mobula japonica</i>		F	66	26M + 12SM + 28 ST/A	104		9.3 FD, 9.6 FCM			Japan (Samriku)	A-104, C-100
<i>Mobula japonica</i>		M	66	26M + 11SM + 29 ST/A	103		9.4 FD			Japan (Samriku)	A-104
<b>Myliobatinae</b>											
<i>Myliobatis aquila</i>			52	32 M/SM + 20A	84	84	10.8 FD			(Atlantic to Indian)	S-113
<i>Myliobatis californica</i>		F	52	50 non-A + 2A	102	102	10.4 FCM, 9.8 BFA			(E. Pacific)	S-40, M-114, H-37
<i>Myliobatis freminvillei</i>		M	52	50 non-A + 2A	102	102	10.6 FCM, 9.8 BFA		XY?	USA (NC)	S-40, M-114, H-37
<i>Myliobatis tobijei</i>		M	54	40 M/SM + 14 ST/A	94		8.7 FD, 10.7 FCM			Japan (Misaki)	A-100, C-100
<b>Rhinopterinae</b>											
<i>Rhinoptera bonasus</i>			64	42 non-A + 22A		106	10.0 FCM			(W. Atlantic)	S-40
<b>Potamotrygonidae</b>											
<i>Paratrygon atereba</i>		F, M	90	4M + 2SM + 10ST + 74A	96	106	3		ACN=92	Brazil (AM)	V-77
<i>Potamotrygon motoro</i>		F, M	66	18M + 12SM + 10ST + 26A	96	106	7		ACN=92	Brazil (AM)	V-77
<i>Potamotrygon orbignyi</i>		F	66	22M + 10SM + 8ST + 26A	98	106	8		ACN=92	Brazil (AM)	V-77
<b>Urolophidae</b>											
<i>Urolophus aurantiacus</i>		F	52	44 M/SM + 8 ST/A	96		15.5 FCM, 13.1 FD			Japan	A-100, C-100
<i>Urolophus halleri</i>			72	20 M/SM + 52A	92		13.0 BFA			(E. Pacific)	S-40, H-37



Table 6 Class ACTINOPTERYGII (OSTEICHTHYES)

Table 6.1 Order POLYPTERIFORMES

A		B		C	D	E		F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup> NORs	Genome size (pg/cell)	Comments	Locality	Reference			
Family/species	karyotype paper													
<b>Polypteridae</b>														
<i>Erpetoichthys calabaricus</i>	<i>Calamoichthys</i>		36	28M + 6SM + 2ST	70	72	2		(Africa)		S-131, S-132			
<i>Erpetoichthys calabaricus</i>	<i>Calamoichthys</i>	M	36	32M + 4ST	68	72			ACN=46	(Africa)	C-13			
<i>Erpetoichthys calabaricus</i>	<i>Calamoichthys</i>	F, M	36	30M + 6SM	72	72				(Africa)	D-8			
<i>Erpetoichthys calabaricus</i>	<i>Calamoichthys</i>	F, M	36	36 M/SM	72	72		(9.1 FD, 9.8 BFA)	ACN=46	Cameroon	V-37, G-85, H-37			
<i>Polypterus delhezi</i>		F	36	26M + 10SM	72	72				(Africa)	U-52			
<i>Polypterus delhezi</i>		F, M	36	36 M/SM	72	72		9.7 FD	ACN=46	Zaire	V-37			
<i>Polypterus delhezi</i>		F	36	32M + 4SM	72	72			ACN=46	Africa (Zaire R.)	C-92			
<i>Polypterus endlicheri</i>	<i>endlicheri congicus</i>	F, M	36	32M + 4SM	72	72			ACN=46	Africa (Zaire R.)	C-92			
<i>Polypterus ornatipinnis</i>			36	26M + 10SM	72	72				(Africa)	U-52			
<i>Polypterus ornatipinnis</i>		F, M	36	36 M/SM	72	72		9.6 FD	ACN=46	(Africa)	V-37			
<i>Polypterus palmas</i>		F, M	36	24M + 12SM	72	72				(W. Africa)	D-8			
<i>Polypterus palmas</i>			36	26M + 10SM	72	72			ACN=46	(W. Africa)	U-52			
<i>Polypterus palmas</i>		F	36	32M + 4SM	72	72			ACN=46	Africa (Zaire R.)	C-92			
<i>Polypterus palmas</i>		F, M	36	36 M/SM	72	72		8.9 FD, (7.4 FIA)	ACN=46	(Africa)	V-37, H-41			
<i>Polypterus senegalus</i>			36	28M + 8SM	72	72	2			(Africa)	S-131, S-132			
<i>Polypterus senegalus</i>		F, M	36	26M + 10SM	72	72	2		ACN=46	Nigeria	M-127, U-52			
<i>Polypterus weeksii</i>		F, M	38	34 M/SM + 4A	72	72		9.8 FD	ACN=46	(Africa)	V-37			

Table 6.2 Order ACIPENSERIFORMES

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Family/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<b>Acipenseridae</b>											
<i>Acipenser baeri</i>			ca. 248				8	8.3 FCM	4X	Russia (Siberia)	V-9, V-10, B-68, F-70
<i>Acipenser brevirostrum</i>			372	178 M/SM + 194 ST/A	550		10	13.1 FCM, 13.8 FIA	6X	USA (FL)	K-54, B-69, H-41
<i>Acipenser brevirostrum</i>								18.6 FIA		N. America	H-41
<i>Acipenser fulvescens</i>		F	264	134 M/SM + 70 ST/A + 60 MC	398		6-8	8.9 FCM	4X	USA (WI)	B-69, F-62
<i>Acipenser gueldenstaedtii</i>			250	92 M/SM + 158 A/MC	342			7.9 FCM	4X	Russia (Volga R.)	B-37, B-68, V-72
<i>Acipenser medirostris</i>			249					8.8 FCM	4X	N. America	B-69, V-110
<i>Acipenser mikadoi</i>	<i>medirostris</i>							14.3 FCM	6X	Far East	B-68, L-78
<i>Acipenser naccarii</i>			ca. 239		390		8	6.3 FD	4X	Italy	F-58, F-61, F-70
<i>Acipenser nudiventris</i>			118	54M + 5A + 59 A/MC	172			3.9 FCM	2X	Russia (Black Sea)	A-88, B-68
<i>Acipenser oxyrinchus</i>			122	78 M/SM + 44 A/MC	200			(4.4 FIA)	2X	(Atlantic)	F-63, H-41
<i>Acipenser oxyrinchus</i>	<i>oxyrinchus desotoi</i>							4.6 FCM	4X	N. America	B-69
<i>Acipenser persicus</i>			262	134 M/SM + 128 A/MC	396				4X	Iran	N-38
<i>Acipenser ruthenus</i>			118	82 M/SM + 36 A/MC	200		2-3	3.7 FCM	2X	Russia (Volga R.)	V-72, B-37, B-68
<i>Acipenser ruthenus</i>			118	58M + 4A + 56 MC	176				2X	Danube R.	R-10
<i>Acipenser schrenckii</i>			240					6.1 FD	4X	Amur R.	F-61
<i>Acipenser sinensis</i>			264	78M + 20SM + 26 ST/A + 140 MC	362				4X	China (Hubei)	Y-15
<i>Acipenser sinensis</i>		F, M	240	76M + 80SM + 20 ST/A + 64 MC	396			9.1 FD	4X	China (Hubei)	X-2
<i>Acipenser stellatus</i>			118	70 M/SM + 48 A/MC	188		2-3	3.7, 4.7 FCM	2X	Caspian Sea	V-72, B-37, B-68, L-78
<i>Acipenser sturio</i>			ca. 116					3.2 FD	2X	(Atlantic)	F-58, M-133
<i>Acipenser transmontanus</i>		M	ca. 248		ca. 186		8	9.5 FCM	4X	N. America	B-69, F-61, F-70, V-110
<i>Huso dauricus</i>			120					3.8 FCM	2X	Amur R.	B-68
<i>Huso huso</i>			118	60 M/SM + 58 A/MC	178		2-3	2.4 FCM	2X	Russia (Volga R.)	B-37, B-68, V-72
<i>Huso huso</i>			118	84 M/SM + 34 A/MC	202		4	3.6 FD	2X	(E. Europe)	F-32, F-61
<i>Pseudoscaphirhynchus kaufmanni</i>								3.5 FCM		Amu Darya R.	B-68
<i>Scaphirhynchus platyrhynchus</i>	<i>platyrhynchus</i>	M	112	50 M/SM + 14A + 48 MC	162			3.5 FD	2X	USA (Great Lakes)	O-7
<i>Scaphirhynchus platyrhynchus</i>	<i>platyrhynchus</i>							4.7 FCM		N. America	B-69
<b>Polyodontidae</b>											
<i>Polyodon spathula</i>		M	120	32M + 8SM + 8A + 72 MC	160		4	3.2, 3.9 FCM	2X	USA (AL)	D-14, B-68, T-73
<i>Polyodon spathula</i>								4.9 FCM		N. America	B-69

Table 6.3 Order LEPISSOSTEIFORMES

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup>	Genome size	Comments	Locality	Reference
Family/species	karyotype paper						NORs	(pg/cell)			
<b>Lepisosteidae</b>											
<i>Lepisosteus osseus</i>		F, M	56	22M + 12SM + 6ST + 16 MC	90		2			USA (Mississippi R.)	R-120
<i>Lepisosteus osseus</i>			56	12M + 22SM + 22 ST/A	90		4			(N. America)	O-32
<i>Lepisosteus oculatus productus</i>		F	68	28 M/SM + 14A + 26 MC	96			2.8* FCM, 2.9 FD, 2.8 FIA		USA (Great Lakes)	O-7, O-48, H-40

Table 6.4 Order AMIIFORMES

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup>	Genome size	Comments	Locality	Reference
Family/species	karyotype paper						NORs	(pg/cell)			
<b>Amiidae</b>											
<i>Amia calva</i>		F	46	20 M/SM + 26 ST/A	66			2.6 FD, 2.3 FIA	ACN=56	USA (Great Lakes)	O-7, H-40
<i>Amia calva</i>		F	46	2M + 24 SM/ST + 20A		72	2	2.0 FD		(USA)	S-135

Table 6.5 Order HIODONTIFORMES

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup>	Genome size	Comments	Locality	Reference
Family/species	karyotype paper						NORs	(pg/cell)			
<b>Hiodontidae</b>											
<i>Hiodon absooides</i>	Osteoglossiformes		50	40 M/SM + 10ST	90	100		1.2 FD	ACN=56?	USA, Canada	U-68, B-14
<i>Hiodon tergisus</i>	Osteoglossiformes		50	42 M/SM + 8 ST/A	92			1.2 FD	ACN=56	Canada (Manitoba)	B-14

Table 6.6 Order OSTEOGLOSSIFORMES

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Family/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<b>Osteoglossidae</b>											
<i>Arapaima gigas</i>			56	4M + 12 SM/ST + 40A		72		(1.6 FIA, 2.0 BFA)	ACN=56	(S. America)	U-51, H-13, H-40
<i>Arapaima gigas</i>		F, M	56	28 M/SM + 28 ST/A	84		2		ACN=56	Brazil (MT)	M-147
<i>Heterotis niloticus</i>			40	26M + 10SM + 2ST + 2A	76	78	2	2.0 FD	ACN=56	(W. Africa)	H-14
<i>Osteoglossum bicirrhosum</i>		F	56	1SM + 1ST + 54A	57	58		1.8 FIA, 2.0 BFA	ACN=56	(S. America)	U-68, H-13, H-40
<i>Osteoglossum bicirrhosum</i>			56	3ST + 53A	56	59			ACN=56	(S. America)	S-125
<i>Osteoglossum ferreirai</i>			54	2M + 4SM + 14ST + 34A	60	74			ACN=56	(S. America)	S-125
<i>Scleropages formosus</i>			50	4 M/SM + 10ST + 36A	54	64		1.9 FD	ACN=56	(SE Asia)	U-51, H-14
<i>Scleropages Jardini</i>			48	16M + 6SM + 26A	70	70	2	2.0 FD	ACN=56	(New Guinea)	H-14
<i>Scleropages leichardti</i>			44	16M + 8SM + 6ST + 14A	68	74	2	2.0 FD	ACN=56	(N. Australia)	H-14
<b>Pantodontidae</b>											
<i>Pantodon buchholzi</i>	<i>buchholzi</i>		48	12M + 12 SM/ST + 24A		72		1.5 BFA	ACN=56?	(W. Africa)	U-68, H-13
<b>Mormyridae</b>											
<i>Gnathonema petersii</i>			48	10M + 6SM + 32A	64	64		2.4 BFA	ACN=56	Africa	U-68, H-13
<i>Marcusenius brachistius</i>			48	1M + 4SM + 2ST + 41A	53	55				Africa	U-68
<b>Notopteridae</b>											
<i>Chitala chitala</i>	<i>Notopterus</i>		42	42A	42	42	2	2.1* FCM	ACN=50	(Asia)	U-68, T-22, O-48
<i>Notopterus notopterus</i>		F, M	42	42A	42	42	2			India (Haryana, WB)	R-60, R-72, K-42
<i>Papyrocranus afer</i>			34	4SM + 30A	38	38			ACN=46	Africa	U-68
<i>Xenomystus nigri</i>			42	42A	42	42		2.6 BFA	ACN=50	Africa	U-68, H-13

Table 6.7 Order ELOPIFORMES

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup>	Genome size	Comments	Locality	Reference
Family/species	karyotype paper						NORs	(pg/cell)			
<b>Elopiidae</b>											
<i>Elops saurus</i>		F, M	48	6 M/SM + 42 ST/A	54			2.4 BFA	ACN=54	USA (LA)	D-26, H-13
<b>Megalopidae</b>											
<i>Megalops atlanticus</i>			50	50A	50	50			ACN=54	USA (Atlantic)	D-23
<i>Megalops cyprinoides</i>	<i>cundlinga</i>		46	46A	46	46				India (WB)	K-46
<i>Megalops cyprinoides</i>		F	52	52A	52	52		(2.0 FIA)		India (Bombay)	R-66, H-40

Table 6.8 Order ANGUILLIFORMES

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup>	Genome size	Comments	Locality	Reference
Suborder/family/species	karyotype paper						NORs	(pg/cell)			
<b>Suborder Anguilloidei</b>											
<b>Anguillidae</b>											
<i>Anguilla anguilla</i>		F	38	12M + 10SM + 16A	60	60			ZW, ACN=53	Poland (Krakow)	P-13, P-14
<i>Anguilla anguilla</i>		M	38	12M + 10SM + 16A	60	60			ZZ, ACN=54	Poland (Krakow)	P-13, P-14
<i>Anguilla anguilla</i>		F	38	12M + 10SM + 16A	60	60			ZW, ACN=53	Germany	P-10
<i>Anguilla anguilla</i>		M	38	12M + 10SM + 16A	60	60			ZZ, ACN=54	Germany	P-10
<i>Anguilla anguilla</i>		F, M	38	22 M/SM + 16A	60	60	2	(3.2 BFA)		Italy	S-87, H-13
<i>Anguilla anguilla</i>	Type I		38	20 M/SM + 18A	58	58			ACN=52	(Europe)	K-88
<i>Anguilla anguilla</i>	Type II		38	21 M/SM + 17A	59	59			ACN=53	(Europe)	K-88
<i>Anguilla australis</i>		F, M	38	22 M/SM + 16A	60					New Zealand	S-87
<i>Anguilla australis</i>			38	20 M/SM + 18A	58					(New Zealand)	N-28
<i>Anguilla japonica</i>		F, M	38	20 M/SM + 18A	58				ACN=54	Japan	N-28, K-88
<i>Anguilla japonica</i>			38	10M + 10SM + 18A	58	58				China (Wuhan)	Y-15
<i>Anguilla japonica</i>		F	38	12M + 8SM + 18A	58	58			ZW, ACN=53	Korea (Han R.)	P-7, P-9
<i>Anguilla japonica</i>		M	38	12M + 8SM + 18A	58	58			ZZ, ACN=54	Korea (Han R.)	P-9
<i>Anguilla marmorata</i>			38	20 M/SM + 18A	58	58			ACN=54	Japan (Amami-oshima)	K-93
<i>Anguilla rostrata</i>		F	38	12M + 10SM + 16A	60	60			ZW, ACN=53	USA (Philadelphia)	P-10
<i>Anguilla rostrata</i>		M	38	12M + 10SM + 16A	60	60			ZZ, ACN=54	USA (Philadelphia)	P-10
<i>Anguilla rostrata</i>		F, M	38	22 M/SM + 16A	60	60	2	(2.8 BFA)		USA (Boston Bay)	S-87, H-13
<i>Anguilla rostrata</i>			38	14M + 6SM + 18A	58					USA (FL)	O-10
<i>Anguilla rostrata</i>		F	38	10M + 10SM + 18A	58	58			ZW, ACN=53	USA (ME)	P-14, H-41

Table 6.8 Order ANGUILLIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup>	Genome size (pg/cell)	Comments	Locality	Reference
Suborder/family/subfamily/species	karyotype paper						NORs				
<b>Moringuidae</b>											
<i>Moringua linearis</i>			50							India (Porto Novo)	S-118
<b>Suborder Muraenoidei</b>											
<b>Muraenidae</b>											
<i>Enchelycore nigricans</i>		F, M	42	6M + 8SM + 12ST + 16A	56	68	2		ACN=54	Brazil (Atlantic)	V-106
<i>Enchelycore pardalis</i>	<i>Muraena</i>		42	8M + 2SM + 32A	52	52	2	4.6* FCM	ACN=52	Japan (Wakayama)	T-5, T-6, T-79, O-48
<i>Gymnothorax eurostus</i>		F, M	42	12 M/SM + 30A	54	54	2		XX/XY, ACN=52	Japan (Okinawa)	T-5, T-6
<i>Gymnothorax kidako</i>			36	16M + 8SM + 12A	60	60	2		ACN=52	Japan (Wakayama)	T-5, T-6, T-79
<i>Gymnothorax milliaris</i>		F	42	14M + 18SM + 10ST	74	84	2		ACN=54	Brazil (Bahia)	V-106
<i>Gymnothorax ocellatus</i>		F, M	42	16M + 18SM + 8A	76	76	2		ACN=54	Brazil (SP)	P-43
<i>Gymnothorax pictus</i>	<i>Sideria picta</i>		42	14M + 14SM + 14A	70	70		3.8 FIA		India (WB)	K-46, H-41
<i>Gymnothorax pictus</i>	<i>Sideria picta</i>		42	42 ST/A	42					India (Andaman Is.)	R-45
<i>Gymnothorax reevesi</i>		F, M	42	34 M/SM + 8A	76	76				China (Guangdong)	R-90
<i>Gymnothorax unicolor</i>		F, M	42	12 M/SM + 30A	54	54	2	4.4 BFA	ACN=54	Italy	D-5, S-9, G-85
<i>Gymnothorax vicinus</i>			42	8M + 6SM + 28A	56	56	2		ACN=54	Brazil (RN)	V-106
<i>Muraena helena</i>		F, M	42	18 M/SM + 24A	60	60	2	5.1 BFA	ACN=54	Mediterranean	C-99, S-9, G-85
<i>Muraena pavonina</i>		F	42	6M + 4SM + 32A	52	52	2		ACN=54	Brazil (Atlantic)	V-106
<b>Suborder Congroidei</b>											
<b>Congridae</b>											
<i>Ariosoma anagoides</i>	<i>Alloconger</i>	F	34	10M + 8SM + 6ST + 10A	52	58			ACN=54	Japan (Wakayama)	T-5
<i>Ariosoma anago</i>	<i>Anago</i>		38	18 M/SM + 20A	56	56	2	3.6* FCM		Japan (Kobe)	T-8, O-48
<i>Conger conger</i>		F, M	38	8M + 4SM + 26 ST/A	50	50	2	3.3 FCM	ACN=48	Mediterranean	S-47, G-85
<i>Conger conger</i>			38	12 M/SM + 26 ST/A	50	50	2			Spain (Malaga)	A-46
<i>Conger japonicus</i>		F	38	10M + 10SM + 18A	58	58		2.4* FCM	ACN=52	Japan (Wakayama)	T-5, O-48
<i>Conger myriaster</i>	<i>Astroconger</i>	F	38	12M + 8 SM + 18A	58	58			ZW, ACN=53	Korea (Yellow Sea)	P-7, P-9
<i>Conger myriaster</i>	<i>Astroconger</i>	M	38	12M + 8 SM + 18A	58	58			ZZ, ACN=54	Korea (Yellow Sea)	P-9
<i>Conger myriaster</i>		F	38	14M + 4SM + 20A	56	56			ACN=54	Japan (Yamaguchi)	N-32
<i>Conger myriaster</i>		F, M	38	8M + 10SM + 20A	56	56		2.4* FCM	ZW/ZZ, ACN=54	Japan (Kobe)	O-39, O-48
<i>Conger myriaster</i>			38	8M + 10SM + 20A	56	56				China (Shandong)	Y-20

Table 6.8 Order ANGUILLIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup>	Genome size	Comments	Locality	Reference
Suborder/family/subfamily/species	karyotype paper						NORs	(pg/cell)			
<b>Muraenesocidae</b>											
<i>Muraenesox cinereus</i>			38	12M + 4SM + 6ST + 16A	54	60		(2.3 F/A)		China	Z-23, H-41
<b>Ophichthidae</b>											
<b>Myrophinae</b>											
<i>Muraenichthys gymnotus</i>		F	48	4ST + 44A	48	52			X <sub>1</sub> X <sub>1</sub> X <sub>2</sub> X <sub>2</sub> , ACN=48	Japan (Suruga Bay)	M-108
<i>Muraenichthys gymnotus</i>		M	47	1M + 4ST + 42A	48	52			X <sub>1</sub> X <sub>2</sub> Y, ACN=48	Japan (Suruga Bay)	M-108
<b>Ophichthinae</b>											
<i>Dalophis imberbis</i>		F	46	2M + 6SM + 5ST + 33A	54	59	3-4		ZW, ACN=53	Italy (Sardinia)	S-182
<i>Dalophis imberbis</i>		M	46	2M + 6SM + 6ST + 32A	54	60	3-4		ZZ, ACN=54	Italy (Sardinia)	S-182
<i>Echelus myrus</i>			38	20 M/SM + 18 ST/A	58		2			Spain (Malaga)	A-46
<i>Myrrichthys ocellatus</i>			38	8M + 14SM + 10ST + 6A	60	70	2		ACN=54	Brazil (RN)	V-106
<i>Ophichthys altipennis</i>			38	10M + 16SM + 4ST + 8A	64	68			ACN=54	Japan (Yamaguchi)	N-32
<i>Ophisurus macrorhynchus</i>		F	38	20M + 14SM + 4ST	72	76			ACN=54	Japan (Yamaguchi)	N-32
<i>Ophisurus serpens</i>	<i>Ophisurus</i>		38	16M + 20ST + 2A	54	74	2			Spain (Malaga)	T-35
<i>Pisodonophis boro</i>			38	18M + 4SM + 4ST + 12A	60	64				India (WB)	K-42
<i>Pisodonophis boro</i>		M	40							India (Portonovo)	N-13
<b>Synphobranchidae</b>											
<i>Synphobranchus kaupii</i>		F	26	22 M/SM + 2ST + 2A	48	50				Japan (Hokkaido)	I-13

Table 6.9 Order CLUPEIFORMES

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup>	Genome size (pg/cell)	Comments	Locality	Reference
Suborder/family/subfamily/species	karyotype paper						NORs	(pg/cell)			
<b>Suborder Clupeoidei</b>											
<b>Clupeidae</b>											
<b>Alosinae</b>											
<i>Alosa kessleri pontica</i>			48	2ST + 46A	48	50		2.8 BFA	ACN=48	former USSR	V-72
<i>Alosa pseudoharengus aurea</i>		F, M	48	48A	48	48	2		X <sub>1</sub> X <sub>2</sub> X <sub>2</sub>	USA (ME, MA, NY)	M-53, H-13
<i>Brevoortia aurea</i>		F	46	2M + 2SM + 42A	50	50	2		X <sub>1</sub> X <sub>2</sub> Y, ACN=48	Brasil (RJ)	B-55
<i>Brevoortia aurea</i>		M	45	3M + 2SM + 40A	50	50	2			Brasil (RJ)	B-55
<i>Brevoortia patronus</i>		F, M	46	2M + 2SM + 42A	50	50			ACN=48	USA (Atlantic)	D-23
<i>Brevoortia pectinata</i>			46	2M + 2SM + 42A	50	50	2			Brazil	B-86
<i>Brevoortia smithi</i>		F, M	46	2M + 2SM + 42A	50	50			ACN=48	USA (Atlantic)	D-23
<i>Brevoortia tyrannus</i>		F, M	46	2M + 2SM + 42A	50	50			ACN=48	USA (Atlantic)	D-23
<i>Gadusia chapra</i>	<i>Gadusia</i>	M	46		46				ACN=46	India (WB)	K-31
<i>Gadusia variegata</i>	<i>Gadusia</i>		46	46A	46	46			ACN=46	(Myanmar)	M-162
<b>Clupeinae</b>											
<i>Clupea harengus</i>			52							USA (ME)	R-82
<i>Clupea harengus</i>		F, M	52	6M + 2ST + 44A	58	60	2		ACN=52	N. Europe	K-81, K-82
<i>Clupea harengus</i>		F, M	52	6M + 2ST + 44A	58	60	2			Russia (White Sea)	K-81, K-82
<i>Clupea harengus</i>			52	8M + 4ST + 40A	60	64	2			Norwegian Sea	K-81, K-82
<i>Clupea harengus</i>		F, M	50	6M + 2ST + 42A	56	58	2			Germany (Baltic Sea)	K-81, K-82
<i>Clupea harengus harengus</i>			54	12-16 M/SM + 42-38 ST/A	66-70					Russia (Baltic Sea)	S-72
<i>Clupea pallasi</i>		F, M	52	6 M/SM + 46 ST/A	58			1.9 FD	ACN=52	Japan	I-8
<i>Clupea harengus pallasi</i>			52	8 M/SM + 44 ST/A	60			(1.8 FIA, 1.5 BFA)		Russia (White Sea)	S-72, H-13, H-40
<i>Clupea pallasi marisalbi</i>			52	6M + 2SM + 44A	60	60			ACN=52	Russia (White Sea)	L-86
<i>Clupea pallasi marisalbi</i>			51	7M + 2SM + 42A	60	60			ACN=52	Russia (White Sea)	L-86
<i>Clupea pallasi marisalbi</i>			50	8M + 2SM + 40A	60	60			ACN=52	Russia (White Sea)	L-86
<i>Clupea soborna</i>			56	16M + 20SM + 20A	92	92				India (WB)	K-46
<i>Clupea clupeola</i>			28	22M + 2SM + 2ST + 2A	52	54			ACN=50	USA (Atlantic)	D-23
<i>Clupea quadrinaculatus</i>			48	48A	48	48				Japan	O-48
<i>Clupea melanura</i>			44	8 M/SM + 36 ST/A	52					India (Andaman Is.)	R-45
<i>Clupea zunasi</i>		F, M	48	48 ST/A	48			2.3 FD	ACN=48	Japan (Tokyo Bay)	I-8
<i>Clupea zunasi</i>			48	48A	48	48			ACN=48	China (Shandong)	W-7
<i>Clupea melanostictus</i>	<i>melanostictus</i>	F, M	48	48 ST/A	48			2.7 FD	ACN=48	Japan (Iwate)	I-8



Table 6.9 Order CLUPEIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup>	Genome size	Comments	Locality	Reference
Suborder/family/subfamily/species	karyotype paper						NORs	(pg/cell)			
<b>Dorosomatinae</b>											
<i>Clupanodon punctatus</i>			48	2M + 46A	50	50			ACN=48	China (Shandong)	W-7
<i>Dorosoma cepedianum</i>		F, M	48	2SM + 4ST + 42A	50	54		2.0 FCM	ACN=50	USA (LA)	F-26, G-85
<i>Dorosoma petenense</i>		F, M	48	2SM + 2ST + 44A	50	52			ACN=50	USA (LA)	F-26
<i>Goniaiosa manmina</i>			38	38A	38	38				(India)	M-162
<i>Konosirus punctatus</i>			48	48A	48	48		1.6 FCM	ACN=48	Korea (Busan)	K-125
<b>Engraulidae</b>											
<b>Coilinae</b>											
<i>Coilia nasus</i>		F	47	47A	47	47	2		ZO, ACN=47	China (Hubei)	H-21, Y-15
<i>Coilia brachygnathus</i>		M	48	48A	48	48	2		ZZ, ACN=48	China (Hubei)	H-21, Y-15
<i>Thryssa baelama</i>			42	42 ST/A	42					India (Andaman Is.)	R-45
<b>Engraulinae</b>											
<i>Anchoa mitchilli</i>		F, M	48	48A	48	48			ACN=48	Atlantic	D-23
<i>Engraulis compressa</i>	<i>Anchoa</i>		48		48					USA (CA)	C-46
<i>Engraulis encrasicolus ponticus</i>			44							Russia	I-20
<i>Engraulis japonicus</i>			48	48A	48	48		2.8* FCM		Japan	O-48
<i>Engraulis mordax</i>			48	48A	48	48		3.0 FD, 3.8 BFA	ACN=48	(E. Pacific)	O-6, O-8, H-13

Table 6.10 Order GONORYNCHIFORMES

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup>	Genome size	Comments	Locality	Reference
Suborder/family/subfamily/species	karyotype paper						NORs	(pg/cell)			
<b>Suborder Chanoidei</b>											
<b>Chanidae</b>											
<i>Chanos chanos</i>			32	14M + 4SM + 14 ST/A	50				ACN=50	Taiwan	A-63
<b>Suborder Knerioidei</b>											
<b>Phractolaemidae</b>											
<i>Phractolaemus ansorgei spinosus</i>		F, M	28	24M + 2SM + 2A	54			3.0 FD		Zaire	V-34

Table 6.11 Order CYPRINIFORMES

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Superfamily/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<b>Superfamily Cyprinoidea</b>											
<b>Cyprinidae</b>											
<b>Acheilognathinae</b>											
<i>Acheilognathus chankaensis</i>	<i>Acanthorhodeus</i>	F, M	44	14M + 14SM + 16 ST/A	72			1.8* FD	ACN=50	China (Hubei)	H-19, Y-15, C-83
<i>Acheilognathus chankaensis?</i>	<i>Acanthorhodeus gracilis</i>	F, M	44	24 M/SM + 20 ST/A	68				ACN=50	Korea (Sam-rye)	L-9, L-11
<i>Acheilognathus cyanostigma</i>		F, M	44	28 M/SM + 16 ST/A	72	2			ACN=50	Japan (Lake Biwa)	O-20, T-6, T-11
<i>Acheilognathus gracilis</i>		F, M	42	16M + 12SM + 14ST	70	84			ACN=50	China (Wuhan)	H-23, Y-15
<i>Acheilognathus imberbis</i>	<i>Paracheilognathus</i>	F, M	44	14M + 18SM + 12 ST/A	76				ACN=50	China (Wuhan)	H-19, Y-15
<i>Acheilognathus longipinnis</i>		F, M	44	28 M/SM + 16 ST/A	72				ACN=50	Japan (Yodo R.)	O-20
<i>Acheilognathus macropterus</i>	<i>Acanthorhodeus asmusi</i>	F, M	44	24 M/SM + 20 ST/A	68				ACN=50	Korea (Eui-ryeong)	L-9, L-11
<i>Acheilognathus macropterus</i>	<i>Acanthorhodeus</i>	F, M	44	14M + 18SM + 12 ST/A	76				ACN=50	China (Wuhan)	H-19, Y-15
<i>Acheilognathus macropterus</i>		F, M	44	14M + 16SM + 14ST	74	88	8 in embryo		ACN=50	China (Amur R.)	U-24
<i>Acheilognathus melanogaster</i>	<i>moriokae</i>	M	44	28 M/SM + 16 ST/A	72				ACN=50	Japan (Ibaraki)	O-20
<i>Acheilognathus peihoensis</i>	<i>Acanthorhodeus</i>	F, M	44	14M + 12SM + 8ST + 10A	70	78			ACN=50	China (Guilin)	Y-15
<i>Acheilognathus rhombeus</i>	<i>rhombea</i>	F, M	44	28 M/SM + 16 ST/A	72				ACN=50	Korea (Ma-ryeong)	L-9, L-11
<i>Acheilognathus rhombeus</i>		F, M	44	10M + 20 SM/ST + 14A	74				ACN=50	Korea (Geum R.)	U-33
<i>Acheilognathus rhombeus</i>		F, M	44	14M + 16SM + 14ST	74	88			ACN=50	South Korea	U-80, U-81
<i>Acheilognathus rhombeus</i>		F, M	45	29 M/SM + 16ST	74	90			ACN=50	South Korea	U-80, U-81
<i>Acheilognathus rhombeus</i>		F, M	46	28 M/SM + 18ST	74	92			ACN=50	South Korea	U-80, U-81
<i>Acheilognathus rhombeus</i>		F, M	47	27 M/SM + 20ST	74	94			ACN=50	South Korea	U-80, U-81
<i>Acheilognathus rhombeus</i>	<i>rhombea</i>	F, M	44	14M + 14SM + 16 ST/A	72		2	(2.3* FCM, 2.0 FD)	ACN=50	Japan (Lake Biwa)	O-20, O-48, T-6, T-11
<i>Acheilognathus rhombeus</i>	<i>rhombea</i>	F, M	44	12M + 20 SM/ST + 12A	72	76			ACN=50	Japan (Lake Biwa)	O-18
<i>Acheilognathus tabira erythropterus</i>	<i>Akahire-tabira</i>	M	44	28 M/SM + 16 ST/A	72			(1.9 FD)	ACN=50	Japan (Ibaraki)	O-20, S-141
<i>Acheilognathus tabira nakamurae</i>	<i>Seboshi-tabira</i>	F, M	44	28 M/SM + 16 ST/A	72				ACN=50	Japan (Fukuoka)	O-20
<i>Acheilognathus tabira tabira</i>		F, M	44	14M + 14SM + 16 ST/A	72		2		ACN=50	Japan (Yodo R., Yoshii R.)	O-20, O-48, T-6, T-11
<i>Acheilognathus tabira tabira</i>		F, M	44	12M + 20 SM/ST + 12A	72	76			ACN=50	Japan (Lake Biwa)	O-18
<i>Acheilognathus tonkinensis</i>	<i>Acanthorhodeus</i>	F, M	44	14M + 14SM + 16 ST/A	72				ACN=50	China (Guilin)	Y-15
<i>Acheilognathus tonkinensis</i>		M	44	14M + 14SM + 8ST + 8A	72	80			ACN=50	(China)	A-85
<i>Acheilognathus tonkinensis</i>		F	44						ACN=50	China (Wuhan)	H-19
<i>Acheilognathus yamatsutae</i>		F	44	12M + 16SM + 16 ST/A	72				ACN=50	Korea	L-9
<i>Acheilognathus yamatsutae</i>		M	44	24 M/SM + 20 ST/A	68				ACN=50	Korea (Eui-ryeong)	L-9, L-11
<i>Acheilognathus yamatsutae</i>	<i>cyanostigma</i>	F	44	12M + 16SM + 16 ST/A	72				ACN=50	Korea (Go-san)	L-9, L-10
<i>Acheilognathus typus</i>	<i>Pseudoperilampus</i>	M	44	28 M/SM + 16 ST/A	72			1.9 FD	ACN=50	Japan (Chiba)	O-20, S-141
<i>Rhodeus atremius atremius</i>	<i>atremius</i>	F, M	46	4 SM + 42 ST/A	50				ACN=50	Japan (Fukuoka)	O-20
<i>Rhodeus fangi</i>	<i>atremius fangi</i>	F, M	46	4SM + 42ST	50	92	15 in embryo		ACN=50	China (Fujian)	U-24
<i>Rhodeus fangi</i>	<i>atremius</i>	F, M	46	4 M/SM + 42 ST/A	50		2 (6 in embryo)		ACN=50	China (Zhejiang)	U-18
<i>Rhodeus atremius suigensis</i>	<i>suigensis</i>	F, M	46	4SM + 42 ST/A	50				ACN=50	Japan (Yoshii R.)	O-20
<i>Rhodeus notatus</i>	<i>atremius suigensis</i>	F, M	46	4SM + 42ST	50	92	8 in embryo		ACN=50	China (Liaoning)	U-80, U-81
<i>Rhodeus notatus</i>	<i>suigensis</i>	F	46	4 M/SM + 42 ST/A	50				ACN=50	Korea (Go-san)	L-9, L-11

Table 6.11 Order CYPRINIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag-NORs	Genome size (pg/cell)	Comments	Locality	Reference
Superfamily/family/subfamily/species	karyotype paper										
<i>Rhodeus notatus</i>		F, M	46	4SM + 42 ST/A	50				ACN=50	Korea (Go-san)	L-9, L-10
<i>Rhodeus ocellatus</i>		F, M	48	28 M/SM + 20 ST/A	76				ACN=50	Korea (Jang-heung)	L-9, L-11
<i>Rhodeus ocellatus</i>		F, M	48	10M + 24SM + 14ST	82	96			ACN=50	China (Hubei)	H-19, Y-15
<i>Rhodeus ocellatus smithii</i>		F, M	48	28 M/SM + 20 ST/A	76				ACN=50	Japan (Fukuoka)	O-20
<i>Rhodeus ocellatus kurumeus</i>		F, M	48	18M + 10SM + 20ST	76	96	2		ACN=50	Japan (Osaka)	K-22
<i>Rhodeus ocellatus kurumeus</i>		F, M	48	14M + 14SM + 20ST	76	96	2		ACN=50	Japan (Yanagawa)	K-22
<i>Rhodeus ocellatus kurumeus</i>		F, M	48	8M + 20SM + 20ST	76	96	1-2		ACN=50	Japan (Saga)	S-93
<i>Rhodeus ocellatus ocellatus</i>		F, M	48	8M + 20SM + 20A	76	76	2	(2.2* FCM)	ACN=50	Japan (Kobe, Lake Biwa)	O-20, O-48, T-4, T-11
<i>Rhodeus ocellatus ocellatus</i>		F, M	48	8M + 20SM/ST + 20A	76	76	2	(2 in embryo)	ACN=50	Japan (Osaka)	O-18
<i>Rhodeus pseudosericeus</i>		F, M	48	8M + 20SM + 20ST	76	96			ACN=50	China (Gyonggi)	U-24
<i>Rhodeus sericeus amarus</i>	<i>amarus</i>	F, M	48	14M + 24 SM/ST + 10A	86			2.1 FD	ACN=50	Korea (Gangwon-do)	A-86
<i>Rhodeus sericeus amarus</i>		F, M	48	6M + 26SM + 4ST + 12A	80	84			ACN=50	France	H-2, H-4
<i>Rhodeus sericeus amarus</i>		F, M	48	6M + 26SM + 16A	80				ACN=50	Hungary	B-64
<i>Rhodeus sericeus amarus</i>		F, M	48	34 M/SM + 14 ST/A	82				ACN=50	Hungary	M-64
<i>Rhodeus sericeus amarus</i>		F, M	48	14M + 12SM + 12ST + 10A	74	86			ACN=50	Russia (Don R.)	S-77
<i>Rhodeus sericeus sericeus</i>	<i>sericeus</i>	F	48							China (Hubei)	H-19
<i>Rhodeus sinensis</i>		F, M	48	8M + 20SM + 20ST	76	96	8	(15 in embryo)	ACN=50	China (Amur R.), Korea	U-24
<i>Rhodeus sinensis</i>	<i>Pseudoperilampus lighti</i>	F, M	48	12M + 22SM + 8ST + 6A	82	90			ACN=50	China (Sichuan)	Y-15
<i>Rhodeus sinensis</i>	<i>uyekii</i>	F, M	48	28 M/SM + 20 ST/A	76				ACN=50	Korea (Go-san)	L-9, L-10
<i>Rhodeus sp.</i>	<i>sinensis</i>	F, M	48	14M + 28SM + 6 ST/A	90				ACN=50	China (Kunming)	L-38
<i>Rhodeus sp.</i>	<i>sinensis</i>	F, M	48	12M + 28SM + 8 ST/A	88				ACN=50	China (Shandong)	W-34
<i>Tanakia himantegus chii</i>	<i>himantegus</i>	M	48							China (Wuhan)	H-19
<i>Tanakia himantegus chii</i>		F, M	48	8M + 20SM + 18ST + 2A	76	94			ACN=50	China (Shanghai)	U-22
<i>Tanakia himantegus himantegus</i>		F, M	48	8M + 20SM + 18ST + 2A	76	94	2-3		ACN=50	China (Shanghai)	U-71
<i>Tanakia himantegus himantegus</i>		F, M	48	8M + 20SM + 18ST + 2A	76	94	2-3		ACN=50	Taiwan	U-71
<i>Tanakia intermedia intermedia</i>	<i>Paracheilognathus himantegus</i>	F, M	48	10M + 18SM + 6ST + 14A	72				ACN=50	(Taiwan)	A-83
<i>Tanakia intermedia intermedia</i>	<i>Acheilognathus</i>	F, M	48	24 M/SM + 24 ST/A	76				ACN=50	Korea (Jang-heung)	L-9, L-11
<i>Tanakia intermedia</i>	<i>Acheilognathus</i>	F, M	48	28 M/SM + 20 ST/A	76	96	4		ACN=50	Korea (Gong-ju)	L-9, L-11
<i>Tanakia korensis</i>	<i>Acheilognathus</i>	F, M	48	8M + 20SM + 20ST	76	96			ACN=50	Korea (Gyongsangbuk-do)	U-24
<i>Tanakia lanceolata</i>	<i>Acheilognathus limbata</i>	F, M	48	8M + 20SM + 20ST	76	96	2	(2.1* FCM, 2.1FD)	ACN=50	Korea (Go-san)	L-9, L-10
<i>Tanakia lanceolata</i>	<i>Acheilognathus</i>	F, M	48	8M + 20 SM/ST + 20A	76				ACN=50	Japan (Lake Biwa, Fukuoka)	O-20, O-48, T-6, T-11
<i>Tanakia limbata</i>	<i>Acheilognathus</i>	F, M	48	10M + 18SM + 20 ST/A	76				ACN=50	Japan (Lake Biwa)	O-18
<i>Tanakia limbata</i>	<i>Acheilognathus</i>	F, M	48	10M + 18SM + 20 ST/A	76				ACN=50	Japan (Fukuoka, Hyogo)	O-20, O-48, T-6, T-11
<i>Tanakia limbata</i>	<i>Acheilognathus</i>	F, M	48	28 M/SM + 20 ST/A	76				ACN=50	Japan	U-13
<i>Tanakia limbata</i>		F, M	48	8M + 20SM + 20ST	76	96	1-3		ACN=50	Japan (Mie)	S-93
<i>Tanakia signifer</i>		F, M	48	8M + 20SM + 16ST + 4A	76	92	2		ACN=50	Korea (Gangwon-do)	U-24
<i>Tanakia signifer</i>	<i>Acheilognathus</i>	F, M	48	8M + 12SM + 28ST	68	96			ACN=50	Korea	L-15
<i>Tanakia somjinensis</i>		F, M	48	8M + 20SM + 20ST	76	96	2-4		ACN=50	Korea	U-71

Table 6.11 Order CYPRINIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Superfamily/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Tanakaia tanago</i>		F, M	48	28 M/SM + 20 ST/A	76				ACN=50	Japan (Chiba)	O-20
<b>Barbinae</b>											
<i>Acrossocheilus wenchowensis beijiangensis</i>		F, M	50	14M + 16SM + 14ST + 6A	80	94			ACN=50	China (Guangdong)	G-69, Y-15
<i>Acrossocheilus deauratus</i>		F, M	50	10M + 12SM + 28A	72				ACN=50	N.E. Thailand	A-84
<i>Acrossocheilus fasciatus</i>		F, M	50	14M + 16SM + 10ST + 10A	80	90			ACN=50	China (Guangdong)	G-69, Y-15
<i>Acrossocheilus hemispinus</i>		F, M	50	10M + 16SM + 8ST + 16A	76	84			ACN=50	China (Guangxi)	Y-15
<i>Acrossocheilus iridescens zhujiangensis</i>		F, M	50	14M + 16SM + 10ST + 10A	80	90			ACN=50	China (Guangdong)	G-69, Y-15
<i>Acrossocheilus labiatus</i>		F, M	50	16M + 12SM + 4ST + 18A	78	82			ACN=50	Taiwan	A-78
<i>Acrossocheilus parallels</i>		F, M	50	14M + 16SM + 14ST + 6A	80	94			ACN=50	China (Guangdong)	G-69, Y-15
<i>Acrossocheilus yunnanensis</i>		F	50	18M + 16SM + 16 ST/A	84			2.5 FD	ACN=50	China (Yunnan)	Z-5, Z-8
<i>Acrossocheilus yunnanensis</i>		F	50	10M + 18SM + 12ST + 10A	78	90			ACN=50	China (Sichuan)	L-43, Y-15
<i>Aulopyge huegeli</i>			100	48 M/SM + 52 ST/A	148				4X, ACN=100	Bosnia	B-20
<i>Balantiocheilus melanopterus</i>			50	10M + 12SM + 28A	72		2	2.1* FGM	ACN=50	(S.E. Asia)	O-48
<i>Balantiocheilus melanopterus</i>		F, M	50	6M + 18SM + 16ST + 10A	74	90	2		ACN=50	(S.E. Asia)	K-136
<i>Barbodes carnaticus</i>			100	22M + 40SM + 22ST + 16A	162	184	6		4X, ACN=100	India (W. Ghats)	N-55
<i>Barbonymus altus</i>	<i>Puntius</i>		50	10M + 24SM + 4ST + 12A	84	88			ACN=50	Thailand (Ayuthaya)	M-9
<i>Barbonymus gonionotus</i>	<i>Puntius</i>		50	2M + 20SM + 4ST + 24A	72	76		(2.2 FD)	ACN=50	Thailand (Ayuthaya)	M-9, S-141
<i>Barbonymus gonionotus</i>	<i>Puntius</i>	F, M	50	12M + 12SM + 4ST + 22A	74	78			ACN=50	Thailand	W-31
<i>Barbonymus schwanenfeldii</i>	<i>Puntius</i>		50	6M + 28 SM/ST + 16A	84			2.2 BFA	ACN=50	(Asia)	T-60, H-13
<i>Barbus ablabes</i>		F	50	18M + 30SM + 2 ST/A	98		2			Guinea, Africa	R-21
<i>Barbus amatolicus</i>			48	22 M/SM + 26 ST/A	70					S. Africa	S-193
<i>Barbus andrewi</i>			100	34 M/SM + 66 ST/A	134				4X, ACN=100	S. Africa	T-55
<i>Barbus anema</i>			50	42 M/SM + 8A	92	92			ACN=50	Ethiopia (Alvero R.)	G-47
<i>Barbus anoplus</i>			48	30 M/SM + 18 ST/A	78		2			S. Africa	S-193
<i>Barbus anoplus</i>			50							S. Africa	T-59
<i>Barbus argenteus</i>			50	44 M/SM + 6 ST/A	94		2			S. Africa	S-193
<i>Barbus barbatus</i>			100	12M + 48 SM/ST + 40A	160			3.5 FD	4X, ACN=100	France	H-2, H-4
<i>Barbus bigornei</i>		F, M	48	18M + 30SM	96	96	2		ACN=50	Guinea	R-21
<i>Barbus brevipinnis</i>			48	40 M/SM + 8 ST/A	88		2			S. Africa	S-193
<i>Barbus bynni</i>		F, M	150	70 M/SM + 80 ST/A	220				6X, ACN=150	Ethiopia (L. Abaya)	G-47
<i>Barbus bynni bynni</i>			150	50 M/SM + 100A	200				6X	Ethiopia (Baro R.)	K-108
<i>Barbus bynni bynni</i>			150	70 M/SM + 80A	220				6X	Ethiopia (L. Abaya)	K-108
<i>Barbus bynni occidentalis</i>			148							W. Africa, Guinea	G-86
<i>Barbus bynni waldroni</i>		F	150							W. Africa	G-84
<i>Barbus calidus</i>			100		126				6X	S. Africa	S-193
<i>Barbus callensis</i>	<i>setivimensis</i>		100						4X	Africa	G-84
<i>Barbus canis</i>			150	76M + 24ST + 50A	226	250			6X	Israel (Jordan R.)	G-59
<i>Barbus cyclolepis</i>		F, M	100	26M + 16SM + 36ST + 22A	142	178	4		4X	Macedonia	R-24
<i>Barbus erubescens</i>			100						4X	Africa	D-27

Table 6.11 Order CYPRINIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Superfamily/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Barbus ethiopicus</i>		M	150	40 M/SM + 110 ST/A	190				6X	Ethiopia (Meki R.)	G-47
<i>Barbus eutaenia</i>			48		82,84					S. Africa	S-193
<i>Barbus fasciolatus</i>	<i>bariloides</i>		48	32M + 16SM	96	96			ACN=48	(Africa)	R-4
<i>Barbus goktschaicus</i>		F, M	100	6M + 18SM + 76 ST/A	124				4X	Armenia (Lake Sevan)	K-109
<i>Barbus gurneyi</i>			50	26 M/SM + 24 ST/A	76		2			S. Africa	S-193
<i>Barbus holotaenia</i>		F, M	50	24M + 26 SM/ST	100				ACN=50	(Africa)	R-4
<i>Barbus hospes</i>			96	46 M/SM + 50 ST/A	142		2		4X	S. Africa	S-193
<i>Barbus intermedius</i>			150	90M + 60A	240				6X	Ethiopia	G-47
<i>Barbus intermedius</i>			150	66M + 84A	216				6X	Ethiopia	G-47
<i>Barbus issenensis</i>			100						4X	N. Africa	G-84
<i>Barbus kerstenii</i>		F	50	34 M/SM + 16A	84				ACN=50	Ethiopia (Lake Abaya)	G-47
<i>Barbus ksibi</i>			100						4X	NW. Africa	G-84
<i>Barbus kubanicus</i>	<i>tauricus kubanicus</i>		100						4X	(Russia)	V-72
<i>Barbus macrops</i>			50	14M + 28SM + 8 ST/A	92		2		ACN=50	Guinea	R-21
<i>Barbus massaensis</i>			100						4X	N. Africa	G-84
<i>Barbus meridionalis</i>		M	100	22M + 20SM + 12ST + 46A	142	154			4X	Italy	C-34
<i>Barbus motebensis</i>			50	24 M/SM + 26 ST/A	74		2			S. Africa	S-193
<i>Barbus moulouyensis</i>			100						4X	NW. Africa	G-84
<i>Barbus nasus</i>			100						4X	N. Africa	G-84
<i>Barbus paludinosus</i>	developed dorsal spine		50	46 M/SM + 4A	96	96			ACN=50	Ethiopia (Bulbula R.)	G-47
<i>Barbus paludinosus</i>	reduced dorsal spine		50	44 M/SM + 6 ST/A	94				ACN=50	Ethiopia (Omo R.)	G-49
<i>Barbus paludinosus</i>			50	44 M/SM + 6 ST/A	94				ACN=50	Ethiopia (Omo R.)	G-49
<i>Barbus paludinosus</i>			50	30 M/SM + 20 ST/A	80		2			S. Africa	S-193
<i>Barbus parawaldroni</i>			150						6X	W. Africa	G-84
<i>Barbus peloponnesius petenyi</i>	<i>meridionalis petenyi</i>	F, M	100	50 M/SM + 50 ST/A	150				4X	Bosnia-Herzegovina	S-76
<i>Barbus petityeani</i>		F, M	150	36M + 90 SM/ST + 24A		276			6X	W. Africa, Guinea	G-86
<i>Barbus plebejus</i>	<i>barbus plebejus</i>	F, M	100	26M + 18SM + 18ST + 38A	144	162			4X	Italy	C-34
<i>Barbus pleurogramma</i>			50	44 M/SM + 6 ST/A	94				ACN=50	Ethiopia (Lake Tana)	G-49
<i>Barbus sacriatus</i>			150						6X	W. Africa	G-84
<i>Barbus serra</i>			100						4X	S. Africa	T-55
<i>Barbus trevellyani</i>			100						4X	S. Africa	T-55
<i>Barbus trevellyani</i>			96	32 M/SM + 64 ST/A	128		4		4X	S. Africa	S-193
<i>Barbus trimaculatus</i>			48	30 M/SM + 18 ST/A	78		2		4X	S. Africa	S-193
<i>Barbus wurtzi</i>		F, M	150						6X	W. Africa, Guinea	G-84
<i>Barbus</i> sp. 1			50	44 M/SM + 6A	94	94			ACN=50	Ethiopia (Alvero R.)	G-47
<i>Barbus</i> sp. 2		F, M	50	44 M/SM + 6A	94	94			ACN=50	Ethiopia (Lake Abaya)	G-47
<i>Barbus</i> sp. 3		F, M	50	48 M/SM + 2A	98	98			ACN=50	Ethiopia (Hare R.)	G-47
<i>Caecobarbus geertsii</i>		F, M	50	12M + 28SM + 10ST	90	100			ACN=50	Zaire	V-36
<i>Capoeta capoeta</i>			150	24M + 60SM + 14ST + 52A	234	248			6X	Iran (Roudbar)	S-1

Table 6.11 Order CYPRINIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Superfamily/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Capoeta capoeta</i>			150	24M + 56SM + 14ST + 56A	230	244			6X	Iran (Golestan Natn. Park)	S-1
<i>Capoeta capoeta sevangi</i>	<i>Varicorhinus</i>	M	150	10M + 30SM + 110A	190	190			6X	Armenia (Lake Sevan)	K-109
<i>Capoeta capoeta umbra</i>		F, M	150	86 M/SM + 64 ST/A	236				6X	Turkey (Tigris R.)	K-51
<i>Capoeta damascina</i>			148	78 M/SM + 32ST + 38A	226	258			6X	Jordan	G-59
<i>Capoeta truttia</i>		F, M	150	70 M/SM + 80 ST/A	220				6X	Turkey (Tigris R.)	K-51
<i>Carasobarbus canis</i>	<i>Barbus</i>		150	76 M/SM + 24ST + 50A	226	250			6X	Middle East	G-59
<i>Catla catla</i>		F, M	50	8M + 16SM + 14ST + 12A	74	88			ACN=50	India (WB)	M-27
<i>Catla catla</i>			50	4M + 12SM + 34A	66	66	4		ACN=50	India	L-2
<i>Catla catla</i>			50	10M + 16SM + 8ST + 16A	76	84	4		ACN=50	India (near Lucknow)	N-4
<i>Catlocarpio siamensis</i>			98	18M + 54 SM/ST + 26A	170			3.5 FD	4X, ACN=98	(Asia)	S-127
<i>Chagunius chagunio</i>		F	50	16M + 28SM + 6A	94	94			ACN=50	India (Assam)	K-46, C-108
<i>Cychocheilichthys apogon</i>			50	12M + 8SM + 6ST + 24A	70	76			ACN=50	Thailand (Ayuthaya)	M-9
<i>Cychocheilichthys enoplos</i>			50	10M + 30SM + 4ST + 6A	90	94	4		ACN=50	Thailand (Uthai Thani)	M-12
<i>Cyprinion macrostomus</i>		F, M	50	6M + 24SM + 12ST + 8A	80	92	4		ACN=50	Turkey	Y-24
<i>Folifer brevifilis brevifilis</i>	<i>Tor (Folifer)</i>		50	14M + 14SM + 16ST + 6A	78	94			ACN=50	China (Guangdong)	G-69, Y-15
<i>Folifer brevifilis brevifilis</i>	<i>Tor (Folifer)</i>	F, M	50	14M + 16SM + 20 ST/A	80				ACN=50	China	Z-8
<i>Hypseobarbus curmuca</i>	<i>Gonoproktopterus</i>		100	18M + 38SM + 28ST + 16A	156	184	6		4X, ACN=100	India (W. Ghats)	N-55
<i>Hypseobarbus wetmorei</i>	<i>Puntius darphani</i>		50	12M + 8SM + 6ST + 24A	70	76			ACN=50	Thailand (Ayuthaya)	M-9
<i>Labeobarbus aeneus</i>	<i>Barbus</i>		148	48 M/SM + 100 ST/A	196				6X	S. Africa (Ciskei)	O-2
<i>Labeobarbus capensis</i>	<i>Barbus</i>		150	58 M/SM + 92 ST/A	208				6X	S. Africa (S.W. Cape)	O-2
<i>Labeobarbus capensis</i>		M	150	16M + 58SM + 42ST + 34A	224	266			6X	S. Africa (Rondegat R.)	N-67
<i>Labeobarbus intermedius</i>	<i>Barbus</i>	F, M	150	66 M/SM + 84 ST/A	216				6X	Ethiopia (L. Tana, Kulfo R.)	G-47, K-108
<i>Labeobarbus intermedius</i>	<i>Barbus</i>	F, M	150	90 M/SM + 60 ST/A	240				6X	Ethiopia (Awash R.)	G-47
<i>Labeobarbus kimberleyensis</i>	<i>Barbus</i>		148	56 M/SM + 92 ST/A	204				6X	S. Africa	O-2
<i>Labeobarbus marequensis</i>		F, M	150	26M + 44SM + 42ST + 38A	220	262			6X	S. Africa (Marico R.)	N-67
<i>Labeobarbus natalensis</i>	<i>Barbus</i>		150	50 M/SM + 100 ST/A	200				6X	S. Africa (Mgeni R.)	O-2
<i>Labeobarbus polylepis</i>	<i>Barbus</i>		150	56 M/SM + 94 ST/A	206				6X	S. Africa	O-2
<i>Labeobarbus polylepis</i>		F	150	18M + 60SM + 42ST + 30A	228	270			6X, ACN=150	S. Africa (Elands R.)	N-67
<i>Labeobarbus polylepis</i>	<i>Barbus</i>		148	62 M/SM + 86 ST/A	210		4		6X	S. Africa	S-193
<i>Leptobarbus hoevenii</i>			50	10M + 34 SM/ST + 6A	94				ACN=50	(Asia)	S-126
<i>Leptobarbus hoevenii</i>	<i>Barbus</i>		50	16M + 30SM + 2ST + 2A	96	98				(India, Thailand)	Z-29
<i>Luciobarbus bocagei</i>	<i>Barbus</i>	F, M	100	64 M/SM + 36A	164			3.8 FCM	4X	Portugal	C-72, C-75
<i>Luciobarbus brachycephalus</i>	<i>Barbus</i>		100	24M + 46 SM/ST + 30A	172	170			4X	Portugal (Caspian Sea)	V-72
<i>Luciobarbus comizo</i>	<i>Barbus</i>	F, M	100	12M + 60SM + 28 ST/A	172			2.7 FCM	4X	Portugal	C-72, C-75
<i>Luciobarbus microcephalus</i>	<i>Barbus</i>	F, M	100	18M + 50SM + 32 ST/A	168			3.7 FCM	4X	Portugal	C-72, C-75
<i>Luciobarbus sclateri</i>	<i>Barbus</i>	F, M	100	10M + 44SM + 46 ST/A	154			3.7 FCM	4X	Portugal	C-72, C-75
<i>Luciobarbus steindachneri</i>	<i>Barbus</i>	F, M	100	10M + 48SM + 42 ST/A	158			3.6 FCM	4X	Portugal	C-72, C-75
<i>Myristacoleucus marginatus</i>	<i>Barbus</i>		50	16M + 10SM + 24A	76	76			ACN=50	C. Thailand	A-84
<i>Neolissochilus dukai</i>			100	26M + 50 SM + 6ST + 18A	176	182			4X	India (Assam)	K-46

Table 6.11 Order CYPRINIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Superfamily/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Neolissochilus hexagonolepis</i>	<i>Acrossocheilus</i>		100	16M + 26SM + 58 ST/A	142				4X	Nepal	M-48
<i>Neolissochilus hexagonolepis</i>	<i>Acrossocheilus</i>		100	32M + 16SM + 6ST + 46A	148	154			4X	India (A.P.)	S-173
<i>Neolissochilus hexagonolepis</i>	<i>Acrossocheilus</i>		100	20M + 18SM + 14ST + 48A	138	152	4		4X	India (Meghalaya)	M-160
<i>Neolissochilus sumatranus</i>	<i>Acrossocheilus</i>		98	8M + 36SM + 16ST + 38A	142	158			4X	(Asia)	S-123
<i>Neolissochilus</i> sp.	<i>Barbus</i>		100	44M + 12SM + 44A	156	156			4X	India	K-46
<i>Onychostoma elongatus</i>	<i>Varicorhinus</i>	F, M	50	12M + 12SM + 14ST + 12A	74	88			ACN=52	China (Guangdong)	G-69, Y-15
<i>Onychostoma gerlachi</i>	<i>Varicorhinus</i>	F, M	50	12M + 12SM + 14ST + 12A	74	88			ACN=52	China (Guangdong)	G-69, Y-15
<i>Onychostoma sima</i>	<i>Varicorhinus simus</i>	F, M	50	10M + 16SM + 16ST + 8A	76	92			ACN=52	China (Sichuan)	L-43, Y-15
<i>Percocypris pingi pingi</i>			98	42M + 30SM + 26 ST/A	170			4.6 FD	4X, ACN=98	China (Yunnan)	Z-5, Z-8
<i>Percocypris pingi regani</i>			98	40M + 18SM + 40 ST/A	156				4X, ACN=98	China (Yunnan)	Z-8
<i>Poropuntius sinensis</i>			50	10M + 22SM + 18 ST/A	82				ACN=50	China (Yunnan)	Z-5
<i>Poropuntius chonglingchungi</i>	<i>Barbodes deliensis</i>		50	12M + 18SM + 20 ST/A	80			2.3 FD	ACN=50	China (Yunnan)	Z-5, Z-8
<i>Poropuntius jullieni</i>	<i>Barbodes lacustris</i>		98	18M + 28 SM/ST + 52A		144			4X	(Asia)	S-126
<i>Pseudobarbus afer</i>		F, M	100	12M + 40SM + 38ST + 10A	152	190			4X	S. Africa	N-63, T-55
<i>Pseudobarbus afer</i>		F, M	100	12M + 42SM + 36ST + 10A	154	190	3		4X	S. Africa (Blindkloof)	N-63
<i>Pseudobarbus asper</i>		F, M	100	14M + 46SM + 32ST + 8A	160	192			4X	S. Africa (Groot R.)	N-63
<i>Pseudobarbus burchelli</i>	B type	F, M	100	10M + 42SM + 34ST + 14A	152	186			4X	S. Africa (Bainskloof)	N-63
<i>Pseudobarbus burchelli</i>	S type	F, M	100	10M + 40SM + 36ST + 14A	150	186	3		4X, ACN=100	S. Africa (Wolvekloof)	N-63
<i>Pseudobarbus burgi</i>		F, M	100	14M + 36SM + 38ST + 12A	150	188			4X	S. Africa (Wemmers R.)	N-63
<i>Pseudobarbus phlegethon</i>		F, M	100	14M + 40SM + 38ST + 8A	154	192	4		4X	S. Africa (Thee R.)	N-63
<i>Pseudobarbus quathlambae</i>			100						4X	S. Africa	O-2
<i>Pseudobarbus tenuis</i>		F, M	100	14M + 40SM + 32ST + 14A	154	186	4		4X	S. Africa (Grobbebaars R.)	N-63
<i>Proctozyron arulius</i>			50	16M + 10SM + 24A	76	76			ACN=50	Thailand (Uthai Thani)	M-12
<i>Puntius binotatus</i>			50	6M + 26 SM/ST + 18A	82				ACN=50	(Asia)	T-61
<i>Puntius brevis</i>	<i>japonicus</i>	M, F	50	8M + 34 SM/ST + 8A	92				ACN=50	(Asia)	T-60
<i>Puntius chola</i>			50	6M + 14SM + 8ST + 22A	70	78			ACN=50	(Asia)	K-27
<i>Puntius chola</i>			50	2M + 4 SM/ST + 44A		56			ACN=50	(Asia)	T-61
<i>Puntius chola</i>	<i>tetrarupagus</i>	M	50	2M + 2SM + 46A	54				ACN=50	India (A.P.)	S-173
<i>Puntius chola</i>		M	50	2M + 2SM + 4ST + 42A	54	58			ACN=50	India (J & K)	T-52
<i>Puntius conchomius</i>		M	50	16M + 24SM + 2ST + 8A	90	92		(2.0* FCM)	ACN=50	India (Similipal Hills)	K-41, O-48
<i>Puntius conchomius</i>			50	6M + 38 SM/ST + 6A	94			(1.9 BFA)	ACN=50	(Asia)	T-61, H-13
<i>Puntius conchomius</i>			50	4M + 40SM + 6A	94	94				(Asia)	T-12
<i>Puntius conchomius</i>			50					(1.7 FCM)		(Asia)	V-72, V-86
<i>Puntius cumingi</i>		F, M	48	10M + 20SM + 10ST + 8A	78	88			ACN=50	India (J & K)	S-49
<i>Puntius denisonii</i>			50	18M + 26 SM/ST + 6A	94				ACN=50	(Asia)	T-61
<i>Puntius everetti</i>			50	4M + 20SM + 18ST + 8A	74	92	8		ACN=50	India (Kerala)	N-57
<i>Puntius fasciatus</i>			50	6M + 30 SM/ST + 14A	86			1.8 FCM, 2.0 BFA	ACN=50	(Asia)	T-60, V-86, H-13
<i>Puntius fasciatus</i>	<i>Barbus</i>	M	50	6M + 26 SM/ST + 18A	82				ACN=50	(Asia)	T-60
<i>Puntius fasciatus</i>			50	30 M/SM + 4ST + 16A	80	84		1.5 FD	2B	(Asia)	O-5

Table 6.11 Order CYPRINIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Superfamily/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup> NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Puntius filamentosus</i>			50	8M + 26 SM/ST + 16A	84				ACN=50	(Asia)	T-61
<i>Puntius filamentosus</i>			50	12M + 16SM + 12ST + 10A	78	90	8		ACN=50	India (Kerala)	N-56
<i>Puntius lateristriga</i>			50	6M + 32 SM/ST + 12A	88				ACN=50	(Asia)	T-60
<i>Puntius manipurensis</i>		F, M	50	22M + 14SM + 6ST + 8A	86	92			ACN=50	India (Manipur)	S-74
<i>Puntius melanampyx</i>			50	12M + 12SM + 14ST + 12A	74	86			ACN=50	India (Tamil Nadu)	K-41
<i>Puntius nigrofasciatus</i>			50	16M + 34 SM/ST	100				ACN=50	(Asia)	T-61
<i>Puntius oligolepis</i>			50	8M + 30 SM/ST + 12A	88				ACN=50	(Asia)	T-60
<i>Puntius orphoides</i>			50	14M + 16SM + 4ST + 16A	80	84			ACN=50	N. Thailand	A-84
<i>Puntius orphoides</i>			50	6M + 36 SM/ST + 8A	92			1.5 FD	ACN=50	(Asia)	T-60, S-127
<i>Puntius partipentazona</i>			50	6M + 34 SM/ST + 10A	90				ACN=50	(Asia)	T-60
<i>Puntius pentazona</i>			50	22M + 26 SM/ST + 2A	98				ACN=50	(Asia)	T-60
<i>Puntius sarana</i>		M	50	12M + 14SM + 12ST + 12A	76	88			ACN=50	India (Haryana)	R-55
<i>Puntius sarana subnasutus</i>			50	12M + 26SM + 8ST + 4A	88	96	8		ACN=50	India (Kerala)	N-57
<i>Puntius semifasciatus</i>		F, M	50	12M + 14SM + 14ST + 10A	76	90			ACN=50	China (Guangdong)	G-69, Y-15
<i>Puntius semifasciatus</i>			50	8M + 18 SM/ST + 24A	76			(1.7 FOM)	ACN=50	(Asia)	S-136, V-86
<i>Puntius sophone</i>		F	50	2M + 4SM + 44A	56	56			ACN=50	India (Tamil Nadu)	K-41
<i>Puntius sophone</i>		F, M	48	2M + 4SM + 42A	54	54				India (Haryana)	R-51
<i>Puntius sophone</i>		F, M	48	4M + 2ST + 42A	52	54				India (Haryana)	R-75
<i>Puntius sophone</i>		F	48	4M + 6ST + 38A	52	58			ACN=50	India (J & K)	T-52
<i>Puntius sophone</i>		F, M	48	4M + 2SM + 42A	54	54				India (WB)	K-42
<i>Puntius sophone</i>		F, M	48	2M + 2 SM/ST + 44A	54	52				India (Haryana)	R-46
<i>Puntius sopheroides</i>			50	2M + 2SM + 46A	54	54			ACN=50	Thailand (Ayuthaya)	M-9
<i>Puntius stoliczkanus</i>			50	22M + 22SM + 4ST + 2A	94	98			ACN=50	Thailand (Mae Hong Son)	M-9
<i>Puntius tetrazona</i>		M	50	34 M/SM + 6ST + 10A	84	90		1.4 FD		(Asia)	O-5
<i>Puntius tetrazona</i>			50					(1.5 FOM)		India	K-102, V-86
<i>Puntius tetrazona</i>			50	6M + 28 SM/ST + 16A	84			2.0 FD, (1.9 BFA)	ACN=50	(Asia)	T-60, S-141, H-13
<i>Puntius tetrazona partipentazona</i>			50	6M + 34 SM/ST + 10A	90				ACN=50	(Asia)	T-60
<i>Puntius ticto</i>		F, M	50	20M + 12SM + 10ST + 8A	82	92		(1.8 FOM)		India (Jammu)	S-58, V-86
<i>Puntius ticto</i>			50	28M + 22 SM/ST	100				ACN=50	(Asia)	T-61
<i>Puntius ticto</i>			50	28M + 16SM + 6ST	94	100				India (A.P.)	S-173
<i>Puntius titteya</i>			50	20M + 28 SM/ST + 2A	98			2.4 BFA	ACN=50	(Asia)	T-61, H-13
<i>Sinocyclocheilus grahami grahami</i>			96	22M + 36SM + 38 ST/A	154				4X	China (Kunming)	L-38
<i>Sinocyclocheilus grahami tingi</i>			96	20M + 32SM + 44 ST/A	148				4X	China (Yunnan)	L-38
<i>Sinocyclocheilus grahami tingi</i>			96	18M + 34SM + 44 ST/A	148			4.6 FD	4X	China (Yunnan)	Z-5, Z-7, Z-8
<i>Sinocyclocheilus grahami tingi</i>			96	14M + 34SM + 48ST/A	144				4X	China (Yunnan)	Z-5
<i>Sinocyclocheilus maculatus</i>			96	18M + 32SM + 46 ST/A	146			4.6 FD	4X	China (Yunnan)	Z-5, Z-7, Z-8
<i>Spinibarbus hollandi</i>		F, M	100	18M + 32SM + 26ST + 24A	150	176			4X, ACN=100	China (Guangdong)	G-68, Y-15
<i>Denticulatus denticulatus</i>		F, M	100	18M + 32SM + 26ST + 24A	150	176			4X, ACN=100	China (Guangdong)	G-68, Y-15
<i>Spinibarbus sinensis</i>		F, M	100	18M + 32SM + 26ST + 24A	150	176			4X, ACN=100	China (Wuhan)	G-68, Y-15



Table 6.11 Order CYPRINIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Superfamily/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Tor chelynooides</i>			100	20M + 30SM + 24ST + 26A	150	174	4		4X, ACN=100	India (Uttarakhand)	S-189, M-160
<i>Tor douronensis</i>			100	22M + 30SM + 48 ST/A	152				4X, ACN=100	China	Z-8
<i>Tor khudree</i>		F, M	100	16M + 28SM + 6ST + 50A	144	150			4X, ACN=100	India (Jammu)	K-36
<i>Tor khudree</i>			100	16M + 16SM + 8ST + 60A	132	140			4X, ACN=100	India (Maharashtra)	L-4
<i>Tor khudree</i>			100	18M + 16SM + 44ST + 22A	134	178	10		4X, ACN=100	India (Maharashtra)	K-111
<i>Tor khudree</i>			100	20M + 14SM + 22ST + 44A	134	156	4		4X, ACN=100	India (Karnataka)	M-160
<i>Tor mussullah</i>			100	22M + 24SM + 24ST + 30A	146	170	4		4X, ACN=100	India (Maharashtra)	K-111, M-160
<i>Tor progeneilus</i>			100	20M + 20SM + 20ST + 40A	140	160	4		4X, ACN=100	India (Assam)	S-189, M-160
<i>Tor putitora</i>		F, M	100	10M + 24SM + 14ST + 52A	134	148			4X, ACN=100	India (U.P.)	K-33
<i>Tor putitora</i>			100	32M + 16ST + 52A	132	148			4X, ACN=100	India (U.P.)	L-4
<i>Tor putitora</i>			100	12M + 18SM + 70 ST/A	130				4X, ACN=100	India (U.P.)	R-71
<i>Tor putitora</i>			100	12M + 22SM + 14ST + 52A	134	148	4		4X, ACN=100	India (Uttarakhand)	S-189, M-160
<i>Tor sinensis</i>			100	18M + 30SM + 52 ST/A	144	150			4X, ACN=100	China	Z-8
<i>Tor soro</i>			100	44M + 14SM + 42 ST/A	148				4X, ACN=100	Thailand (Kanchana Buri)	M-12
<i>Tor tor</i>			100	10M + 30SM + 60 ST/A	140				4X, ACN=100	India (Orissa)	K-41
<i>Tor tor</i>		F, M	100	24M + 24SM + 6ST + 46A	148	154			4X, ACN=100	India (Haryana)	R-71
<i>Tor tor</i>		M	100	26M + 18ST + 56A	126	144			4X, ACN=100	India (U.P.)	K-36
<i>Tor tor</i>			100	20M + 24SM + 24ST + 32A	144	168	8		4X, ACN=100	India (Madhya Pradesh)	L-4
<i>Tor beso</i>		F, M	150	66 M/SM + 84 ST/A	216				6X, ACN=150	Ethiopia (Blue Nile, L. Tana)	S-189, M-160
<i>Varicorhinus nelspruitensis</i>			ca. 150						6X	S. Africa	G-47, K-108
<b>Cultrinae</b>											
<i>Anabarilius alburnops</i>			48	12M + 24SM + 12ST	84	96			ACN=50	China (Kunming Lake)	Z-3
<i>Anabarilius alburnops</i>			48	14M + 20SM + 14ST	82	96			ACN=50	China (Qilu Lake)	Z-3
<i>Anabarilius andersoni</i>			48	12M + 24SM + 12ST	84	96			ACN=50	China (Kunming)	Z-3
<i>Anabarilius grahami</i>			48	14M + 20SM + 14ST	82	96			ACN=50	China (Yunnan)	Z-3
<i>Anabarilius macrolepis</i>			48	12M + 24SM + 12ST	84	96			ACN=50	China (Yunnan)	Z-3
<i>Ancherythroculter kurematsui</i>		F, M	48	18M + 24SM + 6ST	90	96			ACN=50	China (Sichuan)	Y-15
<i>Ancherythroculter nigrocauda</i>		F, M	48	20M + 24SM + 4ST	92	96			ACN=50	China (Sichuan)	L-32, Y-15
<i>Ancherythroculter wangi</i>		F, M	48	18M + 26SM + 4ST	92	96			ACN=50	China (Sichuan)	L-32, Y-15
<i>Aphyocypris chinensis</i>		M	48	16M + 26SM + 6ST	90	96		(2.3 FD)		Japan (Kyushu)	M-50, S-141
<i>Aphyocypris chinensis</i>		F, M	48	16M + 26SM + 6 ST/A	90	96				Korea (Yesan-gun)	K-55, L-12
<i>Chanodichthys dabryi</i>	<i>Erythroculter</i>	F, M	48	16M + 28SM + 4ST	92	96	7		ACN=50	China (Hubei)	L-40, R-43
<i>Chanodichthys dabryi</i>	<i>Erythroculter hypselonotus</i>	F, M	48	16M + 24SM + 8ST	88	96			ACN=50	China (Guangdong)	L-32
<i>Chanodichthys erythropterus</i>	<i>Culter</i>	F, M	48	16M + 26SM + 6ST	90	96	6	2.1* FD	ACN=50	China (Hubei)	L-40, R-42, C-83
<i>Chanodichthys erythropterus</i>	<i>Erythroculter ilishaeformis</i>	F, M	48	16M + 26SM + 6ST	90	96	6	1.6* FD	ACN=50	China (Hubei)	L-40, R-43, R-105, C-83
<i>Chanodichthys erythropterus</i>	<i>Erythroculter ilishaeformis</i>	F, M	48	20M + 28 SM/ST	96				ACN=50	(Hubei, China)	L-53
<i>Chanodichthys mongolicus</i>	<i>Erythroculter</i>	F, M	48	14M + 28SM + 6ST	90	96		2.0* FD	ACN=50	China (Hubei)	L-40, Y-15, C-83
<i>Chanodichthys mongolicus</i>	<i>Erythroculter</i>		48	20M + 28 SM/ST	96				ACN=50	(Hubei, China)	L-53

Table 6.11 Order CYPRINIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Superfamily/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Culter oxycephaloides</i>	<i>Erythroculter</i>	F, M	48	20M + 24SM + 4ST	92	96			ACN=50	China (Hubei)	L-40
<i>Hemiculter bleekeri bleekeri</i>		M	48	16M + 26SM + 6ST	90	96			ACN=50	China (Hubei)	L-40, Y-15
<i>Hemiculter eigenmanni</i>			48		90				ACN=50	USSR	V-3
<i>Hemiculter leucisculus</i>		F, M	48	16M + 26SM + 6ST	90	96		2.2* FD	ACN=50	China (Hubei, Guangdong)	L-40, Y-15, C-83
<i>Hemiculter nigromarginis</i>		F, M	48	18M + 26SM + 4ST	92	96			ACN=50	China (Sichuan)	L-32, Y-15
<i>Hemiculterella sauvagei</i>		F, M	48	18M + 24SM + 6ST	90	96			ACN=50	China (Sichuan)	L-32, Y-15
<i>Hemiculterella</i> sp.		F	48							China (Pearl R.)	C-85
<i>Ischikauia steenackeri</i>		F, M	48	10M + 38 SM/ST	96	6	6	2.6* FCM	ACN=50	Japan (Osaka, Kobe)	T-4, O-48
<i>Megalobrama amblycephala</i>		F, M	48	18M + 26SM + 4ST	92	96	4		ACN=50	China (Hubei)	L-40, R-43, R-105, Z-1
<i>Megalobrama amblycephala</i>		F, M	48	16M + 24SM + 6ST + 2 special				(2.4, 2.0* FD)	ACN=50	China (Hubei)	L-41, L-73, C-83
<i>Megalobrama amblycephala</i>		F, M	48	20M + 24SM + 4ST	92	96			ACN=50	China (Hubei)	Z-1
<i>Megalobrama amblycephala</i>		F, M	48	26M + 22SM	96	96	4	(2.9* FCM)	ACN=50	China (Shashi)	Z-22, F-5
<i>Megalobrama amblycephala</i>		F, M	48	16M + 20SM + 12ST	84	96			ACN=50	China (Beijing)	Y-11
<i>Megalobrama terminalis</i>			48	18M + 22SM + 8ST	88	96			ACN=50	China (Hunan)	L-63
<i>Megalobrama terminalis</i>		F, M	48	14M + 26SM + 8ST	88	96			ACN=50	China (Hubei)	L-40, Y-15
<i>Osteobrama belangeri</i>	<i>Rohtee</i>	F	50	6M + 16SM + 12ST + 16A	72	84	2-4		ACN=50	India (Manipur)	K-137
<i>Osteobrama coto</i>		F	48	22M + 14SM + 8ST + 4A	84	92			ACN=50	India (WB)	M-27
<i>Osteobrama coto</i>		F	48	18M + 24SM + 6A	90	90			ACN=50	India (Jammu)	S-56
<i>Osteobrama coto coto</i>		F	48	24M + 14SM + 8ST + 2A	86	94			ACN=50	India (WB)	K-46
<i>Parabramis pekinensis</i>		F, M	48	14M + 26SM + 8ST	88	96	4	1.7* FD	ACN=50	China (Hubei)	L-40, R-43, C-83
<i>Parapelecus argenteus</i>		F, M	48	18M + 22SM + 8ST	88	96			ACN=50	China (Sichuan)	Y-15
<i>Parapelecus engraulis</i>		F, M	48	18M + 24SM + 6ST	90	96			ACN=50	China (Sichuan)	L-32, Y-15
<i>Pseudohemiculter dispar</i>		F, M	48	18M + 24SM + 6ST	90	96			ACN=50	China (Guangdong)	L-32, Y-15
<i>Pseudolaubuca sinensis</i>			48					2.4* FD		China (Wuhan)	C-83
<i>Sinibrama changi</i>		F, M	48	14M + 26SM + 8ST	88	96			ACN=50	China (Sichuan)	L-32
<i>Sinibrama macrops</i>		F, M	48	22M + 20SM + 6ST	90	96			ACN=50	China (Guangxi)	Y-15
<i>Sinibrama melrosei</i>		F, M	48	20M + 24SM + 4ST	92	96			ACN=50	China (Guangdong)	L-32
<b>Cyprininae</b>											
<i>Carassioides cantoniensis</i>		F, M	100	18M + 32SM + 18ST + 32A	150	168			4X, ACN=100	China (Guangdong)	G-68, Y-15
<i>Carassius auratus</i>	goldfish	F, M	100	24M + 30SM + 46 ST/A	154				4X, ACN=100	China (Beijing)	W-1
<i>Carassius auratus auratus</i>	goldfish		100	20M + 40 SM/ST + 40A		160		(4.1* FCM)	4X, ACN=100	Japan	K-115, O-48
<i>Carassius auratus auratus</i>	<i>carassius auratus</i> , goldfish		100	20M + 28 SM/ST + 52A		148		3.7 FD	4X, ACN=100	France	H-2, H-4
<i>Carassius auratus auratus</i>			100	22M + 30SM + 48 ST/A	152			3.2 FD	XX/XY	China (Yunnan)	Z-2, Z-8
<i>Carassius auratus auratus</i>			104	20M + 84 SM/ST/A					4X, ACN=100	Italy	C-60
<i>Carassius auratus auratus</i>		F, M	100	12M + 36SM + 52 ST/A	148		2		4X, ACN=100	China	O-29
<i>Carassius auratus auratus</i>		F, M	100	22m + 34SM + 22ST + 22A	156	178		(3.5 FCM)	4X, ACN=100	China	Y-14, R-105, V-86
<i>Carassius auratus auratus</i>			100	30M + 34SM + 36 ST/A	164			(3.4 FIA, 4.0 BFA)	4X, ACN=100	China (Amur)	S-62, S-64, H-13, H-41
<i>Carassius auratus auratus</i>			100	52 M/SM + 48 ST/A	152		1-3		4X, ACN=100	Croatia	A-23, M-54
<i>Carassius auratus auratus</i>	var. Dongtingking		100	30M + 20SM + 26ST + 24A	150	176			4X, ACN=100	China (Lake Dongting)	Y-25

Table 6.11 Order CYPRINIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Superfamily/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Carassius auratus</i>	back-low type	F, M	100	22M + 30SM + 48 ST/A	152		4	3.2 FD	XX/XY	China (Kunming Lake)	W-10, Z-4, Z-8
<i>Carassius auratus</i>	back-high type		156	30M + 46SM + 80 ST/A	232		6		6X, ACN=150	China (Yunnan)	W-10
<i>Carassius auratus</i>	back-high type		162	36M + 56SM + 70 ST/A	254		6		6X	China (Yunnan, Er hai Lake)	W-11
<i>Carassius auratus</i>	back-high type	F	162	33M + 53SM + 76 ST/A	248			4.6 FD	6X	China (Kunming Lake)	Z-4, Z-8
<i>Carassius auratus</i>	Xiji colour-crucian carp		100	24M + 30SM + 46 ST/A	154				4X, ACN=100	China (Xiji)	W-2
<i>Carassius auratus auratus</i>	Chinese crucian carp		100	12M + 36SM + 52 ST/A	148		2		4X, ACN=100	China	O-30, T-18
<i>Carassius auratus auratus</i>	Hibuna	F	100	12M + 36SM + 52 ST/A	148		2		4X, ACN=100	Japan (Hokkaido)	O-45
<i>Carassius auratus auratus</i>	Hibuna	F	151						3B, 6X	Japan (Hokkaido)	O-45
<i>Carassius auratus auratus</i>	Wakin	F, M	100	20M + 40 SM/ST + 40A			2		4X, ACN=100	Japan (Tokyo)	K-115
<i>Carassius auratus auratus</i>	Wakin	F, M	100	12M + 36SM + 52 ST/A	148		2		4X, ACN=100	Japan	O-12, O-30
<i>Carassius auratus auratus</i>	Ryukin	F, M	100	12M + 36SM + 52 ST/A	148				4X, ACN=100	Japan	O-12
<i>Carassius auratus auratus</i>	Comet	F, M	100	12M + 36SM + 52 ST/A	148				XX/XY	Japan	O-26, O-37
<i>Carassius auratus auratus</i>	Shubunkin	F, M	100	12M + 36SM + 52 ST/A	148				XX/XY	Japan	O-26, O-37
<i>Carassius auratus auratus</i>	Kuro-demekin		100	16M + 84 SM/ST/A					4X, ACN=100	Japan (Tokyo)	A-70
<i>Carassius auratus auratus</i>	Ranchuu		100	16M + 42SM + 42 ST/A	158				4X, ACN=100	Japan (Tokyo)	A-70
<i>Carassius auratus auratus</i>	Sanshiki-demekin		100	16M + 40SM + 44 ST/A	156				4X, ACN=100	Japan (Tokyo)	A-70
<i>Carassius auratus auratus</i>	Tetsugyo	F, M	100						4X, ACN=100	Japan (Niigata)	S-156
<i>Carassius auratus auratus</i>	Tetsugyo	F	153						6X, ACN=150	Japan (Niigata)	S-156
<i>Carassius auratus buergeri</i>	Tetsugyo	F	100	12M + 36SM + 52 ST/A	148		2		4X, ACN=100	Japan (Lake Suwa)	O-30
<i>Carassius auratus gibello</i>	Nagabuna	F	162	34M + 58SM + 42ST + 28A	254			(5.5* FD)	6X, ACN=150	China	Y-14, Y-15
<i>Carassius auratus gibello</i>			150						6X	China (Wuhan)	C-83
<i>Carassius auratus gibello</i>		F, M	156	42M + 74SM + 40 ST/A	272				6X, ACN=150	China (Amur)	S-62
<i>Carassius auratus gibello</i>		F, M	156	44M + 64SM + 48 ST/A	264				6X, ACN=150	China (Amur, Mishan)	S-64
<i>Carassius auratus gibello</i>		F, M	156	42M + 74SM + 40 ST/A	272				6X, ACN=150	China (Amur, Fangzheng)	S-64
<i>Carassius auratus gibello</i>		F, M	162	48M + 56SM + 18ST + 40A	266	284		(6.6* FCM)	6X	China (Amur, Fangzheng)	S-46, F-5
<i>Carassius auratus gibello</i>		F	156	50M + 64SM + 42 ST/A	270				6X, ACN=150	China (Amur, Dedou)	S-64
<i>Carassius auratus gibello</i>		F	162	32M + 52SM + 78 ST/A	246		4		6X	China (Amur, Fangzheng)	W-10
<i>Carassius auratus gibello</i>		M	100	20M + 40SM + 40 ST/A	160				4X, ACN=100	Russia (Amur R.)	K-85, K-94
<i>Carassius auratus gibello</i>		F	156	34M + 62SM + 60 ST/A	252				6X, ACN=150	Russia (Amur R.)	K-85, K-94
<i>Carassius auratus gibello</i>		F	150						6X, ACN=150	Bosnia	S-80
<i>Carassius auratus gibello</i>			98	48 M/SM/ST + 50A		146			4X, ACN=100	Rumania (Danube plaine)	R-36
<i>Carassius auratus gibello</i>		F	160	46M + 82 SM/ST + 32A		288		(5.5 FCM)	6X	Czech	P-22, G-85
<i>Carassius auratus gibello</i>		F, M	100	14M + 24SM + 10ST + 52A	138	148	1-4	(3.7 FCM)	4X, ACN=100	Poland	B-50, G-85
<i>Carassius auratus gibello</i>		F	150	26M + 50SM + 20ST + 54A	226	246	2-8		6X, ACN=150	Poland	B-50
<i>Carassius auratus gibello</i>	clone A		150	36M + 54SM + 36ST + 24A	240	276			6B, 6X	N. China	Z-36
<i>Carassius auratus gibello</i>	clone P		150	36M + 54SM + 36ST + 24A	240	276			6B, 6X	China (Jiangxi)	Z-36
<i>Carassius auratus gibello</i>	clone D		156	42M + 54SM + 36ST + 24A	252	288			6B, 6X	N. China	Z-36
<i>Carassius auratus grandoculis</i>	Nigorobuna	F, M	100	12M + 36SM + 52 ST/A	148		2	2.7-4.1 FD	4X, ACN=100	Japan (Lake Biwa)	M-96, O-30, S-141
<i>Carassius auratus grandoculis</i>	Nigorobuna	F, M	100	20M + 40SM + 40 ST/A	160				4X, ACN=100	Japan (Lake Biwa)	K-86

Table 6.11 Order CYPRINIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Superfamily/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Carassius auratus langsdorffii</i>	Gunbuna	F	150	28M + 56SM + 66 ST/A	234		8	(5.4* FCM)	6B, 6X	Japan (Lake Biwa)	O-30, O-48
<i>Carassius auratus langsdorffii</i>	Gunbuna	F	150	18M + 66SM + 66 ST/A	234				4B, 6X	Japan (Lake Biwa)	T-15
<i>Carassius auratus langsdorffii</i>	Gunbuna	F, M	100	20M + 40 SM/ST + 40A	160	160		(4.1* FCM, 3.4 FD)	4X, ACN=100	Japan, Taiwan, Russia	K-94, K-115, O-48, S-141
<i>Carassius auratus langsdorffii</i>	Gunbuna	F	156	34M + 62 SM/ST + 60A	252				6X, ACN=150	Japan, Taiwan, Russia	K-94, K-115
<i>Carassius auratus langsdorffii</i>	Gunbuna	F	206	44M + 82 SM/ST + 80A	332				8X, ACN=200	Japan (Kanto District)	K-94, K-115
<i>Carassius auratus langsdorffii</i>	Gunbuna	F, M	100	20M + 40SM + 40A	160	160			4X, ACN=100	Japan (Hokkaido, Honshu)	M-96
<i>Carassius auratus langsdorffii</i>	Gunbuna	F, M	ca. 150		148				6X, ACN=150	Japan (Hokkaido, Honshu)	M-96
<i>Carassius auratus buergeri</i>	Ookinbuna		100	12M + 36SM + 52 ST/A	148				4X, ACN=100	Japan (Okayama)	T-15
<i>Carassius auratus</i> subsp. 2	Kinbuna		100	12M + 36SM + 52 ST/A	148		2	3.8* FCM	XX/XY	Japan (Lake Jonuma)	O-30, O-37, O-48, U-1
<i>Carassius auratus</i> subsp. 2	Kinbuna	F, M	100	20M + 40 SM/ST + 40A	160	160	2		4X, ACN=100	Japan (Ibaraki)	K-115
<i>Carassius auratus</i> subsp. 1	<i>buergeri</i> , Nagabuna	F, M	100	20M + 40 SM/ST + 40A	160				4X, ACN=100	Japan (Lake Suwa)	K-86, K-117
<i>Carassius auratus</i> subsp. 1	<i>buergeri</i> , Nagabuna	F	156	34M + 62 MS/ST + 60A	252				6X, ACN=150	Japan (Hokkaido)	K-86
<i>Carassius auratus</i> subsp.	<i>auratus</i> subsp.	M	100	12M + 36SM + 52 ST/A	148				4X, ACN=100	Japan (Ishigaki Is.)	T-13
<i>Carassius auratus</i>	white crucian carp	F	100	20M + 28SM + 38ST + 14A	148	186			4X, ACN=100	China (Jiangsu)	Z-18
<i>Carassius carassius</i>		F, M	100	20M + 40SM/ST + 40A	160	160	1-3		4X, ACN=100	Netherlands	K-115, M-54
<i>Carassius carassius</i>			100	48 M/SM + 52 ST/A	148			4.3 FCM	4X, ACN=100	Russia	V-72, V-86
<i>Carassius carassius</i>			50	20M + 12SM + 10ST + 8A	82	92			2X	Rumania (Danube plaine)	R-36
<i>Carassius carassius</i>			100	52 M/SM + 48 ST/A	152				4X, ACN=100	Bosnia	S-80
<i>Carassius carassius</i>			100	20M + 44 SM/ST + 36A	164				4X, ACN=100	France	H-2, H-4
<i>Carassius cuvieri</i>	Gengorobuna	F, M	100	12M + 36SM + 52 ST/A	148		2	4.4* FCM, 4.8 FD	4X, ACN=100	Japan (Lake Biwa)	O-12, O-30, O-48, S-141
<i>Carassius cuvieri</i>	<i>auratus cuvieri</i>	F, M	100	20M + 40SM + 40A	160	160			4X, ACN=100	Japan (Lake Biwa)	M-96
<i>Cyprinus carpio</i>			104					(3.4 FCM), 3.4 BFA	4X, ACN=100		T-73, H-13
<i>Cyprinus carpio</i>		F, M	100	12M + 36SM + 52 ST/A	148		2	4.1* FCM	4X, ACN=100	Japan	T-14, O-13, O-48
<i>Cyprinus carpio</i>			100	20M + 32 SM/ST + 48A	152			3.6 FD	4X, ACN=100	France	H-2
<i>Cyprinus carpio</i>	mirror carp		100	34 M/SM + 30ST + 36A	134	164	2		4X, ACN=100	Germany	A-51
<i>Cyprinus carpio</i>			98	50 M/SM + 48 ST/A	148				4X, ACN=100	former Yugoslavia	A-27, A-28
<i>Cyprinus carpio</i>		F, M	100	24M + 24 SM/ST + 52A	148		148		4X, ACN=100	Rumania, Hungary, Ukraine	R-33
<i>Cyprinus carpio</i>			98	54 M/SM + 44 ST/A	152				4X, ACN=100	Croatia	A-24
<i>Cyprinus carpio</i>			100					2.9*, 3.5 FD		China (Hubei)	L-41, C-83
<i>Cyprinus carpio carpio</i>		F, M	100	22M + 34SM + 22ST + 22A	156	178			4X, ACN=100	China	Y-14, R-105
<i>Cyprinus carpio carpio</i>	Hebao carp		100	28M + 22SM + 50 ST/A	150		2	4.1* FCM	4X, ACN=100	China (Jiangxi)	W-9, F-5
<i>Cyprinus carpio carpio</i>	Xinguo red carp		100	28M + 22SM + 50 ST/A	150		2	4.1* FCM	4X, ACN=100	China (Jiangxi)	W-9, F-5
<i>Cyprinus carpio carpio</i>	Pili carp		100	28M + 22SM + 50 ST/A	150		2		4X, ACN=100	China (Jiangxi)	W-9
<i>Cyprinus carpio carpio</i>	Blue carp		100	28M + 22SM + 50 ST/A	150		2		4X, ACN=100	China (Jiangxi)	W-9
<i>Cyprinus carpio</i>	Scattered mirror carp	M	100	20M + 26SM + 30ST + 24A	146	176		4.1* FCM	4X, ACN=100	China (Jiangsu)	Z-18, F-5
<i>Cyprinus carpio</i>	Ogon	F	99	12M + 35 SM + 52 ST/A	146			ACN=100	4X, ACN=100	Japan	O-35
<i>Cyprinus carpio</i>	Ogon	M	99	12M + 35 SM + 52 ST/A	146			1B, ACN=100	4X, ACN=100	Japan	O-35
<i>Cyprinus carpio</i>	Kohaku	F, M	99	12M + 35 SM + 52 ST/A	146			1B, ACN=100	4X, ACN=100	Japan	O-35
<i>Cyprinus carpio</i>	Kohaku	M	99	12M + 35 SM + 52 ST/A	146			2B, ACN=100	4X, ACN=100	Japan	O-35

Table 6.11 Order CYPRINIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Superfamily/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Cyprinus carpio</i>	Sanshoku	F	99	12M + 35 SM + 52 ST/A	146			1B, ACN=100	4X, ACN=100	Japan	O-35
<i>Cyprinus carpio chilia</i>	Sanshoku	M	99	12M + 35 SM + 52 ST/A	146			2-3 B, ACN=100	4X, ACN=100	Japan	O-35
<i>Cyprinus carpio chilia</i>			100	22M + 30SM + 48 ST/A	152	2		3.3 FD	4X, ACN=100	China (Yunnan)	W-9, Z-3, Z-8
<i>Cyprinus carpio communis</i>			150	28M + 52SM + 70 ST/A	230				6X, ACN=150	China (Yunnan)	Z-8
<i>Cyprinus carpio haematopterus</i>		M	100	24M + 24SM + 52A	148				4X, ACN=100	India (WB)	K-42
<i>Cyprinus carpio haematopterus</i>		M	100	20M + 30SM + 50 ST/A	150				XY, 4X	China	Z-8
<i>Cyprinus carpio haematopterus</i>		F, M	100	22M + 34SM + 22ST + 22A	156	178			4X, ACN=100	China (Wuhan)	Y-15
<i>Cyprinus carpio haematopterus</i>		F, M	100	28M + 38SM + 22ST + 12A	166	188	2		4X, ACN=100	USSR (Amur R.)	R-14
<i>Cyprinus carpio rubrofusculus</i>			100	22M + 30SM + 48 ST/A	152			3.4 FD	XX/XY, 4X	China	Z-2, Z-8
<i>Cyprinus carpio rubrofusculus</i>			100	26M + 36SM + 38 ST/A	162				4X, ACN=100	China	S-67
<i>Cyprinus daliensis</i>			100	22M + 30SM + 48 ST/A	152			3.1 FD	XX/XY, 4X	China (Yunnan)	Z-7, Z-8
<i>Cyprinus longiptoralis</i>	<i>yunnanensis daliensis</i>		100	22M + 30SM + 48 ST/A	152		2	3.7 FD	XX/XY, 4X	China (Yunnan)	W-9, Z-3, Z-8
<i>Cyprinus megalophthalmus</i>			100	22M + 30SM + 48 ST/A	152				XX/XY, 4X	China (Yunnan)	Z-3
<i>Cyprinus micristius fuxianensis</i>			100	22M + 30SM + 48 ST/A	152				XX/XY, 4X	China (Yunnan)	Z-3
<i>Cyprinus pellegrini barbatus</i>			100	22M + 30SM + 48 ST/A	152			3.5 FD	XX/XY, 4X	China (Yunnan)	Z-3, Z-8
<i>Cyprinus pellegrini pellegrini</i>			100	22M + 30SM + 48 ST/A	152				XX/XY, 4X	China (Yunnan)	Z-7, Z-8
<i>Procypris rabaudi</i>		F, M	100	22M + 26SM + 22ST + 30A	148	170			4X, ACN=100	China (Nanchong)	Y-14, Y-15
<b>Gobiobotinae</b>											
<i>Gobiobotia abbreviata</i>		F, M	50	22M + 22SM + 6ST	94	100	2		ACN=50	China (Sichuan)	L-45, Y-15, R-43
<i>Gobiobotia boulengeri</i>		M	50	24M + 14SM + 12 ST/A	88		2		ACN=50	China (Sichuan)	L-38, R-43
<i>Gobiobotia boulengeri</i>		F, M	50	14M + 26SM + 10ST	90	100			ACN=52	China (Sichuan)	L-45, Y-14, Y-15
<i>Gobiobotia brevibarba</i>		M	50	12M + 30 SM/ST + 8A	92				ACN=50	Korea (Han R.)	U-33
<i>Gobiobotia ichangensis</i>			50	32M + 12SM + 6 ST/A	94				ACN=50	China (Sichuan)	L-38
<i>Gobiobotia longibarba meridionalis</i>		F, M	50	22M + 18SM + 10ST	90	100			ACN=50	China (Guangdong)	L-45, Y-15
<i>Gobiobotia longidorsalis</i>		M	50	18M + 32 SM/ST	100				ACN=50	Korea (Han R.)	U-33
<i>Microphysogobio longidorsalis</i>		M	50	18M + 32SM	100	100			ACN=50	Korea	L-15
<i>Microphysogobio yaluensis</i>		M	50	18M + 32 SM/ST	100				ACN=50	Korea (Geum R.)	U-33
<i>Microphysogobio yaluensis</i>			50	16M + 32SM + 2ST	98	100			ACN=50	Korea	L-15
<b>Gobioninae</b>											
<i>Abbottina kiatingensis</i>		M	50							China (Pearl R.)	C-85
<i>Abbottina labeooides</i>		M	50	24M + 24SM + 2ST	98	100			ACN=52	China (Guangxi, Guangdong)	Y-15
<i>Abbottina rivularis</i>		F	50	24M + 24SM + 2ST	98	100		2.7* FD	ACN=50	China (Hubei)	L-29, Y-15, C-83
<i>Abbottina rivularis</i>		F, M	50	22M + 24SM + 4ST	96	100			ACN=50	China (Amur)	W-14
<i>Abbottina rivularis</i>			50	12M + 32SM + 6ST	94	100			ACN=50	Korea	L-15
<i>Belligobio nummifer</i>		F, M	50	18M + 20SM + 10ST + 2A	88	98			ACN=52	China (Sichuan)	L-43, Y-15
<i>Coreius guichenoti</i>		F, M	50	16M + 22SM + 10ST + 2A	88	98			ACN=50	China (Wuhan)	L-29, Y-15
<i>Coreius heterodon</i>		F, M	50	16M + 22SM + 10ST + 2A	88	98			ACN=50	China (Hubei)	L-29, Y-15
<i>Coreoleuciscus splendidus</i>		F, M	50	12M + 30SM + 8 ST/A	92				ACN=50	Korea (Ko-san)	L-77
<i>Coreoleuciscus splendidus</i>		M	50	14M + 30 SM/ST + 6A	94				ACN=50	Korea (Han R.)	U-33

Table 6.11 Order CYPRINIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Superfamily/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Coreoleuciscus splendidus</i>		F, M	100	36M + 64 SM/ST	86	200			4X, ACN=100	Korea (Geum R.)	K-10
<i>Gnathopogon caeruleus</i>		F, M	50	12M + 24SM + 14 ST/A	88		4		ACN=50	Japan (Lake Biwa)	T-17
<i>Gnathopogon caeruleus</i>		F, M	50	14M + 36 SM/ST	100		4		ACN=50	Japan (Lake Biwa)	U-40
<i>Gnathopogon caeruleus</i>	<i>elongatus caeruleus</i>		50	12M + 26SM + 12 ST?A	88		2		ACN=50	Japan (Kobe, Lake Biwa)	T-4
<i>Gnathopogon elongatus</i>			50	12M + 24SM + 14 ST/A	86		4	2.4* FCM	ACN=50	Japan (Kobe)	T-17, O-48
<i>Gnathopogon elongatus</i>		F, M	50	14M + 36 SM/ST			4		ACN=50	Japan (Shiga)	U-40
<i>Gnathopogon elongatus</i>		F, M	50	12M + 32 SM/ST + 6A	94				ACN=50	Japan (Gifu)	O-18
<i>Gnathopogon imberbis</i>		F, M	50	22M + 24SM + 4ST	96	100			ACN=52	China (Sichuan)	L-43, Y-15
<i>Gnathopogon strigatus</i>		F, M	50	14M + 30SM + 6 ST/A	94				ACN=50	Korea (Ko-san)	L-77
<i>Gobio delyamurei</i>	<i>tauricus</i>		50	22M + 22SM + 6 ST/A	94				ACN=50	Ukraine (Crimea)	V-82
<i>Gobio gobio</i>			50	22M + 26 SM/ST + 2A	98			2.8 FD	ACN=50	France	H-2, H-4
<i>Gobio gobio</i>			50	22M + 24SM + 2ST + 2A	96			(3.3 FCM)	ACN=50	Rumania (Bucharest)	R-34, C-75
<i>Gobio gobio</i>		F, M	50	38 M/SM + 12 ST/A	88				ACN=50	former Yugoslavia	S-78
<i>Gobio gobio</i>			50	20M + 26SM + 2ST + 2A	96		88		ACN=50	former Yugoslavia	V-83
<i>Gobio gobio</i>			50	24M + 24SM + 2 ST/A	98				ACN=50	Russia (Volga basin)	V-83
<i>Gobio kubanicus</i>			50	20M + 28SM + 2 ST/A	98				ACN=52	Russia (Kuban R.)	V-83
<i>Gobio soldatovi</i>		F, M	50	18M + 26SM + 4ST + 2A	94				ACN=50	China (Amur)	W-14
<i>Gobio tenuicorpus</i>		F, M	50	18M + 26SM + 4ST + 2A	94				ACN=50	China (Amur)	W-14
<i>Hemibarbus barbatus</i>			50	16M + 26 SM + 8 ST/A	92		4	(2.5* FCM)	ACN=50	Japan (Kobe)	T-17, O-48
<i>Hemibarbus barbatus</i>		F, M	50	14M + 28 SM/ST + 8A	92				ACN=50	Japan (Lake Biwa)	O-18
<i>Hemibarbus labeo</i>		F, M	50	18M + 22 SM/ST + 10A	90			2.1 FD	ACN=50	Korea (Han R.)	K-4
<i>Hemibarbus labeo</i>		F, M	50	16M + 16SM + 14ST + 4A	82		2	2.1* FD	ACN=50	China (Guangdong)	L-29, Y-15, C-83
<i>Hemibarbus longirostris</i>			50							China (Amur)	W-14
<i>Hemibarbus longirostris</i>		F, M	50	18M + 18SM + 10ST + 4A	86		96		ACN=50	China (Guangdong)	L-29, Y-15
<i>Hemibarbus longirostris</i>		M	50	14M + 28SM + 8 ST/A	92				ACN=50	Korea (Ko-san)	L-77
<i>Hemibarbus longirostris</i>		F, M	50	14M + 28 SM/ST + 8A	92			2.2 FD	ACN=50	Korea (Han R.)	K-4
<i>Hemibarbus longirostris</i>		F, M	50	16M + 28 SM/ST + 6A	94				ACN=50	Korea (Geum R.)	U-33
<i>Hemibarbus maculatus</i>		F, M	50	16M + 14SM + 16ST + 4A	80		2	2.1* FD	ACN=50	China (Wuhan)	L-29, R-43, C-83
<i>Hemibarbus maculatus</i>			50							China (Amur)	W-14
<i>Hemibarbus mylodon</i>	<i>Gonoproktopterus</i>		50	12M + 28 SM/ST + 10A	90				ACN=50	Korea (Han R.)	U-33
<i>Huigobio chenhshienensis</i>		F, M	50	24M + 24SM + 2ST	98	100			ACN=50	China (Guangdong)	H-22, Y-15
<i>Paracanthobrama guichenoti</i>		F, M	50	18M + 20SM + 10ST + 2A	88		4	2.6 FD	ACN=50	China (Hubei)	L-29, L-41, R-43, Z-25
<i>Paracanthobrama umbrifer</i>		F, M	50	20M + 12SM + 4ST + 14A	82		86		ACN=50	China (Guilin)	Y-15
<i>Paraleucogobio strigatus</i>		F, M	50	14M + 16SM + 20ST	80	100			ACN=52	China (Amur)	W-14
<i>Paraleucogobio strigatus</i>		F, M	50	14M + 30SM + 6 ST/A	94				ACN=50	Korea	L-77
<i>Platysmacheilus exiguus</i>		F, M	50	24M + 14SM + 12ST	88	100			ACN=50	China (Guangxi)	Y-15
<i>Pseudogobio esocinus</i>		F, M	50	16M + 28 SM/ST + 6A	94	2	3.1* FCM, 3.3 FD		ACN=50	Japan (Lake Biwa, Kobe)	T-4, O-18, O-48, S-141
<i>Pseudogobio esocinus</i>		F, M	50	16M + 28SM + 6A	94				ACN=52	Korea (Ko-san)	L-77
<i>Pseudogobio vaillanti guilinensis</i>		F, M	50	18M + 18SM + 12ST + 2A	86		2		ACN=50	China (Guilin)	L-43, Y-15

Table 6.11 Order CYPRINIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Superfamily/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Pseudogobio vaillanti vaillanti</i>		F, M	50	18M + 22SM + 8ST + 2A	90	98			ACN=52	China (Guangdong)	H-22, Y-15
<i>Pseudopungtungia nigra</i>		F, M	50	14M + 36 SM/ST	100	100			ACN=50	Korea (Kum R.)	K-59
<i>Pseudopungtungia tenuicorpus</i>		M	50	20M + 30 SM/ST	100	100			ACN=50	Korea (Han R.)	K-59
<i>Pseudorasbora parva</i>		F, M	50	16M + 22SM + 12 ST/A	88	4		3.1* FGM	ACN=50	Japan (Kobe)	T-17, O-48
<i>Pseudorasbora parva</i>		F, M	50	14M + 36 SM/ST	100	100			ACN=50	Japan (Lake Biwa)	O-18
<i>Pseudorasbora parva</i>		F, M	50	14M + 36SM	100	100			ACN=50	Korea	L-15
<i>Pseudorasbora parva</i>		F, M	50	18M + 22SM + 10ST	90	100	2	2.8* FD	ACN=50	China (Hubei)	L-29, R-43, C-83
<i>Pseudorasbora parva</i>		F, M	50					2.5 FD	ACN=50	China (Hubei)	L-41
<i>Pseudorasbora parva</i>		F, M	50	20M + 26SM + 4ST	96	100			ACN=50	China (Kunming)	L-38
<i>Pseudorasbora pumila pumila</i>		F, M	50	18M + 22SM + 10 ST/A	90				ACN=50	China (Amur)	W-14
<i>Pseudorasbora pumila</i> subsp.		F, M	50	26M + 20SM + 4ST	96	100			ACN=50	Japan (Akita)	A-78
<i>Pseudorasbora helzi</i>		F, M	50	14M + 36 SM/ST	100	100			ACN=50	Japan	M-49
<i>Pungtungia helzi</i>		F, M	50	18M + 18SM + 14 ST/A	86		4	3.0* FGM	ACN=50	Japan (Kobe)	T-17, O-48
<i>Pungtungia helzi</i>		F, M	50	20M + 30 SM/ST	100				ACN=50	Japan (Lake Biwa)	O-18, K-10
<i>Pungtungia helzi</i>		F, M	50	16M + 26SM + 8 ST/A	92				ACN=50	Korea (Ko-san)	L-77
<i>Pungtungia cylindricus</i>		F, M	50	16M + 22SM + 6ST + 6A	88	94			ACN=50	Korea	L-15
<i>Rhinogobio typus</i>		F, M	50	14M + 22SM + 12ST + 2A	86	98			ACN=50	China (Wuhan)	H-22, Y-15
<i>Rhinogobio ventralis</i>		F, M	50	14M + 22SM + 12ST + 2A	86	98			ACN=50	China (Wuhan)	H-22, Y-15
<i>Rhinogobio banaticus</i>		F, M	50	12M + 24SM + 12ST + 2A	86	98			ACN=50	China (Sichuan)	L-43, Y-15
<i>Romanogobio kessleri</i>	<i>Gobio kessleri banaticus</i>	F, M	50	24M + 20SM + 4ST + 2A	94	98			ACN=50	Rumania (Uliuc village)	R-34
<i>Romanogobio kessleri</i>	<i>Gobio</i>		50	30M + 18 SM/ST + 2A		98		3.7 FGM	ACN=50	Czech	J-12, G-85
<i>Romanogobio uranoscopus</i>	<i>Gobio</i>		52	24M + 12SM + 12ST + 4A	88	100			ACN=50	Rumania (Buda village)	R-34
<i>Romanogobio vladkovi</i>	<i>Gobio</i>	F, M	50	30M + 18SM + 2ST	98	100			ACN=50	Slovakia	R-22
<i>Rostrogobio amurensis</i>	<i>Gobio albipinnatus vladkovi</i>		50	28M + 20SM + 2A	98			3.4 FGM	ACN=50	Rumania (Uliuc village)	R-34, G-85
<i>Sarcocheilichthys biwaensis</i>			50	18M + 24SM + 6ST + 2A	92	98			ACN=50	China (Amur)	W-14
<i>Sarcocheilichthys czerskii</i>		M	50	12M + 30SM + 8A	92				ACN=52	China (Amur)	K-12
<i>Sarcocheilichthys kiangsiensis</i>		M	50	18M + 32 SM/ST	100				ACN=52	Japan (Lake Biwa)	U-33
<i>Sarcocheilichthys lacustris</i>		F, M	50	18M + 22SM + 8ST + 2A	90	98			ACN=52	Korea (Geum R.)	H-22, Y-15
<i>Sarcocheilichthys nigripinnis czerskii</i>		F, M	50	18M + 22SM + 8ST + 2A	90	98			ACN=52	China (Guangdong)	H-22, Y-15
<i>Sarcocheilichthys nigripinnis morii</i>		F, M	50	18M + 22SM + 10ST	90	100			ACN=52	China (Amur)	W-14
<i>Sarcocheilichthys nigripinnis nigripinnis</i>		F, M	50	16M + 26SM + 8 ST/A	92				ACN=52	China (Amur)	W-14
<i>Sarcocheilichthys nigripinnis nigripinnis</i>		F, M	50	18M + 22SM + 10ST	90	100	2	2.6 FD	ACN=52	Korea (Ko-san)	L-77
<i>Sarcocheilichthys parvus</i>		F, M	50	18M + 22SM + 10ST	90			2.5, 2.8* FD	ACN=52	China (Hubei)	H-22, R-43, R-105, Z-28
<i>Sarcocheilichthys sinensis sinensis</i>		F, M	50	18M + 22SM + 8ST + 2A	90	98			ACN=52	China (Hubei)	L-41, C-83
<i>Sarcocheilichthys variegatus microoculus</i>	<i>variegatus</i>	F, M	50	18M + 22SM + 8ST + 2A	90	98			ACN=52	China (Guangdong)	H-22, Y-15
<i>Sarcocheilichthys variegatus variegatus</i>	<i>variegatus</i>	F, M	50	12M + 30 SM/ST + 8A	92	4		2.8* FGM, 2.4 FD	ACN=52	China (Wuhan)	H-22, Y-15
<i>Saurogobio dabryi</i>	<i>variegatus</i>	M	50	18M + 32 SM/ST	100				ACN=52	Japan (Lake Biwa)	T-4, T-12, O-18, O-48
<i>Saurogobio dumerilii</i>		F, M	50	18M + 26SM + 6ST	94	100			ACN=50	Japan (Okayama)	U-33
<i>Saurogobio dumerilii</i>		F, M	50	18M + 26SM + 6ST	94	100			ACN=50	China (Wuhan)	H-22, Y-15
<i>Saurogobio dumerilii</i>		F, M	50	18M + 26SM + 6ST	94	100			ACN=50	China (Wuhan)	H-22, Y-15

Table 6.11 Order CYPRINIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Superfamily/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Saurogobio argynchoheilus</i>		F, M	50	18M + 24SM + 8ST	92	100			ACN=50	China (Wuhan)	H-22, Y-15
<i>Squalidus argentatus</i>	<i>Gnathopogon</i>	F, M	50	22M + 26SM + 2ST	98	100			ACN=50	China (Wuhan)	K-29, Y-15
<i>Squalidus biwae</i>			50	16M + 34SM	100	100	2		ACN=50	Japan (Yodo R.)	T-17
<i>Squalidus chankaensis</i>	<i>Gnathopogon</i>	F, M	50	22M + 24SM + 4ST	96	100			ACN=52	China (Amur)	W-14
<i>Squalidus chankaensis biwae</i>		F, M	50	20M + 30 SM/ST	100	2			ACN=50	Japan (Lake Biwa)	U-40
<i>Squalidus chankaensis</i> subsp.		F, M	50	20M + 30 SM/ST	100	2			ACN=50	Japan (Hyogo, Okayama)	U-40
<i>Squalidus gracilis gracilis</i>	<i>gracilis</i>	F, M	50	16M + 34SM	100	100	2	(2.5 FD)	ACN=50	Japan (Lake Biwa)	K-14
<i>Squalidus gracilis gracilis</i>		F, M	50	20M + 30 SM/ST	100	2			ACN=50	Japan (Shiga, Okayama)	U-40, S-141
<i>Squalidus gracilis majimae</i>		F, M	50	14M + 28SM + 8 ST/A	92				ACN=50	Korea (Ko-san)	L-77
<i>Squalidus japonicus japonicus</i>		F, M	50	20M + 30 SM/ST	100	2			ACN=50	Japan (Lake Biwa)	U-40
<i>Squalidus nitens</i>	<i>Gnathopogon sihuensis</i>	F	50	22M + 24SM + 4ST	96	100			ACN=52	China (Hubei)	L-29, Y-15
<b>Hypophthalmichthyinae</b>											
<i>Aristichthys nobilis</i>			48	26M + 20SM + 2ST	94	96	6		ACN=48	China (Beijing)	L-59, R-43
<i>Aristichthys nobilis</i>		F, M	48	18M + 22SM + 8ST	88	96		1.8* FD	ACN=48	China (Wuhan)	R-105, Y-15, C-83
<i>Aristichthys nobilis</i>			48	14M + 24SM + 10 ST/A	86			(2.3* FCM), 2.1 FD	ACN=48	China	Z-2, Z-8, F-5
<i>Aristichthys nobilis</i>	<i>Hypophthalmichthys</i>		48	18M + 20SM + 10ST	86	96				Hungary	B-54
<i>Hypophthalmichthys molitrix</i>			48	24M + 16SM + 8ST	88	96			ACN=48	China (Beijing)	L-60
<i>Hypophthalmichthys molitrix</i>			48	14M + 24SM + 10A	86	86		(2.4* FCM), 2.0 FD	ACN=48	China	Z-2, Z-8, F-5
<i>Hypophthalmichthys molitrix</i>		F, M	48	18M + 22SM + 8ST	88	96		1.8*, 2.0 FD	ACN=48	China (Wuhan)	R-105, L-41, C-83
<i>Hypophthalmichthys molitrix</i>	<i>molitrix</i>	F, M	48	18M + 22SM + 8ST	88	96			ACN=48	China (Wuhan)	Z-26
<i>Hypophthalmichthys molitrix</i>		F, M	48	20M + 12SM + 6ST + 10A	80	86				India (WB)	M-27
<b>Laboninae</b>											
<i>Cirrhinus jullieni</i>			50	26M + 14SM + 4ST + 6A	90	94	2		ACN=50	Thailand (Uthai Thani)	M-12
<i>Cirrhinus molitorella</i>		F	50	20M + 26SM + 2ST + 2A	96	98			ACN=50	China (Guangxi, Guangdong)	Z-16
<i>Cirrhinus molitorella</i>		F, M	50	16M + 24SM + 10ST	90	100	4		ACN=50	China (Guangdong)	G-69, R-43, R-105, Y-15
<i>Cirrhinus mrigala</i>			50	10M + 12SM + 10ST + 18A	72	82	2		ACN=50	Thailand (Ayuthaya)	M-12
<i>Cirrhinus mrigala</i>			50	4M + 18SM + 28ST	72	100			ACN=50	India	L-2
<i>Cirrhinus mrigala</i>	<i>Cirrhina</i>	F, M	50	8M + 6SM + 14ST + 22A	64	78			ACN=50	India (Haryana)	R-55
<i>Cirrhinus mrigala</i>			50	12M + 18SM + 6ST + 14A	80	86	2		ACN=50	India (near Lucknow)	N-4
<i>Cirrhinus reba</i>	<i>Cirrhina</i>		50	6M + 8SM + 14ST + 22A	64	78			ACN=50	India (Haryana)	R-55
<i>Cirrhinus reba</i>		M	48	18M + 20SM + 6ST + 4A	86	92			ACN=50	India	M-27
<i>Crossocheilus latius latius</i>		F	50	12M + 28SM + 10A	90	90			ACN=50	India (Assam)	K-46, C-108
<i>Crossocheilus latius latius</i>		F	50	8M + 12SM + 12ST + 18A	70	82			ACN=50	India (J & K)	T-52
<i>Crossocheilus latius punjabensis</i>			48	12M + 36A	60					India	L-1
<i>Discogobio tetrabarbatulus</i>		F, M	50	10M + 18SM + 12ST + 10A	78	90			ACN=50	China (Guangdong)	G-69, R-43, Y-15
<i>Garra cambodgigensis</i>	<i>taeniata</i>		50	8M + 18 SM/ST + 24A	76			2.2 BFA	ACN=50	(Asia)	S-141, H-13
<i>Garra dembeensis</i>			50	14M + 18SM + 18A	82	82			ACN=52	Ethiopia	K-107
<i>Garra gotyla gotyla</i>		F	50	14M + 10SM + 10ST + 16A	74	84			ACN=50	India (Jammu)	K-38
<i>Garra gotyla gotyla</i>		F, M	50	14M + 26SM + 10A	90	90			ACN=50	India (Tamilnadu)	K-42



Table 6.11 Order CYPRINIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Superfamily/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Garra gotyla gotyla</i>			50	12M + 8SM + 8ST + 22A	70	78			ACN=50	India (A.P.)	S-171
<i>Garra kempfi</i>			50	14M + 14SM + 10ST + 12A	78	88			ACN=50	India (A.P.)	S-171
<i>Garra lamta</i>		F, M	50	12M + 24SM + 2ST + 12A	86	88			ZW/ZZ	India (Bihar)	K-41
<i>Garra lamta</i>		M	50	6M + 18SM + 12ST + 14A	74	86			ACN=50	India (Bihar)	K-32
<i>Garra lissorhynchus</i>			50	16M + 16SM + 6ST + 12A	82	88			ACN=50	India (A.P.)	S-171
<i>Garra makiensis</i>			50	14M + 20SM + 16A	84	84			ACN=52	Ethiopia	K-107
<i>Garra mulliya</i>			50	18M + 14SM + 10ST + 8A	82	92	2		ACN=50	India (Kerala)	N-73
<i>Garra orientalis</i>		F, M	50	16M + 12SM + 14ST + 8A	78	92			ACN=50	China (Guangdong)	G-69, R-43, Y-15
<i>Garra ornata</i>			50							W.C. Africa	G-84
<i>Garra imberba</i>	<i>pingi pingi</i>		50	18M + 20SM + 12 ST/A	88				ACN=50	China (Yunnan)	Z-5
<i>Garra imberba</i>	<i>pingi pingi</i>	F, M	50	14M + 20SM + 12ST + 4A	84	96			ACN=50	China (Sichuan)	L-43, Y-15
<i>Garra quadrimaculata</i>			50	16M + 22SM + 12A	88	88			ACN=52	Ethiopia	K-107
<i>Garra rufa obtusa</i>			44-52							Middle East	D-27
<i>Garra rufa rufa</i>			44-52							Middle East	D-27
<i>Garra rufa</i>			44	22M + 20SM + 2A	86					Turkey	S-171
<i>Garra surendranathanii</i>			50	14M + 20SM + 8ST + 8A	84	92			ACN=52	India (W. Ghats)	N-72
<i>Garra variabilis</i>			74						3X	Middle East	D-27
<i>Garra alluaudi</i>			50							W. Africa	G-84
<i>Labeo bata</i>			50	18M + 12SM + 8ST + 12A	80	88	2		ACN=50	India (Allahabad)	J-10
<i>Labeo bata</i>		F, M	50	6M + 18SM + 16ST + 10A	74	90			ACN=50	India (WB)	M-27
<i>Labeo behri</i>			50	12M + 8SM + 2ST + 28A	70	72			ACN=50	N.E. Thailand	A-84
<i>Labeo calbasu</i>			50	10M + 10SM + 14ST + 16A	70	84	2		ACN=50	India (Allahabad)	J-10
<i>Labeo calbasu</i>		F, M	50	6M + 8SM + 22ST + 14A	64	86			ACN=50	India (WB)	M-27
<i>Labeo calbasu</i>		F, M	50	8M + 22 SM/ST + 20A		80	2		ACN=50	India (Haryana)	R-75, R-101
<i>Labeo caeruleus</i>	<i>cerulaeus</i>	F, M	48	12M + 6SM + 6ST + 24A	66	72			ACN=48	India (Haryana)	R-55
<i>Labeo coubie</i>			50							Mali, W. Africa	P-18
<i>Labeo dero</i>		M	50	26M + 12SM + 2ST + 10A	88	90			ACN=50	India (Assam)	K-43
<i>Labeo dero</i>		F, M	48	12M + 16SM + 20 ST/A	76				ACN=50	India (U.P.)	R-73
<i>Labeo diplostomus</i>		F	50	10M + 6SM + 8ST + 26A	66	74			ACN=50	India (Jammu)	K-38
<i>Labeo dussumieri</i>			50	12M + 12SM + 10ST + 16A	74	84	4		ACN=50	India (Kerala)	N-56
<i>Labeo gonius</i>			54	54A	54		2			India	L-1
<i>Labeo pangusia</i>		M	50	6M + 12SM + 16ST + 16A	68	84			ACN=50	India (J & K)	T-52
<i>Labeo parvus</i>			50							W.C. Africa	G-84
<i>Labeo parvus</i>	<i>obscurus</i>		50							W.C. Africa	G-84
<i>Labeo rohita</i>			50	14M + 16SM + 8ST + 12A	80	88	2		ACN=50	Thailand (Ayuthaya)	M-12
<i>Labeo rohita</i>			50	10M + 14SM + 6ST + 20A	74	80	2		ACN=50	India (Allahabad)	J-10
<i>Labeo rohita</i>			50	10M + 20SM + 20A	80	80			ACN=50	India	L-2
<i>Labeo rohita</i>			50	8M + 12SM + 6ST + 24A	70	76			ACN=50	India (Haryana)	R-67
<i>Labeo rohita</i>			50	10M + 14SM + 8ST + 18A	74	82	4		ACN=50	India (near Lucknow)	N-4

Table 6.11 Order CYPRINIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Superfamily/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Labeo rohita</i>		F, M	50	10M + 16SM + 12ST + 12A	76	88			ACN=50	China (Guangdong)	G-69, R-43, Y-15
<i>roseopunctatus</i>			50							Mali, W. Africa	P-18
<i>rouaneti</i>			50							Guinea	G-84
<i>senegalensis</i>			50							Mali, W. Africa	P-18
<i>lineatus</i>			50	20M + 10SM + 20A	80	80			ACN=50	Thailand (Ayuthaya)	M-10
<i>Morulus chrysophekadion</i>	<i>Labeo</i>		50	14 M/SM + 18ST + 18A	64	82	2.8 FD, 2.2 FIA, 2.4 BFA		ACN=50	(Asia)	M-91, H-13, H-41
<i>longidorsalis</i>			100	24M + 26SM + 22ST + 28A	150	172	2		4X, ACN=100	India (W. Ghats)	N-55
<i>hasselti</i>			50	30M + 14SM + 6ST	94	100			ACN=50	Thailand (Ayuthaya)	M-10
<i>vittatus</i>			50	16M + 30SM + 4ST	96	100			ACN=50	Thailand (Ayuthaya)	M-10
<i>waandersi</i>			50	18M + 24SM + 4ST + 4A	92	96	2		ACN=50	Thailand (Kanchana Buri)	M-12
<i>assimilis</i>		F, M	50	16M + 12SM + 18ST + 4A	78	96			ACN=50	China (Guangdong)	G-69, Y-15
<i>notabilis</i>		F, M	50	8M + 10SM + 12ST + 20A	68	80			ACN=50	China (Guangdong)	G-69, Y-15
<i>prochilus</i>		F	50	16M + 20SM + 14ST + 2A	84	98			ACN=52	China (Sichuan)	L-43, Y-15
<i>decoratus decoratus</i>	<i>decorus decorus</i>	F, M	50	16M + 18SM + 14ST	86	100	7		ACN=50	China (Yunnan)	W-12
<i>decoratus tungting</i>		F, M	50	10M + 18SM + 10ST + 12A	78	88			ACN=50	China (Guangdong)	G-69, Y-15
<i>rendahii rendahii</i>		M	50	12M + 16SM + 10ST + 12A	78	88			ACN=50	China (Hunan)	Z-16
		F, M	50	10M + 14SM + 18ST + 8A	74	92			ACN=52	China (Sichuan)	L-43, Y-15
<b>Leuciscinae</b>											
<b>Eurasian Leuciscinae</b>											
<i>Abramis brama</i>			50	16M + 14SM + 12ST + 8A	80	92		2.7 FCM	ACN=50	Russia	A-118, V-86
<i>brama</i>		M	52	30 M/SM + 22 ST/A	82				ACN=52	Sweden	N-50
<i>brama</i>		F, M	50	16M + 18SM + 16A	84	84	2		ACN=50	Poland	J-2
<i>brama</i>			50	12M + 18 SM/ST + 20A	80	80		2.5 FD	ACN=50	France	H-2, H-4
<i>marmid</i>		F, M	50	16M + 26SM + 8 ST/A	92		4		ACN=50	Turkey (Dam Lake)	G-79
<i>arcasii</i>	<i>Rutilus</i>	F, M	50	16M + 30 SM/ST + 4A	96			2.8 FCM	ACN=50	Portugal	C-69, C-75
<i>oligolepis</i>			50	12M + 32SM + 6 ST/A	94		4		ACN=50	Portugal	P-76
<i>bipunctatus</i>		F, M	50	38 M/SM + 12 ST/A	88				ACN=50	Bosnia-Herzegovina	S-82
<i>albidus</i>			50	16M + 26SM + 8 ST/A	92		2		ACN=50	Italy	B-36
<i>arborella</i>	<i>albidus arborella</i>		50	12M + 25SM + 13 ST/A	87			(2.6 FCM)	ACN=50	(Europe)	F-30
<i>albunus</i>	<i>albunus alborella</i>	F	50	16M + 10SM + 16ST + 8A	76	92			ACN=50	Italy	C-34, G-85
<i>albunus</i>			50	16M + 20 SM/ST + 14A	86			2.7 FD	0-2 B	France	H-3, H-4, H-5
<i>albunus</i>		F, M	50	14M + 14SM + 14ST + 8A	78	92		3.1 FCM	0-2 B	Germany	S-164, L-82
<i>albunus</i>		F, M	50	32 M/SM + 18 ST/A	82				ACN=50	Bosnia-Herzegovina	S-82
<i>albunus</i>		F, M	50	16M + 16SM + 18A	82				ACN=50	Turkey	G-80
<i>filippii</i>		F, M	50	10M + 36 SM/ST + 4A	92		2	2.5 FCM	ACN=50	Portugal	C-69, C-75
<i>hispanica</i>		F, M	50	14M + 28SM + 8 ST/A	94			(2.5 FCM)	ACN=50	Danube R., Don R.	R-16, G-85
<i>aspius</i>		F, M	52	42 M/SM + 10 ST/A	86			(2.3 FCM)	ACN=52	Sweden	N-50
<i>aspius</i>	<i>Abramis</i>	F, M	50	16M + 20SM + 6ST + 8A	86	92			ACN=50	Russia	A-118, G-85
<i>ballerus</i>	<i>Ballerus</i>		50	14M + 28 SM/ST + 8A		92			ACN=50	Russia	V-72



Table 6.11 Order CYPRINIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Superfamily/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Leuciscus waleckii</i>		F	50	18M + 20SM + 6ST + 6A	88	94	2		ACN=50	China (Nei Mongol, Gansu)	Z-17, R-42
<i>Leucobrama macrocephalus</i>		M	48	12M + 22SM + 12ST + 2A	82	94			ACN=50	China (Hubei)	Z-28, L-42, Y-15
<i>Ochetobius elongatus</i>		F, M	48	10M + 16SM + 22ST	74	96		1.9* FD	ACN=50	China (Hubei)	Z-28, L-42, C-83
<i>Pachychilon macedonicum</i>		F	50	8M + 34SM + 8 ST/A	92		2		ACN=50	Macedonia	R-25
<i>Pachychilon pictum</i>			50	8M + 22SM + 20A	80				ACN=50	(S.E. Europe)	K-133
<i>Pachychilon pictum</i>			50							former Yugoslavia	B-19
<i>Parachondrostoma arrigonis</i>		F, M	50	14M + 30SM + 6 ST/A	94		2		ACN=50	Spain (Valencia)	K-119
<i>Parachondrostoma toxostoma</i>	<i>Chondrostoma</i>	F, M	50	16M + 14SM + 14ST + 6A	80	94			ACN=50	Italy	C-34
<i>Parachondrostoma toxostoma</i>	<i>Chondrostoma</i>		50	16M + 24 SM/ST + 10A	90			2.6 FD	ACN=50	France	H-2, H-4
<i>Pelecus cultratus</i>			50	16M + 30 SM/ST + 4A	96				ACN=50	Russia	V-72
<i>Petroleuciscus borysthenicus</i>	<i>Leuciscus</i>	M	50	16M + 28 SM/ST + 6A	94				ACN=50	Greece	R-23
<i>Petroleuciscus persidis</i>			50	29M + 18SM + 3ST	97	100			ACN=50	Iran (Fars)	E-7
<i>Phoxinellus alepidotus</i>	<i>Paraphoxinus</i>		50	26 M/SM + 24 ST/A	76				ACN=50	Bosnia-Herzegovina	B-16
<i>Phoxinus keumkang</i>	<i>Morocco keumkang</i>	F, M	50	12M + 28SM + 10 ST/A	90				ACN=50	Korea (Muju, Togu-ri)	K-55, L-12
<i>Phoxinus lagowskii steindachneri</i>	<i>Morocco steindachneri</i>	F, M	50	12M + 28SM + 10 ST/A	90			2.4* FCM	ACN=50	Korea (Gangreung)	K-55, L-12, P-69
<i>Phoxinus lagowskii steindachneri</i>	<i>Morocco steindachneri</i>		50	14M + 22SM + 8ST + 6A	86	94			ACN=50	Japan	O-22
<i>Phoxinus oxycephalus</i>	<i>Morocco</i>	F, M	50	12M + 28SM + 10 ST/A	90			(2.2 FD)	ACN=50	Korea (Ochon-gun)	K-4, K-5, K-55, L-12
<i>Phoxinus oxycephalus</i>	<i>Morocco</i>	M	50	12M + 28SM + 10 ST/A	90			2.5* FCM	ACN=50	Korea (Imjin R.)	L-13, P-69
<i>Phoxinus oxycephalus</i>	<i>Morocco</i>	F	50	16M + 26SM + 8 ST/A	92				ACN=50	Korea (Taejong R.)	L-13
<i>Phoxinus oxycephalus joiyi</i>	<i>Morocco joiyi</i>	F, M	50	10M + 34 SM/ST + 6A	90		4		ACN=50	Japan (Kuramoto)	U-33
<i>Phoxinus oxycephalus joiyi</i>	<i>Morocco joiyi</i>		50	14M + 26SM + 10A	90			3.1* FCM	ACN=50	Japan (Lake Biwa, Kobe)	T-4, O-48
<i>Phoxinus oxycephalus joiyi</i>	<i>Morocco joiyi</i>	F, M	50	18M + 24SM + 8 ST/A	92				ACN=50	Japan (Sagami R.)	L-13
<i>Phoxinus oxycephalus joiyi</i>	<i>Morocco joiyi</i>	F, M	50	12M + 26SM + 12 ST/A	88				ACN=50	Japan (Ihara R.)	L-13
<i>Phoxinus oxycephalus joiyi</i>	<i>Morocco joiyi</i>	F, M	50	12M + 30SM + 8 ST/A	92				ACN=50	Japan (Kanagawa)	L-13
<i>Phoxinus oxycephalus joiyi</i>	<i>Morocco joiyi</i>	F, M	50	16M + 22SM + 12 ST/A	88				ACN=50	Korea (Chongson-gun)	K-55, L-12
<i>Phoxinus phoxinus</i>		F, M	50	10M + 34 SM/ST + 6A	90		94		ACN=50	Korea (Han R.)	U-33
<i>Phoxinus phoxinus</i>		F, M	50	8M + 32SM + 10 ST/A	90				ACN=50	Poland	B-62
<i>Phoxinus phoxinus</i>		F, M	50	14M + 26 SM/ST + 10A	90			2.3 FD	ACN=50	France	H-2, H-4
<i>Phoxinus phoxinus</i>		F	50	14M + 12SM + 16ST + 8A	76	92			ACN=50	Italy	C-34
<i>Phoxinus phoxinus</i>		F, M	50	32 M/SM + 18 ST/A	82				ACN=50	Bosnia-Herzegovina	B-21
<i>Pseudaspius leptoccephalus</i>		F	50	14M + 26SM + 10 ST/A	90			2.7 FCM	ACN=50	Mongolia	R-20
<i>Pseudochondrostoma durienae</i>	<i>Chondrostoma</i>		50							Iberia	C-75
<i>Pseudochondrostoma durienae</i>			50	14M + 30SM + 6 ST/A	94		2		ACN=50	Portugal	P-76
<i>Pseudochondrostoma polyepis</i>			50	14M + 30SM + 6 ST/A	94				ACN=50	Portugal	P-76
<i>Pseudochondrostoma willkommii</i>	<i>Chondrostoma</i>		50					2.7 FCM		Iberia	C-75
<i>Rhynchocypris lagowskii</i>	<i>Morocco</i>	F, M	50	12M + 28SM + 10 ST/A	90			2.0 FD	ACN=50	Korea (Mt. Sorak)	K-4, K-5, L-13
<i>Rhynchocypris percunus</i>	<i>Eupallassella perenurus</i>		50	8M + 32SM + 10ST	90	100	4		ACN=50	Poland	B-62
<i>Rutilus aula</i>			50	16M + 26SM + 8 ST/A	92		2		ACN=50	Italy	B-36
<i>Rutilus aula</i>	<i>Leuciscus</i>		50	15M + 23SM + 12 ST/A	88				ACN=50	(Europe)	F-30

Table 6.11 Order CYPRINIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Superfamily/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Rutilus frisii kutum</i>			50	32 M/SM + 18 ST/A	82				ACN=50	(Russia)	V-72
<i>Rutilus macrolepidotus</i>		F, M	50	14M + 32 SM/ST + 4A		96		2.8 FCM	ACN=50	Portugal	C-69, C-75
<i>Rutilus pigus virgo</i>		F	50	16M + 24SM + 10 ST/A	90		2		ACN=50	Danube R.	R-15
<i>Rutilus prespensis</i>			50	16M + 26SM + 8 ST/A	92				ACN=50	Greece	B-36
<i>Rutilus rubilio</i>			50	16M + 26SM + 8 ST/A	92		2		ACN=50	Italy	B-36
<i>Rutilus rubilio</i>		F, M	50	18M + 10SM + 16ST + 6A	78	94		(2.6 FCM)	ACN=50	Italy	C-34
<i>Rutilus rutilus</i>		F, M	50	16M + 28SM + 6 ST/A	94		2		ACN=50	Danube R., Elbe R.	R-15, V-86
<i>Rutilus rutilus</i>		F, M	50	16M + 28SM + 6 ST/A	94				0-1 B	Danube R.	R-13
<i>Rutilus rutilus</i>			50	14M + 18SM/ST + 18A		82		1.9 FD	ACN=50	France	H-3, H-4
<i>Rutilus rutilus</i>			50	26 M/SM + 24 ST/A	76				ACN=50	Sweden	N-50
<i>Rutilus rutilus</i>		F, M	50	16M + 16SM + 10ST + 8A	82	92			ACN=50	Germany (Baltic Sea side)	K-76
<i>Rutilus rutilus</i>		F, M	51	16M + 18SM + 10ST + 7A	85	95			ACN=50	Germany (Baltic Sea side)	K-76
<i>Rutilus rutilus</i>		F, M	52	16M + 16SM + 11ST + 9A	84	95			ACN=50	Germany (Baltic Sea side)	K-76
<i>Rutilus rutilus caspicus</i>			50	14M + 18SM + 12ST + 6A	82	94	2		ACN=50	(Caspian Sea basin)	V-72
<i>Rutilus ylikiensis</i>			50	16M + 26SM + 8 ST/A	92				ACN=50	Greece	B-36
<i>Scardinius acarnanicus</i>			50	16M + 26SM + 8 ST/A	92		2		ACN=50	Greece	B-36
<i>Scardinius erythrophthalmus</i>			50	16M + 26SM + 8 ST/A	92		2	(2.8 FCM)	ACN=50	Italy	B-36, G-85
<i>Scardinius erythrophthalmus</i>			50	14M + 24SM + 8ST + 4A	88	96			ACN=50	(Europe)	V-72
<i>Scardinius erythrophthalmus</i>	<i>erythrophthalmus</i>		48	13M + 35 ST/A	61				ACN=50	(Europe)	F-30
<i>Scardinius erythrophthalmus</i>			48	22 M/SM + 20ST + 6A	70	90			ACN=50	Sweden	N-50
<i>Scardinius erythrophthalmus</i>		F, M	50	20M + 12SM + 12ST + 6A	82	94			ACN=50	Italy	C-34
<i>Scardinius erythrophthalmus</i>			50	14M + 20 SM/ST + 16A		84		2.0 FD	ACN=50	France	H-2, H-4
<i>Scardinius erythrophthalmus</i>		F, M	50	16M + 26 SM/ST + 8A		92	2		ACN=50	Elbe R., Danube R.	M-54
<i>Scardinius erythrophthalmus</i>		F, M	50	30 M/SM + 20 ST/A	80				ACN=50	Bosnia	S-84
<i>Scardinius graecus</i>			50	16M + 26SM + 8 ST/A	92		2		ACN=50	Greece	B-36
<i>Scardinius scardafa</i>			50	16M + 26SM + 8 ST/A	92		2		ACN=50	Italy	B-36
<i>Squalius albus</i>	<i>Leuciscus cephalus albus</i>		50	28M + 8SM + 14A	86				ACN=50	Bosnia-Herzegovina	S-79
<i>Squalius aradensis</i>	<i>Leuciscus</i>		50					2.4 FCM		Portugal	C-75
<i>Squalius carolitterii</i>	<i>Leuciscus</i>		50					2.4 FCM		Iberia	C-75
<i>Squalius cephalus</i>	<i>Leuciscus</i>		50	18M + 20 SM/ST + 12A		88			ACN=50	France	H-2, H-4
<i>Squalius cephalus</i>	<i>Leuciscus</i>	F, M	50	10M + 22SM + 10ST + 8A	82	92	2		ACN=50	Poland	B-66
<i>Squalius cephalus</i>	<i>Leuciscus</i>		50	16M + 26SM + 8 ST/A	92		2		ACN=50	Italy	B-36
<i>Squalius cephalus</i>	<i>Leuciscus</i>		50	34 M/SM + 16 ST/A	84				ACN=50	Croatia	A-27, A-28
<i>Squalius cephalus cephalus</i>	<i>Leuciscus cephalus</i>	F, M	50	22M + 14SM + 14A	86				ACN=50	Bosnia-Herzegovina	S-79
<i>Squalius leadicus</i>	<i>Leuciscus</i>		50	14M + 12SM + 10ST + 14A	76	86			ACN=50	Greece	T-54
<i>Squalius pyrenaicus</i>	<i>Leuciscus</i>		50					2.4 FCM		Iberia	C-75
<i>Squalius squalus</i>	<i>Leuciscus cephalus cabeda</i>		50	16M + 12SM + 12ST + 10A	78	90			ACN=50	Portugal	C-71
<i>Squalius squalus</i>	<i>Leuciscus cephalus cabeda</i>	F, M	50	16M + 12SM + 12ST + 10A	78	90			ACN=50	Italy	C-34
<i>Squalius svallize</i>	<i>Leuciscus svallize svallize</i>	F, M	50	20M + 12SM + 16ST + 2A	82	98			ACN=50	Bosnia-Herzegovina	S-79

Table 6.11 Order CYPRINIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Superfamily/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Squalius tenellus</i>	<i>Leuciscus turskyi tenellus</i>	F, M	50	18M + 16SM + 8ST + 8A	84	92			ACN=50	Bosnia-Herzegovina	S-79
<i>Telestes croaticus</i>	<i>Paraphoxinus</i>	F, M	50	36 M/SM + 14A	86				ACN=50	Croatia	B-19
<i>Telestes metohiensis</i>	<i>Paraphoxinus</i>	F, M	50	32 M/SM + 18A	82				ACN=50	Bosnia-Herzegovina	B-19
<i>Telestes muticellus</i>	<i>Leuciscus souffia muticellus</i>	M	50	20M + 12SM + 8ST + 10A	82	90		2.7 FCM	ACN=50	Italy	C-34
<i>Telestes polylepis</i>	<i>Chondrostoma</i>		50							Croatia	C-71, C-75
<i>Telestes souffia</i>	<i>Leuciscus souffia agassizi</i>		50	20M + 22SM + 2ST + 6A	92	94			ACN=50	Bosnia-Herzegovina	S-79
<i>Tribolodon ezoe</i>		F, M	50	10M + 20SM + 12ST + 8A	80	92			ACN=50	Japan (Hokkaido)	I-17
<i>Tribolodon ezoe</i>			50	14M + 22SM + 8ST + 6A	86	94			ACN=50	Japan	O-22
<i>Tribolodon hakonensis</i>		F, M	50	10M + 20SM + 12ST + 8A	80	92			ACN=50	Japan (Hokkaido)	I-17
<i>Tribolodon hakonensis</i>			50	14M + 26SM + 10A	90		4	1.8 FD	ACN=50	Japan	T-4, S-141
<i>Tribolodon hakonensis</i>		M	50	14M + 30SM + 6 ST/A	94				ACN=50	Korea (Hadong-gun)	K-55, L-12
<i>Vimba elongatus</i>	<i>vimba natio carinata</i>	F	50	14M + 20SM + 16 ST/A	84				XX, ACN=50	Poland (Baltic Sea basin)	R-95
<i>Vimba elongatus</i>	<i>vimba natio carinata</i>	M	50	13M + 20SM + 17 ST/A	83				XY, ACN=50	Poland (Baltic Sea basin)	R-95
<i>Vimba vimba</i>		F, M	52	24-28 M/SM + 28-24 ST/A	76-80				XX, ACN=50	Russia	S-70
<i>Vimba vimba</i>		F	50	14M + 20SM + 16 ST/A	84				XX, ACN=50	Poland (Baltic Sea basin)	R-95
<i>Vimba vimba vimba</i>		M	50	13M + 20SM + 17 ST/A	83				XY, ACN=50	Poland (Baltic Sea basin)	R-95
<b>North American Leuciscinae</b>											
<i>Acrocheilus alutaceus</i>			50				8		ACN=50	USA (OR)	J-6
<i>Campostoma anomalum</i>		F, M	50	12M + 16SM + 18ST + 4A	78	96	6	2.3 FD	ACN=50	USA (TX)	G-28, G-35, G-36, G-48
<i>Covesius plumbeus</i>	<i>Hybopsis plumbea</i>		50							Canada (Quebec)	L-16
<i>Chrosomus cumberlandensis</i>	<i>Phoxinus</i>	F, M	50	14M + 24SM + 12 ST/A	88			2.8 FCM	ACN=50	USA (KY)	J-11
<i>Chrosomus eos</i>			50							Canada (Quebec)	L-16, G-88
<i>Chrosomus erythrogaster</i>			50	10M + 36SM + 4A	96			2.6 FD	ACN=50	USA (IL)	G-38, G-60
<i>Chrosomus neogaeus</i>	<i>Phoxinus</i>	F, M	50	12M + 24SM + 14 ST/A	86			3.1 FCM, 2.8 FIA	ACN=50	USA (MI, WY)	J-11, G-88, H-41
<i>Chrosomus oreas</i>	<i>Phoxinus</i>	F, M	50	14M + 24SM + 12 ST/A	88			2.5 FCM	ACN=50	USA (VA)	J-11, G-88
<i>Cyprinella callista</i>	<i>Notropis callistius</i>		50	24 M/SM + 26 ST/A	74			2.1 FD	ACN=50	USA (AL)	D-6, G-87
<i>Cyprinella camura</i>	<i>Notropis camurus</i>		50	18M + 28 SM/ST + 4A		96			ACN=50	USA (LA)	G-33
<i>Cyprinella camura</i>	<i>Notropis camurus</i>		50	10M + 26SM + 14 ST/A	86		2	2.4 FD	ACN=50	USA (LA)	G-43, G-87
<i>Cyprinella formosa</i>			50	10M + 32SM + 8ST	92		2		ACN=50	USA (NM)	G-39
<i>Cyprinella galactura</i>	<i>Notropis galacturus</i>		50	20M + 28SM + 2 ST/A	98		2		ACN=50	USA (AR)	G-43
<i>Cyprinella gibbsi</i>			50	10M + 34SM + 6ST	94	100	2	2.5 FD	ACN=50	USA (AL)	G-39
<i>Cyprinella lepida</i>	<i>Notropis lutrensis lepida</i>		50	50 M/SM	94		2	2.4 FD	ACN=50	USA (TX)	A-39, A-40, G-87
<i>Cyprinella lutrensis</i>	<i>Notropis</i>		50	10M + 32 SM/ST + 8A	100	100	2	2.4 FD	ACN=50	USA (TX)	G-31, G-35, G-48
<i>Cyprinella lutrensis</i>	<i>Notropis</i>	F, M	50	10M + 34SM + 6A	94	94	2		ACN=50	USA (TX)	L-50
<i>Cyprinella proserpina</i>	<i>Notropis proserpinus</i>	F, M	50	12M + 24SM + 14 ST/A	86		2	2.9 FD	ACN=50	USA (TX)	G-36
<i>Cyprinella spiloptera</i>	<i>Notropis spilopterus</i>		50	8M + 38SM + 4 ST/A	96		2		ACN=50	USA (OH)	G-43
<i>Cyprinella venusta</i>	<i>Notropis</i>		50	48 M/SM + 2 ST/A	98		2	2.4 FD	ACN=50	USA (TX)	G-31, G-35, G-48
<i>Cyprinella venusta</i>	<i>Notropis venustus</i>	F, M	50	2M + 38SM + 10A	90				ACN=50	USA (TX)	C-6

Table 6.11 Order CYPRINIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Superfamily/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Cyprinella whipplei</i>	<i>Notropis</i>		50	22M + 26SM + 2 ST/A	98		2	2.5 FD	ACN=50	USA (AR)	G-38, G-43
<i>Dionda argentosa</i>			50				2	2.1 FCM	ACN=50	USA (TX)	G-86
<i>Dionda diaboli</i>			50				2	2.0 FCM	ACN=50	USA (TX)	G-86
<i>Dionda episcopa</i>			50				2	2.1 FCM, 2.1 FD	ACN=50	USA (TX, NM)	G-33, G-86
<i>Dionda serena</i>			50				2	2.0 FCM	ACN=50	USA (TX)	G-86
<i>Dionda</i> sp.			50				2	2.0 FCM	ACN=50	USA (TX)	G-86
<i>Exoglossum maxillingua</i>			48				2	2.0 FCM	ACN=50	Canada (Quebec)	L-16
<i>Gila bicolor</i>			50	44 M/SM + 6 ST/A	94				ACN=50	USA (CA)	G-27
<i>Gila elegans</i>			50				4			USA (NM)	J-6
<i>Gila nigrescens</i>			50				4			USA (NM)	J-6
<i>Gila orcutti</i>			50	14M + 24ST + 12A	88		4		ACN=50	USA (CA)	G-61, J-6
<i>Gila pandora</i>			50				4			USA (NM)	J-6
<i>Gila purpurea</i>			50				4			USA (AZ)	J-6
<i>Gila flammea</i>			50		96		2	2.4 FD		USA (AL)	A-39, A-40, G-87
<i>Hemitemia symmetricus</i>			50	44 M/SM + 6 ST/A	94				ACN=50	USA (CA)	G-27
<i>Hesperoleucus symmetricus</i>			50	20M + 20SM + 10A	90				ACN=50	USA (CA)	G-61
<i>Hybognathus hayi</i>		F, M	50	10M + 36SM + 4 ST/A	96				ACN=50	USA (TX)	G-28
<i>Hybognathus nuchalis</i>			50							USA (LA)	G-33
<i>Hybognathus pleictus</i>			50	6M + 32SM + 12 ST/A	88		2	2.8 FD	ACN=50	USA (TX)	G-36, G-87, A-39
<i>Hybognathus amblops</i>	<i>Notropis (Hybopsis)</i>		50	16M + 30SM + 4A	96	96			ACN=50	USA (LA)	G-33
<i>Lavinia exilicauda</i>			50	42 M/SM + 8 ST/A	92		4	2.5 FCM	ACN=50	USA (CA)	G-27, G-44, G-45, J-6
<i>Lepidomeda albivallis</i>			50	12M + 32 SM/ST + 6A	94				ACN=50	USA (NV)	U-69
<i>Lepidomeda mollispinis</i>			50	12M + 30 SM/ST + 8A	92		92		ACN=50	USA (AZ)	U-69
<i>Lepidomeda vittata</i>			50	14M + 32 SM/ST + 4A	96		96		ACN=50	USA (AZ)	U-69
<i>Luxilus albeolus</i>			50	8M + 32SM + 10 ST/A	90		4		ACN=50	USA (VA)	P-47
<i>Luxilus cardinalis</i>			50	12M + 34SM + 4 ST/A	96		2		ACN=50	USA (AR)	P-47
<i>Luxilus cerasinus</i>			50	8M + 28SM + 14 ST/A	86		2		ACN=50	USA (VA)	P-47
<i>Luxilus chrysocephalus</i>	<i>Notropis</i>		50	48 M/SM + 2 ST/A	98		4	2.3 FD	ACN=50	USA (LA)	G-31, G-38
<i>Luxilus chrysocephalus chrysocephalus</i>			50	6M + 40SM + 4 ST/A	96		4		ACN=50	USA (AR)	P-47
<i>Luxilus chrysocephalus isolepis</i>			50	10M + 28SM + 12 ST/A	88		4		ACN=50	USA (AL, LA, MS)	P-47
<i>Luxilus chrysocephalus isolepis</i>			50	10M + 28SM + 12 ST/A	88		2		ACN=50	USA (OK)	P-47
<i>Luxilus coccogenis</i>			50	12M + 30SM + 8 ST/A	92		4		ACN=50	USA (VA)	P-47
<i>Luxilus cornutus</i>	<i>Notropis</i>		50	6M + 40SM + 4A	96		4		ACN=50	USA (IL, MI)	G-60, P-47
<i>Luxilus pilsbryi</i>	<i>Notropis</i>		50	14M + 34SM + 2 ST/A	98		2	2.5 FD	ACN=50	USA (MS, AR)	G-43, G-38, P-47
<i>Luxilus zonatus</i>			50	6M + 34SM + 10 ST/A	90		2		ACN=50	USA (AR)	P-47
<i>Luxilus zonistius</i>			50	12M + 30SM + 8 ST/A	92		2		ACN=50	USA (AL)	P-47
<i>Lythrurus ardens</i>	<i>Notropis</i>	F, M	50	8M + 36SM + 6 ST/A	94		4	2.5 FD	ACN=50	USA (AL)	G-36, G-87, A-39
<i>Lythrurus bellus</i>	<i>Notropis</i>		50		92			2.6 FD		USA (AL)	A-39, G-87
<i>Lythrurus fumus</i>	<i>Notropis</i>		50	48 M/SM + 2 ST/A	98				ACN=50	USA (TX)	G-31

Table 6.11 Order CYPRINIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Superfamily/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Lythrurus roseipinnis</i>	<i>Notropis</i>		50	48 M/SM + 2 ST/A	98				ACN=50	USA (LA)	G-31
<i>Lythrurus umbratilis</i>	<i>Notropis</i>		50	50 M/SM	100		4	2.7 FD	ACN=50	USA (TX, OK)	A-40, G-31, G-38
<i>Macrhybopsis aestivalis</i>	<i>Hybopsis</i>	F, M	50	6M + 16SM + 22ST + 6A	72	94	4	2.5 FD	ACN=50	USA (AL, TX)	G-28, G-36, G-87
<i>Margariscus margarita</i>	<i>Semotilus</i>		50							Canada (Quebec)	L-16
<i>Meda fulgida</i>			50	18M + 24 SM/ST + 8A		92			ACN=50	USA (AR)	U-69
<i>Mylopharodon conocephalus</i>			50	44 M/SM + 6 ST/A	94		4	2.7 FCM	ACN=50	USA (CA)	G-27, G-44, G-45, J-6
<i>Nocomis leptocephalus</i>			50	14M + 28SM + 8A	92	92	4	2.5 FD	ACN=50	USA (LA)	A-40, G-33, G-87
<i>Nocomis micropogon</i>			50							USA (WV)	M-90
<i>Notemigonus crysoleucus</i>		F, M	50	16M + 24 SM/ST + 10A		90			ACN=50	USA (TX)	L-50
<i>Notemigonus crysoleucus</i>			50	12M + 24SM + 8ST + 6A	86	94	2	2.3 FD	ACN=50	USA (CA)	G-27, G-35, G-36, G-38, G-48
<i>Notropis amabilis</i>			50	14M + 34SM + 2 ST/A	98		2	2.5 FD	ACN=50	USA (TX)	A-40, G-33, G-87
<i>Notropis atherinoides</i>			50	16M + 32SM + 2 ST/A	98			2.4 FD	ACN=50	USA (TX)	G-33, G-87
<i>Notropis atrocaudalis</i>			50	10M + 36SM + 4A	96			2.9 FD	ACN=50	USA (TX)	G-33, G-87
<i>Notropis baileyi</i>			50	4M + 28SM + 18ST	82	100	2	2.8 FD	ACN=50	USA (MS)	G-43, G-87
<i>Notropis boops</i>			50	6M + 32SM + 12ST	88	100	2	2.2 FD	ACN=50	USA (OK)	G-38, G-39, C-75
<i>Notropis braytoni</i>		F, M	50	14M + 20 SM + 10ST + 6A	84	94	2	2.6 FD	ACN=50	USA (TX)	G-36, G-87, A-39
<i>Notropis buccatus</i>	<i>Ericymba buccata</i>		50					2.3 FD	ACN=50	USA (LA)	G-33, G-87
<i>Notropis buchamani</i>			50	8M + 36SM + 6 ST/A	94		2		ACN=50	USA (TX)	A-41
<i>Notropis chrosomus</i>			50	42 M/SM + 8A	92	92		2.5 FD	ACN=50	USA (AL)	A-39, G-87
<i>Notropis dorsalis</i>			50	10M + 32SM + 8ST	92	100	2		ACN=50	USA (IL)	G-39
<i>Notropis jemezanus</i>			50	42 M/SM + 8A	92	92	2		ACN=50	USA (TX)	A-39, A-40
<i>Notropis longirostris</i>			50	10M + 28SM + 12ST	88	100	2		ACN=50	USA (LA)	G-31, G-36
<i>Notropis cf longirostris</i>			50	8M + 30SM + 4ST + 8A	88	92	2		ACN=50	USA (AL)	G-36, A-39
<i>Notropis maculatus</i>			50	10M + 34SM + 6 ST/A	94		2		ACN=50	USA (LA)	A-41
<i>Notropis rubilus</i>			50	16M + 30SM + 4 ST/A	96		2	2.4 FD	ACN=50	USA (AR)	G-38, G-43
<i>Notropis oxyrinchus</i>			50	48 M/SM + 2A	98	98	2	2.1 FD	ACN=50	USA (TX)	A-40, G-31, G-87
<i>Notropis petersoni</i>			50	8M + 30SM + 12ST	88	100	4		ACN=50	USA (FL)	G-39
<i>Notropis pottieri</i>			50	12M + 34SM + 2ST + 2A	96	98	2	2.4 FD	ACN=50	USA (TX)	G-33, G-36, G-87
<i>Notropis sabiniae</i>			50	50 M/SM	100	100	4		ACN=50	USA (TX)	G-31, G-39
<i>Notropis shumardi</i>			50	14M + 34SM + 2 ST/A	98		2	2.7 FD	ACN=50	USA (TX)	G-31, G-36, G-38
<i>Notropis stilbius</i>			50					2.5 FD		USA (AL)	D-6, G-87
<i>Notropis stramineus</i>			50	8M + 34SM + 8 ST/A	92		2	2.5 FD	ACN=50	USA (TX, OK)	A-41, G-38
<i>Notropis stramineus</i>			50	16M + 34SM	100	100			ACN=50	USA (TX)	G-33
<i>Notropis texanus</i>			50	48 M/SM + 2A	98	98	2	(2.7 FD)	ACN=50	USA (TX)	A-40, G-31, G-87
<i>Notropis texanus</i>		F, M	50	2M + 42SM + 6A	94	94			ACN=50	USA (TX)	C-6
<i>Notropis volucellus</i>			50	14M + 28SM + 8 ST/A	92		2	2.5 FD	ACN=50	USA (TX, AL)	A-41, G-87
<i>Notropis volucellus</i>			50	46 M/SM + 4 ST/A	96				ACN=50	USA (TX)	G-31
<i>Opsopoeodus emiliae</i>		F, M	48	2M + 30SM + 16A	80				ACN=50	USA (TX)	C-6
<i>Opsopoeodus emiliae</i>	<i>Notropis</i>		50	8M + 20SM + 16ST + 6A	78	94	2	2.1 FD	ACN=50	USA (LA)	G-35, G-36, A-39



Table 6.11 Order CYPRINIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Superfamily/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Orthodon microlepidotus</i>			50	44 M/SM + 6 ST/A	94		4		ACN=50	USA (CA)	G-27, J-6
<i>Phenacobius mirabilis</i>			50	18M + 28SM + 4 ST/A	96		6	3.2 FD	ACN=50	USA (TX, IL)	G-28, G-39, G-87
<i>Pimephales notatus</i>			50	46 M/SM + 4 ST/A	96		2	2.2 FD		USA (OK)	A-39, A-40, L-46, G-38
<i>Pimephales notatus</i>			52							Canada (Quebec)	L-16
<i>Pimephales promelas</i>			50	14M + 34SM + 2A	98	98	4	2.2 FD	ACN=50	USA (TX)	G-33, G-38, L-46
<i>Pimephales vigilax</i>		F, M	50	8M + 24SM + 16ST + 2A	82	98	2	2.2 FD	ACN=50	USA (TX)	G-28, G-35, G-36, G-38, G-48
<i>Plagopterus argentissimus</i>			50	18M + 26 SM/ST + 6A	94		4		ACN=50	USA (AZ, NM)	U-89, J-6
<i>Macrolepidotus macrolepidotus</i>			50	44 M/SM + 6 ST/A	94				ACN=50	USA (CA)	G-27
<i>Pogonichthys hubbsi</i>			50	22M + 22SM + 6ST	94	100	2		ACN=50	USA (TX)	A-41
<i>Pteronotropis signipinnis</i>			50	22M + 22SM + 6 ST/A	94		4		ACN=50	USA (LA)	A-41
<i>Pteronotropis welaka</i>			50	22M + 22SM + 6 ST/A	94		4		ACN=50	USA (LA)	A-41
<i>Ptychocheilus grandis</i>			50	42 M/SM + 8 ST/A	92		4	2.6 FCM	ACN=50	USA (CA)	G-27, G-44, J-6
<i>Ptychocheilus lucius</i>			50				4	2.5 FCM		USA (NM)	G-44, J-6
<i>Ptychocheilus oregonensis</i>			50				4	2.8 FCM		USA (OR)	G-44, J-6
<i>Ptychocheilus umpqua</i>			50				4	2.5-2.8 FCM		USA (OR)	G-44, J-6
<i>Ptychocheilus cf. umpqua</i>			50				4			USA (OR)	J-6
<i>Rhinichthys atratulus</i>			50	16M + 28SM + 2ST + 4A	94	96	4	2.6 FD	ACN=50	USA (NY, AL)	H-30, K-73, G-87
<i>Rhinichthys cataractae</i>			50	16M + 28SM + 2ST + 4A	94	96	4		ACN=50	USA (NY, NM)	H-30, J-6
<i>Rhinichthys cataractae</i>			50							USA (WV)	M-90
<i>Rhinichthys cobitis</i>	<i>cobitis</i>		50				6			USA (AZ)	J-6
<i>Rhinichthys evermanni</i>			50							N. America	M-61
<i>Rhinichthys osculus</i>			50				6			USA (AZ)	J-6
<i>Rhinichthys cf. osculus</i>			50				6			USA (OR)	J-6
<i>Richardsonius baiteatus</i>			50				8	2.5 FCM		USA (OR)	G-45, J-6
<i>Richardsonius egregius</i>			50	36 M/SM + 14 ST/A	86	6	6	2.7 FCM	ACN=50	USA (CA)	G-27, G-45
<i>Semotilus atromaculatus</i>			50	22M + 24SM + 4A	96		4	2.5 FD	ACN=50	USA (TX, MS, IL)	G-33, G-38, G-39
<i>Semotilus atromaculatus</i>			52							Canada (Quebec)	L-16
<i>Semotilus corporalis</i>			52					2.5 FIA		Canada (Quebec)	L-16, H-41
<b>Rasbora</b> (= Danioninae)											
<i>Amblypharyngodon microlepis</i>		F, M	50	12M + 14SM + 6ST + 18A	76	82	2		ACN=50	India (WB)	K-136
<i>Amblypharyngodon mola</i>		F	50	12M + 20SM + 8ST + 10A	82	90			ACN=50	India (WB)	M-27
<i>Aspidoparia morar</i>		F	50	8M + 18SM + 14ST + 10A	76	90			ACN=50	India (J & K)	T-52
<i>Aspidoparia morar</i>		F	48	8M + 6SM + 34A	62					India (Bihar)	K-42
<i>Aspidoparia morar</i>		M	48	14M + 28SM + 6A	90	90				India (Assam)	C-108
<i>Barilius bakeri</i>			50	24M + 14SM + 6ST + 6A	88	94	2		ACN=50	India (W. Ghats)	N-73
<i>Barilius barila</i>		F	50	8M + 20SM + 8ST + 14A	78	86			ACN=50	India (Bihar)	K-35
<i>Barilius barna</i>		F	50	8M + 16SM + 12ST + 14A	74	86			ACN=50	India (WB)	K-45
<i>Barilius bendelisis</i>		F, M	50	6M + 6SM + 10 ST + 28A	62	72			ACN=50	India (Bihar)	K-30
<i>Barilius bendelisis</i>		F, M	50	6M + 18SM + 20ST + 6A	74	94			ACN=50	India (Jammu)	S-50

Table 6.11 Order CYPRINIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Superfamily/family/subfamily/species	Reported in karyotype/paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Barilius bendelisis</i>	<i>bendelisis</i> var. <i>chedra</i>		50	24M + 4SM + 22A	78	78			ACN=50	India (Assam)	K-41
<i>Barilius bendelisis</i>	<i>bendelisis</i> var. <i>cocksa</i>		50							India (Tamil Nadu)	K-41
<i>Barilius gatensis</i>			50	18M + 16SM + 10ST + 6A	84	94	2		ACN=50	India (W. Ghats)	N-72
<i>Barilius naseeri</i>			50	24M + 24SM + 2A	98	98			ACN=50	Pakistan (Punjab)	R-31
<i>Barilius pakistanicus</i>			50	12M + 32SM + 6A	94	94			ACN=50	Pakistan (Punjab)	R-31
<i>Barilius shacra</i>		F	52	22M + 24SM + 6A	98	98				India (WB)	K-45
<i>Barilius shacra</i>		M	52	22M + 23SM + 7A	97	97			XY	India (Assam)	K-45
<i>Barilius tileo</i>		M	50	12M + 32SM + 6A	94	94			ACN=50	India (Assam)	K-45
<i>Barilius vagra</i>		M	50	27M + 17SM + 6 ST/A	94				ACN=50	India (U.P.)	R-74
<i>Barilius vagra</i>		M	50	22M + 22SM + 6A	94	94			ACN=50	Pakistan (Punjab)	R-31
<i>Chela cachius</i>	<i>Perilampus atpar</i>	F	70	16M + 6SM + 16ST + 32A	92	108			ACN=72	India (J & K)	T-52
<i>Chela caeruleostigmata</i>	<i>mouhoti</i>		48					3.2 BFA		(Asia)	H-13
<i>Chela laubuca</i>			50							India	L-1
<i>Chelaethiops bibie</i>			50							E. Africa	G-84
<i>Danio albolineatus</i>			50	10M + 39SM + 1A	99	99		2.8 FD	ACN=50	(Asia)	F-30, S-141
<i>Danio rerio</i>			50	10M + 39SM + 1A	99	99		(3.4-3.6, 4.8 FCM)	ACN=50	(Asia)	F-30, V-86, G-85
<i>Danio rerio</i>		F, M	50	10M + 16 SM/ST + 24A	76	76			ACN=50	(India)	R-51
<i>Danio rerio</i>			50	12M + 26SM + 12ST	88	100	4		ACN=50	(Asia)	P-35
<i>Danio rerio</i>	<i>Brachydanio frankelii</i>		50							S. China	W-32
<i>Devario aequipinnatus</i>	<i>Danio</i>		50	14M + 32SM + 4A	96	96				India (Assam)	K-41
<i>Devario aequipinnatus</i>	<i>Danio</i>		50	8M + 28SM + 10ST + 4A	86	96			ACN=50	Thailand (Nakhonphanom)	M-166
<i>Devario devario</i>	<i>Danio</i>		50	12M + 24SM + 10ST + 4A	86	96			ACN=50	India (Orissa)	K-41
<i>Devario devario</i>	<i>Danio</i>		50	10M + 40 ST/A	60				ACN=50	(Asia)	F-30
<i>Devario malabaricus</i>	<i>Danio</i>		50	10M + 40ST	60	100		2.8 FIA, 4.4 BFA	ACN=50	(Asia)	F-30, H-13, H-40
<i>Esomus danrica</i>	<i>danricus</i>	F, M	50	12M + 16SM + 10ST + 12A	78	88			ACN=50	India (WB)	M-27
<i>Esomus danrica</i>	<i>danricus</i>		50	10M + 18SM + 18ST + 4A	78	96			ACN=50	India (Jammu)	S-56
<i>Hemigrammocypripis rasborella</i>			48	10M + 38 SM/ST				1.8 FD		Japan	S-141
<i>Leptocypripis niloticus</i>			50							Africa	G-84
<i>Opsarichthys bidens</i>		F, M	76	4M + 6SM + 4ST + 62A	86	90			ACN=76	China (Guangdong)	L-42
<i>Opsarichthys bidens</i>		F, M	74	6M + 6SM + 4ST + 58A	86	90			ACN=74	China (Sichuan)	L-44
<i>Opsarichthys bidens</i>			76	4M + 72A	80				ACN=76	Korea	L-15
<i>Opsarichthys uncirostris amurensis</i>		F	76	4M + 4SM + 68A	84				ACN=76	Korea (Pongdong)	K-55, L-12
<i>Opsarichthys uncirostris bidens</i>			74	6M + 6SM + 4ST + 58A	86	90			ACN=74	China	Y-14
<i>Opsarichthys uncirostris</i>		F, M	78	4M + 4SM + 70A	86		4	2.3* FCM, 3.3 FD	ACN=78	Japan (Osaka, Kobe)	T-4, O-18, O-48
<i>Raiamas bola</i>	<i>Barilius</i>		50	6M + 14SM + 10ST + 20A	70	80			ACN=50	India (Bihar)	K-35
<i>Raiamas nigeriensis</i>			50							W. Africa	G-84
<i>Raiamas senegalensis</i>			50							W. Africa	G-84
<i>Raiamas steindachneri</i>			50	16M + 30SM + 4ST	96	100	2		ACN=50	Guinea	R-26
<i>Rasbora argyrotaenia</i>			50	24M + 22SM + 4 ST/A	96				ACN=50	Thailand	M-166

Table 6.11 Order CYPRINIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Superfamily/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Rasbora aurotaenia</i>			50	28M + 16SM + 4ST + 2A	94	98			ACN=50	Thailand (Chi Nat)	M-166
<i>Rasbora daniconius</i>		F	50	18M + 6SM + 6ST + 20A	74	80			ACN=50	India (U.P.)	K-30
<i>Rasbora rasbora</i>	<i>buchanani</i>	F	50	30M + 18SM + 2ST	98	100			ACN=50	India (WB)	M-27
<i>Rasbora sumatrana</i>			50	22M + 18SM + 6ST + 4A	90	96			ACN=50	Thailand (Khanchanaburi)	M-166
<i>Rasbora trilineata</i>			50	24M + 14SM + 12 ST/A	88				ACN=50	Thailand (Chi Nat)	M-166
<i>Salmostoma bacaila</i>	<i>Chela</i>	F, M	50	10M + 12SM + 10ST + 18A	72	82			ACN=50	India (WB)	M-27
<i>Securicula gora</i>			50	20M + 8SM + 22A	78				ACN=50	India	L-1
<i>Albonubes albonubes</i>	White cloud mountain type	F, M	50	24M + 14SM + 12 ST/A	88				ACN=50	China	A-81
<i>Albonubes subsp.</i>	Hong Kong type	F, M	50	22M + 22SM + 6 ST/A	94				ACN=50	China	A-81
<i>Trigonostigma espei</i>	<i>Rasbora</i>		50	14M + 6SM + 30A	70	70			ACN=50	Thailand (Narativat)	M-166
<i>Zacco platypus</i>		F, M	48	18M + 22 SM/ST + 8A	88	88	4	2.2* FCM, 2.2 FD	ACN=48	Japan (Osaka, Kobe)	T-4, O-18, O-48
<i>Zacco platypus</i>		F, M	48	18M + 22SM + 8A	88	88			ACN=48	Korea (Yesan Pongdeng)	K-55, L-12
<i>Zacco platypus</i>		F, M	78	4M + 4SM + 4ST + 66A	86	90			ACN=78	China (Guangdong)	L-42, C-85
<i>Zacco sieboldi</i>	<i>Zacco</i> sp. type A	F, M	48	22M + 20SM + 6 ST/A	90				ACN=48	Japan (Yamaguchi)	N-54
<i>Zacco temminckii</i>	<i>Zacco</i> sp. type B	F, M	48	18M + 18SM + 12 ST/A	84				ACN=48	Japan (Yamaguchi)	N-54
<i>Zacco temminckii</i>			48	12M + 22SM + 14A	82	82	8	2.3* FOM		Japan	T-4, O-48
<i>Zacco temminckii</i>		F, M	48	18M + 22 SM/ST + 8A	88	88		2.9 FD		Japan (Osaka)	O-18
<i>Zacco temminckii</i>		F, M	48	18M + 22SM + 8A	88	88			ACN=48	Korea (Yemgye-gun)	K-55, L-12
<b>Schizothoracinae</b>											
<i>Chuanchia labiosa</i>	<i>labiosa</i>	F, M	92	32M + 26SM + 18ST + 16A	150	168			4X	China (Heihe R.)	Y-16
<i>Diptychus maculatus</i>	<i>gymnogaster microcephalus</i>	F, M	100	70 M/SM + 30 ST/A	170				4X, ACN=100	Kirghiz Tan	M-60
<i>Diptychus maculatus</i>	<i>gymnogaster oschanini</i>		100	80 M/SM + 20 ST/A	180				4X, ACN=100	Kirghiz Tan	M-60
<i>Diptychus micromaculatus</i>		F, M	98	62 M/SM + 36 ST/A	160				4X	Kirghiz Tan	M-60
<i>Diptychus sewerzowi</i>		F, M	98	80 M/SM + 18 ST/A	178				4X, ACN=98	Kirghiz Tan	M-60
<i>Diptychus sp.</i>		F, M	98	28M + 32SM + 38 ST/A	158			4.9 FD	4X	China (Yunnan)	Z-6, Z-8
<i>Gymnocypris eckloni</i>		F, M	94	26M + 28SM + 22ST + 18A	148	170	4		4X, ACN=100	China (Heihe R.)	Y-16, R-42
<i>Gymnodiptychus dybowskii</i>	<i>Diptychus</i>	F, M	98	54 M/SM + 4-6 ST + 40-38 A	152	156-158			4X	Kirghiz Tan	M-60
<i>Gymnodiptychus dybowskii lansdelli</i>	<i>Diptychus</i>		98	54 M/SM + 4ST + 40A	152	156			4X	Kirghiz Tan	M-60
<i>Gymnodiptychus pachycheilus</i>		F, M	90-98						4X	(China)	C-74
<i>Oxygymnocypris stewarti</i>		F, M	92	26M + 30SM + 22ST + 14A	148	170			ACN=98	China (Central Asia)	Y-16
<i>Pletypharodon extremus</i>		F, M	90	24M + 30SM + 20ST + 16A	144	164		2.7* FD	4X	China (Heihe R.)	Y-16, C-83
<i>Ptychobarbus dipogon</i>	<i>Diptychus</i>	F, M	417-470					17.2* FD	18X	China (Tibet)	Y-17, C-83
<i>Schizocypris oconnori</i>	<i>Schizothorax</i>	F, M	92	30M + 26SM + 20ST + 16A	148	168		2.7* FD	ACN=96	China (Central Asia)	Y-16, C-83
<i>Schizocypris curvifrons</i>	<i>Schizothorax intermedius</i>		98-100						4X	(C. Asia)	C-74
<i>Schizopygopsis pylzovi</i>		F, M	92	32M + 26SM + 20ST + 14A	150	170			4X, ACN=98	China (Heihe R.)	Y-16
<i>Schizopygopsis youngghusbandi</i>	<i>youngghusbandi youngghusbandi</i>	F, M	90	26M + 28SM + 20ST + 16A	144	164			4X, ACN=98	China (Central Asia)	Y-16
<i>Schizothoracichthys kumaonensis</i>	<i>Schizothorax</i>	F, M	98	24M + 6SM + 68 ST/A	128				4X	India (U.P.)	R-74
<i>Schizothoracichthys niger</i>	<i>Schizothorax</i>	F, M	98	22M + 26SM + 8ST + 42A	146	154			4X	India (Kashmir)	K-37
<i>Schizothoracichthys pragastus</i>		F, M	98	16M + 20SM + 12ST + 50A	134	146			4X	India (Haryana)	R-62

Table 6.11 Order CYPRINIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Superfamily/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Schizothoraichthys richardsonii</i>	<i>Schizothorax</i>		98	24M + 28SM + 24ST + 22A	150	174	2		4X, ACN=100	India (Beas R.)	B-5
<i>Schizothoraichthys richardsonii</i>	<i>Schizothorax</i>		98	24M + 28SM + 24ST + 22A	150	174	4		4X, ACN=100	India (Kosi R.)	B-5
<i>Schizothoraichthys richardsonii</i>	<i>Schizothorax</i>		98	66M + 16SM + 6ST + 10A	180	186			4X	India (Jammu)	B-5
<i>Schizothorax argentatus</i>			98-150						4X, 6X	(Asia)	D-27
<i>Schizothorax davidi</i>		F, M	98	20M + 34SM + 24ST + 20A	152	176			4X, ACN=104	China (Sichuan)	L-45, Y-14
<i>Schizothorax grahami</i>		F, M	148	52M + 30SM + 66 ST/A	230			6.5 FD	6X	China (Yunnan)	Z-6, Z-7, Z-8
<i>Schizothorax lissolabiatatus</i>			148	38M + 32SM + 78 ST/A	218				6X	China (Yunnan)	Z-8
<i>Schizothorax macropogon</i>			90-98						4X	(C. Asia)	C-74
<i>Schizothorax prenanti</i>		F, M	148	28M + 40SM + 36ST + 44A	216	252			6X, ACN=156	China (Sichuan)	L-45, Y-14
<i>Schizothorax pseudoaksaiensis issykkuli</i>			98-100						4X	Kazakhstan	C-74
<i>Schizothorax taliensis</i>	<i>daliensis</i>	M	148	48M + 30SM + 70 ST/A	226			6.9 FD	6X	China (Yunnan)	Z-6, Z-7, Z-8
<i>Schizothorax taliensis</i>	<i>yunnanensis daliensis</i>		148	48M + 28SM + 72 ST/A	224				6X	China (Yunnan)	Z-8
<i>Schizothorax waltoni</i>		F, M	92	26M + 28SM + 22ST + 16A	146	168			4X	China (Central Asia)	Y-16
<i>Schizothorax sp. 1</i>			148	50M + 28SM + 70 ST/A	226			7.0 FD	6X	China (Yunnan)	Z-6, Z-7, Z-8
<i>Schizothorax sp. 2</i>			148	48M + 30SM + 70 ST/A	226				6X	China (Yunnan)	Z-8
<b>Squaliobarbinae</b>											
<i>Ctenopharyngodon idellus</i>			48	16M + 20SM + 12ST	84	96		(2.4* FCM)	ACN=50	China (Beijing)	Y-11, F-5
<i>Ctenopharyngodon idellus</i>			48	20M + 20SM + 8ST	88	96				China (Hunan)	L-63
<i>Ctenopharyngodon idellus</i>		F, M	48	18M + 24SM + 6ST	90	96	6	2.1 FD	ACN=50	China (Hubei)	L-42, G-70, R-42, R-105
<i>Ctenopharyngodon idellus</i>			48	18M + 22SM + 8 ST/A	88	96		2.0 FD	ACN=50	China (Yunnan)	Z-1, Z-8
<i>Ctenopharyngodon idellus</i>			48	16M + 32SM	96	96		(2.0 FCM)		China (Beijing)	L-58, T-74
<i>Ctenopharyngodon idellus</i>			48	18M + 20SM + 10ST	86	96	4	(1.9* FD)	ACN=50	China (Shashi)	Z-22, C-83
<i>Ctenopharyngodon idellus</i>		F, M	48	14M + 24SM + 10 ST/A	86			2.1 FD		Japan	O-16
<i>Ctenopharyngodon idellus</i>			48	16M + 20 SM/ST + 12A		84				Japan (Osaka)	O-18
<i>Ctenopharyngodon idellus</i>		F, M	48	14M + 20SM + 8ST + 6A	82	90				India (WB)	M-27
<i>Ctenopharyngodon idellus</i>			48	32 M/SM + 16 ST/A	80					former Yugoslavia	A-28
<i>Ctenopharyngodon idellus</i>			48	28M + 20SM	96	96				Hungary	B-54
<i>Mylopharyngodon piceus</i>			48	24M + 20SM + 4ST	92	96	4	(2.4* FCM)	ACN=50	China (Shashi)	Z-22, F-5
<i>Mylopharyngodon piceus</i>			48	14M + 34 SM/ST		96			ACN=50	China (Shashi)	Z-27
<i>Mylopharyngodon piceus</i>			48	16M + 28SM + 4ST	92	96				China (Shanghai)	L-68
<i>Mylopharyngodon piceus</i>		M	48	18M + 24SM + 6ST	90	96		(1.9* FD)	ACN=50	China (Wuhan)	G-70, C-83
<i>Squaliobarbus curriculus</i>		F, M	48	14M + 30SM + 4ST	92	96			ACN=50	China (Wuhan)	L-42, Y-15
<b>Tincae</b>											
<i>Tinca tinca</i>			48	14M + 12SM + 22ST	74	96				Bulgaria	P-37
<i>Tinca tinca</i>			48	30 M/SM + 18 ST/A	78					Croatia	A-28
<i>Tinca tinca</i>		F, M	48	36 M/SM + 12 ST/A	84				ACN=50	Bosnia-Herzegovina	B-23
<i>Tinca tinca</i>			48	6M + 28SM + 14 ST/A	82			2.3 FCM		(Europe)	C-75, F-30
<i>Tinca tinca</i>		M	48	8M + 12SM + 10ST + 18A	68	78			ACN=50	Italy	C-34
<i>Tinca tinca</i>			48	20 M/SM + 16ST + 12A	68	84			ACN=50	Sweden	N-50

Table 6.11 Order CYPRINIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Superfamily/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Tinca tinca</i>		F, M	48	16M + 26 SM/ST + 6A	84	90	2			Elbe R., Danube R.	M-54
<i>Tinca tinca</i>			48	18M + 18SM + 6ST + 6A		80				Hungary	B-54
<i>Tinca tinca</i>			48	14M + 24 SM/ST + 10A		86		2.1 FD	ACN=50	France	H-2, H-4
<b>Xenocyprinae</b>											
<i>Distoechodon tumirostris</i>		F, M	48	18M + 26SM + 4ST	92	96			ACN=50	China (Sichuan)	L-32, Y-15
<i>Plegognathops microlepis</i>		F, M	48	18M + 26SM + 4ST	92	96	4	1.8* FD	ACN=50	China (Hubei)	L-28, Z-25, C-83
<i>Pseudobrama simoni</i>	<i>Acanthobrama</i>	F, M	48	18M + 26SM + 4ST	92	96			ACN=50	China (Hubei)	L-28, Y-15
<i>Xenocypris argentea</i>		F, M	48	20M + 26SM + 2ST	94	96	4		ACN=50	China (Hubei)	L-28, Y-15, Z-25
<i>Xenocypris davidi</i>		F, M	48	18M + 26SM + 4ST	92	96	4	2.5* FD	ACN=50	China (Hubei)	L-28, Z-25, C-83
<i>Xenocypris fangi</i>		F, M	48	16M + 28SM + 4ST	92	96	4		ACN=50	China (Sichuan)	Z-25, Y-15
<i>Xenocypris sechuanensis</i>		F, M	48	18M + 26SM + 4ST	92	96	4		ACN=50	China (Sichuan)	Z-25, Y-15
<b>Psilorhynchidae</b>											
<i>Psilorhynchus balitora</i>			50	24M + 16SM + 10A	90				ACN=50	India (Assam)	K-41
<i>Psilorhynchus sucatio</i>	<i>Psilorhynchus bolitora</i>	M	50	22M + 18SM + 10A	90				ACN=50	India (Assam)	K-43
<b>Superfamily Cobitoidea</b>											
<b>Gyrinocheilidae</b>											
<i>Gyrinocheilus aymonieri</i>			48	4M + 4SM + 4ST + 36A	56	60	2	1.2* FCM, 1.0 FD, 1.3 FIA	ACN=50	S.E. Asia	A-82, O-48, H-41
<b>Catostomidae</b>											
<i>Carpiodes carpio</i>			96-100						4X	USA (KS)	U-66
<i>Carpiodes cyrinus</i>			100					4.5 FCM	4X, ACN=100	USA	F-23
<i>Catostomus catostomus</i>			98	8M + 6SM + 84 ST/A	112			4.2 FIA	4X	Canada (Ont.)	B-11, H-41
<i>Catostomus clarki</i>			96-100						4X	USA (AZ)	U-66
<i>Catostomus commersoni</i>			98	12M + 14SM + 72 ST/A	124			(5.5 FCM)	4X	Canada (Ont.)	B-11, F-23
<i>Catostomus commersoni</i>			96-98					(5.1 FIA)	4X	USA (MI)	U-66, H-41
<i>Catostomus commersoni</i>		F, M	100	24 M/SM + 76 ST/A	124				4X, ACN=100	USA (ME)	B-64
<i>Catostomus discobolus</i>			96-100						4X	USA (CO)	U-66
<i>Catostomus latipinnis</i>			96-100						4X	USA (UT)	U-66
<i>Catostomus elongatus</i>			96-100						4X	USA (MO)	U-66
<i>Cycleptus sucetta</i>			96-100						4X	USA (MI)	U-66
<i>Hypentelium nigricans</i>			96-100						4X	USA (MI)	U-66
<i>Idtiobius</i> sp.			<96						4X	USA (MO)	U-66
<i>Minytrema melanops</i>			96-100						4X	USA (MI)	U-66
<i>Moxostoma duquesnei</i>			96-100						4X	USA (MI)	U-66
<i>Moxostoma erythrurum</i>			96-100					4.3 FCM	4X	USA (MI)	U-66, F-23
<i>Moxostoma macrolepidotum</i>			96-100						4X	USA (MI)	U-66
<i>Myxocyprinus asiaticus</i>		F, M	100	18 M/SM + 82 ST/A	118				4X, ACN=100	China (Sichuan)	L-37

Table 6.11 Order CYPRINIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup> NORs	Genome size (pg/cell)	Comments	Locality	Reference
Superfamily/family/subfamily/species	karyotype paper										
<i>Myxocyprinus asiaticus</i>			100	6M + 8SM + 86 ST/A	114			4.0 FD	4X, ACN=100	(China)	U-37
<i>Myxocyprinus asiaticus</i>			100	4M + 14 SM/ST + 82A		118			4X, ACN=100	(China)	S-138
<b>Cobitiidae</b>											
<b>Botiinae</b>											
<i>Botia almorhae</i>			100						4X, ACN=100	(Asia)	S-157
<i>Botia birdi</i>		M	98	14M + 18SM + 4ST + 62A	130	134			4X	India (Kashmir)	K-37
<i>Botia dario</i>			98	32M + 6SM + 60A	136	136			4X	India (Assam)	K-41
<i>Botia dario</i>			90	12M + 2SM + 76A	104				4X	India (Assam)	R-65
<i>Botia dayi</i>		F, M	98						4X	India (U.P.)	R-74
<i>Botia histriónica</i>			100						4X	(Asia)	S-157
<i>Botia lohachata</i>			100	28M + 26 SM/ST + 46A		154		1.9 FD	4X, ACN=100	(Asia)	S-144
<i>Botia lohachata</i>		F, M	98	16M + 20SM + 62 ST/A	134				4X	India (U.P.)	R-74
<i>Botia rostrata</i>			98	22M + 8SM + 2ST + 66A	128	130			4X	India (WB)	K-46
<i>Botia striata</i>			100	20M + 26 SM/ST + 54A	146	146			4X, ACN=100	(Asia)	S-144
<i>Chromobotia macracantha</i>	<i>Botia</i>		100	16M + 20 SM/ST + 64A		136		1.9 FD	4X, ACN=100	(Sumatra, Borneo)	S-144
<i>Chromobotia macracantha</i>	<i>Botia</i>		98	28 M/SM + 70A	126			1.9 FD	4X	(Asia)	M-91
<i>Sinibotia pulchra</i>	<i>Botia</i>		100	12M + 40 SM/ST + 48A		152			4X, ACN=100	(Asia)	S-144
<i>Sinibotia pulchra</i>	<i>Botia</i>	F	100	10M + 12SM + 14ST + 64A	122	136			4X, ACN=100	China (Guilin)	Y-15
<i>Syncrossus berdmorei</i>	<i>Botia</i>		100	8M + 14 SM/ST + 78A	122	122		2.0 FD	4X, ACN=100	(Myanmar)	S-144
<i>Syncrossus helodes</i>	<i>Botia</i>		100	8M + 12 SM/ST + 80A	120	120		1.7 FD	4X, ACN=100	(Cambodia)	S-144
<i>Syncrossus hymenophysa</i>	<i>Botia</i>		100	8M + 12 SM/ST + 80A	120	120			4X, ACN=100	(Asia)	S-144
<i>Syncrossus hymenophysa</i>	<i>Botia</i>	F	90	4M + 86A	94				4X	India (Manipur)	R-65
<i>Syncrossus reversa</i>			100						4X	(Indonesia)	S-157
<i>Yasuhikotakia eos</i>			100						4X	(Laos)	S-157
<i>Yasuhikotakia lecontei</i>	<i>Botia</i>		100	10M + 20 SM/ST + 70A		130			4X, ACN=100	(Thailand)	S-144
<i>Yasuhikotakia modesta</i>	<i>Botia</i>		100	14M + 14 SM/ST + 72A	128	128		1.6* FCM, 1.2 FD	4X, ACN=100	(Thailand)	S-144, O-48
<i>Yasuhikotakia morleti</i>	<i>Botia</i>		100	14M + 12 SM/ST + 74A	126	126		1.5 FD	4X, ACN=100	(Cambodia, Thailand)	S-144
<i>Yasuhikotakia nigrolineata</i>			100						4X	(China, Yunnan)	S-157
<i>Yasuhikotakia sidthimunki</i>	<i>Botia</i>		100	12M + 12 SM/ST + 76A		124			4X, ACN=100	(Thailand)	S-144
<b>Leptobotiinae</b>											
<i>Leptobotia curta</i>			50	8M + 10SM + 32 ST/A	68		2	1.1 FD	ACN=50	Japan (Okayama)	S-17, S-144
<i>Leptobotia elongata</i>		F, M	50	6M + 12SM + 18ST + 14A	68	86			ACN=50	China (Leshan)	Y-15
<i>Leptobotia guilinensis</i>		F, M	50	6M + 8SM + 8ST + 28A	64	72			ACN=50	China (Guilin)	Y-15
<i>Leptobotia pellegrini</i>		F, M	50	8M + 8SM + 12ST + 22A	66	78			ACN=50	China (Guilin)	Y-15
<i>Leptobotia pellegrini</i>			50	6M + 22 SM/ST + 22A	78	78			ACN=50	(China)	S-144
<i>Leptobotia taeniops</i>		F	50	6M + 10SM + 12ST + 22A	66	78			ACN=50	China (Nanchong)	Y-15
<i>Leptobotia zebra</i>		F, M	50	6M + 10SM + 10ST + 24A	66	76			ACN=50	China (Guilin)	Y-15
<i>Parabotia banarescui</i>			50	6M + 14 SM/ST + 30A	72			1.1 FD	2B, ACN=50	(China)	S-137

Table 6.11 Order CYPRINIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Superfamily/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Parabotia fasciata</i>		F, M	50	10M + 8SM + 14ST + 18A	68	82			ACN=50	China (Guangdong)	Y-15
<i>Parabotia kwangsiensis</i>	<i>Botia</i>	F, M	50	10M + 6SM + 4ST + 30A	66	70			ACN=50	China (Guilin)	Y-15
<i>Parabotia lijiangensis</i>		F, M	50	8M + 8SM + 10ST + 24A	66	76			ACN=50	China (Guilin)	Y-15
<i>Parabotia maculosa</i>		F, M	50	8M + 8SM + 14ST + 20A	66	80			ACN=50	China (Guilin)	Y-15
<b>Cobitinae</b>											
<i>Acanthopsis choirorhynchus</i>			50	16M + 30 SM/ST + 4A		96			ACN=50	(Asia)	S-137
<i>Acanthopsis sp. 2</i>			50	22M + 18SM + 4ST + 6A	90	94			ACN=50	Thailand	D-28
<i>Canthophrys gongota</i>			50	8M + 4SM + 2ST + 36A	62	64			ACN=50	India (WB)	K-46
<i>Cobitis biwae</i>	<i>Somileptes</i>	F, M	48	18M + 30SM	96	96			2X	Japan	K-61, K-91
<i>Cobitis biwae</i>			48	20M + 24SM + 4A	92	92			2X	Japan (Tochigi)	U-30
<i>Cobitis biwae</i>			46	20M + 22SM + 4A	88	88			2X	Japan (Toyama)	U-30
<i>Cobitis biwae</i>		F, M	48	42 M/SM + 6 ST/A	90			4.3 FD	2X	Japan (Shiga)	T-1
<i>Cobitis biwae</i>			48	18M + 26 SM/ST + 4A		92			2X	Japan (Okayama)	S-137
<i>Cobitis biwae</i>			48	20M + 22 SM/ST + 6A		90			2X	Japan (Shiga)	U-27, U-29
<i>Cobitis biwae</i>			48	16M + 24 SM/ST + 8A		88			2X	Japan (Kochi)	U-29
<i>Cobitis biwae</i>			48	16M + 22 SM/ST + 10A		86	2		2X	Japan (Shimane)	U-29
<i>Cobitis biwae</i>			96	32M + 54 SM/ST + 10A		182		(6.7* FCM)	4X	W. Japan	U-27, U-29, O-48
<i>Cobitis biwae</i>		F, M	96	36M + 52SM + 8ST	184	192			4X	W. Japan	K-61, K-91
<i>Cobitis biwae</i>		F, M	96	58 M/SM + 38 ST/A	154				4X	Japan (Hyogo)	H-16, O-14
<i>Cobitis calderoni</i>		F, M	96	34M + 50 SM/ST + 12A		180			4X	Japan (Okayama)	S-137
<i>Cobitis calderoni</i>			50	6M + 14SM + 30A	70			7.2 FD	ACN=50	Portugal, Spain	M-4
<i>Cobitis hankugensis</i>	<i>taenia taenia</i>		50	6M + 12SM + 32 ST/A	68				ACN=50	Portugal	V-25
<i>Cobitis hankugensis</i>	<i>sinensis</i>		48	14M + 4SM + 30 ST/A	66				2X	Korea	K-56
<i>Cobitis hankugensis</i>			48	14M + 4SM + 30 ST/A	66			(2.8 FCM)	2X	Korea (Nagdong R.)	K-116, V-102
<i>Cobitis koreensis pumilus</i>			50	10M + 12SM + 28A	72				ACN=50	Korea	K-56
<i>Cobitis cf. laosensis</i>			48	14M + 4SM + 30 ST/A	66				2X	Korea	K-129
<i>Cobitis lutheri</i>	<i>taenia lutheri</i>		50	10M + 6SM + 34 ST/A	66				ACN=50	Korea (Yongjin)	K-56
<i>Cobitis lutheri</i>	<i>taenia lutheri</i>		49	11M + 6SM + 32A	66				2X	Korea (Tamjin R.)	K-129
<i>Cobitis lutheri</i>	<i>taenia lutheri</i>		51	9M + 6SM + 36A	66				2X	Korea (Tamjin R.)	K-129
<i>Cobitis lutheri</i>	<i>taenia lutheri</i>		50	12M + 4SM + 34A	66				2X, ACN=50	Korea (Han R.)	U-35
<i>Cobitis lutheri</i>			50	12M + 8SM + 30 ST/A	70			3.5, 3.9 FCM	2X, ACN=50	Russia (Amur basin)	V-86, V-98, V-102
<i>Cobitis maroccana</i>		F, M	50	6M + 12SM + 32A	68	68	2		ACN=50	Portugal, Spain	M-4, V-73
<i>Cobitis melanoleuca</i>			50	8M + 16SM + 26 ST/A	74				2X, ACN=50	Mongolia	V-98
<i>Cobitis melanoleuca</i>			50	6M + 16SM + 28 ST/A	72			(3.1 FCM)	2X, ACN=50	Russia (Amur basin)	V-86, V-98
<i>Cobitis melanoleuca gladhkovi</i>	<i>granoei</i>		50	8M + 18SM + 24 ST/A	76				2X, ACN=50	Russia	V-24, V-98
<i>Cobitis melanoleuca gladhkovi</i>			50	8M + 18SM + 24 ST/A	76				2X, ACN=50	Russia (Don basin)	V-98
<i>Cobitis pacifica</i>	<i>taenia granoei</i>		50	24 M/SM + 26 ST/A	74				2X, ACN=50	Korea	K-128
<i>Cobitis pacifica</i>	<i>granoei</i>		50	6M + 24SM + 20ST	80	100			2X, ACN=50	Korea	L-15
<i>Cobitis sinensis</i>		F	40	20M + 8SM + 4ST + 8A	68	72			2X	China (Guilin)	Y-15

Table 6.11 Order CYPRINIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup>	Genome size	Comments	Locality	Reference
Superfamily/family/subfamily/species	karyotype paper						NORs	(pg/cell)			
<i>Cobitis sinensis</i>		F	90	26M + 18SM + 16ST + 30A	134	150			4X	China (Guilin)	Y-15
<i>Cobitis taenia</i>		F, M	48	12M + 18SM + 18 ST/A	78		2		2X	Poland	B-48, B-52
<i>Cobitis taenia</i>		F	74	21M + 30SM + 23 ST/A	125				3X	Poland	B-48, B-52
<i>Cobitis taenia</i>			50	8M + 16SM + 6ST + 20A	74	80			2X, ACN=50	Russia (Volga R.)	V-15
<i>Cobitis taenia</i>			48	12M + 12SM + 10ST + 14A	72	82			2X	Russia (Volga R.)	V-15
<i>Cobitis taenia</i>			48	10M + 18SM + 20 ST/A	76			(3.5 FCM)	ACN=50	Russia (Volga R.)	V-15
<i>Cobitis taenia</i>		F, M	50	12M + 6SM + 16ST + 16A	68	84			2X, ACN=50	Russia	V-24, V-102
<i>Cobitis sp.</i>			49	9M + 24SM + 16 ST/A	82				2X	Russia (Dnepr R.)	C-94
<i>Cobitis sp.</i>			50	8M + 24SM + 18 ST/A	82				2X, ACN=50	Russia (Dnepr R.)	V-19
<i>Cobitis sp.</i>			74	23M + 25SM + 26 ST/A	122			6.0 FCM	3X	Russia (Dnepr R.)	V-19, V-102
<i>Cobitis sp.</i>			98					7.6 FCM	4X	Russia	V-102
<i>Cobitis taenia satunini</i>			50	16 M/SM + 34 ST/A	66				2X	(Asia)	V-72
<i>Cobitis taenia striata</i>	small race	F	50	16 M/SM + 34 ST/A	66				X <sub>1</sub> X <sub>1</sub> X <sub>2</sub> X <sub>2</sub>	Japan (Okayama)	S-3, S-4
<i>Cobitis taenia striata</i>	small race	M	49	17 M/SM + 32 ST/A	66				X <sub>1</sub> X <sub>2</sub> Y, ACN=50	Japan (Okayama)	S-3, S-4
<i>Cobitis taenia striata</i>	middle race	F, M	50	16 M/SM + 34A	66				2X, ACN=50	Japan (Okayama)	S-3
<i>Cobitis taenia striata</i>	large race	F, M	98	42 M/SM + 56A	140				4X	Japan (Lake Biwa)	S-3
<i>Cobitis taenia striata</i>		F	50	16 M/SM + 34 ST/A	66				2X, ACN=50	Japan (Yodo R.)	T-1
<i>Cobitis taenia striata</i>			50	12M + 4SM + 34A	66	66		(3.9* FCM)	2X, ACN=50	W. Japan	U-27, U-29, O-48
<i>Cobitis taenia striata</i>			98	20M + 22 SM/ST + 56A	140				4X	Japan (Shiga)	U-27, U-29
<i>Cobitis taenia taenia</i>			50	12M + 4SM + 34 ST/A	66				2X, ACN=50	Japan (Fukuoka)	U-29
<i>Cobitis taenia taenia</i>			86	32M + 32 SM/ST + 22A		150	2		4X	Japan (Fukuoka, Nagasaki)	U-29
<i>Cobitis taenia taenia</i>			94	26M + 32 SM/ST + 36A	152	2			2X, ACN=50	Japan (Fukuoka, Oita)	U-29
<i>Cobitis taenia taenia</i>		M	50	38 M/SM + 12 ST/A	88				2X, ACN=50	Bosnia	S-81
<i>Cobitis taenia taenia</i>		F	75	57 M/SM + 18 ST/A	132				3X	Bosnia	S-81
<i>Cobitis taenia taenia</i>		F, M	86	64 M/SM + 22 ST/A	150				2X	Japan (Saga)	T-1
<i>Cobitis takatsuensis</i>			48	12M + 18 SM/ST + 18A	72	78			2X	W. Japan	K-60
<i>Cobitis tetralineata</i>			48	12M + 12SM + 24A					2X	Japan	K-117
<i>Cobitis vardarensis</i>	<i>taenia striata</i>		50	10M + 6SM + 34 ST/A	66				2X, ACN=50	Korea	K-56
<i>Cobitis choui</i>			50	26M + 20SM + 4ST	96	100			2X, ACN=50	Macedonia	R-104
<i>Cobitis choui</i>	<i>Cobitis</i>		50	8M + 10SM + 8ST + 24A	68	76			2X, ACN=50	Korea	K-127
<i>Cobitis choui</i>			50	24 M/SM + 26 ST/A	74				2X, ACN=50	Amur basin	V-98
<i>Cobitis hugowolfeldi</i>			50	12M + 8SM + 30 ST/A	70				2X, ACN=50	Korea	K-128
<i>Cobitis koreensis</i>	<i>Cobitis</i>		50	10M + 12SM + 28A	72				2X, ACN=50	Korea (Han R., Geum R.)	U-35
<i>Cobitis longicorpa</i>	<i>Cobitis longicorpus</i>		50	14M + 6SM + 30 ST/A	70				2X, ACN=50	Korea (Mankyong R.)	K-56
<i>Cobitis longicorpa</i>	<i>Cobitis longicorpus</i>	F, M	50	12M + 8SM + 30 ST/A	70				2X, ACN=50	Korea (Nakton R.)	K-116
<i>Cobitis pumila</i>		F	50	22 M/SM + 28 ST/A	72				2X, ACN=50	Korea (Nakton R.)	K-56, U-35
<i>Cobitis yongdokensis</i>			100	44 M/SM + 56 ST/A	144				4X	Korea (Kyongsangbuk-do)	V-98
											K-127



Table 6.11 Order CYPRINIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag-NORs	Genome size (pg/cell)	Comments	Locality	Reference
Superfamily/family/subfamily/species	karyotype paper										
<i>Kichulchoia brevifasciata</i>		F, M	48	6M + 10SM + 32 ST/A	64				2X, ACN=48	Korea (Jeollanam-do)	K-128
<i>Koreocobitis rotundicaudata</i>	<i>Cobitis</i>	M	50	10M + 4SM + 36 ST/A	64				2X, ACN=50	Korea (Han R.)	U-35
<i>Lepidocephalichthys berdmorei</i>		F	62	24 M/SM + 38A	86					India (Portonovo)	N-13
<i>Lepidocephalichthys guntea</i>		F	50	18M + 18SM + 10ST + 4A	86	96	2		1B, 2X, ACN=50	India (Jammu)	S-57, K-136
<i>Lepidocephalichthys guntea</i>		M	50	18M + 18SM + 10ST + 4A	86	96	2		2B, 2X, ACN=50	India (Jammu)	S-57, K-136
<i>Lepidocephalichthys guntea</i> var. <i>baigara</i>		F, M	50	22M + 14SM + 2ST + 12A	86	88			2X, ACN=50	India (WB)	B-4
<i>Misgurnus anguillicaudatus</i>		F, M	50	14 M/SM + 36 ST/A	64			(2.8 BFA)	2X, ACN=50	Japan (Hokkaido)	H-13, H-15, H-16, O-14
<i>Misgurnus anguillicaudatus</i>		F, M	50	10M + 4SM + 36 ST/A	64				ACN=50	Japan	O-28, I-15
<i>Misgurnus anguillicaudatus</i>		F, M	48	12M + 4SM + 32 ST/A	64				ACN=50	Japan (Shiga)	O-28
<i>Misgurnus anguillicaudatus</i>		F	75	15M + 6SM + 54 ST/A	96				3X	Japan (Shiga)	O-28
<i>Misgurnus anguillicaudatus</i>		F, M	100	20M + 8SM + 72 ST/A	128				4X	Japan (Shiga)	O-28
<i>Misgurnus anguillicaudatus</i>		F, M	50	8M + 6 SM/ST + 36A	64			3.7 FD	2X, ACN=50	Japan	S-137
<i>Misgurnus anguillicaudatus</i>			50					2.4 FCM	2X	S. Korea	L-15, P-70
<i>Misgurnus anguillicaudatus</i>			50	10M + 4SM + 36 ST/A	64				2X, ACN=50	N. Korea	V-28
<i>Misgurnus anguillicaudatus</i>		F	50	8M + 6SM + 36A	64	64			2X, ACN=50	N. Korea	L-44, Y-15
<i>Misgurnus anguillicaudatus</i>		F, M	100	16M + 12SM + 72A	128	128		4.6, 4.0* FD	2X, ACN=50	China (Sichuan)	L-27, L-41, Y-15, C-83
<i>Misgurnus bufoensis</i>			48	10M + 2SM + 36 ST/A	60				4X	China (Hubei)	L-27, L-41, Y-15, C-83
<i>Misgurnus fossilis</i>			100	36 M/SM/ST + 64A						N. Korea	V-98
<i>Misgurnus mohoty</i>			50			136			4X	Rumania	R-32
<i>Misgurnus nikolskyi</i>			50	8M + 6SM + 36 ST/A	64					Russia (Amur basin)	V-98
<i>Misgurnus nikolskyi</i>			50	10M + 4SM + 36 ST/A	64				2X, ACN=50	Russia (Far East)	V-28
<i>Misgurnus delicata</i>	<i>Cobitis</i>	F, M	50	18 M/SM + 32 ST/A	68				ACN=50	Russia (Amur basin)	V-98
<i>Niwaella delicata</i>		F, M	50	6M + 14 SM/ST + 30A	70				2X, ACN=50	W. Japan	O-14, T-1, H-16
<i>Niwaella multifasciata</i>			50	38 M/SM + 12 ST/A	88				2X, ACN=50	Korea	K-60
<i>Pangio borneensis</i>	<i>Acanthopthalmus</i>		50	10M + 18 SM/ST + 22A	88			2.0 FD	2X, ACN=50	Asia	K-128
<i>Pangio khulli</i>	<i>Acanthopthalmus</i>	F	50	14 M/SM + 12ST + 24A	64	76		2.0 FD	2X, ACN=50	(Asia)	S-137
<i>Pangio pangii</i>	<i>Acanthopthalmus</i>		50	14M + 4ST + 32A	64	68		(2.4 BFA)	2X, ACN=50	Thailand	M-91
<i>Paramisgurnus dabryanus</i>	<i>Acanthopthalmus</i>		50	16M + 10SM + 24A	76	76			2X, ACN=50	India	D-20, H-13
<i>Paramisgurnus dabryanus</i>	<i>Misgurnus mizolepis</i>	F, M	48	12M + 4SM + 32A	64			2.2, 2.0* FD	0-1 B, ACN=50	China (Hubei)	L-27, L-41, Y-15, C-83
<i>Sabanejewia caspia</i>	<i>aurata balcanica</i>	F, M	48	12M + 4SM + 32 ST/A	64		2		2X, ACN=50	Korea (Geum R.)	U-35
<i>Sabanejewia caspia</i>			50	4M + 12SM + 34 ST/A	66	82			2X, ACN=50	Slovakia	R-19, V-26
<i>Sabanejewia kubanica</i>	<i>aurata kubanica</i>		50	4M + 6SM + 22ST + 18A	60				2X		V-72
<i>Sabanejewia kubanica?</i>	<i>aurata</i>		50	4M + 18SM + 20 ST/A	72				2X	(Caspian Sea basin)	V-108
<i>Sabanejewia larvata</i>		F, M	50	6M + 14SM + 30 ST/A	70				2X, ACN=50	Russia (Kuban R.)	V-25
			50	6M + 14SM + 30 ST/A	70				2X, ACN=50		V-72
			50	4M + 6SM + 22ST + 18A	60				2X, ACN=50	Italy (near Torino)	L-65

Table 6.11 Order CYPRINIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag-NORs	Genome size (pg/cell)	Comments	Locality	Reference
Superfamily/family/subfamily/species	karyotype paper										
<b>Balitoridae (= Homalopteridae)</b>											
<b>Nemacheilinae</b>											
<i>Acanthocobitis botia</i>	<i>Nemacheilus</i>	F, M	50	20M + 16 SM/ST + 14A	86				ACN=50	India	R-51
<i>Acanthocobitis botia</i>	<i>Nemacheilus aureus</i>		50	28M + 4SM + 18A	82	82			ACN=50	India (Orissa)	K-41
<i>Barbatula barbatula</i>	<i>Nemacheilus barbatulus</i>	F, M	50	8M + 20SM + 22A	78	78	2		ACN=50	Swiss, Spain	M-4
<i>Barbatula barbatula</i>	<i>Nemacheilus barbatulus</i>	F, M	50	8M + 20SM + 22 ST/A	78	78	2		ACN=50	Poland	B-51
<i>Barbatula barbatula</i>	<i>Nemacheilus barbatulus</i>	F, M	50	20 M/SM + 30 ST/A	70				ACN=50	Bosnia-Herzegovina	S-83
<i>Barbatula barbatula</i>	<i>Nemacheilus barbatulus</i>		50	8M + 20 SM/ST + 22A		78			ACN=50	Slovakia	C-73
<i>Barbatula barbatula</i>	<i>Nemacheilus barbatulus</i>		75	12M + 30 SM/ST + 33A		117			3X	Slovakia	C-73
<i>Barbatula barbatula</i>	<i>Nemacheilus barbatulus</i>		50	6M + 12 SM/ST + 32A		68			ACN=50	Slovakia	V-72
<i>Barbatula toni</i>		F, M	50	16 M/SM + 34 ST/A	66				ACN=50	Japan (Hokkaido)	H-16
<i>Barbatula toni</i>			50	6M + 24 SM/ST + 20A		80		1.1 FD	ACN=50	Japan (Hokkaido)	S-137
<i>Barbatula toni</i>	<i>Nemacheilus</i>	M	50	8M + 12SM + 30 ST/A	70				ACN=50	Korea (Han R., Nakton R.)	K-58
<i>Barbatula toni</i>	<i>Nemacheilus</i>	F	50	8M + 6SM + 36 ST/A	64				ACN=50	Korea (Maeubchon R.)	K-58
<i>Lefua costata</i>		M	50	6M + 4SM + 40 ST/A	60				ACN=50	Korea	K-58
<i>Lefua echigonia</i>			50	4M + 8 SM/ST + 38A		62		1.0 FD	ACN=50	Japan (Kanagawa)	S-124, S-137
<i>Lefua echigonia</i>			50	4M + 8SM + 38 ST/A	62				ACN=50	Japan	U-30
<i>Lefua nikkonis</i>		F, M	50	12 M/SM + 38 ST/A	62				ACN=50	Japan (Hokkaido)	H-16
<i>Lefua nikkonis</i>			50	4M + 24 SM/ST + 22A		78	2	0.9 FD	ACN=50	Japan (Hokkaido)	S-145
<i>Micronemacheilus pulcher</i>		F, M	50	10M + 12SM + 12ST + 16A	72	84			ACN=50	China (Guilin)	Y-15
<i>Micronemacheilus pulcher</i>			50	8M + 30 SM/ST + 12A		88	2		ACN=50	China	S-145
<i>Nemacheilus mooreh</i>	<i>sinuatus</i>	M	50	24M + 22SM + 4A	96	96			ACN=50	India (Assam)	K-46
<i>Nemacheilus selangoricus</i>			40	6M + 2SM + 32A	48	48			ACN=42	Asia	S-137
<i>Paracobitis potanini</i>	<i>Nemacheilus</i>	F, M	48	14M + 26SM + 6ST + 2A	88	94			ACN=48	China (Ya'an, Sichuan)	Y-15
<i>Schistura fasciolata</i>	<i>Nemacheilus fasciolatus</i>	M	44	10M + 8SM + 10ST + 16A	62	72			ACN=48	China (Guilin)	Y-15
<i>Schistura fasciolata</i>	<i>Nemacheilus fasciolatus</i>	F, M	50	12M + 14SM + 14ST + 10A	76	90			ACN=50	China (Guilin)	Y-15
<i>Schistura incerta</i>	<i>Nemacheilus incertus</i>	F, M	50	8M + 8SM + 4ST + 30A	66	70			ACN=50	China (Guilin)	Y-15
<i>Schistura prashadi</i>	<i>Nemacheilus incertus</i>		50	10M + 10SM + 4ST + 26A	70	74			ACN=50	India	L-1
<i>Schistura rupecula</i>	<i>Nemacheilus rupicola</i>	F, M	50	20M + 8SM + 22 ST/A	78				ACN=50	India (U.P.)	R-74
<i>Schistura savona</i>	<i>Nemacheilus</i>	F, M	36	20M + 6SM + 2ST + 8A	62	64			ACN=50	India (Bihar)	K-41
<i>Triphophysa kungessana</i>	<i>Nemacheilus dorsalis</i>		50	16 M/SM + 34 ST/A	66			2.0* FD	ACN=50	Central Asia	M-57
<i>Triphophysa siluroides</i>			48							Tibet	C-83
<i>Triphophysa stoliczkae</i>	<i>Nemacheilus</i>		50	12 M/SM + 38 ST/A	62				ACN=50	Central Asia	M-57
<i>Triphophysa strauchii</i>	<i>Nemacheilus</i>		50	18 M/SM + 32 ST/A	68				ACN=50	Central Asia	M-57
<b>Balitorinae</b>											
<i>Beaufortia kweichowensis kweichowensis</i>			48	10M + 26 SM/ST + 12A		84	2			China	S-145
<i>Jinshaia abbreviata</i>	<i>Hemimyzon abbreviata</i>		50							China	Y-15
<i>Pseudogastromyzon myersi</i>			50	6M + 16 SM/ST + 28A		72		0.9 FD	ACN=50	Asia	S-139
<i>Sinohomaloptera kwangsiensis</i>	<i>Homaloptera hoffmanni</i>		50	6M + 18 SM/ST + 26A		74		0.9 FD	ACN=50	Asia	S-139
<i>Yunnanenia pingchowensis</i>		F, M	50	8M + 6SM + 6ST + 30A	64	70			ACN=50	China (Guilin)	Y-15
<b>Vaillantellidae</b>											
<i>Vaillantella maassi</i>			50	26 M/SM + 24ST	76	100	2		ACN=50	Thailand	B-72

Table 6.12 Order CHARACIFORMES

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2h	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup> NORs	Genome size (pg/cell)	Comments	Locality	Reference
Suborder/family/subfamily/species	karyotype paper										
<b>Suborder Characoidei</b>											
<b>Acestrorhynchidae</b>											
<i>Acestrorhynchus altus</i>		F	50	8M + 22SM + 14ST + 6A	80	94			ACN=52	Brazil (MS)	F-2
<i>Acestrorhynchus lacustris</i>		F, M	50	12M + 32SM + 4ST + 2A	94	98			ACN=52	Brazil (SP)	F-2
<i>Acestrorhynchus pantaneiro</i>			50	36 M/SM + 14 ST/A	86		1.7 FD			Argentina	F-20, C-94
<b>Alestidae</b>											
<i>Arnoldichthys spilopterus</i>			56					2.4 BFA		(Africa)	H-13
<b>Anostomidae</b>											
<i>Abramites hypselonotus</i>			54	30M + 22SM + 2ST	106	108				Argentina	F-20, O-50
<i>Abramites hypselonotus solarii</i>		F, M	54	54 M/SM	108	108	2		ACN=56	Brazil (AM)	M-44
<i>Anostomus anostomus?</i>			54	54 M/SM	108	108		2.8 BFA		(S. America)	O-22, H-13
<i>Anostomus ternetzi</i>		F, M	54	54 M/SM	108	108	2		ACN=56	Brazil (AM)	M-44, O-50
<i>Leporellus vittatus</i>		F, M	54	30M + 24SM	108	108	2		ACN=56	Brazil (SP)	G-2, G-4
<i>Leporinus acutidens</i>			54	28M + 26SM	108	108				Argentina	F-20
<i>Leporinus affinis</i>			54	54 M/SM	108	108				(Brazil)	P-88
<i>Leporinus amblyrhynchus</i>			54	54 M/SM	108	108				(S. America)	A-92
<i>Leporinus brunneus</i>			54	54 M/SM	108	108				(Brazil, Venezuela)	A-92
<i>Leporinus conirostris</i>		F	54	52 M/SM + 1SM + 1ST	107	108	2		ZW, ACN=54	Brazil (SP)	G-10
<i>Leporinus conirostris</i>		M	54	52 M/SM + 2SM	108	108	2		ZZ, ACN=54	Brazil (SP)	G-10
<i>Leporinus copelandii</i>			54	26M + 28SM	108	108				Brazil (SP)	B-32
<i>Leporinus cylindricornis</i>			54	26M + 28SM	108	108				(Brazil)	A-92
<i>Leporinus desmotes</i>		F	54	54 M/SM	108	108	2		ACN=56	Brazil (TO)	M-155

Table 6.12 Order CHARACIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag-NORs	Genome size (pg/cell)	Comments	Locality	Reference
Suborder/family/subfamily/species	karyotype paper										
<i>Leporinus</i> sp		F	54	32M + 21SM + 1ST	107	108	2		ZW, ACN=56	Brazil (MS)	G-91, K-135
<i>Leporinus</i> sp		M	54	32M + 22SM	108	108	2		ZZ, ACN=56	Brazil (MS)	G-91
<i>Pseudanous trimaculatus</i>		F, M	54	54 M/SM	108	108	2		ACN=56	Brazil (AM)	M-44
<i>Rhytiodus microlepis</i>			54							Brazil (AM)	B-32
<i>Schizodon altoparanae</i>			54	54 M/SM	108	108	2		ACN=56	Brazil (SP)	M-43
<i>Schizodon borellii</i>			54	54 M/SM	108	108				Argentina	F-20
<i>Schizodon borellii</i>			54	32M + 22SM	108	108		(3.0 FD)		Brazil (SP)	B-32, C-94
<i>Schizodon borellii</i>		F, M	54	54 M/SM	108	108	2		ACN=56	Brazil (Paraguay R.)	M-154
<i>Schizodon fasciatus</i>			54	54 M/SM	108	108				Brazil	O-50
<i>Schizodon fasciatus</i>			54	28M + 26SM	108	108	2			Brazil	P-88
<i>Schizodon intermedius</i>			54	54 M/SM	108	108	2	2.9 FD	ACN=56	Brazil (SP)	M-43, C-93
<i>Schizodon isognathus</i>	<i>isognathum</i>	F, M	54	54 M/SM	108	108	2		ACN=56	Brazil (Paraguay R.)	M-154
<i>Schizodon knerii</i>			54	54 M/SM	108	108	2		ACN=56	Brazil (MG)	M-43
<i>Schizodon nasutus</i>		F, M	54	32M + 22SM	108	108	2	3.1 FD	ACN=56	Brazil (SP)	G-2, G-4, M-43, C-93
<i>Schizodon nasutus</i>			54	32M + 22SM	108	108	2		0-1 B	Argentina	P-81, M-43, F-20, C-98
<i>Schizodon platae</i>			54	54 M/SM	108	108				Argentina	F-20
<i>Schizodon vittatus</i>			54	54 M/SM	108	108	2		ACN=56	Brazil (MT)	M-43
<b>Characidae</b>											
<b>Aphyocharacinae</b>											
<i>Aphyocharax alburnus</i>			50*						ACN=50	(S. America)	S-29
<i>Aphyocharax anisitsi</i>	<i>rubropinnis</i>		50*					2.7 FD, 3.4 BFA	ACN=50	(S. America)	S-29, C-94, H-13
<i>Aphyocharax dentatus</i>	<i>difficilis</i>	F, M	50	2M + 2SM + 2ST + 44A	54	56	4	(2.5 FD)	ACN=50	Brazil (Parana R.)	S-98, C-94
<i>Inpaichthys kerri</i>		M	52	12M + 26SM + 14ST	90	104			ACN=54	(Brazil)	A-91
<b>Bryconinae</b>											
<i>Brycon cephalus</i>		F, M	50	24M + 20SM + 6ST	94	100	2		ACN=52	Brazil (AM)	M-37
<i>Brycon cf. cephalus</i>		F, M	50	24M + 26 SM/ST		100	2		ACN=52	Brazil (AM)	A-22
<i>Brycon cf. cephalus</i>			50	20M + 22SM + 8ST	92	100	2			Brazil (AM)	P-88
<i>Brycon cf. cephalus</i>	<i>cf. erythropterum</i>		50	20M + 22SM + 8ST	92	100	2			Brazil (AM)	P-88
<i>Brycon falcatus</i>	<i>brevicauda</i>	F, M	50	20M + 24SM + 6ST	94	100	2		ACN=52	Brazil (MT)	M-37
<i>Brycon hilarii</i>	<i>microlepis</i>	F, M	50	20M + 24SM + 6ST	94	100	2	2.4 FD	ACN=52	Brazil (MT)	M-37, M-151, C-94
<i>Brycon insignis</i>		F, M	50	22M + 20SM + 8ST	92	100	2		ACN=52	Brazil (SP)	M-37
<i>Brycon insignis</i>		F, M	50	26M + 24 SM/ST		100	2		ACN=52	Brazil (SP)	A-22
<i>Brycon cf. nattereri</i>	<i>cf. reinhardtii</i>	M	50	22M + 28 SM/ST		100	2		ACN=52	Brazil (SP)	A-22
<i>Brycon orbignyanus</i>		F, M	50	24M + 22SM + 4ST	96	100	2		ACN=52	Brazil (PR)	M-37

Table 6.12 Order CHARACIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag-NORs	Genome size (pg/cell)	Comments	Locality	Reference
Suborder/family/subfamily/species	karyotype paper										
<i>Leporinus</i> sp		F	54	32M + 21SM + 1ST	107	108	2		ZW, ACN=56	Brazil (MS)	G-91, K-135
<i>Leporinus</i> sp		M	54	32M + 22SM	108	108	2		ZZ, ACN=56	Brazil (MS)	G-91
<i>Pseudanous trimaculatus</i>		F, M	54	54 M/SM	108	108	2		ACN=56	Brazil (AM)	M-44
<i>Rhytiodus microlepis</i>			54							Brazil (AM)	B-32
<i>Schizodon altoparanae</i>			54	54 M/SM	108	108	2		ACN=56	Brazil (SP)	M-43
<i>Schizodon borellii</i>			54	54 M/SM	108	108				Argentina	F-20
<i>Schizodon borellii</i>			54	32M + 22SM	108	108		(3.0 FD)		Brazil (SP)	B-32, C-94
<i>Schizodon borellii</i>		F, M	54	54 M/SM	108	108	2		ACN=56	Brazil (Paraguay R.)	M-154
<i>Schizodon fasciatus</i>			54	54 M/SM	108	108				Brazil	O-50
<i>Schizodon fasciatus</i>			54	28M + 26SM	108	108	2			Brazil	P-88
<i>Schizodon intermedius</i>			54	54 M/SM	108	108	2	2.9 FD	ACN=56	Brazil (SP)	M-43, C-93
<i>Schizodon isognathus</i>	<i>isognathum</i>	F, M	54	54 M/SM	108	108	2		ACN=56	Brazil (Paraguay R.)	M-154
<i>Schizodon knerii</i>			54	54 M/SM	108	108	2		ACN=56	Brazil (MG)	M-43
<i>Schizodon nasutus</i>		F, M	54	32M + 22SM	108	108	2	3.1 FD	ACN=56	Brazil (SP)	G-2, G-4, M-43, C-93
<i>Schizodon nasutus</i>			54	32M + 22SM	108	108	2		0-1 B	Argentina	P-81, M-43, F-20, C-98
<i>Schizodon platae</i>			54	54 M/SM	108	108				Argentina	F-20
<i>Schizodon vittatus</i>			54	54 M/SM	108	108	2		ACN=56	Brazil (MT)	M-43
<b>Characidae</b>											
<b>Aphyocharacinae</b>											
<i>Aphyocharax alburnus</i>			50*						ACN=50	(S. America)	S-29
<i>Aphyocharax anisitsi</i>	<i>rubropinnis</i>		50*					2.7 FD, 3.4 BFA	ACN=50	(S. America)	S-29, C-94, H-13
<i>Aphyocharax dentatus</i>	<i>difficilis</i>	F, M	50	2M + 2SM + 2ST + 44A	54	56	4	(2.5 FD)	ACN=50	Brazil (Parana R.)	S-98, C-94
<i>Inpaichthys kerri</i>		M	52	12M + 26SM + 14ST	90	104			ACN=54	(Brazil)	A-91
<b>Bryconinae</b>											
<i>Brycon cephalus</i>		F, M	50	24M + 20SM + 6ST	94	100	2		ACN=52	Brazil (AM)	M-37
<i>Brycon cf. cephalus</i>		F, M	50	24M + 26 SM/ST		100	2		ACN=52	Brazil (AM)	A-22
<i>Brycon cf. cephalus</i>			50	20M + 22SM + 8ST	92	100	2			Brazil (AM)	P-88
<i>Brycon cf. cephalus</i>	<i>cf. erythropterus</i>		50	20M + 22SM + 8ST	92	100	2			Brazil (AM)	P-88
<i>Brycon falcatus</i>	<i>brevicauda</i>	F, M	50	20M + 24SM + 6ST	94	100	2		ACN=52	Brazil (MT)	M-37
<i>Brycon hilarii</i>	<i>microlepis</i>	F, M	50	20M + 24SM + 6ST	94	100	2	2.4 FD	ACN=52	Brazil (MT)	M-37, M-151, C-94
<i>Brycon insignis</i>		F, M	50	22M + 20SM + 8ST	92	100	2		ACN=52	Brazil (SP)	M-37
<i>Brycon insignis</i>		F, M	50	26M + 24 SM/ST		100	2		ACN=52	Brazil (SP)	A-22
<i>Brycon cf. nattereri</i>	<i>cf. reinhardtii</i>	M	50	22M + 28 SM/ST		100	2		ACN=52	Brazil (SP)	A-22
<i>Brycon orbignyanus</i>		F, M	50	24M + 22SM + 4ST	96	100	2		ACN=52	Brazil (PR)	M-37

Table 6.12 Order CHARACIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag-NORs	Genome size (pg/cell)	Comments	Locality	Reference
Suborder/family/subfamily/species	karyotype paper										
<i>Brycon orthotaenia</i>	<i>lundii</i>	F, M	50	22M + 24SM + 4ST	96	100	2		ACN=52	Brazil (MG)	M-37, M-151
<i>Brycon cf. pesu</i>			50	20M + 22SM + 8ST	92	100	2			(Brazil)	P-88
<i>Brycon sp.</i>		F	50	20M + 22SM + 8ST	92	100	2		ACN=52	Brazil (MT)	M-37
<i>Brycon sp.</i>			50							Brazil (AM)	O-50
<i>Salminus brasiliensis</i>	<i>maxillosus</i>	F, M	50	14M + 30SM + 6ST	94	100	2			Brazil (SP)	O-81
<i>Salminus hilarii</i>		F, M	50	14M + 30SM + 6ST	94	100	2	(2.6 FD)		Brazil (SP)	O-81, C-93
<i>Salminus hilarii</i>		F, M	50	12M + 18SM + 20ST	80	100			ACN=52	Brazil (SP)	M-151
<b>Chalceinae</b>											
<i>Chalceus macrolepidotus</i>	Characiniidae		54	32 M/SM + 22ST	86	108		2.1 FD	ACN=56	(S. America)	M-91
<i>Chalceus macrolepidotus</i>			52	44 M/SM + 8ST	96	104		(2.2 BFA)		(S. America)	O-22, H-13
<b>Characinae</b>											
<i>Charax leticiae</i>			52					2.9 FD		(S. America)	C-25, C-94
<i>Charax sp.</i>		F	52	22 M/SM + 30 ST/A	74		2			Brazil (Acre)	C-25
<i>Cynopotamus cf. kincaidi</i>			52	30 M/SM + 22 ST/A	82					Argentina	F-20
<i>Exodon paradoxus</i>		F	52	2M + 4SM + 10ST + 36A	58	68		(3.4 BFA)	ACN=52	Brazil (MT)	V-32, H-13
<i>Exodon paradoxus</i>			52*			(74)			ACN=52	(S. America)	S-152
<i>Galeocharax gulo</i>		F, M	52	6M + 24SM + 22ST	82	104	2		ACN=52	Brazil (MT)	V-32
<i>Galeocharax humeralis</i>			52	36 M/SM + 16 ST/A	88					Argentina	F-20
<i>Galeocharax knerii</i>		F, M	52	6M + 26SM + 20ST	84	104		3.2 FD	ACN=52	Brazil (SP, MG)	F-2, C-93
<i>Phenacogaster aff. microstictus</i>	cytotype A		52*							(S. America)	S-30
<i>Phenacogaster cf. pectinatus</i>	cytotype B		50*							(S. America)	S-30
<i>Phenacogaster descalvadensis</i>	<i>paranensis</i>	M	46	12M + 25T + 32A	58	60	2			Brazil (Acre)	C-26
<i>Roeboides microlepis</i>	<i>bonariensis</i>		52	4M + 20SM + 8ST + 20A	76	84	2		ACN=52	Parana R.	V-32
<i>Roeboides xenodon</i>			52	34 M/SM + 18 ST/A	86			2.2 FD		Argentina	F-20, C-94
<i>Roeboides sp.</i>		F, M	52	4M + 28SM + 16ST + 4A	84	100	2		ACN=52	Brazil (MG)	V-32
<i>Roeboides sp.</i>		F, M	52	6M + 20SM + 12ST + 14A	78	90	2		ACN=52	Brazil (MT)	V-32
<b>Cheirodontinae</b>											
<i>Cheirodon sp.</i>			52							(Brazil)	W-19
<i>Grundulus bogotensis</i>		F, M	50	10M + 28SM + 12ST	88	100			ACN=52	Colombia	G-53
<i>Microschemobrycon casiquiare palmeri</i>			42*							(S. America)	S-30
<i>Nematobrycon palmeri</i>			50						ACN=52	(Colombia)	S-152
<i>Nematobrycon claudiae</i>		F, M	50	8 M/SM + 10ST + 32A	58	68				(Colombia)	A-93
<i>Odontostilbe paranensis</i>		F	52	36 M/SM + 13ST + 3A	88	101				Parana	W-19
<i>Odontostilbe paranensis</i>		M	52	36 M/SM + 12ST + 4A	88	100			ZW, ACN=52	Brazil (SP)	W-19
<i>Odontostilbe paranensis</i>			52						ZZ, ACN=52	Brazil (SP)	W-19

Table 6.12 Order CHARACIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Suborder/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Odontostilbe stenodon</i>	<i>Cheirodon stenodon</i>		52					3.7 FD		(Brazil, PR)	C-93
<i>Paracheirodon axelrodi</i>	<i>Cheirodon</i>		52			(54)			ACN=52	(S. America)	S-153
<i>Paracheirodon innesi</i>			32			(64)			ACN=52	(S. America)	S-153
<i>Paracheirodon innesi</i>	<i>Hyphessobrycon</i>	M	36			(96)			ACN=52	Brazil, Colombia, Peru	L-75
<i>Paracheirodon simulans</i>	<i>Hyphessobrycon</i>		50			(74)			ACN=52	(Amazon R., Orinoco R.)	S-152
<i>Pristella maxillaris</i>	<i>riddlei</i>		52*						ACN=52	(S. America)	S-152
<i>Probolodus heterostomus</i>			50							Brazil (SP)	O-50
<i>Serrapinnus heterodon</i>	<i>Holoshestes</i>	F	52	37 M/SM + 12ST + 3A	89	101			ZW, ACN=52	Brazil (SP)	W-19
<i>Serrapinnus heterodon</i>			52	16M + 20SM + 14ST + 2A	88	102	2			Brazil (Sao Francisco R.)	P-77
<i>Serrapinnus heterodon</i>			52	15M + 20SM + 14ST + 3A	87	101				Brazil (Sao Francisco R.)	P-77
<i>Serrapinnus heterodon</i>			52	17M + 20SM + 14ST + 1A	89	103				Brazil (Sao Francisco R.)	P-77
<i>Serrapinnus notomelas</i>	<i>Cheirodon</i>		52						ZW/ZZ	(Brazil)	W-19
<i>Serrapinnus notomelas</i>		F	52	16M + 23SM + 10ST + 3A	91	101	2		ZW, ACN=52	Brazil (SP)	S-201
<i>Serrapinnus notomelas</i>		M	52	16M + 22SM + 10ST + 4A	90	100	2		ZZ, ACN=52	Brazil (SP)	S-201
<i>Serrapinnus piaba</i>			52	16M + 20SM + 14ST + 2A	88	102	3			Brazil (Sao Francisco R.)	P-77
<i>Serrapinnus sp. 1</i>		F	52	8M + 15SM + 4ST + 25A	75	79			ZW	Paraná R.	S-201
<i>Serrapinnus sp. 1</i>		M	52	8M + 16SM + 4ST + 24A	76	80	3		ZZ, ACN=52	Paraná R.	S-201
<b>Glandulocaudinae</b>											
<i>Gephyrocharax caucanus</i>			52*							(Colombia)	S-30
<i>Gephyrocharax valencia</i>			52*							(Venezuela)	S-30
<i>Glandulocauda melanogenys</i>			52	4M + 12SM + 22ST + 14A	68	90				Brazil (SP)	T-71
<i>Glandulocauda lateralis</i>			54	8M + 18SM + 14ST + 14A	80	94				Brazil (PR)	T-71
<i>Mimagoniates microlepis</i>			52	6M + 20SM + 16ST + 10A	78	94				Brazil (SP)	T-71
<i>Mimagoniates microlepis</i>			52	6M + 20SM + 18ST + 8A	78	96		3.1 FD		Brazil (SP)	T-71, C-94
<i>Mimagoniates microlepis</i>		F, M	52	12M + 18SM + 14ST + 8A	82	96	2		ACN=52	Brazil (PR)	T-71
<b>Iguanodectinae</b>											
<i>Iguanodectes spilurus</i>			50*							(S. America)	S-30
<b>Paragoniatiinae</b>											
<i>Prionobrama filigera</i>			52	12 M/SM + 40 ST/A	64				ACN=54	(S. America)	A-93
<b>Serrasalminae</b>											
<i>Catoptrion mento</i>			60							(Brazil)	P-88
<i>Colossoma macropomum</i>		F, M	54	20M + 34SM	108	108		(3.0 FIA)	ACN=54	Brazil	A-129, H-41
<i>Colossoma macropomum</i>			54	18M + 36SM	108	108				S. America	K-113
<i>Colossoma macropomum</i>			54	28M + 26SM	108	108	4		ACN=54	Venezuela	N-25
<i>Metynnys argenteus</i>			62*							(Brazil)	S-30

Table 6.12 Order CHARACIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Suborder/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Metynnix hypsauchen</i>	<i>schreitmuelleri</i>		62	60 M/SM + 2A	122	122		3.4 BFA		(S. America)	O-22, H-13
<i>Metynnix lippincottianus</i>		F, M	62	30M + 30 SM/ST + 2A		122		(3.4 BFA)	0-2 B	(Brazil, French Guiana)	A-91, A-92, H-13
<i>Metynnix lippincottianus</i>			62	30M + 24SM + 6ST + 2W	116	122				Brazil (AM)	C-98
<i>Metynnix lippincottianus</i>	cf. <i>roosevelti</i>		62	26M + 20SM + 14ST + 2A	108	122			1B	Brazil	M-167
<i>Metynnix maculatus</i>			62	32M + 22SM + 4ST + 4A	116	120				Brazil (SP)	C-98
<i>Metynnix mola</i>			62	60 M/SM + 2A	122	122				Brazil	J-19
<i>Mylesinus paraschomburgkii</i>			58				6-12			Brazil (Amazon R.)	P-88
<i>Mylesinus schomburgkii</i>	<i>Myleus</i>		58	42 M/SM + 16 ST/A	100		5-8			(Guyana, Venezuela)	P-88
<i>Myleus arnoldi</i>	<i>Myloplus</i>		58	34 M/SM + 24 ST/A	92					(Brazil)	O-22
<i>Myleus micans</i>		F, M	58	26M + 18SM + 8ST + 6A	102	110	4			Brazil (Sao Francisco R.)	A-128
<i>Myleus pacu</i>			58	40 M/SM + 18 ST/A	98		5-9			(Guyana)	P-88
<i>Myleus tiete</i>			58							Argentina	F-20
<i>Myloplus rubripinnis</i>			58				5-8			(Guyana)	P-88
<i>Mylossoma aureum</i>			54	54 M/SM	108	108	6-14			(Brazil)	P-88
<i>Mylossoma duriventris</i>	<i>duriventris</i>		54	54 M/SM	108	108	6-14			(S. America)	P-88
<i>Mylossoma duriventris</i>	<i>duriventris</i>		54	18M + 34SM + 2A	106	106				(S. America)	K-113
<i>Mylossoma duriventris</i>	<i>duriventris</i>		54	50 M/SM + 4A	104	104				(S. America)	O-22
<i>Mylossoma duriventris</i>	<i>duriventris</i>		54							Argentina	F-20
<i>Mylossoma duriventris</i>	<i>paraguayensis</i>		54					2.9 FD		Brazil (Miranda R., MG)	C-94
<i>Piaractus brachypomus</i>			54	28M + 26SM	108	108	2		ACN=54	Venezuela	N-25
<i>Piaractus mesopotamicus</i>			54						ACN=54	Argentina	F-20
<i>Pristobrycon striolatus</i>	<i>Colossoma mitrei</i>	F, M	54	20M + 34SM	108	108				Brazil	A-129
<i>Pygocentrus nattereri</i>			62	46 M/SM + 16 ST/A	108					(S. America)	P-88
<i>Pygocentrus nattereri</i>			60	50 M/SM + 10A	110					(S. America)	P-84
<i>Pygocentrus nattereri</i>	<i>Serrasalmus</i>		60							Argentina	F-20
<i>Pygocentrus piraya</i>			60	48 M/SM + 12A	108	108				(Brazil, Sao Francisco R.)	P-84
<i>Serrasalmus altispinis</i>			60	24M + 20SM + 6ST + 10A	104	110	9		ACN=60	Brazil (Amazon basin)	N-8
<i>Serrasalmus altispinis</i>		F, M	60	20M + 28SM + 2ST + 10A	108	110	5-12		ACN=60	Brazil (Amazon basin)	N-71
<i>Serrasalmus altuvei</i>			60	46 M/SM + 14 ST/A	106					(Venezuela)	P-88
<i>Serrasalmus brandtii</i>		F, M	60	18M + 24SM + 8ST + 10A	102	110	10	(3.3 FD)	ACN=60	Brazil (MG)	C-87, C-94
<i>Serrasalmus compressus</i>		F, M	60	18M + 30SM + 2ST + 10A	108	110	5-12			Brazil (Amazon basin)	N-71
<i>Serrasalmus eigenmanni</i>	<i>Pristobrycon</i>		60	44 M/SM + 16 ST/A	104					(S. America)	P-88
<i>Serrasalmus elongatus</i>		F, M	60	22M + 22SM + 4ST + 12A	104	108	5-12			Brazil (Amazon basin)	N-71
<i>Serrasalmus gouldingi</i>			60	22M + 22SM + 6ST + 10A	104	110	8		ACN=60	Brazil (Amazon basin)	N-8
<i>Serrasalmus hollandi</i>	Characinae	M	64	30 M/SM + 16ST + 18A	94	110		3.4 FD		(Brazil, Guyana)	M-91



Table 6.12 Order CHARACIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag-NORs	Genome size (pg/cell)	Comments	Locality	Reference
Suborder/family/subfamily/species	karyotype paper										
<i>Serrasalmus humeralis</i>			60	16M + 26SM + 6ST + 12A	102	108				Brazil (Amazon basin)	N-71
<i>Serrasalmus manuellii</i>		F, M	60	22M + 24SM + 6ST + 8A	106	112	5-12			Brazil (Amazon basin)	N-71
<i>Serrasalmus marginatus</i>		F, M	60	16M + 26SM + 8ST + 10A	102	110	8		ACN=60	Brazil (Paraguay R.)	C-87
<i>Serrasalmus marginatus</i>			60	18M + 26SM + 4ST + 12A	104	108				Argentina	F-20
<i>Serrasalmus rhombus</i>		F, M	60	30M + 16SM + 4ST + 10A	106	110	8		ACN=60	Venezuela (Bolivar)	N-60
<i>Serrasalmus rhombus</i>	cytotype 1	F, M	60	20M + 24SM + 6ST + 10A	104	110	5-12		ACN=60	Brazil (Amazon basin)	N-9
<i>Serrasalmus rhombus</i>	cytotype 2		58	22M + 24SM + 2ST + 10A	104	106	5-12		ACN=60	Brazil (Amazon basin)	N-9
<i>Serrasalmus serrulatus</i>			60	20M + 22SM + 8ST + 10A	102	110	12		ACN=60	Brazil (Amazon basin)	N-8
<i>Serrasalmus serrulatus</i>	<i>Pristobrycon</i>		60	44 M/SM + 16 ST/A	104		6-10			(S. America)	P-88
<i>Serrasalmus spilopleura</i>		F, M	60	50 M/SM + 10A	110	110	5-10	(2.9 FD)		Brazil (SP)	G-90, C-93
<i>Serrasalmus spilopleura</i>	cytotype A	F, M	60	24M + 20SM + 4ST + 12A	104	108	5-12	(3.2 FD)	ACN=60	Brazil (Amazon basin)	C-94, C-103, N-71
<i>Serrasalmus spilopleura</i>	cytotype C		60	23M + 21SM + 4ST + 12A	104	108			ACN=60	Brazil (Central Amazon)	C-103
<i>Serrasalmus spilopleura</i>	cytotype D		60	24M + 20SM + 4ST + 12A	104	108			ACN=60	Brazil (Central Amazon)	C-103
<i>Serrasalmus spilopleura</i>	cytotype a	F, M	60	20M + 26SM + 4ST + 10A	106	110	10		ACN=60	Upper Parana	C-41
<i>Serrasalmus spilopleura</i>	cytotype b	F, M	60	18M + 26SM + 4ST + 12A	104	108	12		ACN=60	Paraguay	C-41, F-20
<i>Serrasalmus spilopleura</i>	cytotype c	F, M	60	19M + 26SM + 4ST + 11A	105	109	11		ACN=60	Lower Parana, Argentina	C-41, F-20
<b>Stethaprioninae</b>											
<i>Brachyhalcinus copei</i>		F, M	50	42 M/SM + 8A	92	92	2	3.5 FD	ACN=52	Brazil (Acre)	C-25, C-94
<i>Orthospinus franciscensis</i>			50	10M + 32SM + 8A	92	92	2		ACN=52	Brazil (MG)	P-25
<i>Orthospinus franciscensis</i>			50	22M + 20SM + 2ST + 6A	92	94	2		ACN=52	Brazil (Sao Francisco R.)	A-122
<i>Poptella compressa</i>			50*							(Argentina)	F-20, S-30
<i>Poptella paraguayensis</i>		F, M	50	10M + 26SM + 8ST + 6A	86	94	2	3.5 FD	ACN=52	Brazil (MS, MT)	F-39, C-94
<b>Tetragonopterinae</b>											
<i>Astyanax abramis</i>			50					3.2 FD		Brazil (Miranda R., MG)	C-94
<i>Astyanax altiparanae</i>	cytotype 1		50	10M + 26SM + 4ST + 10A	86	90	1-4		ACN=52	Brazil (PR)	P-1
<i>Astyanax altiparanae</i>	cytotype 2		50	10M + 24SM + 4ST + 12A	84	88	1-4		ACN=52	Brazil (PR)	P-1
<i>Astyanax altiparanae</i>	cytotype 3		50	10M + 22SM + 4ST + 14A	82	86	1-4		ACN=52	Brazil (PR)	P-1
<i>Astyanax altiparanae</i>			50	6M + 28SM + 8ST + 8A	84	92	4		ACN=52	Brazil (Tibagi, PR)	D-29
<i>Astyanax altiparanae</i>			50	6M + 30SM + 8ST + 6A	86	94	2		ACN=52	Brazil (Iguacu, PR)	D-29
<i>Astyanax altiparanae</i>			50						1B	Brazil (SP)	C-98
<i>Astyanax asuncionensis</i>			50					2.4 FD		Brazil (Miranda R., MG)	C-94
<i>Astyanax bimaculatus</i>		F, M	50	6M + 22SM + 12ST + 10A	78	90		(2.1 FD)	ACN=52	Brazil (SP)	M-86, C-93
<i>Astyanax bimaculatus</i>		F, M	50	10M + 18SM + 12ST + 10A	78	90	6		ACN=52	Argentina	A-14, F-20
<i>Astyanax bimaculatus</i>			50	28 M/SM + 22 ST/A	78		2			Brazil (PR)	T-80

Table 6.12 Order CHARACIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Suborder/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Astyanax bimaculatus</i>			50	34 M/SM + 16 ST/A	84		2			Brazil (PR)	T-80
<i>Astyanax bimaculatus</i>			50	40 M/SM + 10 ST/A	90		2			Brazil (PR)	T-80
<i>Astyanax bimaculatus</i>			50*		(96)					(Brazil)	S-152
<i>Astyanax bimaculatus lacustris</i>			50					2.9 FD		Brazil (MG)	C-94
<i>Astyanax bockmanni</i>		F, M	50	10M + 12SM + 12ST + 16A	72	84	1-4		ACN=52	Brazil	K-126
<i>Astyanax eigenmanniorum</i>		F, M	50	6M + 20SM + 8ST + 16A	76	84			ACN=52	Brazil (MG)	F-6
<i>Astyanax eigenmanniorum</i>		F, M	75	9M + 30SM + 12ST + 24A	114	126			3X	Brazil (MG)	F-6
<i>Astyanax eigenmanniorum</i>		F, M	48	14M + 20SM + 4ST + 10A	82	86	5		0-1 B, ACN=50	Brazil (MG)	T-77, C-98
<i>Astyanax fasciatus</i>		F, M	46	6M + 24SM + 8ST + 8A	76	84		(3.5 FD)	0-1 B	Brazil (MG)	M-85, C-93
<i>Astyanax fasciatus</i>		F, M	48	8M + 22SM + 12ST + 6A	78	90			ACN=52	Brazil (SP)	C-39
<i>Astyanax fasciatus</i>			48	8M + 22SM + 12ST + 6A	78	90	2		ACN=52	Brazil (SP)	P-79
<i>Astyanax fasciatus</i>			46	12M + 20SM + 10ST + 4A	78	88	2, 4		0-1 B, ACN=52	Brazil (SP)	P-79, P-80, C-98
<i>Astyanax fasciatus</i>			45	12M + 20SM + 10ST + 3A	77	87	2		ACN=52	Brazil (SP)	P-79
<i>Astyanax fasciatus</i>			47	12M + 19SM + 10ST + 6A	78	88	2		ACN=52	Brazil (SP)	P-79
<i>Astyanax fasciatus</i>			47	12M + 21SM + 10ST + 4A	80	90	2		ACN=52	Brazil (SP)	P-79
<i>Astyanax fasciatus</i>			47	12M + 20SM + 10ST + 5A	79	89	2		ACN=52	Brazil (SP)	P-79
<i>Astyanax fasciatus</i>		F, M	46	8M + 26SM + 10ST + 2A	80	90				Brazil (SP)	M-86
<i>Astyanax fasciatus</i>		F, M	48	8M + 24SM + 14ST + 2A	80	94				Brazil (Juquia R., SP)	M-86
<i>Astyanax fasciatus</i>		F, M	48	8M + 20SM + 16ST + 4A	76	92	2	(2.8 FD)	ACN=52	Brazil (MG)	P-91, C-94
<i>Astyanax fasciatus</i>		F, M	48	8M + 20SM + 16ST + 4A	76	92	2-5		ACN=52	Brazil (Piumhi R.)	P-91
<i>Astyanax giton</i>		F, M	50	6M + 8SM + 8ST + 28A	64	72	3			Brazil (RJ)	K-19
<i>Astyanax hastatus</i>			50	4M + 8SM + 10ST + 28A	62	72	3		ACN=52	Brazil (RJ)	K-121
<i>Astyanax hastatus</i>			50	8M + 10SM + 14ST + 18A	68	82	3		ACN=52	Brazil (RJ)	K-121
<i>Astyanax hastatus</i>			50	6M + 8SM + 4ST + 32A	64	68	2		ACN=52	Brazil (RJ)	K-121
<i>Astyanax intermedius</i>		F, M	50	6M + 8SM + 4ST + 32A	64	68	6			Brazil (RJ)	K-19
<i>Astyanax janiroensis</i>		F, M	50	6M + 14SM + 14ST + 16A	70	84	6		ACN=52	Brazil (SP)	C-26, C-94
<i>Astyanax jordani</i>	<i>Anoptichthys</i>	F, M	50	40 M/SM + 10ST	90	100			ACN=52	(Mexico)	K-63
<i>Astyanax jordani</i>	<i>Anoptichthys</i>		50*		(92)					(S. America)	S-152
<i>Astyanax mexicanus</i>		F, M	50	40 M/SM + 10ST	90	100			ACN=52	USA (TX)	K-63
<i>Astyanax aff. mexicanus</i>			50	8M + 18SM + 12ST + 12A	76	88			0-2 B	Mexico	C-98
<i>Astyanax parhybae</i>		F, M	48	8M + 18SM + 12ST + 10A	74	86	6		ACN=52	Brazil (Paraiba basin)	C-39, K-19
<i>Astyanax scabripinnis</i>		F, M	50	6M + 8SM + 36A	64		4-12		0-4 B	Brazil (ES)	S-106
<i>Astyanax scabripinnis</i>		F	50	8M + 20SM + 6ST + 16A	78	84	3		ACN=52	Brazil (MG)	B-70
<i>Astyanax scabripinnis</i>		F, M	50	6M + 28SM + 6ST + 10A	84	90	3		ACN=52	Brazil (MG)	B-70
<i>Astyanax scabripinnis</i>		F, M	50	6M + 24SM + 8ST + 12A	80	88	5		ACN=52	Brazil (MG)	B-70

Table 6.12 Order CHARACIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
Suborder/family/subfamily/species	karyotype paper										
<i>Astyanax scabripinnis</i>		F, M	50	6M + 22SM + 10ST + 12A	78	88		(3.7 FD)	0-2 B	Brazil (SP)	F-6, S-8, M-85, C-93
<i>Astyanax scabripinnis</i>		F	75	9M + 33SM + 15ST + 18A	117	132			0-2 B, 3X	Brazil (SP)	F-6
<i>Astyanax scabripinnis</i>		F, M	50	6M + 22SM + 10ST + 12A	78	88			0-2 B, ACN=52	Brazil (SP, 1720m alt.)	V-39
<i>Astyanax scabripinnis</i>		F, M	50	6M + 22SM + 10ST + 12A	78	88			0-2 B	Brazil (SP, 1920m alt.)	N-20
<i>Astyanax scabripinnis</i>		F, M	50	6M + 22SM + 10ST + 12A	78	88			0-1 B	Brazil (SP, 1800m alt.)	N-20
<i>Astyanax scabripinnis</i>		F, M	50	6M + 22SM + 10ST + 12A	78	88			0 B	Brazil (SP, 700m alt.)	N-20
<i>Astyanax scabripinnis</i>		F, M	50	6M + 24SM + 6ST + 14A	80	86	2		0-1 B, ACN=52	Brazil (SP, 1800m alt.)	S-99
<i>Astyanax scabripinnis</i>		F, M	50	4M + 10SM + 6ST + 30A	64	70	8		0 B, ACN=52	Brazil (SP, 780m alt.)	S-99
<i>Astyanax scabripinnis</i>	cytotype I	F, M	50	4M + 26SM + 4ST + 16A	80	84	1-6		ACN=52	Brazil (SP)	S-100, S-101, S-174
<i>Astyanax scabripinnis</i>	cytotype II	F, M	48	6M + 22SM + 8ST + 12A	76	84			ACN=52	Brazil (SP)	S-100
<i>Astyanax scabripinnis</i>		F, M	50	6M + 30SM + 4ST + 10A	86	90	1-3		0-1 B, ACN=52	Brazil (PR, Ivai basin)	M-75, M-76
<i>Astyanax scabripinnis</i>		F, M	50	6M + 28SM + 16A	84	84	1-4		0-2 B, ACN=52	Brazil (PR, Parana basin)	M-75, M-76
<i>Astyanax scabripinnis</i>		F, M	48	10M + 20SM + 8ST + 10A	78	86	3		ACN=50	Brazil (PR)	A-33
<i>Astyanax scabripinnis</i>		F, M	48	10M + 24SM + 6ST + 8A	82	88	7		ACN=50	Brazil (PR)	A-33
<i>Astyanax scabripinnis</i>		F, M	48	8M + 24SM + 4ST + 12A	80	84	8		ACN=50	Brazil (PR, Ivai basin)	F-21
<i>Astyanax scabripinnis</i>		F, M	48	8M + 20SM + 6ST + 14A	76	82	6		ACN=50	Brazil (PR, Ivai basin)	F-21
<i>Astyanax scabripinnis</i>	cytotype I	F, M	50	6M + 22SM + 6ST + 16A	78	84			1B, ACN=52	Brazil (PR, Ivai basin)	F-22
<i>Astyanax scabripinnis</i>	cytotype II	F, M	48	8M + 26SM + 6ST + 8A	82	88			3B, ACN=52	Brazil (PR, Ivai basin)	F-22
<i>Astyanax scabripinnis</i>	cytotype III	F, M	46	8M + 22SM + 6ST + 10A	76	82			2B, ACN=50	Brazil (PR, Ivai basin)	F-22
<i>Astyanax scabripinnis paranae</i>		F, M	50	8M + 22SM + 12ST + 10A	78	90			ACN=52	Brazil (SP)	M-86
<i>Astyanax scabripinnis paranae</i>		F, M	50	8M + 22SM + 10ST + 10A	80	90			0-1 B	Brazil (SP)	P-82, C-98
<i>Astyanax scabripinnis paranae</i>		F, M	50	4M + 30SM + 4ST + 12A	84	88	4		0-1 B, ACN=52	Brazil (SP)	M-135
<i>Astyanax aff. scabripinnis</i>		F, M	48	6M + 22SM + 4ST + 16A	76	80			ACN=50	Brazil (PR)	C-79
<i>Astyanax aff. scabripinnis</i>		F	72	9M + 33SM + 6ST + 24A	114	120	4		3X, ACN=75	Brazil (PR)	C-79
<i>Astyanax schubarti</i>		F, M	36	16M + 14SM + 4ST + 2A	66	70			ACN=52	Brazil (SP)	M-86, M-87
<i>Astyanax schubarti</i>		F, M	54	24M + 21SM + 6ST + 3A	99	105			3X	Brazil (SP)	M-87
<i>Astyanax schubarti</i>		F, M	36	12M + 14SM + 10ST	62	72			0-1 B, ACN=52	Argentina	M-85
<i>Astyanax schubarti</i>		F	36	14M + 14SM + 6ST + 2A	64	70	2		ACN=52	Argentina (Paraná)	A-14
<i>Astyanax taeniatus</i>			50	12M + 2SM + 24ST + 12A	64	88				Brazil	S-192
<i>Astyanax sp. B</i>		F, M	50	6M + 24SM + 6ST + 14A	80	86			0-2 B, ACN=52	Brazil (PR)	F-7
<i>Astyanax sp. C</i>		F, M	50	4M + 22SM + 8ST + 16A	76	84	2, 4		ACN=52	Brazil (PR)	K-7
<i>Astyanax sp.</i>		F, M	48	6M + 18SM + 14ST + 10A	72	86	2, 4		ACN=50	Brazil (PR, sinkhole)	M-47
<i>Astyanax sp.</i>			50							Argentina	F-20
<i>Bryconamericus aff. exodon</i>	cytotype I	F, M	52	16M + 12SM + 6ST + 18A	80	86			ACN=52	Brazil (PR)	P-2
<i>Bryconamericus aff. exodon</i>	cytotype II	F, M	52	10M + 24SM + 6ST + 12A	86	92			ACN=52	Brazil (PR)	P-2

Table 6.12 Order CHARACIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Suborder/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Bryconamericus aff. iheringii</i>	cytotype I	F, M	52	12M + 18SM + 8ST + 14A	82	90	4		ACN=54	Brazil (PR)	C-27, P-65
<i>Bryconamericus aff. iheringii</i>	cytotype II	F, M	52	8M + 28SM + 6ST + 10A	88	94	4		ACN=54	Brazil (PR)	C-27, P-65
<i>Bryconamericus aff. iheringii</i>	cytotype III	F, M	52	8M + 20SM + 8ST + 16A	80	88	2		ACN=54	Brazil (Ivair R. basin)	C-27
<i>Bryconamericus aff. iheringii</i>		F, M	52	8M + 28SM + 6ST + 10A	88	94			ACN=54	Brazil (PR)	P-65
<i>Bryconamericus stramineus</i>		F, M	52	8M + 22SM + 10ST + 12A	82	92	2		ACN=54	Brazil (PR)	P-90
<i>Bryconamericus</i> sp. A		F	52	26 M/SM + 26 ST/A	78			3.3 FD	ACN=52	Brazil (SP)	P-38, C-93
<i>Bryconamericus</i> sp. B		F	52	6M + 30SM + 6ST + 10A	88	94	2-3		ACN=54	Brazil (SP)	W-17, W-18
<i>Bryconamericus</i> sp. C		F, M	52	6M + 10SM + 20ST + 16A	68	88	3		ACN=54	Brazil (SP)	W-17, W-18
<i>Bryconamericus</i> sp. D		F, M	52	6M + 18SM + 14ST + 14A	76	90	4		ACN=54	Brazil (PR)	W-17, W-18
<i>Bryconamericus</i> sp. E		F	52	8M + 14SM + 16ST + 14A	74	90	4		ACN=54	Brazil (MG)	W-17, W-18
<i>Bryconamericus pallidifrons</i>	<i>pallidifrons</i>	F, M	54	10M + 16SM + 22ST + 6A	80	102			ACN=54	Brazil (MG)	W-17
<i>Bryconops humeralis</i>	<i>Cynopotamus</i>		50*							(Brazil, Peru)	S-30
<i>Ctenobrycon hauxwellianus</i>		F, M	50	10M + 6SM + 34ST	66	100	2		ACN=52	Brazil (Acre)	O-50
<i>Deuterodon pedri</i>		F, M	50	14 M/SM + 36 ST/A	64				ACN=52	Brazil (SP)	C-26
<i>Gymnocorymbus ternetzi</i>		F, M	50	14M + 12SM + 6ST + 18A	76	82		3.7 FCM, 4.2 BFA	ACN=52	Argentina	P-38
<i>Gymnocorymbus ternetzi</i>			50			(60)			ACN=52	(S. America)	A-14, V-86, H-13
<i>Hasemanina nana</i>	<i>marginata</i>	F, M	50	12M + 18SM + 10ST + 10A	80	90			ACN=52	(Brazil, Sao Francisco R.)	S-152
<i>Hasemanina nana</i>	<i>marginata</i>		50*			(100)			ACN=52	(Brazil, Sao Francisco R.)	A-93
<i>Hasemanina nana</i>			50*	8M + 42SM	100	100	2		ACN=52	Brazil, Sao Francisco R.	S-152
<i>Hemigrammus analis</i>			54*			(82)				(S. America)	S-152
<i>Hemigrammus bellottii</i>	<i>Hyphessobrycon</i>		48*					(4.0* FCM)		(S. America)	S-30
<i>Hemigrammus erythrozonus</i>		F	48	2SM + 46 ST/A	50				ACN=52	(Guyana)	L-75, O-48
<i>Hemigrammus erythrozonus</i>			52*			(56)				(Guyana)	S-152
<i>Hemigrammus hyanuary</i>		F, M	52	22 M/SM + 30 ST/A	74					(Brazil, Peru)	A-93
<i>Hemigrammus hyanuary</i>			54*			(70)				(Brazil, Peru)	S-152
<i>Hemigrammus marginatus</i>		F, M	50	10M + 34SM + 6A	94	94	2		ACN=52	Brazil (PR)	P-39
<i>Hemigrammus marginatus</i>			50*			(100)			ACN=52	(S. America)	S-152
<i>Hemigrammus matei</i>	<i>matei</i>		36			(70)				(Argentina)	S-152
<i>Hemigrammus micropterus</i>			52*							(Venezuela)	S-30
<i>Hemigrammus ocellifer</i>			38*							(Amazon R.)	S-152, V-86, H-13
<i>Hemigrammus pulcher</i>			50*							(Peru)	S-30
<i>Hemigrammus rhodostomus</i>			50*			(98)			ACN=52	(Lower Amazon R.)	S-152
<i>Hemigrammus rodwayi</i>	<i>Hyphessobrycon</i>		50*						ACN=50	(S. America)	S-29
<i>Hemigrammus aff. schmardae</i>			52			(88)			ACN=52	(Amazon R.)	S-152

Table 6.12 Order CHARACIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Suborder/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Hemigrammus stictus</i>	<i>Hypheosobrycon</i>		50			(100)			ACN=52	(Amazon R., Orinoco R.)	S-152
<i>Hemigrammus aff. ulreyi</i>			52*			(76)			ACN=52	(Argentina, Brazil)	S-152
<i>Hemigrammus unilineatus</i>			52*							(northern S. America)	S-30
<i>Hemigrammus vorderwinkleri</i>			48*							(Brazil, Negro R.)	S-30
<i>Hollandichthys multifasciatus</i>		F, M	50	10M + 12SM + 28ST	72	100	2		ACN=52	Brazil (SP)	C-26
<i>Hypheosobrycon aff. agulha</i>			50*							(Brazil)	S-30
<i>Hypheosobrycon anisitsi</i>		F, M	50	6M + 16SM + 12ST + 16A	72	84	0-4	(3.8 FCM)	ACN=52	Brazil (SP)	C-40
<i>Hypheosobrycon anisitsi</i>	<i>Hemigrammus caudovittatus</i>		50	2M + 32SM + 16 ST/A	84			(3.4 BFA)	ACN=52	(S. America)	F-30, V-86
<i>Hypheosobrycon anisitsi</i>	<i>Hemigrammus caudovittatus</i>		50*			(98)			ACN=52	(S. America)	S-152, H-13
<i>Hypheosobrycon bentosi</i>			52*			(66)			ACN=52	(Amazon R.)	S-152
<i>Hypheosobrycon bentosi</i>	<i>robertsi</i>		52*			(52)			ACN=52	(Amazon R.)	S-152
<i>Hypheosobrycon bifasciatus</i>			50*			(98)			ACN=52	(Argentina, Brazil)	S-152
<i>Hypheosobrycon copelandi</i>			52*			(100)			ACN=52	(Brazil)	S-152
<i>Hypheosobrycon aff. eos</i>			48*							(S. America)	S-30
<i>Hypheosobrycon eques</i>	<i>callistus</i>		52*			(90)		3.3 FCM	ACN=52	(S. America)	S-152, V-86
<i>Hypheosobrycon eques</i>	<i>serpae</i>		52*			(82)			ACN=52	(S. America)	S-152
<i>Hypheosobrycon erythrostrigma</i>	<i>rubrostigma</i>		52*			(76)				(S. America)	S-152
<i>Hypheosobrycon flammeus</i>		F, M	52	18 M/SM + 32ST + 2A	70	102		(2.5 FCM)		(Brazil)	A-93, V-86
<i>Hypheosobrycon flammeus</i>			50*			(100)			ACN=52	(Brazil)	S-152
<i>Hypheosobrycon griemi</i>			50*			(100)			ACN=52	(Brazil)	S-152
<i>Hypheosobrycon griemi</i>			48					2.6 FD		Brazil (SP)	C-94
<i>Hypheosobrycon herbertaxelrodi</i>			52	10 M/SM + 42 ST/A	62				ACN=52	(Brazil)	A-93
<i>Hypheosobrycon herbertaxelrodi</i>			52*			(76)				(Brazil)	S-152
<i>Hypheosobrycon heterorhabdus</i>			48*							(Brazil)	S-30
<i>Hypheosobrycon megalopterus</i>	<i>Megalamphodus melanopterus</i>		52*			(94)			ACN=52	(Brazil, Bolivia)	S-152
<i>Hypheosobrycon minimus</i>			52*							(Guyana)	S-30
<i>Hypheosobrycon minor</i>	<i>'minor'</i>		52	14M + 12SM + 26 ST/A	78					(Guyana)	A-91
<i>Hypheosobrycon peruvianus</i>			50*						ACN=50	(Amazon R., Peru)	S-29
<i>Hypheosobrycon pulchripinnis</i>			50*			(82)		3.7 FCM	ACN=52	(Brazil)	S-152, V-86
<i>Hypheosobrycon reticulatus</i>		F, M	50	14M + 20SM + 16ST	84	100		2.3 FD		Brazil (SP)	C-26, C-94
<i>Hypheosobrycon rosaceus</i>	<i>ornatus</i>		52*							(Guyana, Suriname)	S-152
<i>Hypheosobrycon rosaceus</i>	<i>Cheirodon troemneri</i>		50*						ACN=50	(Guyana, Suriname)	S-29, S-152, S-153
<i>Hypheosobrycon santae</i>			50*			(90)			ACN=52	(Brazil, Sao Francisco R.)	S-152
<i>Hypheosobrycon scholzei</i>		F, M	50	8M + 20SM + 8ST + 14A	78	86				(Lower Amazon R.)	A-93
<i>Hypheosobrycon scholzei</i>			50*			(86)			ACN=52	(S. America)	S-152

Table 6.12 Order CHARACIFORMES (continued)

A		B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon		Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag-NORs	Genome size (pg/cell)	Comments	Locality	Reference
Suborder/family/subfamily/species		karyotype paper										
<i>Hyphessobrycon simulatus</i>		<i>Pseudopristella simulata</i>		52*			(74)			ACN=52	(French Guiana)	S-152
<i>Hyphessobrycon sweglesii</i>		<i>Megalampodus</i>		52*			(98)			ACN=52	(Colombia)	S-152
<i>Hyphessobrycon tropis</i>				46*							(Rio Negro)	S-30
<i>Knodus aff. beta</i>				52*			(102)		2.2 FD		(Colombia)	S-152
<i>Markiana nigripinnis</i>			M	52			(94)			ACN=52	Brazil (Miranda R.)	C-94
<i>Moenkhausia collettii</i>				50*							(S. America)	S-152
<i>Moenkhausia costae</i>			F	50	50 M/SM	100	100	1-2		ACN=52	Brazil (MG)	P-38
<i>Moenkhausia dichroua</i>				50	32M + 14SM + 4ST	96	100		2.0 FD		Brazil (MT)	P-39, C-94
<i>Moenkhausia gracilima</i>		cytotype A		50	14M + 26SM + 6ST + 4A	90	96				Brazil (AM)	P-39
<i>Moenkhausia gracilima</i>		cytotype B		48	4M + 24SM + 12ST + 8A	76	88				Brazil (AM)	P-39
<i>Moenkhausia intermedia</i>			F, M	50	50 M/SM	100	100	1-2		0-1 B, ACN=52	Brazil (SP)	P-38
<i>Moenkhausia intermedia</i>			F, M	50	16M + 34SM	100	100	2		ACN=52	Brazil (PR)	P-39
<i>Moenkhausia intermedia</i>			F, M	50	16M + 34SM	100	100	2		0 B, ACN=52	Brazil (SP)	D-31
<i>Moenkhausia oligolepis</i>				50*			(100)		3.2 BFA	ACN=52	(Brazil, Venezuela)	S-152, H-13
<i>Moenkhausia pittieri</i>				50*			(92)			ACN=52	(Venezuela)	S-152
<i>Moenkhausia pittieri</i>				50	4M + 40 SM/ST + 6A	94					(Venezuela)	A-91
<i>Moenkhausia pittieri</i>				49	4M + 39 SM/ST + 6A	92					(Venezuela)	A-91
<i>Moenkhausia sanctaefilomenae</i>			F, M	50	48 M/SM + 2 ST/A	98				0-3 B, ACN=52	Argentina	A-14
<i>Moenkhausia sanctaefilomenae</i>			F, M	50	48 M/SM + 2A	98	98		(2.4 FD)	1-8 B, ACN=52	Brazil (SP)	F-35, C-94
<i>Moenkhausia sanctaefilomenae</i>			F, M	50	12M + 36SM + 2ST	98	100	3	(2.8 FD)	0-6 B, ACN=52	Brazil (SP)	D-31, C-93
<i>Moenkhausia sanctaefilomenae</i>			F, M	50	12M + 36SM + 2ST	98	100	2		0-2 B, ACN=52	Brazil (PR)	P-39, P-73
<i>Moenkhausia sp.</i>			F, M	50	16M + 34SM	100	100	2		0 B, ACN=52	Brazil (MT)	D-31
<i>Oligosarcus hepsetus</i>				50	2M + 16SM + 16ST + 16A	68	84	3	3.3 FD	ACN=52	Brazil	H-38, C-94
<i>Oligosarcus hepsetus</i>			F, M	50	6M + 10SM + 16ST + 18A	66	82	2		ACN=52	Brazil (Paraiba do Sul R.)	K-21
<i>Oligosarcus jenynsii</i>				50	2M + 24SM + 10ST + 14A	76	86	2		ACN=52	Brazil	H-38
<i>Oligosarcus macrolepis</i>			F, M	50	8M + 20SM + 6ST + 16A	78	84			ACN=52	Brazil (MG)	F-2
<i>Oligosarcus paranensis</i>			F, M	50					3.3 FD		Brazil (SP)	C-93
<i>Oligosarcus pintoi</i>				50	2M + 20SM + 12ST + 16A	72	84	2		ACN=52	Brazil (SP)	H-38
<i>Oligosarcus pintoi</i>			F, M	50	24 M/SM + 26 ST/A	74				0-1 B, ACN=52	Brazil (SP)	F-56
<i>Oligosarcus argentea</i>		<i>Paroligosarcus</i>	F, M	52	26 M/SM + 26 ST/A	78	90	1-4		ACN=52	Brazil (SP)	P-38
<i>Piabina argentea</i>				52	8M + 14SM + 16ST + 14A	74	90	2		ACN=52	Brazil (MG)	A-122
<i>Piabina argentea</i>				52	18 M/SM + 12ST + 22A	70	82		2.4 FD	0-1 B	Brazil (SP)	C-98, C-93
<i>Piabina axerlodi</i>				52*							(Colombia)	S-30
<i>Schultzites argenteus</i>			F	52	16 M/SM + 2ST + 34A	68	70	2	3.0 FD	ACN=52	Argentina (Parana R.)	A-14, C-94
<i>Tetragonopterus chalcus</i>			F, M	52	26 M/SM + 26 ST/A	78		1-2	3.9 FD	ACN=52	Brazil (MG)	P-38, C-94

Table 6.12 Order CHARACIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
Suborder/family/subfamily/species	karyotype paper										
<i>Thayeria boehlkei</i>			50*			(100)			ACN=52	(Peru, Brazil)	S-152
<b>Triporthinae</b>											
<i>Triporthesus albus</i>		F, M	52	14M + 20SM + 14ST + 4A	86	100	1-4		ZW/ZZ	Amazon basin	S-12
<i>Triporthesus culter</i>			52	14M + 16SM + 16ST + 6A	82	98				Amazon basin	S-12
<i>Triporthesus auritus</i>	<i>elongatus</i>	F, M	52	22M + 12SM + 16ST + 2A	86	102	1-4		ZW/ZZ	Amazon basin	S-12
<i>Triporthesus cf. auritus</i>	<i>cf. elongatus</i>	F, M	52						ZW/ZZ	Brazil (MT)	A-117
<i>Triporthesus angulatus</i>	<i>flavus</i>	F, M	52	22M + 14SM + 12ST + 4A	88	100	1-4		ZW/ZZ	Amazon basin	S-12
<i>Triporthesus guentheri</i>		F	52	20 M/SM + 12 ST/A	72		1-4		ZW, ACN=53	Brazil (MG)	A-117, S-12
<i>Triporthesus guentheri</i>		M	52	20 M/SM + 12 ST/A	72		1-4		ZZ, ACN=54	Brazil (MG)	A-117, S-12
<i>Triporthesus nematurus</i>		F	52	13M + 23SM + 16ST	88	104	3		ZW, ACN=53	Brazil (SP)	D-30
<i>Triporthesus nematurus</i>		M	52	14M + 22SM + 16ST	88	104	2		ZZ, ACN=54	Brazil (SP)	D-30
<i>Triporthesus nematurus</i>	<i>paranensis</i>	F	52	25M + 23SM + 4ST	100	104	1-4		ZW, ACN=53	Argentina	S-12
<i>Triporthesus nematurus</i>	<i>paranensis</i>	M	52	26M + 22SM + 4ST	100	104	1-4	2.7 FD	ZZ, ACN=54	Argentina	S-12, C-94
<i>Triporthesus pictus</i>			52					3.5 FD		(Brazil, Peru)	P-88, C-94
<i>Triporthesus pictus</i>			50*			(100)			ACN=52	(S. America)	S-152
<i>Triporthesus pictus</i>			52*							(Brazil)	S-30
<i>Triporthesus rotundatus</i>			52*							(Brazil)	S-30
<i>Triporthesus rotundatus</i>			50*			(100)			ACN=52	(S. America)	S-152
<i>Triporthesus signatus</i>			52						ZW/ZZ	(Parana-Paraguay basin)	A-117
<i>Triporthesus venezuelensis</i>		F	52	20M + 16SM + 16ST	88	104	2-4		ZW, ACN=55	Venezuela (Bolivar)	N-69
<i>Triporthesus venezuelensis</i>		M	52	20M + 16SM + 16ST	88	104	2-4		ZZ, ACN=56	Venezuela (Bolivar)	N-69
<b>Chilodontidae</b>											
<i>Caenotropus labyrinthicus</i>		F, M	54	54 M/SM	108	108	2		ACN=56	Brazil (MT)	M-44
<i>Chilodus punctatus</i>		F, M	54	54 M/SM	108	108	2	3.2 BFA		Brazil (AM)	M-44, H-13
<b>Crenuchidae</b>											
<i>Characidium cf. alipioi</i>		F, M	50	30M + 20SM	100	100	2		ZW/ZZ	Brazil (SP)	C-91
<i>Characidium cf. fasciatum</i>			50	32M + 18SM	100	100		2.4 FD	0-4 B, ZW/ZZ	Brazil (SP)	C-93, C-98
<i>Characidium gomesi</i>		F, M	50	32M + 18SM	100	100	2		1-2 B, ZW/ZZ	Brazil (SP)	M-113
<i>Characidium cf. gomesi</i>		F	50	31M + 18SM + 1ST	99	100	2-7		ZW, ACN=52	Brazil (PR)	V-91
<i>Characidium cf. gomesi</i>		M	50	32M + 18SM	100	100	2-7		ZZ, ACN=52	Brazil (PR)	V-91
<i>Characidium cf. lagosantense</i>		F, M	50	32M + 18SM	100	100			ACN=52	Brazil (SP)	M-74
<i>Characidium lauroi</i>		F, M	50	24M + 24SM + 2ST	98	100	2-3			Brazil (SP)	C-91
<i>Characidium oiticicae</i>		F	50	30M + 18SM + ZW					0-3 B, ZW	Brazil (SP)	C-98

Table 6.12 Order CHARACIFORMES (continued)

A		B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon		Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
Suborder/family/subfamily/species		karyotype paper										
<i>Characidium pterostictum</i>			F, M	50	32M + 16SM + 2ST	98	100			ACN=52	Brazil (SP)	M-74
<i>Characidium cf. zebra</i>			F, M	50	32M + 18SM	100	100	6		0-1 B, ACN=52	Brazil (SP)	M-74, V-94
<i>Characidium sp.</i>			F	50	32M + 18SM	100	100			ACN=52	Brazil (SP)	M-74
<i>Characidium sp.</i>				50	32M + 16SM + 2A	98	98			0-2 B	Brazil (SP)	C-98
<b>Otenoluciidae</b>												
<i>Boulengerella sp.</i>				36							(S. America)	P-88
<i>Otenolucius hujeti</i>		<i>hujeti</i>		36	26 M/SM + 10 ST/A	62					(S. America)	A-92
<b>Curimatidae</b>												
<i>Curimata cyprinoides</i>			F, M	54	44M + 10SM	108	108	2		ACN=56	Brazil (AM)	F-12, V-92
<i>Curimata inornata</i>			F, M	54	40M + 14SM	108	108	2		ACN=56	Brazil (AM)	F-12, V-92
<i>Curimata knerii</i>			F, M	54	40M + 12SM + 2ST	106	108	2		ACN=56	Brazil (AM)	F-12
<i>Curimata ocellata</i>			F	56	40M + 16SM	112	112	2		ACN=56	Brazil (AM)	F-12
<i>Curimata vittata</i>			F, M	54	42M + 12SM	108	108	2	3.0 FD	ACN=56	Brazil (AM)	F-12, V-92, C-94
<i>Curimatella alburna</i>			M	54	46M + 8SM	108	108	2		ACN=56	Brazil (AM)	F-12
<i>Curimatella dorsalis</i>			F, M	54	46M + 8SM	108	108	2	2.8 FD	ACN=56	Brazil (MS)	N-14, C-94
<i>Curimatella dorsalis</i>			F, M	54	54 M/SM	108	108	2		ACN=56	Argentina	B-74
<i>Curimatella immaculata</i>			F, M	54	46M + 8SM	108	108	2			Brazil (GO)	V-92
<i>Curimatella lepidura</i>			F, M	54	54 M/SM	108	108	2			Brazil (MG)	V-93
<i>Curimatella meyeri</i>			F, M	54	46M + 8SM	108	108	2		ACN=56	Brazil (AM)	F-12
<i>Curimatopsis aff. macrolepis</i>		cytotype A		52*							(S. America)	S-30
<i>Curimatopsis aff. macrolepis</i>		cytotype B		46*							(S. America)	S-30
<i>Curimatopsis myersi</i>			F	46	42M + 4SM	92	92	2			Brazil (MS)	N-14
<i>Cyphocharax gilberti</i>			F, M	54	44M + 10SM	108	108	2			Brazil (SP)	V-92
<i>Cyphocharax cf. gillii</i>			F	54	54 M/SM	108	108	2			Brazil (MT)	V-93
<i>Cyphocharax gouldingi</i>			F, M	54	54M	108	108	2		1 B	Brazil (GO)	V-92
<i>Cyphocharax modestus</i>		<i>Curimata modesta</i>	F, M	54	54 M/SM	108	108	2	(3.2 FD)	0-1 B	Brazil (SP)	V-30, C-93
<i>Cyphocharax modestus</i>		<i>Curimata modesta modesta</i>		82	82 M/SM	164	164	3		0-1 B, 3X	Brazil (SP)	V-30
<i>Cyphocharax modestus</i>			F, M	54	54 M/SM	108	108	2		0-1 B, ACN=56	Brazil (PR)	M-42
<i>Cyphocharax modestus</i>			F, M	54	54 M/SM	108	108	2		0-2 B, ACN=56	Brazil (PR)	G-95, T-82
<i>Cyphocharax modestus</i>		<i>modesta</i>	F, M	54	54 M/SM	108	108	2			Brazil (Upper Parana)	V-93
<i>Cyphocharax modestus</i>		<i>modesta</i>		54	54 M/SM					0-1 B	Brazil (SP)	V-94
<i>Cyphocharax modestus</i>			F, M	54	50M + 4SM	108	108	2		1 B	Brazil (SP)	V-92
<i>Cyphocharax nagelii</i>			F, M	54	54 M/SM	108	108	2		1 B	Brazil (Upper Parana)	V-93, C-98



Table 6.12 Order CHARACIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Suborder/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Cyphocharax nagelii</i>		F, M	54	46M + 8SM	108	108	2-9			Brazil (SP)	V-92
<i>Cyphocharax platanus</i>		F, M	58	52 M/SM + 6ST	110	116	2			Argentina	B-74
<i>Cyphocharax platanus</i>		F, M	58	48M + 4SM + 6ST	110	116	2			Argentina	V-92
<i>Cyphocharax spilolotus</i>		F, M	54	54 M/SM	108	108	2		0-1 B, ACN=56	Argentina	B-74, C-98
<i>Cyphocharax cf. spilurus</i>	<i>spilura</i>	F, M	54	54 M/SM	108	108	2			Brazil (RO)	V-93
<i>Cyphocharax vanderi</i>		F, M	54	54 M/SM	108	108	2			Brazil (SP)	V-93
<i>Cyphocharax voga</i>		F, M	54	54 M/SM	108	108	2			Brazil (RS)	V-93
<i>Cyphocharax voga</i>		F, M	54	54 M/SM	108	108	2		ACN=56	Argentina	B-74
<i>Potamorhina altamazonica</i>		F, M	102	2M + 2SM + 98A	106	106	2			Brazil (AM)	F-13
<i>Potamorhina latior</i>		F, M	56	52M + 2SM + 2ST	110	112	2		ACN=56	Brazil (AM)	F-13
<i>Potamorhina pristigaster</i>		F, M	54	44M + 10SM	108	108	2		ACN=56	Brazil (AM)	F-13
<i>Potamorhina squamoralevis</i>		F, M	102	14 M/SM + 88A	116	116	2	3.8 FD		Argentina	B-74, C-94
<i>Psectrogaster amazonica</i>		F, M	54	44M + 10SM	108	108	2			Brazil (MT)	V-92
<i>Psectrogaster curviventris</i>		F, M	54	42M + 12SM	108	108	2		ACN=56	Brazil (MS)	N-14
<i>Psectrogaster curviventris</i>		F, M	54	54 M/SM	108	108	2		ACN=56	Argentina	B-74
<i>Psectrogaster rutiloides</i>		F, M	54	42M + 12SM	108	108	2			Brazil (AM)	F-12
<i>Steindachnerina amazonica</i>		F, M	54	42M + 12SM	108	108	3			Brazil (GO)	V-92
<i>Steindachnerina brevipinna</i>		F, M	54	48M + 6SM	108	108	2		ACN=56	Brazil (MS)	N-14
<i>Steindachnerina brevipinna</i>		F, M	54	54 M/SM	108	108	2		ACN=56	Argentina	B-74
<i>Steindachnerina conspersa</i>		F, M	54	46M + 8SM	108	108	2		ACN=56	Argentina	B-74
<i>Steindachnerina conspersa</i>		F, M	54	54 M/SM	108	108	2			Brazil (MS)	V-93
<i>Steindachnerina elegans</i>		F, M	54	54 M/SM	108	108	2	3.5 FD		Brazil (MG)	V-93, C-94
<i>Steindachnerina gracilis</i>		F, M	54	38M + 16SM	108	108	2-6			Brazil (MT)	V-92
<i>Steindachnerina cf. guentheri</i>		F, M	54	54 M/SM	108	108	2	3.2 FD		Brazil (Acre)	C-25, C-94
<i>Steindachnerina insculpta</i>		F, M	54	54 M/SM	108	108	2	(2.9 FD)	0-2 B, ACN=56	Brazil (PR)	V-93, C-93, G-95
<i>Steindachnerina insculpta</i>		F, M	54	50M + 4SM	108	108	2			Brazil (SP)	V-92
<i>Steindachnerina leucisca</i>	<i>leuciscus</i>	F	54	48M + 6SM	108	108	2		ACN=56	Brazil (AM)	F-12
<b>Erythrinidae</b>											
<i>Erythrinus erythrinus</i>		F, M	54	6M + 2ST + 46A	60	62			4B, no sex chrom.	Brazil (Birigui)	B-35
<i>Erythrinus erythrinus</i>		F, M	54	6M + 2ST + 46A	60	62			No sex chrom.	Brazil (Penapolis)	B-35
<i>Erythrinus erythrinus</i>		F	54	6M + 2ST + 46A	60	62			2B, X <sub>1</sub> X <sub>1</sub> X <sub>2</sub> X <sub>2</sub>	Brazil (Guaira, PR)	B-35, C-110
<i>Erythrinus erythrinus</i>		M	53	7M + 2ST + 44A	60	62			X <sub>1</sub> X <sub>2</sub> Y, ACN=54	Brazil (Guaira, PR)	B-35, C-110
<i>Erythrinus erythrinus</i>		F	52	6M + 2SM + 6ST + 38A	60	66	3-8		X <sub>1</sub> X <sub>1</sub> X <sub>2</sub> X <sub>2</sub> , ACN=54	Brazil (Manaus, AM)	B-33, B-35, C-110
<i>Erythrinus erythrinus</i>		M	51	7M + 2SM + 6ST + 36A	60	66			X <sub>1</sub> X <sub>2</sub> Y, ACN=54	Brazil (Manaus, AM)	B-35, C-110

Table 6.12 Order CHARACIFORMES (continued)

A		B		C		D		E		F		G		H		I		J		K		L	
Current scientific name of taxon		Reported in		Sex		2n		Karyotype		NF <sub>1</sub>		NF <sub>2</sub>		Ag <sup>-</sup> NORs		Genome size (pg/cell)		Comments		Locality		Reference	
Suborder/family/species		karyotype paper																					
<i>Erythrinius erythrinius</i>				F	52	4M + 2SM + 2ST + 44A	58	60										X <sub>1</sub> X <sub>1</sub> X <sub>2</sub> X <sub>2</sub> , ACN=54	Brazil (Natal)			B-35, C-110	
<i>Erythrinius erythrinius</i>				M	51	5M + 2SM + 2ST + 42A	58	60										X <sub>1</sub> X <sub>2</sub> Y, ACN=54	Brazil (Natal)			B-35, C-110	
<i>Erythrinius erythrinius</i>					54														Argentina				F-20
<i>Hoplerythrinius unitaeniatus</i>				F, M	48	48 M/SM	96	96										ACN=50	Brazil (AM)				G-96
<i>Hoplerythrinius unitaeniatus</i>				F, M	48	47 M/SM + 1 ST/A	95											ACN=48	Brazil (AM)				G-96
<i>Hoplerythrinius unitaeniatus</i>				F, M	48	46 M/SM + 2 ST/A	94												Brazil (AM)				G-96
<i>Hoplerythrinius unitaeniatus</i>				F, M	48	48 M/SM	96	96										ACN=50	Brazil (RO, MS, Argentina)				G-21
<i>Hoplerythrinius unitaeniatus</i>				F, M	48	46 M/SM + 2A	94	94										ACN=48	Brazil (Su)				G-21
<i>Hoplerythrinius unitaeniatus</i>				F, M	52	46 M/SM + 6A	98	98										ACN=52	Brazil (MG)				G-21
<i>Hoplerythrinius unitaeniatus</i>				F, M	48	44 M/SM + 4ST	92	96	2-4									No sex chrom.	Brazil (SP, MS)				D-16
<i>Hoplerythrinius unitaeniatus</i>				F, M	52	44 M/SM + 4ST + 4A	96	100	4-6									No sex chrom.	Brazil (MG)				D-16
<i>Hoplerythrinius unitaeniatus</i>				F	72	69 M/SM + 3 ST/A	141											3X	Brazil (AM)				G-20
<i>Hoplerythrinius unitaeniatus</i>					48														Argentina				F-20
<i>Hoplias lacerdae</i>				F, M	50	50 M/SM	100	100	2									No sex chrom.	Brazil				B-78
<i>Hoplias lacerdae</i>				F, M	50	36M + 14SM	100	100										XX/XY, ACN=50	Brazil (SP)				B-29
<i>Hoplias malabariensis</i>				F, M	42	22M + 20SM	84	84	2-6									No sex chrom.	Brazil (RS, MG)				B-61, B-77
<i>Hoplias malabariensis</i>				F, M	42	24M + 18SM	84	84	3-8									No sex chrom.	Brazil (SP, AM, PR)				B-61, B-77, P-21, C-93
<i>Hoplias malabariensis</i>				F, M	42	20M + 22SM	84	84	3-7									No sex chrom.	Brazil (SP, MT)				B-61, B-77
<i>Hoplias malabariensis</i>				F, M	42	42 M/SM	84	84										No sex chrom.	Argentina				L-90
<i>Hoplias malabariensis</i>				F	42	24M + 16SM + 2ST	82	84	4-7									XX, ACN=50	Brazil (MG)				B-61, B-76
<i>Hoplias malabariensis</i>				M	42	24M + 17SM + 1ST	83	84	4-7									XY, ACN=50	Brazil (MG)				B-76
<i>Hoplias malabariensis</i>				F, M	40	40 M/SM	80	80										No sex chrom.	Brazil (AM, PA, RO, MT, PR)				B-61, P-21
<i>Hoplias malabariensis</i>				F, M	40	40 M/SM	80	80										No sex chrom.	Argentina				L-90
<i>Hoplias malabariensis</i>				F, M	40	40 M/SM	80	80										X <sub>1</sub> X <sub>1</sub> X <sub>2</sub> X <sub>2</sub>	Brazil (SP, MG, PR)				B-31, B-34, B-61, H-13
<i>Hoplias malabariensis</i>				F	40	40 M/SM	80	80										(2.8 BFA)	Brazil (SP, PR)				B-31, B-34, B-61, P-21
<i>Hoplias malabariensis</i>				M	39	39 M/SM	78	78										X <sub>1</sub> X <sub>2</sub> Y, ACN=48	Brazil (SP, PR)				B-61
<i>Hoplias malabariensis</i>				M	42	40 M/SM + 2A	82	82										ACN=50	Brazil (PA)				B-61
<i>Hoplias malabariensis</i>				F, M	40	40 M/SM	80	80										No sex chrom.	Brazil (PA, MA, RN, MG)				B-61
<i>Hoplias malabariensis</i>				F	40	40 M/SM	80	80										XX, ACN=48	Brazil (PA, RO, MT)				B-61
<i>Hoplias malabariensis</i>				M	41	40 M/SM + 1A	81	81										XY <sub>1</sub> Y <sub>2</sub> , ACN=48	Brazil (PA, RO, MT)				B-61

Gasteropelecidae

<i>Carnegiella marthae</i>				F	50	20M + 12SM + 4ST + 14A	82	86	1-3									ZW, ACN=55	Brazil (AM)				T-76
<i>Carnegiella marthae</i>				M	50	20M + 12SM + 4ST + 14A	82	86	1-3									ZZ, ACN=56	Brazil (AM)				T-76
<i>Carnegiella strigata</i>				F	50	4M + 4SM + 2ST + 40A	58	60	1-3									ZW, ACN=56	Brazil (AM)				T-76
<i>Carnegiella strigata</i>				M	50	4M + 4SM + 2ST + 40A	58	60	1-3									ZZ, ACN=56	Brazil (AM)				T-76

Table 6.12 Order CHARACIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag-NORs	Genome size (pg./cell)	Comments	Locality	Reference
Suborder/family/subfamily/species	karyotype paper										
<i>Carnegiella strigata</i>			50-52					2.8 BFA		(S. America)	H-13
<i>Carnegiella strigata</i>			48*								S-30
<i>Gasteropelecus sternicla</i>			54*							(S. America)	S-30
<i>Thoracocharax stellatus</i>			54							Paraguay R.	C-101
<i>Thoracocharax stellatus</i>		F, M	54	6M + 6SM + 6ST + 36A	66	72	4		ZW/ZZ	Brazil (MT)	V-90
<i>Thoracocharax cf. stellatus</i>		F	52	8M + 16SM + 4ST + 24A	76	80	2	2.2 FD	ZW, ACN=54	Brazil (Rio Branco, Acre)	C-94, C-101
<i>Thoracocharax cf. stellatus</i>		M	52	8M + 16SM + 4ST + 24A	76	80	2	2.2 FD	ZZ, ACN=54	Brazil (Rio Branco, Acre)	C-94, C-101
<b>Hemiodontidae</b>											
<i>Anodus elongatus</i>		M	54	24M + 26SM + 4ST	104	108	2		ACN=56	Brazil (AM)	P-40
<i>Anodus elongatus</i>	<i>steatops</i>		54	52 M/SM + 2A	106	106				(Brazil)	A-92
<i>Anodus elongatus</i>	<i>melanopogon</i>	F, M	54	20M + 28SM + 6ST	102	108	2		ACN=56	Brazil (AM)	P-40
<i>Anodus sp.</i>		F, M	54	24M + 24SM + 6ST	102	108	2		ACN=56	Brazil (AM)	P-40
<i>Argonectes longiceps</i>	<i>scapularis</i>		54	50 M/SM + 4ST	104	108	2			(S. America)	P-88
<i>Hemiodus argenteus</i>	<i>ocellatus</i>	F, M	54	26M + 24SM + 4ST	104	108	2		ACN=56	Brazil (AM)	P-40
<i>Hemiodus immaculatus</i>		F, M	54	22M + 26SM + 6ST	102	108	2		ACN=56	Brazil (AM)	P-40
<i>Hemiodus microlepis</i>			54	52 M/SM + 2A	106	106				(Brazil, Venezuela)	A-92
<i>Hemiodus cf. microlepis</i>		F, M	54	20M + 30SM + 4ST	104	108	2		ACN=56	Brazil (AM)	P-40
<i>Hemiodus unimaculatus</i>		F, M	54	26M + 24SM + 4ST	104	108	2		ACN=56	Brazil (AM)	P-40
<b>Lebiasinidae</b>											
<i>Copeina guttata</i>			42*							(S. America)	S-30
<i>Copella amoldi</i>			44*							(S. America)	S-30
<i>Copella nattereri</i>			36*							(S. America)	S-30
<i>Nannostomus beckfordi</i>		M	42	2M + 40A	44	44			ACN=44	(S. America)	A-92
<i>Nannostomus beckfordi</i>	cytotype A		44*							(S. America)	S-30
<i>Nannostomus beckfordi</i>	cytotype B		36*							(S. America)	S-30
<i>Nannostomus eques</i>	<i>Nannobrycon</i>		34	34A						(Brazil, Peru)	A-92
<i>Nannostomus eques</i>	<i>Poecilobrycon</i>		36*							(S. America)	S-30
<i>Nannostomus harrisoni</i>	<i>Poecilobrycon</i>		40*							(Guyana)	S-30
<i>Nannostomus marginatus</i>			42*							(S. America)	S-30
<i>Nannostomus trifasciatus</i>	<i>erythrurus</i>		46*							(S. America)	S-30
<i>Nannostomus trifasciatus</i>	<i>erythrurus</i>		38*							(S. America)	S-30
<i>Nannostomus trifasciatus</i>	<i>erythrurus</i>		30*							(S. America)	S-30
<i>Nannostomus trifasciatus</i>	<i>erythrurus</i>		24*							(S. America)	S-30

Table 6.12 Order CHARACIFORMES (continued)

A		B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon		Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
Suborder/family/subfamily/species		karyotype paper										
<i>Nannostomus unifasciatus</i>		<i>Poecilobrycon</i>		22*							(S. America)	S-30
<i>Pyrhulina cf. australis</i>			F, M	40	6ST + 34A	40	46	8		ACN=42	Brazil (SP)	O-53
<i>Pyrhulina australis</i>		<i>rachoviana</i>		42					(2.0 FD), 2.4 BFA		(S. America)	C-93, H-13
<i>Pyrhulina</i> sp.				42	2M + 2SM + 38 ST/A	46					Brazil	O-82
<b>Parodontidae</b>												
<i>Apareiodon affinis</i>			F	55	51 M/SM + 4ST	106	110	2		ZW, W <sub>2</sub> , ACN=56	Brazil (MG, SP)	M-82, M-83, L-85
<i>Apareiodon affinis</i>			M	54	50 M/SM + 4ST	104	108	2	(2.0, 2.5 FD)	ZZ, ACN=56	Brazil (MG, SP)	M-82, M-83, L-85, C-93, C-94
<i>Apareiodon affinis</i>			F	55	47 M/SM + 8ST	102	110	2		ACN=56	Argentina	C-96
<i>Apareiodon affinis</i>			F	55	43 M/SM + 10ST + 2A	98	108	2		ACN=55, 56	Argentina	C-96
<i>Apareiodon affinis</i>			F	54	45 M/SM + 8ST + 1A	99	107	2		ACN=55	Argentina	C-96
<i>Apareiodon affinis</i>			M	54	40 M/SM + 12ST + 2A	94	106	2		ACN=54	Argentina	C-96
<i>Apareiodon affinis</i>			M	54	42 M/SM + 8ST + 4A	96	104	2		ACN=55	Argentina	C-96
<i>Apareiodon ibitiensis</i>			F, M	54	50 M/SM + 4ST	104	108	2		ACN=56	Brazil (PR, SP)	M-83, J-8
<i>Apareiodon piracicabae</i>			F, M	54	52 M/SM + 2ST	106	108	4		0-1 B, ACN=56	Brazil (SP)	J-8, F-56
<i>Apareiodon vittatus</i>				54	52 M/SM + 2ST	106	108	2		ACN=56	Brazil (Timbo R)	J-8
<i>Apareiodon</i> sp. A				54	50 M/SM + 4ST	104	108	2		ACN=56	Brazil (MG)	J-8
<i>Apareiodon</i> sp. B				54	50 M/SM + 4ST	104	108	2		ACN=56	Brazil (MG)	J-8
<i>Apareiodon</i> sp. C				54	52 M/SM + 2ST	106	108	2		ACN=54	Brazil (Araguaia R., MT)	J-8
<i>Parodon hilarii</i>			F	54	31M + 22SM + 1ST	107	108	2		ZW, ACN=55	Brazil (MG)	M-84, J-7
<i>Parodon hilarii</i>			M	54	32M + 22SM	108	108	2		ZZ, ACN=54	Brazil (MG)	M-84, J-7
<i>Parodon nasus</i>		<i>tortuosus</i>	F, M	54	48 M/SM + 6ST	102	108	2		ACN=56	Brazil (MT)	B-81
<i>Parodon nasus</i>		<i>tortuosus</i>	F, M	54	48 M/SM + 6ST	102	108	2		ACN=56	Brazil (SP)	B-81
<i>Parodon nasus</i>			F, M	54	48 M/SM + 6ST	102	108	2		ACN=56	Brazil (PR)	J-7
<i>Parodon</i> sp.			F, M	54	50 M/SM + 4ST	104	108	2		ACN=54	Brazil (MT)	J-7
<b>Prochilodontidae</b>												
<i>Prochilodus argenteus</i>			F, M	54	40M + 14SM	108	108	2	3.1 FD	ACN=56	Brazil (CE)	P-20, C-94
<i>Prochilodus brevis</i>		<i>cearaensis</i>	F, M	54	40M + 14SM	108	108	2		0-2 B, ACN=56	Brazil (CE)	P-20
<i>Prochilodus costatus</i>		<i>affinis</i>	F, M	54	40M + 14SM	108	108	2	3.1 FD	ACN=56	Brazil (MG)	P-20, C-94
<i>Prochilodus lineatus</i>			F, M	54	40M + 14SM	108	108		(3.4 FD)	ACN=56	Brazil (MS)	P-20, C-93
<i>Prochilodus lineatus</i>				54	54 M/SM	108	108				Argentina	F-20
<i>Prochilodus lineatus</i>		<i>platensis</i>		54	54 M/SM	108	108				Argentina	F-20
<i>Prochilodus lineatus</i>			F, M	54	40M + 14SM	108	108	2		0-7 B, ACN=56	Brazil (PR, SP)	D-12, A-119, V-107
<i>Prochilodus lineatus</i>		<i>scrofa</i>	F, M	54	40M + 14SM	108	108	2		0-5 B, ACN=56	Brazil (SP)	P-19, P-20

Table 6.12 Order CHARACIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Suborder/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup> NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Prochilodus magravravi</i>		F, M	54	40M + 14SM	108	108	2			Brazil (MG)	P-20
<i>Prochilodus mariae</i>		54	40M + 14SM	108	108			0-3 B, ACN=54		Venezuela (Bolivar)	C-77, C-98
<i>Prochilodus nigricans</i>		F, M	54	40M + 14SM	108	108	2		0-2 B, ACN=56	Brazil (AM.)	P-20, V-94
<i>Prochilodus vinbooides</i>		F, M	54	40M + 14SM	108	108			ACN=56	Brazil (SP)	P-20
<i>Semaprochilodus insignis</i>		F, M	54	54 M/SM	108	108	2		ACN=56	Brazil (AM.)	F-11
<i>Semaprochilodus kneri</i>		54	40M + 14SM	108	108	2		ACN=54		Venezuela (Bolivar)	O-78
<i>Semaprochilodus laticeps</i>		54	40M + 14SM	108	108	2		ACN=54		Venezuela (Bolivar)	O-78
<i>Semaprochilodus taeniurus</i>		F	54	53 M/SM + 1large M	108	108	2		ZW, ACN=55	Brazil (AM.)	F-11
<i>Semaprochilodus taeniurus</i>		M	54	54 M/SM	108	108	2		ZZ, ACN=54	Brazil (AM.)	F-11

Table 6.13 Order SILURIFORMES

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup> NORs	Genome size (pg/cell)	Comments	Locality	Reference
<b>Amblycipitidae</b>											
<i>Amblyiceps mangois</i>		F, M	36	4M + 12SM + 16ST + 4A	52	68				India (J & K)	S-48
<i>Liobagrus andersoni</i>		F, M	28	18M + 10SM	56	56			ACN=30	Korea (Han R.)	S-94
<i>Liobagrus andersoni</i>		F, M	28	14M + 14SM	56	56			ACN=30	Korea (Gapyeong)	K-52
<i>Liobagrus anguillicauda</i>		34	20M + 12SM + 2ST	66	68					China (Zhejiang)	L-38
<i>Liobagrus marginatoides</i>	<i>Leiobagrus</i>	F	30	16M + 6SM + 6ST + 2A	52	58			XX, ACN=36	China (Nanchong)	Y-15
<i>Liobagrus marginatoides</i>	<i>Leiobagrus</i>	M	30	16M + 5SM + 7ST + 2A	51	58			XY, ACN=35	China (Nanchong)	Y-15
<i>Liobagrus marginatus</i>		F, M	24	20M + 2SM + 2ST	46	48				China (Sichuan)	L-36
<i>Liobagrus marginatus</i>	<i>Leiobagrus</i>	F	24	20M + 2SM + 2ST	46	48			XX, ACN=30	China (Sichuan)	L-30, Y-15
<i>Liobagrus marginatus</i>	<i>Leiobagrus</i>	M	24	19M + 2SM + 2ST + 1A	45	47			XY, ACN=30	China (Sichuan)	L-30, Y-15
<i>Liobagrus mediadiposalis</i>		F, M	42	26M + 16SM	84	84			ACN=42	Korea (Nakdong R.)	S-94
<i>Liobagrus mediadiposalis</i>		F, M	42	26M + 12SM + 4 ST/A	80		2		ACN=42	Korea (Hamyang)	K-52
<i>Liobagrus mediadiposalis</i>		28	18M + 6SM + 4ST	52	56				ACN=30	Korea (Gum R.)	U-34
<i>Liobagrus nigricauda</i>	<i>Leiobagrus</i>	F	30	16M + 6SM + 6ST + 2A	52	58			XX, ACN=36	China (Nanchong)	Y-15
<i>Liobagrus nigricauda</i>	<i>Leiobagrus</i>	M	30	16M + 5SM + 7ST + 2A	51	58			XY, ACN=35	China (Nanchong)	Y-15
<i>Liobagrus obesus</i>		F, M	20	20M	40	40				Korea (Kum R.)	S-94
<i>Liobagrus reinii</i>		F, M	38	26M + 8SM + 4ST	72	76			ACN=46	Japan (Gifu)	U-34
<i>Liobagrus reinii</i>		38	28M + 10SM	76	76					Japan	O-22

Table 6.13 Order SILURIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<b>Artidae</b>											
<i>Ariopsis felis</i>	<i>Arius</i>		54	26 M/SM + 28 ST/A	80			(4.5 FCM)	ACN=54	USA (LA)	L-19, T-73
<i>Ariopsis felis</i>	<i>Arius</i>	F, M	54	16M + 12SM + 20ST + 6A	82	102			ACN=54	Mexico	G-74
<i>Ariopsis guatemalensis</i>	<i>Galeichthys caeruleescens</i>		52	16M + 24SM + 10ST + 2A	92	102				Mexico	G-74
<i>Bagre bagre</i>			56	24M + 26SM + 6ST	106	112				Brazil (SP)	G-52
<i>Bagre marinus</i>			54	12M + 8SM + 34 ST/A	74			4.8 BFA		USA (LA)	F-27, H-13
<i>Cathorops melanopus</i>	<i>Arius</i>		52	16M + 30SM + 6ST	98	104				Mexico	G-74
<i>Cathorops spixii</i>			54							Brazil	G-52
<i>Cathorops sp.</i>			54	13M + 13SM + 28ST	80	108				Brazil (SP)	B-86
<i>Genidens barbatus</i>	<i>Netuma barba</i>		56	18M + 18SM + 18ST + 2A	92	110			XX/XY	Brazil	B-86, G-52
<i>Genidens genidens</i>			56	12M + 20SM + 20ST + 4A	88	108				Brazil (SP)	B-86, G-52
<i>Nemapteryx caelata</i>	<i>Arius caelatus</i>		54	6M + 20SM + 28A	80	80				India (Bombay)	K-101
<i>Nemapteryx nenga</i>	<i>Arius</i>	F, M	54	16M + 36SM + 2ST	106	108			ACN=54	India (Orissa)	C-63
<i>Netuma thalassina</i>	<i>Arius serratus</i>	F	56	8M + 24SM + 24ST	88	112			ACN=56	India (Orissa)	C-63
<i>Notarius luniscutis</i>	<i>Sciadeichthys</i>		56							Brazil	G-52
<i>Plicofollis dussumieri</i>	<i>Arius</i>	F, M	54	12M + 18SM + 12ST + 12A	84	96				India (Bombay)	R-59
<i>Sciades parkeri</i>	<i>Arius</i>		56	16M + 16SM + 22ST + 2A	88	110				Brazil (SP)	B-86
<b>Aspredinidae</b>											
<i>Bunocephalus cf. larai</i>			50	6M + 8SM + 8ST + 28A	64	72	2			S. America	F-20
<b>Auchenipteridae</b>											
<i>Ageneiosus atronasus</i>	<i>atronasus</i>	F, M	56	16M + 16SM + 12ST + 12A	88	100	2			Brazil (AM)	F-18
<i>Ageneiosus inermis</i>	<i>brevifilis</i>	F, M	56	20M + 16SM + 10ST + 10A	92	102	2			Brazil (AM)	F-18
<i>Auchenipterus nuchalis</i>		F, M	58	24M + 14SM + 10ST + 10A	96	106	2		ACN=58	Brazil (PR)	R-39
<i>Glanidium ribeiroi</i>		F, M	58	28M + 16SM + 10ST + 4A	102	112	2		ACN=58	Brazil (Iguaçu, PR)	R-39
<i>Trachelyopterus galeatus</i>	<i>Parauchenipterus</i>	F, M	58	22M + 12SM + 6ST + 18A	92	98	2		ACN=58	Brazil (PR)	R-39
<i>Trachelyopterus galeatus</i>			58							Argentina	F-20
<b>Bagridae</b>											
<i>Bagrichthys macracanthus</i>	<i>Bagroides</i>		50	16M + 26SM + 2ST + 6A	92	94				Thailand (Nakhon Phanom)	M-8
<i>Coreobagrus brevicorpus</i>		F, M	44	22M + 14SM + 8 ST/A	80				ACN=48	Korea (Hamyang)	K-52
<i>Coreobagrus ichikawai</i>		F, M	56	18M + 14SM + 24 ST/A	88				ACN=56	Japan (Gifu)	U-34
<i>Hemibagrus guttatus</i>	<i>Mystus</i>	F, M	60	20M + 12SM + 16ST + 12A	92	108			ACN=62	China (Guangdong)	Y-15
<i>Hemibagrus guttatus</i>	<i>Mystus elongatus</i>	F, M	60	20M + 12SM + 16ST + 12A	92	108			ACN=62	China (Yangshan)	Y-15
<i>Hemibagrus macropterus</i>	<i>Mystus</i>	F, M	60	20M + 12SM + 16ST + 12A	92	108			ACN=62	China (Wuhan)	H-20, Y-15



Table 6.13 Order SILURIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Pseudobagrus koreanus</i>	sp.	F, M	48	18M + 14SM + 16 ST/A	80				ACN=54	Korea (Han R.)	U-34
<i>Pseudobagrus koreanus</i>	sp.	F, M	48	20M + 14SM + 14 ST/A	82				ACN=54	Korea (Gapyeong)	K-52
<i>Pseudobagrus longirostris</i>	<i>Leiocassis</i>	F, M	52	20M + 16SM + 16ST	88	104			ACN=56	China (Wuhan)	H-20, Y-15
<i>Pseudobagrus nitidus</i>	<i>Pelteobagrus</i>	F, M	52	22M + 20 SM/ST + 10A	94	94			ACN=54	Korea (Kangkyeong)	K-52
<i>Pseudobagrus nitidus</i>	<i>Pelteobagrus</i>	F, M	52	20M + 16SM + 16ST	88	104			ACN=56	China (Wuhan)	H-20, Y-15
<i>Pseudobagrus pratti</i>		M	52	20M + 14SM + 8ST + 10A	86	94			ACN=58	China (Guilin)	Y-15
<i>Pseudobagrus tenuis</i>		F, M	52	22M + 16SM + 14ST	90	104			ACN=56	China (Wuhan)	H-20, Y-15
<i>Pseudobagrus tokiensis</i>	<i>aurantiacus</i>	F, M	56	24M + 12SM + 20 ST/A	92				ACN=56	Japan (Tokyo, Chiba, Iwate)	U-25
<i>Pseudobagrus truncatus</i>		F, M	52	26M + 14SM + 12ST	92	104			ACN=58	China (Nanchong)	Y-15
<i>Pseudobagrus vachellii</i>	<i>Pelteobagrus</i>	F, M	52	22M + 16SM + 14ST	90	104			ACN=56	China (Wuhan)	H-20, Y-15
<i>Pseudobagrus vachellii</i>	<i>Pelteobagrus</i>	M	52	16M + 20SM + 16 ST/A	88		2		ACN=56	Korea (Gum R.)	U-34
<i>Rita chrysea</i>			54	28M + 20SM + 6ST	102	108				India (Orissa)	D-2
<i>Rita chrysea</i>			52	8M + 22SM + 2ST + 20A	82	84			ACN=52	India (WB)	K-139
<i>Rita rita</i>		F, M	54	14M + 34SM + 6ST	102	108	2		ACN=54	India (WB)	K-42, D-33
<i>Rita rita</i>			54	14M + 24SM + 12ST + 4A	92	104				India	M-20
<i>Sperata aor</i>	<i>Aorichthys</i>		52	20M + 14SM + 10ST + 8A	86	96				India	L-1
<i>Sperata seenghala</i>	<i>Myxus</i>	F	54	28M + 12SM + 8ST + 6A	94	102	2			India (Jammu)	S-55, R-122
<i>Sperata seenghala</i>			50	10M + 14SM + 6ST + 20A	74	80	2			India	D-34
<i>Tachysurus adiposalis</i>	<i>Pseudobagrus</i>	F, M	50	20M + 14SM + 14ST + 2A	84	98			ACN=56	China (Yangshan)	Y-15
<i>Tachysurus fulvidraco</i>	<i>Pelteobagrus</i>	F, M	52	24M + 14SM + 10ST + 4A	90	100		1.9*, 2.0 FD	ACN=54	China (Hubei)	H-20, L-41, C-83
<i>Tachysurus fulvidraco</i>	<i>Pelteobagrus</i>		52	22M + 12SM + 14ST + 4A	86	100	4			China (Shasi)	Z-21
<i>Tachysurus fulvidraco</i>	<i>Pelteobagrus</i>	F, M	52	18M + 26 SM/ST + 8A	96				ACN=54	Korea (Kangkyeong)	K-52
<i>Tachysurus fulvidraco</i>	<i>Pseudobagrus</i>	F, M	52	28M + 12SM + 12ST	92	104				China (Amur)	S-63
<i>Tachysurus fulvidraco</i>	<i>Pseudobagrus</i>	F, M	52	22 M + 24 SM/ST + 6A	98					(Hubei, China)	L-53
<i>Tachysurus fulvidraco</i>	<i>Pseudobagrus</i>		52	24M + 24SM + 4A	100	100				Korea	L-15
<i>Tachysurus fulvidraco</i>	<i>Pseudobagrus</i>	F, M	52	18M + 26SM + 8A	96	96				Korea (Kum R.)	P-68
<b>Callichthyidae</b>											
<b>Callichthyinae</b>											
<i>Callichthys callichthys</i>		F, M	58	22M + 22SM + 14ST	102	116	2	1.9 FD, (3.4 BFA)	0-5 B, ACN=58	Brazil (SP)	O-56, H-13
<i>Callichthys callichthys</i>		F, M	56	14M + 10SM + 32 ST/A	80		2		0-2 B	Argentina	S-11
<i>Callichthys callichthys</i>			54	46 M/SM + 8 ST/A	100		3			Brazil (Central Amazon)	P-89
<i>Callichthys callichthys</i>			52	44 M/SM + 8 ST/A	96					Brazil (Central Amazon)	P-89
<i>Dianema longibarbis</i>			60	6M + 54A	66	66	2			Brazil (Central Amazon)	M-148
<i>Dianema urostriatum</i>			62	6M + 6ST + 50A	68	74	2			Brazil (Central Amazon)	M-148
<i>Dianema urostriata</i>		F, M	62	8M + 4SM + 4ST + 46A	74	78	2	1.2 FD	ACN=64	Brazil (SP)	O-56



Table 6.13 Order SILURIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg./cell)	Comments	Locality	Reference
<i>Hoplosternum littorale</i>		F, M	60	4M + 4SM + 52A	68	68	2		ACN=62	Brazil (Amazon R.)	O-56, P-85
<i>Hoplosternum</i> sp.			60	6M + 2SM + 52A	68	68	2	1.4 FD	ACN=62	Brazil (SP)	O-56
<i>Hoplosternum</i> sp.			62	8 M/SM + 54ST	70	124	4			Brazil (Amazon R.)	P-88
<i>Megalechis thoracata</i>	<i>Hoplosternum</i>	F, M	64	8M + 12SM + 44 ST/A	84		2	3.2 FCM	ACN=66	Brazil (Amazon R.)	P-85, V-86
<b>Corydoradinae</b>											
<i>Aspidoras fuscoguttatus</i>		F, M	44	28M + 12SM + 4ST	84	88	2	1.5 FD	ACN=62	Brazil (SP)	O-56
<i>Aspidoras</i> cf. <i>fuscoguttatus</i>		F, M	46	32M + 10SM + 4ST	88	92	2		ACN=58	(Brazil)	S-190
<i>Aspidoras poecilus</i>		F	46	30M + 10SM + 6ST	86	92	2		ACN=60	Brazil (MG)	S-190
<i>Aspidoras taurus</i>		F, M	46	30M + 10SM + 6ST	86	92	1		ACN=60	Brazil (MG)	S-190
<i>Brochis britskii</i>		F	90	4M + 10SM + 22ST + 54A	104	126	2			Brazil (SP)	O-56
<i>Brochis britskii</i>	<i>Corydoras</i>	F, M	90	4M + 10SM + 22ST + 54A	104	126	4		ACN=90	Brazil (MG)	S-190
<i>Brochis splendens</i>		M	100	18M + 18SM + 20ST + 44A	136	156	4	2.3 FD	4X, ACN=100	Brazil (SP)	O-56
<i>Corydoras aeneus</i>		F	56	32 M/SM + 24 ST/A	88			3.6 FD	XX	Brazil (Belem, PA)	T-58
<i>Corydoras aeneus</i>		M	56	33 M/SM + 23 ST/A	89				XY	Brazil (Belem, PA)	T-58
<i>Corydoras aeneus</i>	<i>schultzei</i>		ca. 58	48 non-A + 10A		(106)		(3.2 FIA)		(S. America)	S-27, H-40
<i>Corydoras aeneus</i>			60	20M + 20SM + 20 ST/A	100					(Brazil)	K-17
<i>Corydoras aeneus</i>		F, M	60	26M + 26SM + 8ST	112	120	8	2.8 FD	0-3 B, ACN=64	Brazil (SP)	O-51, O-56
<i>Corydoras aeneus</i>		F	61	25M + 26 SM + 8ST + 2A	112	120			0-1B, ACN=64	Brazil (SP)	O-51
<i>Corydoras aeneus</i>			60	26M + 18SM + 16ST	104	120			2B	Brazil (SP)	C-98
<i>Corydoras aeneus</i>			134					6.3 FD	4X	Peru, Guyana	T-58
<i>Corydoras aeneus</i>			ca. 132	90 non-A + 42A		(222)		(8.4* FCM)	4X	(S. America)	S-27, O-48
<i>Corydoras aeneus</i>			120					8.8 BFA		(S. America)	H-13
<i>Corydoras agassizii</i>			98	82 non-A + 16A		(180)				(S. America)	S-27
<i>Corydoras araguaiaensis</i>		F, M	94	46M + 40SM + 8ST	180	188	6			(Brazil)	S-69
<i>Corydoras arcuatus</i>		M	46	28M + 18SM	92	92	2	(4.5 FD)		Brazil, Peru	O-54
<i>Corydoras arcuatus</i>			46	46 non-A		(92)				(S. America)	S-27
<i>Corydoras axelrodi</i>			46	46 non-A		(92)				(Colombia)	S-27
<i>Corydoras bondi</i>			46	46 non-A		(92)				(northern S. America)	S-27
<i>Corydoras delphax</i>			84	12M + 22SM + 50 ST/A	118					(Colombia)	K-16
<i>Corydoras diffluvialis</i>		F, M	78	6M + 2SM + 20ST + 50A	86	106	2			Brazil (SP)	S-69
<i>Corydoras ehrhardti</i>		F, M	44	22M + 22SM	88	88	2			Brazil (SC)	S-69
<i>Corydoras ehrhardti</i>		F, M	44	18M + 26SM	88	88	4		ACN=58	Brazil (SC)	O-55
<i>Corydoras elegans</i>			50	50 non-A		(100)				(Brazil, Colombia, Peru)	S-27
<i>Corydoras elegans</i>			50					6.0 BFA		(S. America)	H-13
<i>Corydoras flaveolus</i>		F, M	58	18M + 26SM + 14ST	102	116	4	3.0 FD	ACN=58	Brazil (SP)	O-54
<i>Corydoras julii</i>			46	32M + 14SM	92	92				(Brazil)	K-16

Table 6.13 Order SILURIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Corydoras julii</i>			92	92 non-A		(184)		(8.4 BFA)		(S. America)	S-27, H-13
<i>Corydoras melanistius</i>			46	32M + 14SM	92	92				(northern S. America)	K-16
<i>Corydoras melanistius</i>			46	46 non-A		(92)				(S. America)	S-27
<i>Corydoras melanistius</i>			48					6.0 BFA		(S. America)	H-13
<i>Corydoras metae</i>		F, M	92	40M + 36SM + 6ST + 10A	168	174	6	(8.8 FD, 6.4 FIA)	4X, ACN=106	Brazil (PA)	O-54, H-41
<i>Corydoras metae</i>			92	88 non-A + 4A		(180)				(S. America)	S-27
<i>Corydoras nattereri</i>		M	44	18M + 26SM	88	88	2			Brazil (PR)	S-69
<i>Corydoras nattereri</i>		F, M	44	18M + 26SM	88	88	2			Brazil (PR)	O-55
<i>Corydoras nattereri</i>		F, M	44	20M + 24SM	88	88	2		ACN=58	Brazil (RJ)	O-52, O-55
<i>Corydoras nattereri</i>		F, M	40	20M + 20SM	80	80	2	(3.6 FD)	ACN=58	Brazil (Bonito R., RJ)	O-52, O-55
<i>Corydoras nattereri</i>		F, M	42	18M + 24SM	84	84	4		ACN=58	Brazil (Bigua R., SP)	O-52
<i>Corydoras cf. nijsseni</i>		F, M	52	32M + 20SM	104	104	2			(Brazil)	S-69
<i>Corydoras aff. osteocarus</i>			76	50 non-A + 26A		(126)			4X	(Venezuela, Suriname)	S-27
<i>Corydoras paleatus</i>		F, M	44	20M + 24SM	88	88	4			Brazil (RS)	S-69
<i>Corydoras paleatus</i>		F, M	44	20M + 24SM	88	88	4-6		ACN=58	Brazil (PR, RS)	O-55
<i>Corydoras paleatus</i>		F, M	44	22M + 22SM	88	88	4		ACN=58	Brazil (RS)	O-55
<i>Corydoras panda</i>		F, M	46	24M + 22SM	92	92	2		ACN=58	Brazil (SP)	O-56
<i>Corydoras pulcher</i>		M	102	10M + 14SM + 42ST + 36A	126	168	2			(Brazil)	S-69
<i>Corydoras punctatus</i>			44-46					5.8 BFA		(S. America)	H-13
<i>Corydoras aff. punctatus</i>		F	102	10M + 14SM + 20ST + 58A	126	146	2		4X, ACN=106	Brazil (AM)	O-54
<i>Corydoras rabauti</i>		F, M	58	20M + 22SM + 10ST + 6A	100	110	2		ACN=60	Brazil (SP)	O-56
<i>Corydoras rabauti</i>	<i>myersi</i>		56					4.8 BFA		S. America	O-54, H-13
<i>Corydoras reticulatus</i>		F, M	74	16M + 20SM + 12ST + 26A	110	122	2	(2.0 FD)	ACN=76	Brazil (AM)	O-54
<i>Corydoras reticulatus</i>			74	20M + 10SM + 44 ST/A	104					(Brazil)	K-16
<i>Corydoras robineae</i>		F, M	84	8M + 18SM + 16ST + 42A	110	126	2			(Brazil)	S-69
<i>Corydoras schwartzi</i>		F, M	46	32M + 14SM	92	92	2	4.8 FD	ACN=62	Brazil (AM)	O-54
<i>Corydoras simulatus</i>		M	62	32M + 18SM + 6ST + 6A	112	118	4	1.3 FD	ACN=62	Colombia	O-54
<i>Corydoras cf. simulatus</i>		M	62	34M + 22SM + 6ST	118	124	2	1.0 FD	ACN=62	Colombia	O-54
<i>Corydoras sodalis</i>		F, M	74	16M + 18SM + 10ST + 30A	108	118	2		ACN=84	(Brazil)	S-190
<i>Corydoras trilineatus</i>		M	46	28M + 18SM	92	92	2	4.9 FD	ACN=58	Brazil (PA)	O-54
<i>Corydoras undulatus</i>		F, M	52	24M + 14SM + 12ST + 2A	90	102	10	6.0 BFA		Brazil (RS)	S-69
<i>Corydoras undulatus</i>			50							(Brazil)	H-13
<i>Corydoras zygatus</i>		F, M	56	18M + 20SM + 10ST + 8A	94	104	2			(Brazil)	S-69
<i>Corydoras sp.</i>		M	60	38M + 16SM + 6ST	114	120	2	1.3 FD	ACN=62	Brazil (Caripi R., PA)	O-54
<i>Corydoras sp.</i>		F, M	84	4M + 2SM + 18ST + 60A	90	108	10	2.4 FD	ACN=88	Brazil (Galheiro R., MG)	O-54
<i>Corydoras sp.</i>			62							Argentina	F-20

Table 6.13 Order SILURIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Scleromystax barbatus</i>	<i>Corydoras</i>	F, M	66	38M + 22SM + 4ST + 2A	126	130	6			Brazil (SP)	S-69
<i>Scleromystax barbatus</i>	<i>Corydoras</i>	F, M	66	38M + 22SM + 6ST	126	132	6			Brazil (PR)	S-69
<i>Scleromystax barbatus</i>	<i>Corydoras</i>	F, M	64	38M + 20SM + 4ST + 2A	122	126	8	1.7, 1.9 FD	ACN=64	Brazil (SP)	O-55
<i>Scleromystax barbatus</i>	<i>Corydoras</i>	F, M	66	38M + 22SM + 4ST + 2A	126	130	8		ACN=66	Brazil (PR, SC)	O-55
<i>Scleromystax macropterus</i>	<i>Corydoras</i>	F, M	66	28M + 14SM + 16ST + 8A	108	124	6	1.4 FD	ACN=66	Brazil (SP)	O-55
<i>Scleromystax prionotos</i>	<i>Corydoras</i>	F, M	68	14M + 12SM + 14ST + 28A	94	108	4	1.2 FD	ACN=68	Brazil (SP)	O-55
<i>Scleromystax prionotos</i>	<i>Corydoras</i>	F	86	20M + 28SM + 20ST + 18A	134	154	4	1.6 FD	ACN=86	Brazil (RJ)	O-55
<b>Clariidae</b>											
<i>Clarias batrachus</i>		F	100	4M + 6SM + 78A + 12 MC	110				XX, 4X	Thailand	W-30
<i>Clarias batrachus</i>		M	100	4M + 7SM + 77A + 12 MC	111				XY, 4X	Thailand	W-30
<i>Clarias batrachus</i>			56					1.6* FD		China	C-83, C-85
<i>Clarias batrachus</i>	<i>Clarius</i>		52	6 M/SM + 46 ST/A	58					India (U.P.)	S-104
<i>Clarias batrachus</i>			50	16M + 8SM + 14ST + 12A	74	88				India	R-52
<i>Clarias batrachus</i>			50	18M + 20SM + 8ST + 4A	88	96				India (WB)	P-92
<i>Clarias batrachus</i>			54					2.4 BFA			H-13
<i>Clarias camerunensis</i>			54				2			(W. and W.C. Africa)	O-83
<i>Clarias ebriensis</i>			50							(W. Africa)	O-83
<i>Clarias fuscus</i>		F	56	18M + 24SM + 8ST + 6A	98	106			XX, ACN=56	China (Guangdong)	W-30
<i>Clarias fuscus</i>		M	56	19M + 23SM + 8ST + 6A	98	106			XY, ACN=56	China (Guangdong)	W-30
<i>Clarias fuscus</i>		F	56	20M + 22SM + 8ST + 6A	98	106			XX, ACN=56	China (Guangdong)	L-76
<i>Clarias fuscus</i>		M	56	20M + 22SM + 8ST + 6A	98	106			XY, ACN=56	China (Guangdong)	L-76
<i>Clarias fuscus</i>		F, M	56	18M + 14SM + 14ST + 10A	88	102			ACN=56	China (Guangdong)	Y-15
<i>Clarias fuscus</i>			56	32 M/SM + 24 ST/A	88					Japan (Ishigaki)	A-56
<i>Clarias gariepinus</i>		F	56	8M + 25SM + 23A	89		2		ZW, ACN=56	Africa, Israel	T-29, O-69
<i>Clarias gariepinus</i>		M	56	8M + 24SM + 24A	88		2	(2.4 BFA)	ZZ, ACN=56	Africa, Israel	T-29, O-69, H-13
<i>Clarias gariepinus</i>		F	56	14M + 17SM + 25A	87				ZW	Egypt	N-3
<i>Clarias gariepinus</i>		M	56	14M + 18SM + 24A	88				ZZ	Egypt	N-3
<i>Clarias gariepinus</i>			56	20M + 16SM + 10ST + 10A	92	102				India (introduced)	N-3
<i>Clarias macrocephalus</i>		F, M	54	24M + 20SM + 6ST + 4A	98	104			XX/XY	Thailand	W-30
<i>Clarias platycephalus</i>			54				2			(W. and W.C. Africa)	O-83
<i>Heterobranchius longifilis</i>		F	52	6M + 25SM + 21A	83		2		ZW	Ivory Coast	T-29
<i>Heterobranchius longifilis</i>		M	52	6M + 24SM + 22A	82		2		ZZ	Ivory Coast	T-29
<b>Cranoglanididae</b>											
<i>Cranoglanis boudierius</i>	<i>sinensis</i>	F, M	74	8M + 16SM + 18ST + 32A	98	116			ACN=74	China	Y-15

Table 6.13 Order SILURIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<b>Diplomystidae</b>											
<i>Diplomystes camposensis</i>		F, M	56	16M + 24SM + 8ST + 8A	96	104	2		ACN=58	Chile	C-7
<i>Diplomystes nahuelbutaensis</i>		M	56	14M + 26SM + 8ST + 8A	96	104	2		ACN=58	Chile	C-7
<i>Oliveichthys mesembrinus</i>	<i>Diplomystes</i>	F, M	56	22M + 24SM + 6ST + 4A	102	108	2	2.6 FD	ACN=56	Argentina (Chubut)	O-60
<b>Doradidae</b>											
<i>Doras eigenmanni</i>			66							(S. America)	E-11
<i>Hassar orestis</i>			58	42M + 14SM + 2A	114	114	2			Brazil (MT)	M-144
<i>Hassar orestis</i>		F, M	58	32M + 20SM + 6ST	110	116	2		ACN=58	Brazil (Xingú R., PA)	M-144
<i>Hassar cf. orestis</i>		F, M	58	32M + 18SM + 8ST	108	116	2		ACN=58	Brazil (Jari R., PA)	M-144
<i>Hassar wilderi</i>		F	58	32M + 16SM + 10ST	106	116	2		ACN=58	Brazil (Araguaia R., MT)	E-11
<i>Hassar sp.</i>		F	58	32M + 18SM + 8ST	108	116	2		ACN=58	Brazil (Jari R., PA)	M-144
<i>Leptodoras acipenserinus</i>			58	24M + 16SM + 14ST + 4A	98	112	2		ACN=58	Brazil (MT)	M-144
<i>Nemadoras humeralis</i>	<i>Opsodoras</i>		58							Brazil (Amazon)	D-32
<i>Opsodoras ternetzi</i>		F, M	58	44M + 12SM + 2A	114	114	2		ACN=58	Brazil (Xingú R., PA)	M-144
<i>Opsodoras sp.</i>		F	58	21M + 18SM + 12ST + 7A	97	109	2			Brazil (MT)	M-144
<i>Opsodoras sp.</i>		M	58	20M + 18SM + 12ST + 8A	96	108				Brazil (MT)	M-144
<i>Platyodoras cf. costatus</i>		F	58	26M + 16SM + 4ST + 12A	100	104	2		ACN=58	Brazil (Xingú R., PA)	M-144
<i>Oxyodoras niger</i>	<i>Pseudodoras</i>	F, M	58	20M + 16SM + 8ST + 14A	94	102	2		ACN=58	Brazil (PA)	F-16
<i>Pterodoras granulatus</i>			58							Brazil (Parana R., PR)	J-20
<i>Rhinodoras dorbigny</i>		F, M	58	20M + 20SM + 4ST + 14A	98	102	2	3.5 FD	ACN=58	Brazil (SP)	F-16, F-64
<i>Rhinodoras sp.</i>		F, M	58	18M + 16SM + 12ST + 12A	92	104	2			Brazil (MT)	M-144
<i>Trachydoras paraguayensis</i>		F, M	56	32M + 20SM + 4ST	108	112	2		ACN=56	Argentina	F-16
<i>Wertheimeria maculata</i>			58	24M + 14SM + 8ST + 12A	96	104	2		ACN=58	Brazil (MG)	E-11
<b>Erethistidae</b>											
<i>Pseudolaguvia ribeiroi</i>	<i>Laguvia rebeiroi</i>		50	6M + 28SM + 16A	84					India (Assam)	K-46, C-108
<b>Heptapteridae</b>											
<i>Cetoporhamdia iheringi</i>	<i>iheringi</i>		58	22M + 16SM + 10ST + 10A	96	106	2	(1.8 FD)	ACN=58	Brazil (MG, PR)	F-19, F-64
<i>Cetoporhamdia iheringi</i>	Pimelodidae	F, M	58	28M + 24SM + 6ST	110	116	2			Brazil (SP)	V-46
<i>Cetoporhamdia sp.</i>		F, M	58	22M + 16SM + 10ST + 10A	96	106	2		ACN=58	Brazil (SP)	F-19
<i>Imparfinis borodini</i>	<i>Heptapterus longicauda</i>	F, M	52	22M + 26SM + 4ST	100	104	4	2.2 FD		Brazil (SP)	V-46, F-64
<i>Imparfinis hollandi</i>	<i>Pariotilus</i>		42	22M + 10SM + 4ST + 6A	74	78				Brazil (PR)	S-180
<i>Imparfinis hollandi</i>		F, M	42	22M + 10SM + 10ST	74	84	2			Brazil (PR)	M-129
<i>Imparfinis mirini</i>		F	58	23M + 35SM	116	116	2	1.9-2.4 FD	ZW	Brazil (SP)	V-45, F-64

Table 6.13 Order SILURIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup> NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Imparfinis miririni</i>		M	58	24M + 34SM	116	116	2		ZZ	Brazil (SP)	V-45
<i>Imparfinis piperatus</i>	cytotype A	F, M	58	32M + 26SM	116	116	2			Brazil (SP)	V-48
<i>Imparfinis piperatus</i>	cytotype B	F, M	58	26M + 22SM + 8ST + 2A	106	114	2			Brazil (SP)	V-48
<i>Imparfinis cf. piperatus</i>		M	56	22M + 26SM + 4ST + 4A	104	108	2			Brazil (SP)	V-48
<i>Imparfinis cf. piperatus</i>		F, M	56	24M + 12SM + 20ST	92	112	2		ACN=58	Brazil (SP)	F-19
<i>Imparfinis aff. miririni</i>	aff. <i>schubarti</i>	F, M	58	28M + 28SM + 2ST	114	116	2		ACN=58	Brazil (PR)	S-180, S-198
<i>Imparfinis aff. miririni</i>	aff. <i>schubarti</i>	F, M	58	22M + 18SM + 10ST + 8A	98	108	2		ACN=58	Brazil (SP, PR)	F-19
<i>Pariolius cf. longicaudus</i>		F, M	52	22M + 16SM + 4ST + 10A	90	94	2			Brazil (PR)	S-180
<i>Pimelodella avanhandavae</i>	Pimelodidae	M	46	20M + 20SM + 6ST	86	92	2			Brazil (SP)	V-46
<i>Pimelodella aff. avanhandavae</i>		F, M	52	30M + 22SM	104	104	2			Brazil (PR)	S-149
<i>Pimelodella cristata</i>			52							Brazil (MT)	S-180
<i>Pimelodella gracilis</i>			52					1.8 BFA		Brazil (MS)	S-180, H-13
<i>Pimelodella kronei</i>		F, M	58	54 M/SM + 4ST	112	116	2		0-1 B	Brazil (SP)	A-20
<i>Pimelodella meeki</i>	Pimelodidae	F, M	46	30M + 12SM + 4ST	88	92	2			Brazil (Tibagi R., PR)	V-95
<i>Pimelodella transitoria</i>		F, M	58	54 M/SM + 4ST	112	116	2			Brazil (SP)	A-20, F-57
<i>Pimelodella sp.</i>			46			84				S. America	L-21
<i>Pimelodella sp.</i>			56							Argentina	F-20
<i>Pimelodella sp.</i>			46							Argentina	F-20
<i>Pimelodella sp. 1</i>		F, M	46	20M + 20SM + 6ST	86	92	2	1.1 FD		Brazil (PR)	V-84, F-64
<i>Pimelodella sp. 2</i>			52	22M + 22SM + 8ST	96	104	8	2.0 FD		Brazil (PR)	V-84, F-64
<i>Pimelodella sp.</i>	Rhamdiidae		46	34M + 12SM	92	92				Brazil (Tibagi R., PR)	S-166
<i>Pimelodella sp.</i>		F	46	40 M/SM + 6 ST/A	86		2		XX	Brazil (MG)	D-11
<i>Pimelodella sp.</i>		M	46	40 M/SM + 6 ST/A	86		2		XY	Brazil (MG)	D-11
<i>Rhamdella microcephala</i>			56	18M + 30SM + 8ST	104	112	2			Brazil (MG)	F-29, S-180
<i>Rhamdella sp.</i>	Rhamdiidae		56	26 M/SM + 30 ST/A	82					Brazil (BA)	S-166
<i>Rhamdella laticauda</i>			58							C. America	L-21
<i>Rhamdia branneri</i>	<i>branneri</i>		58	36M + 14SM + 4ST + 4A	108	112			0-2 B	Brazil (PR)	S-166
<i>Rhamdia quelen</i>	<i>branneri</i>		58	30M + 10SM + 14ST + 4A	98	112			0-4 B	Brazil (PR)	C-98
<i>Rhamdia quelen</i>	<i>branneri</i>	F, M	58	36M + 14SM + 4ST + 4A	108	112			0-4 B	Brazil (SC)	A-5
<i>Rhamdia quelen</i>	<i>hilarii</i>	F, M	58	58 M/SM	116	116	2	(2.0-2.3 FD)	0-2 B, ACN=58	Brazil (SP)	S-166, M-13, F-64
<i>Rhamdia quelen</i>	<i>hilarii</i>	F, M	58-63		>100				0-5 B	Brazil (SP)	F-15
<i>Rhamdia quelen</i>	<i>hilarii</i>	F, M	58	26M + 16SM + 8ST + 8A	100	108	2		0 B, ACN=58	Argentina	F-19
<i>Rhamdia cf. quelen</i>	cf. <i>hilarii</i>	F, M	58	30M + 18SM + 10ST	106	116	2		0-3 B	Brazil (SP)	V-47
<i>Rhamdia quelen</i>	<i>quelen</i>	F, M	58	26M + 20SM + 6ST + 6A	104	110	2		0-4 B	Brazil (SP)	S-154
<i>Rhamdia quelen</i>	<i>quelen</i>	F, M	58	26M + 22SM + 6ST + 4A	106	112	2		0 B	Brazil (PR)	S-154
<i>Rhamdia quelen</i>	<i>quelen</i>		58	26M + 24SM + 8ST	108	116	2		0 B	Brazil (PR)	S-154

Table 6.13 Order SILURIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Rhamdia</i>	<i>quelen</i>	F	58	26M + 16SM + 8ST + 8A	100	108	2		0 B, ACN=58	Argentina	F-19
<i>Rhamdia</i>	<i>quelen</i>	F, M	58	36M + 16SM + 6ST	110	116	2		0-3 B, ACN=58	Brazil (MS)	M-157
<i>Rhamdia</i>	<i>quelen</i>	F, M	58	36M + 16SM + 6ST	110	116			0-2 B, ACN=58	Brazil (SP, PR)	M-158
<i>Rhamdia</i>	<i>quelen</i>		58	36M + 16SM + 6ST	110	116			0-2 B	Brazil (SC)	M-158
<i>Rhamdia</i>	<i>sapo</i>	F, M	58	44 M/SM + 14 ST/A	102				0-1 B	Argentina	V-78
<i>Rhamdia</i>	<i>sapo</i>		56							Uruguay	S-166
<i>Rhamdia</i>	<i>voulezi</i>	F, M	58	36M + 14SM + 4ST + 4A	108	112			0-2 B	Brazil (PR)	A-5
<i>Rhamdia</i>	sp.	F, M	58	46 M/SM + 12ST	104	116	2		0-4 B, ACN=58	Brazil (SP)	G-13
<i>Rhamdia</i>	sp.	F	87	69 M/SM + 18ST (3n)	156	174	3		3X, ACN=87	Brazil (SP)	G-13
<b>Heteropneustidae</b>											
<i>Heteropneustes</i>	<i>fossilis</i>	F, M	56	14M + 26SM + 16ST	96	112				India	P-48
<i>Heteropneustes</i>	<i>fossilis</i>	F, M	56	18M + 10SM + 12ST + 16A	84	96				India (Jammu)	T-51
<i>Heteropneustes</i>	<i>fossilis</i>		56	22M + 16SM + 6ST + 12A	94	100	2			India	R-69
<i>Heteropneustes</i>	<i>fossilis</i>		56	18M + 18 SM/ST + 20A		92				India	R-52
<i>Heteropneustes</i>	<i>fossilis</i>		56	14M + 12SM + 30A	82					Thailand	D-28
<b>Ictaluridae</b>											
<i>Ameiurus</i>	<i>brunneus</i>		62							(S.E. USA)	H-45
<i>Ameiurus</i>	<i>catus</i>	F, M	48	16M + 20SM + 12ST	84	96			ACN=58	USA (AL)	L-22
<i>Ameiurus</i>	<i>melas</i>	F, M	60	12M + 10SM + 12ST + 26A	82	94				USA (TN)	C-65
<i>Ameiurus</i>	<i>melas</i>	M	60	16 M/SM + 44 ST/A	76				ACN=60	USA (OH)	L-21
<i>Ameiurus</i>	<i>natalis</i>	F, M	62	12M + 10SM + 14ST + 26A	84	98				USA (TN)	C-65
<i>Ameiurus</i>	<i>natalis</i>	M	62	22 M/SM + 40 ST/A	84				ACN=64	USA (OH, MO)	L-21
<i>Ameiurus</i>	<i>nebulosus</i>	F, M	60	16 M/SM + 44 ST/A	76			1.9 FD, 2.4 BFA	ACN=60	USA (OH)	L-21, H-13
<i>Ameiurus</i>	<i>nebulosus</i>	F, M	60	20 M/SM + 40 ST/A	80					Bosnia	B-22
<i>Ameiurus</i>	<i>nebulosus marmoratus</i>	F, M	60	16 M/SM + 44 ST/A	76					Italy	B-10
<i>Ameiurus</i>	<i>platycephalus</i>		54							(S.E. USA)	H-45
<i>Ameiurus</i>	<i>serracanthus</i>	F	52	38 M/SM + 14 ST/A	90				ACN=58	USA (FL)	L-21
<i>Ictalurus</i>	<i>furcatus</i>		58	18M + 14SM + 26ST	90	116			ACN=58	USA (AL)	L-22
<i>Ictalurus</i>	<i>punctatus</i>		58	34 M/SM + 24 ST/A	92				ACN=58	USA (LA)	L-21
<i>Ictalurus</i>	<i>punctatus</i>	F, M	58	18M + 14SM + 26ST	90	116		(2.0 FCM, 2.1 FD)	ACN=58	USA	L-22, M-91, T-73
<i>Noturus</i>	<i>albater</i>		66-72		82					USA	L-21
<i>Noturus</i>	<i>elegans</i>	F, M	46	36 M/SM + 10 ST/A	82				ACN=54	USA (KY)	L-21
<i>Noturus</i>	<i>eleutherus</i>	F, M	42	24 M/SM + 18 ST/A	66				ACN=58	USA (AR, VA)	L-21
<i>Noturus</i>	<i>exilis</i>	F	54	14 M/SM + 40 ST/A	68				ACN=56	USA (MO)	L-21

Table 6.13 Order SILURIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Noturus flavater</i>		M	44	20 M/SM + 24 ST/A	64				ACN=58	USA (MO)	L-21
<i>Noturus flavipinnis</i>		F	52	30 M/SM + 22 ST/A	82				ACN=56	USA (VA)	L-21
<i>Noturus flavus</i>		F, M	48	22 M/SM + 26 ST/A	70				ACN=56	USA (OH, PA)	L-20, L-21
<i>Noturus flavus</i>		F	50	20 M/SM + 30 ST/A	70				ACN=56	USA (VA)	L-20, L-21
<i>Noturus flavus</i>			48							USA (IN)	H-17
<i>Noturus funebris</i>		F	44	24 M/SM + 20 ST/A	68				ACN=58	USA (LA)	L-21
<i>Noturus gilberti</i>		M	54	28 M/SM + 26 ST/A	82				ACN=58	USA (VA)	L-21
<i>Noturus gyninus</i>		F, M	42	30 M/SM + 12 ST/A	72				ACN=56	USA (LA, MO, OH)	L-21
<i>Noturus hildebrandi hildebrandi</i>		F, M	46	34 M/SM + 12 ST/A	80				ACN=58	USA (MS)	L-21
<i>Noturus hildebrandi lautus</i>		F, M	46	34 M/SM + 12 ST/A	80				ACN=58	USA (TN)	L-21
<i>Noturus insignis</i>		F, M	54	20 M/SM + 34 ST/A	74				ACN=58	USA (PA, NC)	L-21
<i>Noturus lachneri</i>		F, M	42	30 M/SM + 12 ST/A	72				ACN=54	USA (AR)	L-21
<i>Noturus leptacanthus</i>		F, M	46	26 M/SM + 20 ST/A	72				ACN=56	USA (LA)	L-21
<i>Noturus miurus</i>			50	24 M/SM + 26 ST/A	74				ACN=58	USA (LA, MO, OH)	L-21
<i>Noturus munitus</i>		F	42	20 M/SM + 22 ST/A	62				ACN=58	USA (LA)	L-21
<i>Noturus nocturnus</i>		F, M	48	24 M/SM + 24 ST/A	72				ACN=58	USA (LA, MS, MO)	L-21
<i>Noturus phaeus</i>			42	26 M/SM + 16 ST/A	68				ACN=56	USA (MS, TN)	L-21
<i>Noturus stigmatosus</i>		F	42	20 M/SM + 22 ST/A	62				NAN=54	USA (OH)	L-21
<i>Noturus taylori</i>		F, M	40	24 M/SM + 16 ST/A	64				ACN=56	USA (AR)	L-21
<i>Prietella phreatophila</i>			50			ca. 80	2		ACN=52?	Mexico	A-37
<i>Pyloodictis olivaris</i>			56	26 M/SM + 30 ST/A	82				ACN=60	USA (OH)	L-21
<b>Loricariidae</b>											
<b>Ancistrinae</b>											
<i>Ancistrus cf. dubius</i>		F, M	44	18M + 10SM + 8ST + 8A	72	80	2		ZW/ZZ	Brazil (MT)	M-164
<i>Ancistrus cf. dubius</i>		F, M	42	24M + 10SM + 8ST	76	84	2		XX/XY	Brazil (Pantanal, MT)	M-165
<i>Ancistrus cf. dubius</i>		F, M	42	24M + 10SM + 8ST	76	84	2		no sex chrom.	Brazil (Pantanal, MT)	M-165
<i>Ancistrus multispinis</i>	Hypostominae, Ancistrini		52	28 M/SM + 24 ST/A	80				ACN=52	Brazil (SC)	A-34
<i>Ancistrus ranunculus</i>		F	48	19M + 9SM + 6ST + 14A	76	82	4		ZW, ACN=51	Brazil (Amazon R.)	O-80
<i>Ancistrus ranunculus</i>		M	48	20M + 8SM + 6ST + 14A	76	82	4		ZZ, ACN=52	Brazil (Amazon R.)	O-80
<i>Ancistrus sp.</i>	Purus	F	34	20M + 12SM + 2ST	66	68	2		XX, ACN=42	Brazil (Purus, AM)	O-85
<i>Ancistrus sp.</i>	Purus	M	34	21M + 11SM + 2ST	66	68	2		XY, ACN=42	Brazil (Purus, AM)	O-85
<i>Ancistrus sp.</i>	Trombetas	M	38	22M + 8SM + 5ST + 3A	68	73	2		ACN=48	Brazil (Trombetas, PA)	O-85
<i>Ancistrus sp.</i>	Vermelho	M	42	26M + 6SM + 4ST + 6A	74	78	2		ACN=42	Brazil (Demini, AM)	O-85
<i>Ancistrus sp.</i>	Macoari	F	46	18M + 12SM + 6ST + 10A	76	82	2		XX, ACN=48	Brazil (Branco, RR)	O-85
<i>Ancistrus sp.</i>	Macoari	M	46	18M + 11SM + 6ST + 11A	75	81	2		XY, ACN=48	Brazil (Branco, RR)	O-85

Table 6.13 Order SILURIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub> NF <sub>2</sub>	Ag <sup>-</sup> NORs	Genome size (pg/cell)	Comments	Locality	Reference	
<i>Ancistrus</i> sp.	Dimona	F, M	52	16M + 8SM + 2ST + 26A	76 78	2		ACN=56	Brazil (Dimona, AM)	O-85	
<i>Ancistrus</i> sp. 1	Balbina	F	38	26M + 10SM + 2ST	74 76	2		XX, ACN=48	Brazil (Barretinho, AM)	O-84	
<i>Ancistrus</i> sp. 1	Balbina	M	39	27M + 10SM + 2ST	76 78	2		XY <sub>1</sub> Y <sub>2</sub> , ACN=48	Brazil (Barretinho, AM)	O-84	
<i>Ancistrus</i> sp. 2	Barcelos	F	52	11M + 12SM + 4ST + 25A	75 79	2		Z <sub>1</sub> Z <sub>2</sub> W <sub>1</sub> W <sub>2</sub>	Brazil (Demeni, AM)	O-84	
<i>Ancistrus</i> sp. 2	Barcelos	M	52	12M + 12SM + 4ST + 24A	76 80	2		Z <sub>1</sub> Z <sub>2</sub> Z <sub>2</sub> Z <sub>2</sub>	Brazil (Demeni, AM)	O-84	
<i>Ancistrus</i> sp.	Piagacu	F	52	16M + 9SM + 2ST + 25A	77 79	2		ZW, ACN=52	Brazil (Purus, AM)	O-80	
<i>Ancistrus</i> sp.	Piagacu	M	52	16M + 8SM + 2ST + 26A	76 78	2		ZZ, ACN=52	Brazil (Purus, AM)	O-80	
<i>Ancistrus</i> sp. 1			38	30 M/SM + 8ST	68 76	2			Brazil (Acre)	A-34	
<i>Ancistrus</i> sp. 2			52	32 M/SM + 20 ST/A	84	2		ACN=52	Brazil (SP)	A-34	
<i>Ancistrus</i> n. sp. 1		F	40	34M + 6SM	80 80	2		XX	Brazil (GO)	A-112	
<i>Ancistrus</i> n. sp. 1		M	39	33M + 6SM	78 78	2		XO	Brazil (GO)	A-112	
<i>Ancistrus</i> n. sp. 2		F, M	52	10M + 16SM + 12ST + 14A	78 90	2			Brazil (SC)	A-112	
<i>Baryancistrus</i> aff. <i>niveatus</i>		F	52	16M + 32SM + 4A	100 100	2			Brazil (PA)	O-79	
<i>Hemiancistrus</i> <i>spilomma</i>		F	52	25M + 21SM + 6ST	98 104	6		ZW, ACN=57	Brazil (MT)	O-79	
<i>Hemiancistrus</i> <i>spilomma</i>		M	52	24M + 22SM + 6ST	98 104	6		ZZ, ACN=58	Brazil (MT)	O-79	
<i>Hemiancistrus</i> <i>spinosissimus</i>		F, M	52	26M + 22SM + 4ST	100 104	2		ACN=56	Brazil (MT)	O-79	
<i>Hemiancistrus</i> sp.		F	52	20M + 20SM + 12 ST/A	92			ZW	Brazil (MT)	A-109	
<i>Megalancistrus</i> <i>parananus</i>		F	52	26M + 26SM	104 104	2			Brazil (PR)	A-34	
<i>Panaque</i> cf. <i>nigrolineatus</i>	<i>aculeatus</i>	F, M	52	26M + 20SM + 6ST	98 104				Brazil (MT)	A-109	
<b>Hypoptopomatinae</b>											
<i>Corumbataia</i> <i>cuetae</i>		F, M	54	28M + 20SM + 6 ST/A	102	2			Brazil (SP)	C-3	
<i>Hisonotus</i> <i>depressicauda</i>	<i>Microlepidogaster</i>	F	54	14M + 28SM + 2ST + 10A	96 98	2			Brazil (SP)	A-49	
<i>Hisonotus</i> <i>leucofrenatus</i>	<i>Microlepidogaster</i>	F, M	54	24M + 26SM + 2ST + 2A	104 106	1-2		ZW, 0-2 B	Brazil (SP)	A-48	
<i>Hisonotus</i> <i>leucofrenatus</i>	<i>Microlepidogaster</i>	F	54	22M + 26SM + 4ST + 2A	102 106	1-2		ZW, 0-2 B	Brazil (PR)	A-48	
<i>Hisonotus</i> <i>leucofrenatus</i>		F	54	22M + 24SM + 6ST + 2A	100 106	2		ACN=58	Brazil (SC)	A-108	
<i>Hisonotus</i> <i>nigricauda</i>		F	54	26M + 20SM + 8ST	100 108	2		ACN=58	Brazil (RS)	A-108	
<i>Hisonotus</i> sp. 1			54				2.7 FD	ZW	Brazil (SP)	F-64	
<i>Hisonotus</i> sp. 2			54				1.8 FD	ZW	Brazil (SP)	F-64	
<i>Hisonotus</i> sp. A	<i>Microlepidogaster</i>	F	54	30M + 20SM + 4ST	104 108	4			Brazil (SP)	A-49	
<i>Hisonotus</i> sp. A			54	26M + 26SM + 2ST	106 108	2		ACN=58	Brazil (SP)	A-108	
<i>Hisonotus</i> sp. B	<i>Microlepidogaster</i>	F	54	22M + 28SM + 4ST	104 108	2			Brazil (SP)	A-49	
<i>Hisonotus</i> sp. D			54	26M + 26SM + 2ST	106 108	2		ACN=58	Brazil (SP)	A-108	
<i>Lampiella</i> <i>gibbosa</i>	<i>Hisonotus gibbosus</i>		58						Brazil (SP)	K-20	
<i>Macrotozinclus</i> <i>affinis</i>	<i>Otocinclus</i>	F, M	54	46M + 8SM	108 108	2		(4.2 BFA)	Brazil (SP)	A-49, H-13	
<i>Macrotozinclus</i> <i>affinis</i>	<i>Otocinclus</i>	F, M	54	40M + 12SM + 2ST	106 108	2			Brazil (RJ)	A-49	
<i>Otocinclus</i> <i>aff. vestitus</i>		F	72	22M + 12SM + 4ST + 34A	106 110	2		ZW	Brazil (PA)	A-49	



Table 6.13 Order SILURIFORMES (continued)

A		B		C		D		E		F		G		H		I		J		K		L	
Current scientific name of taxon Family/subfamily/species		Reported in karyotype paper		Sex	2n	Karyotype		NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup> NORs	Genome size (pg/cell)	Comments		Locality		Reference							
<i>Parotocinclus maculicauda</i>		M	54	20M + 32SM + 2ST	106	108	2							Brazil (SP)		A-49							
<i>Pseudotocinclus tietensis</i>		F	54	26M + 22SM + 6ST	102	108	2					XX		Brazil (SP)		A-47							
<i>Pseudotocinclus tietensis</i>		M	54	27M + 21SM + 6ST	102	108	2					XY		Brazil (SP)		A-47							
<i>Pseudotothyris obtusa</i>		M	54	26M + 18SM + 4ST + 6A	98	102	2							Brazil (SP)		A-49							
Hypostominae																							
<i>Corymbophanes</i>																							
<i>Hypostomus</i>	<i>Pareiorhina</i>		54	20M + 20SM + 14ST	94	108						ACN=54		Brazil (MG)		A-35							
<i>Hypostomus affinis</i>			66	14M + 14SM + 12ST + 26A	94	106	5							Brazil (Jacui Stream, SP)		K-20							
<i>Hypostomus albopunctatus</i>		F, M	74	10M + 20SM + 44 ST/A	104		6					ACN=76		Brazil (SP)		A-98							
<i>Hypostomus ancistroides</i>		F, M	68	16M + 18SM + 34 ST/A	102		6					ACN=76		Brazil (SP)		A-98							
<i>Hypostomus ancistroides</i>		F, M	68	18M + 10SM + 12ST + 28A	96	108	6							Brazil (SP)		A-112							
<i>Hypostomus ancistroides</i>	<i>Plecostomus</i>	F	68	10M + 28SM + 30 ST/A	106							XX		Brazil		M-66							
<i>Hypostomus ancistroides</i>	<i>Plecostomus</i>	M	68	10M + 27SM + 31 ST/A	105							XY		Brazil		M-66							
<i>Hypostomus aff. auroguttatus</i>		F	76	8M + 30SM + 38 ST/A	114		2					ACN=76		Brazil (SP)		A-98							
<i>Hypostomus commersoni</i>			68	14M + 14SM + 8ST + 32A	96	104								Argentina		F-20							
<i>Hypostomus goyazensis</i>		F, M	72	10M + 16SM + 10ST + 36A	98	108	2							Brazil (GO)		A-112							
<i>Hypostomus macrops</i>	<i>Plecostomus</i>	M	68	10M + 14SM + 44 ST/A	92									Brazil		M-66							
<i>Hypostomus nigromaculatus</i>			76	8M + 20SM + 48 ST/A	104		3					ACN=76		Brazil (SP)		R-119							
<i>Hypostomus nigromaculatus</i>			76	6M + 20SM + 50 ST/A	102		3					ACN=76		Brazil (PR)		R-119							
<i>Hypostomus paulinus</i>	<i>Plecostomus</i>	M	74	10M + 20SM + 44 ST/A	104									Brazil		M-66							
<i>Hypostomus plecostomus</i>			68								(3.2 FIA, 4.2 BFA)			(S. America)		H-13, H-41							
<i>Hypostomus plecostomus?</i>	<i>plecostomus</i>		54	24 M/SM + 12ST + 18A	78	90					3.6 FD			(S. America)		M-91							
<i>Hypostomus regani</i>		F, M	72	10M + 20SM + 42 ST/A	102							ACN=74		Brazil (SP)		A-98							
<i>Hypostomus regani</i>		F, M	72	12M + 18SM + 26ST + 16A	102	128	4							Brazil (SP)		A-112							
<i>Hypostomus strigaticeps</i>	<i>Plecostomus</i>	F, M	74	8M + 4SM + 62 ST/A	86									Brazil		M-66							
<i>Hypostomus tietensis</i>			68	14M + 12SM + 42 ST/A	94									Brazil (SP)		A-35							
<i>Hypostomus sp.</i>			67	15M + 12SM + 14ST + 26A	94	108						1B		Brazil (SP)		C-98							
<i>Hypostomus sp. A</i>		F, M	70	18M + 14SM + 38 ST/A	102		6					ACN=76		Brazil (SP)		A-98							
<i>Hypostomus sp. B</i>		F, M	72	12M + 18SM + 42 ST/A	102		2					ACN=76		Brazil (SP)		A-98, A-132							
<i>Hypostomus sp. C</i>		F, M	72	10M + 18SM + 44 ST/A	100		4				(4.3 FD)			Brazil (SP)		A-98, F-64							
<i>Hypostomus sp. D<sub>1</sub></i>		M	72	10M + 26SM + 36 ST/A	108		2				(4.7 FD)			Brazil (SP)		A-98, F-64							
<i>Hypostomus sp. D<sub>2</sub></i>		M	72	14M + 20SM + 38 ST/A	106		2				(3.7 FD)			Brazil (SP)		A-98, F-64							
<i>Hypostomus sp. E</i>		F, M	80	8M + 16SM + 56 ST/A	104		4					ACN=80		Brazil (SP)		A-98, A-132							
<i>Hypostomus sp. 3</i>			82	6M + 14SM + 62 ST/A	102							0-2 B		Brazil (MS)		C-98							
<i>Hypostomus sp. 2</i>	Rio Perdido	F, M	84	6M + 16SM + 62 ST/A	106		2					ACN=84		Brazil (MS)		C-107							
<i>Hypostomus sp. 3</i>	Córrego Salobrinha	F, M	82	6M + 12SM + 64 ST/A	100							ACN=82		Brazil (MS)		C-107							
<i>Hypostomus sp. 3</i>	Córrego Salobrinha	F, M	84	6M + 12SM + 66 ST/A	102							ACN=84		Brazil (MS)		C-107							

Table 6.13 Order SILURIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg./cell)	Comments	Locality	Reference
<i>Hypostomus</i> sp. F			76	10M + 16SM + 50 ST/A	102		2	(4.2, 4.9 FD)		Brazil (MG)	A-132, F-64
<i>Hypostomus</i> sp. G			64	14M + 24SM + 26 ST/A	102				ZW	Brazil (MT)	A-109
<i>Hypostomus</i> sp.		F	64	15M + 24SM + 25 ST/A	103		2	3.9 FD	ZW	Brazil (MT)	A-99, F-64
<i>Hypostomus</i> sp.		M	64	14M + 24SM + 26 ST/A	102		2	3.9 FD	ZZ, ACN=82	Brazil (MT)	A-99, F-64
<i>Hypostomus</i> sp. 1?			54	36 M/SM + 18 ST/A	90					Argentina	F-20
<i>Hypostomus</i> sp. 2			72	28 M/SM + 44 ST/A	100					Argentina	F-20
<i>Pterygoplichthys</i> <i>ambrosettii</i>	<i>Liposarcus anisitsi</i>	F, M	52	16M + 24SM + 8ST + 4A	92	100	2	(4.0 FD)		Brazil (SP)	A-133, F-64
<i>Pterygoplichthys</i> <i>ambrosettii</i>	<i>Liposarcus anisitsi</i>	F, M	52	28M + 12SM + 8ST + 4A	92	100	2			Brazil (SP)	A-112
<i>Pterygoplichthys</i> <i>ambrosettii</i>	<i>Liposarcus anisitsi</i>	F, M	52	8M + 14SM + 14ST + 16A	74	88	2			Brazil (MS)	A-112
<i>Pterygoplichthys</i> <i>gibbiceps</i>	<i>Glyptoperichthys</i>	F, M	52	20M + 24SM + 8ST	96	104	2			Venezuela (Orinoco R.)	A-112
<i>Pterygoplichthys</i> <i>Joselimaianus</i>		F, M	52	28M + 16SM + 8 ST/A	96		2			Brazil (MG)	O-79
<i>Pterygoplichthys</i> <i>multiradiatus</i>	<i>Liposarcus</i>	F, M	52	22M + 18SM + 12ST	92	104	2			Venezuela (Orinoco R.)	A-112
<i>Pogonopoma</i> <i>wertheimeri</i>		F	54	20M + 30SM + 4ST	104	108			ACN=58	Brazil (Bahia)	A-109
<i>Rhinelepis</i> <i>aspera</i>		F, M	54	20M + 26SM + 8ST	100	108			ACN=58	Brazil (PR)	A-109
<i>Squaliforma</i> <i>emarginata</i>	<i>Hypostomus emarginatus</i>	F, M	52	16M + 30SM + 6ST	98	104			ACN=56	Brazil (MT)	A-109
<b>Loricariinae</b>											
<i>Brochiloricaria</i> <i>macradon</i>	<i>Loricaria</i>	M	58	18M + 2SM + 38 ST/A	78					Brazil	M-66
<i>Harttia</i> <i>kroni</i>			58	40 M/SM + 18ST	98	116	2		ACN=58	Brazil (SP)	A-34
<i>Harttia</i> <i>loricariformis</i>			52	32 M/SM + 20 ST/A	84		2		ACN=54	Brazil (SP)	A-34
<i>Harttia</i> <i>loricariformis</i>			56	16M + 22SM + 10ST + 8A	94	104	2			Brazil (Paraitinga R., SP)	K-20
<i>Harttia</i> sp.			56	14SM + 42A	70					Brazil (MG)	A-34
<i>Loricaria</i> <i>cataphracta</i>	<i>carinata</i>		64	12 M/SM + 52 ST/A	76					Argentina	F-20
<i>Loricaria</i> sp.			64	10M + 6SM + 4ST + 44A	80	84			1-3 B	Brazil (PR)	A-34, C-98
<i>Loricaria</i> sp.			52							Brazil (PA)	A-34
<i>Loricaria</i> sp.			62							Brazil (AM)	A-34
<i>Loricariichthys</i> <i>maculatus</i>			56	22 M/SM + 34 ST/A	78					Argentina	F-20
<i>Loricariichthys</i> <i>platymetopon</i>			54	7M + 20SM + 4ST + 23A	81	85				Argentina	F-20
<i>Loricariichthys</i> <i>platymetopon</i>		F	54	7M + 20SM + 4ST + 23A	81	85	2		ZW	Brazil (Paraná R., PR)	S-186
<i>Loricariichthys</i> <i>platymetopon</i>		M	54	6M + 20SM + 4ST + 24A	80	84	2		ZZ	Brazil (Paraná R., PR)	S-186
<i>Loricariichthys</i> sp.			54	6M + 26SM + 4ST + 18A	86	90				Argentina	A-34
<i>Loricariichthys</i> sp.			54	28M + 26A	82					Brazil (MG)	A-34
<i>Proloricaria</i> <i>prolixa</i>	<i>Loricaria</i>		62	20M + 4SM + 38A	86	86			0-5 B	Brazil (PR)	A-34, C-98
<i>Rineloricaria</i> <i>cadeae</i>	<i>cadeae</i>		66	2M + 64 ST/A	68				ACN=66	Brazil (RS)	A-34
<i>Rineloricaria</i> <i>cadeae</i>		F, M	64	2 M/SM + 62 ST/A	66		2		ACN=64	Brazil (RS)	M-168
<i>Rineloricaria</i> <i>kroni</i>			64	6 M/SM + 58 ST/A	70		2		ACN=64	Brazil (SC)	A-34
<i>Rineloricaria</i> <i>latirostris</i>			44	12M + 4SM + 28A	60	60				Brazil (Passa Cinco R., SP)	K-20

Table 6.13 Order SILURIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Rineloricaria latirostris</i>			44	10M + 4SM + 30A	58	58				Brazil (Passa Cinco R., SP)	K-20
<i>Rineloricaria latirostris</i>			44	13M + 2SM + 29A	59	59				Brazil (Passa Cinco R., SP)	K-20
<i>Rineloricaria latirostris</i>			44	13M + 4SM + 27A	61	61				Brazil (Passa Cinco R., SP)	K-20
<i>Rineloricaria latirostris</i>			44	13M + 1SM + 30A	58	58				Brazil (Passa Cinco R., SP)	K-20
<i>Rineloricaria latirostris</i>			44	10M + 3SM + 31A	57	57				Brazil (Passa Cinco R., SP)	K-20
<i>Rineloricaria latirostris</i>			45	15 M/SM + 30 ST/A	60					Brazil (Passa Cinco R., SP)	K-20
<i>Rineloricaria latirostris</i>			46	10M + 3SM + 33A	59	59				Brazil (Passa Cinco R., SP)	K-20
<i>Rineloricaria latirostris</i>			46	14 M/SM + 32 ST/A	60					Brazil (Passa Cinco R., SP)	K-20
<i>Rineloricaria latirostris</i>			47	13 M/SM + 34 ST/A	60					Brazil (Passa Cinco R., SP)	K-20
<i>Rineloricaria latirostris</i>			36	24 M/SM + 12 ST/A	60					Brazil (Mogi-Guaçu R., SP)	K-20
<i>Rineloricaria latirostris</i>			37	23 M/SM + 14 ST/A	60					Brazil (Mogi-Guaçu R., SP)	K-20
<i>Rineloricaria latirostris</i>			38	22 M/SM + 16 ST/A	60					Brazil (Mogi-Guaçu R., SP)	K-20
<i>Rineloricaria latirostris</i>			39	21 M/SM + 18 ST/A	60					Brazil (Mogi-Guaçu R., SP)	K-20
<i>Rineloricaria latirostris</i>			40	20 M/SM + 20 ST/A	60					Brazil (Mogi-Guaçu R., SP)	K-20
<i>Rineloricaria latirostris</i>			43	17 M/SM + 26 ST/A	60					Brazil (Tres Bocas R., PR)	K-20
<i>Rineloricaria latirostris</i>			44	16 M/SM + 28 ST/A	60					Brazil (Tres Bocas R., PR)	K-20
<i>Rineloricaria latirostris</i>			46	14 M/SM + 32 ST/A	60					Brazil (Tres Bocas R., PR)	K-20
<i>Rineloricaria latirostris</i>			47	13 M/SM + 34 ST/A	60					Brazil (Tres Bocas R., PR)	K-20
<i>Rineloricaria latirostris</i>			48	12 M/SM + 36 ST/A	60					Brazil (Tres Bocas R., PR)	K-20
<i>Rineloricaria parva</i>			48					3.2 BFA		Brazil (Tres Bocas R., PR)	K-20
<i>Rineloricaria pentamaculata</i>		F, M	56	8 M/SM + 48 ST/A	64		2		ACN=60	(S. America)	G-73, H-13
<i>Rineloricaria strigilata</i>		F, M	68	6 M/SM + 62 ST/A	74		2		ACN=68	Brazil (PR)	A-34, M-168
<i>Rineloricaria</i> sp.			70	2SM + 68A	72				ACN=70	Brazil (RS)	M-168
<i>Sturisoma cf. nigrostrum</i>		F, M	74	20M + 18SM + 36 ST/A	112				ACN=70	Brazil (SP)	A-34
<b>Neoplecostominae</b>										Brazil (MT)	A-109
<i>Isbrueckerichthys duseni</i>			54	20M + 20SM + 14ST	94	108	2		ACN=56	Brazil (SP)	A-35
<i>Kronichthys lacerta</i>			54	20M + 20SM + 14ST	94	108	2		ACN=54	Brazil (PR)	A-35
<i>Kronichthys subteres</i>			54	20M + 20SM + 14ST	94	108	2		ACN=54	Brazil (SP)	A-35
<i>Neoplecostomus microps</i>			54	20M + 20SM + 14ST	94	108	2		ACN=54	Brazil (SP)	A-35
<i>Neoplecostomus microps</i>			54	24M + 20SM + 10ST	98	108	2			Brazil (Paraitinga R., SP)	K-20
<i>Neoplecostomus paranensis</i>			54	20M + 20SM + 14ST	94	108	2	2.3 FD	0-2 B, ACN=54	Brazil (MG)	A-35, F-64, C-98
<i>Neoplecostomus paranensis</i>			54	20M + 20SM + 14ST	94	108	2		ACN=54	Brazil (SP)	A-35
<i>Pareiorhaphis splendens</i>	<i>Hemipsilichthys</i>		54	20M + 20SM + 4ST	104	108	2		ACN=54	Brazil (SC, PA)	A-35
<i>Pareiorhaphis steindachneri</i>	<i>Hemipsilichthys</i>		54	20M + 20SM + 14ST	94	108	2		ACN=54	Brazil (SC)	A-35
<i>Pareiorhaphis vestigipinnis</i>	<i>Hemipsilichthys</i>		54	20M + 20SM + 14ST	94	108	2		ACN=56	Brazil (SC)	A-35
<i>Pareiorhaphis</i> sp.	<i>Hemipsilichthys</i>		54	20M + 20SM + 14ST	94	108	2		ACN=56	Brazil (PR)	A-35

Table 6.13 Order SILURIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup> NORs	Genome size (pg/cell)	Comments	Locality	Reference
Family/subfamily/species	karyotype paper										
<i>Pareiorhina rudolphi</i>			54	26M + 16SM + 12ST	96	108	2		ACN=54	Brazil (SP)	A-35
<b>Upsilodinae</b>											
<i>Upsilodus</i> sp.			96	16M + 8SM + 72A	120		2			Brazil (Paraitinga R., SP)	K-20
<b>Mochokidae</b>											
<i>Hemisyndontis membranaceus</i>		M	54	30 M/SM + 14ST + 10A	84	98	2		ZZ, ACN=56	Africa	A-10, O-1
<i>Hemisyndontis membranaceus</i>		F	54	31 M/SM + 13ST + 10A	85	98	2		ZW, ACN=56	Africa	A-10, O-1
<i>Syndontis bastiani</i>		F	54	23 M/SM + 18ST + 13A	77	95			ZW, ACN=56	Ivory Coast	A-10
<i>Syndontis budgetti</i>		M	54	30 M/SM + 18ST + 6A	84	102	2		ACN=56	Mali	A-10, O-1
<i>Syndontis courteti</i>		F	54	28 M/SM + 19ST + 7A	82	101			ACN=56	Mali	A-10
<i>Syndontis filamentosa</i>	<i>filamentosus</i>	F	56	24 M/SM + 22ST + 10A	80	102	2		ACN=56	Mali	A-10, O-1
<i>Syndontis ocellifer</i>		F	54	22 M/SM + 20ST + 12A	76	96			ACN=56	Mali	A-10
<i>Syndontis schall</i>		F	54	24 M/SM + 17ST + 13A	78	95	2	2.2 BFA	ACN=56	Mali	A-10, O-1, H-13
<i>Syndontis sorex</i>		M	54	26 M/SM + 16ST + 12A	80	96	2		ZZ, ACN=56	Mali	A-10, O-1
<i>Syndontis sorex</i>		F	54	27 M/SM + 15ST + 12A	81	96	2		ZW, ACN=56	Mali	A-10, O-1
<i>Syndontis violacea</i>	<i>violacea</i>	M	54	32 M/SM + 14ST + 8A	86	100	2		ACN=56	Mali	A-10, O-1
<b>Pangasiidae</b>											
<i>Pangasianodon gigas</i>		F, M	60	10M + 26SM + 14ST + 10A	96	110			XX/XY	Thailand (Chiang Mai)	M-30
<i>Pangasianodon gigas</i>			60	32M + 8SM + 12ST + 8A	100	112				Thailand	D-21
<i>Pangasianodon hypophthalmus</i>	<i>Pangasius</i>		60	20M + 12SM + 4ST + 24A	92	96				Thailand	D-21
<i>Pangasianodon hypophthalmus</i>	<i>Pangasius</i>	M	60	12M + 12SM + 6ST + 30A	84	90	2			(Thailand)	K-136
<i>Pangasianodon hypophthalmus</i>	<i>Pangasius sutchi</i>		60	20M + 12SM + 4ST + 24A	92	96			ACN=60	Thailand (Nakhonsawan)	M-7
<i>Pangasius larnaudii</i>			60	24M + 20SM + 4ST + 12A	104	108			ACN=60	Thailand (Nakhonsawan)	M-7
<i>Pangasius pangasius</i>		F	58	14M + 20SM + 2ST + 22A	92	94				India (WB)	K-42
<i>Pangasius pangasius</i>			62	14M + 6SM + 18ST + 24A	82	100				India	M-20
<i>Pangasius sanitwongse</i>			60	20M + 6SM + 18ST + 16A	86	104				Thailand	D-21
<b>Pimelodidae</b>											
<i>Bergia westermanni</i>		F, M	56	42 M/SM + 14 ST/A	98		2		0-5 B	Brazil (MG)	D-11
<i>Calophyus macropterus</i>			50	22M + 18SM + 10A	90		2			Brazil (R. Negro)	S-166
<i>Hemisorubim platyrhynchos</i>		F, M	56	22M + 18SM + 6ST + 10A	96	102	2		ACN=56	Brazil (Parana basin)	M-46
<i>Iheringichthys labrosus</i>		F	56	22M + 18SM + 10ST + 6A	96	106	2			Brazil (SP)	V-47
<i>Iheringichthys labrosus</i>		F, M	56	32M + 8SM + 6ST + 10A	96	102			0-3 B	Brazil (Lower Tibagi R., PR)	C-97
<i>Iheringichthys labrosus</i>		F, M	56	14M + 32SM + 4ST + 6A	102	106	2		0 B, ACN=56	Brazil (Upper Tibagi R., PR)	R-124
<i>Iheringichthys labrosus</i>		F, M	56	26M + 12SM + 6ST + 12A	94	100	2		0-1 B, ACN=56	Brazil (PR)	C-104, C-105

Table 6.13 Order SILURIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Iheringichthys labrosus</i>			56							Argentina	F-20
<i>Luciopimelodus pati</i>			50	16M + 14SM + 8ST + 12A	80	88				Argentina	S-180
<i>Megalonema platanum</i>			54	14M + 18SM + 12ST + 10A	86	98				Argentina	S-180
<i>Megalonema platanum</i>			54	26M + 10SM + 18ST	90	108			0-1 B	Brazil (PR)	C-98
<i>Parapimelodus nigribarbis</i>		F, M	56	20M + 20SM + 4ST + 12A	96	100	2		ACN=56	Brazil (Porto Alegre, RS)	T-78
<i>Parapimelodus valenciennis</i>			56							Brazil (RS)	S-166
<i>Pimelodus absconditus</i>		F, M	56	24M + 18SM + 8ST + 6A	98	106	2			Brazil (PR)	B-46
<i>Pimelodus albicans</i>			56							Argentina	F-20
<i>Pimelodus argenteus</i>		F, M	56	24M + 16SM + 12ST + 4A	96	108	2			Brazil (Paraguai R.)	S-102, S-197
<i>Pimelodus blochii</i>			56	36 M/SM + 20 ST/A	92					Brazil (MT)	B-47
<i>Pimelodus clarias</i>			56					(2.4 BFA)		Argentina	F-20, H-13
<i>Pimelodus fur</i>			56	30M + 14SM + 12A	100	100				S. America	L-21
<i>Pimelodus fur</i>		F, M	54	32M + 8SM + 6ST + 8A	94	100	2		ACN=56	Brazil (MG)	G-81
<i>Pimelodus heraldoi</i>		F, M	56	22M + 22SM + 6ST + 6A	100	106	2			Brazil (PR)	S-180, S-197
<i>Pimelodus heraldoi</i>		F, M	56	18M + 24SM + 6ST + 8A	98	104	2		ACN=56	Brazil (PR)	T-81
<i>Pimelodus maculatus</i>		F, M	56	22M + 16SM + 10ST + 8A	94	104	2	(2.7-2.8 FD)		Brazil (Paraguai R.)	S-102, S-197, F-64
<i>Pimelodus maculatus</i>		F, M	56	40 M/SM + 16 ST/A	96		2			Brazil (MG)	D-11
<i>Pimelodus maculatus</i>		M	56	41 M/SM + 15 ST/A	97		2			Brazil (MG)	D-11
<i>Pimelodus maculatus</i>		F, M	56	20M + 20SM + 10ST + 6A	96	106	2		ACN=56	Brazil (PR)	B-46, M-161, V-46
<i>Pimelodus maculatus</i>		F, M	56	32M + 12SM + 12ST	100	112	2		ACN=56	Brazil (MG)	G-81
<i>Pimelodus maculatus</i>		F, M	56	24M + 20SM + 6ST + 6A	100	106	2		ACN=56	Brazil (Porto Alegre, RS)	T-78
<i>Pimelodus mysterosus</i>		F, M	56	26M + 20SM + 2ST + 8A	102	104	2			Brazil (Paraguai R.)	S-102, S-197
<i>Pimelodus ornatus</i>		F, M	56	20M + 18SM + 8ST + 10A	94	102	2			Brazil (PR)	B-46
<i>Pimelodus ornatus</i>			56							Argentina	F-20
<i>Pimelodus ortmanni</i>		F, M	56	24M + 18SM + 8ST + 6A	98	106	2		0-4 B	Brazil (PR)	B-47
<i>Pimelodus ortmanni</i>			56	20M + 12SM + 14ST + 10A	88	102				Brazil (PR)	B-47
<i>Pimelodus paranaensis</i>		F, M	56	22M + 22SM + 4ST + 8A	100	104	2		ACN=56	Brazil (PR)	T-81
<i>Pimelodus sp.</i>		F, M	56	41 M/SM + 15 ST/A	97		2			Brazil (MG)	D-11
<i>Pimelodus sp.</i>		F, M	56	30M + 14SM + 8ST + 4A	100	108	2		0-4 B	Brazil (PR)	B-47
<i>Pimelodus sp.</i>		F, M	56	32M + 12SM + 6ST + 6A	100	106	2		ACN=56	Brazil (MG)	G-81
<i>Pirinampus pirinampu</i>		F	50	22M + 12SM + 4ST + 12A	84	88	2			Brazil (PR)	V-84
<i>Pirinampus pirinampu</i>		F, M	50	26M + 12SM + 2ST + 10A	88	90	2			Brazil (PR)	S-146, S-147
<i>Pseudoplatystoma coruscans</i>	<i>coruscans</i>	F, M	56	18M + 16SM + 10ST + 12A	90	100	2			Brazil (Parana basin)	M-46
<i>Pseudoplatystoma coruscans</i>	<i>coruscans</i>		56	24M + 16SM + 8ST + 8A	96	104				Brazil	P-42
<i>Pseudoplatystoma coruscans</i>	<i>coruscans</i>		56	20M + 16SM + 8ST + 12A	92	100	2			Brazil (MS, Paraguay R.)	S-150
<i>Pseudoplatystoma coruscans</i>	<i>coruscans</i>		56	26M + 10SM + 6ST + 14A	92	98	2			Brazil (SP, Parana R.)	S-150

Table 6.13 Order SILURIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup> NORS	Genome size (pg./cell)	Comments	Locality	Reference
<i>Pseudoplatystoma fasciatum</i>		F, M	56	18M + 14SM + 10ST + 14A	88	98	2		ACN=56	Brazil (AM)	F-17
<i>Pseudoplatystoma fasciatum</i>		F, M	56	20M + 12SM + 12ST + 12A	88	100	2		ACN=56	Brazil (MS)	P-42
<i>Pseudoplatystoma tigrinum</i>		F, M	56	18M + 16SM + 8ST + 14A	90	98	2		ACN=56	Brazil (AM)	F-17
<i>Sorubim lima</i>		F, M	56	18M + 12SM + 14ST + 12A	86	100	2		ACN=56	Brazil (AM)	F-17
<i>Sorubim lima</i>		F, M	56	20M + 14SM + 10ST + 12A	90	100	2		ACN=56	Brazil (Parana basin)	M-46
<i>Sorubim lima</i>			56							Argentina	F-20
<i>Steindachneridion scriptum</i>	<i>inscripta</i>		56							Argentina	F-20
<i>Steindachneridion scriptum</i>	<i>scripta</i>	F, M	56	24M + 20SM + 4ST + 8A	100	104	2		ACN=56	Brazil (PR)	S-199, S-200
<i>Steindachneridion melanodermatum</i>	sp.	F	56	20M + 24SM + 2ST + 10A	100	102	2		XX, ACN=56	Brazil (PR)	S-165, S-180, S-200
<i>Steindachneridion melanodermatum</i>	sp.	M	56	21M + 23SM + 2ST + 10A	100	102	2		XY, ACN=56	Brazil (PR)	S-165, S-200
<i>Zungaro zungaro</i>			56	32M + 6SM + 8ST + 10A	94	102	2			Brazil (SP)	S-148
<i>Zungaro zungaro</i>	<i>Paulicea luetkeni</i>	F, M	56	28M + 10SM + 6ST + 14A	92	98	2		ACN=56	Brazil (Parana basin)	M-46
<b>Plotosidae</b>											
<i>Plotosus lineatus</i>			48	12 M/SM + 36 ST/A	60				ACN=48	Japan (Okinawa)	A-58
<i>Plotosus canius</i>	<i>anguillaris</i>	F, M	36	10M + 10SM + 16A	56				ACN=36	India (Orissa)	R-58
<i>Plotosus canius</i>		F	36	14M + 12SM + 2ST + 8A	62	64			ACN=36	India (WB)	K-139
<i>Plotosus canius</i>		F, M	36	20M + 8SM + 8 ST/A	64				ACN=36	India (Orissa)	T-49
<b>Pseudopimelodidae</b>											
<i>Cephalosilurus apurensis</i>		M	54	6M + 28SM + 14ST + 6A	88	102	2		ACN=56	Venezuela (Orinoco R.)	M-142
<i>Conorhynchos conirostris</i>		F, M	60	20M + 18SM + 10ST + 12A	98	108	2		ACN=60	Brazil (MG)	A-17
<i>Lophiosilurus alexandri</i>	<i>Conorhynchus</i>		54	54 M/SM/ST/A			2			Brazil	M-128
<i>Lophiosilurus alexandri</i>		F, M	54	16M + 18SM + 10ST + 10A	88	98	2		ACN=58	Brazil (MG)	A-17
<i>Microglanis cottoides</i>		F, M	54	22M + 20SM + 12ST	96	108	2	2.5 FD		Brazil (SP)	V-46, F-64
<i>Microglanis aff. cottoides</i>		F, M	54	10M + 32SM + 10ST + 2A	96	106	4		ACN=56	Brazil (SC)	M-142
<i>Pseudopimelodus bufonius</i>			54	18M + 22SM + 6ST + 8A	94	100	2			Brazil (PR)	M-128
<i>Pseudopimelodus bufonius</i>		F, M	54	12M + 30SM + 12ST	96	108	6		ACN=56	Brazil (AM)	M-142
<i>Pseudopimelodus mangurus</i>		F, M	54	6M + 26SM + 12ST + 10A	86	98	2	2.2 FD	ACN=56	Brazil (SP)	M-128, F-64
<b>Schilbeidae</b>											
<i>Ailia coila</i>			58	14M + 36SM + 8A	108	108			ACN=58	India (Assam)	K-46, C-108
<i>Clupisoma garua</i>			56	18M + 34SM + 4A	108	108			ACN=56	India (Assam)	C-108
<i>Clupisoma garua</i>			66	66A	66	66				India	L-1
<i>Eutropichthys vacha</i>		F, M	58	10M + 20SM + 12ST + 16A	88	100			ACN=58	India (WB)	M-28
<i>Neotropis atherinoides</i>	<i>Pseudeutropius</i>		58	10M + 30SM + 18A	98	98			ACN=58	India (Assam)	K-46, C-108
<i>Neotropis atherinoides</i>	<i>Pseudeutropius</i>	F, M	58	28M + 12SM + 2ST + 16A	98	100			ACN=58	India (Orissa)	R-58

Table 6.13 Order SILURIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup>	Genome size	Comments	Locality	Reference
Family/subfamily/species	karyotype paper						NORs	(pg/cell)			
<b>Scoplacidae</b>											
<i>Scoplax</i>	<i>distolothrix</i>	F, M	50	18M + 18SM + 10ST + 4A	86	96	2		ACN=54?	Brazil (MT)	O-72
<b>Siluridae</b>											
<i>Kryptopterus</i>	<i>bicirrhis</i>		60					1.8 BFA		(SE Asia)	H-13
<i>Ompok</i>	<i>bimaculatus</i>	F	42	18M + 12SM + 12A	72				XX, ACN=42	India (Haryana)	R-49
<i>Ompok</i>	<i>bimaculatus</i>	M	41	17M + 12SM + 12A	70				XY	India (Haryana)	R-49
<i>Ompok</i>	<i>bimaculatus</i>	F	42	6M + 24SM + 12A	72		2			India (WB)	K-136
<i>Ompok</i>	<i>bimaculatus</i>	M	41	5M + 24SM + 12A	70		2			India (WB)	K-136
<i>Ompok</i>	<i>pabda</i>		54	28M + 10SM + 8ST + 8A	92	100				India	D-2
<i>Ompok</i>	<i>pabo</i>		54	36M + 12SM + 6A	102				ACN=54	India (Assam)	K-43
<i>Silurus</i>	<i>aristotelis</i>	F, M	58	30M + 20SM + 8ST	108	116				Greece	I-22
<i>Silurus</i>	<i>aristotelis</i>	F	58	20M + 24SM + 14 ST/A	102		2		ACN=58	Macedonia	R-121
<i>Silurus</i>	<i>asotus</i>	M	58	38 M/SM + 8ST + 12A	96	104				Japan	M-92
<i>Silurus</i>	<i>asotus</i>		58	46 M/SM + 12 ST/A	104		2		ACN=58	Japan (Yamaguchi)	F-51
<i>Silurus</i>	<i>asotus</i>		58	44 M/SM + 14 ST/A	102			(2.3* FCM)	ACN=58	Japan (Tochigi)	A-58, O-48
<i>Silurus</i>	<i>asotus</i>	F, M	58	24M + 24SM + 10 ST/A	106				ACN=58	Korea (Janghyeon)	K-52
<i>Silurus</i>	<i>asotus</i>	F, M	58	20M + 24SM + 10ST + 4A	102	112		(1.5* FD)	ACN=58	China (Wuhan)	H-18, Y-15, C-83
<i>Silurus</i>	<i>asotus</i>		58	20M + 14SM + 6ST + 18A	92	98	2	2.9 FD		China (Shasi)	Z-21, L-41
<i>Silurus</i>	<i>asotus</i>		58	20M + 24SM + 10ST + 4A	102	112				China (Amur)	Y-13
<i>Silurus</i>	<i>biwaensis</i>		58	44 M/SM + 14 ST/A	102				ACN=58	Japan (Lake Biwa)	A-58
<i>Silurus</i>	<i>glanis</i>		48	30 M/SM + 18 ST/A	78					Yugoslavia	A-28
<i>Silurus</i>	<i>glanis</i>		60	28M + 26SM + 6ST	114	120			ACN=60	Czech	R-1
<i>Silurus</i>	<i>glanis</i>		60	22M + 38 SM/ST	120		2		ACN=60	Czech	R-18
<i>Silurus</i>	<i>glanis</i>		60	18M + 32 SM/ST + 10A	110					(Russia)	V-72
<i>Silurus</i>	<i>lithophilus</i>		58	44 M/SM + 14 ST/A	102				ACN=58	Japan (Lake Biwa)	A-58
<i>Silurus</i>	<i>meridionalis</i>	F, M	58	20M + 20SM + 14ST + 4A	98	112			ACN=58	China (Wuhan)	H-18, Y-15, C-83
<i>Silurus</i>	<i>microdorsalis</i>	F, M	60	22M + 24SM + 14 ST/A	106				ACN=60	Korea (Janghyeon)	K-52
<i>Silurus</i>	<i>microdorsalis?</i>		28	12M + 14SM + 2ST	54	56				Korea	L-15
<i>Silurus</i>	<i>soldatovi</i>		58	24M + 16SM + 14ST + 4A	98	112			ACN=58	China (Jilin)	H-34
<i>Wallago</i>	<i>attu</i>	F, M	86	12M + 6SM + 2ST + 66A	104	106			ACN=86	India (Haryana)	R-61
<i>Wallago</i>	<i>attu</i>	F, M	86	10M + 12SM + 8ST + 56A	108	116			ACN=86	India (Jammu)	S-202

Table 6.13 Order SILURIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup> NORs	Genome size (pg/cell)	Comments	Locality	Reference
<b>Sisoridae</b>											
<b>Glyptosterninae</b>											
<i>Euchiloglanis davidi</i>		F, M	36	8M + 6SM + 22 ST/A	50				ACN=36	China (Sichuan)	L-35
<i>Euchiloglanis kishinouyei</i>	<i>Coraglanis</i>	F, M	50	14M + 6SM + 30 ST/A	70				ACN=50	China (Sichuan)	L-35
<i>Glyptosternon reticulatum</i>	<i>Exostoma stoliczkae</i>		42							India	R-74
<i>Glyptothorax fokiensis</i>	<i>fukiensis</i>	F, M	52	20M + 18SM + 14ST	90	104			ACN=52	China (Guangdong)	Y-15
<i>Glyptothorax telchitta</i>			56	18M + 26SM + 2ST + 10A	100	102			ACN=56	India (Bihar)	K-41
<i>Glyptothorax trilineatus</i>			52	18M + 24SM + 10A	94				ACN=52	India (Assam)	K-46, C-108
<i>Pseudecheneis sulcata</i>	<i>sulcata</i>	F, M	52	8M + 14SM + 30 ST/A	74				ACN=52	India (U.P.)	R-74
<b>Sisorinae</b>											
<i>Gagata cenia</i>			46	4M + 8SM + 8ST + 26A	58	66			ACN=46	India (U.P.)	M-162
<i>Gogangra viridescens</i>	<i>Nangra punctata</i>		42	14M + 20SM + 8A	76				ACN=42	India (Assam)	K-46, C-108
<i>Gogangra viridescens</i>	<i>Gagata</i>	M	48	12M + 22SM + 4ST + 10A	82	86			ACN=48	India (Jammu)	S-52
<b>Trichomycteridae</b>											
<i>Bullockia maldonadoi</i>			60	46 M/SM + 14 ST/A	106					(Chile)	A-127, B-80
<i>Eremophilus mutisii</i>		F, M	54	30M + 20SM + 4ST	104	108	2		ACN=56	Colombia	G-53
<i>Hatcheria macraei</i>			52	30 M/SM + 22 ST/A	82					(Chile)	A-127, B-80
<i>Trichogenes longipinnis</i>		F, M	54	36M + 12SM + 6ST	102	108	2		ACN=56	Brazil (SP)	L-51
<i>Trichomycterus alternatus</i>	<i>florensis</i>		54	42M + 10SM + 2ST	106	108			ACN=56	Brazil (MG)	S-109
<i>Trichomycterus areolatus</i>			56	56 M/SM	112	112				(Chile)	A-127
<i>Trichomycterus areolatus</i>			54	44M + 8SM + 2ST	106	108	2	(5.0 FD)	ACN=56	Chile (Osomo)	C-66
<i>Trichomycterus areolatus</i>			55	43M + 8SM + 2ST + 2A	106	108			ACN=56	Chile (Osomo)	C-66
<i>Trichomycterus areolatus</i>			56	42M + 8SM + 2ST + 4A	106	108			ACN=56	Chile (Osomo)	C-66



Table 6.13 Order SILURIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup> NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Trichomycterus auroguttatus</i>			54	42M + 10SM + 2ST	106	108			ACN=56	Brazil (MG)	S-109
<i>Trichomycterus chiltoni</i>			52	44 M/SM + 8 ST/A	96					(Chile)	A-127
<i>Trichomycterus davisi</i>		F, M	54	40M + 12SM + 2ST	106	108	2		ACN=58	Brazil (Iguaçu R.)	B-67, B-79, B-80
<i>Trichomycterus davisi</i>			55	41M + 12SM + 2ST	108	110			ACN=58	Brazil (Iguaçu R.)	B-79
<i>Trichomycterus davisi</i>			56	40M + 12SM + 2ST + 2A	108	110			ACN=58	Brazil (Iguaçu R.)	B-79
<i>Trichomycterus davisi</i>			54	42M + 10SM + 2ST	106	108			ACN=58	Brazil (PR)	S-109
<i>Trichomycterus davisi</i>		M	81	60M + 18SM + 3ST	159	162	3		3X	Brazil (PR)	B-67
<i>Trichomycterus cf. iheringi</i>		F, M	54					2.3 FD		Brazil (SP)	F-64
<i>Trichomycterus aff. itatuyae</i>			54	42M + 10SM + 2ST	106	108			ACN=58	Brazil (PR)	S-109
<i>Trichomycterus laucaensis</i>			58	42 M/SM + 16 ST/A	100					(Chile)	A-127, B-80
<i>Trichomycterus laucaensis</i>			62	62 M/SM/ST		124				Chile	B-80
<i>Trichomycterus paolence</i>		F, M	54	46M + 6SM + 2ST	106	108	2			Brazil (Itatinga, SP)	T-48, T-69
<i>Trichomycterus paolence</i>			54	46M + 6SM + 2ST	106	108			1B	Brazil (Itatinga, SP)	T-48
<i>Trichomycterus paolence</i>			55	46M + 6SM + 3ST	107	110				Brazil (Itatinga, SP)	T-48
<i>Trichomycterus paolence</i>			56	46M + 6SM + 4ST	108	112			1B	Brazil (Itatinga, SP)	T-48
<i>Trichomycterus paolence</i>			54	44M + 8SM + 2ST	106	108	2		ACN=56	Brazil (Botucatu, SP)	T-69
<i>Trichomycterus paolence</i>	cytotype A		54	40M + 14SM	108	108	2		ACN=56	Brazil (Bofete, SP)	T-69
<i>Trichomycterus reinhardtii</i>	cytotype B		54	42M + 10SM + 2ST	106	108			ACN=56	Brazil (MG)	S-109
<i>Trichomycterus spegazzinii</i>			54	54 M/SM	108	108				Argentina	F-20
<i>Trichomycterus stawiariski</i>			54	42M + 8SM + 4ST	104	108			ACN=58	Brazil (Iguaçu R.)	B-80
<i>Trichomycterus sp.</i>			54	42M + 10SM + 2ST	106	108			ACN=58	Brazil (Iguaçu R.)	B-80
<i>Trichomycterus sp.</i>			54					2.6 FD		Brazil	L-51, F-64
<i>Trichomycterus sp. B</i>		F, M	54	42M + 8SM + 4ST	104	108			0-2 B	Brazil (PR)	C-98
<i>Vandellia cirrhosa</i>			32							(S. America)	L-51

Table 6.14 Order GYMNOTIFORMES

A		B		C		D		E		F		G		H		I		J		K		L		
Current scientific name of taxon		Reported in		Sex		2h		Karyotype		NF <sub>1</sub>		NF <sub>2</sub>		Ag-		Genome size		Comments		Locality		Reference		
Suborder/family/subfamily/species		karyotype paper												NORs		(pg/cell)								
Suborder Gymnotoidei																								
Gymnotidae																								
<i>Electrophorus</i>	<i>electricus</i>					52	42 M/SM + 10A			94														
<i>Gymnotus</i>	<i>carapo</i>					54	54 M/SM			108	108								ACN=54		Brazil (AM, GO)		A-125	
<i>Gymnotus</i>	<i>carapo</i>					54	44M + 8SM + 2ST			106	108	2							ACN=54		Brazil (SP)		F-71, F-72	
<i>Gymnotus</i>	<i>carapo</i>					54	52 M/SM + 2 ST/A			106									X <sub>1</sub> X <sub>2</sub> Y		Brazil (PR)		A-125	
<i>Gymnotus</i>	<i>carapo</i>			F, M		54	54 M/SM			108	108	2							ACN=54		Brazil (SP)		F-34	
<i>Gymnotus</i>	<i>carapo</i>			F, M		52	50 M/SM + 2 ST/A			102		2									Brazil (SP)		F-34	
<i>Gymnotus</i>	<i>carapo</i>					48	34 M/SM + 14 ST/A			82											Brazil (AM)		F-34	
<i>Gymnotus</i>	<i>carapo</i>			F, M		42	32 M/SM + 10 ST/A			74											Brazil (PA)		F-34	
<i>Gymnotus</i>	<i>carapo</i>					40	36 M/SM + 4 ST/A			76											Brazil (PR)		A-125	
<i>Gymnotus</i>	<i>carapo</i>					54	54 M/SM			108	108	2							ACN=54		Argentina		F-20	
<i>Gymnotus</i>	<i>carapo</i>					38															(S. America)		H-13	
<i>Gymnotus</i>	<i>carapo</i>					81	78 M/SM + 3 ST/A			159									3X		Brazil (SP)		A-125	
<i>Gymnotus</i>	<i>inaequilabiatus</i>					52	40M + 10SM + 2 ST/A			102		2							ACN=52		Brazil (SP)		F-71, F-72	
<i>Gymnotus</i>	<i>pantanal</i>					40	14 M/SM + 26 ST/A			54											Brazil (Pantanal)		A-125	
<i>Gymnotus</i>	<i>pantherinus</i>					52	38M + 8SM + 6 ST/A			98											East basin		A-125	
<i>Gymnotus</i>	<i>pantherinus</i>					52	38M + 8SM + 6 ST/A			98		2									Brazil (SP)		F-71, F-72	
<i>Gymnotus</i>	<i>paraguensis</i>			F, M		54	50 M/SM + 4 ST/A			104		3							ACN=54		Brazil (MG)		V-85	
<i>Gymnotus</i>	<i>sylvius</i>					40	30 M/SM + 10 ST/A			70		2									Brazil		A-15	
<i>Gymnotus</i>	<i>sylvius</i>					40	30 M/SM + 10 ST/A			70											Parana River		A-125	
<i>Gymnotus</i>	<i>sylvius</i>					40	30 M/SM + 10 ST/A			70											Brazil (SP)		A-125	
<i>Gymnotus</i>	<i>sylvius</i>					40	30 M/SM + 10 ST/A			70											Brazil (SP)		F-71, F-72	
<i>Gymnotus</i>	<i>sylvius</i>			F, M		40	28M + 10SM + 2 ST/A			78		2							ACN=50		Brazil (MG)		V-85	
<i>Gymnotus</i>	<i>sylvius</i>					40	36 M/SM + 4 ST/A			76		2									Brazil (MG)		V-85	
<i>Gymnotus</i>	sp.			M		50	26 M/SM + 24 ST/A			76		2							ACN=52		Brazil (MG)		V-85	
<i>Gymnotus</i>	sp.			F		52	50 M/SM + 2 ST/A			102											Brazil (SP)		F-34	
<i>Gymnotus</i>	sp.			F		40	14 M/SM + 26 ST/A			54									X <sub>1</sub> X <sub>1</sub> X <sub>2</sub> X <sub>2</sub>		Brazil (PR)		A-125	
<i>Gymnotus</i>	sp.			M		39	14 M/SM + 25 ST/A			53									X <sub>1</sub> X <sub>2</sub> Y		Brazil (PR)		A-125	
<i>Gymnotus</i>	sp.			F		40	14 M/SM + 26 ST/A			54		2							X <sub>1</sub> X <sub>1</sub> X <sub>2</sub> X <sub>2</sub>		Argentina		S-155	
<i>Gymnotus</i>	sp.			M		39	15 M/SM + 24 ST/A			54		2							X <sub>1</sub> X <sub>2</sub> Y		Argentina		S-155	

Table 6.14 Order GYMNOTIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Suborder/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup> NORs	Genome size (pg/cell)	Comments	Locality	Reference
<b>Suborder Sternopygoidei</b>											
<b>Apterodontidae</b>											
<i>Apterodontus albifrons</i>		F, M	24	14M + 2SM + 2ST + 6A	40	42				(Brazil)	H-29
<i>Apterodontus albifrons</i>			24	14M + 2SM + 2ST + 6A	40	42			0-4 B	Brazil (PR)	C-98
<i>Apterodontus albifrons</i>		F, M	24	12M + 4SM + 2ST + 6A	40	42	2			Brazil (PA)	A-18
<i>Apterodontus albifrons</i>			22					1.4 BFA		(Brazil)	H-13
<i>Apterodontus</i> sp.			52	46 M/SM + 6 ST/A	98					Brazil (SP)	A-125
<i>Parapterodontus bonapartii</i>	<i>Apterodontus anas</i>		52	30M + 12SM + 10A	94					Brazil (Manaus)	A-125
<i>Parapterodontus hasemani</i>	<i>Apterodontus</i>		52	26M + 16SM + 10A	94					Brazil (Manaus)	A-125
<b>Hypopomidae</b>											
<i>Brachyhypopomus brevirostris</i>			36	4M + 2SM + 8ST + 22A	42	50				Brazil (AM)	A-125
<i>Brachyhypopomus pinnicaudatus</i>		F	42	42A	42	42			X <sub>1</sub> X <sub>1</sub> X <sub>2</sub> X <sub>2</sub>	Brazil (SP)	A-113
<i>Brachyhypopomus pinnicaudatus</i>		M	41	1M + 40A	42	42			X <sub>1</sub> X <sub>2</sub> Y, ACN=42	Brazil (SP)	A-113
<i>Hypopomus artedi</i>			38	32 M/SM + 6 ST/A	70					Brazil (AM)	A-125
<i>Hypopogys lepturus</i>			50	16M + 20SM + 10ST + 4A	86	96				Brazil (PA)	A-125
<b>Rhamphichthyidae</b>											
<i>Rhamphichthys</i> cf. <i>marmoratus</i>			52	38M + 10SM + 4ST	100	104				Brazil (AM)	A-125
<b>Sternopygidae</b>											
<i>Eigenmannia humboldtii</i>			40	8 M/SM + 32 ST/A	48					Brazil (PR)	A-125
<i>Eigenmannia virescens</i>			40							Argentina	F-20
<i>Eigenmannia virescens</i>		F, M	38	16 M/SM + 22 ST/A	54		2		no sex chrom.	Brazil (SP)	A-114
<i>Eigenmannia virescens</i>		F	38	16 M/SM + 22 ST/A	54		2		XX, ACN=44	Brazil (SP)	A-114
<i>Eigenmannia virescens</i>		M	38	16 M/SM + 22 ST/A	54		2		XY, ACN=44	Brazil (SP)	A-114
<i>Eigenmannia virescens</i>		F	38	23 M/SM + 15 ST/A	61		2		ZW, ACN=44	Brazil (MG)	A-115
<i>Eigenmannia virescens</i>		M	38	22 M/SM + 16 ST/A	60		2		ZZ, ACN=44	Brazil (MG)	A-115
<i>Eigenmannia virescens</i>		F	38	15 M/SM + 23 ST/A	53		2		ZW, ACN=44	Brazil (PA)	A-115, S-206
<i>Eigenmannia virescens</i>		M	38	14 M/SM + 24 ST/A	52		2		ZZ, ACN=44	Brazil (PA)	A-115, S-206
<i>Eigenmannia</i> sp.		F	31	13 M/SM + 18 ST/A	44		2		ACN=32	Brazil (PA)	A-19
<i>Eigenmannia</i> sp.		F, M	32	12 M/SM + 20 ST/A	44		2		ACN=32	Brazil (PA)	A-19
<i>Eigenmannia</i> sp.			46	20 M/SM + 26 ST/A	66		3		3X	Brazil (PA)	A-19
<i>Eigenmannia</i> sp.		F	30	6M + 24 ST/A	36		2			Brazil (PA)	M-169
<i>Eigenmannia</i> sp.		M	29	7 M/SM + 22 ST/A	36					Brazil (PA)	A-125
<i>Eigenmannia</i> sp.	cytotype A		36	14 M/SM + 22ST/A	50		2			Brazil (SP)	M-169

Table 6.14 Order GYMNOTIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup>	Genome size	Comments	Locality	Reference
Suborder/family/subfamily/species	karyotype paper						NORs	(pg/cell)			
<i>Eigenmannia</i> sp.	cytotype B		36	8 M/SM + 28 ST/A	44		2			Brazil (SP)	M-169
<i>Eigenmannia</i> sp.	cytotype C		36	16 M/SM + 20 ST/A	52		2		ACN=44	Brazil (MG)	M-169
<i>Eigenmannia</i> sp.			34	24 M/SM + 10 ST/A	58		2		ACN=44	Brazil (MG)	M-169
<i>Eigenmannia</i> sp.			34					2.0 BFA		(S. America)	H-13
<i>Eigenmannia</i> sp. 1		F, M	28	14 M/SM + 14 ST/A	42		2		ACN=32	Brazil (SP)	A-125, A-131
<i>Eigenmannia</i> sp. 2		F	32	8 M/SM + 24A	40	40	2		X <sub>1</sub> X <sub>1</sub> X <sub>2</sub> X <sub>2</sub>	Brazil (SP)	A-116, A-130
<i>Eigenmannia</i> sp. 2		M	31	9 M/SM + 22A	40	40	2		X <sub>1</sub> X <sub>2</sub> Y, ACN=44	Brazil (SP)	A-116, A-130
<i>Sternopygus macrurus</i>		M	46	30M + 16SM	92	92	2		ACN=46	Brazil (AM)	A-21
<i>Sternopygus macrurus</i>		F	46	32M + 14SM	92	92	2		ACN=46	Brazil (MG)	A-21
<i>Sternopygus macrurus</i>		F, M	46	28M + 18SM	92	92	2		ACN=46	Brazil (SP)	A-21
<i>Sternopygus macrurus</i>			48					2.0 BFA		(S. America)	H-13

Table 6.15 Order ARGENTINIFORMES

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup>	Genome size	Comments	Locality	Reference
Family/subfamily/species	karyotype paper						NORs	(pg/cell)			
<b>Argentinidae</b>											
<i>Argentina silus</i>		M	44	17 M/SM + 27A	61	61		1.7 FD	ACN=47	(N. Atlantic)	E-2
<b>Microstomatidae (= Bathylagidae)</b>											
<b>Bathylaginae</b>											
<i>Bathylagoides wesethi</i>	<i>Bathylagus</i>	F	36	20M + 14SM + 2 satellited chrom.					XX	USA (off CA)	C-46, C-48
<i>Bathylagoides wesethi</i>	<i>Bathylagus</i>	M	36	19M + 14SM + 1A + 2 satellited chrom.				3.5 FD	XY	USA (off CA)	C-45, C-48, E-2
<i>Leuroglossus stibius</i>	<i>Bathylagus</i>	M	62	14M + 9SM + 1A + 2 satellited chrom. + 36 MC				3.4 FD	XY	USA (off CA)	C-46, C-48, E-2
<i>Lipolagus ochotensis</i>	<i>Bathylagus</i>	M	54	9M + 2SM + 43A	65				XY, ACN=60	USA (off CA)	C-46, C-48, E-2
<i>Pseudobathylagus milleri</i>	<i>Bathylagus</i>	F	60	12M + 4SM + 2A + 2 satellited chrom. + 40 MC				6.3 FD	XX	USA (off CA)	E-2, E-6, C-46
<i>Pseudobathylagus milleri</i>	<i>Bathylagus</i>	M	60	11M + 4SM + 2A + 2 satellited chrom + 41 MC					XY	USA (off CA)	C-48

Table 6.16 Order OSMERIFORMES

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup>	Genome size	Comments	Locality	Reference
Family/subfamily/species	karyotype paper						NORs	(pg/cell)			
<b>Galaxiidae</b>											
<i>Brachygalaxias bullocki</i>		F, M	38	10M + 16SM + 12A	64	64			ACN=44	Chile	C-5
<i>Brachygalaxias bullocki</i>		F, M	40	18M + 8SM + 14 ST/A	66		4			Chile	C-82
<i>Brachygalaxias gothi</i>		F, M	40	12M + 6SM + 22 ST/A	58					Chile	C-82
<i>Galaxias auratus</i>		F, M	32	10M + 2SM + 6ST + 14A	44	50			ACN=44	Tasmania	J-14
<i>Galaxias brevipinnis</i>		F, M	44	6M + 8SM + 2ST + 28A	58	60			ACN=44	Tasmania	J-14
<i>Galaxias fontanus</i>		F, M	44	10M + 8SM + 12ST + 14A	62	74			ACN=44	Tasmania	J-14
<i>Galaxias johnstoni</i>		F, M	44	4M + 10SM + 8ST + 22A	58	66			ACN=44	Tasmania	J-14
<i>Galaxias maculatus</i>		F, M	22	8M + 12SM + 2A	42	42			ACN=44	Chile, Australia	C-5
<i>Galaxias maculatus</i>		F, M	22	8M + 10SM + 4ST	40	44			ACN=44	New Zealand	M-62
<i>Galaxias maculatus</i>		F, M	22	18M + 4SM	44	44		(2.1* FD)	ACN=44	Tasmania	J-14, J-17
<i>Galaxias platei</i>		F	30	2M + 16SM + 12A	48	48			Sex chrom.	Chile	C-5
<i>Galaxias platei</i>		M	30	1M + 18SM + 11A	49	49		(1.8* FD)	Y chrom., ACN=42	Chile	C-5, J-18
<i>Galaxias tanycephalus</i>		F, M	32	10M + 2SM + 4ST + 16A	44	48			ACN=44	Tasmania	J-14
<i>Galaxias truttaceus</i>		F, M	32	10M + 2SM + 2ST + 18A	44	46			ACN=44	Tasmania	J-14
<b>Osmeridae</b>											
<b>Hypomesinae</b>											
<i>Hypomesus olidus</i>			56	22 M/SM + 34 ST/A	78					Russia	V-72
<i>Hypomesus olidus</i>			56	4M + 12SM + 40A	72	72				China	Z-23
<i>Hypomesus pretiosus</i>			50±					1.5 FD	Figure absent	USA	O-8, O-11
<i>Hypomesus transpacificus nipponensis</i>		F, M	56	26SM + 30A	82	82	2		ACN=56	Japan (Shimane)	K-69
<b>Osmerinae</b>											
<i>Mallotus villosus</i>		F, M	54	26 M/SM + 28 ST/A	80				ACN=56	Barents Sea	G-89
<i>Osmerus eperlanus</i>			54	16 M/SM + 38 ST/A	70			(1.2 FCM)	ACN=56	Sweden	N-42, V-86
<i>Osmerus eperlanus</i>		F, M	56	10M + 18SM + 28 ST/A	84		2		ACN=56	Poland (Lake Galadus)	O-77
<i>Osmerus eperlanus</i>			56		68			1.7 FD	Figure absent	Russia (White Sea)	L-88
<i>Spirinchus starksi</i>			50±							USA	O-8, O-11
<b>Plecoglossinae</b>											
<i>Plecoglossus altivelis</i>			56	12 M/SM/ST + 44A		68			ACN=56	Japan (Lake Biwa)	Y-8
<b>Salanginae</b>											
<i>Neosalanx tshuensis</i>			56	50M + 6SM	112	112			ACN=56	China (Lake Taihu)	S-121
<i>Salangichthys microdon</i>			56							Japan	N-37

Table 6.17 Order SALMONIFORMES

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag-	Genome size	Comments	Locality	Reference
Family/ subfamily/ species	karyotype paper						NORs	(pg/cell)			
<b>Salmonidae</b>											
<b>Coregoninae</b>											
<i>Coregonus albus</i>		M	80	14M + 2SM + 64 ST/A	96					Sweden	N-41, V-41
<i>Coregonus albus</i>			81	14M + 2SM + 4ST + 61A	97	101	4		0-2 B	Finland	J-3
<i>Coregonus albus</i>			80	14M + 2SM + 4ST + 60A	96	100			ACN=100	Finland	J-3
<i>Coregonus artedii</i>			80	14M + 2SM + 4ST + 60A	96	100			ACN=100	USA (Lake Huron)	P-33
<i>Coregonus artedii</i>			80	16M + 10SM + 54A	106	106		6.5 FD		USA (Lake Superior)	B-43
<i>Coregonus autumnalis</i>			78-80		96-98			6.0, 6.4 FCM		Europe, N. America	P-34
<i>Coregonus chadary</i>			80-84		98-100					Russia	P-34
<i>Coregonus clupeaformis</i>			80	20M + 8SM + 52A	108	108		6.9 FD		USA (Lake Superior)	B-43
<i>Coregonus clupeaformis</i>			80	20 M/SM + 60A	100	100	2	(4.9 FIA)	ACN=100	Canada (Ontario)	P-31, P-33, H-41
<i>Coregonus hoyi</i>			80	10M + 8SM + 62A	98	98		5.5 FD		USA (Lake Superior)	B-43
<i>Coregonus hoyi</i>			80	14M + 2SM + 4ST + 60A	96	100			ACN=100	USA (Lake Michigan)	P-33
<i>Coregonus lavaretus</i>			80	12 M/SM + 68 ST/A	92				ACN=100?	Sweden	N-45
<i>Coregonus lavaretus</i>		M	80	18 M/SM + 62 ST/A	98					Sweden	N-45
<i>Coregonus lavaretus ludoga</i>			80	22M + 58 ST/A	102					Russia (Siberia)	V-43
<i>Coregonus lavaretus maraenoides</i>			80	22M + 58 ST/A	102					Russia (Siberia)	V-43
<i>Coregonus muksun</i>			78		100					Russia	P-34
<i>Coregonus nasus</i>			80	10 M/SM + 2ST + 68A	90	92			ACN=100	Sweden	N-45
<i>Coregonus nasus</i>			60	30M + 8SM + 22 ST/A	98			(7.1 FCM)	3B, ACN=100	Russia (Anadyr River)	F-41, L-34
<i>Coregonus nasus</i>			58-60	22-24 M + 10SM + 24-28 ST/A	92					Russia (E. Siberia Sea)	V-42
<i>Coregonus nigripinnis</i>			80	14M + 2SM + 4ST + 60A	96	100			ACN=98	Canada (Lake Nipigon)	P-33
<i>Coregonus peled</i>			80	12 M/SM + 68 ST/A	92					Sweden	N-45
<i>Coregonus peled</i>			80	18 M/SM/ST + 62A		98			ACN=100	Sweden	N-45
<i>Coregonus peled</i>			74	22 S/SM + 52 ST/A	96					Russia	V-43
<i>Coregonus peled</i>			76							(Europe)	J-4
<i>Coregonus pidschian</i>		M	80	18 M/SM + 62 ST/A	98				ACN=100	Sweden	N-45
<i>Coregonus pidschian</i>	<i>lavaretus pidschian</i>		80	22M + 58 ST/A	102					Russia (Siberia)	V-43
<i>Coregonus pidschian</i>	<i>lavaretus pidschian</i>		80-82	12-14 M + 8SM + 62-58 ST/A	102					Russia (E. Siberia Sea)	V-42
<i>Coregonus reighardi</i>			80	12M + 12SM + 56A	104	104		6.0 FD		USA (Lake Huron)	B-43
<i>Coregonus sardinella</i>		F	80	8M + 10SM + 62 ST/A	98				XX, 1-6 B	Russia (Anadyr River)	F-45
<i>Coregonus sardinella</i>		M	81	9M + 10SM + 62 ST/A	100				XY <sub>1</sub> Y <sub>2</sub> , 1-6 B	Russia (Anadyr River)	F-42, F-45
<i>Coregonus tugun</i>			86	12M + 8SM + 66A	106	106			ACN=100	Russia (Siberia)	V-43
<i>Coregonus ussuriensis</i>			80	20 M/SM + 60 ST/A	100				ACN=100	Russia	V-43
<i>Coregonus ussuriensis</i>			80-82	10-12 M + 8SM + 64-60 A	100					Russia (Far East)	V-41

Table 6.17 Order SALMONIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup>	Genome size	Comments	Locality	Reference
Family/subfamily/species	karyotype paper						NORs	(pg/cell)			
<i>Coregonus widegreni</i>	<i>lavaretus baeri</i>		80	12M + 4SM + 64 ST/A	96					Russia	V-41
<i>Coregonus zenithicus</i>			80	10M + 8SM + 62A	98	98		5.3 FD		USA (Lake Superior)	B-43
<i>Coregonus zenithicus</i>			80	14M + 2SM + 4ST + 60A	96	100	2		ACN=98	Canada (Lake Nipigon)	P-33
<i>Coregonus</i> sp.			80	12M + 6SM + 62A	98	98			ACN=98	Russia (Anadyr R.)	V-43
<i>Coregonus</i> sp.		F, M	80	14M + 16 SM/ST + 50A		110	5		ACN=99	Italy (Bolsena)	S-89
<i>Coregonus</i> sp.		F, M	80	14M + 15 SM/ST + 51A		109	3		ACN=99	Italy (Bracciano)	S-89
<i>Prosopium abyssicola</i>			72	12M + 16SM + 44A	100	100				USA (Bear Lake)	B-44
<i>Prosopium coulteri</i>			82	10M + 8SM + 64A	100	100		5.1 FD	ACN=100?	USA (Lake Superior)	B-43
<i>Prosopium cylindraceum</i>			78	12M + 10SM + 56A	100	100		5.0 FD, 4.0 FIA		USA (Lake Superior)	B-43, H-41
<i>Prosopium gemmifer</i>	<i>gemmiferum</i>		64	24M + 12SM + 28A	100	100				USA (Bear Lake)	B-44
<i>Prosopium spilonotus</i>			74	12M + 14SM + 48A	100	100				USA (Bear Lake)	B-44
<i>Prosopium williamsoni</i>			78	8M + 14SM + 56A	100	100				USA	B-44
<i>Stenodus leucichthys</i>			74	20M + 14SM + 40A	108	108		(6.5 FD)		USA (AK)	B-45, B-43
<i>Stenodus leucichthys nelma</i>			76	22 M/SM/ST + 54A	98	98			ACN=100	Russia (Anadyr R.)	F-46
<b>Thymallinae</b>											
<i>Thymallus arcticus</i>			100	58 SM/M + 10ST + 32A	158	168		(3.9-4.0 FIA)	ACN=102	Russia (upper Ob R.)	S-44, H-40
<i>Thymallus arcticus</i>			102	56 SM/M + 10ST + 36A	158	168			ACN=102	Russia (upper Ob R.)	S-44
<i>Thymallus arcticus</i>			98	52 M/SM + 10ST + 36A	150	160				Russia (lower Ob R.)	S-44
<i>Thymallus grubei</i>			98-100	46-50 M/SM + 10-18 ST + 34-44A					ACN=100?	Russia (Far East)	M-16
<i>Thymallus grubei</i>			98	32M + 18SM + 14ST + 34A	148	162				Russia (Far East)	M-16
<i>Thymallus thymallus</i>			102	68 M/SM + 34A	170	170		(4.3 FCM)	ACN=102	Russia (Sylva R.)	S-43, V-86
<i>Thymallus thymallus</i>			104	66 M/SM + 38A	170	170				Russia (Sylva R.)	S-43
<i>Thymallus thymallus</i>			102	58 M/SM + 10ST + 34A	160	170			short-cycle type	Russia (Kama basin)	S-45
<i>Thymallus thymallus</i>			102	58 M/SM + 10ST + 34A	160	170			middle-cycle type	Russia (Kama basin)	S-45
<i>Thymallus thymallus</i>			104	56 M/SM + 10ST + 38A	160	170			long-cycle type	Russia (Kama basin)	S-45
<i>Thymallus thymallus</i>		M	102	68 M/SM/ST + 34A	170	170				Sweden	N-41
<i>Thymallus thymallus</i>							2			Europe	K-2
<i>Thymallus thymallus</i>							1-4			Poland	J-5
<b>Salmoninae</b>											
<i>Brachymystax lenok</i>			92	16M + 12SM + 64 ST/A	120				ACN=100	Russia	V-44
<i>Brachymystax lenok</i>		F, M	90	26 M/SM + 64 ST/A	116				ACN=100	Korea	K-3
<i>Hucho hucho</i>			82	26M + 6SM + 12ST + 38A	114	126			ACN=100	former Yugoslavia	R-5
<i>Hucho hucho</i>			82	26M + 4SM + 12ST + 40A	112	124			ACN=100	Slovakia	R-5
<i>Hucho taimen</i>			84	20M + 12SM + 52 ST/A	116				ACN=100	Russia	V-44
<i>Hucho taimen</i>			82	22M + 8SM + 12ST + 40A	112	124				Russia (Amur R.)	F-50

Table 6.17 Order SALMONIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup> NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Hucho taimen</i>			83	22M + 7SM + 12ST + 42A	112	124				Russia (Amur R.)	F-50
<i>Parahucho perryi</i>			62	42 M/SM + 4ST + 16A	104	108	2		ACN=102	Japan (Hokkaido)	C-38, U-72
<i>Parahucho perryi</i>			62	38 M/SM + 8ST + 16A	100	108				Russia	V-72
<i>Oncorhynchus aguabonita</i>	<i>Salmo</i>		58	44M + 2SM + 2ST + 10A	104	106		5.0* FCM	ACN=102	USA (CA)	M-71, G-25, J-15
<i>Oncorhynchus apache</i>	<i>Salmo</i>		56	50 M/SM + 6 ST/A	106				ACN=102	USA (AZ)	M-71, G-26
<i>Oncorhynchus chrysogaster</i>	<i>Salmo</i>		60		102					Mexico	P-34
<i>Oncorhynchus clarkii alvordensis</i>	<i>Salmo</i>		64	40 M/SM + 24 ST/A	104					USA (OR)	G-26
<i>Oncorhynchus clarkii bouvieri</i>	<i>Salmo</i>		64	38M + 2SM + 24A	104	104		5.0* FCM		USA (WY)	L-70, J-15
<i>Oncorhynchus clarkii clarki</i>	<i>Salmo</i>		68	36 M/SM + 32 ST/A	104			(5.2* FCM)	ACN=100	USA (CA)	G-26, G-97, J-15
<i>Oncorhynchus clarkii clarki</i>	<i>Salmo</i>		70	36 M/SM + 34 ST/A	106		2			USA (WA)	G-26, P-31
<i>Oncorhynchus clarkii clarki</i>	<i>Salmo</i>		64	40 M/SM + 24 ST/A	104				ACN=100	USA (CA)	G-26, G-97
<i>Oncorhynchus clarkii clarki</i>	<i>Salmo</i>		64	42 M/SM + 22 ST/A	106				ACN=100	USA (NV)	G-26
<i>Oncorhynchus clarkii clarki</i>	<i>Salmo</i>		66	34M + 4SM + 12ST + 16A	104	116			ACN=100	USA (MT)	L-70
<i>Oncorhynchus clarkii clarki</i>	<i>Salmo</i>		64	42 M/SM + 22 ST/A	106					USA (MT, WY)	G-26
<i>Oncorhynchus clarkii subsp.</i>	<i>Salmo</i>		64	42 M/SM + 22 ST/A	106					USA (NV)	G-26, M-71
<i>Oncorhynchus gilae</i>	<i>Salmo</i>		56	49 M/SM + 7A	105	105			ACN=100	USA (NM)	B-13
<i>Oncorhynchus gilae</i>	<i>Salmo</i>		56	48 M/SM + 8A	104	104				USA (NM)	B-13
<i>Oncorhynchus gorbuscha</i>		F, M	52	48 M/SM + 4ST	100	104	2	(5.1* FCM, 4.5 FD)	ACN=100	Japan (Hokkaido)	M-95, J-15, P-93
<i>Oncorhynchus gorbuscha</i>			52	52 M/SM	104	104			XX/XY	USA (AK)	S-71, P-62
<i>Oncorhynchus gorbuscha</i>			52		104					Russia (Kamchatka)	G-56
<i>Oncorhynchus keta</i>			74	26 M/SM + 6ST + 42A	100	106		(5.3* FCM, 5.5 FD)	ACN=100	Japan (Hokkaido)	S-14, J-15, O-33
<i>Oncorhynchus keta</i>			74	28 M/SM + 46 ST/A	102			(5.0 FIA)		Japan	U-72, H-41
<i>Oncorhynchus keta</i>			74	32 M/SM/ST + 42A		106			ACN=100	Japan (Hokkaido)	I-11
<i>Oncorhynchus keta</i>			74	28 M/SM + 46 ST/A	102		2		XX/XY	USA (WA)	S-71, P-31, P-62
<i>Oncorhynchus keta</i>			74	26M + 6SM + 42A	106	106				Russia (Kamchatka)	G-55
<i>Oncorhynchus kisutch</i>			60	48 M/SM + 12ST	108	120		(5.2* FCM, 6.1 FD)		Japan	U-72, J-15, O-8
<i>Oncorhynchus kisutch</i>			60	38M + 8SM + 14 ST/A	106					Korea?	K-118
<i>Oncorhynchus kisutch</i>			60	44M + 14-16 ST + 2-0 A	104	118-120			ACN=102	Russia (Kamchatka)	G-55
<i>Oncorhynchus kisutch</i>			60	34M + 8SM + 14ST + 4A	102	116			ACN=102	Russia (Pacific)	S-61
<i>Oncorhynchus kisutch</i>		F, M	60	38M + 12SM + 10 ST/A	110		2			USA	U-67, P-93
<i>Oncorhynchus kisutch</i>			60	52 M/SM + 8 ST/A	112		2			USA (WA)	S-71, P-31
<i>Oncorhynchus masou</i>	Sakuramasu		66	38 M/SM + 28 ST/A	104			(5.1* FCM, 4.1 FD)		Japan	U-72, J-15, O-8
<i>Oncorhynchus masou</i>			66	36 M/SM + 22ST + 8A	102	124	2		ACN=100	Japan (Hokkaido)	C-38
<i>Oncorhynchus masou</i>			66	34 M/SM + 32 ST/A	100					Russia	V-72
<i>Oncorhynchus masou ishikawae</i>	<i>rhodurus</i> var. <i>macrostomus</i>		66	34 M/SM + 24ST + 8A	100	124		5.9* FCM	ACN=100	Japan	M-95, O-48



Table 6.17 Order SALMONIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup> NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Oncorhynchus masou ishikawae</i>	<i>masou</i> , Amago		66	38 M/SM + 28 ST/A	104					Japan	U-72, F-52
<i>Oncorhynchus masou ishikawae</i>	<i>masou</i> var. <i>ishikawae</i>		66	34 M/SM + 24ST + 8A	100	124			ACN=100	Japan	M-95
<i>Oncorhynchus masou masou</i>	<i>masou</i> var. <i>masou</i>	F, M	66	34 M/SM + 24ST + 8A	100	124		6.6 FD	ACN=100	Japan	M-95, O-33
<i>Oncorhynchus masou</i> subsp. <i>rhodurus</i>	<i>rhodurus</i> var. <i>rhodurus</i>	F, M	66	34 M/SM + 24ST + 8A	100	124		4.3 FD	ACN=100	Japan	M-95, O-33
<i>Oncorhynchus masou</i> subsp.	Biwamasu		66							Japan	F-52
<i>Oncorhynchus mykiss</i>	<i>Parasalmo</i>		58	46M + 2ST + 10A	104	106		(5.2 FD)	XY, ACN=100	Russia (Kamchatka)	F-40, F-43, G-85
<i>Oncorhynchus mykiss</i>	<i>Salmo</i>		58	46 M/SM + 2ST + 10A	104	106		(5.2, 5.4 FCM)	ACN=100	Russia (Kamchatka)	G-58, V-86
<i>Oncorhynchus mykiss</i>	<i>Salmo</i>		60-62		104-108				diadromous	Russia (Kamchatka)	V-2
<i>Oncorhynchus mykiss</i>	<i>Salmo</i>		58-60		104				lacustrine	Russia (Kamchatka)	V-2
<i>Oncorhynchus mykiss</i>	<i>Salmo</i>		58	46M + 2ST + 10A	104	106				USA, Canada, Russia	O-64
<i>Oncorhynchus mykiss</i>	<i>Salmo</i>		60	44M + 4ST + 12A	104	108				USA (WA), Canada	O-64
<i>Oncorhynchus mykiss</i>	<i>Salmo</i> , Nijimasu		60							culture pond, Japan	F-52
<i>Oncorhynchus mykiss</i>	<i>Salmo gairdnerii</i>		64							Mexico	N-21
<i>Oncorhynchus mykiss</i>	<i>Salmo gairdnerii</i>		58-60		104		2	(4.9* FCM)		USA (AK-CA)	P-54, P-93, T-47, J-15
<i>Oncorhynchus mykiss</i>	<i>Salmo gairdnerii</i>		58		104					USA (AK, ID)	T-47, P-78
<i>Oncorhynchus mykiss</i>	<i>Salmo gairdnerii</i>		58-63		104					UK (Scotland)	H-6
<i>Oncorhynchus mykiss</i>	<i>Salmo gairdnerii</i>		60	44 M/SM + 16 ST/A	104			(4.8 FIA)		USA (MT)	M-71, G-26, H-41
<i>Oncorhynchus mykiss</i>	<i>Salmo gairdnerii</i>		58-60		104					USA (WA)	T-44
<i>Oncorhynchus mykiss</i>	<i>Salmo gairdnerii</i>	F, M	58	46M + 2ST + 10A	104	106			XX/XY	USA (WA)	T-45
<i>Oncorhynchus mykiss</i>	<i>Salmo gairdnerii</i>		60	44 M/SM + 2ST + 14A	104	106				USA (MI)	C-81
<i>Oncorhynchus mykiss</i>	<i>Salmo gairdnerii</i>		90	66 M/SM + 3ST + 21A	156	159			3X	USA (MI)	C-81
<i>Oncorhynchus mykiss</i>	<i>Salmo gairdnerii</i>	F, M	60	44 M/SM + 2ST + 14A	104	106	2		ACN=100	Japan	M-95, U-6
<i>Oncorhynchus mykiss</i>	<i>Salmo gairdnerii</i>	F, M	60	44 M/SM + 2ST + 14A	104	106	2		XX/XY, ACN=100	Japan	U-6
<i>Oncorhynchus mykiss</i>	<i>Salmo gairdnerii</i>	F, M	62	42 M/SM + 2ST + 18A	104	106	2		XX/XY, ACN=100	Japan (Tochigi)	U-6
<i>Oncorhynchus mykiss</i>	<i>Salmo gairdnerii</i>	F, M	61	43 M/SM + 1ST + 17A	104	105	2		XX/XY, ACN=100	Japan (Tochigi)	U-6
<i>Oncorhynchus mykiss</i>	<i>Salmo gairdnerii</i>		60	44 M/SM + 16 ST/A	104					Japan	U-78
<i>Oncorhynchus mykiss</i>	<i>Salmo gairdnerii</i>		60	44 M/SM + 16 ST/A	104				ACN=100	Croatia	A-26
<i>Oncorhynchus mykiss</i>	<i>Salmo gairdnerii</i>		62		104					Russia	V-2
<i>Oncorhynchus mykiss</i>	<i>Salmo gairdneri aquilarum</i>		58	46 M/SM + 2ST + 10A	104	106				USA (CA)	B-60
<i>Oncorhynchus mykiss irideus</i>	<i>Salmo irideus</i>		60	44 M/SM + 16A	104	104			ACN=100	Rumania (Carpathians)	R-35
<i>Oncorhynchus mykiss irideus</i>	<i>Salmo irideus</i>		62	44 M/SM + 18A	106	106			ACN=102	Rumania (Carpathians)	R-35
<i>Oncorhynchus mykiss irideus</i>	<i>Salmo irideus</i>		61	42 M/SM + 19A	103	103			ACN=101	Rumania (Carpathians)	R-35
<i>Oncorhynchus mykiss irideus</i>	<i>Salmo irideus</i>		58	42 M/SM + 16A	100	100				Rumania (Carpathians)	R-35
<i>Oncorhynchus mykiss</i>			58, 60							USA (CA, ID)	P-78
<i>Oncorhynchus mykiss</i>	PdD 66		58	46 M/SM + 2ST + 10A	104	106				former Czechoslovakia	F-28

Table 6.17 Order SALMONIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup>	Genome size (pg/cell)	Comments	Locality	Reference
Family/subfamily/species	karyotype paper						NORs				
<i>Oncorhynchus mykiss</i>	PoD 66		60	44 M/SM + 2ST + 14A	104	106				former Czechoslovakia	F-28
<i>Oncorhynchus nerka</i>			58	44M + 2SM + 12A	104	104		(6.1 FD)	ACN=102	Russia (Kamchatka)	G-55, O-33
<i>Oncorhynchus nerka</i>		F	58	44 M/SM + 2ST + 12A	102	104				Russia (Kamchatka)	S-60, S-61
<i>Oncorhynchus nerka</i>		M	57	45 M/SM + 2ST + 10A	102	104				Russia (Kamchatka)	S-60, S-61
<i>Oncorhynchus nerka</i>		F	58		104				Sex chrom.	Russia	F-44
<i>Oncorhynchus nerka</i>		M	57		104				Sex chrom.	Russia	F-44
<i>Oncorhynchus nerka</i>			56	46 M/SM + 10A	102	102				Canada (B.C.)	S-71
<i>Oncorhynchus nerka</i>		F	58	44 M/SM + 2ST + 12A	104	104	2	(5.5-5.9* FCM)	X <sub>1</sub> X <sub>2</sub> X <sub>2</sub>	USA (WA)	T-46, J-15, P-31, P-93
<i>Oncorhynchus nerka</i>		M	57	45 M/SM + 2ST + 10A	102	104			X <sub>1</sub> X <sub>2</sub> Y	USA (WA)	T-46
<i>Oncorhynchus nerka</i>	Himemasu	F	58	46 M/SM + 12A	104	104		(6.1 FD)	X <sub>1</sub> X <sub>2</sub> X <sub>2</sub>	Japan (Tochigi)	U-5, U-72, O-33
<i>Oncorhynchus nerka</i>	Himemasu	M	57	47 M/SM + 10A	104	104			X <sub>1</sub> X <sub>2</sub> Y	Japan (Tochigi)	U-5, U-72
<i>Oncorhynchus nerka</i>	Himemasu		58	44 M/SM + 2ST + 12A	102	104			ACN=102	Japan	S-14, M-95
<i>Oncorhynchus penshinensis</i>	<i>Salmo</i>	F, M	58	46 M/SM + 2ST + 10A	104	106			ACN=102	Russia (Kamchatka)	G-58
<i>Oncorhynchus tshawytscha</i>			68	32M + 4SM + 32A	104	104	2	(5.2* FCM, 4.9 FIA)	ACN=100	USA, E. Pacific	P-28, P-93, J-15, H-41
<i>Oncorhynchus tshawytscha</i>			68	36 M/SM + 32A	104	104				USA (WA)	S-71
<i>Oncorhynchus tshawytscha</i>		M	68	32 M/SM + 28ST + 8A	100	128			ACN=100	W. Pacific	M-95
<i>Oncorhynchus tshawytscha</i>			68			120				Russia (Kamchatka)	G-56
<i>Oncorhynchus sp.</i>	<i>Salmo</i>		58		104					USA (CA., OR)	G-26
<i>Salmo carpio</i>			80		98					Italy	P-34
<i>Salmo ischchan aestivalis</i>			82	18M + 64A	100	100			ACN=100	Armenia (Sevan basin)	D-22, R-98
<i>Salmo ischchan danilewskii</i>			82	16M + 66A	98	98			ACN=100	Armenia (Sevan basin)	D-22, R-98
<i>Salmo ischchan gegarkuni</i>			80	18M + 62A	98	98			ACN=100	Armenia (Sevan basin)	D-22, R-98
<i>Salmo ischchan ischchan</i>			80	16M + 64A	96	96			ACN=98	Armenia (Sevan basin)	D-22, R-98
<i>Salmo letnica</i>			80		104					Macedonia	P-34
<i>Salmo marmoratus</i>			80	22 M/SM + 58A	102	102			ACN=100	Croatia	A-26
<i>Salmo obtusirostris</i>	<i>Salmothymus o. oxyrhynchus</i>		82	12 M/SM + 70A	94	94			ACN=98	former Yugoslavia	B-18
<i>Salmo salar</i>			54	18 M/SM + 36A	72	72	2		ACN=92	Atlantic	U-73
<i>Salmo salar</i>		F, M	58	16 M/SM + 42A	74	74		(6.2 FCM)	ACN=98	Russia (Lake Onega)	Z-11, V-86
<i>Salmo salar</i>			56	14 M/SM + 42A	70	70			ACN=94	Russia (Lake Onega)	Z-11
<i>Salmo salar</i>			56	18 M/SM + 38A	74	74			ACN=98	Russia (White Sea basin)	Z-33
<i>Salmo salar</i>			57	16 M/SM + 41A	73	73			ACN=97	Russia (White Sea basin)	Z-33
<i>Salmo salar</i>			58	14M + 2SM + 42A	74	74			ACN=98	Russia (Lake Ladoga)	Z-10
<i>Salmo salar</i>			58	14 M/SM + 44A	72	72			ACN=98	Russia (Neva)	B-7, B-8
<i>Salmo salar</i>			58	16 M/SM + 42A	74	74			ACN=98	Russia (Neva)	B-7, B-8
<i>Salmo salar</i>			58	16 M/SM + 42A	74	74			ACN=98	Sweden	N-39, N-48

Table 6.17 Order SALMONIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup>	Genome size	Comments	Locality	Reference
Family/subfamily/species	karyotype paper						NORs	(pg/cell)			
<i>Salmo salar</i>			56	16 M/SM + 40A	72	72				Sweden	N-39
<i>Salmo salar</i>			58	10M + 6SM + 42A	74	74			ACN=98	Norway	B-42
<i>Salmo salar</i>			57-59							Norway	G-23
<i>Salmo salar</i>			58	16 M/SM + 42A	74	74		(6.0* FCM)	ACN=98	UK (Scotland)	H-7, J-15
<i>Salmo salar</i>			58	16M + 42 ST/A	74	74				UK (Scotland)	H-10
<i>Salmo salar</i>			57	17 M/SM + 40A	74	74			ACN=98	UK (Scotland)	H-7
<i>Salmo salar</i>			56	18 M/SM + 38A	74	74			ACN=98	UK (Scotland)	H-7
<i>Salmo salar</i>			58	16 M/SM + 42A	74	74				Canada (Chaleur Bay)	N-48
<i>Salmo salar</i>			56		72		2	(6.2-6.5 FIA)		Atlantic	P-31, P-54, H-40
<i>Salmo salar salar</i>			54-56								B-63
<i>Salmo salar salar</i>			54	18 M/SM + 36 ST/A	72	72					B-63
<i>Salmo salar salar</i>			56-57							(USA, Lake Sebago)	B-63
<i>Salmo salar salar sebago</i>			56	16 M/SM + 40 ST/A	72	72				(USA, Lake Sebago)	B-63
<i>Salmo trutta</i>			82	16M + 66A	98	98		(6.1 FCM)		Armenia (Marmarik R.)	R-99, V-86
<i>Salmo trutta</i>			84	16M + 68A	100	100		(5.9 FCM)	ACN=100	Armenia (Argichi R.)	R-99, T-73
<i>Salmo trutta</i>			80	14M + 8SM + 58A	102	102	2			Poland	W-29
<i>Salmo trutta</i>			77-82	20-25 M/SM + 52-62 ST/A	102	102				Germany	Z-14
<i>Salmo trutta</i>		F, M	80	20 M/SM + 60 ST/A	100	100			ACN=100	Sweden (Morrum)	N-44, N-51
<i>Salmo trutta</i>			80						migratory	Norway	G-23
<i>Salmo trutta</i>			80	22M/SM + 58A	102	102	4	(5.2* FCM)	ACN=100	UK (Scotland)	H-6, J-15
<i>Salmo trutta</i>			80	21M/SM + 59A	101	101				UK (Scotland)	H-6
<i>Salmo trutta</i>			78	20 M/SM + 58A	98	98				Armenia (Veda R.)	D-22
<i>Salmo trutta</i>		F	80	18 M/SM + 62 ST/A	98	98			ACN=100	Japan (Tochigi)	U-77
<i>Salmo trutta trutta fario</i>			80	24 M/SM + 56A	104	104		(6.3 FCM, 5.8 FD)	ACN=100	Rumania (Carpathians)	R-35, G-85
<i>Salmo trutta trutta fario</i>			80	22 M/SM/ST + 58A	102	102			ACN=100	Spain	M-81
<i>Salmo trutta trutta fario</i>			79	23 M/SM/ST + 56A	102	102			ACN=100	Spain	M-81
<i>Salmo trutta m. fario</i>			80	20 M/SM + 60 ST/A	100	100			ACN=100	Croatia	A-26
<i>Salmo trutta m. fario</i>			80	22 M/SM + 58 ST/A	102	102				Poland	W-28
<i>Salmo trutta m. trutta</i>			80	14M + 8SM + 58A	102	102	2		migratory	Poland	W-29
<i>Salmo trutta m. trutta</i>			80	14M + 8SM + 58A	102	102	2-3	(5.9 FCM, 5.5 FD)		Spain (Galicia)	M-40, M-137, G-85
<i>Salmo trutta m. trutta</i>			80	18 M/SM + 62 ST/A	98	98				Kyrgyzstan (Kyzylsu R.)	M-59
<i>Salvelinus albus</i>			78-80							Russia	P-34
<i>Salvelinus alpinus</i>			82-84	16-18 M/SM + 64-68 ST/A	100	100				Russia (Kamchatka)	V-74
<i>Salvelinus alpinus</i>			82	18 M/SM + 64 ST/A	100	100			ACN=98	Russia (Kamchatka)	V-74
<i>Salvelinus alpinus</i>			80	20 M/SM + 60 ST/A	100	100			ACN=98	Russia (Kamchatka)	V-74

Table 6.17 Order SALMONIFORMES (continued)

A		B		C		D		E		F		G		H		I		J		K		L	
Current scientific name of taxon		Reported in		Sex		2n		Karyotype		NF <sub>1</sub>		NF <sub>2</sub>		Ag <sup>-</sup>		Genome size (pg/cell)		Comments		Locality		Reference	
Family/subfamily/species		karyotype paper												NORs									
<i>Salvelinus alpinus</i>							78	20 M/SM + 58A		98	98		4-8	6.9 FD		ACN=98	UK (Scotland)					H-9, H-28	
<i>Salvelinus alpinus</i>							82							(5.8, 6.7 FIA)			(N. Europe)					P-54, P-93, H-41	
<i>Salvelinus alpinus</i>							78-80										Norway					G-23	
<i>Salvelinus boganiidae</i>				M			80	20 M/SM + 60 ST/A		100							Sweden					N-44	
<i>Salvelinus confluentus</i>							76-78										Russia (Lake Elgygytgyn)					P-34	
<i>Salvelinus elgyticus</i>				F, M			78	24 M/SM + 54 ST/A		102		2				ACN=98	USA (MT)					C-38	
<i>Salvelinus elgyticus</i>				F, M			78	18M + 2SM + 58 ST/A		98		2				ACN=96	Russia (Lake Elgygytgyn)					F-48	
<i>Salvelinus elgyticus</i>				F, M			77	19M + 2SM + 56 ST/A		98		2				ACN=96	Russia (Lake Elgygytgyn)					F-48	
<i>Salvelinus elgyticus</i>				M			76	20M + 2SM + 54 ST/A		98						ACN=96	Russia (Lake Elgygytgyn)					F-48	
<i>Salvelinus fontinalis</i>							84					8-12	(5.7* FCM)				USA					K-73, P-54, J-15	
<i>Salvelinus fontinalis</i>				F, M			84	18 M/SM + 66 ST/A		102				(6.5 FD)		ACN=98	Japan					U-2, O-33	
<i>Salvelinus fontinalis</i>				F, M			84	16 M/SM + 6ST + 62A		100	106						Japan					M-95	
<i>Salvelinus fontinalis</i>							84	16 M/SM + 68 ST/A		100				(6.5 FIA, 7.0 BFA)			N. America					U-67, B-63, H-39, H-40	
<i>Salvelinus kronocius</i>							78-82										Russia (Kamchatka)					P-34	
<i>Salvelinus leucomaenis</i>							84	16 M/SM + 2ST + 66A		100	102						Russia					V-72	
<i>Salvelinus leucomaenis</i>				F, M			84	14M + 4SM + 66 ST/A		102						ACN=98	Russia (Prymorye)					F-47	
<i>Salvelinus leucomaenis imbricus</i>							84	16 M/SM + 2 SM/ST + 66 ST/A	100/102								Japan (Hyogo)					U-72	
<i>Salvelinus leucomaenis imbricus</i>							84	16 M/SM + 68 ST/A		100		2				ACN=98	Japan (Shimane)					C-38	
<i>Salvelinus leucomaenis leucomaenis</i>				F, M			84	16 M/SM + 2ST + 66A		100	102			(7.5 FD)		ACN=98	Japan (Hokkaido)					A-2, U-72, O-33	
<i>Salvelinus leucomaenis leucomaenis</i>							84	16 M/SM + 2 SM/ST + 66 ST/A	100/102								Japan (Hokkaido)					U-72	
<i>Salvelinus leucomaenis leucomaenis</i>							84	16 M/SM + 68 ST/A		100		2				ACN=98	Japan (Hokkaido)					C-38	
<i>Salvelinus leucomaenis pluvius</i>				F, M			84	16 M/SM + 2 SM/ST + 66 ST/A	100/102								Japan (Tochigi)					U-72, U-77	
<i>Salvelinus leucomaenis pluvius</i>							84	16 M/SM + 68 ST/A		100		2				ACN=98	Japan (Toyama)					C-38	
<i>Salvelinus levanidovi</i>							78-80										Russia					P-34	
<i>Salvelinus malma</i>				F, M			82	14M + 4SM + 64 ST/A		100						ACN=98	Russia (Prymorye)					F-47	
<i>Salvelinus malma krascheninnikovi</i>							82	16 M/SM + 66 ST/A		98		2				ACN=98	Japan (Hokkaido)					C-38	
<i>Salvelinus malma lordi</i>							82	16 M/SM + 66 ST/A		98		2				ACN=98	USA (AK)					C-38, U-14	
<i>Salvelinus malma malma</i>				F, M			82	16 M/SM + 4ST + 62A		98	102					ACN=98	Japan (Hokkaido)					A-2, M-95	
<i>Salvelinus malma malma</i>				F, M			82	16 M/SM + 2 SM/ST + 64 ST/A	98/100							ACN=98	Japan (Hokkaido)					U-2, U-72	
<i>Salvelinus malma miyabei</i>							82	16 M/SM + 66 ST/A		98		2				ACN=98	Japan (Hokkaido)					C-38	
<i>Salvelinus malma miyabei</i>							82	18 M/SM + 64 ST/A		100						ACN=98	Japan (Hokkaido)					U-2, U-72	
<i>Salvelinus namaycush</i>							84	16 M/SM + 68 ST/A		100		8-12	5.7-6.3 FIA			XX,XY	N. America					B-63, P-34, P-54, H-40	
<i>Salvelinus taranetzi</i>							76-78			98-100							Russia					P-34	
<i>Salvelinus svetovidovi</i>				F, M			56	38M + 4SM + 14A		98	98					ACN=98	Russia (Lake Elgygytgyn)					F-49	

Table 6.18 Order ESOCIFORMES

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2h	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup> NORs	Genome size (pg/cell)	Comments	Locality	Reference
<b>Esocidae</b>											
<i>Esox a. americanus</i>			50	50A	50	50	2	2.4 FD	ACN=50	Canada, USA	B-12, R-115
<i>Esox a. vermiculatus</i>			50	50A	50	50	2	2.3 FD, 2.1 FIA	ACN=50	Canada (Ontario)	B-12, R-115, H-40
<i>Esox lucius</i>			50	50A	50	50		(2.3 FCM, 2.2 FIA)		USA	A-32, V-86, H-41
<i>Esox lucius</i>			50	50A	50	50	2	2.7 FD	ACN=50	Canada, UK	B-12, R-115
<i>Esox lucius</i>		M	50	50A	50	50			ACN=50	Sweden	N-40
<i>Esox masquinongy</i>			50	50A	50	50	2	2.6 FD	ACN=50	Canada (Ontario)	B-12
<i>Esox masquinongy</i>			50	50A	50	50	2	(1.8 FIA)		N. USA, Canada	R-115
<i>Esox niger</i>			50	50 ST/A	50					N. America	B-63, H-41
<i>Esox niger</i>			50		50	50	2			USA (NC)	R-115
<i>Esox niger</i>			50		50			2.4 FD	ACN=50	USA (NC)	B-12
<i>Esox reichertii</i>			50	50 ST/A	50			2.6 FD	ACN=50	Russia (Amur R.)	B-12, B-63
<b>Umbridae</b>											
<i>Dallia pectoralis</i>			78	18M/SM + 60 ST/A	96		2	2.5 FD		USA (AK)	B-12, R-115
<i>Novumbra hubbsi</i>		F, M	48	4M + 10SM + 14ST + 20A	62	76	4	2.1 FD	ACN=48	USA (WA)	B-12, C-80
<i>Umbrina krameri</i>			44	44A	44	44	2		ACN=44	Slovakia	R-2, R-12
<i>Umbrina limi</i>			22	22M	44	44		(5.0 FD, 5.1 FIA)	ACN=44	Canada (Ontario)	B-12, H-40
<i>Umbrina limi</i>			22	18M + 4SM	44	44	2	(5.4 BFA)		USA (NY)	K-72, K-73, H-13, H-26
<i>Umbrina pygmaea</i>			22	22M	44	44	2	4.8 FD	ACN=44	USA (NC)	B-12, R-115

Table 6.19 Order STOMIIFORMES

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2h	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup> NORs	Genome size (pg/cell)	Comments	Locality	Reference
<b>Suborder Gonostomatoidei</b>											
<b>Gonostomatidae</b>											
<i>Bonapartia pedaliota</i>			48*							Atlantic	P-46
<i>Gonostoma elongatum</i>			ca. 48*							Atlantic	P-46
<i>Sigmops bathyphilum</i>	<i>Gonostoma</i>		12*							Atlantic	P-46
<b>Sternoptychidae</b>											
<b>Sternoptychinae</b>											
<i>Argyropelecus affinis</i>	<i>pacificus</i>		50	20 M/SM + 28A + 2 satellited chrom.					ACN=52	USA (off CA)	C-46
<i>Argyropelecus hemigymnus</i>	<i>intermedius</i>		52	26M + 10SM + 10A + 6 satellited chrom.					ACN=52	USA (off CA)	C-46
<i>Argyropelecus lychmus</i>			48	20M + 10SM + 12A + 6 satellited chrom.					ACN=52	USA (off CA)	C-46
<i>Sternoptyx diaphana</i>		M	35	16M + 8SM + 5A + 6 satellited chrom.					XO	USA (off CA)	C-46, C-48

Table 6.20 Order AULOPIFORMES

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup>	Genome size (pg/cell)	Comments	Locality	Reference
Suborder/family/species	karyotype paper						NORs				
Suborder Synodontoidaei											
Synodontidae											
<i>Saurida</i>		F	48	47A + 1 MC	48	48			ZW	Japan (Yamaguchi)	N-35
<i>Saurida</i>		M	48	48A	48	48			ZZ, ACN=48	Japan (Yamaguchi)	N-35
<i>Saurida</i>		F	48	47A + 1 MC	48	48			ZW	Japan (Wakayama)	U-44
<i>Saurida</i>		M	48	48A	48	48		2.8* FCM	ZZ, ACN=48	Japan (Wakayama)	U-44
<i>Saurida</i>	<i>undosquamis</i> , Ma-eso	F	48	47A + 1 MC	48	48			ZW	Japan (Yamaguchi)	N-35
<i>Saurida</i>	<i>undosquamis</i> , Ma-eso	M	48	48A	48	48			ZZ, ACN=48	Japan (Yamaguchi)	N-35
<i>Synodus</i>			48	48A	48	48			ACN=48	Japan	I-21
<i>Synodus</i>		F	48	2ST + 45A + 1 MC	48	50	1		ZW	Japan (Wakayama)	U-44
<i>Synodus</i>		M	48	2ST + 46A	48	50		2.2* FCM	ZZ, ACN=48	Japan (Wakayama)	U-44
<i>Synodus</i>		F	48	28 M/SM + 20 ST/A	76			2.5 FD	ACN=48	USA (GA)	C-54, E-2
<i>Synodus</i>		F	48	47A + 1 MC	48	48	1		ZW	Japan (Wakayama)	U-44
<i>Synodus</i>		M	48	48A	48	48		2.9* FCM	ZZ, ACN=48	Japan (Wakayama)	U-44
<i>Trachinocephalus myops</i>		F	27	23M + 1ST + 2A + 1 MC	50	51	2		ZW, W <sub>2</sub>	Japan (Wakayama)	U-44
<i>Trachinocephalus myops</i>		M	26	24M + 2A	50	50		2.7* FCM	ZZ, ACN=48	Japan (Wakayama)	U-44
Suborder Chlorophthalmoidaei											
Chlorophthalmidae											
<i>Chlorophthalmus albatrossis</i>			36		48	48	2			Japan (Suruga Bay)	O-65
<i>Chlorophthalmus</i> sp.	<i>Bake-aome-eso</i>		24	24M	48	48			ACN=48	Japan	I-21

Table 6.21 Order MYCTOPHIFORMES

A Current scientific name of taxon Family/species	B Reported in karyotype paper		C Sex	D 2n	E Karyotype	F NF <sub>1</sub>	G NF <sub>2</sub>	H Ag <sup>-</sup> NORs	I Genome size (pg/cell)	J Comments	K Locality	L Reference
	M, F	48										
<b>Neoscolecidae</b>												
<i>Scopelengys tristis</i>			M, F	48	2SM + 46A	50	50	50	2.6 FD	ACN=48	USA (off CA)	C-54, E-2
<b>Myctophidae</b>												
<i>Bolinichthys photothorax</i>		<i>Lepidophanes</i>		48*							Atlantic	P-45
<i>Bolinichthys supralateralis</i>		<i>Lepidophanes</i>		48*							Atlantic	P-45
<i>Ceratoscopus townsendi</i>				48	48 ST/A	48				ACN=48	USA (off CA)	C-54
<i>Ceratoscopus warmingii</i>		<i>warmingii</i>		48*							Atlantic	P-45
<i>Diaphus brachycephalus</i>				48*							Atlantic	P-45
<i>Diaphus dumerilii</i>		<i>dumerilii</i>		48*							Atlantic	P-45
<i>Diaphus fragilis</i>				48*							Atlantic	P-45
<i>Diaphus rafinesquii</i>		<i>rafinesquii</i>		48*							Atlantic	P-45
<i>Diaphus theta</i>				48						ACN=48	USA (off CA)	C-54
<i>Electrona risso</i>		<i>rissoi</i>		48*							Atlantic	P-45
<i>Hygophum hygomi</i>		<i>hygomi</i>		48*							Atlantic	P-45
<i>Lampadena chavesi</i>				48*							Atlantic	P-45
<i>Lampadena urophaos</i>				44	44 ST/A	44				ACN=48	USA (off CA)	C-54
<i>Lepidophanes guentheri</i>				48*							Atlantic	P-45
<i>Lobianchia gemellani</i>				48*							Atlantic	P-45
<i>Myctophum nitidulum</i>				48							Atlantic	P-45
<i>Myctophum phengodes</i>		<i>Ctenoscopus</i>		48*						ACN=48	USA (off CA)	C-54
<i>Nannibrachium sp. "ater"</i>		<i>Lampanyctus</i>		48*							Atlantic	P-45
<i>Nannibrachium nigrum</i>		<i>Lampanyctus niger</i>		50*							Atlantic	P-45
<i>Nannibrachium regale</i>		<i>Lampanyctus regalis</i>	M	48	48A	48	48			ACN=48	USA (off CA)	C-54
<i>Nannibrachium ritteri</i>		<i>Lampanyctus</i>	F	48	48A	48	48		4.0 FD	XX, ACN=48	USA (off CA)	C-48, C-54, E-2
<i>Nannibrachium ritteri</i>		<i>Lampanyctus</i>	M	47	1SM + 46A	48	48		4.0 FD	XO, ACN=48	USA (off CA)	C-48, C-54, E-2
<i>Notoscopus resplendens</i>				48							Atlantic	P-45
<i>Parvilux ingens</i>			M	49	1 M/SM + 48 ST/A	50			(3.9 FD)		USA (off CA)	C-46, C-48, E-2
<i>Parvilux ingens</i>		<i>Lampanyctus</i>		50?							USA (off CA)	C-54
<i>Protomyctophum crockeri</i>				48	48A	48	48			ACN=48	USA (off CA)	C-54
<i>Stenobrachius leucopsarus</i>				48	48A	48	48			ACN=48	USA (off CA)	C-54
<i>Symbolophorus californiensis</i>				48	2SM + 46A	50	50			ACN=48	USA (off CA)	C-46, C-54
<i>Triphoturus mexicanus</i>			M	48	48A	48	48		3.8 FD	ACN=48	USA (off CA)	C-54, E-2

Table 6.22 Order PERCOPSIFORMES

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Family/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup> NORs	Genome size (pg/cell)	Comments	Locality	Reference
<b>Aphredoderidae</b>											
<i>Aphredoderus sayanus</i>			48	2M + 18 SM/ST + 28A	68			1.2 FD	ACN=50	USA (TX)	G-82

Table 6.23 Order GADIFORMES

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup> NORs	Genome size (pg/cell)	Comments	Locality	Reference
<b>Gadidae</b>											
<b>Gadinae</b>											
<i>Eleginus gracilis</i>		F	26	22M + 4A	48	48				Japan (Hokkaido)	I-14
<i>Eleginus navaga</i>			26	20M + 6A	46	46				Russia	V-72
<i>Eleginus navaga</i>		F, M	26	22M + 4A	48	48			ACN=46	Russia (White Sea)	K-83
<i>Eleginus navaga</i>			27		49					Russia (White Sea)	L-88
<i>Gadus macrocephalus</i>		F	44	10M + 10ST + 24A	54	64		1.7 FIA	ACN=46	Japan (Hokkaido)	I-14, H-40
<i>Gadus morhua</i>			46					(1.9 FIA)	ACN=46	Sweden	J-1, N-49, H-41
<i>Gadus morhua</i>			46	10 M/SM + 36 ST/A	56				ACN=46	UK	F-4
<i>Gadus morhua</i>			45	11 M/SM + 34 ST/A	56				ACN=46	UK	F-4
<i>Gadus morhua</i>			46		52					Russia (White Sea)	L-88
<i>Gadus ogac</i>			46	8 M/SM + 38 ST/A	54					Russia	V-72
<i>Gadus ogac</i>		F, M	46	6M + 2SM + 10ST + 28A	54	64				Russia (White Sea)	K-83
<i>Micromesistius poutassou</i>			44							Sweden	N-49
<i>Pollachius pollachius</i>			38	10M + 28 ST/A	48				ACN=44	Sweden	N-49
<i>Pollachius virens</i>			40	10M + 30 ST/A	50				ACN=46	Sweden	N-49
<i>Theragra chalcogramma</i>		F, M	44	10M + 4ST + 30A	54	58		1.8 FIA	ACN=46	Japan (Hokkaido)	I-14, H-40
<i>Trisopterus minutus</i>			48							Sweden	N-49
<b>Lotinae</b>											
<i>Lota lota</i>		F, M	48	12M + 18SM + 14ST + 4A	78	92				Europe	R-9, K-83
<b>Ranicipitinae</b>											
<i>Raniceps raninus</i>			48	30 M/SM + 18 ST/A	78				ACN=48	Sweden	N-49
<b>Muraenolepididae</b>											
<i>Muraenolepis marmoratus</i>		M	48	4M + 2SM + 42 ST/A	54				ACN=48	Antarctica	D-4



Table 6.23 Order GADIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup> NORs	Genome size (pg/cell)	Comments	Locality	Reference
<b>Phycidae</b>											
<i>Gaidropsarus mediterraneus</i>			28	24 M/SM + 4A	52	52			ACN=48	Black Sea	V-5
<i>Gaidropsarus mediterraneus</i>	A karyotype	F, M	28	24 M/SM + 4A	52	52				Italy (Palermo)	V-50
<i>Gaidropsarus mediterraneus</i>	B karyotype	F, M	28	18M + 5SM + 5A	51	51				Italy (Palermo)	V-50
<i>Gaidropsarus mediterraneus</i>	C karyotype	F, M	28	22 M/SM + 6A	50	50	2			Italy (Palermo)	V-50
<i>Phycis phycis</i>		F	48	48A	48	48			ACN=48	Spain	A-30

Table 6.24 Order OPHIDIIFORMES

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Suborder/family/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup> NORs	Genome size (pg/cell)	Comments	Locality	Reference
<b>Suborder Ophidionei</b>											
<b>Carapidae</b>											
<i>Carapus acus</i>		F, M	36	2SM + 34A	38	38	2		ACN=36	Italy (Palermo)	V-55
<b>Ophidiidae</b>											
<i>Ophidion barbatum</i>	A-type	F, M	44	44A	44	44			ACN=44	Italy (Palermo)	V-75
<i>Ophidion barbatum</i>	B-type	F, M	43	1M + 42A	44	44			ACN=44	Italy (Palermo)	V-75
<i>Parophidion vassali</i>	A-type	F, M	44	44A	44	44			ACN=44	Italy (Palermo)	V-75
<i>Parophidion vassali</i>	B-type	F, M	43	1M + 42A	44	44			ACN=44	Italy (Palermo)	V-75

Table 6.25 Order MUGILIFORMES

A		B		C		D		E		F		G		H		I		J		K		L	
Current scientific name of taxon		Reported in		Sex		2n		Karyotype		NF <sub>1</sub>		NF <sub>2</sub>		Ag <sup>-</sup>		Genome size		Comments		Locality		Reference	
Family/species		karyotype paper												NORs		(pg/cell)							
<b>Mugilidae</b>																							
<i>Agonostomus</i>	<i>monticola</i>			F, M	48	2ST + 46A	48	50	2										ACN=48	Panama, Venezuela		N-64	
<i>Chelon</i>	<i>labrosus</i>			F, M	48	2ST + 46A	48	50											ACN=48	Italy (Tyrrhenian Sea)		C-30, C-32	
<i>Liza</i>	<i>aurata</i>			F, M	48	2ST + 46A	48	50									2.3 FD		ACN=48	Mediterranean		C-9, C-32	
<i>Liza</i>	<i>haematochella</i>				48	48A	48	48											ACN=48	China (Shandong)		Y-20, Z-37	
<i>Liza</i>	<i>parisa</i>		<i>Mugil</i>	M	48	48A	48	48											ACN=48	India (WB)		K-28	
<i>Liza</i>	<i>ramada</i>			F, M	48	2ST + 46A	48	50									1.6 FCM		ACN=48	Italy (Tyrrhenian Sea)		C-30, C-32, G-85	
<i>Liza</i>	<i>saliens</i>			F, M	48	2ST + 46A	48	50	2										ACN=48	Italy		C-32, G-75	
<i>Mugil</i>	<i>cephalus</i>			F, M	48	48A	48	48											ACN=48	Italy (Rome)		C-32	
<i>Mugil</i>	<i>cephalus</i>				48	48A	48	48									(2.4 FD)		ACN=48	Europe, USA, Australia, Taiwan		C-9, C-30, R-92	
<i>Mugil</i>	<i>cephalus</i>				48	48A	48	48	1-2								(1.6 FIA)		ACN=48	USA (LA)		L-18, H-40	
<i>Mugil</i>	<i>cephalus</i>				48	48A	48	48											ACN=48	India (A.P.)		L-3	
<i>Mugil</i>	<i>cephalus</i>			F, M	48	48A	48	48											ACN=48	India (Portonovo)		N-13	
<i>Mugil</i>	<i>cephalus</i>			F, M	48	48A	48	48									(1.6* FCM)		ACN=48	China		L-54, Y-21, O-48	
<i>Mugil</i>	<i>curema</i>				28	20M + 4ST + 4A	48	52									(1.4 FD)		ACN=48	USA (LA)		L-18, G-85	
<i>Mugil</i>	<i>curema</i>				28	20M + 4ST + 4A	48	52	2										ACN=48	Brazil (PR)		N-74	
<i>Mugil</i>	<i>curema</i>				24	22M + 2SM	48	48	2										ACN=48	Venezuela (Margarita Is.)		N-52, N-74, R-94	
<i>Mugil</i>	<i>gaimardianus</i>			F, M	48	48A	48	48											ACN=48	Panama		N-52	
<i>Mugil</i>	<i>liza</i>				48	48A	48	48											ACN=48	Venezuela (Margarita Is.)		N-52	
<i>Mugil</i>	<i>liza</i>				48	48A	48	48	2										ACN=48	Venezuela (Margarita Is.)		R-94	
<i>Mugil</i>	<i>platanus</i>				48	48A	48	48	2										ACN=48	Brazil (SP)		J-13	
<i>Mugil</i>	<i>rubrioculus</i>				48	48A	48	48	2										ACN=48	Venezuela (Margarita Is.)		N-66	
<i>Mugil</i>	<i>trichodon</i>				48	48A	48	48	2										ACN=48	Venezuela (Margarita Is.)		N-53	
<i>Oedalechilus</i>	<i>labeo</i>			F, M	48	2ST + 46A	48	50	2										ACN=48	Italy (Tyrrhenian Sea)		C-32, R-93	
<i>Paramugil</i>	<i>parmatus</i>		<i>Liza macrolepis</i>	F, M	48	48A	48	48											ACN=48	India (Orissa)		C-61	
<i>Paramugil</i>	<i>parmatus</i>		<i>Liza oligolepis</i>	F, M	48	48A	48	48											ACN=48	India (Orissa)		C-61	
<i>Rhinomugil</i>	<i>consula</i>		<i>Mugil</i>		48	48A	48	48											ACN=48	India (WB)		N-18, K-26	
<i>Valamugil</i>	<i>speigleri</i>		<i>Mugil</i>	F, M	48	48A	48	48											ACN=48	India (Orissa)		R-57	
<i>Valamugil</i>	<i>speigleri</i>			M	48	48A	48	48											ACN=48	India (WB)		K-136	

Table 6.26 Order ATHERINIFORMES

A		B		C		D		E		F		G		H		I		J		K		L	
Current scientific name of taxon		Reported in		Sex		2n		Karyotype		NF <sub>1</sub>		NF <sub>2</sub>		Ag <sup>-</sup>		Genome size		Comments		Locality		Reference	
Suborder/family/subfamily/species		karyotype paper												NORs		(pg/cell)							
Suborder Atherinopsoidae																							
Atherinopsidae																							
Atherinopsinae																							
<i>Basilichthys australis</i>				F, M	48	4M + 4SM + 40 ST/A		56							1-4			ACN=48		Chile (Augustura)		G-1	
<i>Basilichthys microlepidotus</i>				F, M	46	2M + 8SM + 36 ST/A		56										ACN=46		Chile (Petorca)		G-1	
<i>Odontesthes bonariensis</i>					48															Argentina		F-20	
<i>Odontesthes bonariensis</i>		Atherinidae		F, M	48	4 M/SM + 44 ST/A		52												Italy (Lake Nemi)		S-170	
<i>Odontesthes bonariensis</i>		Atherinidae			48	3 M/SM + 45 ST/A		51												Italy (Lake Nemi)		S-170	
<i>Odontesthes bonariensis</i>		Atherinidae			48	2SM + 46 ST/A		50												Italy (Lake Nemi)		S-170	
<i>Odontesthes bonariensis</i>		Atherinidae			48	2M + 46 ST/A		50												Italy (Lake Nemi)		S-170	
<i>Odontesthes bonariensis</i>		<i>Basilichthys</i>			48	4SM + 44 ST/A		52											ACN=48	(introduced, Japan)		A-76	
Menidiinae																							
<i>Chirostoma attenuatum</i>					48	4M + 24SM + 2ST + 18A		76	78											Mexico		U-50	
<i>Chirostoma estor</i>					48	12M + 8SM + 12ST + 16A		68	80										ACN=48	Mexico (Michoacán)		U-50	
<i>Chirostoma grandocule</i>					48															Mexico		U-50	
<i>Chirostoma jordani</i>					48	8M + 12SM + 10ST + 18A		68	78										ACN=48	Mexico (Lake Chapultepec)		U-50	
<i>Chirostoma patzcuaro</i>					44	12ST + 32A		44	56											Mexico (Michoacán)		U-50	
<i>Labidesthes sicculus</i>				F, M	48	12M + 22SM + 14 ST/A		82										1.3 FIA		USA		K-100, H-40	
<i>Membras martinica</i>				F, M	48	18M + 18SM + 12 ST/A		84												USA (LA)		K-100	
<i>Menidia beryllina</i>				F, M	48	8M + 18SM + 22 ST/A		74											freshwater	USA (LA)		K-100	
<i>Menidia beryllina</i>				F, M	48	10M + 24SM + 14 ST/A		82											marine	USA (LA)		K-100	
<i>Menidia menidia</i>					48	4M + 14SM + 12ST + 18A		66	78											USA (Long Island)		W-16	
Suborder Atherinoidei																							
Atherinidae																							
<i>Atherina boyeri</i>		<i>mochon caspia</i>			48	6SM + 42 ST/A		54												Russia		V-72	
<i>Atherina boyeri</i>		<i>mochon pontica</i>			48	6SM + 42 ST/A		54												Russia		V-72	
<i>Hypoatherina valenciennesi</i>		<i>bleekeri</i>			48	4M + 44SM		96	96	2									ACN=48	Japan (Wakayama)		K-50	
Atherionidae																							
<i>Atherion elymus</i>					48	2SM + 10ST + 36A		50	60											Japan (Chiba)		A-71	
Melanotaeniidae																							
<i>Bedotia geayi</i>					48															Madagascar		S-24	
<i>Marosatherina ladigesii</i>		<i>Telmaterina</i>			48															(Sulawesi)		S-24	
<i>Melanotaenia fluviatilis</i>					48															(Australia)		H-13	
<i>Melanotaenia goldiei</i>		<i>nigricans</i>			48															(Papua New Guinea)		H-13	
<i>Melanotaenia maccullochi</i>					46	46A		46	46											Australia		S-24	
<i>Melanotaenia cf. splendida</i>		<i>Nematocentris cf. rubrostriata</i>	M		48	48A		48	48										ACN=48	(Australia)		A-71	

Table 6.27 Order BELONIFORMES

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup>	Genome size	Comments	Locality	Reference
Suborder/family/subfamily/species	karyotype paper						NORs	(pg/cell)			
<b>Suborder Adrianichthyoidei</b>											
<b>Adrianichthyidae</b>											
<b>Oryziinae</b>											
<i>Oryzias</i>	<i>celebensis</i>	F, M	36	8M + 4SM + 24A	48	48	2	1.7 FD	ACN=44	Sulawesi	U-53, U-59
<i>Oryzias</i>	<i>curvinotus</i>		48	2M + 14SM + 32 ST/A	64		2	1.5 FD	XX/XY, ACN=48	China (Hainan Is.)	U-57, T-85
<i>Oryzias</i>	<i>dancena</i>	F, M	48	48A	48	48	2	1.8 FD	XX/XY, ACN=48	India (Chidambaram)	U-58, U-59, T-85
<i>Oryzias</i>	<i>hubbsi</i>		48	48A	48	48		1.8 FD	ZZ/ZW, ACN=48	Indonesia (Jakarta)	U-59, T-85
<i>Oryzias</i>	<i>javanicus</i>	M	48	2ST + 46A	48	50	2	1.7 FD	ZZ/ZW, ACN=48	Thailand (Phuket), Singapore	M-6, U-55, U-59, T-85
<i>Oryzias</i>	<i>latipes</i>	M	48	20 M/SM + 28A	68			(2.2 BFA)	ACN=48	Japan	O-15, H-13
<i>Oryzias</i>	<i>latipes</i>	F, M	48	4M + 16SM + 2ST + 26A	68	70	2	(2.1* FCM), 1.7 FD	XX/XY, ACN=48	Japan (Ehime)	U-54, O-48, T-85
<i>Oryzias</i>	<i>latipes</i>		48	4M + 18SM + 4ST + 22A	70	74	2	1.7 FD	ACN=48	Japan (Aomori)	U-59
<i>Oryzias</i>	<i>latipes</i>	F, M	48	20 M/SM + 2ST + 26A	68	70			ACN=48	Japan	A-53
<i>Oryzias</i>	<i>latipes</i>		48	22 M/SM + 26 ST/A	70				ACN=48	Korea	P-71
<i>Oryzias</i>	<i>latipes</i>		48	10M + 10SM + 2ST + 26A	68	70	2	1.9 FD	XX/XY, ACN=48	Philippines (Solsona)	U-61, K-57
<i>Oryzias</i>	<i>luzonensis</i>	F, M	48	14M + 34SM	96	96	2		XX/XY, ACN=48	Philippines (Solsona)	F-38, T-85
<i>Oryzias</i>	<i>marmoratus</i>		42	2M + 4SM + 36A	48	48	2		ACN=48	Sulawesi	U-75
<i>Oryzias</i>	<i>matanensis</i>		42	2M + 4SM + 2ST + 34A	48	50	2		ACN=48	Sulawesi	U-75
<i>Oryzias</i>	<i>mekongensis</i>		48	2M + 8SM + 24ST + 14A	58	82		1.5 FD	XX/XY, ACN=48	N.E. Thailand	U-60, M-6, T-85
<i>Oryzias</i>	<i>minutillus</i>		42	42A	42	42	2		ACN=42	S. and NE Thailand	M-11
<i>Oryzias</i>	<i>minutillus</i>		42	2SM + 40A	44	44	2		ACN=42	SE Thailand	M-11
<i>Oryzias</i>	<i>minutillus</i>		40	2M + 2SM + 36A	44	44	2		ACN=42	SE Thailand	M-11
<i>Oryzias</i>	<i>minutillus</i>		34	8M + 2SM + 24A	44	44	2		XX/XY, ACN=42	C. Thailand (Bangkok)	M-5, M-6, M-11, T-85
<i>Oryzias</i>	<i>minutillus</i>		32	10M + 2SM + 20A	44	44	2		ACN=42	N. Thailand	M-11
<i>Oryzias</i>	<i>minutillus</i>		30	12M + 2SM + 16A	44	44	2		XX/XY, ACN=42	C. and N. Thailand (Chiang Mai)	M-5, M-11, U-59, T-85
<i>Oryzias</i>	<i>minutillus</i>		28	14M + 2SM + 12A	44	44	2		ACN=42	C. Thailand	M-11
<i>Oryzias</i>	<i>nigrinas</i>		38	6M + 4SM + 28A	48	48	2		ACN=44	Sulawesi	U-75
<i>Oryzias</i>	<i>sinensis</i>		46	12M + 12SM + 22A	70	70			ACN=48	Korea (Yellow Sea side)	K-57
<i>Oryzias</i>	<i>sinensis</i>		46	6M + 16SM + 2ST + 22A	68	70			ACN=48	Korea	U-61
<i>Oryzias</i>	<i>sinensis</i>		46	22 M/SM + 24 ST/A	68				ACN=48	Korea	P-71
<i>Oryzias</i>	<i>sinensis</i>		46	6M + 18SM + 4ST + 18A	70	74			ACN=48	China (Shanghai)	U-59, C-58

Table 6.27 Order BELONIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup>	Genome size	Comments	Locality	Reference
Suborder/family/subfamily/species	karyotype paper						NORs	(pg/cell)			
<b>Suborder Belonoidei (= Exocoetoidei)</b>											
<b>Exocoetidae</b>											
<i>Cheilopogon</i>	<i>Cypselurus</i>		48					1.9* FCM		Japan	O-48
<b>Hemiramphidae</b>											
<i>Dermogenys</i>	<i>pusillus</i>		48			(58)		1.5 BFA		E. Asia	S-24, H-13
<i>Hemiramphus</i>	<i>marginatus</i>		52	52 ST/A	52					India (Goa)	R-45
<i>Hyporhamphus</i>	<i>kurumeus</i>	F, M	40	2M + 38A	42			1.3* FD	ACN=48	China (Hubei)	Z-28, H-32, C-83
<i>Rhynchorhamphus</i>	<i>georgii</i>		46	6 M/SM + 40 ST/A	52					India (Goa)	R-45
<b>Belonidae</b>											
<i>Potamorhaphis</i>	cf. <i>eigenmanni</i>	F, M	54	6 M/SM + 48 ST/A	60		2			Argentina (Misiones)	P-15
<i>Potamorhaphis</i>	<i>guianensis</i>		48					2.4 BFA		(S. America)	H-13
<i>Pseudotylorus</i>	<i>microps</i>	F, M	50	50 ST/A	50		2		0-2 B, ACN=50	Argentina (Misiones)	P-15
<i>Strongylura</i>	<i>incisa</i>		48					2.2* FCM		Japan	O-48
<i>Strongylura</i>	<i>leiura</i>		48	48 ST/A	48					India (Goa)	R-45
<i>Strongylura</i>	<i>strongylura</i>	F, M	50	16M + 14SM + 20A	80	80			ACN=50	India (Orissa)	R-57
<i>Strongylura</i>	<i>strongylura</i>		48	48 ST/A	48					India (Tamil Nadu)	R-45
<i>Xenentodon</i>	<i>cancila</i>	F, M	48	16M + 18SM + 6ST + 8A	82	88				India (Jammu)	S-51
<i>Xenentodon</i>	<i>cancila</i>	F	48	30M + 2SM + 2ST + 14A	80	82			ACN=48	India (WB)	N-16
<i>Xenentodon</i>	<i>cancila</i>		48	24M + 8SM + 4ST + 12A	80	84			ACN=48	Thailand	D-20
<b>Scomberesocidae</b>											
<i>Cololabias</i>	<i>saira</i>	M	42							N. Pacific	Y-2

Table 6.28 Order CYPRINODONTIFORMES

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Suborder/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup> NORs	Genome size (pg/cell)	Comments	Locality	Reference
<b>Suborder Aplocheiloidei</b>											
<b>Aplocheilidae (Asian rivulines)</b>											
<i>Aplocheilus blockii</i>			48	2 M/SM + 46 ST/A	50	(70)			ACN=48	S. India	S-24, S-158
<i>Aplocheilus dayi</i>			48	6 M/SM + 42 ST/A	54	(86)				Ceylon	S-24, S-158
<i>Aplocheilus lineatus</i>			48	48 ST/A	48	(60)				S. India	S-24, S-158
<i>Aplocheilus panchax</i>			38	12 M/SM + 26 ST/A	50	(56)				India, Thailand	S-24, S-158
<i>Aplocheilus panchax</i>		F	38	13M + 9SM + 4ST + 12A	60	64			ZW	India (WB)	K-31
<i>Aplocheilus panchax</i>		M	38	14M + 8SM + 4ST + 12A	60	64		(1.5 FD, 1.4 BFA)	ZZ	India (WB)	K-31, U-59, H-13
<i>Aplocheilus werneri</i>			48			(88)				Ceylon	S-24
<i>Pachypanchax playfairii</i>			48	22 M/SM + 26 ST/A	70	(96)		1.5 FIA	ACN=48	Seychelles	S-24, S-158, H-41
<b>Nothobranchiidae (African rivulines)</b>											
<i>Aphyosemion ahli</i>	AHL-NN		40	12SM + 6ST + 22A	52	58			ACN=44	E. Cameroon (Nyong)	S-158
<i>Aphyosemion ahli</i>	AHL-NS		38	2M + 2SM + 12ST + 22A	42	54			ACN=42	E. Cameroon (Nyong)	S-158
<i>Aphyosemion ahli</i>	AHL-ED		38	4M + 2SM + 6ST + 26A	44	50			ACN=42	E. Cameroon	S-158
<i>Aphyosemion ahli</i>	AHL-MB		36	8 M/SM + 28A	44	44			ACN=44	E. Cameroon	S-158
<i>Aphyosemion ahli</i>	AHL-SA		34	6M + 2SM + 2ST + 24A	42	44			ACN=44	E. Cameroon	S-158
<i>Aphyosemion ahli</i>	AHL-BE		26	10M + 2SM + 2ST + 12A	38	40			ACN=40	E. Cameroon	S-158
<i>Aphyosemion ahli</i>	AHL-CO		20	20 M/SM	40	40			ACN=40	E. Cameroon	S-158
<i>Aphyosemion ahli</i>	AHL-BN, KI, LO		22	22 M/SM	44	44			ACN=44	E. Cameroon	S-158
<i>Aphyosemion alpha</i>	<i>Chromaphyosemion</i>	F, M	38	2SM + 12ST + 24A	40	52	2		ACN=42	N.W. Gabon	V-71
<i>Aphyosemion amoenum</i>	AMO-TY		34			(44)				E. Cameroon	S-158
<i>Aphyosemion australe</i>	AUS-CA		30	6M + 2SM + 22A	38	38			ACN=42	Gabon	S-158
<i>Aphyosemion australe</i>	AUS-LI		34	2M + 2SM + 30A	38	38			ACN=42	Gabon	S-158
<i>Aphyosemion bamilekorum</i>	BAM-TY		34	6M + 6SM + 22 ST/A	46	(66)			ACN=40	E. Cameroon	S-158
<i>Aphyosemion batesii</i>	BAT-AK		34	34 M/SM	68	68			ACN=44	E. Cameroon	S-158
<i>Aphyosemion batesii</i>	<i>splendidum</i> SPL-DJ		32			(60)				Congo	S-158
<i>Aphyosemion bitaeniatum</i>	BIT-BI		34	2M + 4SM + 8ST + 20A	40	48			ACN=42	Cameroon	S-158
<i>Aphyosemion bitaeniatum</i>	BIT-LO		36	6SM + 2ST + 28A	42	44			ACN=40	Cameroon (Kribi)	S-158
<i>Aphyosemion bitaeniatum</i>	BIT-EC		26	14 M/SM + 2ST + 10A	40	42			ACN=40	Cameroon (Rio Muni)	S-158
<i>Aphyosemion bitaeniatum</i>	BIT-KA		36	2M + 2ST + 32A	38	44			ACN=44	Cameroon	S-158
<i>Aphyosemion bitaeniatum</i>	BIT-DI		38	6ST + 32A	38	44			ACN=42	E. Cameroon	S-158
<i>Aphyosemion bitaeniatum</i>	BIT-BA, EK, MB, NN, TK		38	2ST + 36A	38	40			ACN=42	Cameroon	S-158
<i>Aphyosemion bitaeniatum</i>	BIT-IJ		40	4M + 2ST + 34A	44	46			ACN=42	S.W. Nigeria	S-158
<i>Aphyosemion bitaeniatum</i>	<i>Chromaphyosemion</i> , Afanyangan	F, M	40	10 M/SM/ST + 30A	50	2			ACN=44	Cameroon	V-97
<i>Aphyosemion bivittatum</i>	BIV-ES		34	4M + 4SM + 2ST + 24A	42	44			ACN=42	E. Cameroon	S-24
<i>Aphyosemion bivittatum</i>	BIV-NE		36	2M + 2ST + 32A	38	40			ACN=44	W. Cameroon	S-158
<i>Aphyosemion bivittatum</i>	BIV-NW		32	8SM + 4ST + 20A	40	44			ACN=44	W. Cameroon	S-158

Table 6.28 Order CYPRINODONTIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Suborder/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup> NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Aphyosemion bivittatum</i>	<i>Chromaphyosemion</i> 'Fungé'		36	3 M/SM + 1ST + 32A	39	40	2		ACN=40	Cameroon	V-81
<i>Aphyosemion bivittatum</i>	<i>Chromaphyosemion</i> CO3/4	F, M	34	3 M/SM + 3ST + 28A	37	40	2		ACN=40	Cameroon	V-81
<i>Aphyosemion bivittatum</i>	<i>Chromaphyosemion</i> CO3/6		34	4 M/SM + 6ST + 24A	38	44	2		ACN=42	Cameroon	V-81
<i>Aphyosemion bivittatum</i>	<i>Chromaphyosemion</i> CO3/6		33	7 M/SM + 4ST + 22A	40	44	2		ACN=42	Cameroon	V-81
<i>Aphyosemion bivittatum</i>	<i>Chromaphyosemion</i> CO3/6		31	9 M/SM + 4ST + 18A	40	44	2		ACN=42	Cameroon	V-81
<i>Aphyosemion bivittatum</i>	<i>Chromaphyosemion</i> CO3/6		30	8 M/SM + 6ST + 16A	38	44	2		ACN=42	Cameroon	V-81
<i>Aphyosemion bivittatum</i>	<i>Chromaphyosemion</i> CO3/6		29	11 M/SM + 4ST + 14A	40	44	2		ACN=42	Cameroon	V-81
<i>Aphyosemion bivittatum</i>	<i>Chromaphyosemion</i> CO3/9	F, M	32	6 M/SM + 4ST + 22A	38	42	2		ACN=40	Cameroon	V-81
<i>Aphyosemion bivittatum</i>	<i>Chromaphyosemion</i> KYO3/34	F, M	32	6 M/SM + 4ST + 22A	38	42	2		ACN=40	Cameroon	V-81
<i>Aphyosemion bualanum</i>	BUA-BA		40	4M + 4SM + 4ST + 28A	48	52			ACN=44	E. Cameroon	S-158
<i>Aphyosemion bualanum</i>	BUA-ND		38	2M + 4SM + 10ST + 22A	44	54			ACN=44	W. Cameroon	S-158
<i>Aphyosemion bualanum kekemense</i>	BUA-KE		36	4SM + 32 ST/A	40	(72)			ACN=42	S.W. Cameroon	R-30
<i>Aphyosemion buytaerti</i>	BUY-AQ		38			(58)				Congo	S-158
<i>Aphyosemion calliurum</i>	CAL-JU		32	2M + 4SM + 26A	38	38			ACN=42	S.W. Nigeria	S-158
<i>Aphyosemion calliurum</i>	CAL-DM, ME		20	20 M/SM	40	40			6B, ACN=44	E. Cameroon (Nyong)	S-158
<i>Aphyosemion calliurum</i>	CAL-OM		24	16 M/SM + 8A	40	40			ACN=44	E. Cameroon (Nyong)	S-158
<i>Aphyosemion calliurum</i>	CAL-BK, MO, MU		20	20 M/SM	40	40			ACN=44	E. & W. Cameroon	S-158
<i>Aphyosemion calliurum</i>	CAL-NK		20	18 M/SM + 2ST	38	40			ACN=44	E. Cameroon	S-158
<i>Aphyosemion calliurum</i>	CAL-WC		20	20 M/SM	40	40				Cameroon	S-158
<i>Aphyosemion calliurum</i>	CAL-NT		18	18 M/SM	36	36			ACN=44	E. Cameroon	S-158
<i>Aphyosemion cameronense</i>	CAM-MI		34	4M + 2SM + 6ST + 22A	40	46			ACN=44	E. Cameroon	S-158
<i>Aphyosemion cameronense</i>	CAM-LN		34	4M + 2SM + 4ST + 24A	40	44			ACN=44	E. Cameroon	S-158
<i>Aphyosemion cameronense</i>	CAM-BE, EC, YA		34							E. Cameroon	S-158
<i>Aphyosemion cameronense</i>	CAM-MA		32			(46)				W. Cameroon	S-24
<i>Aphyosemion cameronense</i>	CAM-KO		30			(46)				E. Cameroon	S-24
<i>Aphyosemion cameronense</i>	CAM-NG		28	14 M/SM + 2ST + 12A	42	44			ACN=44	E. Cameroon	S-158
<i>Aphyosemion cameronense</i>	CAM-LW		24	14 M + 6ST + 4A	38	44			ACN=44	E. Cameroon	S-158
<i>Aphyosemion cellae</i>	CEL-BA, BU, MA		20	20 M/SM	40	40			ACN=40	W. Cameroon	S-158
<i>Aphyosemion cellae</i>	<i>cellae winifredae</i> WIN-TY		20	20 M/SM	40	40			ACN=40	W. Cameroon	S-158
<i>Aphyosemion chauchei</i>	CHO		24	12 M/SM + 12A	36	36			ACN=40	Congo	H-33
<i>Aphyosemion christyi</i>	CHR-SA		36	36A	36	36				Zaire	H-33, S-158
<i>Aphyosemion christyi</i>	CHR		18	16M + 2SM	36	36			ACN=40	Zaire	S-28, S-158
<i>Aphyosemion christyi</i>	<i>shoutedeni</i> SCH-AQ		22	10M + 4SM + 8A	36	36			ACN=40	Zaire	H-33, S-28, S-158
<i>Aphyosemion coeleste</i>	COL-TY		32	4 M/SM + 28 ST/A	36					Gabon	S-158
<i>Aphyosemion coeleste</i>	COL-TI		30	6 M/SM + 24 ST/A	36					Congo	S-158
<i>Aphyosemion cognatum</i>	COG-AQ		28	6M + 2SM + 20A	36	36			ACN=40	Congo	S-158
<i>Aphyosemion cognatum</i>	COG		30	6 M/SM + 24A	36	36				Congo	S-158
<i>Aphyosemion congicum</i>	<i>melanopteron</i> MET		30	6M + 24A	36	36			ACN=40	Zaire	S-24, S-28, H-33

Table 6.28 Order CYPRINODONTIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Suborder/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup> NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Aphyosemion cyanostictum</i>	CYA-AQ		34	14 M/SM + 6ST + 14A	48	54			ACN=38	N. Gabon	S-158
<i>Aphyosemion decorsei</i>	DEC-KOF 5		24	18 M/SM + 6ST	42	48			ACN=42	Zaire	H-33
<i>Aphyosemion elberti</i>	<i>rubrifascium</i>		38			(40)				Cameroon	S-159
<i>Aphyosemion elberti kekemense</i>	<i>kekemense</i> KEK-TY		36	6 M/SM + 30 ST/A	42	(72)			ACN=42	E. Cameroon	S-158
<i>Aphyosemion elegans</i>	ELE-SA		20	12M + 4SM + 4A	36	36			ACN=38	Congo	S-28, S-158, H-33
<i>Aphyosemion escherichi</i>	<i>simulans</i> SIM-AQ		40			(70)				Gabon	S-158
<i>Aphyosemion exigoidium</i>	EXO-AQ		22			(42)				Gabon	S-158
<i>Aphyosemion exiguum</i>	EXI-NG		36	20 M/SM + 16ST	56	72			ACN=42	E. Cameroon	S-158
<i>Aphyosemion franzwerneri</i>	FRA-TY		22	22 M/SM	44	44			ACN=44	E. Cameroon	S-158
<i>Aphyosemion fulgens</i>	FUL-AQ		38	38A	38	38				N. Gabon	S-158
<i>Aphyosemion gabunense</i>	MRG-AQ		36			(64)				Gabon	S-158
<i>Aphyosemion gabunense</i>	GAB-AQ		40			(54)				Gabon	S-158
<i>Aphyosemion georgiae</i>	GEO-AQ		36	4SM + 32A	40	40				Gabon	S-158
<i>Aphyosemion georgiae</i>	GEO-AQ		34	4 M/SM + 30A	38	38				Gabon	S-158
<i>Aphyosemion herzogii</i>	HEZ-AQ		34			(68)				N. Gabon	S-158
<i>Aphyosemion kouamense</i>	<i>Chromaphyosemion</i>	F, M	38	10ST + 28A	38	48	2		ACN=42	N. W. Gabon	V-71
<i>Aphyosemion labarrei</i>	LAB-AQ		28	8M + 12SM + 2ST + 6A	48	50			ACN=44	Congo	S-158
<i>Aphyosemion labarrei</i>	LAB-NSC-4		26	20 M/SM + 4ST + 2A	46	50			ACN=44	Congo	S-158
<i>Aphyosemion lamberti</i>	LAI-AQ		36	2M + 6SM + 4ST + 24A	44	48			ACN=44	Gabon	H-33, S-158
<i>Aphyosemion loennbergii</i>	LOE-NS		38	2M + 4SM + 6ST + 26A	44	50			ACN=42	E. Cameroon	S-158
<i>Aphyosemion loennbergii</i>	LOE-KI		34	2M + 6SM + 6ST + 20A	42	48			ACN=42	E. Cameroon	S-158
<i>Aphyosemion loennbergii</i>	LOE-MO		32	4M + 6SM + 4ST + 18A	42	46			ACN=42	E. Cameroon	S-158
<i>Aphyosemion loennbergii</i>	<i>pappenheimi</i> PAP-BI		32			(52)				E. Cameroon	S-158
<i>Aphyosemion loennbergii</i>	<i>Chromaphyosemion</i> KV03/38	F	34	20 M/SM/ST + 14A	54	54	2		XX	Cameroon	V-97
<i>Aphyosemion loennbergii</i>	<i>Chromaphyosemion</i> KV03/38	M	34	19 M/SM/ST + 15A	53	53	2		XY	Cameroon	V-97
<i>Aphyosemion loennbergii</i>	<i>Chromaphyosemion</i> C03/29	F, M	34	8 M/SM/ST + 26A		42			XX/XY	Cameroon	V-97
<i>Aphyosemion louessense</i>	LOU-AQ		40	2 M/SM + 38 ST/A	42	(74)				Congo	H-33
<i>Aphyosemion louessense</i>	LOU-MI		20	16M + 4SM	40	40			ACN=40	Congo	S-158
<i>Aphyosemion lugens</i>	<i>Chromaphyosemion</i>	F, M	36	2M + 34A	38	38	2		ACN=42	S. W. Cameroon	V-71
cf. <i>lugens</i>	<i>Chromaphyosemion</i> GMM36	M	40*	12 M/SM/ST + 16A	40	40	2			Cameroon (Zaire)	V-97
<i>Aphyosemion lujae</i>											G-65
<i>Aphyosemion maculatum</i>	MAL-AQ		34			(44)				N. Gabon	S-158
<i>Aphyosemion malumbresi</i>	<i>Chromaphyosemion</i> GEMHS00/31	F, M	24	20 M/SM/ST + 4A	44	44	2		XX/XY	Cameroon	V-97
<i>Aphyosemion melanogaster</i>	<i>Chromaphyosemion</i> KV03/41	F, M	36	14 M/SM/ST + 22A	50	50	2		XX/XY	Cameroon	V-97
<i>Aphyosemion microphthalmum</i>	MIP-AQ		38	16 M/SM + 22 ST/A	54	(76)			ACN=42	Congo, Gabon	S-158
<i>Aphyosemion mimbon</i>	MIM-AQ		30			(50)				Gabon	S-158
<i>Aphyosemion obscurum</i>	<i>Panchax obscurus</i>		34			(40)				Cameroon	S-159
<i>Aphyosemion ocellatum</i>	OCE-AQ		30			(54)				Congo, Gabon	S-158



Table 6.28 Order CYPRINODONTIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Suborder/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup> NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Aphyosemion ogoense</i>	OGO-AQ		40	18 M/SM + 22 ST/A	58	(72)			ACN=40	Gabon	S-158
<i>Aphyosemion ogoense</i>	OGO-BA		32			(56)				C. Congo	S-158
<i>Aphyosemion ogoense caudofasciatum</i>	CAU-AQ		38			(76)				S. Congo	S-158
<i>Aphyosemion ogoense pyrophore</i>	PYR-AQ		38			(64)				S. Congo	S-158
<i>Aphyosemion ogoense ottogartneri</i>	OTT-AQ		40	12 M/SM + 28 ST/A	52	(76)			ACN=44	C. Congo	S-24, S-158
<i>Aphyosemion pascheni</i>	PAS-TY		24	18 M/SM + 4ST + 2A	42	46			ACN=42	E. Cameroon	S-158
<i>Aphyosemion pascheni</i>	PAS-AQ		24			(48)			ACN=42	E. Cameroon	S-158
<i>Aphyosemion primigenium</i>	PRI-AQ		22			(42)				Gabon	S-158
<i>Aphyosemion punctatum</i>	PUC-OV		24	22 M/SM + 2ST	46	48				Gabon	H-33
<i>Aphyosemion punctatum</i>	<i>Chromaphyosemion</i> CMM22	F, M	36	8 M/SM/ST + 28A			2		ACN=42	Cameroon	V-97
<i>Aphyosemion raddai raddai</i>	RAD-TY		32	12 M/SM + 20A	44	44			ACN=44	E. Cameroon	S-158
<i>Aphyosemion rectoense</i>	REC		18	18 M/SM	36	36			ACN=44	Gabon	H-33
<i>Aphyosemion riggenbachi</i>	RIG-YA		38	38 ST/A	38	(42)			ACN=42	E. Cameroon (Dibonba)	S-158
<i>Aphyosemion riggenbachi</i>	RIG-GI		34	4SM + 30A	38	38			ACN=40	E. Cameroon (Vuri)	S-158
<i>Aphyosemion riggenbachi</i>	RIG-SA		30	2M + 8SM + 20A	40	40			ACN=36	E. Cameroon (Sabaga)	S-158
<i>Aphyosemion riggenbachi</i>	RIG-WN		20	12M + 8SM	40	40			ACN=42	E. Cameroon (Wuri)	S-158
<i>Aphyosemion riggenbachi</i>	<i>Chromaphyosemion</i> KVO3/16	M	36	2SM + 2ST + 32A	38	40	6		ACN=40	E. Cameroon	V-80
<i>Aphyosemion riggenbachi</i>	<i>Chromaphyosemion</i> KVO3/27	F, M	30	8 M/SM + 8ST + 14A	38	46	2		ACN=38	E. Cameroon	V-80
<i>Aphyosemion riggenbachi</i>	<i>Chromaphyosemion</i> KVO3/25	F, M	24	12 M/SM + 8ST + 4A	36	44	2		ACN=38	E. Cameroon	V-80
<i>Aphyosemion riggenbachi</i>	<i>Chromaphyosemion</i> KVO3/28	F, M	20	16 M/SM + 4ST	36	40	2, 4		ACN=36	E. Cameroon	V-80
<i>Aphyosemion riggenbachi</i>	<i>Chromaphyosemion</i> KVO3/29	F, M	20	16 M/SM + 4ST	36	40	2		ACN=36	E. Cameroon	V-80
<i>Aphyosemion schoetzi</i>	SIO-AQ		18	18 M/SM	36	36			ACN=36	C. Africa	H-33
<i>Aphyosemion schluppi</i>	SLU-AQ		28	12 M/SM + 16 ST/A	40	(54)			ACN=40	S. Gabon	S-158
<i>Aphyosemion splendopleure</i>	<i>Chromaphyosemion</i> Bioko		38	4ST + 34A	38	42	2		ACN=42	Cameroon	V-97
<i>Aphyosemion striatum</i>	STR-AQ		40	4 M/SM + 36 ST/A	44	(66)			ACN=44	N. Gabon	S-158
<i>Aphyosemion thysi</i>	THY-AQ		28			(52)				S. Congo	S-158
<i>Aphyosemion volcanum</i>	VOL-TY		36	2M + 2ST + 32A	38	40			ACN=44	W. Cameroon	S-158
<i>Aphyosemion volcanum</i>	<i>Chromaphyosemion</i>	F, M	38	2ST + 36A	38	40	2		ACN=44	W. Cameroon	V-79
<i>Aphyosemion wachtersi</i>	WAC-AQ		34			(68)				Congo	S-158
<i>Aphyosemion wildekampi</i>	WIL-TY		30	4M + 2SM + 24A	36	36			ACN=40	E. Cameroon	H-33, S-158
<i>Aphyosemion zygarma</i>	ZYG-MI		20			(40)				Congo	S-158
<i>Archaphyosemion guineense</i>	<i>Aphyosemion</i> GUI-AQ		38	2M + 6SM + 2ST + 28A	46	48			ACN=44	Upper Niger	S-158
<i>Callapanchax monroviae</i>	<i>Aphyosemion</i>		46						annual	Liberia	S-158
<i>Callapanchax occidentalis</i>	<i>Roloffia o. occidentalis</i>	M	46*							Sierra Leone	G-65
<i>Callapanchax occidentalis</i>	<i>Aphyosemion</i> OCC-AQ		46	32 M/SM + 14 ST/A	78	(92)			ACN=46	Sierra Leone	S-24, S-158
<i>Callapanchax toddi</i>	<i>Roloffia occidentalis toddi</i>	M	46*							Sierra Leone	G-65
<i>Callapanchax toddi</i>	<i>Aphyosemion</i> TOD-TY		46	32 M/SM + 14 ST/A	78	(86)			ACN=46	Sierra Leone	S-24, S-158
<i>Chromaphyosemion poliaki</i>		F, M	38	2ST + 36A	38	40	2		ACN=44	W. Cameroon	V-79

Table 6.28 Order CYPRINODONTIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Suborder/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup> NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Chromaphyosemion</i> sp.	GEMHS00/41	F, M	36	8 M/SM/ST + 28A		44	2		XY	Rio Muni	V-97
<i>Epiplatys annulatus</i>	<i>Aplocheilichthys</i>		50	20 M/SM + 30 ST/A	70	(86)				Guinea, Liberia	S-24, S-158, S-159
<i>Epiplatys ansorgii</i>	<i>Aplocheilichthys</i>		46	4 M/SM + 42 ST/A	50	(88)				Gabon	S-158
<i>Epiplatys barmoiensis</i>	<i>Aplocheilichthys</i> BAR		34	14 M/SM + 20 ST/A	48	(54)			ACN=46	Sierra Leone, W. Liberia	S-24, S-158
<i>Epiplatys berkenkampii</i>	<i>Aplocheilichthys</i>		48	2 M/SM + 46A	50	50				Gabon	S-158
<i>Epiplatys bifasciatus</i>		M	40							Volta	S-18
<i>Epiplatys bifasciatus</i>	<i>Aplocheilichthys</i>		40	8M + 32A	48	48			ACN=48	W. Africa to Nile	S-24, S-159
<i>Epiplatys chaperi</i>	<i>Aplocheilichthys</i>		50	50 ST/A	50	(56)				Ghana, Ivory Coast	S-24, S-159
<i>Epiplatys chaperi schreibleri</i>	<i>Aplocheilichthys</i>		50			(52)				Ghana	S-158
<i>Epiplatys chaperi shelluzhikoi</i>	<i>Aplocheilichthys</i>		50			(52)				Ivory Coast	S-158
<i>Epiplatys dageti</i>		M	50							Monrovia	S-18
<i>Epiplatys dageti</i>	<i>Aplocheilichthys</i>		50	32 M/SM + 18 ST/A	82	(92)				Ghana to Liberia	S-24, S-159
<i>Epiplatys dageti monroviae</i>	<i>Aplocheilichthys</i>		50			(92)				Liberia	S-158
<i>Epiplatys duboisi</i>	<i>Aplocheilichthys</i>		48*		48	(52)				Congo	S-24, S-159
<i>Epiplatys esekanus</i>	<i>Aplocheilichthys</i>		42	8M + 34A	50	50				E. Cameroon	S-24, S-159
<i>Epiplatys fasciolatus fasciolatus</i>	<i>Aplocheilichthys</i>		40	10 M/SM + 30 ST/A	50	(76)			ACN=48	Guinea, Liberia	S-24, S-158, S-159
<i>Epiplatys fasciolatus</i>		M	38							Sierra Leone	S-18
<i>Epiplatys fasciolatus</i>	<i>Aplocheilichthys</i>		38			(76)				Guinea, Liberia	S-24, S-159
<i>Epiplatys fasciolatus</i>	<i>Aplocheilichthys</i>		36			(76?)				Guinea, Liberia	S-24, S-159
<i>Epiplatys grahami</i>	<i>Aplocheilichthys</i>		48	2SM + 46A	50	50			ACN=48	Nigeria to Congo	S-24
<i>Epiplatys grahami</i>	<i>Aplocheilichthys nigromarginatus</i>		48			(50)				Cameroon	S-158
<i>Epiplatys huberi</i>	<i>Aplocheilichthys</i>		46	6 M/SM + 40A	52	52			ACN=48	S.W. Gabon	S-158
<i>Epiplatys lamottei</i>	<i>Aplocheilichthys</i> LAM		48	4 M/SM + 44A	52	52				Liberia	S-158
<i>Epiplatys maeseni</i>	<i>Aphyosemion</i> MAE-AQ		42			(52)				Ivory Coast	S-158
<i>Epiplatys mesogramma</i>	<i>Aplocheilichthys</i>		48	48A	48	48				C. Afrin Rep.	S-158
<i>Epiplatys multifasciatus</i>	<i>Aplocheilichthys</i>		46	14 M/SM + 32 ST/A	60	(92)				Zaire	S-158
<i>Epiplatys multifasciatus</i>	<i>Aplocheilichthys bouleengeri</i>		46	14 M/SM + 32 ST/A	60	(92)				Congo	S-158
<i>Epiplatys olbrechtsi</i>	<i>Aplocheilichthys</i>		38	12 M/SM + 26 ST/A	50	(76)				Ivory Coast	S-158
<i>Epiplatys roloffi</i>	<i>Aplocheilichthys</i>		46			(92)				Liberia	S-158
<i>Epiplatys sangmelinensis</i>	<i>Aplocheilichthys</i>		48*		48	48				E. Cameroon	S-24, S-159
<i>Epiplatys sexfasciatus</i>	<i>Aplocheilichthys</i>		48	48 ST/A	48	(50)				Ghana to Gabon	S-24, S-159
<i>Epiplatys sexfasciatus rathkei</i>	<i>Aplocheilichthys</i>		48			(50)				W. Cameroon	S-158
<i>Epiplatys singa</i>	<i>Aplocheilichthys</i>		42			(58)				Zaire	S-158
<i>Epiplatys spilargyreus</i>		M	34							Nigeria	S-18
<i>Epiplatys spilargyreus</i>	<i>Aplocheilichthys</i>		34*			(48)				W. Africa to Nile	S-24, S-159
<i>Fenerbahce formosus</i>	Adamas FOR-AQ		24	24A	24	24				Zaire	S-158
<i>Foerschichthys flavipinnis</i>	FLA-AQ		40			52				Nigeria	S-158
<i>Fundulopanchax arnoldi</i>	<i>Aphyosemion</i>		38	10 M/SM + 28 ST/A	48	(62)			ACN=42	Nigeria	S-24, S-159

Table 6.28 Order CYPRINODONTIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Suborder/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup> NORs	Genome size (pg./cell)	Comments	Locality	Reference
<i>Fundulopanchax cinnamomeum</i>	<i>Aphyosemion</i> CIN-TY		40	4M + 4SM + 32 ST/A	48	(64)			ACN=44	Cameroon	S-24, S-158, R-29
<i>Fundulopanchax fallax</i>	<i>Aphyosemion schwoiseri</i>		44			(48)				W. Cameroon	S-158
<i>Fundulopanchax filamentosum</i>	<i>Aphyosemion</i> FIL-IJ		36	4 M/SM + 2ST + 30A	40	42			ACN=40	Nigeria	S-24, S-158
<i>Fundulopanchax filamentosum</i>	<i>Aphyosemion</i> FIL-AQ		30	8M + 2ST + 20A	38	40			ACN=38	Nigeria	S-24, S-158
<i>Fundulopanchax filamentosum</i>	<i>Aphyosemion</i> FIL-AQ		30	6M + 10ST + 14A	36	46			ACN=38	Nigeria	S-24, S-158
<i>Fundulopanchax gardneri</i>	<i>Aphyosemion</i> GAR-QE		40	4M + 6SM + 30 ST/A	50	(68)				W. Cameroon	S-24, S-158, S-159
<i>Fundulopanchax gardneri</i>	<i>Aphyosemion</i> GAR-MI		38			(68)				Nigeria	S-158
<i>Fundulopanchax gardneri</i>	<i>Aphyosemion</i> GAR-EG		36	4 M/SM + 32 ST/A	40	(68)				Nigeria	S-24
<i>Fundulopanchax gardneri</i>	<i>Aphyosemion</i> GAR-OW		36	4 M/SM + 32 ST/A	40	(66)				Nigeria (Owo)	S-158
<i>Fundulopanchax gardneri clauseni</i>	<i>Aphyosemion</i> CLA		36	4 M/SM + 32 ST/A	40	(66)				Nigeria	S-158
<i>Fundulopanchax gardneri lacustre</i>	<i>Aphyosemion</i>	F	39	3M + 4SM + 12ST + 20A	46	58			ACN=42	W. Cameroon	R-29
<i>Fundulopanchax gardneri lacustre</i>	<i>Aphyosemion</i>	M	37	5M + 4SM + 12ST + 16A	46	58			ACN=42	W. Cameroon	R-29
<i>Fundulopanchax gardneri mamfense</i>	<i>Aphyosemion</i>	F	40	16 M/SM + 2ST + 22A	56	58			ACN=42	W. Cameroon	R-29
<i>Fundulopanchax gularis</i>	<i>Aphyosemion gularis</i> GUL-AQ		32	32A	32	32			ACN=40	Nigeria	S-24, S-158
<i>Fundulopanchax gularis</i>	<i>Aphyosemion gularis</i>	M	36							Nigeria	G-65
<i>Fundulopanchax intermittens</i>	<i>Aphyosemion</i>		33, 36							Cameroon	S-158
<i>Fundulopanchax kribianus</i>	<i>Aphyosemion</i> KRI-TY		44			(48)				E. Cameroon	S-158
<i>Fundulopanchax marmoratum</i>	<i>Aphyosemion</i> MAM-TY		40	6 M/SM + 10ST + 24A	46	56			ACN=42	W. Cameroon	S-158, S-159
<i>Fundulopanchax mirabilis</i>	<i>Aphyosemion mirabile</i>		32-38			(60)				W. Cameroon	S-158
<i>Fundulopanchax mirabilis</i>	<i>Aphyosemion mirabile</i> MIR-TY		30	30 M/SM/ST		(60)				W. Cameroon	S-158
<i>Fundulopanchax mirabilis</i>	<i>Aphyosemion mirabile</i>		38	20 M/SM + 18 ST/A	58	(60)				W. Cameroon	S-158
<i>Fundulopanchax mirabilis</i>	<i>Aphyosemion mirabile</i> MIR-TY		37	19 M/SM + 18A	56	56			ACN=42	W. Cameroon	R-29
<i>Fundulopanchax moensis</i>	<i>Aphyosemion mirabile moense</i> MOE-IN	F	32			(60)				W. Cameroon	S-158
<i>Fundulopanchax moensis</i>	<i>Aphyosemion mirabile moense</i> MOE-TY		38			(66)				W. Cameroon	S-158
<i>Fundulopanchax indianus</i>	<i>Aphyosemion indianus</i> NDI-AQ		40	40A	40	40			ACN=44	E. Nigeria	S-158
<i>Fundulopanchax oeseri</i>	<i>Aphyosemion s. santaisabellae</i>		40	6 M/SM + 10ST + 24A	46	56			ACN=42	Fernando Po	S-24, S-158
<i>Fundulopanchax puerzlii</i>	<i>Aphyosemion</i> PUE-TY		38	2SM + 2ST + 34A	40	42			ACN=40	E. Cameroon	R-28, S-158
<i>Fundulopanchax robertsoni</i>	<i>Aphyosemion</i> ROS-TY		42	20 M/SM + 22 ST/A	62	(78)			ACN=44	W. Cameroon	R-28, S-158
<i>Fundulopanchax rubrolabialis</i>	<i>Aphyosemion rubrolabiale</i> RUL-MB		44	6M + 6SM + 2ST + 30A	56	58			ACN=44	W. Cameroon	R-28, S-158
<i>Fundulopanchax rubrolabialis</i>	<i>Aphyosemion rubrolabiale</i> RUL-YO		40	10 M/SM + 8ST + 22A	50	58			ACN=44	W. Cameroon	R-28, S-158
<i>Fundulopanchax rubrolabialis</i>	<i>Aphyosemion rubrolabiale</i>		40	8SM + 2ST + 30A	48	50				W. Cameroon	R-28
<i>Fundulopanchax scheeli</i>	<i>Aphyosemion</i> SCE-AQ		40	10 M/SM + 30 ST/A	50	(76)			ACN=42	S.E. Nigeria, Cameroon	S-24
<i>Fundulopanchax schwoiseri</i>	<i>Aphyosemion</i>		44			(48)				W. Cameroon	S-158
<i>Fundulopanchax sjostedti</i>	<i>Aphyosemion</i> SJO-AQ		40	40A	40	40			ACN=42	W. Cameroon	S-158
<i>Fundulopanchax traudeae</i>	<i>Aphyosemion mirabile traudeae</i>		37							W. Cameroon	R-29
<i>Fundulopanchax walkeri</i>	<i>Aphyosemion</i> WAL-AQ		36	12 SM + 24 ST/A	48	(70)			ACN=40	Ivory Coast	S-158
<i>Nimbapanchax petersii</i>	<i>Aphyosemion</i> PET-AQ		40	10M + 30A	50	50			ACN=44	Ivory Coast	S-24, S-158

Table 6.28 Order CYPRINODONTIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup>	Genome size	Comments	Locality	Reference
Suborder/family/subfamily/species	karyotype paper						NORs	(pg/cell)			
<i>Nimbapanchax viridis</i>	<i>Aphyosemion viride</i> VIR-AQ		40	10M + 30A	50	50			ACN=48	Liberia	S-158
<i>Nothobranchius egersi</i>			36			(66)				S. Tanzania	S-158
<i>Nothobranchius elongatus</i>			38			(76)				Kenya	S-158
<i>Nothobranchius foerschi</i>		F, M	34	12 M/SM + 22A	46	46			ACN=42	Tanzania	E-5
<i>Nothobranchius foerschi</i>	FOE-AQ		34			(46)				Tanzania	S-158
<i>Nothobranchius furzeri</i>	FUR-TY		38			(76)				Rhodesia	S-158
<i>Nothobranchius guentheri</i>		F	36	2M + 34A	38	38			X <sub>1</sub> X <sub>1</sub> X <sub>2</sub> X <sub>2</sub> , ACN=44	Zanzibar	E-5
<i>Nothobranchius guentheri</i>		M	35	2M + 1SM + 32A	38	38			X <sub>1</sub> X <sub>2</sub> Y, ACN=44	Zanzibar	E-5
<i>Nothobranchius guentheri</i>	GUE-ZA		36	4 M/SM + 32A	40	40			ACN=42	Mozambique	W-35
<i>Nothobranchius hengstleri</i>			38	6 M/SM + 32 ST/A	44					Tanzania	S-158
<i>Nothobranchius jempapi</i>	JAN-TY		38			(70)				Tanzania	S-158
<i>Nothobranchius jubbi cyaneus</i>	CYN-WA		34			(68)				Kenya	S-158
<i>Nothobranchius jubbi jubbi</i>	JUB-TY		34			(66)				Kenya	S-158
<i>Nothobranchius kirki</i>	KIR-TY		36			(58)				Malawi	S-24, S-158
<i>Nothobranchius cf. kirki</i>	"KIR"		44			(84)				Malawi	S-158
<i>Nothobranchius kiyawensis</i>	<i>Aphyosemion seymouri</i> SEM-VO		28	2M + 26 ST/A	30	(52)			ACN=38	Ghana	S-158
<i>Nothobranchius korthausae</i>	KOR-TY		36			(42)				Tanzania	S-158
<i>Nothobranchius kulmtae</i>	KUH-AQ		38			(66)				Mozambique	S-158
<i>Nothobranchius lourensi</i>	LOR-AQ		32	4M + 28A	36	36				Tanzania	S-158
<i>Nothobranchius lucius</i>			36	22 M/SM + 14 ST/A	58				ACN=42	Tanzania	W-35
<i>Nothobranchius makondorum</i>			38	18 M/SM + 20 ST/A	56				ACN=42	Tanzania, Mozambique	W-35
<i>Nothobranchius melanospilus</i>			38	14 M/SM + 24 ST/A	52				ACN=42	Tanzania	W-35
<i>Nothobranchius melanospilus</i>	MEP-DS		36			(76)				Tanzania	S-158
<i>Nothobranchius melanospilus</i>		F, M	38	2M + 34 ST/A	38	(76)			ACN=44	Tanzania	E-5
<i>Nothobranchius microlepis</i>	MIL-WA		24			(26)				Kenya, Somalia	S-158
<i>Nothobranchius palmqvisti</i>			36			(72)			ACN=42	Kenya, Tanzania	E-5
<i>Nothobranchius palmqvisti</i>	PAL 1956 strain	F, M	36	4M + 32 ST/A	40					Kenya, Tanzania	S-24, S-158
<i>Nothobranchius palmqvisti</i>	PAL 1957 strain		34	12M + 22A	46	46			ACN=38	Kenya, Tanzania	S-24, S-158
<i>Nothobranchius patrizii</i>		F, M	36	12 M/SM + 24 ST/A	48				ACN=44	Kenya, Somalia	E-5
<i>Nothobranchius patrizii</i>			36			(72)				Somali	S-158
<i>Nothobranchius polli</i>	PLL-ZA		36			(72)				Zaire	S-158
<i>Nothobranchius rachovii</i>		F, M	16	8M + 6SM + 2A	30	30			ACN=42	Somalia	K-106, E-5
<i>Nothobranchius rachovii</i>	RAC-AQ		18	12 M/SM + 6A	30	30				Mozambique	S-24, S-158, S-159
<i>Nothobranchius steinforti</i>	STI-AQ		36			(72)			ACN=48	Tanzania	S-158
<i>Nothobranchius thierryi</i>			42			(48)				W. Africa	S-24
<i>Nothobranchius thierryi</i>	<i>Fundulosoma THI-AQ</i>	M	43	4 M/SM + 39A	47	47				Ghana	S-158
<i>Scriptaphyosemion bertholdi</i>			42			(>44)				Sierra Leone	S-158
<i>Scriptaphyosemion bertholdi</i>	<i>Roloffia</i>	M	42							Sierra Leone	G-65

Table 6.28 Order CYPRINODONTIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Suborder/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup> NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Scriptaphyosemion brueningi</i>		M	42			ca. 44				Sierra Leone	S-158
<i>Scriptaphyosemion brueningi</i>	<i>Roloffia</i>	M	42*							Sierra Leone	G-65
<i>Scriptaphyosemion chaytori</i>	<i>Roloffia</i>	M	42							Sierra Leone	G-65
<i>Scriptaphyosemion fredrodi</i>	<i>Aphyosemion</i> FRE-TY		42	2 M/SM + 40A	44	44				Sierra Leone	S-158
<i>Scriptaphyosemion geryi</i>	<i>Aphyosemion</i> GER-AQ		40	2M + 38A	42	42			ACN=44	Guinea, Sierra Leone	S-158
<i>Scriptaphyosemion geryi</i>	<i>Roloffia</i>	M	40	2M + 38A	42	42				Sierra Leone	G-65
<i>Scriptaphyosemion geryi</i>	<i>Aphyosemion guineense</i> GUI-AQ		38	2M + 6SM + 2ST + 28A	46	48			ACN=46	Guinea, Sierra Leone	S-158
<i>Scriptaphyosemion geryi</i>	<i>Roloffia guineensis</i>	M	40	4 M/SM + 36A	44	44				Sierra Leone	G-65
<i>Scriptaphyosemion guignardi</i>	<i>Aphyosemion</i> GUG-TY		40			(44)				W. Guinea	S-158
<i>Scriptaphyosemion liberense</i>	<i>Aphyosemion</i>		42							Liberia	S-24
<i>Scriptaphyosemion liberense</i>	<i>Roloffia calabaricus</i>		42*							(Africa)	G-93
<i>Scriptaphyosemion liberense</i>	<i>Aphyosemion melantereon</i> MEL-AQ		48	2M + 46A	50	50				Liberia	S-158
<i>Scriptaphyosemion roloffi</i>	<i>Aphyosemion</i> ROL-AQ		42	2M + 40A	44	44			ACN=44	Sierra Leone	S-158
<i>Scriptaphyosemion roloffi</i>	<i>Roloffia</i>	M	42							Sierra Leone	G-65
<i>Scriptaphyosemion roloffi</i>	<i>Roloffia caldal</i>		42							(Africa)	G-93
<i>Scriptaphyosemion schmitti</i>	<i>Aphyosemion</i>		40			(60)				Liberia	S-158
<b>Rivulidae (New World rivulines)</b>											
<i>Aphyolebias peruensis</i>	<i>Pterolebias</i>		54*			(90)				Upper Amazon	S-26
<i>Austrofundulus limnaeus</i>		F, M	44	12M + 16SM + 16A	72					Venezuela	E-4
<i>Austrofundulus transilis</i>		F, M	44	12M + 16SM + 16A	72				ACN=46	Venezuela	E-4
<i>Austrofundulus transilis</i>			44			(80)			ACN=46	Venezuela	S-24
<i>Austrolebias adloffii</i>	<i>Cynolebias</i>	F, M	48	2SM + 46A	50		2		ACN=48	Brazil (RS)	G-15
<i>Austrolebias cf. adloffii</i>	<i>Cynolebias</i> sp.		48	4 M/SM + 44 ST/A	52		6			Uruguay	G-14
<i>Austrolebias cf. adloffii</i>	<i>Cynolebias</i> sp.		46	6 M/SM + 40 ST/A	52					Uruguay	G-14
<i>Austrolebias cf. adloffii</i>	<i>Cynolebias</i> sp.		48	8 M/SM + 40 ST/A	56					Uruguay	G-14
<i>Austrolebias affinis</i>	<i>Cynolebias</i>	F	48	2M + 2SM + 44A	52	52	4		ACN=48	Uruguay (Tacuarembó)	G-15
<i>Austrolebias affinis</i>	<i>Cynolebias</i>	F	49	2M + 2SM + 45A	53	53	4			Uruguay (Tacuarembó)	G-15
<i>Austrolebias alexandrii</i>	<i>Cynolebias</i>	F, M	48	4SM + 6ST + 38A	52	58	2		ACN=48	Uruguay (Salto)	G-15
<i>Austrolebias alexandrii</i>	<i>Cynolebias</i>	F, M	48	4SM + 10ST + 34A	52	62			ACN=48	Uruguay (Salto)	G-15
<i>Austrolebias arachan</i>	<i>Cynolebias uruguayensis</i>		48	4 M/SM + 44 ST/A	52		3			Uruguay	G-92
<i>Austrolebias arachan</i>	<i>Cynolebias uruguayensis</i>		48	2 M/SM + 46 ST/A	50		3			Uruguay	G-92
<i>Austrolebias bellotti</i>	<i>Cynolebias</i>	M	48	4 M/SM + 44 ST/A	52		5-6			Uruguay	G-14
<i>Austrolebias bellotti</i>	<i>Cynolebias</i>	M	48	6 M/SM + 42 ST/A	54					Argentina	G-14
<i>Austrolebias bellotti</i>	<i>Cynolebias</i>		48							La Plata	S-24
<i>Austrolebias charrua</i>	<i>Cynolebias</i>		48	2 M/SM + 46 ST/A	50				ACN=48	Uruguay	G-17
<i>Austrolebias charrua</i>	<i>Cynolebias</i>		48	4 M/SM + 44 ST/A	52				ACN=48	Uruguay	G-17
<i>Austrolebias charrua</i>	<i>Cynolebias</i>		48	6 M/SM + 42 ST/A	54				ACN=48	Uruguay	G-17

Table 6.28 Order CYPRINODONTIFORMES (continued)

A		B		C		D		E		F		G		H		I		J		K		L	
Current scientific name of taxon Suborder/family/subfamily/species		Reported in karyotype paper		Sex	2n	Karyotype		NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup> NORs	Genome size (pg/cell)	Comments		Locality		Reference							
<i>Austrolebias</i>	<i>charrua</i>	<i>Cynolebias</i>			48	8 M/SM + 40 ST/A		56					ACN=48	Uruguay			G-17						
<i>Austrolebias</i>	<i>cheradophilus</i>	<i>Cynolebias</i>			40	4 M/SM + 36 ST/A		44		4			ACN=46	Uruguay	Uruguay (Colonia)		H-43						
<i>Austrolebias</i>	<i>cinereus</i>	<i>Cynolebias</i>	F		44	4M + 2SM + 14ST + 24A		50	64	2			ACN=46	Uruguay	Uruguay (Durazno)		G-16						
<i>Austrolebias</i>	<i>duraznensis</i>	<i>Cynolebias</i>	M		48	4M + 6ST + 38A		52	58	3			ACN=48	Uruguay	Uruguay (Durazno)		G-15						
<i>Austrolebias</i>	<i>duraznensis</i>	<i>Cynolebias</i>	F, M		48	2M + 2SM + 6ST + 38A		52	58	3			ACN=48	Uruguay	Uruguay (Rocha)		G-15						
<i>Austrolebias</i>	<i>gymnoventris</i>	<i>Cynolebias</i>	F, M		48	2M + 2SM + 10ST + 34A		52	62	2			ACN=48	Uruguay	Uruguay (Rocha)		G-14						
<i>Austrolebias</i>	<i>luteofoammulatus</i>	<i>Cynolebias</i>	F, M		34	16 M/SM + 6ST + 12A		50	56	4			ACN=48	Uruguay	Uruguay (Tacuarembó)		G-16						
<i>Austrolebias</i>	<i>melanoorus</i>	<i>Cynolebias</i>	F, M		48	2SM + 22ST + 24A		50	72	2			ACN=48	Uruguay	Uruguay (Salto)		G-14						
<i>Austrolebias</i>	<i>nigripinnis</i>	<i>Cynolebias</i>	F, M		48	8 M/SM + 40 ST/A		56		5-6			ACN=48	Uruguay	Uruguay (Artigas)		G-14						
<i>Austrolebias</i>	<i>nigripinnis</i>	<i>Cynolebias</i>	M		48	6 M/SM + 8ST + 34A		54	62				ACN=48	Uruguay	Uruguay (Artigas)		G-14						
<i>Austrolebias</i>	<i>nigripinnis</i>	<i>Cynolebias</i>			48				(74)					La Plata			S-24						
<i>Austrolebias</i>	<i>nioni</i>	<i>Cynolebias</i>	F, M		46	2M + 6SM + 34ST + 4A		54	88	2			ACN=48	Uruguay	Uruguay (Tacuarembó)		G-16						
<i>Austrolebias</i>	<i>vazferreirai</i>	<i>Cynolebias</i>			46	2M + 2SM + 30ST + 12A		50	80	2			ACN=48	Uruguay	Uruguay (Cerro Largo)		G-16						
<i>Austrolebias</i>	<i>vazferreirai</i>	<i>Cynolebias</i>			46	2M + 4SM + 24ST + 16A		52	76				ACN=48	Uruguay	Uruguay (Cerro Largo)		G-16						
<i>Austrolebias</i>	<i>viarius</i>	<i>Cynolebias</i>	M		46	2M + 2ST + 42A		48	50	6			ACN=48	Uruguay	Uruguay		G-14						
<i>Austrolebias</i>	<i>viarius</i>	<i>Cynolebias</i>	M		48	2 M/SM + 46 ST/A		50					ACN=48	Uruguay	Uruguay		G-14						
<i>Cynopoecilus</i>	<i>melanoetaenia</i>				44				(52)					Brazil			S-24						
<i>Cynopoecilus</i>	<i>melanoetaenia</i>	<i>Cynolebias</i>	F, M		44	14 M/SM + 30 ST/A		58		5			ACN=46	Uruguay	Uruguay		G-14						
<i>Gnatholebias</i>	<i>zonatus</i>	<i>Pterolebias</i>	F, M		42	12 M/SM + 30A		54	54				ACN=46	Venezuela	Venezuela		E-3						
<i>Kryptolebias</i>	<i>brasiliensis</i>	<i>Rivulus domi</i>			48*				(70)				hermaphrodite	Brazil (Ru)			S-24						
<i>Kryptolebias</i>	<i>marmoratus</i>	<i>Rivulus</i>			48				(52)				ACN=48	USA (FL), Cuba			S-24						
<i>Kryptolebias</i>	<i>marmoratus</i>	<i>Rivulus</i>			48	4 M/SM + 46 ST/A		52		2			ACN=48	America			S-92						
<i>Kryptolebias</i>	<i>ocellatus</i>	<i>Rivulus</i>			48				(54)					Brazil			S-24						
<i>Megalobias</i>	<i>prognatus</i>	<i>Cynolebias</i>	F, M		36	12M + 6ST + 18A		48	54	3			ACN=48	Uruguay	Uruguay (Rocha)		G-14						
<i>Megalobias</i>	<i>prognatus</i>	<i>Cynolebias</i>	M		36	10 M/SM + 6ST + 20A		46	52				ACN=48	Uruguay	Uruguay (Rocha)		G-14						
<i>Megalobias</i>	<i>wolterstorffi</i>	<i>Cynolebias</i>	M		46	4 M/SM + 42 ST/A		50		5				Uruguay	Uruguay		G-14						
<i>Nematolebias</i>	<i>whitei</i>	<i>Cynolebias</i>			46				(92)					Brazil (Ru)			S-24						
<i>Pterolebias</i>	<i>holgnei</i>		F		46	6M + 40A		52	52				ACN=46	Venezuela	Venezuela		E-3						
<i>Pterolebias</i>	<i>holgnei</i>		M		46	6M + 3SM + 37A		55	55				Y. chrom.	Venezuela	Venezuela		E-3						
<i>Pterolebias</i>	<i>holgnei</i>		F, M		46	6M + 4SM + 36A		56	56				ACN=46	Venezuela	Venezuela		E-4						
<i>Pterolebias</i>	<i>longipinnis</i>				20	20A		20	20				ACN=46	(Lower Amazon)			S-24, K-106						
<i>Rachovia</i>	<i>brevis</i>		F, M		44	12M + 14SM + 18A		70	70				ACN=46	Venezuela	Venezuela		E-4						
<i>Rachovia</i>	<i>humelinckii</i>		F, M		44	10M + 10SM + 24A		64	64				ACN=46	Venezuela	Venezuela		E-4						
<i>Rachovia</i>	<i>maculipinnis</i>	<i>Pterolebias</i>			44				(80)				ACN=48	Venezuela	Venezuela		S-24						
<i>Rachovia</i>	<i>maculipinnis</i>	<i>maculipinna</i>	F, M		44	20M + 12SM + 12A		76	76				ACN=48	Venezuela	Venezuela		E-4						
<i>Rachovia</i>	<i>maculipinnis</i>		F, M		44	10M + 8SM + 26A		62	62				ACN=46	Venezuela	Venezuela		E-4						
<i>Rachovia</i>	<i>pyropunctata</i>		F, M		48	18M + 8SM + 22A		74	74				ACN=48	Venezuela	Venezuela		E-4						
<i>Rachovia</i>	<i>stellifer</i>	<i>Rivulus</i>			44	8M + 2SM + 14ST + 20A		54	68	4			ACN=46	French Guyana			Z-41						
<i>Rivulus</i>	<i>agilae</i>				44	8M + 2SM + 14ST + 20A		54	68	4			ACN=46	French Guyana			Z-41						

Table 6.28 Order CYPRINODONTIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Suborder/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup> NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Rivulus cylindraceus</i>			48			(58)				Cuba	S-24
<i>Rivulus hartii</i>			44			(56)				S. America	S-24
<i>Rivulus holmiae</i>			44			(72)				S. America	S-24
<i>Rivulus magdalenae</i>	<i>milesi</i>		46			(92)			ACN=48	Colombia	S-24
<i>Rivulus ornatus</i>			40			(66)			ACN=46	Lower Amazon	S-24
<i>Rivulus strigatus</i>			46			(88)				Amazon	S-24
<i>Rivulus urophthalmus</i>			46			(86)				Lower Amazon	S-24
<i>Rivulus urophthalmus</i>			44					3.0 BFA		(S. America)	H-13
<i>Terranatos dolichopterus</i>	<i>Austrofundulus</i>		44			(54)				Venezuela	S-24
<b>Suborder Cyprinodontoidi</b>											
<b>Anablepidae</b>											
<i>Anableps dowi</i>		F, M	46	46 ST/A	46				ACN=46	Mexico (Tehuantepec)	M-69
<b>Cyprinodontidae (pupfishes)</b>											
<b>Cyprinodontinae</b>											
<i>Aphanius asquamatus</i>			48*							Turkey	K-9
<i>Aphanius dispar</i>	<i>Kosswigichthys</i>		48*							Middle East	K-9
<i>Aphanius fasciatus</i>		F, M	48	48 ST/A	48		1-8		ACN=48	Italy (Sicily)	V-69
<i>Aphanius iberus</i>			48*							Spain	K-9
<i>Aphanius mento</i>	<i>cypris</i>		48							Iraq, Turkey	K-9
<i>Aphanius persicus</i>			48	22SM + 26ST	70	96			ACN=48	Iran (Fars)	E-12
<i>Aphanius sophiae</i>			48	28SM + 20ST	76	96			ACN=48	Iran (Fars)	E-12
<i>Aphanius sophiae</i>			48*							Iran	K-9
<i>Cyprinodon alvarezi</i>		F	48						X <sub>1</sub> X <sub>1</sub>	Mexico	H-1
<i>Cyprinodon atrorus</i>		F, M	48	2M + 14SM + 32ST	64	96			ACN=48	Mexico	S-108
<i>Cyprinodon beltrani</i>		F, M	48	2M + 14SM + 32ST	64	96			ACN=48	Mexico	S-108
<i>Cyprinodon bifasciatus</i>		F, M	48	2M + 14SM + 32ST	64	96			ACN=48	Mexico	S-108
<i>Cyprinodon bovinus</i>		F, M	48	2M + 14SM + 32ST	64	96			ACN=48	USA (TX)	S-108
<i>Cyprinodon dearborni</i>		F, M	48	2M + 10SM + 36 ST/A	60		2		ACN=48	Venezuela (Margarita Is.)	N-61
<i>Cyprinodon elegans</i>		F, M	48	2M + 14SM + 32ST	64	96			ACN=48	USA (TX)	S-108
<i>Cyprinodon eximius</i>		F, M	48	2M + 14SM + 32ST	64	96			ACN=48	USA (TX)	S-108
<i>Cyprinodon fontinalis</i>			48	2M + 6ST + 40A	50	56				Mexico	S-160
<i>Cyprinodon hubbsi</i>		F, M	48	2M + 14SM + 32ST	64	96			ACN=48	USA (FL)	S-108
<i>Cyprinodon macularius</i>			48	2M + 46A	50	50				USA (Death Valley)	T-62
<i>Cyprinodon macularius</i>			48	2M/SM + 46 ST/A	50					USA (CA)	T-56
<i>Cyprinodon nevadensis amargosae</i>			48	2M + 46A	50	50				USA (Death Valley)	T-62
<i>Cyprinodon pecosensis</i>		F, M	48	2M + 14SM + 32ST	64	96			ACN=48	USA (TX)	S-108

Table 6.28 Order CYPRINODONTIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup> NORs	Genome size (pg/cell)	Comments	Locality	Reference
Suborder/family/subfamily/species	karyotype paper										
<i>Cyprinodon</i>			48	2M + 46A	50	50				USA (Death Valley)	T-62
<i>Cyprinodon rubrofluvialis</i>		F, M	48	2M + 14SM + 32ST	64	96			ACN=48	USA (OK)	S-108
<i>Cyprinodon salinus</i>			48	2M + 46A	50	50				USA (Death Valley)	T-62
<i>Cyprinodon tularosa</i>			48	2M + 14SM + 32ST	64	96				USA (NM)	M-150
<i>Cyprinodon variegatus</i>		F, M	48	2M + 14SM + 32ST	64	96		(3.2 BFA)	ACN=48	USA (LA)	S-59, H-13
<i>Cyprinodon variegatus</i>		F, M	48	2M + 14SM + 32ST	64	96			ACN=48	USA (TX, FL), Mexico	S-108
<i>Garranella pulchra</i>		F	48	2M + 46 ST/A	50				X <sub>1</sub> X <sub>1</sub> X <sub>2</sub> X <sub>2</sub> , ACN=48	Yucatan Peninsula	L-26
<i>Garranella pulchra</i>		F	48	3 M/SM + 44 ST/A	50				X <sub>1</sub> X <sub>2</sub> Y, ACN=48	Yucatan Peninsula	L-26
<i>Jordanella floridae</i>		F, M	48	2M + 46 ST/A	50					Mexico	L-26
<i>Megupsilon aporus</i>		F	48	2M + 6SM + 40 ST/A	56				X <sub>1</sub> X <sub>1</sub> X <sub>2</sub> X <sub>2</sub> , ACN=48	Mexico (Nuevo Leon)	M-68, H-1
<i>Megupsilon aporus</i>		F	48	2M + 6SM + 40 ST/A	56				X <sub>1</sub> X <sub>2</sub> Y, ACN=48	Mexico (Nuevo Leon)	M-68, H-1
<i>Orestias agassii</i>		M	47	3M + 6SM + 38 ST/A	56				ACN=48	Chile (Altiplano)	L-74, V-76, V-111
<i>Orestias ascotanensis</i>		F, M	48	2M + 4SM + 14ST + 28A	54	68			ACN=48	Chile (Altiplano)	V-76, V-111
<i>Orestias chungarensis</i>		F, M	48	2M + 4SM + 4ST + 38A	54	58			ACN=48	Chile (Altiplano)	V-76, V-111
<i>Orestias laucaensis</i>		F, M	50	2M + 2SM + 20ST + 26A	54	74			5B, ACN=48	Chile (Altiplano)	V-76, V-111
<i>Orestias laucaensis</i>		F	50							Chile	V-76
<i>Orestias luteus</i>		M	51							Chile	V-76
<i>Orestias parinacotensis</i>			48*							Peru (Lake Titicaca)	L-74
<i>Orestias piacotensis</i>		F, M	50	2M + 4SM + 10ST + 32A	54	64			ACN=48	Chile (Altiplano)	V-76, V-111
			50	2M + 2SM + 12ST + 34A	54	66			2B, ACN=48	Chile (Altiplano)	V-76, V-111
<b>Fundulidae (topminnows and killifishes)</b>											
<i>Adinia xenica</i>	<i>multifasciatus</i>		32			(64)				USA (TX)	S-24
<i>Adinia xenica</i>		F, M	32	16M + 6SM + 10ST	54	64			ACN=48	USA (LA)	S-59
<i>Fundulus catenatus</i>			46						ACN=48	USA	C-52
<i>Fundulus chrysotus</i>			34	14M + 20 ST/A	48		4		ACN=48	USA (FL)	C-52
<i>Fundulus cingulatus</i>			46	2M + 44 ST/A	48		2		ACN=48	USA (FL)	C-52
<i>Fundulus confluentus</i>			48	48 ST/A	48		2		ACN=48	USA (FL)	C-52
<i>Fundulus diaphanus</i>		F, M	48	4SM + 44A	52	52		3.0 FCM	ACN=48	USA (OT)	C-52, A-87, G-85
<i>Fundulus diaphanus</i>		F	48	4SM + 44A	52	52	2		ACN=48	USA (OT, NY)	C-49, H-27
<i>Fundulus diaphanus</i>		M	48	2M + 2SM + 44A	52	52	2		ACN=48	USA (OT, NY)	C-49, H-27
<i>Fundulus grandis</i>		F, M	48	4ST + 44A	48	52			ACN=48	USA (LA)	S-59
<i>Fundulus grandis</i>			48	2SM + 46 ST/A	50		4		ACN=48	USA (FL)	C-52
<i>Fundulus heteroclitus</i>			48	48 ST/A	48		2	(2.7 FCM, 2.6 FIA)	ACN=48	USA (OT)	C-49, C-52, G-85, H-40
<i>Fundulus heteroclitus</i>		M	48	48 ST/A	48				ACN=48	USA (ME)	K-99
<i>Fundulus heteroclitus</i>	<i>Valencia lozanoi</i>	F, M	48	2SM + 10ST + 36A	50	60			ACN=48	S. W. Spain	B-27
<i>Fundulus kansae</i>			48	48A	48	48	2		ACN=48	USA (MO)	C-52
<i>Fundulus lineolatus</i>			46	2M + 44 ST/A	48		2		ACN=48	USA (FL)	C-52
<i>Fundulus luciae</i>			32	16M + 4SM + 12 ST/A	52		2		ACN=48	USA (OT)	C-52



Table 6.28 Order CYPRINODONTIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Suborder/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup> NORs	Genome size (pg./cell)	Comments	Locality	Reference
<i>Fundulus majalis</i>		F, M	48	2SM + 46 ST/A	50		2	(2.8 BFA)	ACN=48	USA (GT)	C-49, C-52, H-13
<i>Fundulus notatus</i>			44	6M + 12ST + 26A	50	62			ACN=48	USA (AL)	B-38
<i>Fundulus notatus</i>		F, M	40	10M + 12ST + 18A	50	62			ACN=48	USA (MS, TN, TX)	B-38, S-42
<i>Fundulus notatus</i>			40	10M + 2SM + 28 ST/A	52		2		ACN=48	USA (MO)	C-52
<i>Fundulus notti</i>			46	2M + 44 ST/A	48		2		ACN=48	USA (FL)	C-52
<i>Fundulus notti</i>			48							USA (AL)	D-6
<i>Fundulus olivaceus</i>			48	2M + 2SM + 44 ST/A	52		2		ACN=48	USA (MO)	C-52
<i>Fundulus olivaceus</i>		F, M	48	2M + 12SM + 34A	62	62				USA (TX)	C-6
<i>Fundulus olivaceus</i>		F, M	48	2M + 12ST + 34A	50	62			ACN=48	USA (AL, MS, TX)	B-38, S-42
<i>Fundulus parvipinnis</i>		F, M	48	2SM + 46A	50	50				USA (CA)	K-99
<i>Fundulus parvipinnis</i>		F	48	2SM + 46A	50	50			XX, ACN=48	USA (CA)	C-49
<i>Fundulus parvipinnis</i>		M	48	1SM + 47A	49	49			XY, ACN=48	USA (CA)	C-49
<i>Fundulus pulvereus</i>			48	48A	48	48	2		ACN=48	USA (CA)	C-52
<i>Fundulus rathbuni</i>			48	48 ST/A	48		2		ACN=48	USA (AL)	C-52
<i>Fundulus scidiacus</i>			48	2SM + 46 ST/A	50		2		ACN=48	USA (NC)	C-52
<i>Fundulus seminolis</i>			44	4M + 2SM + 38 ST/A	50		2		ACN=48	USA (MO)	C-52
<i>Fundulus similis</i>			48	48A	48	48	2		ACN=48	USA (FL)	C-52
<i>Fundulus stellifer</i>		F, M	48	2SM + 46A	50	50	2		ACN=48	USA (FL)	C-52, S-59
<i>Fundulus waccamensis</i>			48						ACN=48	USA	C-52, D-6
<i>Fundulus zebrinus</i>			48	4SM + 44 ST/A	52		2		ACN=48	USA (NC)	C-52
									ACN=48	USA	C-52
<b>Goodeidae</b>											
<b>Goodeinae</b>											
<i>Allodontichthys hubbsi</i>		F	42	8M + 34 SM/ST/A		54			ACN=48	Mexico (Jalisco)	M-70, U-65, U-70
<i>Allodontichthys hubbsi</i>		M	41	9M + 32 SM/ST/A		54			ACN=48	Mexico (Jalisco)	M-70, U-65, U-70
<i>Allodontichthys tamazulae</i>			48	2M + 2SM + 44 ST/A	52				ACN=48	Mexico	U-70
<i>Allodontichthys zonistius</i>			48	2M + 2SM + 44 ST/A	52				ACN=48	Mexico	U-70
<i>Allodontichthys</i> sp.			48	2M + 2SM + 44 ST/A	52				ACN=48	Mexico	U-70
<i>Allophorus robustus</i>	<i>Neophorus</i>		30	20M + 2ST + 8 ST/A	50				ACN=48	Mexico	U-70
<i>Allotoca catarinae</i>	<i>Neophorus</i>		46	2M + 4ST + 40A	48	52			ACN=48	Mexico	U-70
<i>Allotoca diazi</i>			46	2M + 4ST + 40A	48	52			ACN=48	Mexico	U-70
<i>Allotoca dugesi</i>			26	22M + 4 SM/ST		52			ACN=48	Mexico	U-70
<i>Allotoca dugesi</i>			26	22M + 4ST		52			ACN=48	W. Mexico	B-63, S-160
<i>Allotoca goslinei</i>		F, M	48	6ST + 42A	48	54			ACN=48	Mexico (Jalisco)	S-73
<i>Allotoca maculata</i>			48	4ST + 44A	48	52			ACN=48	W. Mexico	S-160, U-70
<i>Allotoca meeki</i>			46	2M + 6ST + 38A	48	54			ACN=48	Mexico	U-70
<i>Amea splendens</i>		F, M	26	22M + 2SM + 2A	50	50			ACN=48	Mexico (Pacific side)	M-72, U-70

Table 6.28 Order CYPRINODONTIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
Suborder/family/subfamily/species	karyotype paper										
<i>Ataeniobius toweri</i>			48	2SM + 46 ST/A	50				ACN=48	Mexico	U-70
<i>Chapalichthys encaustus</i>			36	12M + 4SM + 16ST + 4A	52	68			ACN=48	Mexico	U-70
<i>Chapalichthys pardalis</i>			36	12M + 2SM + 8ST + 14A	50	58			ACN=48	Mexico	U-70
<i>Characodon lateralis</i>			24	24M	48	48			ACN=48	Mexico	F-59, U-70
<i>Girardinichthys multiradiatus</i>			48	10ST + 38A	48	58			ACN=48	Mexico	U-70
<i>Girardinichthys viviparus</i>			48	10ST + 38A	48	58			ACN=48	Mexico	U-70
<i>Goodea atripinnis</i>			48	2SM + 46 ST/A	50				ACN=48	Mexico	U-70
<i>Goodea gracilis</i>			48	2SM + 46 ST/A	50				ACN=48	Mexico	U-70
<i>Goodea luitpoldi</i>			48	2SM + 46 ST/A	50				ACN=48	Mexico	U-70
<i>Hubsina turneri</i>			48	48 ST/A	48				ACN=48	Mexico	U-70
<i>Ilyodon furcoidens</i>		F, M	48	8ST + 40A	48	56			ACN=48	Mexico	U-70, M-163
<i>Ilyodon furcoidens</i>			48	7ST + 41A	48	55			ACN=48	Mexico (Pacific side)	T-57
<i>Ilyodon furcoidens</i>			48	2 M/SM + 11ST + 35A	50	61			ACN=48	Mexico (Pacific side)	T-57
<i>Ilyodon furcoidens</i>			48	4 M/SM + 12ST + 32A	52	64			ACN=48	Mexico (Pacific side)	T-57
<i>Ilyodon furcoidens</i>			48	6M + 3SM + 10ST + 29A	57	67			ACN=48	Mexico (Pacific side)	T-57
<i>Ilyodon furcoidens</i>			48	12 M/SM + 17ST + 19A	60	77			ACN=48	Mexico (Pacific side)	T-57
<i>Ilyodon lennoni</i>		F	48	2SM + 46 ST/A	50				ACN=48	Mexico (Guerrero)	M-163
<i>Ilyodon lennoni</i>		M	48	48 ST/A	48				ACN=48	Mexico (Guerrero)	M-163
<i>Ilyodon whitei</i>		F, M	48	8ST + 40A	48	56			ACN=48	Mexico	U-70
<i>Ilyodon whitei</i>		F	48	1M + 47 ST/A	49				ACN=48	Mexico (Guerrero)	M-163
<i>Ilyodon whitei</i>		M	48	48 ST/A	48				ZZ, ACN=48	Mexico (Guerrero)	M-163
<i>Ilyodon xantusi</i>		F, M	48	8ST + 40A	48	56			ACN=48	Mexico	U-70, M-163
<i>Skiffia bilineata</i>			48	4M + 2SM + 34ST + 8A	54	88			ACN=48	Mexico	U-70
<i>Skiffia francesae</i>			48	2M + 6SM + 40A	56	56			ACN=48	Mexico	U-70
<i>Skiffia lernae</i>			26	22M + 4A	48	48			ACN=48	Mexico	U-70
<i>Skiffia multipunctata</i>			46	4M + 4ST + 38A	50	54			ACN=48	Mexico	U-70
<i>Xenopohorus captivus</i>		F	48	2SM + 46 ST/A	50				ACN=48	Mexico	U-70
<i>Xenotaenia resolanae</i>		F	48	48 ST/A	48				ACN=48	Mexico	U-70
<i>Xenotoca eiseni</i>		M	48	6ST + 42A	48	54			ACN=48	Mexico	U-70
<i>Xenotoca melanosoma</i>			48	8ST + 40A	48	56			ACN=48	Mexico	U-70
<i>Xenotoca variata</i>			48	4ST + 44A	48	52			ACN=48	Mexico	U-70
<i>Zoogeomticus quitzeoensis</i>			28	22M + 6 ST/A	50				ACN=48	Mexico (Pacific side)	B-63

Table 6.28 Order CYPRINODONTIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
Suborder/family/subfamily/species	karyotype paper										
<b>Poeciliidae</b>											
<b>Aplocheilichthyinae</b>											
<i>Aplocheilichthys hutereaui</i>	<i>schalleri</i>		48	28ST + 20A	48	76				Mozambique	S-31
<i>Aplocheilichthys spilauchen</i>			48			(94)				Africa	S-24
<b>Procatopodinae</b>											
<i>Micropanchax macrophthalmus</i>	<i>Aplocheilichthys</i>		48		48	(48)			ACN=48	Nigeria	S-24
<i>Poropanchax normani</i>	<i>Aplocheilichthys</i>		48		48	(48)			ACN=48	Africa	S-24
<i>Procatopus aberrans</i>			48			(96)				Nigeria, Cameroon	S-24
<i>Procatopus similis</i>			48*			(96)				Nigeria, Cameroon	S-24
<b>Poeciliinae</b>											
<i>Gambusia affinis affinis</i>	<i>affinis</i>	F	48	1M + 47A	49	49		(1.8* FCM)	ZW, ACN=49	Japan (Kochi)	I-16, O-48
<i>Gambusia affinis affinis</i>	<i>affinis</i>	M	48	48A	48	48			ZZ, ACN=48	Japan (Kochi)	I-16
<i>Gambusia affinis affinis</i>	<i>affinis</i>	F	48	1M + 2SM + 45A	51	51		(1.9 FCM)	ZW, ACN=49	USA (GA, TX)	C-47, G-85
<i>Gambusia affinis affinis</i>	<i>affinis</i>	M	48	2SM + 46A	50	50			ZZ, ACN=48	USA (GA, TX)	C-47
<i>Gambusia affinis affinis</i>		F	48	1M + 47A	49	49			ZW, ACN=49	USA (AL, MS, AR, MO)	B-39
<i>Gambusia affinis affinis</i>		M	48	48A	48	48			ZZ, ACN=48	USA (AL, MS, AR, MO)	B-39
<i>Gambusia affinis holbrooki</i>		F, M	48	48A	48	48		(1.5 FCM, 1.7 BFA)	ACN=48	USA (NC)	R-81, T-73, H-13
<i>Gambusia affinis holbrooki</i>		F, M	48	48A	48	48			ACN=48	USA (NC, SC, FL, AL)	B-39
<i>Gambusia affinis holbrooki</i>		F, M	48	48A	48	48			ACN=48	India (J & K)	S-53, K-103
<i>Gambusia affinis holbrooki</i>		F, M	48	48A	48	48	4		ACN=48	Italy, Cyprus	L-66, V-68, R-100
<i>Gambusia affinis holbrooki</i>		F, M	48	1SM + 47A	49	49			ACN=48	Italy (Palermo)	V-68
<i>Gambusia affinis holbrooki</i>		F, M	48	2SM + 46A	50	50			ACN=48	Italy (Palermo)	V-68
<i>Gambusia gaigei</i>		F	48	1M + 47A	49	49			ZW, ACN=48	USA (TX)	C-4
<i>Gambusia gaigei</i>		M	48	48A	48	48			ZZ, ACN=48	USA (TX)	C-4
<i>Gambusia hurtadoi</i>		F	48	1M + 47A	49	49			ZW, ACN=48	Mexico	C-4
<i>Gambusia hurtadoi</i>		M	48	48A	48	48			ZZ, ACN=48	Mexico	C-4
<i>Gambusia luma</i>		F, M	48	48A	48	48			ACN=48	Belize	W-26
<i>Gambusia marshi</i>		F, M	48	48A	48	48			ACN=48	Mexico	C-4
<i>Gambusia nobilis</i>		F, M	42	42A	42	42			ZW, ACN=48	USA (TX)	C-4
<i>Gambusia nobilis</i>		F	48	1M + 47A	49	49			ZZ, ACN=48	USA (TX)	C-4
<i>Gambusia puncticulata puncticulata</i>		M	48	48A	48	48			ACN=48	Cuba	R-7
<i>Gambusia puncticulata puncticulata</i>		F	48	5M/SM + 43A	53	53			ACN=48	Cuba	R-7
<i>Gambusia regani</i>		M	48	6M/SM + 42A	54	54			ACN=48	Mexico	C-4
<i>Gambusia rhizophorae</i>		F, M	48	48A	48	48			ACN=48	USA (FL)	W-26
<i>Gambusia sexradiata</i>		F, M	48	2M + 4SM + 42A	54	54			ACN=48	Belize	W-26
<i>Gambusia vittata</i>		F	48	48A	48	48			ACN=48	Mexico	C-4
<i>Gambusia xanthosoma</i>		F, M	48	48A	48	48			ACN=48	Cayman Islands	W-26
<i>Gambusia sp.</i>		F, M	48	2M + 4SM + 42A	54	54			ACN=48	Tenerife	S-24
<i>Gambusia falcatius</i>	<i>Glaridichthys</i>		48	48A	48	48			ACN=48	Cuba	R-7
<i>Girardinus metallicus</i>		F, M	48	48A	48	48			ACN=48	(Cuba)	F-67
<i>Girardinus vittata</i>			48	2SM + 46A	50	50			ACN=48	Cuba	R-7, G-85
<i>Limia caudimaculatus</i>		M	46	46A	46	46		1.9 FD	ACN=48	Argentina	F-20

Table 6.28 Order CYPRINODONTIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Suborder/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Poecilia formosa</i>			46	46A	46	46	2	1.9 FCM	ACN=48	Mexico (Tamaulipas)	G-8, L-82
<i>Poecilia formosa</i>		F	69	69A	69	69	4	3.1 FCM	3X	Mexico (Tamaulipas)	G-8, L-82
<i>Poecilia latipinna</i>			46		46			2.0 FCM, 1.9 FD		Mexico	K-73, L-82, G-85
<i>Poecilia latipinna</i>		F	46	46A	46	46	1-4		ZW	Mexico	S-188
<i>Poecilia latipinna</i>		M	46	46A	46	46	1-2		ZZ	Mexico	S-188
<i>Poecilia latipunctata</i>		F, M	46	46 ST/A	46	46	8	1.8 FD	ACN=48	Mexico (Tamps)	G-7, G-85
<i>Poecilia mexicana</i>			46					2.0 FCM, 1.5-1.8 FD		Mexico	G-7, G-85, L-82
<i>Poecilia mexicana mexicana</i>		F, M	46	46A	46	46	4			Mexico	S-187
<i>Poecilia mexicana mexicana</i>			69	69A	69	69		2.2 FD	3X	Mexico	S-187
<i>Poecilia reticulata</i>			46	48A	46	46		2.0 FCM, 1.5 FD	ACN=48	(Mexico)	I-16, C-109, V-86
<i>Poecilia sphenops</i>	<i>Lebistes reticulatus</i>		47	47	47	47			ZW	India	R-48
<i>Poecilia sphenops</i>	<i>Mollenesia</i>	F	46	1M + 45A					ZZ	India	R-48
<i>Poecilia sphenops</i>	<i>Mollenesia</i>	M	46	46A	46	46				India	R-48
<i>Poecilia sphenops</i>	<i>Mollenesia</i>	F, M	46	46A	46	46		(1.9 FD)	ACN=48	Japan	I-16, G-85
<i>Poecilia velifera</i>			46							Mexico	G-7
<i>Poecilia vivipara</i>			48	48A	48	48				Brazil	O-50
<i>Poeciliopsis baenschii</i>			48	48A	48	48				(Mexico, Pacific)	F-67
<i>Poeciliopsis latidens</i>			48					1.3 FD		Mexico	S-161, C-109
<i>Poeciliopsis lucida</i>			72						3X	Mexico	S-161
<i>Poeciliopsis monacha</i>			48					1.3 FCM, 1.4 FD	ACN=48	Mexico	S-161, C-109, G-85
<i>Poeciliopsis occidentalis</i>			48					1.3 FCM, 1.3 FD		Mexico	S-183, C-109, G-85
<i>Poeciliopsis viriosa</i>			48					1.4 FD		(S. USA, N. Mexico)	S-207, C-109
<i>Quintana atrizona</i>		F, M	48	48A	48	48		1.4 FD		Mexico	S-183, C-109
<i>Xenophallus umbratilis</i>			46	2SM + 44A					ACN=48	Cuba	R-7
<i>Xiphophorus helleri</i>		F, M	48	48A	48	48		1.9* FCM, 1.9 BFA	ACN=48	Costa Rica (Atlantic)	F-67
<i>Xiphophorus helleri</i>		M	48	48A	48	48		1.5 FCM, 1.6 FD		(C. America)	I-16, O-48, H-13
<i>Xiphophorus maculatus</i>		F, M	48	48A	48	48		(1.8* FCM, 1.9 BFA)	ACN=48	(C. America)	O-4, G-85, T-72
<i>Xiphophorus maculatus</i>			48	48A	48	48		1.5 FCM	XY/XX	(C. America)	I-16, O-48, H-13
<i>Xiphophorus montezumae</i>		F	48	48A	48	48		1.5 FCM	ACN=48	(Mexico)	O-55, S-24, T-72
<i>Xiphophorus xiphidium</i>		M	48	48A	48	48			ACN=48	(Mexico)	L-75, T-72
<b>Valenciidae</b>											
<i>Valencia hispanica</i>			48						(92)	(Spain)	S-24

Table 6.29 Order STEPHANOBERYCIFORMES

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup>	Genome size	Comments	Locality	Reference
Family/species	karyotype paper						NORs	(pg/cell)			
<b>Melamphaidae</b>											
<i>Melanphaes acanthomus</i>		M	48	48A	48	48			ACN=48	USA (off CA)	C-46
<i>Melanphaes parvus</i>		M	50	50A	50	50			XY, ACN=50	USA (off CA)	C-48
<i>Poromitra crassiceps</i>		M	58	56 M/SM/ST/A + 2 satellited chrom.						USA (off CA)	C-46
<i>Scopeloberyx robustus</i>		M	42	40A + 2 satellited chrom.					XY, ACN=44	USA (off CA)	C-46, C-48
<i>Scopelogadus mizolepis bispinosus</i>		M	46	46A	46	46			XY, ACN=48	USA (off CA)	C-46, C-48

Table 6.30 Order BERYCIFORMES

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup>	Genome size	Comments	Locality	Reference
Suborder/family/species	karyotype paper						NORs	(pg/cell)			
<b>Suborder Trachichthyoidei</b>											
<b>Anoplogasteridae</b>											
<i>Anoplogaster cornuta</i>		M	48	2SM + 46A	50	50			ACN=50	USA (off CA)	C-46
<b>Diretmidae</b>											
<i>Diretmus argenteus</i>		M	44-46	2 macro. + 42-44 normal						Atlantic	P-74
<i>Diretmus</i> sp. C		M	70±							Atlantic	P-74
<b>Monocentridae</b>											
<i>Monocentris japonica</i>			48	48A	48	48			ACN=48	Japan (Chiba)	A-67
<i>Monocentris japonica</i>			48	2ST + 46A	48	50			ACN=48	Japan (Suruga Bay)	M-104
<b>Trachichthyidae</b>											
<i>Hoplostethus mediterraneus</i>			48	2ST + 46A	48	50			ACN=48	Japan (Suruga Bay)	M-104
<b>Suborder Berycoidei</b>											
<b>Berycidae</b>											
<i>Beryx splendens</i>		F	48	4M + 8SM + 36A	60	60	2	1.7* FCM	X <sub>1</sub> X <sub>2</sub> X <sub>2</sub> X <sub>2</sub> , ACN=48	Japan (Izu Peninsula)	O-43, O-48
<i>Beryx splendens</i>		M	47	5M + 8SM + 34A	60	60			X <sub>1</sub> X <sub>2</sub> Y, ACN=48	Japan (Izu Peninsula)	O-43

Table 6.30 Order BERYCIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup> NORs	Genome size (pg/cell)	Comments	Locality	Reference
Suborder/family/species	karyotype paper										
Suborder Holocentroidei											
Holocentridae											
<i>Holocentrus adscensionis</i>			50			78		1.3 FD, 1.8 BFA		Brazil (OE, RN)	G-12, G-85, H-13
<i>Myrripristis jacobus</i>			48		48	48				Brazil (RN, SPR)	G-12
<i>Sargocentron rubrum</i>	<i>Adioryx ruber</i>		48	48A	48	48			ACN=48	Japan (Yakushima Is.)	A-67

Table 6.31 Order ZEIFORMES

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup> NORs	Genome size (pg/cell)	Comments	Locality	Reference
Suborder/family/species	karyotype paper										
Suborder Zeioidei											
Oreosomatidae											
<i>Alloctytus verrucosus</i>			42	42A	42	42			ACN=48	Japan (Hokkaido)	S-140
Zeidae											
<i>Zeus faber</i>		F	44	44A	44	44	2		ACN=46	Italy (Palermo)	V-57, V-64
<i>Zeus faber</i>		M	42	1ST + 41A	42	43	2		Y chrom., ACN=46	Italy (Palermo)	V-64

Table 6.33 Order BATRACHOIDIFORMES

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2h	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
Family/species	karyotype paper										
<b>Batrachoididae</b>											
<i>Amphichithys cryptocentrus</i>			46	4M + 2SM + 40A	52	52			ACN=48	Venezuela	N-24
<i>Batrachoides manglae</i>			46	6M + 6SM + 34A	58	58			ACN=48	Venezuela	N-24
<i>Batrachoides pacifici</i>		F, M	46	6M + 6SM + 34A	58	58			ACN=48	Panama (Pacific coast)	N-23
<i>Halobatrachus didactylus</i>		F, M	46	8M + 12SM + 26 ST/A	66	78	2	4.4 BFA	ACN=48	Spain (Bay of Cadiz)	P-3
<i>Porichthys notatus</i>		F	48	10M + 20SM + 18A	78	78			ACN=48	E. Pacific	C-46, H-13
<i>Porichthys plectrodon</i>		F, M	44	8M + 10SM + 6ST + 20A	62	68	2		ACN=48	Venezuela	N-26
<i>Porichthys porosissimus</i>		F, M	44	14 M/SM + 30 ST/A	58		1-3	3.4 BFA	ACN=48	Brazil (Ruj)	B-58, H-13
<i>Thalassophryne maculosa</i>		F, M	46	8M + 6SM + 32 ST/A	60				ACN=48	Venezuela	N-24
<i>Thalassophryne maculosa</i>		F, M	46	12M + 6SM + 20ST + 8A	64	84	2		ACN=48	Venezuela	N-27
<i>Thalassophryne nattereri</i>		F, M	46	8M + 8SM + 24ST + 6A	62	86	2		ACN=48	Brazil (RN)	C-106

Table 6.34 Order SYNBRANCHIFORMES

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2h	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
Suborder/family/species	karyotype paper										
<b>Suborder Mastacembeloidei</b>											
<b>Mastacembelidae</b>											
<i>Macrogathus aculeatum</i>		M	48	8M + 2SM + 38A	58	58			ACN=48	India (WB)	M-26
<i>Macrogathus aculeatum</i>		F, M	48	8M + 2SM + 38A	58	58			ACN=48	India (Bihar)	K-42
<i>Macrogathus aculeatum</i>		F, M	48	10M + 38A	58	58	2			India (Haryana)	R-76
<i>Macrogathus aculeatum</i>		F	48							India (Portonovo)	N-13
<i>Macrogathus pancalus</i>	<i>Mastacembelus</i>	F, M	48	14M + 12SM + 14ST + 8A	74	88			ACN=48	India (Bihar)	K-42
<i>Macrogathus pancalus</i>	<i>Mastacembelus</i>	F	48	16M + 6SM + 8ST + 18A	70	78			ACN=48	India (WB)	M-26
<i>Mastacembelus armatus</i>		F, M	48	14M + 2SM + 4ST + 28A	64	68	2		ACN=48	China (Guangdong, Guilin)	Y-15
<i>Mastacembelus armatus</i>		F	48	10M + 4SM + 2ST + 32A	62	64	2			India (WB)	M-28, D-34
<i>Mastacembelus armatus</i>		F, M	48	10M + 6SM + 4ST + 28A	64	68	2	1.4 FD	ACN=48	(Asia)	O-57
<i>Sinobdella sinensis</i>	<i>Mastacembelus aculeatus</i>	F	48	16M + 4SM + 2ST + 26A	68	70		(1.8* FD)	XX, ACN=48	China (Guilin)	Y-15, C-83
<i>Sinobdella sinensis</i>	<i>Mastacembelus aculeatus</i>	M	48	15M + 4SM + 3ST + 26A	67	70			XY, ACN=48	China (Guilin)	Y-15
<i>Sinobdella sinensis</i>	<i>Mastacembelus aculeatus</i>	F, M	48	16M + 4SM + 28A	68	68			XX, XY	China (Hubei)	L-55

Table 6.33 Order BATRACHOIDIFORMES

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2h	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
Family/species	karyotype paper										
<b>Batrachoididae</b>											
<i>Amphichthys cryptocentrus</i>			46	4M + 2SM + 40A	52	52			ACN=48	Venezuela	N-24
<i>Batrachoides manglae</i>			46	6M + 6SM + 34A	58	58			ACN=48	Venezuela	N-24
<i>Batrachoides pacifici</i>		F, M	46	6M + 6SM + 34A	58	58			ACN=48	Panama (Pacific coast)	N-23
<i>Halobatrachus didactylus</i>		F, M	46	8M + 12SM + 26 ST/A	66	78	2	4.4 BFA	ACN=48	Spain (Bay of Cadiz)	P-3
<i>Porichthys notatus</i>		F	48	10M + 20SM + 18A	78	78			ACN=48	E. Pacific	C-46, H-13
<i>Porichthys plectrodon</i>		F, M	44	8M + 10SM + 6ST + 20A	62	68	2		ACN=48	Venezuela	N-26
<i>Porichthys porosissimus</i>		F, M	44	14 M/SM + 30 ST/A	58		1-3	3.4 BFA	ACN=48	Brazil (Ru)	B-58, H-13
<i>Thalassophryne maculosa</i>		F, M	46	8M + 6SM + 32 ST/A	60				ACN=48	Venezuela	N-24
<i>Thalassophryne maculosa</i>		F, M	46	12M + 6SM + 20ST + 8A	64	84	2		ACN=48	Venezuela	N-27
<i>Thalassophryne nattereri</i>		F, M	46	8M + 8SM + 24ST + 6A	62	86	2		ACN=48	Brazil (RN)	C-106

Table 6.34 Order SYNBRANCHIFORMES

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2h	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
Suborder/family/species	karyotype paper										
<b>Suborder Mastacembeloidei</b>											
<b>Mastacembelidae</b>											
<i>Macrogathus aculeatum</i>		M	48	8M + 2SM + 38A	58	58			ACN=48	India (WB)	M-26
<i>Macrogathus aculeatum</i>		F, M	48	8M + 2SM + 38A	58	58			ACN=48	India (Bihar)	K-42
<i>Macrogathus aculeatum</i>		F, M	48	10M + 38A	58	58	2			India (Haryana)	R-76
<i>Macrogathus aculeatum</i>		F	48							India (Portonovo)	N-13
<i>Macrogathus pancalus</i>	<i>Mastacembelus</i>	F, M	48	14M + 12SM + 14ST + 8A	74	88			ACN=48	India (Bihar)	K-42
<i>Macrogathus pancalus</i>	<i>Mastacembelus</i>	F	48	16M + 6SM + 8ST + 18A	70	78			ACN=48	India (WB)	M-26
<i>Mastacembelus armatus</i>		F, M	48	14M + 2SM + 4ST + 28A	64	68	2		ACN=48	China (Guangdong, Guilin)	Y-15
<i>Mastacembelus armatus</i>		F	48	10M + 4SM + 2ST + 32A	62	64	2			India (WB)	M-28, D-34
<i>Mastacembelus armatus</i>		F, M	48	10M + 6SM + 4ST + 28A	64	68	2	1.4 FD	ACN=48	(Asia)	O-57
<i>Sinobdella sinensis</i>	<i>Mastacembelus aculeatus</i>	F	48	16M + 4SM + 2ST + 26A	68	70		(1.8* FD)	XX, ACN=48	China (Guilin)	Y-15, C-83
<i>Sinobdella sinensis</i>	<i>Mastacembelus aculeatus</i>	M	48	15M + 4SM + 3ST + 26A	67	70			XY, ACN=48	China (Guilin)	Y-15
<i>Sinobdella sinensis</i>	<i>Mastacembelus aculeatus</i>	F, M	48	16M + 4SM + 28A	68	68			XX, XY	China (Hubei)	L-55



Table 6.34 Order SYNBRANCHIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Suborder/family/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<b>Suborder Synbranchioidei</b>											
<b>Synbranchidae</b>											
<i>Monopterus albus</i>	<i>Fluta alba</i>	F, M	24	24A	24	24			ACN=24	Japan (Nara)	K-65
<i>Monopterus albus</i>			24	24A	24	24		(1.3*, 1.6 FD)	ACN=24	China (Hubei)	L-39, C-83
<i>Monopterus albus</i>			24	24A	24	24			ACN=24	China	L-61, Y-12
<i>Monopterus albus</i>	<i>alba</i>	F	24	24A	24	24			ACN=24	India (Manipur)	R-56, R-64
<i>Monopterus cuchia</i>	<i>Amphipnous</i>	F, M	42	2M + 4SM + 14ST + 22A	48	62				India (WB)	K-46
<i>Monopterus cuchia</i>	<i>Amphipnous</i>	F, M	42	4SM + 38A	46	46			ACN=42	India (Assam)	R-64
<i>Ophisternon bengalense</i>	<i>Synbranchus bengalensis</i>	F	46	6 M/SM + 40A	52	52				India (Portonovo)	N-13
<i>Synbranchus marmoratus</i>		F, M	44	4 M/SM + 40 ST/A	48		4		0-2 B	Argentina	S-10, C-98
<i>Synbranchus marmoratus</i>		F	44	4 M/SM + 40 ST/A	48		2		ACN=48	Brazil (CE, SP)	F-57
<i>Synbranchus marmoratus</i>		F, M	42	4 M/SM + 38 ST/A	46		2		ACN=48	Brazil (MS, GO, SP)	F-57
<i>Synbranchus marmoratus</i>			46	6 M/SM + 40 ST/A	52		2			Brazil (SP)	F-57
<i>Synbranchus marmoratus</i>			42	4M + 6SM + 8ST + 24A	52	60		7.6-8.5 FD	ACN=48	Brazil (SP)	T-75
<i>Synbranchus marmoratus</i>			42	4M + 2SM + 8ST + 28A	48	56		6.6-7.4 FD	ACN=48	Brazil (PR)	T-75
<i>Synbranchus marmoratus</i>			42	4M + 2SM + 8ST + 28A	48	56		6.6 FD	ACN=48	Brazil (MS)	T-75
<i>Synbranchus marmoratus</i>			44	4M + 2SM + 8ST + 30A	50	58		7.9 FD	ACN=48	Brazil (SP)	T-75
<i>Synbranchus marmoratus</i>			46	4M + 2SM + 8ST + 32A	52	60		6.4 FD	ACN=48	Brazil (PR)	T-75
<i>Synbranchus marmoratus</i>			46	6M + 2SM + 6ST + 32A	54	60		5.6 FD	ACN=48	Brazil (MS)	T-75

Table 6.35 Order SCORPAENIFORMES

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
Suborder/family/subfamily/species	karyotype paper										
<b>Suborder Dactylopteroidei</b>											
<b>Dactylopteridae</b>											
<i>Dactylopterus volitans</i>			48	16M + 14SM + 6ST + 12A	78	84				Brazil (RJ)	B-86
<b>Suborder Scorpaenoidei</b>											
<b>Scorpaenidae</b>											
<b>Sebastinae</b>											
<i>Helicolenus dactylopterus</i>		F, M	48	2M + 46A	50	50			ACN=48	Italy (Palermo)	V-54
<i>Helicolenus dactylopterus</i>		F, M	47	3M + 44A	50	50			ACN=48	Italy (Palermo)	V-54
<i>Helicolenus hilgendorfi</i>			48		52					Japan	Y-22
<i>Sebastes hubbsi</i>		M	46	4M + 42A	50	50			ACN=48	Japan (Sanriku)	I-4, N-33
<i>Sebastes hubbsi</i>			48	3M + 2ST + 43A	51	53				China	Z-23
<i>Sebastes inermis</i>			48	2M + 46A	50	50			ACN=48	Japan	N-33
<i>Sebastes inermis</i>			48		50			(1.9* FCM)		Japan	Y-22, O-48
<i>Sebastes iracundus</i>		M	48							W.N. Pacific	I-12
<i>Sebastes joyneri</i>			48	2M + 46A	50	50			ACN=48	Japan (Izu)	I-4
<i>Sebastes longispinis</i>			48	2M + 46A	50	50			ACN=48	Japan	N-33
<i>Sebastes matsubarae</i>			48		50					Japan	Y-22
<i>Sebastes oblongus</i>		F, M	48	2SM + 46A	50	50			ACN=48	Japan (Sanriku)	I-4
<i>Sebastes pachycephalus nudus</i>		F, M	48	2M + 46A	50	50			ACN=48	Japan (Sanriku)	I-4
<i>Sebastes schlegeli</i>			48	2M + 2ST + 44A	50	52			ACN=48	Japan	N-33
<i>Sebastes schlegeli</i>		M	48	2M + 46A	50	50			ACN=48	Japan (Sanriku)	I-4
<i>Sebastes schlegeli</i>			48	2M + 2SM + 44A	52	52			ACN=48	China (Liaoning)	Z-15
<i>Sebastes schlegeli</i>		F, M	48	2M + 46A	50	50	2		ACN=48	China (Shandong)	Y-18, W-8
<i>Sebastes taczanowskii</i>		M	48	2M + 46A	50	50			ACN=48	Japan (Hokkaido)	S-15
<i>Sebastes thompsoni</i>		F	48	2SM + 46A	50	50			ACN=48	Japan (Sanriku)	I-4
<i>Sebastes trivittatus</i>		M	48	2M + 46A	50	50			ACN=48	Japan (Hokkaido)	I-4
<i>Sebastes vulpes</i>			48	2M + 46A	50	50			ACN=48	Japan (Hokkaido)	I-4
<i>Sebastiscus albofasciatus</i>			48		52					Japan	Y-22
<i>Sebastiscus marmoratus</i>			48	2M + 46A	50	50		(1.8* FCM)	ACN=48	Japan	N-33, Y-22, O-48
<i>Sebastiscus marmoratus</i>			48	2SM + 46A	50	50			ACN=48	China	P-4
<i>Sebastiscus marmoratus</i>		F, M	48	2M + 46A	50	50		1.6* FCM	ACN=48	Korea (Busan)	P-70
<i>Sebastolobus macrochir</i>		M	46							Okhotsk Sea	I-12

Table 6.35 Order SCORPAENIFORMES (continued)

A		B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon		Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag-NORs	Genome size (pg/cell)	Comments	Locality	Reference
Suborder/family/subfamily/species		karyotype paper										
<b>Scorpaeninae</b>												
<i>Dendrochirus</i>	<i>zebra</i>		F, M	48	4M + 6ST + 38A	52	58	2		ACN=48	Indonesia (Java)	C-23
<i>Pterois</i>	<i>lunulata</i>			48	2M + 10SM + 18 ST + 18A	60	78			ACN=48	Japan	N-33
<i>Pterois</i>	<i>lunulata</i>		F, M	48	2M + 12ST + 34A	50	62	2		ACN=48	Indonesia (Java)	C-23
<i>Pterois</i>	<i>radiata</i>		F, M	48	4M + 8ST + 36A	52	60	2		ACN=48	Indonesia (Java)	C-23
<i>Pterois</i>	<i>volitans</i>			48	2M + 10ST + 36A	50	60	2	2.0 FIA	ACN=48	Indonesia (Java)	C-23, H-41
<i>Scorpaena</i>	<i>brasilensis</i>		F, M	46	2M + 12SM + 32 ST/A	60		2	2.8 BFA	ACN=48	Brazil (RJ)	C-78, H-13
<i>Scorpaena</i>	<i>isthmensis</i>		F, M	40	6M + 8SM + 26 ST/A	54		2		ACN=46	Brazil (RJ)	C-78
<i>Scorpaena</i>	<i>izensis</i>			48			56				Japan	Y-22
<i>Scorpaena</i>	<i>miostoma</i>	<i>neglecta miostoma</i>		48			82				Japan	Y-22
<i>Scorpaena</i>	<i>miostoma</i>	<i>neglecta miostoma</i>		48	6SM + 22ST + 20A	54	76			ACN=48	Japan (Surruga Bay)	M-118
<i>Scorpaena</i>	<i>notata</i>		F, M	34	26ST + 8A	34	60	2		ACN=48	Italy (Senigallia)	C-16
<i>Scorpaena</i>	<i>notata</i>			34	24ST + 10A	34	58	2	1.1 FD	ACN=48	Spain (Malaga)	T-34
<i>Scorpaena</i>	<i>notata</i>	<i>ustulata</i>		34	10 M/SM + 24 ST/A	44					Croatia	S-195
<i>Scorpaena</i>	<i>onaria</i>	<i>neglecta neglecta</i>		48	6SM + 32ST + 10A	54	86			ACN=48	Japan (Surruga Bay)	M-118
<i>Scorpaena</i>	<i>onaria</i>	<i>neglecta neglecta</i>		47	7SM + 32ST + 8A	54	86			ACN=48	Japan (Surruga Bay)	M-118
<i>Scorpaena</i>	<i>onaria</i>	<i>neglecta neglecta</i>		48	6M + 14SM + 18ST + 10A	68	86			ACN=48	Japan	N-33
<i>Scorpaena</i>	<i>onaria</i>	<i>neglecta neglecta</i>		47	7M + 14SM + 18ST + 8A	68	86			ACN=48	Japan	N-33
<i>Scorpaena</i>	<i>onaria</i>	<i>neglecta neglecta</i>		48			56				Japan	Y-22
<i>Scorpaena</i>	<i>porcus</i>		F, M	42	4M + 2SM + 10ST + 26A	48	58	2	(2.8 FCM)	ACN=46	Italy (Senigallia)	C-16, V-86
<i>Scorpaena</i>	<i>porcus</i>			42	6M + 10ST + 26A	48	58	2	1.8 FD	ACN=46	Spain (Malaga)	T-34, C-9
<i>Scorpaena</i>	<i>porcus</i>		M	42	6M + 10ST + 26A	48	58				Italy (Roma)	C-31
<i>Scorpaena</i>	<i>porcus</i>			42	16 M/SM + 26A	58	58				Croatia	S-195
<i>Scorpaena</i>	<i>scrofa</i>			46	20ST + 26A	46	66				Italy	T-34
<i>Scorpaenodes</i>	<i>littoralis</i>		F	36	32 M/SM + 2ST + 2A	68	70	2			Japan (Chiba)	A-54, T-6
<i>Scorpaenodes</i>	<i>littoralis</i>			36	32M + 2ST + 2A	68	70				Japan (Surruga Bay)	M-118
<i>Scorpaenopsis</i>	<i>cirrosa</i>	<i>cirrhosa</i>		48	4ST + 44A	48	52			ACN=48	Japan (Surruga Bay)	M-118
<i>Scorpaenopsis</i>	<i>gibbosa</i>		M	48	10ST + 38A	48	58	2		ACN=48	Indonesia (Java)	C-23
<b>Tetraroginae</b>												
<i>Paracentropogon</i>	<i>rubripinnis</i>	<i>Hypodytes</i>		48	4 M/SM + 44 ST/A	52			(2.1* FCM)	ACN=48	Japan (Chiba, Kanagawa)	A-54, O-48
<i>Paracentropogon</i>	<i>rubripinnis</i>	<i>Hypodytes</i>	F	48	2M + 46A	50	50			X <sub>1</sub> X <sub>1</sub> X <sub>2</sub> X <sub>2</sub>	S. Japan	U-41
<i>Paracentropogon</i>	<i>rubripinnis</i>	<i>Hypodytes</i>	M	47	3M + 44A	50	50			X <sub>1</sub> X <sub>2</sub> Y, ACN=48	S. Japan	U-41
<i>Tetraroge</i>	<i>niger</i>		M	50							India (Portonovo)	N-13

Table 6.35 Order SCORPAENIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Suborder/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<b>Synacellinae</b>											
<i>Inimicus japonicus</i>			48	10M + 4SM + 2ST + 32A	62	64			ACN=48	Japan	N-33
<b>Suborder Platycephaloidei</b>											
<b>Triglidae</b>											
<i>Chelidonichthys lucernus</i>	<i>Trigla lucerna</i>	F, M	48	2M + 2SM + 2ST + 42A	52	54			ACN=48	Italy (Palermo)	V-54
<i>Chelidonichthys lucernus</i>	<i>Trigla lucerna</i>	F, M	47	3M + 2SM + 2ST + 40A	52	54			ACN=48	Italy (Palermo)	V-54
<i>Chelidonichthys lucernus</i>	<i>Trigla lucerna</i>		48	2M + 4SM + 2ST + 40A	54	56	2		ACN=48	Italy (Senigallia)	C-16
<i>Chelidonichthys lucernus</i>	<i>Trigla lucerna</i>		47	3M + 4SM + 2ST + 38A	54	56	2		ACN=48	Italy (Senigallia)	C-16
<i>Chelidonichthys lucernus</i>	<i>Trigla lucerna</i>		48							Russia	V-72
<i>Prionotus punctatus</i>			100-102							Brazil (Rj)	B-86
<i>Trigloporus lastoviza</i>		F, M	48	6M + 4ST + 38A	54	58	2		ACN=48	Italy (Palermo)	C-16
<b>Platycephalidae</b>											
<i>Inegocia guttata</i>			48	20M + 10SM + 6ST + 12A	78	84			ACN=48	Japan (Izu)	I-2
<i>Onigocia macrolepis</i>			48	48A	48	48			ACN=48	Japan (Izu)	I-2
<i>Onigocia spinosa</i>			48	32M + 12SM + 4ST	92	96			ACN=48	Japan (Izu, Tokyo)	I-2
<i>Platycephalus sp. 2</i>	<i>indicus</i>		48	2SM + 6ST + 40A	50	56			ACN=48	Japan (Iwate)	I-2
<i>Platycephalus indicus</i>			48	2M + 8SM + 2ST + 36A	58	60	2	(1.6 FIA)	ACN=48	China (Shandong)	K-96, H-41
<i>Platycephalus indicus</i>			48	4M + 6SM + 2ST + 36A	58	60			ACN=48	China (Shandong)	Z-37
<i>Platycephalus indicus</i>	<i>Thysanophrys</i>		48	10 M/SM + 38 ST/A	58				ACN=48	India (Portonovo)	N-13
<i>Platycephalus indicus</i>		F	48	2SM + 10ST + 36A	50	60			ACN=48	India (Orissa)	C-61
<i>Platycephalus tuberculatus</i>			48	4M + 4SM + 6ST + 34A	56	62			ACN=48	India (WB)	N-17
<i>Thysanophrys chiltonae</i>			48	22M + 12SM + 10ST + 4A	82	92			ACN=48	Japan (Okinawa)	I-2
<b>Suborder Anoploplatycephaloidei</b>											
<b>Anoploplatycephalidae</b>											
<i>Eriolepis zonifer</i>			30	22M + 6SM + 2ST	58	60				N. Pacific	I-21
<i>Eriolepis zonifer</i>			30	22M + 6SM + 1ST + 1A	58	59				N. Pacific	I-21
<i>Eriolepis zonifer</i>			30	18M + 4SM + 4ST + 4A	52	56				N. Pacific	I-21
<i>Eriolepis zonifer</i>			30	18M + 2SM + 4ST + 6A	50	54				N. Pacific	I-21

Table 6.35 Order SCORPAENIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
Suborder/family/subfamily/species	karyotype paper										
<b>Suborder Hexagrammoidei</b>											
<b>Hexagrammidae</b>											
<i>Hexagrammos</i>	<i>Agrammus</i>		48	8M + 26SM + 14ST	82	96			ACN=48	Japan (Hokkaido)	M-51
<i>Hexagrammos</i>	<i>Agrammus</i>	F, M	48	8M + 26SM + 14ST	82	96			ACN=48	China (Liaoning)	Z-15
<i>Hexagrammos</i>	<i>lagocephalus</i>		48	2M + 6SM + 28ST + 12A	56	84			ACN=48	Japan (Hokkaido)	M-51
<i>Hexagrammos</i>	<i>otakii</i>		48	6M + 12SM + 22ST + 8A	66	88		(1.7* FCM)	ACN=48	Japan (Yamaguchi)	N-36, O-48
<i>Hexagrammos</i>	<i>otakii</i>	F, M	48	6M + 8SM + 12ST + 22A	62	74			ACN=48	China (Liaoning)	Z-15
<i>Hexagrammos</i>	<i>otakii</i>	F, M	48	6M + 16SM + 20ST + 6A	70	90	2		ACN=48	China (Shandong)	Y-18
<i>Hexagrammos</i>	<i>otakii</i>	F, M	48	6M + 20SM + 16ST + 6A	74	90			ACN=48	China	W-8
<i>Hexagrammos</i>	<i>stelleri</i>	F	48	4M + 12SM + 12ST + 20A	64	76			ACN=48	Japan (Hokkaido)	M-51
<i>Pleurogrammus</i>	<i>azonus</i>		48	18M + 8SM + 12ST + 10A	74	86			ACN=48	Japan (Hakodate)	M-51
<b>Suborder Cottoidei</b>											
<b>Cottidae</b>											
<i>Alcichthys</i>	<i>alcicornis</i>	F, M	48	2M + 6SM + 40 ST/A	56			1.5 FD	ACN=48	Japan (Iwate)	T-64
<i>Artedius</i>	<i>fenestralis</i>	M	48	10M + 10SM + 10ST + 18A	68	78			ACN=48	USA (WA)	I-7
<i>Artedius</i>	<i>lateralis</i>	M	48	8M + 12SM + 12ST + 16A	68	80			ACN=48	USA (WA)	I-7
<i>Batrachocottus</i>	<i>baicalensis</i>	M	48	6M + 6SM + 36 ST/A	60				ACN=50	Russia (Lake Baikal)	S-167, S-168
<i>Batrachocottus</i>	<i>multiradiatus</i>	F, M	48	12M + 8SM + 18ST + 10A	68	86			ACN=48	Russia (Lake Baikal)	S-167, S-168
<i>Clinocottus</i>	<i>analis</i>		48*					1.9 BFA		USA (CA)	C-46, H-13
<i>Cottocomphorus</i>	<i>grewingkii</i>	F, M	48	10M + 6SM + 32 ST/A	64				ACN=48	Russia (Lake Baikal)	S-168
<i>Cottocomphorus</i>	<i>inermis</i>	M	48	6M + 8SM + 34 ST/A	62				ACN=48	Russia (Lake Baikal)	S-168
<i>Cottus</i>	<i>gobio</i>	F, M	48	10 M/SM + 38 ST/A	58		4		ACN=48	Italy (Vicenza)	V-62
<i>Cottus</i>	<i>gobio</i>	F, M	48	6 M/SM + 42 ST/A	54					Bosnia-Herzegovina	B-24
<i>Cottus</i>	<i>gobio</i>		52	6 M/SM + 46A	58	58				Poland	S-107
<i>Cottus</i>	<i>hangiongensis</i>	F	48	6 M/SM + 42 ST/A	54				ACN=48	Japan (Hokkaido)	A-1
<i>Cottus</i>	<i>kazika</i>	F, M	40	18 M/SM + 22 ST/A	58				ACN=48	Japan (Hokuriku)	A-4
<i>Cottus</i>	<i>nozawae</i>	F, M	48	10 M/SM + 38 ST/A	58				ACN=48	Japan (Hokkaido)	A-1
<i>Cottus</i>	<i>paulus</i>		48		48					USA (AL)	G-32
<i>Cottus</i>	<i>poecilopus</i>		48	8 M/SM + 40A	56	56				Europe	S-107
<i>Cottus</i>	<i>pollux</i>	F, M	48	10 M/SM + 38 ST/A	58		2		ACN=48	Japan	A-4
<i>Cottus</i>	<i>pollux</i>	F, M	48	4M + 6SM + 16ST + 22A	58	74			ACN=48	Japan (Sanriku)	I-7
<i>Cottus</i>	<i>reinii</i>	F	48	12 M/SM + 36 ST/A	60				ACN=48	Japan (Iwate)	A-4

Table 6.35 Order SCORPAENIFORMES (continued)

A		B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Suborder/family/subfamily/species		Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup> NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Gymnocanthus</i>	<i>intermedius</i>		F, M	44	2M + 4SM + 38 ST/A	50			1.5 FD	ACN=48	Japan (Iwate)	T-64
<i>Gymnocanthus</i>	<i>tricuspis</i>			46	4M + 42A	50	50		(1.5 FIA)		Russia	L-87, H-40
<i>Gymnocanthus</i>	<i>tricuspis</i>			46	3M + 1SM + 42A	50	50				Russia	L-87
<i>Icelus</i>	<i>cataphractus</i>		M	40	12M + 12SM + 16 ST/A	64			1.5 FD		Japan (Iwate)	T-64
<i>Leocottus</i>	<i>kesslerii</i>	<i>Cottus</i>	M	48	6M + 4SM + 38 ST/A	58				ACN=48	Russia (Lake Baikal)	S-167, S-168
<i>Myoxocephalus</i>	<i>brandti</i>		F, M	44	2M + 18ST + 24A	46	64			ACN=44	Russia (Amur Bay)	R-103
<i>Myoxocephalus</i>	<i>jaok</i>		F, M	24	16M + 4SM + 4A	44	44			ACN=42	Russia (Far East)	R-113
<i>Myoxocephalus</i>	<i>ochotensis</i>		F, M	42	2M + 20ST + 20A	44	64			ACN=42	Russia (Sea of Okhotsk)	R-114
<i>Myoxocephalus</i>	<i>scorpius</i>			36	8M + 2SM + 2ST + 24A	46	48		1.7 FIA		Russia	V-72, H-40
<i>Myoxocephalus</i>	<i>scorpius</i>			37	7M + 2SM + 2ST + 26A	46	48				Russia	V-72
<i>Myoxocephalus</i>	<i>scorpius</i>			38	6M + 2SM + 2ST + 28A	46	48				Russia	V-72
<i>Myoxocephalus</i>	<i>stelleri</i>			40	6 M/SM + 34 ST/A	46		4		ACN=42	Russia (Far East)	M-67
<i>Ocynectes</i>	<i>maschalis</i>		F, M	46	4M + 6SM + 36 ST/A	56				ACN=46	Japan (Kanagawa)	A-72
<i>Oligocottus</i>	<i>maculosus</i>		F	48	14M + 14SM + 6ST + 14A	76	82			ACN=48	USA (WA)	I-7
<i>Oligocottus</i>	<i>snyderi</i>			48*							USA	C-46
<i>Paracottus</i>	<i>knerii</i>		F, M	48	8M + 6SM + 34 ST/A	62				ACN=48	Russia (Lake Baikal)	S-167, S-168
<i>Pseudoblennius</i>	<i>cottoides</i>		F	46	4M + 8SM + 34 ST/A	58				ACN=46	Japan (Kanagawa)	A-72
<i>Pseudoblennius</i>	<i>marmoratus</i>	Type A		46	4M + 8SM + 34 ST/A	58				ACN=48	Japan (Chiba, Kanagawa)	A-72
<i>Pseudoblennius</i>	<i>marmoratus</i>	Type B	F	46	4M + 7SM + 35 ST/A	57				ACN=48	Japan (Chiba, Kanagawa)	A-72
<i>Pseudoblennius</i>	<i>marmoratus</i>	Type C	M	46	4M + 6SM + 36 ST/A	56				ACN=48	Japan (Chiba, Kanagawa)	A-72
<i>Pseudoblennius</i>	<i>percooides</i>			46	10SM + 36 ST/A	56			1.1 FCM	ACN=48	Korea (Busan)	K-125
<i>Trachidermis</i>	<i>fasciatus</i>			40	24 M/SM + 16 ST/A	64				ACN=48	Japan (Fukuoka)	A-4
<i>Trachidermis</i>	<i>fasciatus</i>			40		60					China (Shanghai)	C-43
<i>Triglopsis</i>	<i>quadricornis</i>	<i>Tryglopsis</i>		32	12 M/SM + 20ST	44	64		1.8 FIA		Russia, White Sea	L-87, L-88, H-41
<b>Comephoridae</b>												
<i>Comephorus</i>	<i>baicalensis</i>		F	48	8M + 40 ST/A	56				ACN=48	Russia (Lake Baikal)	S-168
<i>Comephorus</i>	<i>dybowski</i>			48	2M + 2SM + 44 ST/A	52					Russia (Lake Baikal)	S-168

Table 6.35 Order SCORPAENIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup> NORs	Genome size (pg/cell)	Comments	Locality	Reference
Suborder/family/subfamily/species	karyotype paper										
<b>Abyssocottidae</b>											
<i>Abyssocottus gibbosus</i>			48	10M + 12SM + 26 ST/A	70					Russia (Lake Baikal)	S-168
<i>Abyssocottus korotneffi</i>		F, M	48	8M + 16SM + 14ST + 10A	72	86			ACN=48	Russia (Lake Baikal)	S-167, S-168
<i>Asprocottus herzensteini</i>			48	10M + 10SM + 28 ST/A	68					Russia (Lake Baikal)	S-168
<i>Asprocottus platycephalus</i>		F, M	48	8M + 10SM + 30 ST/A	66				ACN=48	Russia (Lake Baikal)	S-167, S-168
<i>Cottinella boulengeri</i>		F	48	6M + 12SM + 30 ST/A	66				ACN=48	Russia (Lake Baikal)	S-167, S-168
<i>Cyphocottus megalops</i>		F, M	48	14M + 2SM + 32 ST/A	64				ACN=50	Russia (Lake Baikal)	S-167, S-168
<i>Limnocottus bergianus</i>	<i>Limnocottus</i>		48	8M + 12SM + 28 ST/A	68					Russia (Lake Baikal)	S-168
<i>Limnocottus griseus</i>			48	8M + 12SM + 28 ST/A	68					Russia (Lake Baikal)	S-168
<i>Limnocottus pallidus</i>			48	8M + 14SM + 26 ST/A	70					Russia (Lake Baikal)	S-168
<i>Procottus major</i>		F, M	48	10M + 16SM + 22 ST/A	74				ACN=48	Russia (Lake Baikal)	S-167, S-168
<b>Hemitripterae</b>											
<i>Hemitripterus villosus</i>			46	20M + 16SM + 10A	82	82			ACN=46	China (Liaoning)	M-36
<b>Agonidae</b>											
<i>Agonus cataphractus</i>			48							Russia	V-72
<b>Cyclopteridae</b>											
<i>Cyclopterus lumpus</i>			50	8SM + 12ST + 30A	58	70			ACN=50	Canada (Atlantic)	L-33
<i>Cyclopterus lumpus</i>			50		54					Russia (White Sea)	L-88

Table 6.36 Order PERCIFORMES. Part 1 Percoidae and Elasmatoidei

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Suborder/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<b>Suborder Percoidae</b>											
<b>Ambassidae (= Chandidae)</b>											
<i>Chanda nama</i>			48	12ST + 36A	48	60			ACN=48	India	Z-20
<i>Chanda nama</i> ?	<i>Ambassis nama</i>	F, M	40	2M + 12SM + 26A	54	54			ACN=46	India (Orissa)	T-53
<i>Chanda nama</i>		F	48	2SM + 46A	50	50			ACN=48	India (WB)	K-34
<i>Parambassis siamensis</i>	<i>Chanda</i>		40	4M + 6ST + 30A	44	50			ACN=48	Thailand	D-20
<i>Parambassis wolffii</i>			48	48A	48	48				Thailand	D-28
<i>Pseudambassis ranga</i>	<i>Chanda</i>	M	44	4M + 40A	48	48			ACN=46	India (Orissa)	K-41
<i>Pseudambassis ranga</i>	<i>Chanda</i>		48	2ST + 46A	48	50			ACN=48	India	Z-20
<b>Apogonidae</b>											
<i>Apogon binotatus</i>			36	14 M/SM + 22 ST/A	50				ACN=46	USA (FL)	R-109
<i>Apogon binotatus</i>			36	26 M/SM + 10 ST/A	62				ACN=44	USA (WI)	R-109
<i>Apogon binotatus</i>			35	14 M/SM + 21 ST/A	49				ACN=45	USA (FL)	R-109
<i>Apogon doederleini</i>			46	2M + 6SM + 38 ST/A	54			2.4 FIA	ACN=46	Japan (Wakayama)	O-41, H-40
<i>Apogon endekataenia</i>		M	46	46 ST/A	46			2.1 FIA		India (Andaman Is.)	R-45, H-41
<i>Apogon endekataenia</i>			46	2M + 4SM + 16ST + 24A	52	68			ACN=46	Japan	M-111
<i>Apogon imberbis</i>			36		56				ACN=46	Spain	A-32
<i>Apogon lineatus</i>			46	2M + 4SM + 2ST + 38A	52	54			ACN=46	Japan	M-111
<i>Apogon maculatus</i>			34	27 M/SM + 7 ST/A	61				ACN=44	Puerto Rico	R-110
<i>Apogon moluccensis</i>			46	46 ST/A	46			2.1 FIA		India (Andaman Is.)	R-45, H-40
<i>Apogon notatus</i>		F, M	46	2M + 4SM + 40 ST/A	52				ACN=46	Japan (Wakayama)	O-41
<i>Apogon notatus</i>		F, M	46	2M + 5SM + 39 ST/A	53				ACN=46	Japan (Wakayama)	O-41
<i>Apogon notatus</i>		F, M	46	2M * 4SM + 40 ST/A	52				ACN=46	Japan	O-41, M-111
<i>Apogon pseudomaculatus</i>	<i>Apogon (Apogon)</i>		36	30 M/SM + 2ST + 4A	66	68			ACN=46	(Puerto Rico)	R-79, R-110
<i>Apogon semilineatus</i>			46	2M + 4SM + 20ST + 20A	52	72			ACN=46	Japan (Suruga Bay)	M-101
<i>Apogon semilineatus</i>			46	2M + 6SM + 38 ST/A	54				ACN=46	Japan (Wakayama)	O-41
<i>Nectamia fusca</i>	<i>Apogon nubilus</i>		46	2M + 44 SM/ST/A				2.6 FIA	ACN=46	(Pacific)	R-79, H-41
<i>Phaeoptyx pigmentaria</i>			38	6M + 32 SM/ST/A					ACN=46	(Atlantic)	R-79
<i>Sphaeramia orbicularis</i>	<i>Apogon</i>		46	4SM + 42 ST/A	50				ACN=46	(Indo-West Pacific)	O-41



Table 6.36 Order PERCIFORMES. Part 1 Percoidae and Elasmobranchii (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Suborder/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg./cell)	Comments	Locality	Reference
<b>Bramidae</b>											
<i>Brama japonica</i>		F, M	54							N. Pacific	Y-3
<b>Carangidae</b>											
<i>Alectis ciliaris</i>			48	48A	48	48			ACN=48	Japan (Izu Peninsula)	M-97
<i>Alepes djedaba</i>	<i>Selar kalla</i>	F, M	56	56A	56	56			ACN=56	India (Orissa)	C-64
<i>Alepes melanoptera</i>	<i>Selar malam</i>	F, M	48	2SM + 46A	50	50			ACN=48	India (Orissa)	C-64
<i>Atropus atropus</i>	<i>atropus</i>	M	48	48A	48	48			ACN=48	India (Orissa)	D-3
<i>Atule mate</i>	<i>Caranx</i>		50	14SM + 36A	64				ACN=50	USA (Hawaii)	L-8
<i>Carangoides armatus</i>		M	48	2ST + 46A	48	50			ACN=48	India (Orissa)	D-3
<i>Carangoides equula</i>	<i>Caranx</i>		48	2ST + 46A	48	50			ACN=48	Japan (Izu Peninsula)	M-97
<i>Carangoides praeustus</i>	<i>proeustus</i>	M	48	10 M/SM + 38A	58	58			ACN=48	India (Orissa)	D-3
<i>Caranx latus</i>			46	46A	46	46	2	1.2 FD		Brazil (RJ)	B-86
<i>Caranx sansun</i>		F	48	2SM + 46A	50	50			ACN=48	India (Orissa)	P-16
<i>Caranx sexfasciatus</i>			48	2ST + 46A	48	50				Japan (Izu Peninsula)	M-97
<i>Chloroscombrus chrysurus</i>			48	48A	48	48		1.6 BFA		Brazil (RJ)	B-86, H-13
<i>Megalaspis cordyla</i>		F	50	2ST + 48A	50	52			ACN=50	India (Orissa)	C-64
<i>Scomberoides lysan</i>	<i>Chorinemus tolooparah</i>	M	48	4 M/SM + 44A	52	52			ACN=48	India (Orissa)	D-3
<i>Selene setapinnis</i>			46	2SM + 44A	48	48				Brazil (RJ)	B-86
<i>Selene vomer</i>			48	2ST + 46A	48	50	2		ACN=48	Brazil (SP)	R-108
<i>Seriola dumerili</i>			48	2SM + 2ST + 44A	50	52	2	1.5 FIA		Italy (Sicily)	S-91, H-40
<i>Seriola dumerili</i>			48	2SM + 46A	50	50			ACN=48	Italy (Sicily)	V-52
<i>Seriola dumerili</i>			47	1M + 2SM + 44A	50	50			ACN=48	Italy (Sicily)	V-52
<i>Seriola nigrofasciata</i>		F, M	48	48A	48	48		1.4 FD		India (Orissa)	T-53
<i>Seriola quinqueradiata</i>			48	2SM + 2ST + 44A	50	52		1.7* FCM		Japan (Iwate)	I-1, O-48
<i>Trachinotus carolinus</i>			48	8 M/SM + 40A	56	56	2		ACN=48	Brazil (SP)	R-108
<i>Trachinotus falcatius</i>			48	10 M/SM + 38A	58	58	2	1.7 BFA		Brazil (SP)	R-108, H-13
<i>Trachinotus goodei</i>			48	4 M/SM + 44A	52	52	2		ACN=48	Brazil (SP)	R-108
<i>Trachinotus ovatus</i>		M	48	2M + 4SM + 42 ST/A	54				ACN=48	India (Orissa)	C-64
<i>Trachurus japonicus</i>			48	4M + 14SM + 12ST + 18A	66	78			ACN=48	Japan (Izu Peninsula)	M-97
<i>Trachurus mediterraneus ponticus</i>			48	4M + 6SM + 38 ST/A	58				ACN=48	Black Sea	V-5
<i>Trachurus mediterraneus</i>			48	4M + 4SM + 14ST + 26A	56	70	2		ACN=48	Italy (Ancona)	C-14
<i>Trachurus trachurus</i>		F, M	48	2SM + 46A	50	50	2		ACN=48	Italy (Ancona)	C-14

Table 6.36 Order PERCIFORMES. Part 1 Percoidae and Elasmatoidei (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Suborder/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<b>Centracanthidae</b>											
<i>Spicara maena</i>	<i>smaris</i>		46	8M + 4SM + 2ST + 32A	58	60			ACN=48	Black Sea	V-4
<i>Spicara maena</i>	<i>smaris</i>		45	9M + 4SM + 2ST + 30A	58	60			ACN=48	Black Sea	V-4
<i>Spicara maena</i>	<i>smaris</i>		44	10M + 4SM + 2ST + 28A	58	60			ACN=48	Black Sea	V-4
<i>Spicara maena</i>	<i>flexuosa</i>		46	8M + 4SM + 2ST + 32A	58	60			ACN=48	Black Sea	S-7, V-11
<i>Spicara maena</i>	<i>flexuosa</i>		45	9M + 4SM + 2ST + 30A	58	60			ACN=48	Black Sea	S-7, V-11
<i>Spicara maena</i>	<i>flexuosa</i>		44	10M + 4SM + 2ST + 28A	58	60			ACN=48	Black Sea	S-7, V-11
<i>Spicara maena</i>			48	4M + 2SM + 10ST + 32A	54	64			ACN=48	Black Sea	S-7, V-4, V-11
<b>Centrarchidae</b>											
<i>Acantharchus pomotis</i>		F, M	48	48A	48	48			ACN=48	USA (NC)	R-80
<i>Ambloplites rupestris</i>		F, M	48	48A	48	48		2.3 FIA	ACN=48	USA (NC, WV)	R-80, H-40
<i>Archoplites interruptus</i>		F	48	2ST + 46A	48	50			ACN=48	USA (CA)	B-83
<i>Centrarchus macropterus</i>		F	48	48A	48	48			ACN=48	USA (NC)	R-80
<i>Enneacanthus chaetodon</i>			48	48A	48	48			ACN=48	USA (NC)	R-80
<i>Enneacanthus gloriosus</i>			48	48A	48	48			ACN=48	USA (NC)	R-80
<i>Enneacanthus obesus</i>			48	48A	48	48			ACN=48	USA (NC)	R-80
<i>Lepomis auritus</i>			48	48A	48	48			ACN=48	USA (NC)	R-80
<i>Lepomis cyanellus</i>			48	48A	48	48		2.1 FD	ACN=48	USA (NC)	R-80
<i>Lepomis cyanellus</i>			48	48A	48	48		(2.0 FD)	ACN=48	USA (NC)	O-6, R-80
<i>Lepomis cyanellus</i>		F, M	46	2SM + 44A	48	48			ACN=48	USA (WV)	R-80
<i>Lepomis cyanellus</i>		M	48	48A	48	48			ACN=48	USA (CA)	B-15
<i>Lepomis cyanellus</i>		M	47	1M + 46A	48	48			ACN=48	USA (CA)	B-15
<i>Lepomis cyanellus</i>		M	46	2SM + 44A	48	48			ACN=48	USA (CA)	B-15
<i>Lepomis gibbosus</i>		F, M	48	48A	48	48		(1.9 FIA)	ACN=48	USA (NC, WV)	R-80, B-63, H-40
<i>Lepomis gibbosus</i>			46	10M + 36 ST/A	56				ACN=48	(USA)	F-30
<i>Lepomis gulosus</i>	<i>Chaenobryttus</i>		48	48A	48	48			ACN=48	USA (NC)	R-80
<i>Lepomis humilis</i>			48					2.0 FD		USA	A-38
<i>Lepomis humilis</i>			46	2SM + 44A	48	48			ACN=48	USA (KY)	R-80
<i>Lepomis macrochirus</i>		F, M	48	48A	48	48		1.9* FCM, 1.9 FD	ACN=48	USA (WV)	R-80, B-63, O-48
<i>Lepomis marginatus</i>			48	48A	48	48		2.2 FD	ACN=48	USA (NC)	R-80
<i>Lepomis megalotis</i>			48	48A	48	48		2.1* FCM, 2.1 FD	ACN=48	USA (TN)	R-80, O-48
<i>Lepomis microlophus</i>		M	48	48A	48	48		2.0 FD	ACN=48	USA (NC, VA)	R-80
<i>Lepomis symmetricus</i>		F, M	40	8M + 32 ST/A	48				ACN=48	USA (MS)	T-43
<i>Lepomis symmetricus</i>		F, M	41	7M + 34 ST/A	48				ACN=48	USA (MS)	T-43

Table 6.36 Order PERCIFORMES. Part 1 Percoidae and Elasmobranchiiformes (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
Suborder/family/subfamily/species	karyotype paper										
<i>Lepomis symmetricus</i>		F, M	39	9M + 30 ST/A	48				ACN=48	USA (MS)	T-43
<i>Lepomis symmetricus</i>		M	38	10M + 28 ST/A	48				ACN=48	USA (MS)	T-43
<i>Micropterus dolomieu</i>		M	46	2SM + 44A	48	48		2.0 FIA	ACN=48	USA (WV)	R-80, B-63, H-40
<i>Micropterus punctulatus</i>		F, M	46	2 M/SM + 44 ST/A	48				sex chrom.	USA (TX)	T-40
<i>Micropterus salmoides</i>		F, M	46	2 M/SM + 44A	48	48		2.0* FCM	ACN=48	USA (WV)	T-40, T-73, R-80, O-48
<i>Micropterus treculi</i>		F, M	46	2 M/SM + 44 ST/A	48				sex chrom.	USA (TX)	T-40
<i>Pomoxis annularis</i>			48	48A	48	48		2.1 FCM	ACN=48	USA (NC)	R-80
<i>Pomoxis nigromaculatus</i>		F	48	48A	48	48			ACN=48	USA (NC, WV)	R-80
<b>Centropomidae</b>											
<i>Centropomus parallelus</i>			48	48A	48	48	2			Brazil (RJ)	B-86
<b>Chaetodontidae</b>											
<i>Chaetodon auriga</i>			48	48A	48	48		1.4 FIA	ACN=48	Japan (Okinawa)	A-61, H-40
<i>Chaetodon auripes</i>	<i>collaris</i>		48	48A	48	48			ACN=48	Japan (Chiba, Kagoshima)	A-61
<i>Chaetodon auripes</i>			48	48A	48	48		1.5* FCM		Japan	O-48
<i>Chaetodon collaris</i>			48	48A	48	48	2		ACN=48	India (Kerala)	N-65
<i>Chaetodon lunula</i>			48	48A	48	48			ACN=48	Japan (Yakushima)	A-61
<i>Chaetodon plebeius</i>	<i>Megaprotodon</i>		48	2M + 46A	50	50			ACN=48	Japan (Tanegashima)	A-61
<i>Chaetodon sedentarius</i>			48		48					Brazil (ES)	G-12
<i>Chaetodon striatus</i>		F, M	48	48A	48	48	2		ACN=48	Brazil (RN, BA)	A-7
<i>Chaetodon strigangulus</i>	<i>Megaprotodon</i>		48	2SM + 46A	50	50			ACN=48	Japan (Okinawa)	A-61
<i>Chaetodon trifasciatus</i>			48	48A	48	48			ACN=48	Japan (Okinawa)	A-61
<i>Chaetodon vagabundus</i>			48	48A	48	48		1.7 FIA	ACN=48	Japan (Okinawa)	A-61, H-40
<i>Heniochus acuminatus</i>			48	48A	48	48			ACN=48	Japan (Wakayama)	A-77
<b>Echeneidae</b>											
<i>Remora remora</i>		M	42	42 ST/A	42					India (Andaman Is.)	R-45
<b>Gerreidae</b>											
<i>Diapterus olithostomus</i>		F, M	48	48A	48	48	2		ACN=48	Brazil (RN)	M-121
<i>Eucinostomus argenteus</i>		F, M	48	48A	48	48	2		ACN=48	USA (FL), Puerto Rico	R-96
<i>Eucinostomus gula</i>		F, M	48	48A	48	48	2	1.6 BFA	ACN=48	USA (FL)	R-96, H-13
<i>Eucinostomus harengulus</i>		F, M	48	48A	48	48	2		ACN=48	USA (FL)	R-96

Table 6.36 Order PERCIFORMES. Part 1 Percoidei and Elasmatoidei (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Suborder/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Eugerres plumieri</i>		F, M	48	48A	48	48	2		ACN=48	USA (FL)	R-96
<i>Gerres filamentosus</i>	<i>Gerres</i>		48	4M + 44A	52	52				India (WB)	K-46
<i>Gerres oblongus</i>		M	50*					1.4* FCM		India (Andaman Is.)	R-45, O-48
<i>Gerres oyena</i>			48	48 ST/A	48				ACN=48	Japan (Wakayama)	A-77
<b>Haemulidae (= Pomadasysidae)</b>											
<i>Anisotremus moricandi</i>			48	48A	48	48	2		ACN=48	Brazil (RN)	G-12, N-59
<i>Anisotremus surinamensis</i>			48	48A	48	48	2		ACN=48	Brazil (RN)	G-12, N-59
<i>Anisotremus virginicus</i>			48	48A	48	48	2		ACN=48	Brazil (RN, RJ)	G-12, N-59
<i>Conodon nobilis</i>			48	48A	48	48			ACN=48	Brazil (RN)	G-12
<i>Haemulon aurolineatum</i>			48	48A	48	48		(1.5 FD)	ACN=48	Brazil (RN, RJ)	G-12, N-59
<i>Haemulon aurolineatum</i>		F, M	48	48A	48	48	2		ACN=48	Venezuela	N-59
<i>Haemulon bonariense</i>		F, M	48	48A	48	48	2		ACN=48	Venezuela	N-59
<i>Haemulon flavolineatum</i>			48					(1.8 BFA)	ACN=48	Brazil (RN)	G-12, H-13
<i>Haemulon flavolineatum</i>		F, M	48	48A	48	48	2		ACN=48	Venezuela	R-106
<i>Haemulon parra</i>			48	48A	48	48	2	(1.3 FD)	ACN=48	Brazil (RN)	G-12, N-59
<i>Haemulon plumieri</i>			48	48A	48	48	2	(2.0 BFA)	ACN=48	Brazil (RN)	G-12, N-59, H-13
<i>Haemulon plumieri</i>		F, M	48	48A	48	48	2		ACN=48	Venezuela	N-59
<i>Haemulon sciurus</i>			48	48A	48	48		(1.7 BFA)	ACN=48	W. Atlantic	R-41, H-13
<i>Haemulon sciurus</i>			46	2 SM/ST + 44A	48	48		(1.2 FD)	ACN=48	W. Atlantic	R-41
<i>Haemulon striatum</i>			48	48A	48	48	2		ACN=48	Brazil (RN)	G-12, N-59
<i>Hapalogenys analis</i>	<i>micronatus</i>		48	2M + 8SM + 14ST + 24A	58	72			ACN=48	China	Y-20
<i>Hapalogenys nigripinnis</i>	<i>nitens</i>		48	2M + 8SM + 2ST + 36A	58	60			ACN=48	China	Y-20
<i>Orthopristis ruber</i>		F, M	48	2SM + 46 ST/A	50		2		ACN=48	Brazil (RJ)	B-65
<i>Pomadasys argenteus</i>	<i>hasta</i>		48	48A	48	48			ACN=48	India (WB)	K-139
<i>Pomadasys corvinaeformis</i>			48	48A	48	48	2		ACN=48	Brazil (RN)	G-12, N-59
<i>Pomadasys commersonnii</i>	<i>Pristipoma operculare</i>		48	48A	48	48			ACN=48	India (Bombay)	R-63
<b>Kuhliidae</b>											
<i>Kuhlia boninensis</i>			48	2SM + 46A	50	50			ACN=48	Japan (Okinawa)	A-77
<i>Kuhlia mugil</i>	<i>taeniura</i>		48	2SM + 46A	50	50			ACN=48	Japan (Chiba)	A-77

Table 6.36 Order PERCIFORMES. Part 1 Percioidei and Elasmatoidei (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Suborder/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup> NORs	Genome size (pg/cell)	Comments	Locality	Reference
<b>Kyphosidae</b>											
<b>Girellinae</b>											
<i>Girella melanichthys</i>			48	48A	48	48	4		ACN=48	Japan (Yamaguchi)	N-29
<i>Girella melanichthys</i>		F	48	48A	48	48	4		ACN=48	Japan (Wakayama)	U-38
<i>Girella punctata</i>			48	48A	48	48	2		ACN=48	Japan (Wakayama)	U-83
<b>Kyphosinae</b>											
<i>Kyphosus</i> sp.	<i>bigibbus</i>		48	2SM + 2ST + 44A	50	52		1.8* FCM		Japan	O-48
<i>Kyphosus cinerascens</i>	<i>lombus</i>		48	2SM + 46A	50	50	2		ACN=48	Japan (Noto Peninsula)	T-21
<i>Kyphosus vaigiensis</i>	sp.		48	2SM + 46A	50	50	2		ACN=48	Japan (Noto Peninsula)	T-21
<i>Kyphosus bigibbus</i>			48	2SM + 46A	50	50	2		ACN=48	Japan (Noto Peninsula)	T-21
<b>Microcanthinae</b>											
<i>Microcanthus strigatus</i>			48	2SM + 46A	50	50			ACN=48	Japan (Chiba)	A-61
<b>Scorpidinae</b>											
<i>Labracoglossa argentiventris</i>		F, M	48	48A	48	48		1.8* FCM	ACN=48	Japan (Shizuoka)	M-103, O-48
<b>Latidae</b>											
<i>Lates calcarifer</i>	<i>calcarifer</i>	M	48	2M + 6SM + 2ST + 38A	56	58		1.4 FIA	ACN=48	India (WB)	K-31, H-40
<i>Lates calcarifer</i>	Centropomidae		48						ACN=48	India (Portonovo)	N-13
<i>Psammopectera waigiensis</i>			48	48A	48	48	2		ACN=48	Thailand (Gulf of Siam)	U-39
<b>Leiognathidae</b>											
<i>Gazza minuta</i>		F	48	48A	48	48			ACN=48	India (Orissa)	P-16
<i>Leiognathus nuchalis</i>			48	48 ST/A	48				ACN=48	Japan (Suruga Bay)	A-77
<i>Photopectoralis bindus</i>	<i>Leiognathus</i>	M	40	40 ST/A	40			1.3 FIA		India (Goa)	R-45, H-40
<b>Lethrinidae</b>											
<i>Lethrinus nebulosus</i>			48	48A	48	48			ACN=48	China	Z-39
<i>Lethrinus xanthochilus</i>			48	48A	48	48		2.8* FCM		Japan	O-48
<b>Lobotidae</b>											
<i>Lobotus surinamensis</i>		F, M	48	2SM + 46A	50	50			ACN=48	India (Orissa)	T-53

Table 6.36 Order PERCIFORMES. Part 1 Percoidae and Elasmatoidei (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Suborder/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg./cell)	Comments	Locality	Reference
<b>Lutjanidae</b>											
<i>Lutjanus alexandrei</i>		F, M	48	48A	48	48	2		ACN=48	Brazil (RN)	R-111
<i>Lutjanus analis</i>		M	48	48A	48	48	2		ACN=48	Brazil (RN)	R-111
<i>Lutjanus analis</i>			48	48A	48	48	2		ACN=48	Venezuela	N-70
<i>Lutjanus argentimaculatus</i>			48	48A	48	48			ACN=48	China	C-12
<i>Lutjanus argentimaculatus</i>		F, M	48	48A	48	48			ACN=48	India (Orissa)	P-16, K-46
<i>Lutjanus bohar</i>			48	48A	48	48		2.4 FIA	ACN=48	China	C-12, H-40
<i>Lutjanus cyanopterus</i>		M	48	48A	48	48	2		ACN=48	Brazil (RN)	R-111
<i>Lutjanus erythropterus</i>			48	48A	48	48			ACN=48	China	C-12, Y-26
<i>Lutjanus griseus</i>		F, M	48	48A	48	48	2-4		ACN=48	Venezuela	N-70
<i>Lutjanus jocu</i>		F, M	48	48A	48	48	4		ACN=48	Brazil (RN)	R-111
<i>Lutjanus johnii</i>			48	48A	48	48			ACN=48	China (Zhanjiang)	L-81
<i>Lutjanus kasmira</i>		M	48	48A	48	48			ACN=48	India (Orissa)	C-61
<i>Lutjanus kasmira</i>		F, M	48	48A	48	48	2	2.9* FCM	ACN=48	Japan (Okinawa)	U-79
<i>Lutjanus quinquelineatus</i>		F	48	48A	48	48	2	2.9* FCM	X <sub>1</sub> X <sub>2</sub> Y, X <sub>2</sub> X <sub>2</sub>	Japan (Okinawa)	U-79
<i>Lutjanus quinquelineatus</i>		M	47	1M + 47A	48	48	2	2.9* FCM	X <sub>1</sub> X <sub>2</sub> Y, ACN=48	Japan (Wakayama, Okinawa)	U-79
<i>Lutjanus russelli</i>			48	48A	48	48	2	2.3 FIA	ACN=48	Thailand (Gulf of Siam)	U-38, H-40
<i>Lutjanus sanguineus</i>		M	48	48A	48	48			ACN=48	India (Goa)	R-45
<i>Lutjanus sebae</i>			48	48A	48	48		1.6 FIA	ACN=48	China (Hainan)	Y-26, H-41
<i>Lutjanus synagris</i>		F, M	48	48A	48	48	2		ACN=48	Brazil (RN)	R-111
<i>Lutjanus synagris</i>	cytotype I	F, M	48	48A	48	48	2		ACN=48	Venezuela	N-70
<i>Lutjanus synagris</i>	cytotype II		47	1M + 46A	48	48	2		ACN=48	Venezuela	N-70
<i>Lutjanus vitta</i>			48	48A	48	48		2.0 FIA	ACN=48	China (Zhanjiang)	L-81, H-41
<i>Ocyurus chrysurus</i>			48	48A	48	48		2.2 FD, 2.6 BFA	ACN=48	Brazil (RN)	G-12, H-13
<i>Ocyurus chrysurus</i>			48	48A	48	48	2		ACN=48	Brazil (RN), Venezuela	R-111, N-76
<i>Rhomboplites aurorubens</i>		F, M	48	2ST + 46A	48	50	2		ACN=48	Venezuela	N-76
<b>Monodactylidae</b>											
<i>Monodactylus argenteus</i>		F, M	48	48A	48	48		(1.8 BFA)	ACN=48	(Asia)	S-129, H-13
<i>Monodactylus argenteus</i>			48							India (Portonovo)	N-13
<i>Monodactylus sebae</i>		M	47	1M + 46A	48	48			XO, ACN=48	W. Africa	S-129
<i>Monodactylus sebae</i>		F	48	48A	48	48			XX, ACN=48	W. Africa	S-129

Table 6.36 Order PERCIFORMES. Part 1 Percioidei and Elassomatoidei (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
Suborder/family/subfamily/species	karyotype paper										
<b>Moronidae</b>											
<i>Dicentrarchus labrax</i>	Serranidae	F, M	48	48A	48	48	2		XX/XY	Spain (Malaga)	C-11
<i>Dicentrarchus labrax</i>		F, M	48	2ST + 46A	48	50	2		ACN=48	Italy (Tyrrhenian Sea)	V-63, C-31
<i>Dicentrarchus labrax</i>			48	48 ST/A	48		1-2	(1.6 FCM)	ACN=48	Italy	S-90
<i>Dicentrarchus labrax</i>	Serranidae		48	2SM + 46A	50	50	2		ACN=48	USSR (Black Sea)	A-90
<i>Dicentrarchus punctatus</i>		F, M	48	48 ST/A	48		2		ACN=48	Egypt	S-90
<i>Dicentrarchus punctatus</i>		F, M	48	2ST + 46A	48	50	2		ACN=48	Italy (Palermo)	V-63
<i>Lateolabrax japonicus</i>	Serranidae	F, M	48	48A	48	48	2		ACN=48	Japan (Shimane)	K-70, K-82, T-27
<i>Lateolabrax japonicus</i>	Serranidae		48	48A	48	48			ACN=48	China (Shandong)	W-7, Y-20, Y-21
<i>Lateolabrax japonicus</i>	sea bass	F, M	48	48A	48	48		1.7 FCM	ACN=48	Korea (Chungchongnam-do)	P-12
<i>Lateolabrax latus</i>	Serranidae	F, M	48	2ST + 46A	48	50	2		ACN=48	Japan (Shimane)	K-70, K-82, T-27
<i>Lateolabrax</i> sp.	spotted sea bass	F, M	48	48A	48	48		1.7 FCM	ACN=48	Korea (Chungchongnam-do)	P-12
<i>Morone americana</i>	Serranidae		48	48A	48	48			ACN=48	E. USA	B-64
<i>Morone saxatilis</i>			48	2SM + 8ST + 38A	50	58		(1.9 FIA, 1.8 BFA)	ACN=48	USA (NY)	R-27, H-13, H-41
<i>Morone saxatilis</i>			48	2SM + 6ST + 40A	50	56			ACN=48	USA (NY)	R-27
<b>Mullidae</b>											
<i>Mulloidichthys flavolineatus</i>			48	48A	48	48		1.2* FCM		Japan	O-48
<i>Mullus argentinae</i>			44	2SM + 42A	46	46				Brazil	B-86
<i>Mullus barbatus</i>			44	4 M/SM + 40A	48	48			ACN=48	Monaco	L-5
<i>Mullus barbatus</i>			44	6 M/SM + 38A	50	50			ACN=48	Monaco	L-5
<i>Mullus barbatus</i>		F, M	44	6 M/SM + 16ST + 22A	50	66			ACN=48	Italy (Palermo)	V-66
<i>Mullus surmuletus</i>		F, M	48		50			1.3 FD		Spain (Malaga)	C-9
<i>Mullus surmuletus</i>		F, M	44	8 M/SM + 16ST + 20A	52	68			ACN=48	Italy (Palermo)	V-66
<i>Parupeneus spilurus</i>			44	8M + 8SM + 28 ST/A	60		2		ACN=48	Japan (Chiba)	A-74
<i>Upeneus parvus</i>		F, M	44	8 M/SM + 36 ST/A	52				0-4 B, ACN=48	Brazil (Rj)	P-83
<i>Upeneus tragula</i>		M	50	50 ST/A	50					India (Andaman Is.)	R-45
<b>Nandidae</b>											
<b>Badinae</b>											
<i>Badis badis</i>			48	26 M/SM + 22A	74	74				India (Assam)	K-46
<i>Badis badis</i>		F, M	46	10M + 4SM + 32A	60	60			ACN=48	India (Orissa)	T-53
<i>Badis badis</i>		F, M	46	6M + 40A	52	52			ACN=48	India (Jammu)	S-54

Table 6.36 Order PERCIFORMES. Part 1 Percoidei and Elasmatoidei (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Suborder/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<b>Nandinae</b>											
<i>Nandus nandus</i>		F	48	6M + 28SM + 14A	82	82			ACN=48	India (WB)	N-16
<i>Nandus nandus</i>		F, M	48	4M + 36SM + 6ST + 2A	88	94			ACN=48	India (WB)	M-26
<i>Nandus nandus</i>		F, M	48	4M + 30SM + 6ST + 8A	82	88	4		ACN=48	India (WB)	K-136
<i>Nandus nandus</i>		M	48	4M + 18SM + 14ST + 12A	70	84			ACN=48	India (Jammu)	S-54
<i>Nandus oxyrhynchus</i>			48	14M + 8SM + 6ST + 20A	70	76			ACN=48	Thailand	D-28
<b>Pristolepidinae</b>											
<i>Pristolepis marginata</i>			48	48A	48	48	2		ACN=48	India (Kerala)	N-58
<b>Oplegnathidae</b>											
<i>Oplegnathus fasciatus</i>			48	2SM + 46A	50	50		1.8* FCM	ACN=48	Japan	N-29, M-111, O-48
<i>Oplegnathus fasciatus</i>		F, M	48	2 M/SM + 46A	50	50	2	1.3 FD	ACN=48	Korea	K-53
<i>Oplegnathus fasciatus</i>			48	2M + 2ST + 44A	50	52			ACN=48	(China)	Z-39
<i>Oplegnathus punctatus</i>			48	2SM + 46A	50	50			ACN=48	Japan	M-111
<b>Pempheridae</b>											
<i>Pempheris schwenkii</i>	<i>xanthoptera</i>		48	2SM + 46 ST/A	50			1.4* FCM	ACN=48	Japan (Tanegashima)	A-74, O-48
<b>Percichthyidae</b>											
<i>Coreoperca herzi</i>			48	2SM + 46 ST/A	50				ACN=48	Korea (Chungchongnam-do)	U-28
<i>Coreoperca herzi</i>			48							Korea	L-15
<i>Coreoperca kawamebari</i>			48	4SM + 44 ST/A	52			1.8* FCM	ACN=48	Japan (Hyogo)	U-28, O-48
<i>Simiperca chuatsi</i>		F, M	48	24 SM/ST + 24A	48	72		(1.7* FD)	ACN=48	China	Y-10, C-83
<i>Simiperca chuatsi</i>			48	22ST + 26A	48	70			ACN=48	China (Hubei)	L-53
<i>Simiperca kneri</i>			48	6SM + 14ST + 28A	54	68			ACN=48	China	Y-15
<i>Simiperca obscura</i>			48	4SM + 14ST + 30A	52	66			ACN=48	China	Y-15
<i>Simiperca roulei</i>	<i>Coreosiniperca</i>	M	48	2SM + 10ST + 36A	50	60			ACN=48	China	Y-15
<i>Simiperca scherzeri</i>			48	6SM + 14ST + 28A	54	68			ACN=48	China	Y-15
<i>Simiperca scherzeri</i>	black variant	F, M	48	4SM + 44 ST/A	52			1.4 FD	ACN=48	Korea (Han R.)	P-11
<i>Simiperca scherzeri</i>	gold variant	F, M	48	4SM + 44 ST/A	52			1.4 FD	ACN=48	Korea (Han R.)	P-11
<i>Simiperca undulata</i>		F, M	48	2SM + 16ST + 30A	50	66			ACN=48	China	Y-15



Table 6.36 Order PERCIFORMES. Part 1 Percoidae and Elasmobranchii (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Suborder/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg./cell)	Comments	Locality	Reference
<b>Percidae</b>											
<i>Ammocrypta vivax</i>			48	12M + 32SM + 4 ST/A	92				ACN=48	USA (TX)	G-30
<i>Etheostoma blennioides blennioides</i>			48	2M + 46A	50				ACN=48	USA (OH)	R-91
<i>Etheostoma blennioides pholidotum</i>			48	2M + 1SM + 45A	51				ACN=48	USA (OH)	R-91
<i>Etheostoma caeruleum</i>			48	8 M/SM + 40 ST/A	56				ACN=48	Canada (Ontario)	D-1
<i>Etheostoma caeruleum camurum caeruleum</i>			48	4M + 2SM + 42A	54	54			ACN=48	USA (OH)	R-91
<i>Etheostoma camurum</i>			48	2M + 2SM + 44A	52	52			ACN=48	USA (OH)	R-91
<i>Etheostoma ditrema</i>			48		52					N. America	G-32
<i>Etheostoma exile</i>			48	4M/SM + 44 ST/A	52				ACN=48	Canada (Ontario)	D-1
<i>Etheostoma flabellare</i>			48	4M/SM + 44 ST/A	52				ACN=48	Canada (Ontario)	D-1
<i>Etheostoma flabellare flabellare</i>			48	4M + 44A	52	52			ACN=48	USA (OH)	R-91
<i>Etheostoma nigrum</i>			48	6 M/SM + 42 ST/A	54				ACN=48	Canada (Ontario)	D-1
<i>Etheostoma nigrum nigrum</i>			48	2M + 2SM + 44A	52	52			ACN=48	USA (OH)	R-91
<i>Etheostoma swaini</i>			48		52					N. America	G-32
<i>Gymnocephalus baloni</i>		M	48	10M + 32SM + 6ST	90	96			ACN=48	Danube R., Europe	R-11
<i>Gymnocephalus cernuus</i>	<i>Acerina cernua</i>	M	48							Sweden	N-40
<i>Gymnocephalus cernuus</i>	<i>cernua</i>	F, M	48	4M + 22SM + 16ST + 6A	74	90	2		ACN=48	Germany (Baltic Sea)	K-77
<i>Gymnocephalus cernuus</i>	<i>cernua</i>	F, M	48	4M + 22SM + 16ST + 6A	74	90			ACN=48	Hungary	B-84
<i>Gymnocephalus cernuus</i>	<i>cernua</i>	F, M	48	2M + 32SM + 8ST + 6A	82	90			ACN=48	Danube R., Europe	R-11
<i>Gymnocephalus schraester</i>		F, M	48	10M + 32SM + 6ST	90	96			ACN=48	Danube R., Europe	R-11
<i>Perca flavescens</i>			48	48 ST/A	48			1.9 FIA, 2.4 BFA	ACN=48	Canada (Ontario)	D-1, H-13, H-40
<i>Perca fluviatilis</i>		F, M	48	2M + 24SM + 12ST + 10A	74	86	2		ACN=48	Germany (Baltic Sea)	K-78
<i>Perca fluviatilis</i>		F, M	48	2M + 28SM + 10ST + 8A	78	88		(2.4 FCM)	ACN=48	Elbe R., Danube R	R-11, V-86
<i>Perca fluviatilis</i>			48	2M + 32SM + 6ST + 8A	82	88			ACN=48	Hungary	B-84
<i>Perca fluviatilis</i>			48	16SM + 20ST + 12A	64	84			ACN=48	Macedonia	K-8
<i>Percarina demidoffi</i>			48	14M + 14SM + 20 ST/A	76			(2.1 FIA)	ACN=48	Danube Delta, Europe	S-119
<i>Percina caprodes</i>		F, M	48	8M + 36SM + 4ST	92				ACN=48	USA (TX)	G-30, G-32, H-40
<i>Percina caprodes</i>			48	1M + 47 ST/A	49				ACN=48	Canada (Ontario)	D-1
<i>Percina caprodes</i>			46	1M + 2SM + 43 ST/A	49				ACN=48	Canada (Ontario)	D-1
<i>Percina maculata</i>			48	5 M/SM + 43 ST/A	53				ACN=48	Canada (Ontario)	D-1
<i>Percina nigrofasciata</i>			48	8M + 38SM + 2ST	94	96			ACN=48	USA (LA)	G-30
<i>Percina sciera</i>		F, M	48	10M + 22SM + 16 ST/A	80				ACN=48	USA (TX)	G-30
<i>Sander lucioperca</i>	<i>Stizostedion</i>	M	48	2M + 30SM + 10ST + 6A	80	90	2	(2.3 FCM)	ACN=48	Baltic Sea	G-46, R-11, V-86
<i>Sander lucioperca</i>	<i>Lucioperca</i>		48	14M + 14SM + 14ST + 6A	76	90			ACN=48	Hungary	B-84

Table 6.36 Order PERCIFORMES. Part 1 Percoidei and Elassomatoidei (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Suborder/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Sander lucioperca</i>	<i>Lucioperca</i>	M	48						ACN=48	Sweden	N-40
<i>Sander vitreum vitreum</i>	<i>Stizostedion</i>		48	48 ST/A	48			2.1 FIA		Canada (Ontario)	D-1, H-40
<i>Sander volgensis</i>	<i>Stizostedion</i>										
<i>Zingel streber</i>		M	48	2M + 30SM + 10ST + 6A	80	90			ACN=48	Danube R., Europe	R-11
<i>Zingel zingel</i>		F, M	48	6M + 20SM + 22 ST/A	74				ACN=48	Danube R., Europe	R-11
<i>Zingel zingel</i>			48	4M + 20SM + 24 ST/A	72				ACN=48	Danube R., Europe	R-11
<i>Zingel zingel</i>		F	48	4M + 16SM + 28 ST/A	68				X <sub>1</sub> X <sub>1</sub> X <sub>2</sub> X <sub>2</sub> , ACN=48	Czech (Morava R.)	K-122
<i>Zingel zingel</i>		M	47	5M + 16SM + 26 ST/A	68				X <sub>1</sub> X <sub>2</sub> Y, ACN=48	Czech (Morava R.)	K-122
<b>Plesiopidae</b>											
<i>Plesiops coeruleolineatus</i>			48	2M + 46 ST/A	50				ACN=48	Japan (Ogasawara, Okinawa)	A-66
<b>Polycentridae</b>											
<i>Polycentrus schomburgkii</i>			46*							(W. Atlantic)	S-30
<b>Polynemidae</b>											
<i>Eleutheronema tetradactylum</i>		M	48	48A	48	48			ACN=48	India (WB)	K-42
<b>Pomacanthidae</b>											
<i>Centropyge aurantonotus</i>			48	4M + 14SM + 26ST + 4A	66	92	2		ACN=48	Brazil (ES, RJ)	A-9
<i>Centropyge bicolor</i>		F, M	52	2M + 50 ST/A	54		2	1.4 FIA		W. Pacific	T-67, H-41
<i>Centropyge bispinosa</i>		F	48	48 ST/A	48		2		ACN=48	W. Pacific	T-67
<i>Centropyge ferrugata</i>		F	48	48A	48		2		ACN=48	W. Pacific	T-67
<i>Centropyge ferrugata</i>	<i>ferrugatus</i>		48	48A	48		2		ACN=48	Philippines Sea	A-9
<i>Centropyge heraldi</i>		M	52	8M + 22SM + 22 ST/A	82		2		ACN=48	W. Pacific	T-67
<i>Centropyge loricula</i>			48	48A	48		2		ACN=48	W. Pacific	T-67
<i>Centropyge nox</i>		F	52	12M + 18SM + 22 ST/A	82		2		ACN=48	W. Pacific	T-67
<i>Centropyge tiben</i>		F	52	52A	52	52	2		ACN=48	W. Pacific	T-67
<i>Centropyge vrolicikii</i>			48	48A	48	48			ACN=48	Japan (Yakushima Is.)	A-61
<i>Holacanthus ciliaris</i>			48	48A	48	48	2		ACN=48	Brazil (CE, PE, BA, ES)	A-7
<i>Holacanthus tricolor</i>			48	48A	48	48	2		ACN=48	Brazil (BA, ES, RJ)	A-7
<i>Pomacanthus arcuatus</i>			48	2ST + 46A	48	50	2		ACN=48	Brazil (CE, AL, BA, RJ)	A-8
<i>Pomacanthus paru</i>			48	2ST + 46A	48	50	2		ACN=48	Brazil (CE, RN, AL, RJ, SP)	A-8
<i>Pomacanthus semicirculatus</i>			48	48A	48	48			ACN=48	Japan (Yakushima Is.)	A-61

Table 6.36 Order PERCIFORMES. Part 1 Percoidae and Elasmatoidei (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
Suborder/family/subfamily/species	karyotype paper										
<b>Pomatomidae</b>											
<i>Pomatomus saltatrix</i>			48	48A	48			1.6 FIA, 1.9 BFA		Brazil	B-86, H-13, H-40
<b>Priacanthidae</b>											
<i>Priacanthus arenatus</i>		F, M	52	4ST + 48A	52	56	2	2.2 BFA	ACN=48	Brazil (RJ)	G-12, M-121, H-13
<i>Priacanthus arenatus</i>			50	50A	50					Brazil (RJ)	B-86
<b>Sciaenidae</b>											
<i>Aplodinotus grunniens</i>			48	48A	48	48			ACN=48	USA (Mississippi R.)	L-23
<i>Argyrosomus amoyensis</i>	<i>Nibe mitchithioides</i>		48	48A	48	48			ACN=48	China	W-3
<i>Bairdiella chrysoira</i>			48	48A	48	48		1.5 BFA	ACN=48	Gulf of Mexico	L-23, H-13
<i>Boesemania microlepis</i>			48	48A	48	48			ACN=48	Thailand	D-28
<i>Corvina nigra</i>			46	2M + 44A	48	48			ACN=48	Croatia	S-195
<i>Cynoscion acoupa</i>			48	48A	48	48			ACN=48	Brazil (RJ)	B-86
<i>Cynoscion arenarius</i>			48	2 M/SM + 46 ST/A	50				ACN=48	Gulf of Mexico	F-60
<i>Cynoscion nebulosus</i>			48	2 M/SM + 46 ST/A	50				ACN=48	Gulf of Mexico	F-60
<i>Johnius belangerii</i>			48							India	L-1
<i>Johnius belangerii</i>	<i>belangerii</i>		48	48A	48	48			ACN=48	China (Shandong)	W-7
<i>Johnius borneensis</i>	<i>vogleri</i>	F, M	48	48A	48	48			ACN=48	India (Orissa)	P-16
<i>Johnius carutta</i>		M	48	48A	48	48			ACN=48	India (Orissa)	P-16
<i>Johnius dorsalis</i>			48	48A	48	48			ACN=48	India	R-125
<i>Johnius dussumieri</i>		M	48	48A	48	48			ACN=48	India (Assam)	K-46, C-108
<i>Kathala axillaris</i>		F, M	48	48A	48	48			ACN=48	India (Orissa)	T-53
<i>Larimichthys crocea</i>	<i>Pseudosciaena</i>	F, M	48	48A	48	48			ACN=48	China (Fujian)	Z-32
<i>Larimichthys polyactis</i>	<i>Pseudosciaena</i>		48	48A	48	48			ACN=48	China	W-7
<i>Leiostomus xanthurus</i>			48	48A	48	48			ACN=48	Gulf of Mexico	L-23
<i>Menticirrhus americanus</i>			48	48A	48	48	2	1.6 FD	ACN=48	Brazil (RN)	G-51, A-124
<i>Menticirrhus littoralis</i>	<i>littoralis</i>		48	48A	48	48	2		ACN=48	Brazil	R-123
<i>Micropogonias furnieri</i>		F, M	48	48A	48	48	2	1.2 FD	ACN=48	Brazil (SP, RJ)	G-50, B-59
<i>Micropogonias undulatus</i>			48	48A	48	48		1.6 BFA	ACN=48	Gulf of Mexico	L-23, H-13
<i>Nibe albiflora</i>			48	48A	48	48			ACN=48	China (Shandong)	W-7, Y-21
<i>Nibe mitsukurii</i>		F	48	48A	48	48	2	1.4* FCM	ACN=48	Japan (Hyogo)	O-46, O-48
<i>Ophioscion punctatissimus</i>			48	48A	48	48	2		ACN=48	Brazil (RN)	A-124
<i>Otolithes cuvieri</i>			48	48A	48	48			ACN=48	India	C-42

Table 6.36 Order PERCIFORMES. Part 1 Percoidae and Eleasmatoidei (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Suborder/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg./cell)	Comments	Locality	Reference
<i>Otolithoides pama</i>		M	48	48A	48	48			ACN=48	India (WB)	K-139
<i>Pachyurus bonariensis</i>			48							Argentina	F-20
<i>Paranibea semiluctuosa</i>	<i>Nibea</i>		48							India	L-1
<i>Parareques acuminatus</i>			48	48A	48	48	2		ACN=48	Brazil (RN)	A-124
<i>Plagioscion montei</i>			48	2M + 46A	50	50	2			Brazil	P-86
<i>Plagioscion squamosissimus</i>		F, M	48	48A	48	48	2		ACN=48	Brazil (AM)	F-66, P-86
<i>Plagioscion ternetzi</i>			48							Argentina	F-20
<i>Plagioscion</i> sp.	Cytotype a		48	2M + 46A	50	50	2		ACN=48	Brazil (AM)	F-66
<i>Plagioscion</i> sp.	Cytotype b		48	48A	48	48	2		ACN=48	Brazil (AM)	F-66
<i>Pogonias cromis</i>			48	48A	48	48		2.0 BFA		Gulf of Mexico	L-23, H-13
<i>Protonibea diacanthus</i>	<i>Nibea</i>		48	48A	48	48				China	W-13
<i>Protonibea diacanthus</i>	<i>Nibea</i>		48	48A	48	48				India	C-42
<i>Sciaena umbra</i>			48	48A	48	48				Black Sea	V-5
<i>Sciaenops ocellatus</i>			48	48A	48	48				Gulf of Mexico	L-23
<i>Umbrina coroides</i>			46	4SM + 42A	50	50				Brazil (RJ)	B-86
<b>Serranidae</b>											
<b>Epinephelinae</b>											
<i>Alphesthes afer</i>			48	48A	48	48	2		ACN=48	Brazil (RN, Bahia)	M-78
<i>Chromileptes altivelis</i>			48	2ST + 46A	48	50	2		ACN=48	(Indo-West Pacific)	T-20
<i>Epinephelus adscensionis</i>			48	48A	48	48	4		ACN=48	Brazil (RN, Bahia)	M-78
<i>Epinephelus alexandrinus</i>			48	48 ST/A	48		2		ACN=48	Spain (Malaga)	M-39
<i>Epinephelus alexandrinus</i>			48	48A	48	48	4		ACN=48	Spain	A-30
<i>Epinephelus awoara</i>			48	48A	48	48			ACN=48	China	Z-23, A-11
<i>Epinephelus caninus</i>			48	48A	48	48	2		ACN=48	Spain (Alboran Sea)	R-89
<i>Epinephelus coioides</i>			48	2SM + 46A	50	50			ACN=48	China (Fujian)	D-13
<i>Epinephelus diacanthus</i>			48	2SM + 46A	50	50			ACN=48	India (Portonovo)	N-13
<i>Epinephelus fario</i>			48	14 M/SM + 34 ST/A	62				ACN=48	China	C-57
<i>Epinephelus fasciaticaudatus</i>			48	48A	48	48	2		ACN=48	China	L-47
<i>Epinephelus fasciatus</i>			48	48A	48	48	2		ACN=48	China	L-47
<i>Epinephelus guaza</i>			48	48 ST/A	48		2		ACN=48	Spain (Malaga)	M-39
<i>Epinephelus guaza</i>			48	48A	48	48			ACN=48	Brazil (RJ)	A-11, A-12
<i>Epinephelus guttatus</i>			48	48A	48	48		2.1 FD, 2.4 BFA	ACN=48	(W. Atlantic)	M-132, H-13
<i>Epinephelus malabaricus</i>		F	48	2SM + 46A	50	50	2		ACN=48	Thailand (Gulf of Siam)	U-39

Table 6.36 Order PERCIFORMES. Part 1 Percoidae and Elasmobranchii (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Suborder/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Epinephelus marginatus</i>			48	48A	48	48			ACN=48	Brazil (RJ)	G-12
<i>Epinephelus merra</i>			48	6ST + 42A	48	54		2.1* FCM, 2.2 FIA	ACN=48	Japan	O-48, H-41
<i>Epinephelus sexfasciatus</i>			48	2SM + 46A	50	50			ACN=48	China	C-56
<i>Epinephelus tauvina</i>		F	48	2SM + 46A	50	50			ACN=48	India (Orissa)	P-16
<i>Epinephelus ongus</i>	<i>Serranus tumilabris</i>	F	48	48A	48	48			ACN=48	India (Bombay)	R-63
<i>Mycteroperca acutirostris</i>			48	48A	48	48			ACN=48	Brazil (RJ)	G-12
<i>Mycteroperca rubra</i>			48	48A	48	48			ACN=48	Brazil (RJ)	A-11, A-12
<b>Serraninae</b>											
<i>Centropristes ocyurus</i>			48	28M + 20SM	96	96			ACN=48	W. Atlantic	A-11
<i>Diplectrum eumelum</i>			48	2M + 4SM + 42A	54	54			ACN=48	E. Pacific	A-11
<i>Diplectrum formosum</i>			48	2SM + 46A	50	50	2-4		ACN=48	Brazil (RJ)	A-11, A-12
<i>Diplectrum radiale</i>		F, M	48	48A	48	48	2		ACN=48	Brazil (RJ, SP)	A-11, P-41
<i>Paracentropistis hepatus</i>		F, M	48	48A	48	48	2	1.1 FD	ACN=48	Spain (Malaga)	C-8, C-9, M-39
<i>Serranus cabrilla</i>		F, M	48	48A	48	48	2	1.0 FD	ACN=48	Spain (Malaga)	C-8, C-9, M-39
<i>Serranus cabrilla</i>			48	48A	48	48			ACN=48	Spain (Malaga)	C-11
<i>Serranus flaviventris</i>		F, M	48	48A	48	48	2		ACN=48	Italy (Palermo)	V-68
<i>Serranus scriba</i>			48	48A	48	48	2		ACN=48	Brazil (RJ, RN)	A-11, M-78
<i>Serranus scriba</i>			48	48A	48	48	2		ACN=48	Spain (Malaga)	M-39
<i>Serranus scriba</i>		F, M	48	48A	48	48	2		ACN=48	Italy (Palermo)	V-68
<i>Serranus scriba</i>			48	48A	48	48			ACN=48	Croatia	S-86
<i>Serranus scriba</i>			48	48A	48	48			ACN=48	USSR	V-72
<b>Sillaginidae</b>											
<i>Sillago sihama</i>		M	48	48 ST/A	48				ACN=48	India (Andaman Is.)	R-45
<b>Sparidae</b>											
<i>Acanthopagrus latus</i>			48	4SM + 6ST + 38A	52	58			ACN=48	Japan	M-106
<i>Acanthopagrus latus</i>			48	4M + 2SM + 4ST + 38A	54	58			ACN=48	China	Z-23
<i>Acanthopagrus schlegeli</i>		M	48	8 M/SM + 40A	56	56	2	1.2 FD	ACN=48	Korea	K-53
<i>Acanthopagrus schlegeli</i>			48	6SM + 4ST + 38A	54	58			ACN=48	Japan	M-106
<i>Acanthopagrus schlegeli</i>	<i>macrocephalus</i>		48	4M + 4SM + 2ST + 38A	56	58	2		ACN=48	China	Y-19
<i>Archosargus probatocephalus</i>			48	1M + 4SM + 43 ST/A	53				ACN=48	Gulf of Mexico	L-6
<i>Archosargus probatocephalus</i>		F, M	48	12 M/SM + 36 ST/A	60				ACN=48	USA (Atlantic)	F-69
<i>Archosargus probatocephalus</i>			48	48A	48		2		ACN=48	Brazil	A-124

Table 6.36 Order PERCIFORMES. Part 1 Percioidei and Elasmatoidei (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Suborder/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg./cell)	Comments	Locality	Reference
<i>Boops</i>		F, M	48		54			1.0 FD		Spain (Malaga)	C-9
<i>Dentex</i>			48	2M + 2SM + 44 ST/A	52		2-4		ACN=48	Italy	L-48
<i>Dentex hypselosomus</i>	<i>tumifrons</i>		48	4ST + 44A	48	52			ACN=48	Japan	M-106
<i>Diplodus annularis</i>		F, M	48	6 M/SM + 2ST + 40A	54	56			ACN=48	Italy (Tyrrhenian Sea)	C-36
<i>Diplodus annularis</i>			48	2M + 4SM + 42 ST/A	54				ACN=48	Black Sea	V-5
<i>Diplodus annularis</i>		F, M	47	5M + 2SM + 40A	54	54			ACN=48	Italy (Palermo)	V-68
<i>Diplodus annularis</i>		F, M	48	4M + 3SM + 41A	55	55			ACN=48	Italy (Palermo)	V-68
<i>Diplodus annularis</i>		F	48	4M + 2SM + 42A	54	54			ACN=48	Italy (Palermo)	V-68
<i>Diplodus annularis</i>		M	48	4M + 4SM + 40A	56	56			ACN=48	Italy (Palermo)	V-68
<i>Diplodus annularis</i>			48	6 M/SM + 42A	54	54	10		ACN=48	Italy (Palermo)	V-96
<i>Diplodus annularis</i>			47	7 M/SM + 40A	54	54			ACN=48	Italy (Palermo)	V-96
<i>Diplodus argenteus</i>			48	48A	48	48		1.6 FD, 1.9 BFA	ACN=48	Brazil (BA)	G-12, H-13
<i>Diplodus bellottii</i>			46	2M + 6SM + 38 ST/A	54		4		ACN=48	Spain (Malaga)	A-45
<i>Diplodus cervinus</i>			48		54					Spain	A-45
<i>Diplodus puntazzo</i>			48	8 M/SM + 40A	56	56	12		ACN=48	Italy (Sicily)	V-96
<i>Diplodus sargus</i>		F, M	48	6 M/SM + 2ST + 40A	54	56			ACN=48	Italy (Tyrrhenian Sea)	C-36
<i>Diplodus sargus</i>			48	6 M/SM + 42A	54		14		ACN=48	Italy (Sicily)	V-96
<i>Diplodus sargus</i>		F, M	48		52			1.2 FD		Spain (Malaga)	C-9
<i>Diplodus vulgaris</i>			48	6 M/SM + 42 ST/A	54		8		ACN=48	Italy (Palermo)	V-96
<i>Diplodus vulgaris</i>		F, M	48		52			1.1 FD		Spain (Malaga)	C-9
<i>Evynnis tumifrons</i>	<i>Evynnis japonica</i>		48	2SM + 46A	50	50			ACN=48	Japan	M-106
<i>Lagodon rhomboides</i>		F, M	48	6 M/SM + 42 ST/A	54				ACN=48	USA (Atlantic)	F-69
<i>Lithognathus mormyrus</i>			48		52			1.2 FD		Spain (Malaga)	C-9
<i>Lithognathus mormyrus</i>		F, M	48	6M + 16ST + 26A	54	70			ACN=48	Italy (Tyrrhenian Sea)	C-36
<i>Obiada melanura</i>		M	46	6 M/SM + 6ST + 34A	52	58			ACN=48	Italy (Tyrrhenian Sea)	C-36
<i>Pagellus acarne</i>		F, M	48		52			1.3 FD		Spain (Malaga)	C-9
<i>Pagellus acarne</i>		F, M	48	2M + 6ST + 40A	50	56			ACN=48	Italy (Tyrrhenian Sea)	C-36
<i>Pagellus bogaraveo</i>			48	8M + 10SM + 8ST + 22A	66	74	2		ACN=48	Italy (Sicily)	V-61
<i>Pagellus erythrinus</i>		F, M	48	48A	48	48			ACN=48	Italy (Tyrrhenian Sea)	C-36
<i>Pagrus auratus</i>	<i>Sparus latus</i>		48	4M + 2SM + 4ST + 38A	54	58		1.3 FIA		China	L-57, H-40
<i>Pagrus auriga</i>			48	48A	48	48	2		ACN=48	Italy (Palermo)	V-105
<i>Pagrus caeruleostictus</i>	<i>coeruleostictus</i>		48	2SM + 46A	50	50	2		ACN=48	Italy (Palermo)	V-105
<i>Pagrus major</i>	<i>Pagrosomus</i>		48	2ST + 46A	48	50	2		ACN=48	China	Y-19

Table 6.36 Order PERCIFORMES. Part 1 Percoidae and Elasmatoidei (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup>	Genome size	Comments	Locality	Reference
Suborder/family/subfamily/species	karyotype paper						NORs	(pg/cell)			
<i>Pagrus major</i>		F, M	48	48A	48	48	2	1.3 FD	ACN=48	Korea	K-53
<i>Pagrus major</i>	<i>Chrysopteryx</i>		48	2ST + 46A	48	50		1.8* FCM	ACN=48	Japan (Yamaguchi)	N-29, O-48
<i>Pagrus pagrus</i>			48			50				Brazil (RJ)	G-12
<i>Pagrus pagrus</i>			48	2SM + 46A	50	50	2		ACN=48	Italy (Palermo)	V-105
<i>Rhabdosargus sarba</i>	<i>Sparus</i>		48	6SM + 6ST + 34A	54	60		1.5 FIA	ACN=48	Japan	M-106, H-40
<i>Sarpa salpa</i>		F, M	48		58			1.1 FD		Spain (Malaga)	C-9
<i>Sarpa salpa</i>		F, M	48	6M + 10ST + 32A	54	64			ACN=48	Italy (Tyrrenian Sea)	C-36
<i>Sparus aurata</i>			48		56					Spain	A-32
<i>Sparus aurata</i>		F, M	48	8 M/SM + 10ST + 30A	56	66	2	1.9 FCM	ACN=48	Italy (Tyrrenian Sea)	C-36, V-105, G-85
<b>Teraponidae (= Teraponidae)</b>											
<i>Rhynchopelates oxyrhynchus</i>	<i>Rhynchopelates</i>	F	48	2SM + 46A	50	50	2	1.7* FCM	ACN=48	Japan (Hyogo)	O-48, O-46
<i>Terapon jarbua</i>	<i>Terapon</i>	F, M	48	48A	48	48		1.3 FIA	ACN=48	India	S-116, R-45, H-41
<i>Terapon puta</i>	<i>Terapon</i>	F, M	48	48A	48	48		1.6 FIA	ACN=48	India	S-116, H-41
<i>Terapon theraps</i>			48	48A	48	48		1.4 FIA	ACN=48	India (WB)	K-46, G-85
<b>Suborder Elasmatoidei</b>											
<b>Elasmomatidae</b>											
<i>Elassoma zonatum</i>	Centrarchidae		48	2SM + 46 ST/A	50				ACN=48	USA (NC)	R-80

Table 6.37 Order PERCIFORMES. Part 2 Labroides and Zoarcoidei

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Suborder/family/subfamily/species	Reported in karyotype paper	Sex	2h	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<b>Suborder Labroides</b>											
<b>Cichlidae</b>											
<b>American Cichlidae</b>											
<i>Acarichthys heckelii</i>		M	48	6 M/SM + 42 ST/A	54				ACN=48	(Amazon R.)	T-41
<i>Aequidens metae</i>		F, M	48	6 M/SM + 16ST + 28A	54	70			ACN=48	(Orinoco R.)	T-41
<i>Aequidens plagiozonatus</i>			48	48 ST/A	48		2			(Brazil)	M-149
<i>Aequidens pulcher</i>			48					(82)		(Venezuela, Trinidad)	S-184
<i>Amphilophus citrinellus</i>	<i>Cichlasoma citrinellum</i>	F, M	48	8 M/SM + 12ST + 28A	56	68			ACN=48	(C. America, Atlantic side)	T-41
<i>Amphilophus citrinellus</i>	<i>Cichlasoma citrinella</i>		48	36 SM/ST + 12A	84				ACN=48	(C. America, Atlantic side)	N-30
<i>Apistogramma agassizii</i>	<i>agassizii</i>	F, M	46	24 M/SM + 22 ST/A	70			(78)	ACN=46	(S. America)	T-41
<i>Apistogramma agassizii</i>	<i>agassizii</i>		40								S-184
<i>Apistogramma borellii</i>		M	38	22 M/SM + 2ST + 14A	60	62			ACN=46	(S. America)	T-41
<i>Apistogramma borellii</i>			46					(90)		(S. America)	S-184
<i>Apistogramma borellii</i>	<i>reitzigi</i>		46					(86)		(S. America)	S-184
<i>Apistogramma cacatuoides</i>			46					(86)		(S. America)	S-184
<i>Apistogramma ortmanni</i>			46					(86)		(S. America)	S-184
<i>Apistogramma ortmanni</i>		M	46	24 M/SM + 22 ST/A	70				ACN=48	(S. America)	T-41
<i>Apistogramma trifasciata</i>			38					(64)		(S. America)	S-184
<i>Apistogramma sp.</i>			46	16 M/SM + 30 ST/A	62					Argentina	F-20, R-107
<i>Archocentrus centrarchus</i>	<i>Cichlasoma</i>	F	48	6 M/SM + 14ST + 28A	54	68		(86)	ACN=48	(S. America)	S-184
<i>Archocentrus nigrofasciatus</i>	<i>Cichlasoma</i>	F, M	48	4 M/SM + 44 ST/A	52				ACN=48	(C. America, Pacific side)	T-41
<i>Archocentrus septemfasciatus</i>	<i>Cichlasoma</i>	F	48	6 M/SM + 14ST + 28A	54	68			ACN=48	Costa Rica	T-41
<i>Archocentrus spilurus</i>	<i>Cichlasoma spilurus</i>		48	6 M/SM + 42 ST/A	54			(68)	ACN=48	Costa Rica (Atlantic side)	T-41
<i>Archocentrus spilurus</i>	<i>Cichlasoma cutteri</i>		48							Costa Rica	T-39
<i>Astronotus ocellatus</i>		F, M	48	12 M/SM + 36 ST/A	60		2		ACN=48	(S. America)	S-184
<i>Astronotus ocellatus</i>			48					(96)		Brazil (MS, AM)	F-9, F-10
<i>Astronotus ocellatus</i>			48							(S. America)	S-184
<i>Astronotus ocellatus</i>		F	48	6 M/SM + 42 ST/A	54			(2.1* FCM)		(S. America)	T-41, O-48
<i>Australoheros facetus</i>	<i>Cichlasoma facetum</i>	F, M	48	16 M/SM + 32 ST/A	64		2		ACN=48	Brazil (Tiete R., SP)	M-136
<i>Australoheros facetus</i>	<i>Cichlasoma facetum</i>	F, M	48	10 M/SM + 38 ST/A	58		2		ACN=48	Brazil (SP)	F-9, F-10
<i>Australoheros facetus</i>	<i>Cichlasoma facetum</i>	F, M	48	10SM + 38 ST/A	58		2		ACN=48	Brazil (PR)	V-87
<i>Australoheros vittata</i>	<i>Cichlasoma facetum</i>	F, M	48	8SM + 40A	56	56			ACN=48	Uruguay	O-66
<i>Bujurquina vittata</i>	<i>Aequidens paraguayensis</i>		44	22 M/SM + 8 ST/A + 14 MC	66				ACN=46	Argentina	F-20, R-107
<i>Bujurquina vittata</i>	<i>Cichlasoma</i>	F, M	44	26 M/SM + 18 ST/A	70				ACN=46	(Paraguay R.)	T-41
<i>Caquetaia kraussii</i>		F, M	50	6 M/SM + 14ST + 30A	56	70			ACN=48	Colombia	T-41
<i>Chaetobranchopsis australe</i>		F, M	48	48A	48	48	2		ACN=48	Brazil (MS)	F-9, F-10
<i>Cichla monoculus</i>		F, M	48	48A	48	48	2		1-3 B, ACN=48	Brazil (Amazon R.)	F-14, B-85



Table 6.37 Order PERCIFORMES. Part 2 Labroidei and Zoarcoidei (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Suborder/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Cichla</i>		F, M	48	48A	48	48	2		ACN=48	Brazil (Amazon R.)	T-41, B-85
<i>Cichlasoma</i>		F, M	48	6 M/SM + 14ST + 28A	54	68			ACN=48	Mexico (Sonora)	T-41
<i>Cichlasoma</i>		M	48	6 M/SM + 14ST + 28A	54	68			ACN=48	(Brazil, Suriname)	T-41
<i>Cichlasoma</i>			48	8 M/SM + 22ST + 18A	56	78			ACN=48	Argentina	F-20, R-107
<i>Cichlasoma</i>		F, M	48	8 M/SM + 40 ST/A	56				ACN=48	Costa Rica	T-41, S-6
<i>Cichlasoma</i>			48	6 M/SM + 42 ST/A	54				ACN=48	Costa Rica	S-6
<i>Cichlasoma</i>			47	6 M/SM + 41 ST/A	53				ACN=48	Costa Rica	S-6
<i>Cichlasoma</i>	<i>istlana fusca</i>	F, M	48	8SM + 40 ST/A	56				ACN=48	Mexico (Michoacán)	U-49
<i>Cichlasoma</i>	<i>istlana istlana</i>	F	48	8SM + 40 ST/A	56				ACN=48	Mexico (Morelos)	U-49
<i>Cichlasoma</i>	<i>octofasciatum</i>	F, M	48	6 M/SM + 14ST + 28A	54	68		2.6 BFA	ACN=48	(Atlantic side of C. America)	T-41, H-13
<i>Cichlasoma</i>	<i>paranaense</i>	F, M	48	20SM + 12ST + 16A	68	80	2		ACN=48	Brazil (PR)	M-41
<i>Cichlasoma</i>	<i>portalegrensis</i>		48			(68)		2.4 BFA		(Brazil)	O-50, S-184, H-13
<i>Cichlasoma</i>	<i>salvini</i>	F, M	52	28 M/SM + 24 ST/A	80					Belize	T-41
<i>Cichlasoma</i>	<i>tetracanthum</i>		48	6SM + 28ST + 14A	54	82			ACN=48	Cuba	R-6
<i>Cichlasoma</i>	<i>trimaculatum</i>	F, M	48	6 M/SM + 14ST + 28A	54	68				(Mexico)	T-41
<i>Cichlasoma</i>	<i>trimaculatum</i>	F, M	48	8SM + 40 ST/A	56					Mexico (near Acapulco)	U-48
<i>Cichlasoma</i>	sp.	F, M	48	6 M/SM + 42 ST/A	54				ACN=48	Mexico (Coahuila)	T-41
<i>Cleithracara</i>	<i>maronii</i>		48			(82)				(Guyana, Suriname)	S-184
<i>Crenicichla</i>	<i>britskii</i>		48	8 M/SM + 40 ST/A	56		2		ACN=48	Paraná-Paraguay basin	B-82
<i>Crenicichla</i>	<i>cincta</i>		48	8 M/SM + 40 ST/A	56		2		ACN=48	Brazil (AM)	B-82
<i>Crenicichla</i>	<i>iguassuensis</i>	F, M	48	2M + 6SM + 14ST + 26A	56	70	2		ACN=48	Brazil (PR)	M-159
<i>Crenicichla</i>	<i>iguassuensis</i>		48	6 M/SM + 42 ST/A	54		2			Brazil (PR)	B-82
<i>Crenicichla</i>	<i>inpa</i>		48	6 M/SM + 42 ST/A	54		2		ACN=48	Brazil (Amazon basin)	B-82
<i>Crenicichla</i>	cf. <i>johanna</i>		48	6 M/SM + 42 ST/A	54		2		ACN=48	Brazil (Amazon basin)	B-82
<i>Crenicichla</i>	<i>lacustris</i>	M	48	6 M/SM + 40 ST/A	56		2		ACN=48	Brazil (SP.)	F-9, F-10
<i>Crenicichla</i>	<i>lepidota</i>	F	48	6 M/SM + 8ST + 34A	54	62			ACN=48	(S. America)	T-41
<i>Crenicichla</i>	<i>lepidota</i>	M	48	6 M/SM + 42 ST/A	54		2		ACN=50	Brazil (MS)	F-9, F-10
<i>Crenicichla</i>	<i>lepidota</i>		48	6 M/SM + 42 ST/A	54				ACN=48	Argentina	F-20, R-107
<i>Crenicichla</i>	<i>lepidota</i>	F, M	48	2M + 4SM + 6ST + 36A	54	60	2		ACN=48	Brazil (PR)	M-41
<i>Crenicichla</i>	<i>lucius</i>	F	48							(Amazon R.)	T-41
<i>Crenicichla</i>	<i>lugubris</i>		48	8 M/SM + 40 ST/A	56		2		ACN=48	Brazil (Amazon basin)	B-82
<i>Crenicichla</i>	<i>niederleinii</i>	F, M	48	2M + 12SM + 4ST + 30A	62	66	4			Brazil (PR)	M-41
<i>Crenicichla</i>	<i>niederleinii</i>	M	48	2M + 8SM + 38 ST/A	58		2		ACN=48	Brazil (PR)	L-71
<i>Crenicichla</i>	<i>niederleinii</i>		48	6 M/SM + 42 ST/A	54		2		ACN=48	Argentina	F-20, R-107
<i>Crenicichla</i>	<i>notophthalmus</i>	F	48	6 M/SM + 8ST + 34A	54	62				(Amazon R.)	T-41
<i>Crenicichla</i>	<i>reticulata</i>		48	6 M/SM + 42 ST/A	54		2		1-3 B, ACN=48	Brazil (Amazon R.)	B-82, F-14

Table 6.37 Order PERCIFORMES. Part 2 Labroidi and Zoarcoidei (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Suborder/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Crenicichla saxatilis</i>	<i>sexatilis</i>	M	48	4M + 44A	52	52		2.2 BFA	ACN=48	S. America (Atlantic side)	O-66, H-13
<i>Crenicichla semifasciata</i>			48	6 M/SM + 42 ST/A	54					Argentina	F-20
<i>Crenicichla semifasciata</i>	<i>Batrachops semifasciatus</i>	F, M	48	6 M/SM + 42 ST/A	54		2		ACN=48	Brazil (MS)	F-9, F-10
<i>Crenicichla strigata</i>		F, M	48	6 M/SM + 42 ST/A	54				ACN=48	(Amazon R.)	T-41
<i>Crenicichla vittata</i>		M	48	6 M/SM + 42 ST/A	54		2		ACN=48	Brazil (MS)	F-9, F-10
<i>Crenicichla</i> sp.		M	48	2M + 6SM + 40 ST/A	56		2		ACN=48	Brazil (SC)	L-71
<i>Dicrossus filamentosus</i>	<i>Crenicara filamentosa</i>	F	46	12 M/SM + 34 ST/A	58				ACN=46	Brazil, Venezuela	T-41
<i>Dicrossus maculatus</i>	<i>Crenicara</i>		46				(86)			(Brazil)	S-184
<i>Geophagus brasiliensis</i>		F, M	48	4 M/SM + 44 ST/A	52				ACN=48	(Brazil)	T-41
<i>Geophagus brasiliensis</i>		F, M	48	2 M/SM + 46 ST/A	50		2		ACN=48	Brazil (SP)	F-9, F-10
<i>Geophagus brasiliensis</i>		F, M	48	8SM + 18ST + 22A	56	74	2		ACN=48	Brazil (PR)	M-41
<i>Geophagus brasiliensis</i>		F, M	48	6SM + 42 ST/A	54		2		ACN=48	Brazil (PR)	V-87
<i>Geophagus brasiliensis</i>		F, M	48	4SM + 44 ST/A	52		2		ACN=48	Brazil (PR)	L-89
<i>Geophagus surinamensis</i>		F, M	48	4 M/SM + 44 ST/A	52		2		ACN=48	Brazil (AM)	T-41, F-9, F-10
<i>Gymnogeophagus balzanii</i>		F, M	48	2 M/SM + 46 ST/A	50		2		0-4 B, ACN=48	Brazil (MS)	F-9, F-10
<i>Gymnogeophagus balzanii</i>		F, M	48	2 M/SM + 46 ST/A	50		2		ACN=48	Argentina	F-20, R-107
<i>Gymnogeophagus gymnogynys</i>			48	4 M/SM + 44 ST/A	52		2			Brazil	P-87
<i>Gymnogeophagus labiatus</i>			48	4 M/SM + 44 ST/A	52		2			Brazil	P-87
<i>Gymnogeophagus lacustris</i>			48	4 M/SM + 44 ST/A	52					Brazil	P-87
<i>Gymnogeophagus rhabdotus</i>			48	4 M/SM + 44 ST/A	52					Brazil	P-87
<i>Gymnogeophagus</i> sp.			48	2 M/SM + 46 ST/A	50				ACN=48	Argentina	F-20, R-107
<i>Herichthys cyanoguttatus</i>	<i>Cichlasoma cyanoguttatum</i>	F, M	48	6 M/SM + 14ST + 28A	54	68			ACN=48	USA (TX), Mexico	T-41
<i>Herichthys labridens</i>	<i>Cichlasoma</i>	F	48	6 M/SM + 14ST + 28A	54	68			ACN=48	Mexico (Atlantic side)	T-41
<i>Heros severus</i>	<i>Cichlasoma severum</i>	F, M	48	4 M/SM + 44 ST/A	52				ACN=48	Brazil, Venezuela	T-41
<i>Herotilapia multispinosa</i>		F, M	48	6 M/SM + 42 ST/A	54				ACN=48	C. America	T-41
<i>Hypselecara conyphaenoides</i>	<i>Cichlasoma</i>	F, M	48	6 M/SM + 14ST + 28A	54	68			ACN=48	(Amazones)	T-41
<i>Kribia itanyi</i>	<i>Aequidens</i>		46				(64)			(Suriname)	S-184
<i>Laetacara curviceps</i>	<i>Aequidens</i>		38				(76)			(Amazon R.)	S-184
<i>Laetacara cf. dorsigera</i>			45	3M + 42A	48				0-2 B	Brazil (PR)	C-88
<i>Mesonauta festivus</i>	<i>Cichlasoma festivum</i>	F, M	48	8 M/SM + 40 ST/A	56				ACN=48	(S. America)	T-41
<i>Nannacara anomala</i>		F, M	44	18 M/SM + 26 ST/A	62				ACN=48	S. America	T-41
<i>Neotropus nematopus</i>		F, M	48	8 M/SM + 12ST + 28A	56	68			ACN=48	Costa Rica	T-41
<i>Papilochromis ramirezi</i>	<i>Microgeophagus</i>		48				(64)			(S. America)	S-184
<i>Parachromis managuensis</i>	<i>Cichlasoma managuense</i>		48	8 M/SM + 40 ST/A	56				ACN=48	Costa Rica	S-6
<i>Parachromis managuensis</i>	<i>Cichlasoma managuense</i>	F, M	48	6 M/SM + 14ST + 28A	54	68			ACN=48	(Costa Rica)	T-41
<i>Pterophyllum scalare</i>		F, M	48	4 M/SM + 44 ST/A	52				(2.0 FCM, 2.4 BFA)	(S. America)	T-41, V-86, H-13

Table 6.37 Order PERCIFORMES. Part 2 Labroidae and Zoarcoidei (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup>	Genome size	Comments	Locality	Reference
Suborder/family/subfamily/species	karyotype paper						NORs	(pg/cell)			
<i>Pterophyllum scalare</i>		F, M	48	12 M/SM + 36 ST/A	60		2			Brazil (PA)	N-2
<i>Satanoperca jurupari</i>			48	6SM + 42 ST/A	54				0-3 B, XY	S. America	M-41, O-86
<i>Satanoperca jurupari</i>	<i>Geophagus</i>	F, M	48	4 M/SM + 44 ST/A	52			(2.4 BFA)	ACN=48	(S. America)	T-41, H-13
<i>Satanoperca papaterra</i>		F, M	48	6SM + 6ST + 36A	54	60	2		ACN=48	Brazil (PR)	M-41
<i>Symphysodon aequifasciatus</i>	<i>aequifasciata</i>	F, M	60	58 M/SM + 2 ST/A	118			(2.5* FCM, 2.4 FD)		(Amazon R.)	T-41, O-4, O-48
<i>Symphysodon aequifasciatus</i>	cytotype 1	F, M	60	48 M/SM + 8 ST/A + 4 MC			2		ACN=62	Brazil (Amazon)	M-146
<i>Symphysodon aequifasciatus</i>	cytotype 2	M	60	50 M/SM + 6 ST/A + 4 MC			2		ACN=62	Brazil (Amazon)	M-146
<i>Symphysodon discus</i>	cytotype 1	F, M	60	50 M/SM + 10 ST/A	110		2		ACN=62	Brazil (Amazon)	M-146
<i>Symphysodon discus</i>	cytotype 2	M	60	54 M/SM + 6 ST/A	114		2		ACN=62	Brazil (Amazon)	M-146
<i>Symphysodon haraldi</i>	<i>aequifasciata axelrodi</i>		60	26M + 26SM + 8 ST/A	112		2	2.5 FCM		(Amazon R.)	T-24
<i>Symphysodon haraldi</i>		F, M	60	52 M/SM + 4 ST/A + 4 MC			2-5		ACN=62	Brazil (Amazon)	M-146
<i>Thorichthys ellioti</i>	<i>Cichlasoma</i>	F, M	48	6 M/SM + 42 ST/A	54				ACN=48?	Mexico (Veracruz)	U-48
<i>Thorichthys meeki</i>	<i>Cichlasoma</i>	F, M	48	6 M/SM + 14ST + 28A	54	68		2.8 BFA	ACN=48	(S. America)	T-41, H-13
<i>Uaru amphiacanthoides</i>		F, M	46	8 M/SM + 38 ST/A	54				ACN=48	(Amazon R.)	T-41
<b>Asian Cichlidae</b>											
<i>Etroplus maculatus</i>		F, M	46	18 M/SM + 28 ST/A	64				ACN=48?	(Asia)	T-39
<i>Etroplus maculatus</i>		F, M	46							India (Portonovo)	N-13
<i>Etroplus suratensis</i>		F, M	48	48A	48	48			ACN=48	India (Orissa, WB)	R-57, K-46
<i>Etroplus suratensis</i>		F, M	48							India (Portonovo)	N-13
<b>African Cichlidae</b>											
<i>Anomalochromis thomasi</i>	<i>Pelmatochromis</i>		48				(58)			(Africa)	S-25
<i>Astatotilapia burtoni</i>		F, M	40	16 M/SM + 24 ST/A	56			1.9 FCM	ACN=48	Africa (Lake Tanganyika)	T-39, T-42, G-85
<i>Aulonocara baenschi</i>			44	6M + 8SM + 30A	58					Malawi	F-68
<i>Aulonocara hueseri</i>			44	4M + 6SM + 34A	54					Malawi	F-68
<i>Aulonocara komelae</i>			44	4M + 8SM + 32A	56					Malawi	F-68
<i>Aulonocara stuartgranti</i>			44	4M + 6SM + 34A	54					Malawi	F-68
<i>Aulonocara stuartgranti</i>			44	6M + 6SM + 32A	56					Malawi	F-68
<i>Aulonocara</i> sp.			44	6M + 6SM + 32A	56					Malawi	F-68
<i>Chromidotilapia finleyi</i>			48				(68?)			(Africa)	S-184
<i>Chromidotilapia batesii</i>	<i>Pelmatochromis</i> (southern form)		44				(80)			E. Cameroon	S-25
<i>Chromidotilapia batesii</i>	<i>Pelmatochromis</i> (northern form)		42				(80)			E. Cameroon	S-25
<i>Haplochromis flavijosephi</i>		F	44	10 M/SM + 34 ST/A	54			2.2 FD	ACN=48	Sea of Galilee	K-98
<i>Haplochromis obliquidens</i>		F, M	44	12 M/SM + 32 ST/A	56				0-2 B	(E. Africa)	P-95
<i>Hemichromis bimaculatus</i>			44				(64)			(Africa)	S-184
<i>Hemihaplochromis kirki</i>			44				(76)			(Africa)	S-184
<i>Hemihaplochromis multicolor</i>			44				(78)			(Africa)	S-184

Table 6.37 Order PERCIFORMES. Part 2 Labroides and Zoarcoidei (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Suborder/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Heterochromis multidentis</i>	<i>Pelmatochromis taeniatus</i>		42			(74)				(Africa)	S-25
<i>Julidochromis ornatus</i>			44			(58)				(Africa)	S-184
<i>Labrotropheus fuelleborni</i>			44	12 M/SM + 32 ST/A	56					Africa (Lake Malawi)	K-120
<i>Lamplogobius congoensis</i>			44			(46)				(Africa)	S-184
<i>Melanochromis auratus</i>	<i>Pseudotropheus</i>	F	46	10 M/SM + 36 ST/A	56				ACN=48	(E. Africa)	T-42
<i>Melanochromis auratus</i>	<i>Pseudotropheus</i>		46	10 M/SM + 36 ST/A	56					(E. Africa)	T-39
<i>Mitriacoma zebra</i>	<i>Lamplogobius savoyi</i>		44	12 M/SM + 32 ST/A	56					Africa (Lake Malawi)	K-120
<i>Neolamplogobius savoyi</i>			32?			(54?)				(Africa)	S-184
<i>Oreochromis andersonii</i>	<i>Tilapia</i>	F, M	44	6SM + 38 ST/A	50				ACN=48	S. Africa	V-35
<i>Oreochromis aureus</i>			44	14M/SM + 30ST	58	88		2.4 FD	ACN=48	Egypt	M-125
<i>Oreochromis aureus</i>	<i>Sarotherodon</i>	F, M	44	10SM + 34ST	54	88		2.5 FD	ACN=48	Sea of Galilee	K-98
<i>Oreochromis aureus</i>	<i>Sarotherodon</i>	F, M	44	8SM + 2ST + 34A	52	54			ACN=48	(Africa)	T-42
<i>Oreochromis aureus</i>	<i>Tilapia</i>		44	44 ST/A	44					(Africa)	T-39
<i>Oreochromis karongae</i>		F, M	38	4M + 22 SM/ST + 12A	64				ACN=48	Africa (Lake Malawi)	H-36
<i>Oreochromis lepidurus</i>	<i>Tilapia</i>		44			(86)				(C. Africa)	S-184
<i>Oreochromis leucostictus</i>			44					2.4 BFA		(E. Africa)	H-13
<i>Oreochromis macrochir</i>	<i>Tilapia</i>	F, M	44	10SM + 34ST	54	88		1.7 FD	ACN=48	Botswana	M-125
<i>Oreochromis macrochir</i>	<i>Tilapia</i>		44	6SM + 38 ST/A	50				ACN=48	Zaire	V-35
<i>Oreochromis mortimeri</i>			44	18 M/SM + 26A	62	62			ACN=48	Zambezi	H-11
<i>Oreochromis mossambicus</i>			44	6SM + 38ST	50	88		2.0 FD	ACN=48	(Africa)	M-125
<i>Oreochromis mossambicus</i>	<i>Sarotherodon</i>	F, M	44	6SM + 38 ST/A	50				ACN=48	(Africa)	T-42
<i>Oreochromis mossambicus</i>	<i>Tilapia</i>	M	44	6ST + 38A	44	50			ACN=48	(introduced, India)	P-49
<i>Oreochromis mossambicus</i>	<i>Tilapia</i>		44	8SM + 34ST + 2A	52	86		(1.8* FD)	ACN=48	(introduced, China)	C-44, C-83
<i>Oreochromis mossambicus</i>	<i>Tilapia</i>		44	12ST + 32A	44	56			ACN=48	(introduced, China)	L-53
<i>Oreochromis niloticus</i>	<i>Tilapia</i>	F, M	44	18ST + 26A	44	62			ACN=48	(introduced, Japan)	F-54
<i>Oreochromis niloticus</i>	<i>Tilapia</i>		44	2M + 18SM + 24ST	64	88		1.9 FD	ACN=48	Egypt	M-125
<i>Oreochromis niloticus</i>	<i>Tilapia</i>		44	8SM + 34ST + 2A	52	86		2.2* FD	ACN=48	(introduced, China)	C-44, C-83
<i>Oreochromis niloticus</i>	<i>Sarotherodon</i>		44	2M + 16SM + 26 ST/A	62				ACN=48	(introduced, Japan)	A-76
<i>Oreochromis spilurus</i>			44	6SM + 38ST	50	88		1.9 FD	ACN=48	Kenya	M-125
<i>Oreochromis urolepis hornorum</i>			44	8SM + 2ST + 34A	52	54			ACN=48	(introduced, Mexico)	U-47
<i>Pelvicachromis pulcher</i>	<i>Pelmatochromis</i>		44			(82)				(Africa)	S-25
<i>Pelvicachromis subocellatus</i>	<i>Pelmatochromis</i>		40			(70)				(Africa)	S-25
<i>Pelvicachromis taeniatus</i>	<i>Pelmatochromis klugei</i>		40			(70)		2.0 BFA		(Africa)	S-25, H-13
<i>Sarotherodon gallilaeus</i>		F, M	44	6SM + 38 ST/A	50		2	2.2 FD	ACN=48	Sea of Galilee	K-98
<i>Sarotherodon gallilaeus</i>	<i>Tilapia gallilaea</i>	F, M	44	6SM + 38 ST/A	50				ACN=48	(Africa)	V-35
<i>Sarotherodon gallilaeus</i>	<i>Tilapia</i>		44	8SM + 34ST + 2A	52	86				(introduced, China)	C-44

Table 6.37 Order PERCIFORMES. Part 2 Labroidei and Zoarcoidei (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Suborder/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Sarotherodon gallilaeus</i>			44	4SM + 40ST	48	88		1.7 FD	ACN=48	Kenya	M-125
<i>Sarotherodon melanotheron</i>			44	4M + 30 SM/ST + 10A		78			ACN=48	Ivory Coast	H-11
<i>Tilapia congica</i>		F, M	44	10 M/SM + 34 ST/A	54				ACN=48	Zaire	V-35
<i>Tilapia guineensis</i>		F, M	44	8 M/SM + 36 ST/A	52				ACN=48	(Guinea)	V-35
<i>Tilapia mariae</i>		F, M	40	4 M/SM + 36 ST/A	44				ACN=48	(Africa)	V-35
<i>Tilapia mariae</i>		F, M	40	8 M/SM + 32 ST/A	48				ACN=48	(Africa)	T-42
<i>Tilapia rendalli</i>		F, M	44	10SM + 8ST + 26A	54	62	4		ACN=48	Brazil (PR)	K-123, M-65
<i>Tilapia sparrmanii</i>		F, M	42	8 M/SM + 34 ST/A	50				ACN=48	Zaire	V-35
<i>Tilapia sparrmanii</i>		F, M	42	10 M/SM + 32 ST/A	52				ACN=48	(Africa)	T-42
<i>Tilapia zililii</i>		F, M	44	10 M/SM + 34 ST/A	54			2.4 FD, (2.4 BFA)	ACN=48	Sea of Galilee	K-98, H-13
<i>Tilapia zililii</i>			44	4M + 18SM + 22ST	66	88			ACN=48	Egypt	M-125
<i>Tristramella sacra</i>		M	44	6 M/SM + 38 ST/A	50			2.6 FD	ACN=48	Sea of Galilee	K-98
<i>Tristramella simonis</i>		F, M	44	6 M/SM + 38 ST/A	50			2.9 FD	ACN=48	Sea of Galilee	K-98
<i>Thysochromis ansorgii</i>	<i>Pelmatochromis ansorgii</i>		46			(54)				(Africa)	S-25
<i>Tylochromis lateralis</i>	<i>Pelmatochromis guentheri</i>		48			(50)				(Africa)	S-25
<b>Embiotocidae</b>											
<i>Embiotoca jacksonii</i>			48*					2.0 BFA		USA (CA)	C-46, H-13
<i>Micrometrus aurora</i>	<i>Amphigonopterus</i>		48*							USA (CA)	C-46
<i>Neoditrema ransonneti</i>			48	6SM + 42 ST/A	54				ACN=48	Japan (Kanagawa)	A-77
<b>Pomacentridae</b>											
<b>Amphiprioninae</b>											
<i>Amphiprion clarkii</i>			48	14M + 16SM + 18 ST/A	78			2.2* FCM, 2.1 FIA	ACN=48	Japan (Tanegashima Is.)	A-65, O-48, H-41
<i>Amphiprion clarkii</i>			48	12M + 26SM + 10 ST/A	86				ACN=48	(W. Pacific)	T-70
<i>Amphiprion frenatus</i>			48	14M + 22SM + 10ST + 2A	84	94			ACN=48	Japan (Okinawa)	A-66
<i>Amphiprion frenatus</i>			48	12M + 26SM + 10 ST/A	86				ACN=48	(W. Pacific)	T-70
<i>Amphiprion frenatus</i>			48	14M + 22SM + 8ST + 4A	84	92	2		ACN=48	Philippines	M-79
<i>Amphiprion ocellaris</i>			48	14M + 22SM + 12 ST/A	84				ACN=48	Japan (Okinawa)	A-66
<b>Chrominae</b>											
<i>Chromis chromis</i>		F, M	48	48A	48	48		2.6* FD	ACN=48	Spain (Malaga)	A-29
<i>Chromis chrysurus</i>			48	2M + 46 ST/A	50				ACN=48	(Japan)	O-49
<i>Chromis flavicauda</i>		M	39	9M + 6SM + 24A	54	54	2		ACN=48	Brazil (ES)	M-143
<i>Chromis insolata</i>			46	4M + 6SM + 36A	56	56	2		ACN=48	Brazil (ES)	M-143
<i>Chromis insolata</i>			47	3M + 6SM + 38A	56	56	2		ACN=48	Brazil (ES)	M-143
<i>Chromis multilineata</i>		F	48	48A	48	48	2		ACN=48	Brazil (BA)	M-143

Table 6.37 Order PERCIFORMES. Part 2 Labroidae and Zoarcoidei (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Suborder/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg./cell)	Comments	Locality	Reference
<i>Chromis</i>			48	48A	48	48			ACN=48	(Pacific)	T-23
<i>Dascyllus</i>	<i>caeruleus</i>		32	16 M/SM + 16A	48	48	2	(2.1* FCM, 1.7 FIA)	ACN=48	S. Japan	K-15, O-48, H-41
<i>Dascyllus</i>			31	17 M/SM + 14A	48	48			ACN=48	S. Japan	K-15
<i>Dascyllus</i>			30	18 M/SM + 12A	48	48			ACN=48	S. Japan	O-36, K-15
<i>Dascyllus</i>			29	19 M/SM + 10A	48	48			ACN=48	S. Japan	K-15
<i>Dascyllus</i>			28	20 M/SM + 8A	48	48	2		ACN=48	S. Japan	O-36, K-15
<i>Dascyllus</i>			48	48A	48	48	2		ACN=48	S. Japan	O-36, K-15
<i>Dascyllus</i>			36	12 M/SM + 24A	48	48	2		ACN=48	S. Japan	K-15, H-40
<i>Dascyllus</i>			35	13 M/SM + 22A	48	48		(1.7 FIA)	ACN=48	S. Japan	O-36, K-15
<i>Dascyllus</i>			34	14 M/SM + 20A	48	48			ACN=48	S. Japan	O-36, K-15
<i>Dascyllus</i>			48	48A	48	48	2	1.8 FIA	ACN=48	S. Japan	O-36, K-15, H-40
<i>Dascyllus</i>			47	1M + 46A	48	48			ACN=48	Japan (Tanegashima Is.)	A-65
<b>Pomacentrinae</b>											
<i>Abudefduf</i>			48	2M + 2ST + 44A	50	52			ACN=48	Japan (Tanegashima Is.)	A-65
<i>Abudefduf</i>		F	48	2M + 2SM + 44A	52	52	2	(2.0 BFA)	ACN=48	Brazil (RJ)	A-12, B-59, H-13
<i>Abudefduf</i>			48	2M + 2SM + 44A	52	52	2		ACN=48	Brazil (RN)	M-79
<i>Abudefduf</i>	<i>coelestinus</i>		48	2M + 46A	50	50	2	1.4 FIA	ACN=48	(W. Pacific)	T-7, H-40
<i>Abudefduf</i>			48	2M + 2SM + 2ST + 42A	52	54		1.7 FIA	ACN=48	Japan (Tanegashima Is.)	A-65, H-40
<i>Abudefduf</i>			48	2M + 2SM + 2ST + 42A	52	54			ACN=48	Japan (Chiba)	A-65
<i>Abudefduf</i>			48	2M + 2SM + 44A	52	52	2		ACN=48	(W. Pacific)	T-7
<i>Amblyglyphidodon</i>			48	6M + 22SM + 20 ST/A	76		2	2.2* FCM, 1.8 FIA	ACN=48	(Indo-W. Pacific)	T-6, O-48, O-49, H-40
<i>Cheilopriion</i>			48	26SM + 22 ST/A	74		2		ACN=48	Japan (Ryukyu)	T-7
<i>Chrysiptera</i>			42	6M + 16SM + 2ST + 18A	64	66	2	3.4* FCM, 1.6, 2.1 FIA	ACN=48	(W. Pacific)	T-19, O-48, H-41
<i>Chrysiptera</i>	<i>Glyphidodontops cyaneus</i>		48	48 ST/A	48				ACN=48	(Indo-W. Pacific)	O-49
<i>Chrysiptera</i>			48	30SM + 10ST + 8A	78	88	2	2.7* FCM	ACN=48	(Indo-W. Pacific)	O-49
<i>Chrysiptera</i>	<i>Glyphidodontops hemicyaneus</i>		48	32SM + 16 ST/A	80				ACN=48	(W. Pacific)	T-19
<i>Chrysiptera</i>			48	4M + 22SM + 6ST + 16A	74	80	2		ACN=48	(W. Pacific)	T-19
<i>Chrysiptera</i>			36	12M + 10SM + 14 ST/A	58		2		ACN=48	(W. Pacific)	O-49
<i>Chrysiptera</i>	<i>Glyphidodontops rex</i>		48	8M + 22SM + 18 ST/A	78				ACN=48	(Indo-W. Pacific)	T-6, T-7
<i>Chrysiptera</i>			48	2M + 10SM + 36A	60	60	2		ACN=48	(W. Pacific)	T-6, H-41
<i>Chrysiptera</i>			48				2	1.5 FIA	ACN=48	(Indo-W. Pacific)	T-6, H-41
<i>Dischistodus</i>	<i>prosopotaenia</i>		48	6M + 10ST + 32A	54	64	2		ACN=48	Brazil (BA)	G-12, M-79
<i>Microspathodon</i>	<i>chrysurus</i>		48	8M + 26SM + 2ST + 12A	82	84			ACN=48	Japan (Wakayama)	T-84
<i>Neoglyphidodon</i>	<i>melas</i>		48	8M + 26SM + 2ST + 12A	82	84	2		ACN=48	(W. Pacific)	T-16
<i>Neoglyphidodon</i>	<i>nigroris</i>		48	8M + 26SM + 2ST + 12A	82	84	2		ACN=48	(W. Pacific)	T-16
<i>Neoglyphidodon</i>	<i>oxyodon</i>		48	2M + 20SM + 12ST + 14A	70	82	2		ACN=48	(W. Pacific)	T-16
<i>Plectroglyphidodon</i>	<i>lacrymatus</i>		48				2		ACN=48	(Indo-W. Pacific)	T-6

Table 6.37 Order PERCIFORMES. Part 2 Labroidae and Zoarcoidei (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Suborder/family/subfamily/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Plectroglyphidodon leucozonus</i>	<i>Abudefduf</i>		48	4ST + 44A	48	52			ACN=48	Japan (Yakushima Is.)	A-65
<i>Pomacentrus chrysurus</i>	<i>rhodonotus</i>		48	8M + 22SM + 12ST + 6A	78	90	2	2.1 FIA	ACN=48	(W. Pacific)	T-16, H-40
<i>Pomacentrus coelestis</i>			48	48A	48	48	2	(1.8 FIA)	ACN=48	Japan (Tanegashima Is.)	A-65, H-40
<i>Pomacentrus coelestis</i>	<i>Abudefduf</i>		48	48A	48	48	2		ACN=48	(W. Pacific)	T-7, T-23
<i>Pomacentrus moluccensis</i>			48	10M + 26SM + 10ST + 2A	84	94	2	1.5 FIA	ACN=48	(W. Pacific)	T-16, H-40
<i>Pomacentrus cf. nagasakiensis</i>	<i>Paraglyphidodon melas</i>		48	2M + 46A	50	50	2		ACN=48	Japan (Wakayama)	T-7, T-84
<i>Pomacentrus philippinus</i>			48	8M + 24SM + 10ST + 6A	80	90	2		ACN=48	Japan (Yaeyama)	T-16
<i>Pomacentrus trilineatus</i>	<i>biocellatus</i>	M	50	8 M/SM + 42 ST/A	58					India (Andaman Is.)	R-45
<i>Pomacentrus</i> sp.			48	10M + 26SM + 12 ST/A	84					(Pacific)	O-49
<i>Stegastes fuscus</i>		F, M	48	20M + 22SM + 6A	90	90	2	1.5 FD	ACN=48	Brazil (RN)	G-12, G-85, M-145
<i>Stegastes insularis</i>			48	14M + 24SM + 6ST + 4A	86	92	2		ACN=48	India (Kerala)	N-65
<i>Stegastes leucostictus</i>		F, M	48	18M + 22SM + 8A	88	88	2		ACN=48	Brazil (BA)	G-12, M-145
<i>Stegastes lividus</i>	<i>Eupomacentrus</i>		48	6M + 24SM + 18 ST/A	78					(Pacific)	O-49
<i>Stegastes nigricans</i>	<i>Eupomacentrus</i>		48	2M + 2SM + 44 ST/A	52			1.5 FIA	ACN=48	(Indo-W. Pacific)	O-49, H-40
<i>Stegastes pictus</i>		F, M	48	14M + 28SM + 2ST + 4A	90	92	2		ACN=48	Brazil (BA, CE)	G-12, M-145
<i>Stegastes sanctipauli</i>			48			92				Brazil (SPR)	G-12
<i>Stegastes variabilis</i>		F, M	48	18M + 22SM + 8A	88	88	2		ACN=48	Brazil (RN)	G-12, M-145
<b>Labridae</b>											
<i>Bodianus axillaris</i>			48	8M + 30SM + 10 ST/A	86				ACN=48	S. Japan	O-31
<i>Bodianus loxozonus</i>			48	8M + 26SM + 14 ST/A	82					S. Japan	O-31
<i>Bodianus mesothorax</i>			48	8M + 18SM + 22 ST/A	74					S. Japan	O-31
<i>Bodianus rufus</i>			48	48A	48	48				Brazil	B-86
<i>Bodianus rufus</i>			48			80				Brazil (RN)	G-12
<i>Cheilinus bimaculatus</i>			32	4M + 2SM + 26A	38	38			ACN=34	Japan (Wakayama)	O-27
<i>Cheilinus fasciatus</i>			48	12SM + 36 ST/A	60					(Japan)	O-49
<i>Cheilino inermis</i>			48	12M + 12SM + 24 ST/A	72			1.8* FCM		S. Japan	O-31, O-48
<i>Cheilino inermis</i>			48	4M + 2SM + 42A	54	54			ACN=48	Japan (Yakushima Is.)	A-75
<i>Choerodon azurio</i>			48	6M + 2SM + 40 ST/A	56				ACN=48	Japan (Wakayama)	A-75
<i>Cirrhitilabrus cyanopleura</i>			34	10M + 2SM + 22 ST/A	46				ACN=46	S. Japan	O-31
<i>Cirrhitilabrus temminckii</i>			34	12M + 22A	46	46				Japan (Wakayama)	O-27
<i>Coris aygula</i>			48	6M + 6SM + 36 ST/A	60					(Japan)	O-49
<i>Coris dorsomacula</i>	<i>multicolor</i>		48	6M + 8SM + 34 ST/A	62			1.4 FIA	ACN=48	Japan (Wakayama)	O-27, H-40
<i>Coris gaimardi</i>			48	2M + 10SM + 36 ST/A	60					S. Japan	O-31
<i>Coris julis</i>		F	48	10M + 38A	58	58			ACN=48	Elba, Europe	D-24
<i>Coris julis</i>		M	48	11M + 37A	59	59			ACN=48	Elba, Europe	D-24

Table 6.37 Order PERCIFORMES. Part 2 Labroides and Zoarcoidei (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup>	Genome size	Comments	Locality	Reference
Suborder/family/subfamily/species	karyotype paper						NORs	(pg/cell)			
<i>Coris julis</i>		F, M	48	4M + 6SM + 38A	58	58		2.4 FD	ACN=48	Italy (Palermo)	V-58, G-85
<i>Coris julis</i>		F, M	48		56			1.4 FD		Spain (Malaga)	C-9
<i>Ctenolabrus rupestris</i>			48	4M + 22SM + 10ST + 12A	74	84			ACN=48	Spain (Mediterranean)	A-31
<i>Epibulus insidiator</i>			48	4M + 8SM + 36 ST/A	60				ACN=48	S. Japan	O-31
<i>Gomphosus varius</i>			48	48 ST/A	48			2.1* FCM	ACN=48	S. Japan	O-31, O-48
<i>Halichoeres argus</i>	<i>binotopsis</i>		48	48 ST/A	48				ACN=48	Japan (Yakushima Is.)	A-75
<i>Halichoeres hortulanus</i>	<i>centriquadrus</i>		48	48 ST/A	48				ACN=48	S. Japan	O-31
<i>Halichoeres melanocheir</i>			48	2M + 46 ST/A	50				ACN=48	Japan (Tanegashima Is.)	A-75
<i>Halichoeres melanocheir</i>			48	2SM + 46 ST/A	50				ACN=48	Japan	O-27, O-31
<i>Halichoeres melanurus</i>	<i>kallochroma</i>		48	48 ST/A	48			1.7 FIA	ACN=48	S. Japan	O-31, H-40
<i>Halichoeres poecilopterus</i>			48	4M + 2SM + 42 ST/A	54			1.8* FCM	ACN=48	S. Japan	O-31, O-48
<i>Halichoeres poecilopterus</i>			48	4M + 44 ST/A	52				ACN=48	Japan (Chiba)	A-75
<i>Halichoeres poecilopterus</i>		F, M	48	2M + 2SM + 44 ST/A	52				ACN=48	Korea (Cheju Is.)	P-67
<i>Halichoeres poeyi</i>			48			58			ACN=48	Brazil (RN, BA, RJ)	G-12
<i>Halichoeres prosopaeon</i>			48	2SM + 46 ST/A	50				ACN=48	Japan (Wakayama)	O-27
<i>Halichoeres radiatus</i>			48	48A	48	48			ACN=48	Brazil (SPR)	G-12
<i>Halichoeres tenuispinnis</i>			48	2SM + 46 ST/A	50			1.5* FCM	ACN=48	Japan (Wakayama)	O-27, M-2
<i>Halichoeres tenuispinnis</i>			48	2SM + 46 ST/A	50				ACN=48	Japan (Chiba)	A-75
<i>Halichoeres tenuispinnis</i>		F, M	48	2M + 46 ST/A	50				ACN=48	Korea (Cheju Is.)	P-67
<i>Halichoeres trimaculatus</i>			48	48 ST/A	48				ACN=48	S. Japan	O-31
<i>Hemigymnus fasciatus</i>			48	6M + 6SM + 36 ST/A	60				ACN=48	(Japan)	O-49
<i>Hologymnosus annulatus</i>	<i>semidiscus</i>		48	2M + 2SM + 44 ST/A	52				ACN=48	S. Japan	O-31
<i>Labroides dimidiatus</i>			48	48A	48	48		1.8* FCM	ACN=48	Japan (Wakayama)	O-27, O-48
<i>Labrus bimaculatus</i>			48	48A	48	48		2.9 FD	ACN=48	Italy (Palermo)	V-53
<i>Labrus merula</i>			48	48A	48	48			ACN=48	Italy (Palermo)	V-53, G-85
<i>Labrus viridis</i>			48	48A	48	48			ACN=48	Italy (Palermo)	V-53
<i>Novaculichthys taeniurus</i>	<i>Hemipteronotus japonicus</i>		48	4SM + 44 ST/A	52				ACN=48	(Japan)	O-49
<i>Pseudolabrus eoethinus</i>	<i>japonicus</i>		48	2M + 2SM + 44 ST/A	52			2.1* FCM	ACN=48	Japan (Wakayama)	O-27, M-2
<i>Pseudolabrus sieboldi</i>	<i>japonicus</i>		42	20M + 8SM + 14 ST/A	70			2.1* FCM	ACN=46	Japan (Kanagawa, Wakayama)	A-75, M-2
<i>Pseudolabrus sieboldi</i>	<i>japonicus</i>	F, M	42	4M + 24SM + 14 ST/A	70		2		ACN=46	Korea (Cheju Is.)	P-67
<i>Pteragogus auriganus</i>	<i>flagellifera</i>		44	2M + 10SM + 32 ST/A	56			3.5* FCM	ACN=44	Japan (Izu Peninsula)	A-75, M-2
<i>Pteragogus auriganus?</i>	<i>flagellifera</i>	F, M	42	4M + 24SM + 14 ST/A	70		2		ACN=46	Korea (Cheju Is.)	P-67
<i>Stethojulis bandanensis</i>			48	4M + 44 ST/A	52				ACN=48	S. Japan	O-31
<i>Stethojulis interrupta</i>			48	2M + 46 ST/A	50				ACN=48	Japan (Wakayama)	O-27
<i>Stethojulis interrupta</i>			48	2SM + 46 ST/A	50				ACN=48	Japan (Chiba, Kagoshima)	A-75
<i>Stethojulis strigiventer</i>			48	2M + 46 ST/A	50				ACN=48	S. Japan	O-31



Table 6.37 Order PERCIFORMES. Part 2 Labroidei and Zoarcoidei (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup>	Genome size	Comments	Locality	Reference
Suborder/family/subfamily/species	karyotype paper						NORs	(pg/cell)			
<i>Symphodus doderleini</i>		F, M	48	24M + 6SM + 10ST + 8A	78	88			ACN=48	Italy (Palermo)	C-29
<i>Symphodus cinereus</i>	<i>griseus</i>		48	32 M/SM/ST + 16A	80	80		2.5 FD	ACN=48	USSR	V-8, G-85
<i>Symphodus mediterraneus</i>			48	22M + 20SM + 6A	90	90			ACN=48	Italy (Palermo)	V-53
<i>Symphodus mediterraneus</i>		F, M	46		52			1.1 FD		Spain (Malaga)	C-9
<i>Symphodus melops</i>			46	2M + 42 SM/ST + 2A	90	2			ACN=48	Spain (Malaga)	L-67
<i>Symphodus melops</i>	<i>Crenilabrus</i>		46	10M + 36ST	56	92			ACN=48	Italy (Roma)	C-31
<i>Symphodus ocellatus</i>			48	10M + 20SM + 18A	78			2.2 FD	ACN=48	Italy (Palermo)	V-53, G-85
<i>Symphodus ocellatus</i>			48	8M + 18SM + 8ST + 14A	74	82			ACN=48	Spain (Mediterranean)	A-31
<i>Symphodus ocellatus</i>	<i>Crenilabrus</i>		48	36 M/SM/ST + 12A	84				ACN=48	USSR	V-8
<i>Symphodus roissali</i>			38	32M + 4SM + 2A	74	74			ACN=48	Italy (Palermo)	V-53
<i>Symphodus roissali</i>			38	36 M/SM + 2A	74	74	2		ACN=48	Spain (Malaga)	L-67
<i>Symphodus roissali</i>	<i>Crenilabrus quinque maculatus</i>		38	36 M/SM/ST + 2A	74				ACN=48	Black Sea	V-8
<i>Symphodus roissali</i>		F, M	46		60			1.0 FD		Spain (Malaga)	C-9
<i>Symphodus rostratus</i>	<i>scina</i>		48	40 M/SM/ST + 8A	88			2.0 FD	ACN=48	Black Sea	V-8, G-85
<i>Symphodus tinca</i>	<i>Crenilabrus</i>		48	34 M/SM/ST + 14A	82			1.5 FCM	ACN=48	Black Sea	V-8, V-86
<i>Symphodus tinca</i>			48	16M + 14SM + 4ST + 14A	78	82		2.2 FD	ACN=48	Italy (Palermo)	V-53, G-85
<i>Thalassoma amblycephala</i>			48	48 ST/A	48				ACN=48	S. Japan	O-31
<i>Thalassoma cupido</i>			48	48 ST/A	48			2.3* FCM	ACN=48	Japan	O-31, A-75, M-2
<i>Thalassoma cupido</i>		F, M	48	48A	48	48	6		ACN=48	Japan (Wakayama)	U-42
<i>Thalassoma lunare</i>			48	48A	48	48			ACN=48	Japan (Wakayama)	O-27
<i>Thalassoma lutescens</i>			48	48A	48	48			ACN=48	Japan (Wakayama)	O-27
<i>Thalassoma lutescens</i>			48	48 ST/A	48				ACN=48	Japan (Yakushima Is.)	A-75
<i>Thalassoma pavo</i>			48	48A	48	48			ACN=48	Italy (Palermo)	V-53
<i>Thalassoma pavo</i>			48		48			1.6 FD		Spain (Malaga)	C-9
<i>Thalassoma quinquevittata</i>			48	48 ST/A	48					S. Japan	O-31
<i>Thalassoma dea</i>		F	44	44A	44	44	2		ACN=46	Japan (Wakayama, Tokushima)	U-43
<i>Xyrichtys dea</i>	<i>Hemipteronotus</i>		44	44A	44	44				Japan (Wakayama)	O-27
<i>Xyrichtys novacula</i>			48	8SM + 40A	56	56	2		ACN=48	Italy (Palermo)	V-53, V-60
<i>Xyrichtys pavo</i>		F, M	44	44A	44	44	2	1.8* FCM	ACN=46	Japan (Wakayama, Tokushima)	U-43
<i>Xyrichtys twistii</i>		F	22	18 M/SM + 4A	40	40	2	1.7* FCM		Japan (Wakayama)	U-43

Table 6.37 Order PERCIFORMES. Part 2 Labroidei and Zoarcoidei (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2h	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup>	Genome size	Comments	Locality	Reference
Suborder/family/subfamily/species	karyotype paper						NORs	(pg/cell)			
<b>Scaridae</b>											
<i>Calotomus japonicus</i>			48	8M + 10SM + 30 ST/A	66				ACN=48	Japan (Chiba)	A-75
<i>Chlorurus sordidus</i>	<i>Scarus rhoduropterus</i>		48	10M + 8SM + 30 ST/A	66				ACN=48	Japan (Ogasawara)	A-75
<i>Chlorurus sordidus</i>	<i>Scarus</i>		48					4.1* FCM		Japan	O-48
<i>Scarus trispinosus</i>	<i>coelestinus</i>		48	6M + 10SM + 24ST + 8A	64	88	2			Brazil (RN)	S-178
<i>Sparisoma axillare</i>		F, M	46	6M + 14SM + 4ST + 22A	66	70	2		ACN=48	Brazil (BA)	S-178
<b>Suborder Zoarcoidei</b>											
<b>Bathymasteridae</b>											
<i>Ronquilus jordani</i>			26	22 M/SM + 4A	48	48			ACN=48	(Canada)	M-61
<b>Zoarceidae</b>											
<i>Lycodichthys dearborni</i>		F, M	48	2M + 2SM + 44 ST/A	52		2	3.2 FD, 2.2 FIA	ACN=48	Ross Sea	M-89, H-41
<i>Pachycara brachycephalum</i>		F, M	48	2M + 4SM + 42 ST/A	54		2	2.9 FD	ACN=48	Ross Sea	M-89
<i>Pachycara brachycephalum</i>		M	72	3M + 6SM + 63A	81	81	3		3X	Ross Sea	M-89
<i>Zoarces elongatus</i>			48	30M + 14SM + 4A	92	92			ACN=48	China (Liaoning)	M-36
<i>Zoarces viviparus</i>		F, M	48	2M + 6SM + 18ST + 22A	56	74	2		ACN=48	Baltic Sea, White Sea	K-80
<b>Stichaeidae</b>											
<i>Alectrias benjamini</i>			48	18M + 18SM + 12A	84	84			ACN=48	China (Liaoning)	M-34
<i>Chirolophis japonicus</i>	<i>Azuma emmion</i>		56	6M + 10SM + 40A	72	72				China (Liaoning)	M-36
<i>Dictyosoma burgeri</i>			48	12M + 18SM + 6ST + 12A	78	84			ACN=48	Japan (Kanagawa)	A-59
<i>Dictyosoma burgeri</i>		M	46	14M + 18SM + 8ST + 6A	78	86			ACN=48	Japan (Yamaguchi)	N-34
<i>Ernogrammus hexagrammus</i>			48	48A	48	48			ACN=48	China (Liaoning)	M-31
<i>Lumpenus fabricii</i>			48	2M + 14SM + 32 ST/A	64					Russia, White Sea	L-87, L-88
<i>Lumpenus fabricii</i>			47	2M + 15SM + 30 ST/A	64					Russia, White Sea	L-87, L-88
<i>Zoarchias microstomus</i>			28	24M + 4A	52	52			ACN=46?	China (Liaoning)	M-36
<b>Pholidae</b>											
<i>Pholis nebulosa</i>	<i>Enedrias</i>		26	26M	52	52			ACN=48?	China (Liaoning)	M-33
<i>Pholis picta</i>	<i>pictus</i>	M	46							Japan (Hokkaido)	M-14

Table 6.38 Order PERCIFORMES. Part 3 Notothenioidei, Blennioidei, and Callionymoidei

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag-	Genome size	Comments	Locality	Reference
Suborder/family/species	karyotype paper						NORs	(pg/cell)			
<b>Suborder Notothenioidei</b>											
<b>Artedidraconidae</b>											
<i>Artedidraaco mirus</i>			46	2M + 2SM + 42A	50	50			ACN=46	South Georgia Is.	P-57
<i>Artedidraaco orianae</i>		F, M	46	2M + 6SM + 38A	54	54	2		ACN=48	Weddell Sea	O-70
<i>Artedidraaco shackletoni</i>		F, M	46	2M + 6SM + 38A	54	54	2		ACN=48	Weddell Sea	O-70
<i>Hitiidraaco velifer</i>		F, M	46	6SM + 40 ST/A	52		2			Ross Sea	C-21
<i>Pogonophryne barsukovi</i>		F, M	46	2M + 4SM + 40A	52	52	2		ACN=48	Weddell Sea	O-70
<i>Pogonophryne dolichobranchiata</i>			46	4M + 2SM + 2ST + 38A	52	54			ACN=48	South Orkney Is.	P-57
<i>Pogonophryne marmorata</i>		M	46	2M + 4SM + 40A	52	52	2		ACN=48	Weddell Sea	O-70
<i>Pogonophryne mentella</i>		F, M	46	2M + 4SM + 40A	52	52	2		ACN=48	Weddell Sea	O-70
<i>Pogonophryne scotti</i>		F	46	2M + 4SM + 40A	52	52	2		ACN=48	Weddell Sea	O-70
<i>Pogonophryne scotti</i>		M	46	6SM + 40A	52	52	2	4.1 FD	ACN=48	Ross Sea	M-89
<b>Bathydraconidae</b>											
<i>Bathydraaco marri</i>		F	38	4SM + 34A	42	42			XX, ACN=40	Weddell Sea	O-70
<i>Bathydraaco marri</i>		M	39	3SM + 36A	42	42			XY <sub>1</sub> Y <sub>2</sub> , ACN=40	Weddell Sea	O-70
<i>Cygnodraaco mawsoni</i>		F	44-46	44-46 ST/A	44-46					Weddell Sea	O-70
<i>Cygnodraaco mawsoni</i>		F	48	2M + 4SM + 42 ST/A	54		2	2.8 FD	ACN=48	Ross Sea	M-89, O-20
<i>Gerlachea georgianus</i>		F	48	2M + 2-4 SM + 42-44 A	52-54	52-54			ACN=48	Weddell Sea	O-70
<i>Prionodraaco evansii</i>			48								O-70
<i>Psilodraaco breviceps</i>			20								O-70
<i>Racovitzia glacialis</i>		F	48	48A	48	48					O-70
		F	36	4M + 32A	40	40				Weddell Sea	O-70
<b>Bovichtiidae (= Bovichtidae)</b>											
<i>Bovichtus angustifrons</i>			48	48A	48	48			ACN=48	Tasmania	M-123
<i>Bovichtus diacanthus</i>		F, M	48	48A	48	48			ACN=48	Tristan da Cunha	M-123
<i>Bovichtus variegatus</i>		F, M	48	48A	48	48			ACN=48	New Zealand	M-123
<i>Cottopeca gobio</i>			48-50	48-50 A	48-50	48-50				Chile	P-55
<i>Cottopeca gobio</i>		F	48	48A	48	48	2		ACN=48	Magellan Strait	P-58

Table 6.38 Order PERCIFORMES. Part 3 Notothenioidei, Blennioidei, and Callionymioidei (continued)

A		B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon		Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
Suborder/family/species		karyotype/paper										
<b>Channichthyidae</b>												
<i>Chaenocephalus aceratus</i>			M	48	4M + 44A	52	52				South Sandwich Is.	M-88
<i>Chaenodraco wilsoni</i>			F	48	4M + 6SM + 38A	58	58			X <sub>1</sub> X <sub>1</sub> X <sub>2</sub> X <sub>2</sub> , ACN=48	Antarctica	O-68, O-70
<i>Chaenodraco wilsoni</i>			M	47	5M + 6SM + 36A	58	58			X <sub>1</sub> X <sub>2</sub> Y, ACN=48	Weddell Sea	O-70, M-88
<i>Champsococephalus gunnari</i>				48						ACN=48	Antarctica	D-4
<i>Channichthys rhinoceratus</i>			F, M	48	2M + 4SM + 40A + 2A-sat.	54	54			ACN=48	Antarctica	D-4
<i>Chionobathyscus dewitti</i>			M	47	5SM + 4-6 SM + 38-36 A	56-58	56-58			X <sub>1</sub> X <sub>2</sub> Y, ACN=48	Weddell Sea	O-70, M-88
<i>Chionodraco hamatus</i>			F	48	2M + 4SM + 42A	54	54	3		X <sub>1</sub> X <sub>1</sub> X <sub>2</sub> X <sub>2</sub> , ACN=48	Weddell Sea	O-70
<i>Chionodraco hamatus</i>			F	48	2M + 4SM + 42A	54	54		3.7 FD	X <sub>1</sub> X <sub>1</sub> X <sub>2</sub> X <sub>2</sub> , ACN=48	Ross Sea	M-88
<i>Chionodraco hamatus</i>			M	47	2M + 4SM + 41A	53	53	2		X <sub>1</sub> X <sub>2</sub> Y, ACN=48	Ross Sea	M-88
<i>Chionodraco myersi</i>			F	48	2M + 6SM + 40A	56	56			X <sub>1</sub> X <sub>1</sub> X <sub>2</sub> X <sub>2</sub> , ACN=48	Weddell Sea	O-70
<i>Chionodraco myersi</i>			M	47	2M + 6SM + 39A	55	47			X <sub>1</sub> X <sub>2</sub> Y, ACN=48	Weddell Sea	O-70, M-88
<i>Chionodraco rastrorpinosus</i>			M	48	4M + 44A	52	52				South Orkney Is.	M-88
<i>Cryodraco atkinsoni</i>		<i>antarcticus</i>	M	48	2M + 4SM + 42A	54	54			ACN=48	Weddell Sea	O-70
<i>Cryodraco atkinsoni</i>		<i>antarcticus</i>	M	48	2M + 4SM + 42A	54	54	2	3.9 FD	ACN=48	Ross Sea	M-89
<i>Neopagetopsis ionah</i>			F, M	48	2M + 8SM + 38A	58	58	2		ACN=48	Weddell Sea	O-70
<i>Pagetopsis macropterus</i>			M	47	3M + 12SM + 32A	62	62			ACN=48	Weddell Sea	O-70
<i>Pagetopsis macropterus</i>			F	48	2M + 12SM + 34A	62	62	2	4.4 FD	X <sub>1</sub> X <sub>1</sub> X <sub>2</sub> X <sub>2</sub> , ACN=48	Ross Sea	M-88
<i>Pagetopsis macropterus</i>			M	47	3M + 12SM + 32A	62	62			X <sub>1</sub> X <sub>2</sub> Y, ACN=48	Ross Sea	M-88
<i>Pagetopsis maculatus</i>			F	48	2M + 6SM + 40A	56	56				Weddell Sea	O-70
<i>Pseudochaenichthys georgianus</i>				48	4M + 8SM + 36A	60	60				South Georgia	M-88
<b>Eleginopidae</b>												
<i>Eleginops maclovinus</i>			F, M	48	4M + 2SM + 42A	54	54			ACN=48	S. America (subantarctic)	M-124
<b>Harpagiferidae</b>												
<i>Harpagifer antarcticus</i>				48	2M + 4ST + 42A	50	54			ACN=48	South Orkney Is.	P-56
<i>Harpagifer sp.</i>				48	4M + 2SM + 8ST + 34A	54	62			ACN=48	Macquarie Is.	P-56

Table 6.38 Order PERCIFORMES. Part 3 Notothenioidei, Blennioidei, and Callionymoidei (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Suborder/family/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<b>Nototheniidae</b>											
<i>Dissostichus eleginoides</i>			48	2M + 46A	50	50			ACN=48	Antarctica	D-4
<i>Dissostichus eleginoides</i>		F, M	48	2M + 2SM + 44A	52	52	2			Southern Ocean	G-83
<i>Dissostichus mawsoni</i>		F, M	48	2M + 4SM + 42A	54	54	4			Southern Ocean	G-83
<i>Dissostichus mawsoni</i>		F	48	2M + 2SM + 44A	52	52		(2.1 FIA)	ACN=48	Weddell Sea	O-70, H-41
<i>Gobionotothen acuta</i>	<i>Notothenia</i>	F	46	6M + 8SM + 32A	60	60			4B	Antarctica (Heard Is.)	O-67
<i>Gobionotothen gibberifrons</i>	<i>Notothenia</i>	F, M	46	4M + 2SM + 40A	52	52			ACN=48	Antarctica (Admiralty Bay)	P-26, P-27
<i>Lepidonotothen kempi</i>	<i>Notothenia</i>	F, M	48	4M + 44A	52	52				Antarctica (Prydz Bay)	O-67
<i>Lepidonotothen squamifrons</i>	<i>Notothenia</i>	F, M	48	4M + 44A	52	52				Antarctica	O-67
<i>Lindbergichthys mizops</i>	<i>Notothenia</i>	F, M	48	4M + 44A	52	52				Antarctica	O-67
<i>Notothenia angustata</i>		F, M	26	24 M/SM + 2A	50	50	2		ACN=48	New Zealand	P-36
<i>Notothenia coriiceps neglecta</i>		F	22	20M + 2SM	44	44			ACN=44	Duville Is.	P-52
<i>Notothenia coriiceps neglecta</i>		F	22	18M + 2SM + 2ST	42	44			ACN=44	Antarctica (Admiralty Bay)	P-27
<i>Notothenia coriiceps</i>		M	22	18M + 4SM	44	44	2		ACN=44	Ross Sea	M-126
<i>Notothenia cyanobranchia</i>		M	48	4M + 44A	52	52			ACN=48	Antarctica	D-4
<i>Notothenia rossii marmorata</i>			24	24M	48	48			ACN=46	South Georgia	P-52
<i>Notothenia rossii rossii</i>		F, M	24	24M	48	48			ACN=46	Antarctica	D-4
<i>Pagothenia borchgrevinkii</i>		F	46	4M + 2SM + 40A	52	52	2		X <sub>1</sub> X <sub>1</sub> X <sub>2</sub> X <sub>2</sub> , ACN=48	Antarctica	M-126
<i>Pagothenia borchgrevinkii</i>		M	45	5M + 2SM + 38A	52	52	2		X <sub>1</sub> X <sub>2</sub> Y, ACN=48	Antarctica	M-126
<i>Paranotothenia magellanica</i>			26	24M + 2A	50	50			ACN=48	Antarctica	D-4
<i>Paranotothenia microlepidota</i>	<i>Notothenia</i>		26	22M + 2SM + 2A	50	50			ACN=48	Cambell Is.	P-51
<i>Patagonotothen longipes</i>		F, M	48	2M + 46A	50	50			ACN=48	Magellanic Region	P-51
<i>Patagonotothen ramsayi</i>			46	4M + 42 ST/A	50				ACN=48	Magellanic Region	P-51
<i>Pleuragramma antarcticum</i>		F, M	48	8M + 12SM + 28A	68	68			ACN=48	Weddell Sea	O-70
<i>Pseudotrematomus bernacchii</i>	<i>Trematomus</i>		48	2M + 46 ST/A	50					Antarctica (Bransfield Strait)	P-26
<i>Pseudotrematomus bernacchii</i>	<i>Trematomus</i>		48	2M + 2SM + 44A	52	52		(2.4 FIA)	ACN=48	Weddell Sea	O-70, H-41
<i>Pseudotrematomus bernacchii</i>	<i>Trematomus</i>	F, M	48	2M + 2SM + 44A	52	52	2	3.6 FD	ACN=48	Ross Sea	M-89
<i>Pseudotrematomus bernacchii</i>	<i>Pagothenia</i>	F, M	48	2M + 2SM + 44A	52	52	2		ACN=48	Ross Sea	M-126
<i>Pseudotrematomus eulepidotus</i>	<i>Trematomus</i>	F, M	24	20M + 4SM	48	48	2		ACN=46	Weddell Sea	O-70
<i>Pseudotrematomus eulepidotus</i>	<i>Trematomus</i>	F, M	24	22M + 2SM	48	48	2		ACN=46	Ross Sea	M-126
<i>Pseudotrematomus eulepidotus</i>	<i>Trematomus</i>	F, M	24	8M + 14SM + 2A	46	46			ACN=46	Antarctica (Prydz Bay)	O-67, O-70
<i>Pseudotrematomus hansonii</i>	<i>Trematomus</i>		48	2M + 4SM + 42 ST/A	54					Antarctica (Bransfield Strait)	P-26
<i>Pseudotrematomus hansonii</i>	<i>Trematomus</i>		48	2M + 4SM + 42A	54	54				Weddell Sea	O-70
<i>Pseudotrematomus hansonii</i>	<i>Pagothenia</i>	F	46	4M + 2SM + 40A	52	52	2		X <sub>1</sub> X <sub>1</sub> X <sub>2</sub> X <sub>2</sub> , ACN=48	Ross Sea	M-126

Table 6.38 Order PERCIFORMES. Part 3 Notothenioidei, Blennioidei, and Callionymoidei (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Suborder/family/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Pseudotrematomus hansonii</i>	<i>Pagothenia</i>	M	45	5M + 2SM + 38A	52	52	2		X <sub>1</sub> X <sub>2</sub> Y, ACN=48	Ross Sea	M-126
<i>Pseudotrematomus lepidorhinus</i>	<i>Trematomus</i>	F, M	48	4M + 44A	52	52				Weddell Sea	O-67, O-70
<i>Pseudotrematomus pennellii</i>	<i>Trematomus</i>	M	28	9M + 2SM + 17A	39	39			4B	Weddell Sea	O-70
<i>Pseudotrematomus pennellii</i>	<i>Trematomus</i>	F, M	32	12M + 2SM + 18A	46	46	2		ACN=44	Ross Sea	M-126
<i>Pseudotrematomus scotti</i>	<i>Trematomus</i>	F	50	4M + 2-4 SM + 42-44 A	56-58	56-58			ACN=50	Weddell Sea	O-70
<i>Trematomus loenbergii</i>		F, M	28	18M + 6SM + 4A	52	52	2		ACN=48	Ross Sea	M-126
<i>Trematomus loenbergii</i>		F	30	16M + 6SM + 8A	52	52	2			Ross Sea	M-126
<i>Trematomus newnesi</i>		F	46	4M + 2SM + 40A	52	52	2		X <sub>1</sub> X <sub>1</sub> X <sub>2</sub> X <sub>2</sub> , ACN=48	Ross Sea	M-126
<i>Trematomus newnesi</i>		M	45	5M + 2SM + 38A	52	52	2		X <sub>1</sub> X <sub>2</sub> Y, ACN=48	Ross Sea	M-126
<i>Trematomus newnesi</i>			69						3X	Ross Sea	M-89
<i>Trematomus nicolai</i>		F	58	2M + 6SM + 18ST + 32A	66	84	2		X <sub>1</sub> X <sub>1</sub> X <sub>2</sub> X <sub>2</sub> , ACN=58	Ross Sea	M-126
<i>Trematomus nicolai</i>		M	57	3M + 6SM + 18ST + 30A	66	84	2		X <sub>1</sub> X <sub>2</sub> Y, ACN=58	Ross Sea	M-126
<b>Pseudaphritidae</b>											
<i>Pseudaphritis urvillii</i>	Bovichtidae	F	48	4M + 44A	52	52	6		ACN=48	Tasmania	P-58
<b>Suborder Trachinoidei</b>											
<b>Ammodytidae</b>											
<i>Gymnammodytes cicereus</i>	<i>cicereus</i>	F, M	46	22 M/SM + 24 ST/A	68				ACN=46	Italy (Palermo)	V-57
<b>Pinguipedidae (= Parapercidae)</b>											
<i>Parapercis kamoharai</i>			48	48A	48	48			ACN=48	Japan (Wakayama)	A-80
<i>Parapercis pulchella</i>			42	8M + 34A	50	50	2		ACN=44	Japan (Shizuoka, Yamaguchi)	M-109
<i>Parapercis sexfasciata</i>			26	22M + 2ST + 2A	48	50	2		ACN=48	Japan (Shizuoka, Yamaguchi)	M-109
<i>Parapercis sexfasciata</i>		F	26	22M + 2ST + 2A	48	50			XX, ACN=48	Japan (Hyogo)	O-40
<i>Parapercis sexfasciata</i>		M	26	22M + 2ST + 2A	48	50			XY, ACN=48	Japan (Hyogo)	O-40
<i>Parapercis sexfasciata</i>		F, M	26	22M + 2ST + 2A	48	50		1.9* FCM		Korea (Busan)	P-70
<b>Trachinidae</b>											
<i>Echiichthys vipera</i>		F, M	48	48A	48	48	2		ACN=48	Italy (Ancona)	C-22
<i>Trachinus draco</i>			48	48A	48	48				USSR	V-72
<i>Trachinus draco</i>		F, M	48	48A	48	48			ACN=48	Italy (Palermo)	V-57

Table 6.38 Order PERCIFORMES. Part 3 Notothenioidei, Blennioidei, and Callionymoidei (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Suborder/family/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<b>Trichodontidae</b>											
<i>Arctoscopus japonicus</i>		F, M	48	2SM + 46A	50	50	2	1.5 FCM	XY/XX?	Japan	T-66
<b>Uranoscopidae</b>											
<i>Uranoscopus scaber</i>			26	20M + 2SM + 4 ST/A	48					Croatia	S-86
<i>Uranoscopus scaber</i>			30	18M + 12 ST/A	48	2			ACN=48	Italy (Ancona)	C-22
<i>Uranoscopus scaber</i>			28	20M + 8 ST/A	48				ACN=48	Italy (Ancona)	C-22
<i>Uranoscopus scaber</i>			27	21M + 6 ST/A	48				ACN=48	Italy (Ancona)	C-22
<i>Uranoscopus scaber</i>			32	18 M/SM + 14A	50	50			ACN=48	USSR	V-72
<i>Uranoscopus scaber</i>	A-type		30	22M + 4SM + 4A	56	56	2		ACN=48	Italy (Palermo)	V-104
<i>Uranoscopus scaber</i>			31	23M + 4SM + 4A	58	58			ACN=48	Italy (Palermo)	V-104
<i>Uranoscopus scaber</i>	B-type		29	23M + 2SM + 4A	54	54			ACN=48	Italy (Palermo)	V-104
<i>Uranoscopus scaber</i>	C-type		28	24M + 4A	52	52	2		ACN=48	Italy (Palermo)	V-104
<b>Suborder Blennioidei</b>											
<b>Blenniidae</b>											
<i>Aidablennius sphynx</i>		F, M	48	48 ST/A	48		2		ACN=48	Italy (Ancona)	C-19
<i>Aidablennius sphynx</i>	<i>Blennius sphinx</i>		48	48A	48	48			ACN=48	Italy	C-33
<i>Aidablennius sphynx</i>	<i>Blennius sphinx fuscus</i>	F, M	48	4M + 4SM + 40 ST/A	56			1.2 FD	ACN=48	Spain (Malaga)	C-9, C-10
<i>Atrosalanias Blennius</i>	<i>fuscus holomelas</i>		48	48A	48	48			ACN=48	Japan (Ishigakijima)	A-55
<i>Blennius ocellaris</i>		F, M	48	2SM + 2ST + 44A	50	52		1.7 FD	ACN=48	Spain (Malaga)	C-9, C-10
<i>Blennius ocellaris</i>			48	2M + 2ST + 44A	50	52			ACN=48	Italy (Palermo)	V-51
<i>Coryphoblennius galerita</i>	<i>Blennius</i>	F, M	48	2M + 2SM + 44 ST/A	52		2		ACN=48	Spain (Mediterranean)	G-18
<i>Istiblennius enosimae</i>			48	2SM + 46A	50	50			ACN=48	Japan (Chiba, Kanagawa)	A-55
<i>Istiblennius lineatus</i>		F	48	48 ST/A	48				ACN=48	Japan (Ishigakijima)	A-59
<i>Lipophrys adriaticus</i>	<i>Lypophris</i>	F, M	48	48 ST/A	48		2		ACN=48	Italy (Ancona)	C-19
<i>Lipophrys canevae</i>	<i>Blennius</i>	48*	8ST + 40A	48	48	56			ACN=48	Italy	C-33
<i>Lipophrys pholis</i>	<i>Blennius</i>	F, M	46	6M + 2SM + 8ST + 30A	54	62	2	1.6 FD	ACN=48	Spain (Malaga)	C-9, C-10, G-18
<i>Omobranchus elegans</i>		F, M	42	10M + 2SM + 6ST + 24A	54	60			ACN=48	Japan (Kanagawa)	A-59
<i>Omobranchus punctatus</i>	<i>punctatus</i>		44	4M + 40A	48	48			ACN=48	Japan (Wakayama)	A-80
<i>Parablennius gattorugine</i>	<i>gattorugine</i>	F	48	48 ST/A	48		2		ACN=48	Italy (Ancona)	C-19
<i>Parablennius gattorugine</i>	<i>gattorugine</i>	F, M	48	2M + 2SM + 44A	52	52	2	1.2 FD	ACN=48	Spain (Malaga)	C-9, C-10, G-18
<i>Parablennius gattorugine</i>	<i>gattorugine</i>	F, M	48	2M + 2SM + 44A	52	52			ACN=48	Italy (Palermo)	V-51
<i>Parablennius incognitus</i>	<i>Blennius</i>		48	48A	48	48			ACN=48	Italy	C-33

Table 6.38 Order PERCIFORMES. Part 3 Notothenioidei, Blennioidei, and Callionymioidei (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Suborder/family/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Parablennius incognitus</i>	<i>Blennius ponticus incognitus</i>	F, M	48	4ST + 44A	48	52	2	1.6 FD	ACN=48	Spain (Malaga)	C-9, C-10, G-18
<i>Parablennius pilicornis</i>		F, M	48	8ST + 40A	48	56				Italy (Palermo)	C-28
<i>Parablennius pilicornis</i>			48	48A	48	48				Brazil (RJ)	B-86
<i>Parablennius ponticus</i>		F, M	48	48 ST/A	48		2		ACN=48	Italy (Ancona)	C-19
<i>Parablennius sanguinolentus</i>	<i>Blennius</i>	F, M	48	8ST + 40A	48	56			ACN=48	Italy (Tyrrhenian Sea)	C-31, C-33
<i>Parablennius sanguinolentus</i>	<i>Blennius</i>	F, M	48	6ST + 42A	48	54	2	1.8 FD	ACN=48	Spain (Malaga)	C-9, C-10, G-18
<i>Parablennius sanguinolentus</i>	<i>Blennius</i>	F, M	48	22ST + 26A	48	70			ACN=48	Black Sea	A-95
<i>Parablennius tentacularis</i>	<i>Blennius</i>	M	47	1M + 22ST + 24A	48	70			ACN=48	Black Sea	A-95
<i>Parablennius tentacularis</i>	<i>Blennius</i>	F	48	48 ST/A	48				XX, ACN=48	Italy (Palermo)	C-24
<i>Parablennius tentacularis</i>	<i>Blennius</i>	M	48	1ST + 47 ST/A	48				XY, ACN=48	Italy (Palermo)	C-24
<i>Parablennius tentacularis</i>	<i>Blennius</i>	M	47	1SM + 46 ST/A	48				neo Y, ACN=48	Italy (Palermo)	C-24
<i>Parablennius tentacularis</i>		M	48	48 ST/A	48		2		XX, ACN=48	Italy (Ancona)	C-19
<i>Parablennius tentacularis</i>		M	48	1ST + 47 ST/A	48		2		XY, ACN=48	Italy (Ancona)	C-19
<i>Parablennius tentacularis</i>		M	47	1SM + 46 ST/A	48		2		neo Y, ACN=48	Italy (Ancona)	C-19
<i>Parablennius tentacularis</i>	<i>Blennius</i>	F	48	48A	48	48			ACN=48	Black Sea	A-95
<i>Parablennius tentacularis</i>	<i>Blennius</i>	M	47	1 large A + 46 ST/A	47				ACN=48	Black Sea	A-95
<i>Parablennius tentacularis</i>	<i>Blennius</i>	M	47	1 large SM + 46 ST/A	48				ACN=48	Black Sea	A-95
<i>Parablennius tentacularis</i>	<i>Blennius</i>		48	48 ST/A	48				ACN=48	USSR	V-72
<i>Parablennius yatabei</i>	<i>Blennius</i>	F, M	48	6SM + 12ST + 30A	54	66			ACN=48	Japan (Kanagawa)	A-59
<i>Paralipophrys trigloides</i>	<i>Blennius</i>		48	2M + 6SM + 18ST + 22A	56	74			ACN=48	Italy	C-33
<i>Paralipophrys trigloides</i>	<i>Blennius</i>	F, M	46	4M + 4SM + 10ST + 28A	54	64	2	2.4 FD	ACN=48	Spain (Malaga)	C-9, C-10, G-18
<i>Paralipophrys trigloides</i>	<i>Blennius</i>	F, M	48	2M + 6SM + 40 ST/A	56				ACN=48	Italy (Palermo)	V-51
<i>Petroscirtes breviceps</i>	<i>Dasson trossulus</i>	F	40	8M + 32 ST/A	48			1.6* FCM	ACN=44	Japan (Chiba)	A-59, O-48
<i>Salaria fluviatilis</i>	<i>Blennius</i>	M	48							Italy (Roma)	C-31, C-33
<i>Salaria pavo</i>	<i>Blennius</i>	M	48	8ST + 40A	48	56			ACN=48	Italy (Tyrrhenian Sea)	C-31, C-33
<i>Salaria pavo</i>	<i>Blennius</i>	F, M	48	4SM + 12ST + 32A	52	64	2	2.1 FD	ACN=48	Spain (Malaga)	C-9, C-10, G-18
<i>Salaria fasciatus</i>			48	48A	48	48		1.7 FIA	ACN=48	Japan (Okinawa)	A-55, H-40
<i>Salaria luctuosus</i>			48	48 ST/A	48				ACN=48	Japan (Okinawa)	A-59
<i>Scartella cristata</i>	<i>Blennius cristatus</i>	F, M	48	2ST + 46A	48	50			ACN=48	Italy (Palermo)	V-51
<i>Scartella cristata</i>		F, M	48	2SM + 46 ST/A	50		2			Brazil (RJ)	B-65
<b>Clinidae</b>											
<i>Clintrachus argentatus</i>	<i>Clintrachus</i>	F, M	48	48 ST/A	48				ACN=48	Italy (Palermo)	V-51



Table 6.38 Order PERCIFORMES. Part 3 Notothenioidei, Blennioidei, and Callionymoidei (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag-	Genome size	Comments	Locality	Reference
Suborder/family/species	karyotype paper						NORs	(pg/cell)			
<b>Labrisomidae</b>											
<i>Labrisomus nuchipinnis</i>			48			50				Brazil (RN, RJ)	G-12
<b>Suborder Gobiesocoidae</b>											
<b>Gobiesocidae</b>											
<i>Comidens laticephalus</i>			42	12M + 10SM + 20 ST/A	64					Japan (Chiba)	A-68
<i>Diademichthys lineatus</i>			47	3M + 11SM + 33 ST/A	61				sex chrom.?, ACN=48	Japan (Okinawa)	A-68
<i>Lepadichthys frenatus</i>			48	8 M/SM + 40 ST/A	56				ACN=48	Japan (Yakushima)	A-68
<i>Lepadogaster candollei</i>		F, M	46	12M + 18SM + 16ST	76	92	2		XX/XY, ACN=46	Spain (Malaga)	T-36
<i>Lepadogaster lepadogaster</i>		M	46	13M + 17SM + 16 ST/A	76		2		ACN=46	Black Sea	A-89
<b>Suborder Callionymoidei</b>											
<b>Callionymidae</b>											
<i>Eleutherochir mirabilis</i>	<i>Draculo</i>		36	36A	36	36			ACN=36	Japan (Hokkaido)	S-16
<i>Repomucenus beniteguri</i>	<i>Callionymus</i>	F	38	38ST	38	76			X <sub>1</sub> X <sub>1</sub> X <sub>2</sub> X <sub>2</sub> , ACN=38	Japan (Yamaguchi, Shizuoka)	M-105
<i>Repomucenus beniteguri</i>	<i>Callionymus</i>	M	37	1M + 36ST	38	74	2		X <sub>1</sub> X <sub>2</sub> Y, ACN=38	Japan (Yamaguchi, Shizuoka)	M-105
<i>Repomucenus huguenini</i>	<i>Callionymus doryssus</i>	M	32	2M + 30A	34	34	2		ACN=34	Japan (Yamaguchi, Shizuoka)	M-110
<i>Repomucenus ornatipinnis</i>	<i>Callionymus</i>	F	38	38ST	38	76			X <sub>1</sub> X <sub>1</sub> X <sub>2</sub> X <sub>2</sub> , ACN=38	Japan (Yamaguchi)	M-105
<i>Repomucenus ornatipinnis</i>	<i>Callionymus</i>	M	37	1M + 36ST	38	74	2		X <sub>1</sub> X <sub>2</sub> Y, ACN=38	Japan (Yamaguchi)	M-105
<i>Repomucenus richardsonii</i>	<i>Callionymus punctatus</i>	F, M	38	38A	38	38	2		ACN=38	Japan (Yamaguchi, Shizuoka)	M-110
<i>Repomucenus richardsonii</i>	<i>Callionymus punctatus</i>	M	38	36 SM/ST + 2A	74			1.6* FCM	ACN=38	Japan (Hyogo)	O-46, O-48

Table 6.39 Order PERCIFORMES. Part 4 Gobioidae, Kurtzoidae, Acanthuroidei, and Scombroidei

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup> NORs	Genome size (pg/cell)	Comments	Locality	Reference
Suborder/family/species	karyotype paper										
<b>Suborder Gobioidae</b>											
<b>Odontobutidae</b>											
<i>Microperops swinhonis</i>	<i>Hypseleotris</i>		44	44A	44	44				China (Wuhan)	D-18
<i>Odontobutis obscura</i>		F, M	44	44 ST/A	44			(2.4* FCM)	ACN=44	Japan (Oita, Kagoshima)	A-60, O-48
<i>Odontobutis obscura</i>			44	44A	44	44			ACN=44	Japan (Yamaguchi)	N-31
<i>Odontobutis obscura</i>			44	44A	44	44				Korea	L-15
<i>Odontobutis obscura</i>			44	44A	44	44				China (Hubei)	D-18
<i>Odontobutis obscura</i>		F, M	44	4SM + 40A	48	48		(2.8* FD)	ACN=44	China (Wuhan)	G-67, Y-15, C-83
<i>Odontobutis platycephalus</i>		F, M	44	44 ST/A	44				ACN=44	Korea (Kwanchon)	L-79, L-14
<i>Perocottus glehni</i>		F, M	44	44 ST/A	44			2.2 FCM	ACN=44	Russia (Moscow)	K-104, V-86
<i>Perocottus glehni</i>			44	1SM + 43 ST/A	45				ACN=44	Russia (Moscow)	K-104
<b>Eleotridae</b>											
<b>Butinae</b>											
<i>Bostrychus sinensis</i>	<i>Bostrychthys</i>		48	4 M/SM + 44 ST/A	52				ACN=48	Japan (Okinawa)	A-60
<i>Bostrychus sinensis</i>	<i>Bostrychthys</i>		48	4SM + 2ST + 42A	52	52			ACN=48	China (Zhejiang)	F-8
<i>Ophiocara porocephala</i>			48	48 ST/A	48				ACN=48	Thailand	A-73
<i>Oxyeleotris lineolatus</i>			46	2SM + 8ST + 36A	48	56				(Australia)	C-90
<i>Oxyeleotris marmorata</i>			46	2M + 2SM + 42 ST/A	50			(2.5 FIA)	ACN=46	Thailand (Khon Kaen)	A-73, H-40
<i>Oxyeleotris marmorata</i>			46	2M + 2SM + 42A	50	50				Thailand	D-19
<i>Oxyeleotris marmorata</i>			46	2M + 2ST + 42A	48	50				China (Guangdong)	Z-30
<i>Oxyeleotris urophthalmoides</i>			46	6M + 6SM + 8ST + 26A	58	66				Thailand	D-28
<b>Eleotrinae</b>											
<i>Dormitator latifrons</i>			46	12M + 22SM + 10ST + 2A	80	90			ACN=46	Mexico (Pacific coast)	U-45, U-46
<i>Dormitator maculatus</i>		F, M	46	12M + 22SM + 10ST + 2A	80	90			ACN=46	Mexico (Veracruz)	U-46, M-18
<i>Dormitator maculatus</i>		F, M	46	40 M/SM + 6 ST/A	86		2		ACN=46	Brazil (RN)	M-80
<i>Dormitator maculatus</i>		F	46	14M + 28SM + 2ST + 2A	88	90	2		XX, ACN=46	Brazil (SP)	O-76
<i>Dormitator maculatus</i>		M	46	13M + 28SM + 3ST + 2A	87	90	2		XY, ACN=46	Brazil (SP)	O-76
<i>Eleotris acanthopoma</i>		M	46	46 ST/A	46				ACN=46	Japan (Okinawa)	A-57
<i>Eleotris oxycephala</i>		F, M	46	46A	46	46			ACN=46	China (Guangdong)	G-67, Y-15
<i>Eleotris picta</i>			52	52A	52	52				Mexico	U-82
<i>Eleotris pisonis</i>			46	2M + 44A	48					Mexico	M-80
<i>Eleotris pisonis</i>		F, M	46	46A	46	46	2		ACN=46	Brazil (RN)	M-80
<i>Gobiomorus dormitor</i>		F, M	48	2M + 4SM + 42A	54	54			ACN=48	Mexico (Veracruz)	M-18
<i>Hypseleotris cyprinoides</i>			48	48A	48	48			ACN=48	Japan	S-122
<i>Mogurnda mogurnda</i>		F, M	46	6SM + 40 ST/A	52				ACN=46	Australia	A-60

Table 6.39 Order PERCIFORMES. Part 4 Gobioidi, Kurtoidi, Acanthuroidei, and Scombroidei (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup>	Genome size	Comments	Locality	Reference
Suborder/family/subfamily/species	karyotype paper						NORs	(pg./cell)			
<b>Ptereleotridae</b>											
<i>Parioglossus</i>	<i>raoi</i>	F, M	46	46A	46	46			ACN=46	Fiji	W-22
<b>Gobiidae</b>											
<b>Gobiinae</b>											
<i>Acentrogobius</i>	<i>pflaumi</i>		50	48 M/SM/ST + 2A		98			ACN=50	Japan (Shimonoseki)	N-31
<i>Acentrogobius</i>	<i>pflaumi</i>	F, M	50	36 M/SM + 14 ST/A	86				ACN=50	Korea (Kunsan)	L-14
<i>Amblygobius</i>	<i>phalaena</i>		44	2M + 42 ST/A	46			2.0 FIA	ACN=44	Japan (Okinawa)	A-60, H-40
<i>Aphia</i>	<i>minuta</i>	F, M	44	44A	44	44			ACN=44	Italy (Ortona)	C-18
<i>Aphia</i>	<i>minuta</i>	M	43	1ST + 42A	43	44			ACN=44	Italy (Ortona)	C-18
<i>Aphia</i>	<i>minuta</i>	F, M	42	1M + 1ST + 40A	43	44			ACN=44	Italy (Ortona)	C-18
<i>Aphia</i>	<i>minuta</i>	M	42	2M + 40A	44	44			ACN=44	Italy (Ortona)	C-18
<i>Aphia</i>	<i>minuta</i>	F, M	41	2M + 1ST + 38A	43	44			ACN=44	Italy (Ortona)	C-18
<i>Bathygobius</i>	<i>fuscus</i>		48	48A	48	48			ACN=48	Japan (Chiba, Kanagawa)	A-52, A-62
<i>Bathygobius</i>	<i>fuscus?</i>		44	44A	44	44				Thailand	D-19
<i>Bathygobius</i>	<i>soporator</i>		46			48				Brazil (RN)	G-12
<i>Benthophilus</i>	<i>leobergius</i>		44	2SM + 2ST + 40A	46	48				Russia (Volga R.)	G-63
<i>Benthophilus</i>	<i>stellatus</i>		44	2ST + 42A	44	46			ACN=46	Russia (Volga R.)	G-63
<i>Benthophilus</i>	<i>stellatus</i>		44	1SM + 2ST + 41A	45	47				Russia (Volga R.)	G-63
<i>Caspiosoma</i>	<i>caspium</i>		48	4SM + 30ST + 14A	52	82				Russia (Don R.)	G-63
<i>Favonigobius</i>	<i>gymnauchen</i>	F, M	48	48 M/SM	96	96			ACN=50	Korea (Kunsan)	L-14
<i>Glossogobius</i>	<i>giuris</i>	F, M	46	46A	46	46			ACN=46	India (Orissa)	R-57, M-24
<i>Glossogobius</i>	<i>olivaceus</i>		46	16SM + 6ST + 24A	62	68			ACN=46	China (Zhejiang)	F-8
<i>Gobiodon</i>	<i>citrinus</i>	F	44	2M + 42 ST/A	46			2.1 FIA	ACN=46	Japan (Okinawa)	A-57, H-41
<i>Gobiodon</i>	<i>citrinus</i>	M	43	1M + 42 ST/A	44				ACN=44	Japan (Okinawa)	A-57
<i>Gobiodon</i>	<i>quinquestrigatus</i>		44	44 ST/A	44			2.2 FIA	ACN=44	Japan (Okinawa)	A-73, H-40
<i>Gobiodon</i>	<i>rivulatus rivulatus</i>		44	44 ST/A	44				ACN=44	Australia (Heron Is.)	A-73
<i>Gobiopsis</i>	<i>macrostoma</i>		46	10M + 4SM + 32A	60	60				India (WB)	K-46
<i>Gobiosoma</i>	<i>macrodon</i>	F, M	38	38A	38	38				Venezuela	A-13
<i>Gobiosoma</i>	<i>zebrella</i>	F, M	38	38A	38	38				Venezuela	A-13
<i>Gobiosoma</i>	<i>zebrella</i>	F	37	1M + 36A	38	38				Venezuela	A-13
<i>Gobius</i>	<i>bucchichi</i>	M	40	4M + 2SM + 34A	46	46		0.9 FD	ACN=44	Spain (Málaga)	T-32, C-9
<i>Gobius</i>	<i>bucchichi</i>	F, M	44	2SM + 42A	46	46			ACN=44	Spain (Málaga)	T-31
<i>Gobius</i>	<i>cobitis</i>	F, M	46	46A	46	46		1.3 FD	ACN=46	Spain (Málaga)	T-32, C-9
<i>Gobius</i>	<i>cobitis</i>		46	46A	46	46			ACN=46	Italy (Tyrrhenian Sea)	C-31

Table 6.39 Order PERCIFORMES. Part 4 Gobioidei, Kurtoidi, Acanthuroidei, and Scombroidei (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup> NORs	Genome size (pg/cell)	Comments	Locality	Reference
Suborder/family/subfamily/species	karyotype paper										
<i>Gobius cobitis</i>			46 46A		46	46			ACN=46	Black Sea	G-63
<i>Gobius couchi</i>		M	46 2SM + 44A		48	48				Europe	M-116
<i>Gobius cruentatus</i>		F, M	46 2ST + 44A		46	48			ACN=46	Spain (Málaga)	T-31
<i>Gobius fallax</i>		M	38 8 M/SM + 30A		46	46			ACN=46	Spain (Málaga)	T-37
<i>Gobius fallax</i>		M	39 7 M/SM + 32A		46	46			ACN=46	Spain (Málaga)	T-37
<i>Gobius fallax</i>		F, M	40 6 M/SM + 34A		46	46	1-4	0.9 FD	ACN=46	Spain (Málaga)	T-30, T-32, T-37
<i>Gobius fallax</i>			40 7 M/SM + 33A		47	47			ACN=46	Spain (Málaga)	T-37
<i>Gobius fallax</i>		F, M	41 5 M/SM + 36A		46	46			ACN=46	Spain (Málaga)	T-37
<i>Gobius fallax</i>		F, M	42 4 M/SM + 38A		46	46			ACN=46	Spain (Málaga)	T-37
<i>Gobius fallax</i>		M	43 3 M/SM + 40A		46	46			ACN=46	Spain (Málaga)	T-37
<i>Gobius niger</i>			46							UK	M-116
<i>Gobius niger</i>		M	50 1M + 12SM + 37A		63	63		2.0 FD	XY, ACN=46	Spain (Málaga)	T-32, C-9
<i>Gobius niger</i>		F	48 4M + 4SM + 10ST + 30A		56	66	2		ACN=50	Norway	K-131
<i>Gobius niger</i>		F	50 4M + 4SM + 10ST + 32A		58	68			ACN=52	Norway	K-131
<i>Gobius niger</i>		F	51 3M + 4SM + 10ST + 34A		58	68				Norway	K-131
<i>Gobius niger jazo</i>			48 2M + 6SM + 8ST + 32A		56	64				Italy (Rome)	C-31
<i>Gobius niger jazo</i>		M	50*							Italy (Venice)	C-76
<i>Gobius niger jazo</i>	A-type	F, M	52 8 M/SM + 10ST + 28A + 6MC		60	70			ACN=46	Italy (Palermo)	V-59
<i>Gobius niger jazo</i>	B-type	F, M	51 9 M/SM + 10ST + 26A + 6MC		60	70			ACN=46	Italy (Palermo)	V-59
<i>Gobius niger jazo</i>	C-type	F, M	50 10 M/SM + 10ST + 30A		60	70			ACN=46	Italy (Palermo)	V-59
<i>Gobius niger jazo</i>	D-type	M	49 11 M/SM + 10ST + 28A		60	70			ACN=46	Italy (Palermo)	V-59
<i>Gobius niger jazo</i>			52 4SM + 48 ST/A		56					Black Sea	V-22
<i>Gobius niger jazo</i>			52 1M + 4SM + 47 ST/A		57					Black Sea	V-22
<i>Gobius ophioccephalus</i>			45 1M + 44A		46	46			ACN=46	Black Sea	V-72
<i>Gobius ophioccephalus</i>			46 46A		46	46			ACN=46	Black Sea	V-72
<i>Gobius paganellus</i>			45 1M + 44 ST/A		46		4			Spain (Mediterranean)	G-76
<i>Gobius paganellus</i>			45 3M + 42 ST/A		48		4			Spain (Mediterranean)	G-76
<i>Gobius paganellus</i>		F, M	45 2 M/SM + 43 ST/A		47		4		ACN=46	Mediterranean	G-76, V-49
<i>Gobius paganellus</i>		M	46 46 ST/A		46				ACN=46	Spain (Málaga)	T-33
<i>Gobius paganellus</i>		F	46 1 M/SM + 45 ST/A		47				ACN=46	Italy (Palermo)	V-49
<i>Gobius paganellus</i>		F, M	46 2 M/SM + 44 ST/A		48			0.8 FD	ACN=48	Mediterranean	V-49, T-33
<i>Gobius paganellus</i>		F	46 2M + 44A		48	48			XX, ACN=46	Spain (Málaga)	T-32, A-44, C-9
<i>Gobius paganellus</i>		M	46 1M + 45A		47	47			XY, ACN=46	Spain (Málaga)	T-32
<i>Gobius paganellus</i>		F, M	47 1 M/SM + 46 ST/A		48				ACN=47	Italy (Palermo)	V-49
<i>Gobius paganellus</i>		F, M	47 1 M/SM + 46 ST/A		48				ACN=48	Mediterranean	V-49, T-33
<i>Gobius paganellus</i>		M	47 47 ST/A		47				ACN=47	Spain (Málaga)	T-33

Table 6.39 Order PERCIFORMES. Part 4 Gobioidi, Kurtoidei, Acanthuroidei, and Scombroidei (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup>	Genome size	Comments	Locality	Reference
Suborder/family/subfamily/species	karyotype paper						NORs	(pg./cell)			
<i>Gobius paganelius</i>		F	48	48A	48	48			ACN=48	Italy (Palermo)	V-49
<i>Gobius paganelius</i>		F, M	48	48 ST/A	48				ACN=48	Mediterranean	V-49, T-33
<i>Gobius paganelius</i>		F	48	1SM + 47A	49	49			ACN=48	Italy (Palermo)	V-49
<i>Gobius paganelius</i>		M	48	1M/SM + 47A	49	49				Spain (Málaga)	T-33
<i>Gobiusculus flavescens</i>		F, M	46	6 M/SM + 40A	52	52	2		ACN=46	Norway	K-131
<i>Mesogobius batrachocephalus</i>			30	16 M/SM + 14A	46	46			ACN=46	Black Sea	G-64
<i>Mesogobius batrachocephalus</i>	<i>Gobius</i>		30	16M + 14A	46	46				Black Sea	I-18
<i>Neogobius cephalargoides</i>			46	46A	46	46				Black Sea	E-9
<i>Neogobius constructor</i>	<i>platygobius constructor</i>		42	4 M/SM + 38A	46	46			ACN=46	Georgia (Tbilisi Reservoir)	V-18, V-23, V-103
<i>Neogobius constructor</i>	<i>platygobius constructor</i>		44	2M + 42A	46	46			ACN=46	Black Sea basin	V-18, V-23, V-103
<i>Neogobius constructor</i>	<i>platygobius constructor</i>		44	2M + 2SM + 40A	48	48			ACN=46	Black Sea basin	V-18, V-23, V-103
<i>Neogobius cyrius</i>	<i>platygobius constructor</i>		37	9 M/SM + 2ST + 26A	46	48			ACN=46	Georgia (Kura R.)	V-18, V-23, V-103
<i>Neogobius cyrius</i>	<i>platygobius constructor</i>		38	8 M/SM + 30A	46	46			ACN=46	Georgia (Tbilisi Reservoir)	V-18, V-23, V-103
<i>Neogobius cyrius</i>	<i>platygobius constructor</i>		40	6 M/SM + 34A	46	46			ACN=46	Georgia (Kura R.)	V-18, V-23, V-103
<i>Neogobius cyrius</i>	<i>platygobius constructor</i>		41	5 M/SM + 1ST + 35A	46	47			ACN=46	Georgia (Kura R.)	V-18, V-23, V-103
<i>Neogobius eurycephalus</i>		F, M	32	12M + 2SM + 18A	46	46	2		ACN=46	Danube Delta system	E-9
<i>Neogobius eurycephalus</i>		F, M	31	13M + 2SM + 16A	46	46	2		ACN=46	Danube Delta system	E-9
<i>Neogobius eurycephalus</i>		M	30	14M + 2SM + 14A	46	46	2		ACN=46	Danube Delta system	E-9
<i>Neogobius fluviatilis fluviatilis</i>			46	46A	46	46			ACN=46	Russia (Don R.)	G-63
<i>Neogobius fluviatilis pallasi</i>			46	46A	46	46			ACN=46	Russia (Don R.)	G-63
<i>Neogobius gorlap</i>		F, M	46	46 ST/A	46	46				Caspian basin	V-21
<i>Neogobius gymnotrachelus</i>			46	46A	46	46			ACN=46	Black Sea basin	G-64
<i>Neogobius gymnotrachelus</i>			46	2 SM/ST + 44A	48	48			ACN=46	Black Sea basin	G-64
<i>Neogobius gymnotrachelus</i>			46	1M + 1SM + 44A	48	48			ACN=46	Black Sea basin	G-64
<i>Neogobius kessleri</i>		F	30	14M + 2SM + 14 ST/A	46	46				Black Sea basin	V-21
<i>Neogobius kessleri</i>		M	29	15M + 2SM + 12 ST/A	46	46			ACN=46	Black Sea basin	V-21
<i>Neogobius kessleri kessleri</i>			30	14M + 2SM + 14A	46	46			ACN=46	Black Sea basin	G-64
<i>Neogobius kessleri kessleri</i>			29	17 M/SM + 12A	46	46			ACN=45	Black Sea basin	G-64
<i>Neogobius melanostomus</i>	<i>Gobius</i>		46	46A	46	46		(2.5 FIA)		Black Sea basin	I-18, H-41
<i>Neogobius melanostomus affinis</i>			46	46A	46	46			ACN=46	Black Sea basin	V-72
<i>Neogobius melanostomus</i>	<i>cephalargos</i>		46	46A	46	46			ACN=46	Azov Sea basin	V-23
<i>Neogobius rhodioni</i>	<i>platyrostris</i>		46	46A	46	46			ACN=46	Black Sea basin	V-23, V-103
<i>Padogobius bonelli</i>	<i>martensii</i>	F	46	3M + 2SM + 3ST + 38A	51	54			ACN=47	Italy (Liguria)	C-31
<i>Pomatoschistus lozanoi</i>		F, M	37	3M + 12SM + 10ST + 12A	52	62				Dutch North Sea	W-21
<i>Pomatoschistus microps</i>		F, M	46	30SM + 16ST	76	92			ACN=46	UK (Devon)	W-23

Table 6.39 Order PERCIFORMES. Part 4 Gobioidae, Kurtidae, Acanthuroidei, and Scombroidei (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup>	Genome size	Comments	Locality	Reference
Suborder/family/subfamily/species	karyotype paper						NORs	(pg./cell)			
<i>Pomatoschistus microps</i>		F, M	46	4M + 16SM + 20ST + 6A	66	86			ACN=46	Germany (Baltic Sea)	K-74
<i>Pomatoschistus minutus</i>		F, M	46	4M + 16SM + 16ST + 10A	66	82			ACN=46	Germany (Baltic Sea)	K-74
<i>Pomatoschistus minutus</i>		F, M	46	18SM + 18ST + 10A	64	82	2		ACN=46	Norway	K-131
<i>Pomatoschistus minutus</i>		F, M	46	6SM + 24ST + 16A	52	76			ACN=46	UK (Plymouth)	W-21
<i>Pomatoschistus norvegicus</i>		F, M	32	10M + 10SM + 8ST + 4A	52	60			ACN=46	UK (Plymouth)	W-21
<i>Pomatoschistus pictus</i>		F, M	46	22 M/SM + 12ST + 12A	68	80	2		ACN=46	Norway	K-131
<i>Proterorhinus marmoratus</i>		F, M	46	46A	46	46			XX/XY	Slovakia	R-8
<i>Proterorhinus marmoratus</i>			46	46A	46	46				Russia (Don R.)	G-63, V-72
<i>Valenciennesa muralis</i>	<i>Eleotris</i>		46	46A	46	46			ACN=46	India (WB)	K-139
<i>Valenciennesa strigata</i>	<i>Eleotriodes strigatus</i>		44	2M + 42 ST/A	46				ACN=44	Japan (Okinawa)	A-57
<i>Yongeichthys criniger</i>	<i>Ctenogobius</i>	F, M	50	34 M/SM + 6ST + 10A	84	90			ACN=50	Japan (Okinawa)	A-57
<i>Zosterisessor ophiocephalus</i>		F, M	46	2M + 44 ST/A	48		2		ACN=46	Italy (Ancona)	C-15
<i>Zosterisessor ophiocephalus</i>	<i>Gobius</i>		46	46A	46	46				Black Sea	V-72
<b>Gobionellinae</b>											
<i>Acanthogobius elongata?</i>	sp.	F, M	42	8 M/SM + 34 ST/A	50				ACN=46	Korea (Kunsan)	L-14
<i>Acanthogobius flavimanus</i>		M	44	36ST + 8A	44	80			ACN=44	Japan (Kanagawa)	A-52, A-62
<i>Acanthogobius flavimanus</i>			44	10ST + 34A	44	54			ACN=44	Japan (Yamaguchi)	N-31
<i>Acanthogobius flavimanus</i>		F, M	44	44A	44	44				Korea (Dadaepo)	L-14
<i>Acanthogobius flavimanus</i>			44	44A	44	44				China (Shandong)	W-7
<i>Acanthogobius hasta</i>		F, M	44	6 M/SM + 38 ST/A	50				ACN=44	Korea (Kunsan)	L-14
<i>Acanthogobius hasta</i>		F, M	44	2M + 42 ST/A	46				ACN=44	Korea (Gyehwato)	L-79
<i>Acanthogobius hasta</i>	<i>Synechogobius</i>		44	2M + 42 ST/A	46				ACN=44	Japan (Ariake Sea)	A-62
<i>Acanthogobius hasta</i>	<i>Synechogobius</i>		44	2M + 42 ST/A	46				ACN=44	China	Y-21
<i>Acanthogobius lactipes</i>		F, M	40	40A	40	40			ACN=46	Korea (Pi-in)	L-14
<i>Acanthogobius lactipes</i>	<i>Aboma strigatus</i>	F, M	40	40 ST/A	40		2		ACN=44	Japan (Lake Kasumigaura)	A-52, A-57
<i>Awaous flavus</i>			46						X <sub>1</sub> X <sub>2</sub> Y	(Brazil)	O-86
<i>Awaous grammepomus</i>		F, M	46	46A	46	46			ACN=46	India (WB)	K-42
<i>Awaous tajasica</i>			46	46A	46	46				Brazil	S-196
<i>Brachyobius nunus</i>			48							(S. Asia)	P-44
<i>Chaenogobius annularis</i>	<i>Chasmichthys dolichognathus</i>		44	44 ST/A	44				ACN=44	Japan (Kanagawa)	A-52, A-62
<i>Chaenogobius annularis</i>	<i>Chasmichthys dolichognathus</i>	F, M	44	44A	44	44			ACN=44	Korea (Kunsan)	L-79, L-14
<i>Chaenogobius gulosus</i>	<i>Chasmichthys</i>		44	44 ST/A	44				ACN=44	Japan (Chiba, Kanagawa)	A-62
<i>Chaenogobius gulosus</i>	<i>Chasmichthys</i>		44	16ST + 28A	44	60			ACN=44	Japan (Yamaguchi)	N-31
<i>Chaenogobius gulosus</i>	<i>Chasmichthys</i>	F, M	44	8 M/SM + 36 ST/A	52				ACN=44	Korea (Wolsan)	L-14
<i>Ctenogobius shufeldti</i>	<i>Gobionellus</i>	F	48	48A	48	48			X <sub>1</sub> X <sub>2</sub> X <sub>2</sub> , ACN=48	USA (LA)	P-24

Table 6.39 Order PERCIFORMES. Part 4 Gobioidi, Kurtoidei, Acanthuroidei, and Scombroidei (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup>	Genome size	Comments	Locality	Reference
Suborder/family/subfamily/species	karyotype paper						NORs	(pg./cell)			
<i>Ctenogobius shufeldti</i>	<i>Gobionellus</i>	M	47	1M + 46A	48	48			X <sub>1</sub> X <sub>2</sub> Y, ACN=48	USA (LA)	P-24
<i>Gillichthys mirabilis</i>		F, M	44	12ST + 32A	44	56			ACN=44	USA (CA)	C-53
<i>Gillichthys seta</i>		F	44	6M + 14ST + 24A	50	64			ACN=44	Gulf of California	C-53
<i>Gobionellus microdon</i>			56	4M + 6SM + 46 ST/A	66					Mexico	U-82
<i>Gymnogobius breunigii</i>	<i>Chaenogobius</i>		44	36 M/SM/ST + 8A		80			ACN=44	Japan (Yamaguchi)	N-31
<i>Gymnogobius breunigii</i>	<i>Chaenogobius</i>	F, M	42	22 M/SM + 20 ST/A	64				ACN=42	Korea (Samchuk)	L-14
<i>Gymnogobius heptacanthus</i>	<i>Chaenogobius</i>	M	44	44 ST/A	44				ACN=44	Korea (Dolsanto)	L-79
<i>Gymnogobius isaza</i>	<i>Chaenogobius</i>		44	12SM + 32ST	56	88			ACN=44	Japan (Lake Biwa)	A-62
<i>Gymnogobius castaneus</i>	<i>Rhodoniichthys laevis</i>	F, M	42	14 M/SM + 28ST	56	84			ACN=42	Japan (Tokyo)	A-60
<i>Gymnogobius castaneus</i>	<i>Chaenogobius urotaenia</i>		42	14SM + 28ST	56	84			ACN=42	Japan (Hokkaido)	Y-5
<i>Gymnogobius mororanus</i>	<i>Chaenogobius</i>	F, M	42	12 M/SM + 30 ST/A	54				ACN=42	Korea (Kunsan)	L-14
<i>Gymnogobius urotaenia</i>	<i>Chaenogobius annularis</i>		44	36 M/SM + 8ST	80	88		(2.4* FCM)	ACN=44	Japan (Kanto district)	A-60, O-48
<i>Gymnogobius urotaenia</i>	<i>Chaenogobius annularis</i>		44	18SM + 26ST	62	88			ACN=44	Japan (Lake Biwa)	A-62
<i>Gymnogobius urotaenia</i>	<i>Chaenogobius annularis</i>		44	38 SM/ST + 6A		82			ACN=44	Japan (Yamaguchi)	N-31
<i>Gymnogobius urotaenia</i>	<i>Chaenogobius annularis</i>	F, M	44	40 M/SM + 4 ST/A	84				ACN=44	Korea (Kum R.)	L-14
<i>Gymnogobius urotaenia</i>	<i>Chaenogobius annularis</i>		44	20M + 22SM + 2A	86	86			ACN=44	China (Liaoning)	M-35
<i>Luciogobius grandis</i>			44						ACN=44	Japan (Izu Peninsula)	A-123
<i>Luciogobius guttatus</i>		F	44	12ST + 32A	44	56			ACN=44	Japan (Izu Peninsula)	M-102
<i>Luciogobius guttatus</i>			44						ACN=44	Japan (Kanagawa)	A-52
<i>Luciogobius guttatus</i>			44	14M + 14SM + 16A	72	72			ACN=44	China (Liaoning)	M-32
<i>Mugilogobius abei</i>		F, M	46	46 ST/A	46				ACN=46	Korea (Kunsan)	L-14
<i>Mugilogobius abei</i>			46		46					Japan (Okayama)	A-52
<i>Pterogobius elapoides</i>			44	14SM + 30ST	58	88			ACN=44	Japan (Chiba, Kanagawa)	A-52, A-62
<i>Pterogobius zonoleucus</i>			44	14SM + 30 ST/A	58				ACN=44	Japan (Kanagawa)	A-62
<i>Quiétula guaymasiae</i>		F, M	42	6M + 4SM + 32A	52	52			ACN=42	Gulf of California	C-77
<i>Quiétula y-cauda</i>		F	42	42A	42	42			ACN=42	Gulf of California	C-77
<i>Rhinogobius sp. CB</i>	<i>brunneus</i> , Shimayoshinobori		44	44 ST/A	44				ACN=44	Japan (Chiba)	A-62
<i>Rhinogobius sp. LD</i>	<i>brunneus</i> , Ooyoshinobori	F, M	44	44 ST/A	44				ACN=44	Japan (Itoh)	A-62
<i>Rhinogobius sp. DA</i>	<i>brunneus</i> , Kuroyoshinobori	F, M	44	44 ST/A	44				ACN=44	Japan (Tokyo)	A-62
<i>Rhinogobius brunneus</i>		F, M	44	44A	44	44			ACN=44	W. Japan	N-1, N-31
<i>Rhinogobius brunneus</i>		F, M	44	44A	44	44			ACN=44	Korea (Pongdong)	L-14
<i>Rhinogobius flumineus</i>		F, M	44	44A	44	44		3.0* FCM	ACN=44	W. Japan	N-1, O-48
<i>Rhinogobius flumineus</i>	<i>Tukugobius</i>	F, M	44	44A	44	44			ACN=44	Japan	A-52
<i>Rhinogobius glirinus</i>			44	44A	44	44			ACN=44	Japan (Yamaguchi)	N-31

Table 6.39 Order PERCIFORMES. Part 4 Gobioidae, Kurtoidae, Acanthuroidei, and Scombroidei (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup>	Genome size	Comments	Locality	Reference
Suborder/family/subfamily/species	karyotype paper						NORs	(pg./cell)			
<i>Rhinogobius giurinus</i>	<i>Ctenogobius</i>		44	44A	44	44			ACN=44	China (Guangdong)	G-67, Y-15
<i>Rhinogobius giurinus</i>			44	44 ST/A	44				ACN=44	China (Kunming)	L-38
<i>Rhinogobius giurinus?</i>	<i>Ctenogobius</i>		44	8M + 12SM + 24A	64		2-4		ACN=44	China (Anhui)	Z-38
<i>Rhinogobius shennongensis</i>	<i>Ctenogobius</i>		44	44A	44	44				China (Wuhan)	D-18
<i>Stigmatogobius sadanundio</i>	<i>Gobius</i>		48					2.8 BFA			H-13
<i>Stigmatogobius sadanundio</i>			46	2SM + 44A	48	48			ACN=44	India (WB)	K-46
<i>Tridentiger brevispinis</i>	<i>obscurus brevispinis</i>	F, M	44	10 M/SM + 34ST	54	88				Japan (Lake Kasumigaura)	A-52, A-60
<i>Tridentiger nudicervicus</i>			44		62					Korea	L-80
<i>Tridentiger obscurus</i>		F, M	44	12 M/SM + 32 ST/A	56				ACN=44	Korea (Samchuk)	L-14
<i>Tridentiger obscurus</i>	<i>obscurus obscurus</i>		44	10 M/SM + 34ST	54	88			ACN=44	Japan (Chiba)	A-60
<i>Tridentiger obscurus</i>	<i>obscurus obscurus</i>		44	26 M/SM/ST + 18A	70				ACN=44	Japan (Yamaguchi)	N-31
<i>Tridentiger trigonocephalus</i>		F, M	44	16 M/SM + 28 ST/A	60		2		ACN=44	Japan (Kanagawa)	A-52, A-60
<i>Tridentiger trigonocephalus</i>			44	28 M/SM/ST + 16A	72				ACN=44	Japan (Yamaguchi)	N-31
<i>Tridentiger trigonocephalus</i>		F, M	44	20 M/SM + 24 ST/A	64				ACN=44	Korea (Gyeoyato)	L-79
<i>Tridentiger trigonocephalus</i>			44	20M + 12SM + 12A	76	76			ACN=44	China (Liaoning)	M-32
<i>Tridentiger trigonocephalus</i>			44	10M + 28SM + 2ST + 4A	82	84			ACN=44	China (Zhejiang)	F-8
<i>Tridentiger</i> sp.		F, M	44	18 M/SM + 26 ST/A	62				ACN=44	Korea (Kunsan)	L-14
Sicydiinae											
<i>Sicyopterus japonicus</i>			44	10 M + 10SM + 24 ST/A	64				ACN=46	Japan (Chiba)	A-73
Oxudercinae											
Periophthalmini											
<i>Periophthalmodon schlosseri</i>			46	46A	46	46		1.9 FIA	ACN=46	Malaysia	M-52, H-40
<i>Periophthalmus chrysospilus</i>			56							Malaysia	M-52
<i>Periophthalmus modestus</i>	<i>cantonensis</i>		46	18M + 12SM + 16 ST/A	76				ACN=46	Japan (Tokyo Bay)	A-52, A-62
<i>Periophthalmus modestus</i>			46	32 M/SM + 14 ST/A	78				ACN=46	Japan	M-52
<i>Periophthalmus modestus</i>	<i>cantonensis</i>		46	34 M/SM/ST + 12A	80				ACN=46	Japan (Ariake Sea)	N-31
<i>Periophthalmus modestus</i>	<i>cantonensis</i>	F, M	46	16 M/SM + 30A	62	62			ACN=46	Korea (Kohwato)	L-79
Apocryptei											
<i>Apocryptes bato</i>		M	46	24M + 10SM + 12A	80	80			ACN=46	India (WB)	N-15
<i>Apocryptodon madurensis</i>			48							India	V-33
<i>Apocryptodon punctatus</i>			42	24 M/SM + 18 ST/A	66				ACN=44	Japan (Ariake Sea)	M-52
<i>Parapocryptes serperaster</i>	<i>Apocryptes</i>		46	8M + 16SM + 4ST + 18A	70	74			ACN=46	India (WB)	K-139
<i>Pseudapocryptes borneensis</i>			48							India	V-33
<i>Pseudapocryptes lanceolatus</i>	<i>Apocryptes</i>	F	38	14M + 22SM + 2ST	74	76			ACN=46	India (WB)	N-15



Table 6.39 Order PERCIFORMES. Part 4 Gobioidei, Kurtoidi, Acanthuroidei, and Scombroidei (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup> NORs	Genome size (pg/cell)	Comments	Locality	Reference
Suborder/family/subfamily/species	karyotype paper										
<b>Boleophthalmi</b>											
<i>Boleophthalmus boddarti</i>			46	46A	46	46			ACN=46	Malaysia	M-52
<i>Boleophthalmus boddarti</i>	<i>boddaerti</i>	F, M	46	46A	46	46			ACN=46	India	S-177
<i>Boleophthalmus boddarti</i>	<i>Gobius striatus</i>		46							India	V-33
<i>Boleophthalmus dussumieri</i>	<i>dentatus</i>	F, M	46	14M + 18SM + 14A	78	78			ACN=46	India (WB)	K-39
<i>Boleophthalmus dussumieri</i>			46							India	V-33, K-102
<i>Boleophthalmus dussumieri</i>			46	4M + 8ST + 34A	50	58			ACN=46	Malaysia	M-52
<i>Boleophthalmus pectinirostris</i>			46	46 ST/A	46				ACN=46	Japan (Ariake Sea)	A-62
<i>Boleophthalmus pectinirostris</i>			46	46A	46	46			ACN=46	Japan (Ariake Sea)	N-31, M-52
<i>Boleophthalmus pectinirostris</i>			46	2ST + 44A	46	48			ACN=46	China (Zhejiang)	F-8
<i>Scartelaos cantoris</i>	<i>Boleophthalmus glaucus</i>	F, M	46	12M + 20SM + 2ST + 12A	78	80			ACN=46	India (WB)	M-24
<i>Scartelaos histophorus</i>			48	8 M/SM + 40 ST/A	56					Malaysia	M-52
<b>Amblyopinae</b>											
<i>Odontamblyopus rubicundus</i>			46	4M + 16SM + 26 ST/A	66				ACN=46	Japan (Ariake Sea)	A-62
<i>Odontamblyopus rubicundus?</i>	<i>rubicundus</i>		38	20M + 18SM	76	76				China	M-36
<i>Odontamblyopus rubicundus</i>		F, M	46	4M + 24SM + 8ST + 10A	74	82			ACN=46	India (WB)	K-42
<i>Odontamblyopus rubicundus</i>	<i>Gobioides</i>	M	46	2M + 26SM + 10ST + 8A	74	84			ACN=46	India (WB)	M-24
<i>Trypauchen vagina</i>		M	46	12M + 6SM + 10ST + 18A	64	74			ACN=46	India (WB)	K-29
<b>Suborder Kurtoidi</b>											
<b>Kurtidae</b>											
<i>Kurtus gulliveri</i>		F, M	44	2SM + 4A + 38 non-identified					ACN=46	Australia (N. Territory)	E-10
<b>Suborder Acanthroidei</b>											
<b>Acanthuridae</b>											
<i>Acanthurus bahianus</i>			36	16 non-A + 20A		52				Brazil (RN, BA)	G-12
<i>Acanthurus chirurgus</i>			34	16 non-A + 18A		50		1.4 FD		Brazil (RN)	G-12, G-85, M-133
<i>Acanthurus coeruleus</i>			48	4 non-A + 44A		52				Brazil (RN, BA)	G-12
<i>Acanthurus triostegus</i>			48	48A		48		1.6* FCM	ACN=48	Japan (Yakushima)	A-65, O-48
<i>Ctenochaetus striatus</i>			48	48A		48		1.7* FCM		Japan	O-48
<i>Prionurus scalprum</i>	<i>microlepidotus</i>		48	48A		48			ACN=48	Japan (Chiba)	A-65
<b>Ephippidae</b>											
<i>Platax teira</i>	<i>orbicularis</i>		48	48A		48			ACN=48	Japan (Yakushima)	A-66

Table 6.39 Order PERCIFORMES. Part 4 Gobioidae, Kurtoidei, Acanthuroidei, and Scombroidei (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag-NORs	Genome size (pg/cell)	Comments	Locality	Reference
Suborder/family/subfamily/species	karyotype paper										
<b>Scatophagidae</b>											
<i>Scatophagus argus</i>		F	48	2SM + 46A	50	50		(1.5 BFA)	ACN=48	India (Orissa)	C-61, H-13
<i>Scatophagus argus</i>			48							India (Portonovo)	N-13
<i>Scatophagus argus</i>		M	48	1M + 47A	49	49			XY, ACN=48	India	K-26
<i>Scatophagus argus</i>		F	48	48A	48	48			XX, ACN=48	India	K-26
<i>Scatophagus argus</i>			48	48A	48	48	2		ACN=48	(W. Pacific)	S-130
<i>Scatophagus argus</i>			48	48A	48	48				China	Z-39
<i>Selenotoca multifasciata</i>		M, F	48	48A	48	48		1.4 FIA	ACN=48	(W. Pacific)	S-130, H-41
<b>Siganidae</b>											
<i>Siganus fuscescens</i>			48	2ST + 46A	48	50		1.2 FIA	ACN=48	Japan (Shimane)	K-68, H-41
<i>Siganus javus</i>		F	48	48A	48	48			ACN=48	India (Orissa)	C-61
<i>Siganus spinus</i>			42	6M + 36A	48	48		1.1* FCM, 1.2 FIA		Japan	O-48, H-40
<b>Suborder Scombroidei</b>											
<b>Sphyracidae</b>											
<i>Sphyracina tome</i>			48	48A	48	48				Brazil (RJ)	B-86
<b>Scombridae</b>											
<i>Auxis rochei</i>			48		50			1.9 FD	ACN=48	Japan	I-9
<i>Auxis thazard</i>			48	48A	48	48		1.8 FD, 1.7 FIA	ACN=48	Japan (Sanriku)	I-9, H-40
<i>Katsuwonus pelamis</i>		M	48	48A	48	48		(1.6 FIA, 2.0 BFA)	ACN=48	Japan (Sanriku)	I-9, H-13, H-40
<i>Katsuwonus pelamis</i>			48	48A	48	48			ACN=48	N. Pacific	R-38, S-95, S-96
<i>Scomber australasicus</i>	<i>tapaeinocephalus</i>		48	2ST + 46A	48	50		1.7 FIA	ACN=48	Japan (Iwate)	I-1, H-40
<i>Scomber japonicus</i>		F, M	48	2ST + 46A	48	50	2		ACN=48	Japan	M-99, K-50
<i>Thunnus alalunga</i>			48	2M + 2SM + 2ST + 42A	52	54		1.8 FIA	ACN=48	N. Pacific	R-38, S-96, H-41
<i>Thunnus albacares</i>			48	2M + 2SM + 2ST + 42A	52	54		1.8 FIA	ACN=48	N. Pacific	R-38, S-96, H-40
<i>Thunnus orientalis</i>		M	48	4M + 6SM + 4ST + 34A	58	62			ACN=48	India (WB)	K-136
<i>Thunnus thynnus</i>		F	48	2M + 2ST + 44A	50	52		1.7 FD, (1.6 FIA)		Japan (Sanriku)	I-1, I-9, H-40
<i>Thunnus thynnus</i>		F	48	2M + 4ST + 42A	50	54		1.7 FD	ACN=48	Japan (Sanriku)	I-9

Table 6.40 Order PERCIFORMES. Part 5 Anabantoidei, Channoidei, and Caproidei

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup> NORs	Genome size (pg/cell)	Comments	Locality	Reference
Suborder/family/subfamily/species	karyotype paper										
<b>Suborder Anabantoidei</b>											
<b>Anabantidae</b>											
<b>Anabantinae</b>											
<i>Anabas</i>	<i>cobojuis</i>		46						ACN=46	India (Andhra Pradesh)	D-25
<i>Anabas</i>	<i>testudineus</i>		48							India (Andhra Pradesh)	D-25
<i>Anabas</i>	<i>testudineus</i>		46	2M + 6SM + 6ST + 32A	54	60	2		ACN=46	India (Manipur)	K-138
<i>Anabas</i>	<i>testudineus</i>	F, M	46	2SM + 2ST + 42A	48	50	2		ACN=46	India	K-44
<i>Anabas</i>	<i>testudineus</i>		46	2SM + 44 ST/A	48		2		ACN=46	India (Delhi)	R-68
<i>Anabas</i>	<i>testudineus</i>	F, M	46	4ST + 42A	46	50			ACN=46	India (WB)	M-22
<i>Anabas</i>	<i>testudineus</i>	F	46	4 M/SM + 42A	50	50			ACN=46	(Asia)	A-3
<i>Anabas</i>	<i>testudineus</i>		46							(Bangladesh, Dhaka)	T-68
<b>Ctenopominae</b>											
<i>Ctenopoma</i>	<i>acutirostre</i>		48	48A	48	48			ACN=48	(Africa)	K-110
<i>Ctenopoma</i>	<i>muriei</i>		48	48A	48	48			ACN=48	W. Ethiopia	K-110
<i>Ctenopoma</i>	<i>ocellatum</i>		48	48 ST/A	48				ACN=48	(Africa)	K-110
<i>Ctenopoma</i>	<i>petherici</i>		48	48A	48	48			ACN=48	W. Ethiopia	K-110
<i>Ctenopoma</i>	sp.		48	48A	48	48			ACN=48	(Africa)	K-110
<i>Microctenopoma</i>	<i>ansorgei</i>		46	2M + 44A	48	48			ACN=48	(Africa)	K-110
<i>Microctenopoma</i>	<i>congicum</i>		46	2M + 44A	48	48			ACN=48	(Africa)	K-110
<i>Microctenopoma</i>	<i>pekkolai</i>		48	2M + 2SM + 44 ST/A	48	48			ACN=48	(Africa)	K-110
<b>Helostomatidae</b>											
<i>Helostoma</i>	<i>temminckii</i>	F, M	48	48A	48	48		1.8 BFA	ACN=48	(S. E. Asia)	A-3, H-13
<b>Osphromemidae (= Belontiidae)</b>											
<b>Luciocephalinae</b>											
<i>Ctenops</i>	<i>nobilis</i>	F, M	44	8M + 8SM + 28A	60	60			ACN=44	India	R-77, R-78
<i>Luciocephalus</i>	<i>pulcher</i>		20	20A	20	20				Thailand	D-28
<i>Sphaerichthys</i>	<i>osphromenoides</i>	F, M	16	14 M/SM + 2A	30	30			ACN=42	(Asia)	C-89
<i>Sphaerichthys</i>	<i>osphromenoides</i>		16	10M + 4SM + 2A	30	30				(India)	K-134
<i>Trichogaster</i>	<i>chuna</i>	F, M	46	10M + 8SM + 28A	64	64		(1.3 FCM)	ACN=46	(India)	R-77, V-86
<i>Trichogaster</i>	<i>chuna</i>		46	20M + 8SM + 6ST + 12A	74	80				India	L-1
<i>Trichogaster</i>	<i>chuna</i>		46	28M + 12SM + 6A	86	86				India (Assam)	K-46, C-108
<i>Trichogaster</i>	<i>fasciatus</i>		48	16M + 16SM + 6ST + 10A	80	86	2		ACN=48	India (Manipur)	K-138
<i>Trichogaster</i>	<i>fasciatus</i>	F	48	15M + 12 SM/ST + 21A	75				ZW, ACN=48	India (Haryana)	R-47
<i>Trichogaster</i>	<i>fasciatus</i>	M	48	14M + 12 SM/ST + 22A	74				ZZ, ACN=48	India (Haryana)	R-47

Table 6.40 Order PERCIFORMES. Part 5 Anabantoidei, Channoidei, and Caproidei (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup>	Genome size	Comments	Locality	Reference
Suborder/family/subfamily/species	karyotype paper						NORs	(pg./cell)			
<i>Trichogaster fasciatus</i>	<i>Collisa fasciata</i>	F	48	17M + 16SM + 15A	81	81			ZW, ACN=48	India (Haryana)	R-54, R-77, R-78, S-57
<i>Trichogaster fasciatus</i>	<i>Collisa fasciata</i>	M	48	16M + 16SM + 16A	80	80			ZZ, ACN=48	India (Haryana)	R-54, R-77, R-78, S-57
<i>Trichogaster fasciatus</i>	<i>Collisa fasciata</i>	F	48	15M + 16SM + 4ST + 13A	79	83	6		ZW, ACN=48	India (Manipur)	S-175
<i>Trichogaster fasciatus</i>	<i>Collisa fasciata</i>	M	48	16M + 16SM + 4ST + 12A	80	84			ZZ, ACN=48	India (Manipur)	S-175
<i>Trichogaster fasciatus</i>		F, M	48	8M + 20SM + 12ST + 8A	76	88				India (WB)	M-26
<i>Trichogaster fasciatus</i>		F, M	46	18M + 12SM + 16A	76	76			ACN=46	India (Orissa)	T-50
<i>Trichogaster labiosus</i>	<i>Collisa</i>		48	22M + 12SM + 4ST + 12A	82	86				India	L-1
<i>Trichogaster labiosus</i>		M	48	12M + 6SM + 12ST + 18A	66	78				India (WB)	M-26
<i>Trichogaster labiosus</i>	<i>Collisa</i>	F, M	48	22M + 16SM + 10A	86	86			ACN=48	(India)	R-77
<i>Trichogaster lalius</i>	<i>Collisa</i>	F	45	14M + 12 SM/ST + 19A	71	71			ZO	India (Haryana)	R-50
<i>Trichogaster lalius</i>	<i>Collisa</i>	M	46	14M + 12 SM/ST + 20A	72	72			ZZ	India (Haryana)	R-50
<i>Trichogaster lalius</i>	<i>Collisa</i>	F	46	14M + 6SM + 26A	66	66			XX, ACN=46	India (Haryana)	R-77, R-78
<i>Trichogaster lalius</i>	<i>Collisa</i>	M	45	14 M + 6SM + 25A	65	65			XO	India (Haryana)	R-77, R-78
<i>Trichogaster lalius</i>	<i>larius</i>	F, M	46	14M + 10SM + 12ST + 10A	70	82			ACN=46	India (WB)	K-34
<i>Trichogaster lalius</i>	<i>Collisa lalia</i>		46	24 M/SM + 22 ST/A	70	70		(1.2 FCM, 1.2 BFA)	ACN=46	(Asia)	A-3, V-101, H-39
<i>Trichopodus cantonis</i>	<i>Trichogaster pectoralis</i>		46	46A	46	46				(SE Asia)	K-114
<i>Trichopodus leeri</i>	<i>Trichogaster</i>	F, M	46	46A	46	46		(1.4 FCM)	ACN=46	(India)	R-77, V-86
<i>Trichopodus leeri</i>	<i>Trichogaster</i>	M	46	46A	46	46				(Asia)	A-3
<i>Trichopodus microlepis</i>	<i>Trichogaster</i>		46	46A	46	46				(Asia)	K-134
<i>Trichopodus microlepis</i>	<i>Trichogaster</i>		48	48A	48	48		1.8* FCM		(Asia)	O-48
<i>Trichopodus sumatranus</i>	<i>Trichogaster</i>		48		48	48				(Asia)	C-89
<i>Trichopodus trichopterus</i>	<i>Trichogaster</i>	M	46	46A	46	46		(1.2 FCM)	ACN=46	(Asia)	A-3, V-86
<i>Trichopodus t. sumatranus</i>	<i>Collisa</i>	F, M	46	46A	46	46			ACN=46	(India)	R-77
<i>Trichopodus t. trichopterus</i>	<i>Collisa</i>	F, M	46	46A	46	46			ACN=46	(India)	R-77
<b>Macropodusinae</b>											
<i>Betta splendens</i>			42					1.3 FIA, 1.3 BFA		(Thailand)	H-13, H-41
<i>Macropodus chinensis</i>			48	6M + 2SM + 40A	56	56				Korea	L-15
<i>Macropodus chinensis</i>			46	4M + 4SM + 38A	54	54		2.8* FD		China (Wuhan)	D-18, C-83
<i>Macropodus ocellatus</i>		F, M	46	8M + 8SM + 14ST + 16A	62	76			ACN=48	(Asia)	K-97
<i>Macropodus opercularis</i>		F, M	46	8M + 8SM + 16ST + 14A	62	78		(1.1 FCM)		(Asia)	K-97, V-101
<i>Macropodus opercularis</i>		F, M	46	4M + 10SM + 12ST + 20A	60	72		(1.2 BFA)		China (Guilin)	Y-15, H-13
<i>Macropodus opercularis</i>	<i>concolor</i>		46	12 M/SM + 34 ST/A	58	58			ACN=46	(Asia)	A-3
<i>Macropodus spechti</i>		F, M	46	10M + 2SM + 22ST + 12A	58	80			ACN=46	(Asia)	K-97
<i>Osphronemus goramy</i>			48	2SM + 46A	50	50			ACN=48	(S. E. Asia)	K-97
<i>Parosphromenus sumatranus</i>	<i>Collisa</i>		46	46A	46	46			ACN=46	(India)	R-77

Table 6.40 Order PERCIFORMES. Part 5 Anabantoidei, Channoidei, and Caproidei (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup>	Genome size	Comments	Locality	Reference
Suborder/family/subfamily/species	karyotype paper						NORs	(pg/cell)			
<b>Suborder Channoidei</b>											
<b>Channidae</b>											
<i>Channa argus</i>		F, M	48	4SM + 44 ST/A	52			1.7* FD	ACN=48	China (Wuhan)	L-31, Y-15, C-83
<i>Channa argus</i>			48	2M + 4SM + 42ST	54	96	4		ACN=48	China (Shashi)	Z-21
<i>Channa argus</i>			48	20ST + 28A	48	68				China (Hubei)	L-53
<i>Channa argus</i>	<i>Ophiocephalus</i>		48	4SM + 22ST + 22A	52	74			ACN=48	China (Beijing)	Z-31
<i>Channa asiatica</i>	<i>Ophiocephalus</i>	F, M	44	4M + 8SM + 32 ST/A	56			1.8* FD	ACN=46	China (Shaoguan)	L-31, Y-15, C-83
<i>Channa asiatica</i>		F, M	46	2M + 8SM + 36 ST/A	56				ACN=46	China (Guangzhou)	L-31
<i>Channa asiatica</i>		F, M	44	2M + 8SM + 28ST + 6A	54	82	4		ACN=42	China (Shashi)	Z-21
<i>Channa barca</i>			38	6M + 6SM + 4ST + 22A	50	54				India (Assam, Meghalaya)	D-9
<i>Channa gachua</i>		F, M	78	12M + 12SM + 54A	102	102				India (WB)	M-21
<i>Channa gachua</i>		F, M	78	10M + 16SM + 52 ST/A	104			2.0 FD		India	B-2
<i>Channa maculata</i>		F, M	42	4M + 2SM + 36 ST/A	48				ACN=46	China (Guangdong)	L-31, Y-15
<i>Channa maculata</i>	<i>Ophiocephalus</i>	F, M	42	4M + 40A	48	48			ACN=44	China	C-85
<i>Channa marulius</i>			42	2M + 2SM + 38A	46	46			ACN=44	India (Simlipal Hills)	K-41
<i>Channa orientalis?</i>	<i>orientalis</i>		76	2M + 6SM + 68A	84	84			ACN=44	India (Assam)	K-41
<i>Channa orientalis</i>			78	34M + 25M + 42 ST/A	114				ACN=78	India (Assam, Meghalaya)	D-9
<i>Channa orientalis</i>			78	34M + 25M + 42 ST/A	114					Bangladesh (Dhaka)	R-102
<i>Channa punctata</i>	<i>punctatus</i>	F, M	32	20M + 12SM	64	64	2			India (Haryana, U.P.)	R-70, R-73, S-2
<i>Channa punctata</i>	<i>punctatus</i>	F, M	32	24M + 8SM	64	64		1.3 FD	ACN=42	India	B-2
<i>Channa punctata</i>	<i>punctatus</i>	F, M	32	18M + 12SM + 2ST	62	64				India (WB)	M-21
<i>Channa punctata</i>	<i>punctatus</i>	F, M	32	10M + 18SM + 4A	60	60				India (Haryana)	R-46, R-53
<i>Channa punctata</i>	<i>punctatus</i>	F, M	32	16M + 14SM + 2A	62	62				India (Haryana)	R-75
<i>Channa punctata</i>	var. A		34	16M + 14SM + 4A	64	64			ACN=42	India (Assam, Meghalaya)	D-9
<i>Channa punctata</i>	var. B		32	16M + 16SM	64	64			ACN=42	India (Assam, Meghalaya)	D-9
<i>Channa punctata</i>			32	24M + 2SM + 2ST + 4A	58	60				India (Assam, Meghalaya)	R-102
<i>Channa stewartii</i>			66	12M + 6SM + 6ST + 42A	84	90				Bangladesh (Dhaka)	D-9
<i>Channa stewartii</i>		M	104	2M + 102A	106	106				India (Assam, Meghalaya)	D-9
<i>Channa striata</i>	<i>striatus</i>	F, M	40	8M + 2SM + 2ST + 28A	50	52		1.5 FD	ACN=46	India (Nagaland)	R-65
<i>Channa striata</i>	<i>striatus</i>		40	8M + 6ST + 26A	48	54			ACN=46	India	B-2
<i>Channa striata</i>	<i>striatus</i>	F, M	40	8M + 2SM + 30A	50	50				India (Assam, Meghalaya)	D-9
<i>Parachanna obscura</i>	<i>Ophiocephalus obscurus</i>		42					2.0 BFA		India (WB)	M-21
										(Africa)	H-13
<b>Suborder Caproidei</b>											
<b>Caproidae</b>											
<i>Capros aper</i>			46	2M + 2SM + 8ST + 34A	50	58	2		ACN=48	France (Gulf of Lion)	V-67
<i>Capros aper</i>			44	4M + 2SM + 8ST + 30A	50	58	2		ACN=48	France (Gulf of Lion)	V-67
<i>Capros aper</i>			42	6M + 2SM + 8ST + 26A	50	58	2		ACN=48	France (Gulf of Lion)	V-67

Table 6.41 Order PLEURONECTIFORMES

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup> NORs	Genome size (pg./cell)	Comments	Locality	Reference
Suborder/family/species	karyotype paper										
<b>Suborder Pleuronectoidei</b>											
<b>Scophthalmidae</b>											
<i>Psetta maotica</i>	<i>Rhombus maoticus</i>		40	20M + 20 SM/A					ACN=44	Black Sea	I-19
<i>Psetta maotica</i>	<i>Rhombus maoticus</i>		48						ACN=48	Black Sea	I-19
<i>Psetta maotica</i>	<i>Rhombus maoticus</i>		44							Black Sea	V-72
<i>Psetta maxima</i>	<i>Scophthalmus maximus</i>	F, M	44	4M + 12ST + 28A	48	60	2	(1.7 FIA)	ACN=44	Spain	B-53, P-63, H-41
<i>Scophthalmus rhombus</i>			44	4M + 2SM + 38 ST/A	50		2		ACN=44	Spain	P-63
<b>Paralichthyidae</b>											
<i>Citharichthys spilopterus</i>		F, M	28	14M + 6SM + 2ST + 6A	48	50			ACN=46	USA (LA)	L-17
<i>Citharichthys spilopterus</i>		F, M	26	18 M/SM + 8 ST/A	44				ACN=38	Brazil (SP)	A-120
<i>Etropus crossotus</i>		F, M	38	38 M/SM/ST		76		(2.0 BFA)	ACN=44	USA (LA)	L-17, H-13
<i>Etropus crossotus</i>		F, M	38	26 M/SM + 12 ST/A	64				ACN=44	Brazil (SP)	A-120
<i>Hippoglossina macrops</i>			48	48A	48	48			ACN=48	Chile (Coquimbo bay)	W-36
<i>Paralichthys adpersus</i>			46	2M + 44 ST/A	48				ACN=48	Chile (Coquimbo bay)	W-36
<i>Paralichthys dentatus</i>			48	48A	48	48				(W.N. Atlantic)	X-3
<i>Paralichthys lethostigma</i>		M	48	20ST + 28A	48	68			ACN=48	USA (LA)	L-17
<i>Paralichthys microps</i>			46	2M + 44 ST/A	48				ACN=48	Chile (Coquimbo bay)	W-36
<i>Paralichthys olivaceus</i>			48	48A	48	48	2	(1.4* FCM)	ACN=48	K-48, O-48	
<i>Paralichthys olivaceus</i>		F	46	46A	46	46	2		ACN=46	Japan (Yamaguchi)	S-5
<i>Paralichthys olivaceus</i>			48	48A	48	48				China	Y-20, X-3, Z-37
<i>Paralichthys orbignyanus</i>			46	2M + 44 ST/A	48				ACN=46	Brazil (SC)	A-120
<i>Paralichthys patagonicus</i>		F, M	46	46A	46	46			ACN=46	Brazil (SP)	A-120
<i>Pseudorhombus arsius</i>		M	46	46 ST/A	46			1.0 FIA	ACN=46	India (Orissa)	P-17, H-40
<i>Pseudorhombus cinnamomeus</i>			48	48A	48	48				China	Y-20
<i>Pseudorhombus triocellatus</i>		F	48	48A	48	48			ACN=48	India (Orissa)	P-17
<i>Xystreurus liolepis</i>		M	48	48A	48	48		1.6 FD, 1.5 BFA	ACN=48	(E. Pacific)	O-4, H-13
<b>Pleuronectidae</b>											
<i>Cleisthenes herzensteini</i>	<i>pinetorum herzensteini</i>		44	4 SM/ST + 40A		48			ACN=48	Japan (Hokkaido)	F-53
<i>Glyptocephalus stelleri</i>		M	46							Japan (Hokkaido)	Y-1
<i>Hippoglossus hippocrossus</i>			48	48 ST/A	48			1.5 FIA		UK	B-71, H-41
<i>Kareius bicoloratus</i>			48	48A	48	48	2	(1.3* FCM)	ACN=48	Japan (Hokkaido)	F-53, S-142, O-48
<i>Kareius bicoloratus</i>		F	48	48A	48	48			ACN=48	China (Yellow Sea)	Z-15, Z-37, Y-20
<i>Limanda ferruginea</i>	<i>Pleuronectes</i>		48	48A	48	48		1.5 FIA		East coast of Canada	A-120, H-41

Table 6.41 Order PLEURONECTIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Suborder/family/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag- NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Limanda limanda</i>		F, M	46	46 ST/A	46				ACN=46	Europe (Irish Sea)	D-10
<i>Limanda limanda</i>			46		46					Russia (White Sea)	L-88
<i>Liopsetta glacialis</i>			48	48A	48	48				Russia (White Sea)	L-87, L-88
<i>Microstomus achne</i>			48	48A	48	48			ACN=48	Japan (Hokkaido)	F-53
<i>Microstomus achne</i>			48	48A	48	48				China	Y-20
<i>Platichthys flesus</i>	<i>Pleuronectes</i>		48	48A	48	48				Russia (White Sea)	L-87
<i>Platichthys flesus</i>			48	48A	48	48			ACN=48	Germany (Baltic Sea)	K-132
<i>Platichthys flesus</i>			48	48A	48	48	2		ACN=48	Spain	P-63
<i>Platichthys stellatus</i>			48	48A	48	48	2		ACN=48	Japan (Hokkaido)	F-53, S-142
<i>Pleuronectes herzensteini</i>	<i>Limanda</i>	F, M	48	48A	48	48				Japan (Hokkaido)	F-53
<i>Pleuronectes obscurus</i>			48	48A	48	48		1.2 FCM	ACN=48	Korea (Busan)	K-125
<i>Pleuronectes platessa</i>			48	48A	48	48			ACN=48	(UK)	B-6
<i>Pleuronectes platessa</i>			48	48A	48	48			ACN=48	UK	F-4
<i>Pleuronectes platessa</i>			47	1M + 47A	48	48			ACN=48	UK	F-4
<i>Pleuronectes punctatissimus</i>	<i>Limanda</i>	M	48	48A	48	48				Japan (Hokkaido)	F-53
<i>Pleuronectes putnami</i>	<i>Liopsetta</i>		48							WN Atlantic	B-71
<i>Pleuronectes schrenki</i>	<i>Limanda</i>		48	48A	48	48				Japan (Hokkaido)	F-53
<i>Pleuronectes schrenki</i>			48	48A	48	48	2		ACN=48	Japan (Hokkaido)	S-142
<i>Pleuronectes yokohamae</i>	<i>Limanda</i>		48	48A	48	48		1.3* FCM		Japan (Hokkaido)	F-53, O-48
<i>Pleuronectes yokohamae</i>	<i>Pseudopleuronectes</i>		48	48A	48	48				China (Shandong)	Y-20
<i>Pleuronectes yokohamae</i>			48	48A	48	48			ACN=48	Korea (Busan)	P-70
<i>Pleuronichthys cornutus</i>			48	14M + 34A	62	62		1.1* FCM		Japan	O-48
<i>Pleuronichthys cornutus</i>			48	12M + 2SM + 34A	62	62				China (Shandong)	Y-20
<i>Pleuronichthys verticalis</i>		M	48	48A	48	48		1.3 FD	ACN=48	(E. Pacific)	O-4
<i>Pseudopleuronectes americanus</i>			48					1.5 FD, 1.4 BFA		WN Atlantic	B-71, H-13
<i>Verasper moseri</i>		F, M	46	2 SM/ST + 44A		48			ACN=46	Japan (Hokkaido)	F-53
<b>Bothidae</b>											
<i>Bothus ocellatus</i>		F	32	18 M/SM + 14 ST/A	50				ACN=48	Brazil (SP)	A-120
<i>Bothus podas</i>		F	38	12M + 2SM + 24ST	52		2		XX	Italy (Palermo)	V-100
<i>Bothus podas</i>		M	38	12M + 2SM + 24ST	52		2		XY	Italy (Palermo)	V-100
<i>Psettina tosana</i>			44	4M + 2SM + 6ST + 32A	50	56		1.1* FCM		Japan	O-48

**Table 6.42 Order LOPHIIFORMES**

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup>	Genome size	Comments	Locality	Reference
Family/species	karyotype paper						NORs	(pg/cell)			
<b>Antennariidae</b>											
<i>Antennarius nummifer</i>			48	16 M/SM + 32 ST/A	64				ACN=48	Japan (Chiba)	A-69
<i>Histrio histrio</i>			46	46 ST/A	46				ACN=46	Japan (Kanagawa)	A-69
<b>Lophiidae</b>											
<i>Lophius piscatorius</i>		F, M	46	14 M/SM + 32 ST/A	60		2		ACN=46	Italy (Palermo)	V-57, V-65

**Table 6.43 Order TETRAODONTIFORMES**

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup>	Genome size	Comments	Locality	Reference
Suborder/family/species	karyotype paper						NORs	(pg/cell)			
<b>Suborder Balistoidei</b>											
<b>Triacanthidae</b>											
<i>Triacanthus biaculeatus</i>			48	2M + 4ST + 42A	50	54				Japan	I-21
<i>Triacanthus biaculeatus brevis</i>		M	48	1M + 47A	49	49			ACN=48	India (Orissa)	C-62
<i>Triacanthus biaculeatus</i>		F, M	48	48A	48	48			ACN=48	India (Orissa)	R-57
<i>Pseudotriacanthus strigilifer</i>		M	48	48A	48	48				India (Goa)	R-45
<b>Balistidae</b>											
<i>Balistapus undulatus</i>		F	42	42A	42	42	2	1.5* FCM, 1.3 FIA	ACN=46	Japan (Okinawa)	T-9, O-48, H-41
<i>Balistes caprisicus</i>		F, M	44	44A	44	44	2	(1.1 FD)	ACN=46	Italy (Palermo)	V-57, V-65, M-133
<i>Balistes caprisicus</i>		F, M	44	44A	44	44	2		ACN=46	Spain (Malaga)	T-38
<i>Balistes vetula</i>			44	44A	44	44	2		ACN=46	Brazil (Bahia)	S-110
<i>Balistoides conspicillus</i>		F	44	44A	44	44	2		ACN=46	Japan (Okinawa)	T-9
<i>Balistoides viridescens</i>			44	2M + 2SM + 40 ST/A	48		2	1.4* FCM	ACN=46	(Indo-West Pacific)	T-10, O-48
<i>Melichthys niger</i>			40	40A	40	40	2	1.4 FCM	ACN=42	Brazil (Saint Pauls Rocks)	S-110, B-75
<i>Melichthys vidua</i>		M	40	40 ST/A	40		2		ACN=42	(Indo-West Pacific)	K-71
<i>Odonus niger</i>			42	42 ST/A	42		2		ACN=44	(Indo-West Pacific)	K-71
<i>Pseudobalistes flavimarginatus</i>			44	2M + 42 ST/A	46		2		ACN=46	Japan (Yaku and Tanega Is)	A-64
<i>Rhinecanthus aculeatus</i>			44	44A	44	44	2	1.3 FIA	ACN=46	Japan (Okinawa)	A-64, K-71, T-9, H-40
<i>Rhinecanthus echarpe</i>			44	44 ST/A	44		2		ACN=46	(Indo-West Pacific)	K-71, T-9
<i>Rhinecanthus verrucosus</i>			44	44A	44	44	2		ACN=46	Japan (Tanegashima)	A-64, K-71, T-9
<i>Sufflamen chrysopterus</i>			46	46A	46	46		1.2 FIA	ACN=46	Japan (Yakushima)	A-64, H-40
<i>Sufflamen fraenatus</i>		F	46	46A	46	46	2	1.3 FIA	ACN=46	Japan (Okinawa)	T-9, H-41



Table 6.42 Order LOPHIIFORMES

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup>	Genome size (pg/cell)	Comments	Locality	Reference
Family/species	karyotype paper						NORs				
<b>Antennariidae</b>											
<i>Antennarius nummifer</i>			48	16 M/SM + 32 ST/A	64				ACN=48	Japan (Chiba)	A-69
<i>Histrio histrio</i>			46	46 ST/A	46				ACN=46	Japan (Kanagawa)	A-69
<b>Lophiidae</b>											
<i>Lophius piscatorius</i>		F, M	46	14 M/SM + 32 ST/A	60		2		ACN=46	Italy (Palermo)	V-57, V-65

Table 6.43 Order TETRAODONTIFORMES

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup>	Genome size (pg/cell)	Comments	Locality	Reference
Suborder/family/species	karyotype paper						NORs				
<b>Suborder Balistoidei</b>											
<b>Triacanthidae</b>											
<i>Triacanthus biaculeatus</i>			48	2M + 4ST + 42A	50	54				Japan	I-21
<i>Triacanthus biaculeatus brevirostris</i>		M	48	1M + 47A	49	49			ACN=48	India (Orissa)	C-62
<i>Triacanthus biaculeatus</i>		F, M	48	48A	48	48			ACN=48	India (Orissa)	R-57
<i>Pseudotriacanthus strigilifer</i>		M	48	48A	48	48				India (Goa)	R-45
<b>Balistidae</b>											
<i>Balistapus undulatus</i>		F	42	42A	42	42	2	1.5* FCM, 1.3 FIA	ACN=46	Japan (Okinawa)	T-9, O-48, H-41
<i>Balistes caprisicus</i>		F, M	44	44A	44	44	2	(1.1 FD)	ACN=46	Italy (Palermo)	V-57, V-65, M-133
<i>Balistes caprisicus</i>		F, M	44	44A	44	44	2		ACN=46	Spain (Malaga)	T-38
<i>Balistes vetula</i>			44	44A	44	44	2		ACN=46	Brazil (Bahia)	S-110
<i>Balistoides conspicillus</i>		F	44	44A	44	44	2		ACN=46	Japan (Okinawa)	T-9
<i>Balistoides viridescens</i>			44	2M + 2SM + 40 ST/A	48		2	1.4* FCM	ACN=46	(Indo-West Pacific)	T-10, O-48
<i>Melichthys niger</i>			40	40A	40	40	2	1.4 FCM	ACN=42	Brazil (Saint Pauls Rocks)	S-110, B-75
<i>Melichthys vidua</i>		M	40	40 ST/A	40		2		ACN=42	(Indo-West Pacific)	K-71
<i>Odonus niger</i>			42	42 ST/A	42		2		ACN=44	(Indo-West Pacific)	K-71
<i>Pseudobalistes flavimarginatus</i>			44	2M + 42 ST/A	46		2		ACN=46	Japan (Yaku and Tanega Is)	A-64
<i>Rhinecanthus aculeatus</i>			44	44A	44	44	2	1.3 FIA	ACN=46	Japan (Okinawa)	A-64, K-71, T-9, H-40
<i>Rhinecanthus echarpe</i>			44	44 ST/A	44		2		ACN=46	(Indo-West Pacific)	K-71, T-9
<i>Rhinecanthus verrucosus</i>			44	44A	44	44	2		ACN=46	Japan (Tanegashima)	A-64, K-71, T-9
<i>Sufflamen chrysopterus</i>	<i>Hemibalistes</i>		46	46A	46	46	2	1.2 FIA	ACN=46	Japan (Yakushima)	A-64, H-40
<i>Sufflamen fraenatus</i>		F	46	46A	46	46	2	1.3 FIA	ACN=46	Japan (Okinawa)	T-9, H-41

Table 6.43 Order TETRAODONTIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2h	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup> NORs	Genome size (pg/cell)	Comments	Locality	Reference
Suborder/family/species	karyotype paper										
<b>Monacanthidae</b>											
<i>Cantherhines macrocerus</i>			40	40A	40	40			ACN=40	Brazil (RJ)	B-86
<i>Cantherhines pardalis</i>	<i>Amanses sandwichiensis</i>		40	40 ST/A	40				ACN=40	Japan (Tanegashima)	A-64
<i>Meuschenia scaber</i>	<i>Parika</i>	F, M	40	40A	40	40	2		ACN=40	New Zealand	M-112
<i>Oxymonacanthus longirostris</i>			36	36A	36	36			ACN=36	Japan (Okinawa)	A-64
<i>Paramonacanthus japonicus</i>	<i>Stephanolepis</i>	F	34	34A	34	34			ACN=36	Japan (W. Izu Peninsula)	M-98
<i>Paramonacanthus japonicus</i>	<i>oblongus</i>	M	34	34A	34	34			ACN=36	Japan (W. Izu Peninsula)	M-98
<i>Rudarius ercodes</i>			36	36A	36	36		(1.2* FCM)	ACN=36	Japan (Izu Peninsula)	A-64
<i>Stephanolepis cirrifer</i>			34	34A	34	34			ACN=34	Japan (W. Izu Peninsula)	M-98, O-48
<i>Stephanolepis cirrifer</i>		F	34	34A	34	34		X <sub>1</sub> X <sub>1</sub> X <sub>2</sub> X <sub>2</sub>	ACN=34	Japan (Izu Peninsula)	M-100
<i>Stephanolepis cirrifer</i>		M	33	1M + 32A	34	34		X <sub>1</sub> X <sub>2</sub> Y	ACN=34	Japan (Izu Peninsula)	M-100
<i>Stephanolepis cirrifer</i>			33	1M + 32A	34	34				China (Shandong)	W-6
<i>Stephanolepis hispidus</i>		F	34	34A	34	34	2	1.2 FCM, 1.4 BFA	X <sub>1</sub> X <sub>1</sub> X <sub>2</sub> X <sub>2</sub>	Brazil (Bahia, RJ)	S-181, B-75, H-13
<i>Stephanolepis hispidus</i>		M	33	1M + 32A	34	34	2		X <sub>1</sub> X <sub>2</sub> Y	Brazil (Bahia, RJ)	S-181
<i>Thamnaconus modestus</i>	<i>Navodon</i>		40	40 ST/A	40	40		1.1* FCM	ACN=40	Japan (W. Izu Peninsula)	M-98, O-48
<i>Thamnaconus septentrionalis</i>	<i>Navodon</i>	F, M	40	40A	40	40			ACN=40	China (Yellow Sea)	Z-15, W-6, Y-21
<b>Ostraciidae</b>											
<i>Lactoria cornuta</i>			48	2M + 2SM + 44ST	52	96				Japan	I-23, O-72
<i>Lactoria diaphana</i>			48	4M + 44A	52	52				Japan	I-23
<i>Lactoria diaphana</i>			36	10M + 2SM + 24 ST/A	48				ACN=44	Japan (Wakayama)	A-79
<i>Lactoria fornasini</i>			34	12M + 6SM + 16 ST/A	52				ACN=48	Japan	I-23
<i>Ostracion cubicus</i>	<i>tuberculatus</i>		50	4SM + 46 ST/A	54				ACN=48	Japan (Ishigaki and Yaku Is)	A-64
<i>Ostracion immaculatus</i>			50	4SM + 46 ST/A	54				ACN=48	Japan (Wakayama)	A-79
<b>Suborder Tetraodontoidei</b>											
<b>Tetraodontidae</b>											
<i>Arothron hispidus</i>			42					0.8* FCM, 1.0 FIA	ACN=42	India (Portonovo)	N-13, O-48, G-85
<i>Arothron immaculatus</i>		F, M	42	12M + 14SM + 16 ST/A	68				ACN=42	India (Orissa)	C-62
<i>Arothron manilensis</i>	<i>Tetraodon immaculatus</i>		42	14M + 16SM + 12ST	72	84		1.0 FIA	ACN=42	Japan (Okinawa)	A-64, G-85, H-41
<i>Arothron meleagris</i>			38					0.8* FCM		Japan	O-48
<i>Arothron nigropunctatus</i>	<i>Tetraodon</i>		38	14M + 20SM + 4ST	72	76			ACN=40	Japan (Okinawa)	A-64
<i>Arothron reticularis</i>		M	42	12M + 14SM + 16 ST/A	68				ACN=44	India (Orissa)	C-62
<i>Canthigaster coronata</i>			28	6M + 2SM + 20 ST/A	36					Japan (Wakayama)	A-79
<i>Canthigaster rivulata</i>			34	4M + 6SM + 10ST + 14A	44	54		0.7* FCM	ACN=34	Japan (Chiba)	A-64, M-2

Table 6.43 Order TETRAODONTIFORMES (continued)

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon Suborder/family/species	Reported in karyotype paper	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup> NORs	Genome size (pg/cell)	Comments	Locality	Reference
<i>Chelonodon patoca</i>			40	14M + 16SM + 10 ST/A	70				ACN=42	Japan (Okinawa)	A-64
<i>Lagocephalus inermis</i>	<i>Tetraodon</i>		44	2M + 42A	46					India	L-1
<i>Lagocephalus laevigatus</i>			46							Brazil	S-110
<i>Lagocephalus lunaris</i>	<i>Gastrophysus</i>	M	44	10M + 14SM + 20 ST/A	68		2	0.9 FIA	ACN=46	India (Orissa)	C-62, G-85, H-41
<i>Sphoeroides greeleyi</i>		F, M	46	24 M/SM + 22 ST/A	70				ACN=46	Brazil (RJ)	B-56
<i>Sphoeroides spengleri</i>		F, M	46	18 M/SM + 28 ST/A	64				ACN=46	Brazil (RJ)	B-56
<i>Sphoeroides spengleri</i>		F, M	46	20 M/SM + 26 ST/A	66		2		0-2 B, ACN=46	Brazil (SP)	A-126
<i>Sphoeroides testudineus</i>			46	18M + 4SM + 6ST + 18A	68	74			ACN=46	Brazil (RN)	S-110
<i>Sphoeroides tyleri</i>		F, M	46	14 M/SM + 32 ST/A	60				ACN=46	Brazil (RJ)	B-57
<i>Takifugu chrysoptis</i>	<i>Sphoeroides</i>		44	6M + 14SM + 24 ST/A	64			(0.8* FCM)	ACN=46	Japan (Izu Peninsula)	A-64
<i>Takifugu niphobles</i>	<i>Fugu</i>		44	20 M/SM + 24 ST/A	64				ACN=46	Japan (Kanagawa)	A-54, O-48
<i>Takifugu niphobles</i>	<i>Fugu</i>	F	44	4M + 16SM + 24 ST/A	64				ACN=46	Japan (Oomura Bay)	M-134
<i>Takifugu pardalis</i>	<i>Fugu</i>		44							Japan (Wakayama, Shizuoka)	A-79
<i>Takifugu pardalis</i>			44	6M + 16SM + 22 ST/A	66				ACN=46	Japan (Oomura Bay)	M-134
<i>Takifugu poecilonotus</i>		F	44	12M + 10SM + 22 ST/A	66				ACN=46	Japan (Tachibana Bay)	M-134
<i>Takifugu poecilonotus</i>	<i>Fugu</i>		44							Japan (Wakayama)	A-79
<i>Takifugu pseudommus</i>			44	12M + 8SM + 24A	64	64			ACN=46	China (Yellow Sea)	Z-37
<i>Takifugu rubripes</i>	<i>Fugu</i>		44	10M + 12SM + 22 ST/A	66					Japan	M-134
<i>Takifugu rubripes</i>	<i>Fugu</i>		44	20 M/SM + 24 ST/A	64					China	Y-20, G-85
<i>Takifugu rubripes</i>	<i>Fugu</i>		44	12M + 6SM + 26A	62					China (Shandong)	W-6
<i>Takifugu vermicularis</i>	<i>radiatus</i>	F	44	8M + 14SM + 22 ST/A	66					Japan (Tachibana Bay)	M-134
<i>Takifugu xanthopterus</i>		M	44	8M + 14SM + 22 ST/A	66				ACN=46	Japan (Tachibana Bay)	M-134
<i>Tetraodon cutcutia</i>		F, M	42	16M + 12SM + 4ST + 10A	70	74		0.8 FCM	ACN=44	India (WB)	K-42, V-86
<i>Tetraodon fluviatilis</i>		F, M	42	8M + 14SM + 2ST + 18A	64	66		(0.8 FCM, 0.8 BFA)	ACN=42	India (WB)	B-3, B-75, H-13
<i>Tetraodon fluviatilis</i>		F, M	42	2M + 4SM + 2ST + 34A	48	50	4	(0.8* FCM)		(S. Asia)	M-19, O-48
<i>Tetraodon leopardus</i>	<i>Arothron</i>	F, M	40	14M + 14SM + 12 ST/A	68				ACN=42	India (Orissa)	C-62
<i>Tetraodon nigroviridis</i>			42	20 M/SM + 22ST	62	84		0.7 FCM, 1.0 FIA		(S. Asia)	F-24, J-21, H-41
<i>Tetraodon palembangensis</i>			42*					1.0 BFA		(SE Asia)	H-13
<b>Diodontidae</b>											
<i>Chilomycterus antennatus</i>			52	6M + 46 ST/A	58		2			Brazil (RJ)	S-110
<i>Chilomycterus spinosus</i>		F, M	52	16 M/SM + 36 ST/A	68					Brazil (RJ)	B-57
<i>Diodon holocanthus</i>			46	20 M/SM + 26 ST/A	66			1.6 FCM		Brazil	S-110, B-75
<i>Diodon liturosus</i>	<i>bleekeri</i>		46	6M + 6SM + 34 ST/A	58			1.7* FCM	ACN=46	Japan (Okinawa)	A-64, O-48
<b>Molidae</b>											
<i>Mola mola</i>		M	46	46A	46	46	2	(1.7, 1.9 FCM)	ACN=46	Japan (Chiba)	N-7, B-75

Table 7 Class SARCOPTERYGII (OSTEICHTHYES)

Table 7.1 Order COELACANTHIFORMES

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup>	Genome size (pg/cell)	Comments	Locality	Reference
Family/species	karyotype paper						NORs				
<b>Latimeriidae</b>											
<i>Latimeria chalumnae</i>			48	10M + 4ST + 18A + 16 MC	58	62		7.2 FD		Comoro	B-41, C-95

Table 7.2 Order CERATODONTIFORMES

A	B	C	D	E	F	G	H	I	J	K	L
Current scientific name of taxon	Reported in	Sex	2n	Karyotype	NF <sub>1</sub>	NF <sub>2</sub>	Ag <sup>-</sup>	Genome size (pg/cell)	Comments	Locality	Reference
Suborder/family/species	karyotype paper						NORs				
<b>Suborder Ceratodontoidei</b>											
<b>Ceratodontidae</b>											
<i>Neoceratodus forsteri</i>			32-38					(149.7* FD)		Australia	W-25, P-72
<i>Neoceratodus forsteri</i>	<i>Epiceratodus</i>		54	6M + 2SM + 26 ST/A + 20 MC	62	62		105.5 FCM, 109.2 FIA		Australia (Sydney)	R-101, G-85
<b>Suborder Lepidosirenoidei</b>											
<b>Lepidosirenidae</b>											
<i>Lepidosiren paradoxa</i>		F	38	38 M/SM	76	76		(161.1 FCM, 225.6* FD)		(S. America)	O-4, V-101, P-72
<i>Lepidosiren paradoxa</i>			38	38 M/SM/ST	76	76				Brazil (Manaus)	O-50
<i>Lepidosiren paradoxa</i>			38							Argentina	F-20
<b>Protopteridae</b>											
<i>Protopterus aethiopicus congicus</i>			34					80.2, 265.7* FD		Zaire	V-38, P-72
<i>Protopterus annectens</i>			34	14M + 10SM + 4ST + 6A	58	62				(Africa)	S-128
<i>Protopterus annectens</i>		F, M	34	16M + 6 SM + 12A	56	56	2	125.2 FCM		Nigeria	M-115
<i>Protopterus annectens annectens</i>			34	16M + 6SM + 12A	56	56		80.9 FD		Senegal	V-38
<i>Protopterus dolloi?</i>								130.8 FCM		(Africa)	V-101
<i>Protopterus dolloi</i>			68	36 M/SM + 32 ST/A	104			163.2 FD	4X	Zaire	V-38

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(Papers marked with an asterisk were not seen directly.)

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# Journal List

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Acad. Nat. Lincei, ser. 8 = Atti della Accademia Nazionale dei Lincei, Serie Ottava (Roma)  
Acta Amazonica  
Acta Biol. Colombiana = Acta Biologica Colombiana (Bogotá)  
Acta Biol. Debrecina = Acta Biologica Debrecina (Debrecen, Hungary)  
Acta Biol. Exp. Sinica = Acta Biologiae Experimentalis Sinica  
Acta Biol. Iugoslavica = Acta Biologica Iugoslavica  
Acta Cient. Venezolana = Acta Científica Venezolana  
Acta Genet. Sinica = Acta Genetica Sinica  
Acta Hydrobiol. = Acta Hydrobiologica  
Acta Hydrobiol. Sinica = Acta Hydrobiologica Sinica  
Acta Sci. Nat. Brno = Acta Scientiarum Naturalium Academiae Scientiarum Bohemoslovacae Brno,  
Nova series  
Acta Zool. = Acta Zoologica (Stockholm)  
Acta Zool. Fennica = Acta Zoologica Fennica (Helsinki)  
Acta Zool. Sinica = Acta Zoologica Sinica  
Acta Zootax. Sinica = Acta Zootaxonomica Sinica  
Advanced Aquarists Mag. = Advanced Aquarists Magazine  
Afr. Zool. = African Zoology  
AKA-KN = American Killifish Association-Killie Notes  
Amer. Natur. = The American Naturalist  
Amer. Zool. = American Zoologist  
An. Acad. Brasil. Cienc. = Anais da Academia Brasileira de Ciencia (Rio de Janeiro)  
An. Inst. Cienc. Mar Limnol. Univ. Nal. Autón. México = Anales del Instituto do Ciencias del Mar  
y Limnologia, Universidad Nacional Autónoma de México  
Anim. Sci. = Animal Science (Sofia)  
Animals and Nature = The Nature and Animals (Tokyo)  
Ann. Acad. Reg. Sci. Upsalien. = Annales Academiae Regiae Scientiarum Upsaliensis  
Ann. Mus. Royal Afr. Centrale = Annales. Musee Royal de l'Afrique Centrale  
Ann. Nat. Acad. Sci. India = Annals of the National Academy of Sciences India  
Ann. New York Acad. Sci. = Annals of the New York Academy of Sciences  
Ann. Rep. Biol. Res., Jeonbug Natn. Univ. = Annual Report of Biological Research, Jeonbug National  
University (Korea)  
Ann. Rep. Biwako Bunkakan = Annual Report of the Biwako Bunkakan (Japan)  
Antarctic Sci. = Antarctic Science  
Aquaculture  
Aquacult. Res. = Aquaculture Research  
Aquaria  
Aquarien Terrarien = Aquarien und Terrarien

## Aquarium

Aquarium-J. = The Aquarium Journal

Arch. FischWiss. = Archiv für Fischereiwissenschaft

Arch. Zootec. = Archivos de Zootecnia

Arquivos Mus. Bocage = Arquivos do Museu Bocage

Asian Fisheries Science (Manila)

Atti Soc. Ital. Sci. nat. Museo civ. Stor. nat. Milano = Atti della Società Italiano di Scienze Naturali e del Museo Civico di Storia Naturale di Milano

Aust. J. Mar. Freshw. Res. = Australian Journal of Marine and Freshwater Research

Basic Sci. Rev., Jeonbug Natn. Univ. = Basic Science Review, Jeonbug National University (Korea)

Bilješke notes, Inst. Oceanograf. Ribarstvo, Jugoslavija = Bilješke Notes. Instituto za Oceanografiju i Ribarstvo, Jugoslavija

Biochem. Syst. Ecol. = Biochemical Systematics and Ecology

Biol. Bratislava = Biologia, Bratislava

Biol. Bull. = Biological Bulletin

Biol. J. Linn. Soc. = Biological Journal of the Linnean Society

Biol. Morya = Biologiya Morya

Biol. Rev. = Biological Review of the Cambridge Philosophical Society

Biol. Zentralbl. = Biologisches Zentralblatt

BKA-Killi News = British Killifish Association-Killi News

BMC Evol. Biol. = BMC Evolutionary Biology

BMC Genetics

Bol. Inst. Espanol Oceanogr. = Boletin del Instituto Español de Oceanografía

Bol. Inst. Oceanogr. Univ. Oriente = Boletin del Instituto Oceanografico, Universidad de Oriente, Venezuela

Bol. Inst. Pesca = Boletim do Instituto de Pesca

Boll. Zool. = Bollettino di Zoologia

Bolm Inst. Oceanogr. S Paulo = Boletim do Instituto Oceanografica. São Paulo

Brazil. Archiv. Biol. Technol. = Brazilian Archives of Biology and Technology

Brazil. J. Biol. = Brazilian Journal of Biology

Brazil. J. Genet. = Brazilian Journal of Genetics

Bull. Aichi Univ. Educ. (Nat. Sci.) = Bulletin of Aichi University of Education (Natural History) (Japan)

Bull. Biogeogr. Soc. Japan = Bulletin of the Biogeographical Society of Japan

Bull. Dept. Educ. Utsunomiya Univ. = Bulletin of the Department of Education, Utsunomiya University (Japan)

Bull. Fac. Educ. Yamaguchi Univ. = Bulletin of the Faculty of Education, Yamaguchi University (Japan)

Bull. Fac. Fish. Hokkaido Univ. = Bulletin of the Faculty of Fisheries, Hokkaido University (Japan)

Bull. Fr. Pêche Piscic. = Bulletin Français de la Pêche et de la Pisciculture

Bull. Hiroshima Women's Univ. = Bulletin of the Hiroshima Women's University (Japan)

Bull. Inst. Basic. Sci., Inha Univ. = Bulletin of the Institute for Basic Science, Inha University (Korea)

Bull. Inst. Zool. Academia Sinica, Monograph = Bulletin of the Institute of Zoology, Academia Sinica, Monograph

Bull. Japan. Soc. Sci. Fish. = Bulletin of the Japanese Society of Scientific Fisheries

Bull. Korean Fish. Soc. = Bulletin of the Korean Fisheries Society

Bull. Mar. Sci. = Bulletin of Marine Science

Bull. Natl. Res. Inst. Aquaculture = Bulletin of National Research Institute of Aquaculture (Japan)

Bull. Natn. Sci. Mus. Tokyo = Bulletin of the National Science Museum, Tokyo

Bull. Natn. Sci. Mus. Tokyo, (A) = Bulletin of the National Science Museum, Tokyo. Series A  
(Zoology)

Bull. Sci. Yougoslavie, Sec. A = Bulletin Scientifique, Yougoslavie. Section A

Bull. Soc. Hist. Nat. Toulouse = Bulletin de la Société d'Histoire Naturelle de Toulouse

Calif. Fish Game = California Fish and Game

Can. J. Fish. Aquat. Sci. = Canadian Journal of Fisheries and Aquatic Sciences

Can. J. Genet. Cytol. = Canadian Journal of Genetics and Cytology

Can. J. Zool. = Canadian Journal of Zoology

Caribbean J. Sci. = Caribbean Journal of Science

Caryologia

Chinese J. Zool. = Chinese Journal of Zoology

Chrom. Inform. Serv. = Chromosome Information Service

Chrom. Res. = Chromosome Research

Chrom. Sci. = Chromosome Science

Chromatin

Chromosoma

Cien. Cultura = Ciência e Cultura

College Rev. College Liberal Arts Sci., Seoul Natn. Univ. = College Review of College of Liberal  
Arts and Sciences, Seoul National University (Korea)

Comp. Biochem. Physiol. = Comparative Biochemistry and Physiology

Contri. Sci. Nat. Hist. Mus. Los Angeles County = Contribution in Science. Los Angeles County  
Museum of Natural History

Copeia

Curr. Biol. = Current Biology

Curr. Opinion Genet. Develop. = Current Opinion in Genetics and Development

Curr. Sci. = Current Sciences (India)

Cybium

Cybium, 3rd ser.

Cytobios

Cytogenet. Cell Genet. = Cytogenetics and Cell Genetics

Cytogenet. Genome Res. = Cytogenetic and Genome Research

Cytogenetics

Cytologia

Cytometry

Dokl. Akad. Sci. USSR = Doklady Akademii Nauk SSSR

Doklady Acad. Sci. Ukrain. SSR, Ser. B = Doklady Akademii Nauk Ukrainskoy SSR, Ser. B

Dokl. Biol. Sci. = Doklady Biological Sciences

Doñana, Acta Vertebrata = Doñana - Acta Vertebrata

Environ. Biol. Fishes = Environmental Biology of Fishes

Environ. Ecol. = Environment and Ecology

Evolution

Exp. Cell Res. = Experimental Cell Research

Experientia

Fish Genet. Breed. Sci. = Fish Genetics and Breeding Science

Fish. Bull. = Fishery Bulletin

Fish. Sci. = Fisheries Science (Tokyo)

Fish. Sci. (China) = Fisheries Science (China)

- Folia Biol. (Krakow) = Folia Biologica (Kraków)  
Folia Zool. = Folia Zoologica (Brno)  
Freshwater Fish. = Freshwater Fisheries (China)  
Fujian Fish. = Fujian Fisheries (China)
- Gayana  
Gene  
Genen Phaenen  
Genet. Mol. Biol. = Genetics and Molecular Biology (Brazil)  
Genet. Mol. Res. = Genetics and Molecular Research (Brazil)  
Genet. Res. Camb. = Genetical Research, Cambridge  
Genet. Sel. Evol. = Genetics Selection Evolution  
Genetica  
Genetics  
Genetika = Russian Journal of Genetics  
Genetika, Acta Biol. Iugoslavica = Acta Biologica Iugoslavica, serija F, Genetika (Beograd)  
Genome  
Genome Res. = Genome Research  
Geobios  
God. Biol. Inst. Univ. Saraevu = Godišnjaka Biološkog Instituta Univerziteta u Sarajevu
- Hereditas  
Hereditas (Beijing)  
Heredity  
Hydrobiol. J. = Hydrobiological Journal (Gidrobiologichesky Zhurnal)  
Hydrobiologia
- Ichthyol. Explor. Freshwaters = Ichthyological Exploration of Freshwaters  
Ichthyol. Res. = Ichthyological Research (Japan)  
Ichthyologia = Acta Biologica Iugoslavica, Serija E, Ichthyologia  
Iden = Iden (Tokyo)  
In Vitro  
Ind. Biologist = Indian Biologist  
Ind. J. Anim. Sci. = Indian Journal of Animal Sciences  
Ind. J. Exp. Biol. = Indian Journal of Experimental Biology  
Ind. J. Zool. = Indian Journal of Zoology  
Ind. Vet. J. = Indian Veterinary Journal (Madras)  
Interciencia (Caracas)  
Intl. J. Acad. Ichthyol. = International Journal of Academy of Ichthyology (U.P., India)  
Issled. Fauny Morei = Issledovaniia Fauny Morei  
Ital. J. Zool. = The Italian Journal of Zoology
- J. Annamalai Univ. Sci. = Journal of the Annamalai University. Part B, Science (India)  
J. Aquaculture = Journal of Aquaculture (Korea)  
J. Beijing Normal Univ. (Nat. Sci.) = Journal of Beijing Normal University (Natural Science)  
J. Cytol. Genet. = The Journal of Cytology and Genetics (India)  
J. Dalian Fish. Univ. = Journal of Dalian Fisheries University (China)  
J. Dalian Fish. College = Journal of Dalian Fisheries College (China)  
J. Exp. Mar. Biol. Ecol = Journal of Experimental Marine Biology and Ecology.  
J. Exp. Zool. = The Journal of Experimental Zoology

- J. Fac. Sci. Hokkaido Univ., Ser. Zool. = Journal of the Faculty of Science, Hokkaido University, Ser. 6, Zoology (Japan)
- J. Fish Biol. = Journal of Fish Biology
- J. Fish. China = Journal of Fisheries of China
- J. Fish. Res. Board Can. = Journal of the Fisheries Research Board of Canada
- J. Fish. Sci. China = Journal of Fishery Sciences of China
- J. Fish. Sci. Technol. = Journal of Fisheries Science and Technology (Korea)
- J. FisheriesSciences.com = Journal of FisheriesSciences.com
- J. General Biol. = Journal of General Biology
- J. General Physiol. = The Journal of General Physiology
- J. Genet. = Journal of Genetics
- J. Heredity = The Journal of Heredity
- J. Ichthyol. = Journal of Ichthyology
- J. Inland Fish. Soc. India = Journal of the Inland Fisheries Society of India
- J. Liaoning Normal Univ. (Nat. Sci.) = Journal of Liaoning Normal University (Natural Science) (China)
- J. Mar. Biol. Ass. India = Journal of the Marine Biological Association of India
- J. Mar. Biol. Ass. U.K. = Journal of Marine Biological Association of the United Kingdom
- J. Morphol. = Journal of Morphology
- J. Ocean Univ. Qingdao = Journal of Ocean University of Qingdao (China)
- J. Shanghai Fish. Univ. = Journal of Shanghai Fisheries University (China)
- J. Shimonoseki Univ. Fish. = Journal of Shimonoseki University of Fisheries (Japan)
- J. Structural Functional Genomics = Journal of Structural and Functional Genomics
- J. Wuhan Univ. (Nat. Sci.) = Journal of Wuhan University (Natural Science Edition) (China)
- J. Xiamen Univ. (Nat. Sci.) = Journal of Xiamen University (Natural Science) (China)
- J. Yunnan Univ. = Journal of Yunnan University (China)
- J. Zhanjiang Fish. Coll. = Journal of Zhanjiang Fisheries College (China)
- J. Zhejiang College Fish. = Journal of Zhejiang College of Fisheries (China)
- J. Zool. Lond. = Journal of Zoology, London
- J. Zool. Syst. Evol. Res. = Journal of Zoological Systematics and Evolutionary Research
- Japan Women's Univ. J. = Journal of Japan Women's University
- Japan. J. Genetics = Japanese Journal of Genetics
- Japan. J. Ichthyol. = Japanese Journal of Ichthyology
- Korean J. Genet. = Korean Journal of Genetics
- Korean J. Ichthyol. = The Korean Journal of Ichthyology
- Korean J. Limnol. = Korean Journal of Limnology
- Korean J. Zool. = Korean Journal of Zoology
- La Kromosomo
- La Kromosomo, II = La Kromosomo, Series II
- Lat. Am. J. Aquat. Res. = Latin American Journal of Aquatic Research
- Life Sci. Adv. = Life Science Advances (India)
- Mar. Biol. = Marine Biology
- Mar. Freshwater Res. = Marine and Freshwater Research
- Mar. Sci. Monthly = Marine Sciences, Monthly (Tokyo)
- Mar. Sci. Bull. = Marine Science Bulletin (China)
- Marine Sciences (Beijing)
- Matsya (India)
- Medaka = The Fish Biology Journal Medaka (Japan)

- Mem. Hyogo Univ. Agricul. = Memoirs of the Hyogo University of Agriculture (Japan)  
 Mitt. Hamburg. Zool. Mus. Inst. = Mitteilungen aus dem Hamburgischen Zoologischen Museum und Institut  
 Mol. Phylogenet. Evol. = Molecular Phylogenetics and Evolution
- Nat. Acad. Sci. India, Ann. Num. = National Academy of Sciences India, Ann. Num.  
 Nat. Acad. Sci. Letters = National Academy Science Letters (Allahabad, India)  
 Nat. Hist. Mus. Stadt Bern, Jahrbuch = Naturhistorisches Museum der Stadt Bern, Jahrbuch  
 Naturalia = Naturalia, São Paulo  
 Naturaliste can. = Le Naturaliste Canadien  
 Nature  
 Neotrop. Ichthyol. = Neotropical Ichthyology  
 Notulae Naturae = Notulae Naturae of the Academy of Natural Sciences of Philadelphia  
 Nucleus = The Nucleus
- Occ. Pap. Calif. Acad. Sci. = Occasional Papers of the California Academy of Sciences  
 Occ. Pap. Mus. Zool. Univ. Michigan = Occasional Papers of the Museum of Zoology, University of Michigan  
 Oceanol. Limnol. Sinica = Oceanologia et Limnologia Sinica  
 Oikos
- Pakistan J. Zool. = Pakistan Journal of Zoology  
 Perspect. Cytol. Genet. = Perspectives in Cytology and Genetics (New Delhi)  
 Phil. Trans. R. Soc. London, (B) = Philosophical Transactions of the Royal Society of London, Ser. B  
 Physiol. Ecol. Japan = Physiology and Ecology Japan  
 Polar Biol. = Polar Biology  
 Postilla
- Proc. Ind. Acad. Sci., Sec. B = Proceedings of the Indian Academy of Sciences, Section B  
 Proc. Japan Acad. = Proceedings of the Japan Academy  
 Proc. Japan Acad., Ser. B = Proceedings of the Japan Academy. Ser. B, Physical and Biological Sciences  
 Proc. Japan. Soc. Syst. Zool. = Proceedings of the Japanese Society of Systematic Zoology  
 Proc. Louisiana Acad. Sci. = Proceedings of the Louisiana Academy of Sciences  
 Proc. Nat. Acad. Sci. India = Proceedings of the National Academy of Sciences, India  
 Proc. R. Soc. Lond., B = Proceedings of the Royal Society of London. Series B, Biological Sciences  
 Proc. Soc. Exper. Biol. Med. = Proceedings of the Society for Experimental Biology and Medicine  
 Proc. Zool. Inst. Leningrad = Proceedings of the Zoological Institute, Leningrad  
 Proc. Zool. Soc. Calcutta = Proceedings of the Zoological Society, Calcutta  
 Progress Modern Biol. = Progress of Modern Biology (Uspekhi Sovremennoi Biologii)  
 Progressive Fish-Culturist = The Progressive Fish-Culturist (Washington, D.C.)
- Radovi Anubih
- Rapp. Comm. Int. Mer. Médit. = Rapport du Commission International de la Mer Méditerranee  
 Rep. Mishima Res. Inst. Sci. Liv., Nihon Univ. = Report of the Mishima Research Institute of Sciences for Living, Nihon University (Japan)  
 Res. Bull. (N.S.) Panjab Univ. = Research Bulletin (N.S.) of the Panjab University (India)  
 Res. Rev. BioSciences (India) = Research and Reviews in BioSciences (India)  
 Rev. Biol. Trop. = Revista de Biología Tropical (San José)



Rev. Biol. Uruguay = Revista de Biología del Uruguay  
 Rev. Fish Biol. Fish. = Reviews in Fish Biology and Fisheries  
 Rev. fr. Aquariol. = Revue Française D'aquariologie  
 Rev. Hydrobiol. Trop. = Revista Hydrobiologia Tropical  
 Russian J. Genet. = Russian Journal of Genetics  
 Russian J. Mar. Biol. = Russian Journal of Marine Biology

Saber, Univ. Oriente, Venezuela = Saber, Universidad de Oriente, Venezuela  
 Sci. Culture = Science and Culture (Calcutta)  
 Sci. Rep. Res. Inst. Evol. Biol. = Science Report of the Research Institute of Evolutionary Biology  
 (Tokyo)  
 Sci. Mar. = Scientia Marina  
 Science  
 Sinozool. = Sinozoologia  
 Southwest. Nat. = The Southwestern Naturalist  
 Stain Technol. = Stain Technology  
 Swedish. J. Agric. Res. = Swedish Journal of Agricultural Research

Tansuigyo (Osaka)  
 Texas J. Sci. = The Texas Journal of Science  
 Texas Rep. Biol. Med. = Texas Reports on Biology and Medicine  
 TFH = Tropical Fish Hobbyist  
 Theor. Appl. Genet. = Theoretical and Applied Genetics  
 Trans. Amer. Fish. Soc. = Transactions of the American Fisheries Society  
 Trans. Chinese Ichthyol. Soc. = Transactions of the Chinese Ichthyological Society  
 Travaux Mus. Natl. Hist. Nat. "Grigore Antipa" = Travaux du Museum National d'Histoire  
 Naturelle "Grigore Antipa"  
 Trends Genet. = Trends in Genetics  
 Tropic Oceanology (Beijing)  
 Trudy Zool. Inst. = Trudy Zoologicheskogo Instituta  
 Tsitol. Genet. = Tsitologiya i Genetika  
 Tsitologiya  
 Turk. J. Biol. = Turkish Journal of Biology  
 Turk. J. Zool. = Turkish Journal of Zoology

Veterinar. Arhiv = Veterinarski Arhiv  
 Vidensk. Medd. Dansk naturh. Foren. = Videnskabelige Meddelelser fra Dansk Naturhistorisk  
 Forening  
 Vie Milieu = Vie et Milieu  
 Vopr. Ichthyol. = Voprosy Ikhtiologii

Z. Binnenfisch. = Zeitschrift für die Binnenfischerei  
 Z. Fisch. = Zeitschrift für Fischerei  
 Z. Fischkunde = Zeitschrift für Fischkunde  
 Z. Zool. Syst. Evol.-Forsch. = Zeitschrift für Zoologische Systematik und Evolutionsforschung  
 Zool. Abhand. Staat. Mus. Tier. Dresden = Zoologische Abhandlungen Staatliches Museum für  
 Tierkunde in Dresden  
 Zool. Anz. = Zoologischer Anzeiger  
 Zool. Mag. Japan = Zoological Magazine, Japan  
 Zool. Orientalis = Zoologica Orientalis  
 Zool. Res. = Zoological Research (Kunming, China)  
 Zool. Sci. = Zoological Science (Japan)  
 Zool. Zhurnal = Zoologicheskii Zhurnal

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