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ALFRED W. THOMSON[1] & LAWRENCE M. PAGE[2]

[1]*Florida Museum of Natural History, University of Florida, Gainesville, FL 32611 USA.*
E-mail: athomson@flmnh.ufl.edu
[2]*Florida Museum of Natural History, University of Florida, Gainesville, FL 32611 USA.*
E-mail: lpage1@ufl.edu

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Abstract

External morphological traits diagnostic for valid genera in the Asian catfish families Sisoridae and Erethistidae were identified from publications and the examination of specimens. Diagnoses based on external morphological traits are predicted to significantly facilitate taxonomic revisions in these families. Erethistidae contains six valid genera (*Ayarnangra, Caelatoglanis, Conta, Erethistes, Erethistoides, Pseudolaguvia*) and about 25 species. Sisoridae contains 16 valid genera (*Bagarius, Euchiloglanis, Exostoma, Gagata, Glaridoglanis, Glyptosternon, Glyptothorax, Gogangra, Myersglanis, Nangra, Oreoglanis, Parachiloglanis, Pareuchiloglanis, Pseudecheneis, Pseudexostoma, Sisor*) and about 144 species. Lists of valid species and their distributions are given for each genus.

Key words: *Ayarnangra, Bagarius, Caelatoglanis, Conta, Erethistes, Erethistoides, Euchiloglanis, Exostoma, Gagata, Glaridoglanis, Glyptosternon, Glyptothorax, Gogangra, Myserglanis, Nangra, Oreoglanis, Parachiloglanis, Pareuchiloglanis, Pseudecheneis, Pseudexostoma, Pseudolaguvia, Sisor*

Introduction

De Pinna (1996) recognized Erethistidae for six genera previously assigned to Sisoridae (*Conta, Erethistes, Erethistoides, Hara, Laguvia*, and *Pseudolaguvia*) following a phylogenetic analysis of species traditionally assigned to the Asian catfish families Sisoridae, Akysidae, and Amblycipitidae. He also diagnosed supra-generic clades including Erethistidae and Sisoridae, and subfamilies, tribes and subtribes of these families. He treated genera as terminal taxa in his phylogenetic analysis and described character states (primarily osteological), but he did not explicitly diagnose genera.

Our objective was to examine all publications providing descriptive information on sisorid and erethistid genera and, in conjunction with the examination of specimens, provide diagnoses for all described valid genera in Sisoridae and Erethistidae. A phylogenetic analysis of relationships among species in the two families would be preferable prior to diagnosing genera; however, no such analysis has been performed, and we have insufficient access to specimens to perform such an analysis. Meanwhile, even though some of the genera are poorly diagnosed and appear to lack traits to distinguish them from other genera, descriptions of new species in Sisoridae and Erethistidae continue

to appear (e.g., Ng & Kottelat, 2000; Britz & Ferraris, 2003; Ng, 2004a). We believe that an analysis and summary of the literature and descriptions of valid diagnostic traits, especially external morphological traits, will significantly facilitate accurate taxonomic revisions in these families. As currently recognized, Erethistidae contains six genera and about 25 species, and Sisoridae contains 16 genera and about 144 species (Table 1).

TABLE 1. Nominal and valid genera of Erethistidae and Sisoridae as recognized herein.

	Nominal genus	Valid genus
Erethistidae		
	Ayarnangra	*Ayarnangra*
	Caelatoglanis	*Caelatoglanis*
	Conta	*Conta*
	Erethistes	*Erethistes*
	Erethistoides	*Erethistoides*
	Hara	*Erethistes*
	Laguvia	*Erethistes*
	Pseudolaguvia	*Pseudolaguvia*
Sisoridae		
	Aglyptosternon	*Glyptothorax*
	Bagarius	*Bagarius*
	Callomystax	*Gagata*
	Chimarrichthys	*Euchiloglanis*
	Coraglanis	*Euchiloglanis*
	Euchiloglanis	*Euchiloglanis*
	Euclyptosternum	*Glyptothorax*
	Exostoma	*Exostoma*
	Gagata	*Gagata*
	Gangra	*Gogangra*
	Glaridoglanis	*Glaridoglanis*
	Glyptosternon	*Glyptosternon*
	Glyptosternum	*Glyptosternon*
	Glyptothorax	*Glyptothorax*
	Gogangra	*Gogangra*
	Myersglanis	*Myersglanis*
	Nangra	*Nangra*
	Oreoglanis	*Oreoglanis*
	Parachiloglanis	*Parachiloglanis*

to be continued.

TABLE 1 (continued).

	Nominal genus	Valid genus
Sisoridae		
	Paraglyptothorax	*Glyptothorax*
	Parapseudecheneis	*Pseudecheneis*
	Parexostoma	*Glyptosternon*
	Pareuchiloglanis	*Pareuchiloglanis*
	Paroreoglanis	*Oreoglanis*
	Propseudecheneis	*Pseudecheneis*
	Pseudecheneis	*Pseudecheneis*
	Pseudexostoma	*Pseudexostoma*
	Pteroglanis	*Glyptothorax*
	Pteropsoglanis	*Glyptothorax*
	Sisor	*Sisor*
	Sundagagata	*Glyptothorax*
	Superglyptothorax	*Glyptothorax*

Currently, the most comprehensive comparisons of genera are published keys. Keys to genera of Sisoridae (including erethistids) have been published by Jayaram (1979, 1981, 1999), Datta Munshi & Srivastava (1988), Talwar & Jhingran (1991), and Burgess (1989). The keys published by Jayaram (1979, 1981, 1999) and Talwar & Jhingran (1991) are all essentially the same and only include the genera found in the Indian region. They include all six of the erethistid genera, but only 12 sisorid genera are included. The key published by Datta Munshi & Srivastava (1988) includes only three erethistid genera and five sisorid genera. The key by Burgess (1989) includes all sisorid genera (then including erethistids) recognized at the time of its publication; however since its publication three new genera have been described, several of the genera recognized by Burgess are no longer considered valid, and other genera now recognized were not recognized by Burgess. Additionally, the species composition of several sisorid genera has been revised since the publication of this key, necessitating changes in diagnostic (and key) characteristics of these genera. More restrictive keys to genera were published by Hora and Silas (1952b) who, in their revision of the glyptosternoids, included a key recognizing six genera, and by Roberts and Ferraris (1998) who included a key diagnosing *Gagata*, *Gogangra* and *Nangra*.

Methods

Diagnoses and descriptions are based on published information and examination of specimens. Representatives of all genera except *Caelatoglanis*, *Glaridoglanis* and

Myersglanis were examined. Methods of counting fin rays follow Hubbs & Lagler (1974). Erethistids and sisorids typically have a small "spinelet" in front of a longer, typical spine of the dorsal fin. The "spinelet" is not included in the counts. In certain genera we describe the maxillary barbel base as being stiff. In these genera the maxillary bone (os maxillare) is longer than in other genera causing the lower part of the maxillary barbel to feel stiff.

Lists of valid species and synonyms follow recent literature. Our goal was to indicate the current status of all nominal species, not to evaluate the validity of each species. When the validity of a species has been treated inconsistently in the literature, it is treated here as valid. Type localities and type specimens listed follow Eschmeyer (1998) except drainage has been added to the type locality when it could be determined. Distributions of species were determined by examination of published information and museum specimens. Localities reported in the literature that we consider questionable and likely erroneous are listed as "reported from" at the end of the distribution account. Material examined (Appendix I) is listed by species and drainage followed by catalog number, number of specimens and size range of specimens in mm SL. When the drainage could not be determined, the country is listed. Museum abbreviations follow Eschmeyer (1998) with the addition of NCSM for North Carolina State Museum of Natural Sciences.

Erethistidae Bleeker, 1862

Externally, erethistids are easily distinguished from sisorids by having a pectoral girdle with a long coracoid process that extends well beyond the base of the pectoral fin (Fig. 1). The process can be felt through the skin in all erethistids and is visible externally in all erethistids except some specimens of *Pseudolaguvia*. Sisorids lack a prominent coracoid

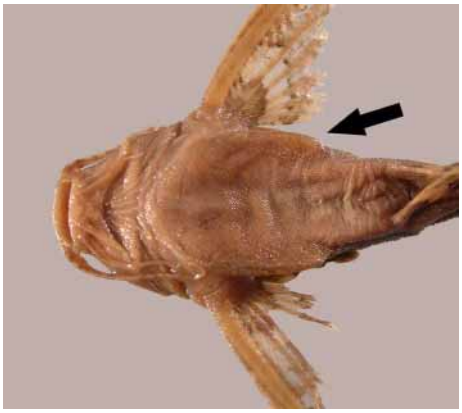

FIGURE 1. Coracoid process (arrow) on pectoral girdle in *Erethistes hara*, UMMZ 208748, 42.8 mm SL. The process extends well beyond the base of the pectoral fin and can be felt through the skin in all erethistids. It also is visible externally in all erethistids except some specimens of *Pseudolaguvia*. Sisorids lack a prominent coracoid process; when present, the process is only detectable as a small nub at the base of the pectoral fin.

process; when present, the process is only detectable as a small nub at the base of the pectoral fin. It is never long and prominent as in erethistids. Amblycipitids differ from erethistids in possessing a cuplike fold of skin in front of the pectoral fin, and a dorsal fin that is covered with thick skin and has only a weak spine. Erethistids lack a cuplike fold of skin in front of the pectoral fin, and have a dorsal fin with a strong spine and no thick covering of skin (de Pinna 1996). Akysids, including Parakysidae of Roberts, 1989, differ from erethistids in having the nostrils on each side of the head widely separated, with a barbel on the posterior nostril. Erethistids have nostrils close together, separated by a nasal barbel. Osteological traits distinguishing Amblycipitidae and Akysidae from erethistids are given by de Pinna (1996). Following are diagnoses and descriptions of valid genera of Erethistidae, with lists of included species and their geographic distributions. Genera are arranged alphabetically. Diagnostic traits are summarized in Table 2.

Ayarnangra Roberts, 2001

Fig. 2

Ayarnangra Roberts, 2001: 83. (Type species: *Ayarnangra estuarius* Roberts, 2001, by original designation). Gender masculine.

Diagnosis: No thoracic adhesive apparatus; granulate anterior margin on pectoral spine; slender body shape; smooth to granulate anterior margin on dorsal spine; papillate upper lip; moderate gill openings; 13–16 anal rays.

Ayarnangra is distinguished from all other erethistid genera by having 13–16 anal fin rays (vs. 8–12) and a granulate (vs. serrated) anterior margin on the pectoral spine. It is further distinguished from *Conta*, *Pseudolaguvia and Caelatoglanis* by the absence of a thoracic adhesive apparatus, from *Caelatoglanis* by having a papillate (vs. plicate) upper lip, from *Caelatoglanis* and *Erethistes* by having a more slender body (Fig. 2), from *Caelatoglanis* and *Pseudolaguvia* by having moderate gill openings (vs. wide, nearly meeting one another on the venter), and from *Conta* by having a granulate (vs. serrated) anterior margin on the dorsal spine and moderate gill openings (vs. extremely narrow gill openings not extending onto venter).

FIGURE 2. *Ayarnangra estuarius*, UF 148530, 38.6 mm SL.

TABLE 2. External traits diagnostic for genera of Erethistidae

	Conta	*Pseudolaguvia*	*Caelatoglanis*
Adhesive apparatus on thorax	Long; extends nearly to pelvic fin base	Short; not reaching nearly to pelvic fin base; with median depression	Short; not reaching nearly to pelvic fin base; without median depression
Gill openings	Extremely narrow; restricted to pectoral fin base	Wide; nearly meet one another on venter	Wide; nearly meet one another on venter
Anterior margin of pectoral spine	Serrations all directed toward tip of spine	Serrations all directed toward tip of spine	Serrations all directed toward tip of spine
Anterior margin of dorsal spine	Serrated	Smooth to granulate	Smooth to granulate
Body shape	Elongate (Fig. 4)	Elongate (Fig. 8)	Moderately elongate (Fig. 3)
Upper Lip	Papillate	Papillate	Plicate
Anal fin rays	9–10	8–10	8–10

continued.

	Erethistes	*Erethistoides*	*Ayarnangra*
Adhesive apparatus on thorax	Absent	Absent	Absent
Gill openings	Moderate; extend onto venter	Moderate; extend onto venter	Moderate; extend onto venter
Anterior margin of pectoral spine	Serrations point toward tip, arranged in divergent pairs, or outwardly directed and not divergent (Fig. 6a & b)	Serrations directed toward tip of spine distally and away proximally (Fig. 6c)	Granulate
Anterior margin of dorsal spine	Smooth to granulate	Smooth to granulate	Smooth to granulate
Body shape	Robust (Fig. 5)	Elongate (Fig. 7)	Elongate (Fig. 2)
Upper Lip	Papillate	Papillate	Papillate
Anal fin rays	8–12	9–11	13–16

Remarks: Roberts (2001) diagnosed *Ayarnangra* as a genus of Sisoridae.

Description: Dorsal fin with 1 spine, 6 rays; pectoral fin with 1 spine, 5–6 rays; 6 pelvic-fin rays, 13–16 anal-fin rays, first 7–8 rays simple; 16 principal caudal rays. Body elongate. Eyes very small, nostrils huge, much larger than eye. Palatal teeth absent. Maxillary barbel with well-developed membrane, soft base; extending slightly beyond

pectoral-fin spine origin. Bases of outer and inner mental barbels nearly parallel. Gill openings moderate; branchiostegal membranes broadly fused to isthmus. Pectoral girdle with large coracoid process externally visible. Pectoral-fin spine with finely granulated anterior edge, serrated posterior edge. Dorsal spine granulated anteriorly, with small serrations posteriorly. No thoracic adhesive apparatus. Paired fins non-plaited.

Distribution: Irrawaddy River drainage, Myanmar (Roberts, 2001).

Ayarnangra estuarius Roberts 2001

Ayarnangra estuarius Roberts 2001: 84, figs. 1–3. Type locality: Pathein Chaung (=Ngawan Chaung) near Pathein, lower Ayeyarwaddy [Irrawaddy] basin, Myanmar. Holotype: KUMF 3190. Paratypes: KUMF 3191 (23, 11 c&s), 3192 (1).

Distribution: Irrawaddy River drainage, Myanmar (Roberts, 2001).

Caelatoglanis Ng & Kottelat, 2005

Fig. 3

Caelatoglanis Ng and Kottelat, 2005: 14. (Type species: *Caelatoglanis zonatus* Ng & Kottelat, 2005, by original designation). Gender masculine.

Diagnosis (based, in part, on Ng & Kottelat 2005): Short thoracic adhesive apparatus without median depression; wide gill openings nearly meeting one another on venter; anterior margin of pectoral spine serrated with all serrations pointing toward tip of spine; smooth to granulate anterior margin on dorsal spine; plicate upper lip; 8–10 anal rays.

Caelatoglanis is distinguished from all other erethistids by having a plicate (vs. papillate) upper lip and a short thoracic adhesive apparatus (not much longer than broad vs. long and narrow in *Conta*, short and with a median depression in *Pseudolaguvia*, and absent in *Erethistes*, *Erethistoides* and *Ayarnangra*). *Caelatoglanis* is further distinguished from *Ayarnangra* by having 8–10 anal rays (vs. 13–16), from *Conta* by having a smooth or granulate (vs. serrated) anterior margin on the dorsal-fin spine and wide gill openings that nearly meet one another on the venter (vs. narrow, restricted to the pectoral-fin base), from *Conta*, *Pseudolaguvia*, *Erethistes* and *Ayarnangra* by having a wider body (Fig. 3), and from *Erethistes*, *Erethistoides* and *Ayarnangra* by having wide (vs. moderate) gill openings and serrations on the anterior margin of the pectoral spine that all point toward the tip of the spine (Table 2).

Description: Dorsal fin with strong spine, 6 rays; pectoral fin with strong spine, 6–7 rays; 6 pelvic-fin rays, 8–10 anal-fin rays. Head moderately compressed; body moderately elongate (Fig. 3). Skin tuberculate. Eyes small, in middle of head dorsally. Jaw teeth villiform, in bands; palatal teeth absent. Maxillary barbel extending to base of pectoral

spine, with well-developed membrane. Gill openings wide, almost meeting one other on venter. Pectoral girdle with long coracoid process. Pectoral spine serrated anteriorly and posteriorly. Dorsal spine smooth or granulate anteriorly and posteriorly. Thoracic adhesive apparatus consisting of longitudinal pleats of skin without a median depression. Paired fins non-plaited.

Distribution: Ataran River drainage, Myanmar (Ng & Kottelat, 2005).

FIGURE 3. *Caelatoglanis zonatus*, ZRC 49885, holotype, 38.6 mm SL; lateral and ventral views. Photograph by H. H. Ng.

Caelatoglanis zonatus Ng & Kottelat 2005

Caelatoglanis zonatus Ng & Kottelat 2005: 14, fig. 2. Type locality: Stream “Chon Son” between Kyondaw and Phadaw, about 20 km NW of Payathouzu [Ataran River drainage] (at border with Thailand), 15° 25’ N 98° 15’ E, Kayin State, Myanmar. Holotype: ZRC 49885, Paratypes: CMK 17787 (3), ZRC 49886 (3), CMK 17976 (4), UMMZ 243668 (2, 1 c&s), CMK 17952 (3).

Distribution: Ataran River drainage, Myanmar (Ng & Kottelat, 2005).

Conta Hora, 1950

Fig. 4

Conta Hora, 1950: 194. (Type species: *Pimelodus conta* Hamilton, 1822, by original designation). Gender feminine.

Diagnosis (based, in part, on Ng 2005b): Long and narrow (about 6 times as long as broad) thoracic adhesive apparatus; extremely narrow gill openings; slender body; serrated anterior margin on dorsal spine; serrations on anterior margin of pectoral spine pointing toward tip of spine; papillate upper lip; 9–10 anal rays.

FIGURE 4. *Conta conta*, UMMZ 208632, 50.0 mm SL; lateral and ventral views. Photograph by H. H. Ng.

Conta is distinguished from all other erethistids (and all sisorids) by the presence of a very long and narrow adhesive apparatus on its thorax. *Conta* is further distinguished from other erethistids by having extremely narrow gill openings (restricted to pectoral-fin base vs. gill openings extending onto venter), and by having a dorsal spine with the anterior margin serrated (vs. smooth or granulate). *Conta* is further distinguished from *Ayarnangra* by having 9–10 anal rays (vs. 13–16), from *Caelatoglanis* by having a papillate (vs. plicate) upper lip, and from *Erethistes*, *Erethistoides* and *Ayarnangra* by having serrations on the anterior margin of the pectoral spine that all point toward the tip of the spine (Table 2).

Description: Dorsal fin with strong spine, 4–5 rays; pectoral fin with strong spine, 5–7 rays; 6 pelvic-fin rays, 9–10 anal-fin rays plus rudimentary anterior ray. Head slightly depressed and flattened ventrally. Body elongate (Fig. 4); caudal peduncle long and narrow (Fig. 4). Skin tuberculate. Eyes small, dorsolateral. Villiform teeth in both jaws. Maxillary barbels short, less than length of head. Maxillary barbel with well-developed membrane, soft base. Branchiostegal membranes broadly fused to isthmus. Pectoral girdle with large coracoid process externally visible. Pectoral- and dorsal-fin spines serrated anteriorly and posteriorly. Elongate thoracic adhesive apparatus extends from gill openings nearly to pelvic fins. Paired fins non-plaited.

Distribution: Ganges and Brahmaputra drainages, India and Bangladesh (Jayaram, 1999; Ng, 2005b).

Conta conta (Hamilton 1822)

Pimelodus conta Hamilton 1822: 191, 378. Type locality: Mahamanda River [Ganges drainage], ne. Bengal. No types known.

Hara elongata Day 1872: 704. Type locality: Stream near Garrow Hills, Meghalaya, India. Holotype: ZSI 436. Synonymized with *Conta conta* by Hora (1950).

Distribution: Ganges and Brahmaputra drainages, India and Bangladesh (Hora, 1950 (in part); Tilak, 1987; Ataur Rahman, 1989; Jayaram, 1999 (in part?); Ng, 2005b). Prashad & Mukerji (1929) reported this species from Indawgyi Lake, Irrawaddy drainage, but this is likely a misidentification of *Erethistes filamentosus*.

Conta pectinata Ng 2005

Conta pectinata Ng 2005b: 24, figs. 1–2. Type locality: Dibrugarh [Brahmaputra drainage], Assam, India. Holotype: ZRC 49672. Paratypes: UMMZ 234675 (1), ZRC 49673 (2).

Distribution: Brahmaputra drainage, India (Ng, 2005b).

Erethistes Müller & Troschel, 1849

Fig. 5

Erethistes Müller & Troschel, 1849: 12. (Type species: *Erethistes pusillus* Müller & Troschel, 1949, by monotypy. Originally proposed as a subgenus of *Bagrus*. Date may be 1845 as given by Kottelat, 1983). Gender masculine.

Hara Blyth, 1860: 152. (Type species: "*Hara buchanani* nobis; *Pimelodus hara*, B. H." [= *Pimelodus hara* Hamilton, 1822], by original designation). Gender feminine.

Laguvia Hora, 1921b: 739. (Type species: *Pimelodus asperus* McClelland, 1844, by subsequent designation. Type designated by Jordan, 1923). Gender feminine.

Diagnosis: No thoracic adhesive apparatus; robust (vs. slender) body; 8–12 anal rays; anterior margin of pectoral spine with serrations all pointing toward tip of spine, or arranged in divergent pairs, or outwardly directed and not divergent; smooth to granulate anterior margin on dorsal spine; papillate upper lip; 8–12 anal rays.

Erethistes is distinguished from *Erethistoides* by its more robust body (Fig. 5), and by the direction of the serrations on the anterior margin of the pectoral spine: all serrations point toward the tip, are arranged in divergent pairs, or are outwardly directed and not divergent (Fig. 6a & b); in *Erethistoides*, the serrations point toward the base of the spine in the proximal half and toward the tip in the distal half (Fig. 6c). *Erethistes* is distinguished from *Ayarnangra* by having 8–12 (vs. 13–16) anal-fin rays, a serrated (vs. granulate) anterior margin on the pectoral spine, and a more robust body (Fig. 5). *Erethistes* is distinguished from *Conta, Caelatoglanis* and *Pseudolaguvia* by the absence of a thoracic adhesive apparatus and by having moderate gill openings (vs. narrow and restricted to pectoral-fin base in *Conta*, and wide and nearly meeting on the venter in *Caelatoglanis* and *Pseudolaguvia*). It is further distinguished from *Conta* by having a smooth to granulate (vs. serrated) anterior margin on the dorsal spine, and from *Caelatoglanis* by having a papillate (vs. plicate) upper lip.

Description: Dorsal fin with strong spine, 5–6 rays; pectoral fin with strong spine, 5 rays; 6 pelvic-fin rays; 8–12 anal-fin rays. Head large, broad; snout conical. Body moderately short, flattened (Fig. 5). Skin tuberculate or smooth. Eyes small to moderate, dorsolaterally situated slightly posterior to middle of head. Teeth in upper jaw villiform, arranged in three to four series; outer series more elongated. Teeth in lower jaw minute, scattered, arranged in crescent-shaped patch; palatal teeth absent. Maxillary barbel with well-developed membrane, soft base. All barbels annulated with black rings. Gill moderate extend onto venter; branchiostegal membranes broadly fused to isthmus. Pectoral girdle with long coracoid process. Pectoral spine serrated anteriorly and posteriorly. Dorsal spine smooth to granulated anteriorly, serrated posteriorly. No thoracic adhesive apparatus. Paired fins non-plaited.

Remarks: Hora (1950) restricted *Erethistes* to "forms in which the denticles on the outer edge of the pectoral spine are divergent" and recognized *Hara* for species in which the denticles on the outer edge of the pectoral spine "are pointed in one direction (backwards)". Kottelat (1983) described *Erethistes maesotensis* with denticles on the anterior edge of the pectoral spine "being outwardly directed and not divergent," placing it in *Erethistes* because "none of the differences between *E. maestotensis* and *E. pusillus* justify separating them at the generic level." We agree with the view that the direction of the denticles on the anterior edge of the pectoral spine is an insufficient characteristic on which to separate genera. We have found no other differences to justify recognizing *Hara* and place it in the synonymy of *Erethistes.*

Ng & Kottelat (2005) synonymized *Laguvia* with *Hara*; both herein become synonyms of *Erethistes*. Generic assignments of species described in *Laguvia* are discussed by Ng & Kottelat (2005).

Distribution: Ganges and Brahmaputra drainages in northern India and Nepal, east and south to the Salween drainage on the border of Myanmar and Thailand (Kottelat, 1983; Jayaram, 1999).

FIGURE 5. *Erethistes hara*, UMMZ 208748, 42.8 mm SL.

Erethistes filamentosus (Blyth 1860)

Hara filamentosa Blyth 1860: 152. Type locality: Tenasserim [Sittang River drainage], Myanmar. No types known.

Distribution: Irrawaddy, Sittang and Salween drainages, Myanmar (Blyth, 1860; Misra, 1976; Jayaram, 1981). We report this species from the Rangoon River drainage in Myanmar based on examination of specimens.

Erethistes hara (Hamilton 1822)

Pimelodus hara Hamilton 1822: 190, 378. Type locality: Hooghly River south of Ranaghat, India. Neotype: UMMZ 244697. Neotype designated by Ng & Kottelat (2005).

Pimelodus asperus McClelland 1844: 404, pl. 24 (fig. 2). Type locality: Hooghly River south of Ranaghat, India. Neotype: UMMZ 244697. Neotype designated by Ng & Kottelat (2005). Synonymized with *Hara hara* (= *Erethistes hara*) by Ng & Kottelat (2005).

Hara saharsai Datta Munshi & Srivastava 1988: 265, fig. 5. Type locality: Kosi Belt [Ganges drainages], n. Bihar, India. Syntypes: Bhagalpur Univ., Dept. Zool. Mus. 67 (13). Also appeared as new in Srivastava & Datta Munshi in Srivastava 1989:121, fig. 1. Synonymized with *Hara hara* (= *Erethistes hara*) by Talwar & Jhingran (1991).

Distribution: Ganges, Brahmaputra and Irrawaddy drainages, northeast India, Bangladesh, Nepal and Myanmar (Jayaram, 1981; Lipton, 1985; Ataur Rahman, 1989; Mamnur Rashid

et al., 1997). Most reports from Myanmar appear to be based on *Erethistes filamentosus*. We have examined specimens from the Brahmaputra drainage in Bangladesh, and the Irrawaddy drainage in northern Myanmar.

FIGURE 6. Pectoral-spine ornamentation in *Erethistes* and *Erethistoides*. a, *Erethistes pusillus*, UMMZ 208991; b. *Erethistes jerdoni*, AMNH 58394; c. *Erethistoides* sp., CAS 50191.

Erethistes horai (Misra 1976)

Hara horai Misra 1976: 245, pl. 9 (figs. 1–3). Type locality: Terai and Duars [Brahmaputra drainage], northern Bengal. Neotype: ZSI FF955 [ex. ZSI F11390/1]. Neotype designated by Tilak & Talwar (1976).

Distribution: Brahmaputra drainage, northeast India (Mamnur Rashid *et al.*, 1997; Jayaram, 1999).

Erethistes jerdoni (Day 1870)

Hara jerdoni Day 1870a: 39, pl. 4 (figs. 2a–c). Type locality: Sylhet dist., [Brahmaputra drainage] Bangladesh. Syntypes: (2) ZSI 431 (1).

Distribution: Ganges and Brahmaputra drainages, northeast India, Bangladesh (Hora, 1950; Husain & Tilak, 1978; Ataur Rahman, 1989; Talwar & Jhingran, 1991).

Erethistes maesotensis Kottelat 1983

Erethistes maesotensis Kottelat 1983: 71, fig. 1. Type locality: Mae Nam Moei, 5 km west of Mae Sot, 16°41'N, 98°31'E, [Salween drainage] Thailand. Holotype: MHNG 2096.63. Paratypes: MHNG 2150.05 (1), 2150.05 (1).

Distribution: Mae Nam Moei, a tributary of the Salween River near Mae Sot on the Thai Burmese border (Kottelat, 1983; Kottelat, 1989).

Erethistes pusillus Müller & Troschel 1849

Erethistes pusillus Müller & Troschel 1849: 12, pl. 1 (fig. 2). Type locality: Assam [Brahmaputra drainage]. Holotype: ZMB 3102.

Distribution: Ganges and Brahmaputra drainages Northeast India (Hora, 1950; Motwani *et al.*, 1962; Ataur Rahman, 1989; Mamnur Rashid *et al.*, 1997; Jayaram, 1999). Hora (1950) lists specimens from Tenasserim, southern Myanmar. Kottelat (1989) reported its distribution in the Salween drainage, Myanmar. Keishing & Vishwanath (1999) listed it as questionable from the Irrawaddy River drainage.

Erethistes serratus (Vishwanath & Kosygin 2000)

Hara serratus Vishwanath & Kosygin 2000: 143, figs. 2–5. Type locality: Jiri River [Brahmaputra drainage] at Jiribam, Manipur, India. Holotype: MUMF 2508. Paratypes: MUMF 2507 (1), 2509 (1).

Distribution: Barak and Jiri Rivers, Brahmaputra drainage, Manipur, India (Vishwanath & Kosygin 2000).

Erethistoides Hora, 1950

Fig. 7

Erethistoides Hora, 1950: 190. (Type species: *Erethistoides montana* Hora, 1950, by original designation). Gender masculine.

Diagnosis: No thoracic adhesive apparatus; serrations on anterior margin of pectoral spine directed toward tip of spine distally and away proximally; slender body; smooth to granulate anterior margin on dorsal spine; moderate gill openings; papillate upper lip; 9–11 anal rays.

Erethistoides is diagnosed from all other erethistids by having the anterior margin of the pectoral spine with serrations directed toward the tip of the spine distally and away from the tip proximally (Fig. 6c). It is further distinguished from *Erethistes* by its more slender body (Fig. 7), from *Ayarnangra* by having 9–11 anal-fin rays (vs. 13–16), from *Conta*, *Caelatoglanis* and *Pseudolaguvia* by the absence of a thoracic adhesive apparatus and by having moderate gill openings (vs. narrow and restricted to the pectoral-fin base in *Conta*, and wide and nearly meeting on the venter in *Caelatoglanis* and *Pseudolaguvia*). It is further distinguished from *Conta* by having a smooth to granulate (vs. serrated) anterior margin on the dorsal spine, and from *Caelatoglanis* by having a papillate (vs. plicate) upper lip and a more slender body.

Description: Dorsal fin with strong spine, 5 rays; pectoral fin with strong spine, 6 rays; 6 pelvic-fin rays; 9–11 anal-fin rays. Depressed, triangular head; elongate, compressed body (Fig. 7). Skin tuberculate or smooth. Eyes small to moderate, dorsolaterally and situated in posterior half of head. Jaw teeth villiform, in bands; palatal teeth absent. Maxillary barbel longer than head, with well-developed membrane. Gill openings moderate, extend onto venter; branchiostegal membranes broadly fused to isthmus. Pectoral girdle with long coracoid process. Pectoral-fin spine serrated anteriorly and posteriorly. Dorsal spine smooth to anteriorly, serrated posteriorly. No thoracic adhesive apparatus. Paired fins non-plaited.

FIGURE 7. *Erethistoides montana*, UMMZ 234715, 34.1 mm SL.

Remarks: Ng (2005c) questioned the utility of the pectoral spine morphology as a useful diagnostic character for *Erethistoides*, noting that some of the serrations on the anterior edge of the pectoral spine in some specimens of *Erethistes filamentosa* are directed toward the tip of the spine distally (as in *Erethistoides*). Additionally, he identified four apomorphies diagnosing *Erethistoides*: 1) neural spines of the first eight post-Weberian vertebrae strongly depressed, inflated posteriorly, and depressed in a groove formed by the prezygapophyses of the vertebrae immediately posterior; 2) an enlarged

maxilla that is almost as long as the palatine; 3) a fan-shaped mesethmoid lacking distinct cornua (shared with *Ayarnangra*); 4) a strongly overhanging snout with premaxillary tooth plate completely exposed when mouth is closed (shared with *Ayarnangra*).

Distribution: Brahmaputra and Meghna drainages, northern India and Nepal (Ng & Edds 2005a).

Erethistoides ascita Ng & Edds 2005

Erethistoides ascita Ng & Edds 2005a: 240, figs. 1, 2a. Type locality: Mechi River at Bhadrapur, 26°32'17.9"N, 88°06'06.1"E. [Ganges drainage], Bhadrapur, Jhapa, Nepal. Holotype: KU 35016. Paratypes: KU 29136 (1), KU 29173 (9), KU 29365 (10).

Distribution: Mechi and Kosi River systems, Ganges drainage, Nepal (Ng & Edds 2005a).

Erethistoides cavatura Ng & Edds 2005

Erethistoides cavatura Ng & Edds 2005a: 243, figs. 2b, 3b, 5 [Ichthyol. Explor. Freshwaters; ref. 28333]. Dhungre R. at Sauraha, Chitawan, Nepal. Holotype: OSUS 15572. Paratypes: OSUS 15554 (2), OSUS 15856 (1), OSUS 16181 (1), OSUS 16992 (2).

Distribution: Rapi River system, Ganges drainage, Nepal (Ng & Edds 2005a).

Erethistoides montana Hora 1950

Erethistoides montana Hora 1950: 191, pl. 1 (figs. 10–12). Type locality: Streamlets near Tangla [Brahmaputra drainage], Darrang dist., Assam, India. Holotype: ZSI F314/2.

Distribution: Brahmaputra and Meghna drainages, northeast India (Hora, 1950; Motwani *et al.*, 1962; Jayaram & Singh, 1977; Mamnur Rashid *et al.*, 1997; Jayaram, 1999; Barman, 2002; Ng, 2005c).

Erethistoides pipri Hora 1950

Erethistoides montana pipri Hora 1950: 193, pl. 1 (figs. 7–9). Type locality: Rihand R at Pipri. [Ganges drainage], Mirzapur dist., Uttar Pradesh, India. Holotype: ZSI F315/2.

Distribution: Son River system, Ganges drainage, India (Hora, 1950; Motwani & David, 1957; Jayaram, 1999; Ng, 2005c).

***Erethistoides sicula* Ng 2005**

Erethistoides sicula Ng 2005c: 2, fig. 1. Type locality: Schutunga River (tributary of the Mansai River) at Ansole, 26°22'24"N, 89°11'17"E. [Brahmaputra drainage], West Bengal, India. Holotype: UMMZ 243718. Paratypes: UMMZ 243647 (12).

Distribution: Brahmaputra drainage, northeast India (Ng, 2005c).

***Pseudolaguvia* Misra, 1976**
Fig. 8

Pseudolaguvia Misra, 1976: 253. Type species: *Glyptothorax tuberculatus* Prashad & Mukerji, 1929, by original designation. Gender feminine.

Diagnosis (based, in part, on Ng 2005d): Short thoracic adhesive apparatus with median depression; wide gill openings nearly meeting one another on venter; serrations on anterior margin of pectoral spine pointing toward tip; smooth to granulate anterior margin on dorsal spine; slender body; papillate upper lip; 8–10 anal rays.

Pseudolaguvia is diagnosed from all other erethistids by having a thoracic adhesive apparatus with a median depression (vs. lacking a thoracic adhesive apparatus or having an apparatus without a median depression) and from all other erethistids except *Caelatoglanis* by having wide gill openings that nearly meet one another on the venter. *Pseudolaguvia* is further distinguished from *Conta* by having a smooth or granulate (vs. serrated) anterior margin on the dorsal-fin spine, from *Caelatoglanis* by having a papillate (vs. plicate) upper lip and a more slender body (Fig. 8), from *Ayarnangra* by having 8–10 (vs. 13–16) anal rays, from *Erethistes* by having a more slender body, and from *Erethistoides* by having the serrations on the anterior margin of the pectoral spine all directed toward the tip of the spine (vs. directed toward the tip of the spine distally and away from the tip proximally).

Description: Dorsal fin with strong spine, 5–6 rays; pectoral fin with strong spine, 6–8 rays; 6–10 pelvic-fin rays, 8–10 anal-fin rays. Head and body slightly depressed; body elongate (Fig. 8). Skin tuberculate. Eyes small, dorsal, in middle of head. Jaw teeth villiform, in bands; palatal teeth absent. Maxillary barbel usually shorter than head, with well-developed membrane, soft base. Barbels annulated with black rings. Gill openings wide, almost meeting each other on venter. Pectoral girdle with long coracoid process. Pectoral-fin spine serrated anteriorly and posteriorly. Dorsal spine smooth or granulate anteriorly, smooth or serrated posteriorly. Thoracic adhesive apparatus present, but may be poorly developed. Paired fins non-plaited.

Distribution: Ganges and Brahmaputra drainages, India, Nepal and Bangladesh, east and south to the Sittang drainage, Myanmar (Jayaram, 1999; Britz & Ferraris, 2003; Ng, 2005d).

FIGURE 8. *Pseudolaguvia tenebricosa*, USNM 374989, paratype, 28.6 mm SL; lateral and ventral views.

Pseudolaguvia ferula Ng 2006

Pseudolaguvia ferula Ng 2006a: 60, figs. 1–3, 5. Type locality: Tista River at Tista barrage, 26°45'10"N, 88°34'11"E, [Brahmaputra drainage] West Bengal, India. Holotype: UMMZ 245985. Paratypes: UMMZ 245986 (12), ZRC 50398 (2).

Distribution: Brahmaputra drainage, northeast India (Ng, 2006a).

Pseudolaguvia foveolata Ng 2005

Pseudolaguvia foveolata Ng 2005d: 174, figs. 1–2, 4A. Type locality: Tista River at Tista barrage, 26°45'10"N, 88°34'11"E, [Brahmaputra drainage] West Bengal, India. Holotype: UMMZ 244867.

Distribution: Brahmaputra drainage, northeast India (Ng, 2005d).

Pseudolaguvia inornata Ng 2005

Pseudolaguvia inornata Ng 2005e: 36, fig. 1. Type locality: Koilla Khal (creek), 10 km E of Feni-Chittagong highway, 26°55'N, 91°36'E, [Brahmaputra drainage] Chittagong district, Bangladesh. Holotype: UMMZ 245580. Paratypes: UMMZ 209010 (3 + 1 c&s).

Distribution: Brahmaputra drainage, Bangladesh (Ng, 2005e).

Pseudolaguvia kapuri (Tilak & Husain 1975)

Laguvia ribeiroi kapuri Tilak & Husain 1975: 1, figs. 1–3. Type locality: Padhoi River near Kalsia Ghat [Ganges drainage], Saharanpur, Uttar Pradesh, India. Holotype: ZSI/NRS 836. Paratypes: ZSI/NRS 837 (22), 838 (1).

Distribution: Ganges drainage, India and Nepal (Tilak & Husain, 1975; Gupta, 1982; Jayaram, 1999; Karmakar, 2000).

Pseudolaguvia muricata Ng 2005

Pseudolaguvia muricata Ng 2005e: 41, fig. 3. Type locality: Rangapani Khal (creek), 6 km NNW of Jaintapur on Sylhet-Shilling highway, 25°10'N, 92°6'E, [Brahmaputra drainage] Sylhet district, Bangladesh. Holotype: UMMZ 245581. Paratypes: NRM 52292 (2), UMMZ 208909 (1), UMMZ 208933 (8), ZRC 50382 (3), CAS 222658 (2), UMMZ 208993 (5).

Distribution: Brahmaputra drainage, Bangladesh (Ng, 2005e).

Pseudolaguvia ribeiroi (Hora 1921)

Laguvia ribeiroi Hora 1921b: 741, pl. 29 (fig. 3). Type locality: Khoila River, trib. of Tista at Jalpaiguri [Brahmaputra drainage], Darjeeling dist., Himalayas, West Bengal, India. Holotype: ZSI F 10086/1.

Distribution: Ganges and Brahmaputra drainages, India, Nepal and Bangladesh (Motwani & David, 1957; Motwani *et al.*, 1962; Lipton, 1985; Ataur Rahman, 1989; Shrestha, 1990).

Pseudolaguvia shawi (Hora 1921)

Glyptothorax shawi Hora 1921b: 740, pl. 29 (fig. 2). Type locality: Mahanadi River below Darjeeling [Brahmaputra drainage], West Bengal, India. Holotype: ZSI F10085/1.

Distribution: Brahmaputra drainage India and Bangladesh (Hora, 1921b; Hora & Gupta, 1941a; Ataur Rahman, 1989; Talwar & Jhingran, 1991; Sen, 1995).

Pseudolaguvia tenebricosa Britz & Ferraris 2003

Pseudolaguvia tenebricosa Britz & Ferraris 2003: 2, fig. 1a–e. Type locality: 13 mi. east of Taungoo, 19°01'11"N, 96°35'33"E, Pathe Chaung, hill stream [Sittang drainage], Kayin Division, Myanmar, elev. 39 m. Holotype: USNM 373293. Paratypes: USNM 374987 (14).

Distribution: Sittang drainage, Myanmar (Britz & Ferraris, 2003).

Pseudolaguvia tuberculatus (Prashad & Mukerji 1929)

Glyptothorax tuberculatus Prashad & Mukerji 1929: 182, pl. 7 (fig. 2); fig. 4. Type locality: Sankha, a large hill-stream, midway between Kamaing and Mogaung [Irrawaddy drainage], Myitkyina dist., upper Myanmar [Burma]. Holotype: ZSI F10876/1.

Distribution: Irrawaddy drainage, Myanmar (Prashad & Mukerji, 1929).

Species *incertae sedis*

Laguvia manipurensis (Arunkumar 2000)

Laguvia manipurensis Arunkumar 2000: 194, fig. 1. Type locality: Lairaok Maru stream near Moreh, 110 km from Imphal City, Yu River System [Irrawaddy drainage], Manipur, India. Holotype: MUMF 3001/1A. Paratypes: MUMF 3001/4A (4). Manipur, northeast India (Arunkmar, 2000).

Distribution: Irrawaddy River drainage, Manipur, India (Arunkumar, 2000).

Remarks: This species cannot be unambiguously assigned to any erethistid genus based on the original description (Ng & Kottelat, 2005).

Sisoridae Bleeker, 1858

In contrast to erethistids, sisorids lack a prominent posterior coracoid process on the pectoral girdle. When present, the coracoid process is only detectable as a small nub at the base of the pectoral fin, and is never long and prominent as in erethistids. Amblycipitids

differ from sisorids in possessing a cuplike fold of skin in front of the pectoral fin; sisorids lack the fold of skin. Akysids, including Parakysidae of Roberts, 1989 (de Pinna 1996), differ from sisorids in having the nostrils on each side of the head widely separated, and a barbel on each posterior nostril. Sisorids have nostrils close together, separated by a nasal barbel (except nasal barbel absent in *Sisor*, nostrils separated by a flap of skin).

TABLE 3. External traits diagnostic for major clades of Sisoridae.

	Sisorinae	Glyptosterninae; Glyptothoracini	Glyptosterninae, Pseudecheneidina	Glyptosterninae; Glyptosternina ("glyptosternoids")
Genera	*Bagarius* *Gagata* *Gogangra* *Nangra* *Sisor*	*Glyptothorax*	*Pseudecheneis*	*Euchiloglanis* *Exostoma* *Glaridoglanis* *Glyptosternon* *Myersglanis* *Oreoglanis* *Parachiloglanis* *Pareuchiloglanis* *Pseudexostoma*
Adhesive apparatus on thorax	No	Yes	Yes	No
Grooves on adhesive apparatus	-	Parallel or oblique to axis of body	Transverse to axis of body	-
Adhesive apparatus on paired fins	No	Variable	Yes	Yes

Osteological traits used by de Pinna (1996) to diagnose Sisoridae from other Asian catfishes included lateral ethmoid with narrow lateral extensions directed posteriorly alongside lateral margin of frontals (coded as missing in all Sisorini), extra cartilaginous element anterior to last basibranchial (reversed in Nangrina and Glyptosternina; convergent in Parakysinae and Luguviini, sensu de Pinna (1996)), distal tip of os suspensorum closely linked and/or adpressed to ventral process of complex centrum, and posterior portion of Weberian lamina with lateral extension alongside anterior margin of parapophysis of fifth vertebra.

Following are diagnoses and descriptions of valid genera of Sisoridae, with lists of included species and their geographic distributions. Diagnostic traits are summarized in Tables 3–7. In identifying external traits to diagnose genera, it is useful to start with the four major clades diagnosed by de Pinna (1996) (Table 3), and then to examine traits within each of these major clades (Tables 4–7).

TABLE 4. External traits diagnostic for genera of Sisorinae

	Sisor	*Bagarius*	*Gagata*	*Gogangra*	*Nangra*
Bony plates from dorsal fin to caudal fin base	Yes	No	No	No	No
Uppermost caudal rays long; more than half length of body	Yes	No	No	No	No
Adipose fin with spine	Yes	No	No	No	No
Teeth in lower jaw	Minute; essentially a roughened bony plate	Heterodont; 2–3 outer rows of small conical teeth, 1–2 inner rows of larger conical teeth	Homodont; several rows of small conical teeth	Homodont; 2–3 rows of small conical teeth	Homodont; 2–3 rows of small conical teeth
Nasal barbel length	Barbel absent	Less than eye diameter	Less than eye diameter	Less than eye diameter	Much longer than eye diameter (extends at least to eye)
Branchiostegal membranes	Broadly fused to isthmus	Free from isthmus	Broadly fused to isthmus	Free from isthmus	Free from isthmus
Head	Depressed	Depressed	Compressed	Moderately depressed	Depressed
Palatal teeth	No	No	No	No	Yes
Maxillary barbel length	Not reaching pectoral fin base	Reaching slightly past pectoral fin base	Reaching pectoral fin base	Reaching pectoral fin base	Reaching at least pelvic fin base
Serrations on anterior margin of pectoral spine	Yes; large	No	No	Yes; small	No
Relative positions of outer and inner mental barbel origins	Far apart; inner barbel posterior to outer barbel	Far apart; inner barbel anterior to outer barbel	Close together; nearly in a straight line	Far apart; inner barbel anterior to outer barbel	Variable
Maxillary barbel membrane	Well-developed	Well-developed	Not well-developed	Not well-developed	Well-developed

A. Sisorinae Bleeker, 1858

Genera within Sisorinae are easily distinguished from other sisorids by the absence of adhesive organs on the thorax or paired fins. Osteological traits used by de Pinna (1996) to diagnose Sisorinae include distal tip of maxilla pointed (reversed in *Sisor*), epioccipital with slender posterior process (reversed in *Sisor*), and posterodorsal corner of Weberian lamina with pointed process directed posteriorly. Five genera are recognized within Sisorinae. (Table 4).

Bagarius Bleeker, 1853

Fig. 9

Bagarius Bleeker, 1853: 121. (Type species: *Pimelodus bagarius* Hamilton, 1822, by monotypy). Gender masculine.

Diagnosis (based, in part, on Roberts 1983): Markedly heterodont teeth in lower jaw; branchiostegal membranes free from isthmus; anterior margin of pectoral-fin spine without serrations; well-developed maxillary barbel membrane; outer and inner mental barbels widely separated, origin of inner barbels anterior to origin of outer barbels; short nasal barbels; palatal teeth absent.

Bagarius is distinguished from all other genera in Sisorinae by having markedly heterodont teeth in the lower jaw. Teeth are present in two or three outer rows of relatively numerous, close-set conical teeth, and one or two inner rows of less numerous, widely separated, and much larger conical teeth (vs. dentition of the lower jaw consisting of only small conical teeth, or a roughened bony plate). *Bagarius* is further distinguished from *Gagata* by having the branchiostegal membranes free from the isthmus (vs. broadly fused to the isthmus), by having a well-developed maxillary barbel membrane (vs. not well-developed), and by having the outer and inner mental barbels widely separated, origin of inner barbels anterior to origin of outer barbels (vs. outer and inner mental barbels close together with their origins nearly parallel, in a transverse line). *Bagarius* is further distinguished from *Nangra* by having very short nasal barbels (length less then eye diameter vs. much greater then eye diameter, often as long as head), having shorter maxillary barbels (reaching slightly past pectoral-fin base vs. reaching to at least pelvic-fin base) and lacking palatal teeth. *Bagarius* is further distinguished from *Gogangra* by having a well-developed maxillary barbel membrane (vs. maxillary barbel membrane not well-developed) and by lacking serrations on the anterior margin of the pectoral spine (vs. having small serrations). *Bagarius* is further distinguished from *Sisor* by having gill openings wide and branchiostegal membranes free from isthmus (vs. gill openings moderate and branchiostegal membranes broadly fused to isthmus), serrations absent on the anterior margin of the pectoral-fin spine (vs. serrations present on both anterior and posterior margins of the pectoral-fin spine), by lacking a series of bony plates on the

dorsum, by lacking a spine in the adipose fin, the uppermost caudal-fin ray not greatly elongated (vs. greatly elongated, more than half the length of the body), and by having the origin of the inner mental barbels anterior (vs. posterior) to the origin of the outer mental barbels.

Description: Dorsal fin with strong spine, 7 rays; pectoral fin with strong spine, 9–14 branched rays; 6 pelvic-fin rays; 13–17 anal-fin rays; 17 principal caudal rays. Head broad, moderately or strongly depressed. Maxillary barbel with well-developedmembrane, stiff base. Coracoid process not visible externally. Pectoral-fin spine smooth anteriorly and serrated posteriorly. Dorsal-fin spine smooth anteriorly and posteriorly. No thoracic adhesive apparatus. Paired fins non-plaited.

Distribution: Indus drainage in Pakistan and India, east (including peninsular India) to the Red River drainage in Vietnam and south throughout Indo-China including the Malay Peninsula and Indonesia (Roberts, 1983; Ng & Kottelat, 2000).

FIGURE 9. *Bagarius yarrelli*, CAS 55888, 120.6 mm SL.

Bagarius bagarius (Hamilton 1822)

Pimelodus bagarius Hamilton 1822: 186, 378, pl. 7 (fig. 62). Type locality: Ganges River, India. Possible syntype: BMNH 1857.6.13.151 [ex Zool. Soc.] (1).

Bagarius buchanani Bleeker 1853: 121. Type locality: Hooghly River, Calcutta, India; Pepeh River, Surakata, cent. Java, Indonesia. Syntypes: (3) NMV 46015 (1). Apparently *Bagarius buchanani* is an unneeded replacement name for *Pimelodus bagarius* Hamilton 1822; if so, the type locality is Ganges River, India.

Distribution: Roberts (1983) reported this species from the Ganges, Chao Phrya and Mekong drainages and noted its possible occurrence in the Malay Peninsula. Prior to Robert's paper, nearly all references to *Bagarius bagarius* were based on, at least in part,

one or more of the other *Bagarius* species. Since Robert's paper, this species has been reliably reported from the Malay Peninsula and the Salween and Mae Klong drainages (Kottelat, 1989; Talwar & Jingran, 1991). It has also been reported from the Brahmaputra drainage (Mamnur Rashid *et al.*, 1997; Karmakar, 2000) and Irrawaddy drainages (Vishwanath *et al.*, 1998; Keishing & Vishwanath, 1999). It has been reported from the Indus drainage (Misra & Hameed, 1974; Datta Munshi & Srivastava, 1988; Rafique, 2000), but the *Bagarius* species in the Indus drainage is most likely referable to *B. yarrelli*.

Bagarius rutilus Ng & Kottelat 2000

Bagarius rutilus Ng & Kottelat 2000: 10, fig. 3. Type locality: Market in Hanoi, Viet Nam. Holotype: ZRC 40440. Paratypes: CAS 94941 (4), CMK 15407 (1), MNHN 1934-286 to 290 (5), NRM 13676 (2), ZRC 45704-05 (1, 1).

Distribution: Red River and Ma drainages in northern Vietnam (Ng & Kottelat, 2000; Kottelat, 2001a, Kottelat, 2001b).

Bagarius suchus Roberts 1983

Bagarius suchus Roberts 1983: 442, figs. 2c, 4. Type locality: Kemrat [Mekong drainage], Thailand. Holotype: ANSP 89521. Paratypes: ANSP 147546 (3), MCZ 57492 (1), NIFI (1), UMMZ 209305-06 (1, 1).

Distribution: Chao Phraya and Mekong drainages (Roberts, 1983; Kottelat, 1989; Rainboth, 1996; Kottelat, 2001a).

Bagarius yarrelli (Sykes 1839)

Bagrus yarrelli Sykes 1839: 163. Type locality: Mota Mola at Poona [Krishna River drainage], Deccan, India. No types known.

Pimelodus carnaticus Jerdon 1849: 341. Type locality: Bowany River, [Cauvery [=Kaveri] drainage] s. India. No types known. Synonymized with *Bagarius yarrelli* by Day (1977a).

Bagarius lica Volz 1903: 557. Type locality: Moresi River [Musi drainage] at Palembang, Sumatra, Indonesia. Holotype: NMBE. First synonymized with *Bagarius bagarius* by Weber & de Beaufort (1913). Determined by Roberts (1983) to be a synonym of *Bagarius yarrelli*.

Bagarius nieuwenhuisii Popta 1904: 190. Type locality: Bo River, Mahakam basin, Central Borneo. No types known. First synonymized with *Bagarius bagarius* by Weber & de Beaufort (1913). Determined by Roberts (1983) to be a synonym of *Bagarius yarrelli*.

Distribution: Krishna, Godavary, Ganges, Brahmaputra, Irrawaddy, Salween, Chao Phraya, Mekong and drainages throughout the Malay Peninsula and Indonesia (Roberts,

1983 (in part); Kottelat, 1989; Talwar & Jingran, 1991; Rainboth, 1996; Jayaram, 1999 (in part); Karmakar, 2000; Kottelat, 2001a). It has also been reported from the Indus drainage (Talwar & Jingran, 1991; Jayaram, 1999; Karmakar, 2000) and Cauvery drainage in southern India (as *Pimelodus carnaticus*) by Jerdon (1849). It was reported as *B. bagarius* in the Godavary drainage by David (1963). This species is replaced by *B. rutilus* in the Red River drainage in Vietnam and China (Ng & Kottelat, 2000; Kottelat, 2001a; Kottelat, 2001b).

Gagata Bleeker, 1858

Fig. 10

Gagata Bleeker, 1858: 204, 206. (Type species: *Pimelodus gagata* Hamilton, 1822, by absolute tautonymy). Gender feminine.

Callomystax Günther, 1864: 218. (Type species: *Pimelodus gagata* Hamilton, 1822, by being a replacement name. Unneeded replacement for *Gagata* Bleeker, 1858. Gender masculine.

Diagnosis (based, in part, on Roberts & Ferraris 1998): Compressed head; eyes on side of head; depressed snout; small conical teeth in lower jaw; branchiostegal membranes broadly fused to isthmus; no serrations on anterior margin of pectoral spine; no well-developed maxillary barbel membrane; outer and inner mental barbels close together with their origins nearly parallel, in a transverse line; short nasal and maxillary barbels; palatal teeth absent.

Gagata is distinguished from *Nangra* by having the branchiostegal membranes broadly fused to the isthmus (vs. free from the isthmus), a compressed (vs. depressed) head, lateral (vs. dorsolateral) eyes, absence of palatal teeth, maxillary barbels extending only to the pectoral-fin base (vs. extending to the pelvic-fin base.) and nasal barbels shorter than the eye diameter (vs. longer, reaching at least to the eye). *Gagata* is distinguished from *Gogangra*, *Bagarius* and *Sisor* by having a compressed (vs. depressed) head, and by having the outer and inner mental barbels close together with their origins nearly parallel (vs. widely separated, origin of the inner barbels anterior in *Gogangra* and *Bagarius*, and origin of the inner barbels posterior in *Sisor*). *Gagata* is further distinguished from *Gogangra* by having the branchiostegal membranes broadly fused to the isthmus (vs. free from the isthmus). *Gagata* is further distinguished from *Bagarius* by having the branchiostegal membranes broadly fused to the isthmus (vs. free from the isthmus), and by having the dentition in the lower jaw consisting of only small conical teeth (vs. dentition markedly heterodont), and by lacking a well-developed maxillary barbel membrane. *Gagata* is further distinguished from *Sisor* by lacking serrations on the anterior margin of the pectoral spine (vs. serrations on both anterior and posterior margins of pectoral spine), no series of bony plates on the dorsum, no spine in the adipose fin, the uppermost caudal-fin ray not greatly elongated (vs. greatly elongated, more than half the length of the body), and no well-developed maxillary barbel membrane.

FIGURE 10. *Gagata cenia*, AMNH 58392, 56.3 mm SL.

Description: Dorsal fin with 1 spine, 6 branched dorsal rays; pectoral fin with 1 spine, 7–10 branched rays; 6 pelvic-fin rays; 8–16 anal-fin rays (8–14 branched); 17 principal caudal rays. Head compressed; snout depressed; eyes large, lateral; teeth finely conical, in few rows, absent from upper jaw in some species. Palatal teeth absent. Maxillary barbel extending only to level of pectoral-fin base, without well-developed membrane at base. Base of maxillary barbel stiff. Branchiostegal membranes fused to isthmus; coracoid process not visible externally. Pectoral-fin spine smooth anteriorly, serrate or granulate posteriorly. Dorsal spine smooth anteriorly and posteriorly. No thoracic adhesive apparatus. Paired fins non-plaited.

Distribution: Indus drainage in Pakistan and India, east and south (including peninsular India) to the Tenasserim drainages, Myanmar (Roberts & Ferraris, 1998; Mirza *et al.*,1999).

Gagata cenia (Hamilton 1822)

Pimelodus cenia Hamilton 1822: 174, pl. 31 (fig. 57). Type locality: n. Bengal rivers. No types known.

Distribution: Indus, Mahanadi, Ganges, and Brahmaputra drainages in Pakistan, India, Bangladesh, Myanmar and possibly Nepal (Roberts & Ferraris, 1998; Mirza *et al.*, 1999; Mirza, 2000; Rafique, 2000). It has also been reported from the Irrawaddy drainage (Vishwanath *et al.*, 1998; Karmakar, 2000), and the Salween drainage (Chu *et al.*, 1999).

Gagata dolichonema He 1996

Gagata dolichonema He 1996a: 380, fig. 1. Type locality: Daojieba, Baoshan Co., 24°41'N, 99°10'E [Salween drainage], Yunnan, China. Holotype: Mus. Freshw. Fishes, Inst. Hydrobiol. Wuhan, 791. Paratypes: Mus. Freshw. Fishes, Inst. Hydrobiol. Wuhan, 790 (1).

Distribution: Known only from the type locality in the Salween drainage, China (He, 1996a; Roberts & Ferraris, 1998).

Gagata gagata (Hamilton 1822)

Pimelodus gagata Hamilton 1822: 197, 379, pl. 39 (fig. 65). Type locality: Fresh water rivers and estuaries of Bengal. No types known.
Gagata typus Bleeker 1863: 90. Type locality: Fresh water rivers and estuaries of Bengal. No types known. Unneeded replacement name for *Pimelodus gagata* Hamilton 1822.

Distribution: Ganges drainage, India and Bangladesh (Roberts & Ferraris 1998). Karmakar (2000) reported this species from the Brahmaputra and Irrawaddy drainages.

Gagata gasawyuh Roberts & Ferraris 1998

Gagata gasawyuh Roberts & Ferraris 1998: 325, figs. 6–7. Type locality: Tenasserim River mainstream upstream from Kita (or Htee-tah), Myanmar. Holotype: CAS 95544. Paratypes: AMNH 8358 (3), 13776 (1); BMNH 1992.3.10.1 (1); CAS 88614 (3), 88899 (4), 88906 (22), 95545-55 (1, 16, 6, 6, 2, 4, 6, 12, 1, 1, 2); NRM 26667 (3), 42002 (3); UMMZ 233234 (2); USNM 345150-51 (2, 5).

Distribution: Irrawaddy, Salween, and Tenasserim drainages, Myanmar. (Roberts & Ferraris, 1998).

Gagata itchkeea (Sykes 1839)

Phractocephalus itchkeea Sykes 1839: 164. Type locality: Deccan, India. No types known.

Distribution: Narmada, Krishna and Cauvery drainages, peninsular India (Roberts & Ferraris, 1998). According to Menon (1999) the record from the Cauvery drainage needs confirmation.

Gagata melanopterus Roberts & Ferraris 1998

Gagata melanopterus Roberts & Ferraris 1998: 330, fig. 10. Type locality: Yangon Division, Hlaing River, 16°53'41"N, 96°05'28"E [Rangoon drainage], Myanmar. Holotype: USNM 348852. Paratypes: AMNH 223191 (15); CAS 91569-70 (1, 1), 95556-59 (1, 5, 3, 3), 99694-95 (300, 15); MZUSP uncat. (35); NRM 14893 (1), 26668 (4), 42001 (10); USNM 44755 (1), 344658 (22), 348851 (100).

Distribution: Irrawaddy, Rangoon, Sittang and lower Salween drainages, Myanmar (Roberts & Ferraris, 1998).

Gagata pakistanica Mirza, Parveen & Javed 1999

Gagata pakistanica Mirza, Parveen & Javed 1999: 1, fig. 1. Type locality: River Indus near Ghazi, Pakistan. Holotype: Uncat. Paratypes: Uncat. (6).

Distribution: Indus drainage, Pakistan (Mirza *et al.*, 1999).

Gagata sexualis Tilak 1970

Gagata sexualis Tilak 1970: 207, fig. 1–6. Type locality: North Koel River at Daltonganj [Ganges drainage], Chotanagpur, s. Bihar, India. Holotype: ZSI F5592/2. Paratypes: RMNH 26072 (2); ZSI F5593/2 to 5598/2 (6).

Distribution: Ganges and Brahmaputra drainages, India, Bangladesh and Nepal (Tilak, 1970; Edds, 1985; Mamnur Rashid *et al.*, 1997; Roberts & Ferraris, 1998).

Gagata youssoufi Ataur Rahman 1976

Gagata youssoufi Ataur Rahman 1976: 5, fig. 1. Type locality: Meghna River near Chandpur, Bangladesh. Holotype: Mus. Freshw. Fish. Res. Sta. Chandpur. Paratypes: Mus. Freshw. Fish. Res. Sta. Chandpur (9, 4, 15).

Distribution: Ganges, Meghna and Brahmaputra drainages, India and Bangladesh (Mamnur Rashid *et al.*, 1997; Roberts & Ferraris, 1998; Jayaram, 1999).

Gogangra Roberts, 2001: 83. (Type species: *Pimelodus viridescens* Hamilton, 1822, by being a replacement name. Replacement name for *Gangra* Roberts & Ferraris, 1998; preoccupied by *Gangra* Walker, 1862, in Lepidoptera). Gender masculine.

Gangra Roberts and Ferraris, 1998: 333. (Type species: *Pimelodus viridescens* Hamilton, 1822, by original designation. Preoccupied by *Gangra* Walker, 1862; in Lepidoptera, replaced by *Gogangra* Roberts, 2001). Gender masculine.

Diagnosis (based, in part, on Roberts & Ferraris 1998)**:** Small conical teeth in lower jaw; branchiostegal membranes free from isthmus; small serrations on anterior margin of pectoral spine; no well-developed maxillary barbel membrane; outer and inner mental barbels widely separated, origin of inner barbels anterior to origin of outer barbels; short nasal and maxillary barbels; palatal teeth absent.

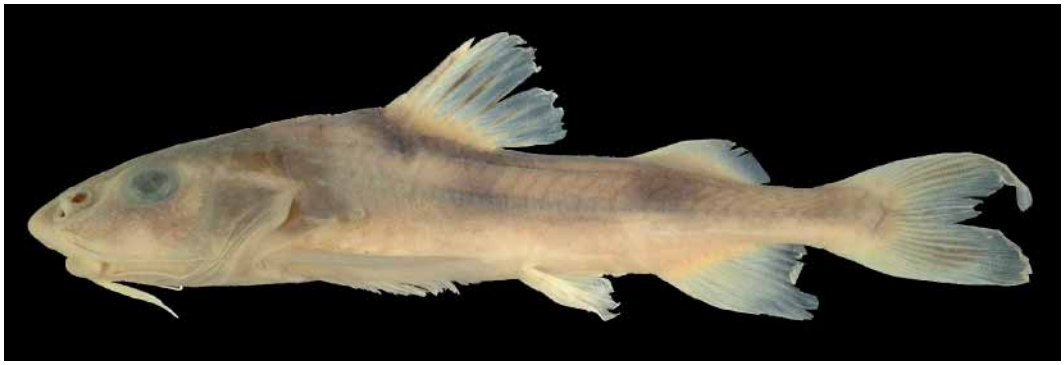

FIGURE 11. *Gogangra viridescens*, UMMZ 243717, 57.7 mm SL. Photograph by H. H. Ng.

Gogangra is distinguished from *Gagata* by having the outer and inner mental barbels widely separated, with the origin of the inner barbels anterior to the origin of the outer barbels (vs. barbels close together with their origins nearly parallel) and by having the branchiostegal membranes free from the isthmus (vs. broadly fused to the isthmus). *Gogangra* is distinguished from *Nangra* by having maxillary barbels extending only to the pectoral-fin base (vs. extending to the pelvic-fin base), by having nasal barbels shorter than the eye diameter (vs. longer than the eye diameter, reaching at least to the eye), by having small serrations on the anterior margin of the pectoral spine (vs. no serrations), and by the absence of palatal teeth and a well-developed maxillary barbel membrane. *Gogangra* is distinguished from *Bagarius* by having only small conical teeth in the lower jaw (vs. teeth in lower jaw markedly heterodont), by having small serrations on the anterior margin of the pectoral spine (vs. no serrations), and by the lack of a well-developed maxillary barbel membrane. *Gogangra* is distinguished from *Sisor* by having small (vs. large) serrations on the anterior margin of its pectoral-fin spine, no bony plates on the dorsum, no spine in the adipose fin, the origin of the inner mental barbels anterior

(vs. posterior) to the origin of the outer mental barbels), branchiostegal membranes free from the isthmus (vs. broadly fused to isthmus), the uppermost caudal-fin ray not greatly elongated (vs. greatly elongated, more than half the length of the body), and no well-developed maxillary barbel membrane.

Description: Dorsal fin with 1 spine, 6 branched rays; pectoral fin with 1 spine, 8–9 branched rays; 6 pelvic-fin rays; 7–9 branched anal-fin rays. Head moderately depressed, jaws with several rows of small conical teeth. Palatal teeth absent. Maxillary barbel not extending posteriorly beyond head; barbel membrane absent or greatly reduced; base of barbel stiff. Coracoid process visible externally. Live specimens with viridescent or silvery supraopercular mark. Pectoral-fin spine smooth anteriorly, serrate posteriorly. Dorsal spine smooth anteriorly and posteriorly. No thoracic adhesive apparatus. Paired fins non-plaited.

Distribution: Ganges, Meghna and Brahmaputra drainages, India and Bangladesh (Jayaram, 1999; Ng, 2005f).

Gogangra laevis Ng 2005

Gogangra laevis Ng 2005f: 280, figs. 1, 2a. Type locality: Gowain River and Khal at Gowainghat [Brahmaputra drainage], Bangladesh. Holotype: UMMZ 244603. Paratypes: CAS 95571 (23, 1 c&s), UMMZ 208725 (3, 1 c&s), 208747 (2).

Distribution: Brahmaputra and Meghna drainages, Bangladesh (Ng, 2005f).

Gogangra viridescens (Hamilton 1822)

Pimelodus viridescens Hamilton 1822: 173, 377, pl. 11 (fig. 56). Type locality: Rivers of n. Bengal. No types known.

Nangra punctata Day 1877a: 494, pl. 115 (fig. 8). Type locality: Sone River at Bheer Bhoom [=Bheerbhoom] [Ganges drainage], Bihar, India. Syntypes and/or Day specimens: AMS B.7566 (1, syntype). Synonymized with *Gagata viridescens* (= *Gogangra viridescens*) by Hora & Law (1941).

Distribution: Ganges and Brahmaputra drainages, India and Bangladesh (Ataur Rahman, 1989; Talwar & Jhingran, 1991; Sen, 1995; Mamnur Rashid *et al.*, 1997; Roberts & Ferraris, 1998; Jayaram, 1999; Ng, 2005f).

Nangra Day, 1877

Fig. 12

Nangra Day, 1877a: 493. (Type species *Pimelodus nangra* Hamilton, 1822, by absolute tautonymy). Gender feminine.

Diagnosis (based, in part, on Roberts & Ferraris 1998)**:** Depressed head; dorsolateral eyes; elongated snout; small conical teeth in lower jaw; branchiostegal membranes free from isthmus; no serrations on anterior margin of pectoral spine; well-developed maxillary barbel membrane; very long nasal and maxillary barbels; palatal teeth present.

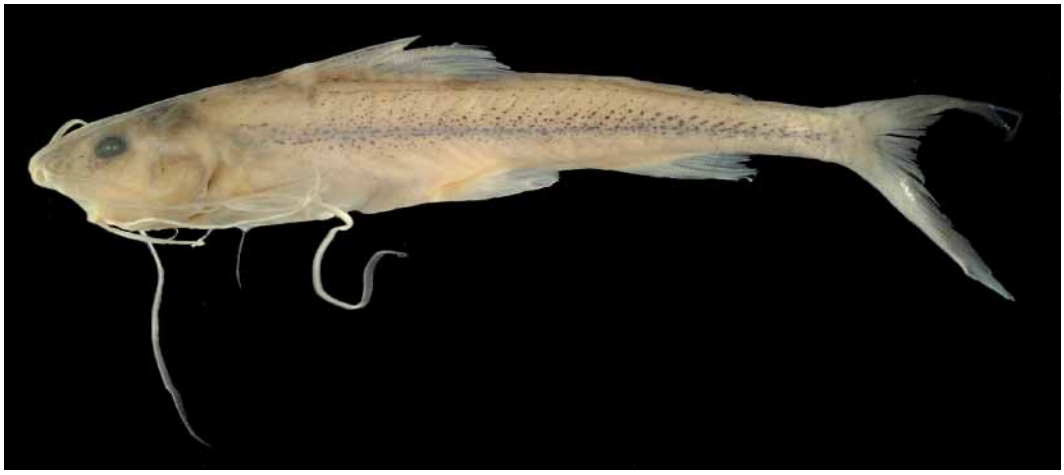

FIGURE 12. *Nangra nangra*, UMMZ 245046, 49.7 mm SL. Photograph by H. H. Ng.

Nangra is distinguished from all sisorids by having maxillary barbels that extend beyond the pectoral-fin base (vs. extending no further than the pectoral-fin base), by having very long nasal barbels (barbel length much greater than the eye diameter, often as long as the head vs. length less than the eye diameter), and by having palatal teeth. *Nangra* is further distinguished from *Gagata* by having the branchiostegal membranes free from the isthmus (vs. broadly fused to the isthmus), depressed (vs. compressed) head, and by having a well-developed maxillary barbel membrane. *Nangra* is further distinguished from *Gogangra* by a well-developed maxillary barbel membrane and no (vs. small) serrations on the anterior margin of the pectoral spine. *Nangra* is further distinguished from *Bagarius* by having only small conical teeth in the lower jaw (vs. teeth of the lower jaw markedly heterodont, consisting of two or three outer rows of relatively numerous, close-set conical teeth, and one or two inner rows of less numerous, widely separated, and much larger conical teeth). *Nangra* is further distinguished from *Sisor* by lacking serrations on the anterior margin of the pectoral-fin spine (vs. serrations present on both anterior and posterior margins of pectoral-fin spine), by having branchiostegal membranes free from the isthmus (vs. broadly fused to the isthmus), no series of bony plates on the dorsum, the uppermost caudal-fin ray not greatly elongated (vs. greatly elongated, more than half the length of the body), and no spine in the adipose fin.

Description: Dorsal fin with 1 spine, 6–9 branched dorsal rays; pectoral fin with 1 spine, 7–9 branched fin ray; 6 pelvic-fin rays; 7–11 branched anal-fin rays. Head depressed; snout elongate. Eyes small, dorsolateral. Palatal teeth present. Maxillary barbel

extending at least to pectoral spine tip and usually beyond pelvic fins, with well-developed membrane, stiff base. Coracoid process not visible externally; pectoral-fin spine smooth anteriorly, serrate posteriorly. Dorsal spine smooth anteriorly and posteriorly. No thoracic adhesive apparatus. Paired fins non-plaited.

Distribution: Indus, Ganges, Meghna and Bramhputra drainages, Pakistan, India, Bangladesh and Nepal (Roberts & Ferraris, 1998).

Nangra assamensis Sen & Biswas 1994

Nangra assamensis Sen & Biswas 1994: 441, pl. 1 (fig. 1). Type locality: Brahmaputra River at Neematighat, 14 km. from Jorhat, Assam, India. Holotype: [ZSI] V/F/ERS/53. Paratypes: [ZSI] V/F/ERS/54 (4), V/F/ERS/55 (30).

Nangra carcharhinoides Roberts & Ferraris 1998: 338, fig. 16. Type locality: Ganges River at Patna, India. Holotype: CAS 95566. Paratypes: CAS 95567 (30), SRS/ZSI F.4847 (6), UMMZ 233235 (2).

Distribution: Ganges and Brahmaputra drainages, India (Sen & Biswas, 1994; Roberts & Ferraris, 1998).

Remarks: *N. carcharhinoides* considered a synonym by Carl J. Ferraris, Jr. (pers. comm.).

Nangra bucculenta Roberts & Ferraris 1998

Nangra bucculenta Roberts & Ferraris 1998: 336, fig. 14. Type locality: Ganges River delta, Tangail District, North Central Region, Bangladesh. Holotype: CAS 95564. Paratypes: CAS 95565 (10, 3 c&s).

Distribution: Ganges drainage, Bangladesh (Roberts & Ferraris, 1998).

Nangra nangra (Hamilton 1822)

Pimelodus nangra Hamilton 1822: 193, 378, pl. 11 (fig. 63). Type locality: Ganges River at Patna, India. Neotype: CAS 96626. Neotype designated by Roberts & Ferraris (1998).

Nangra buchanani Day 1877a: 494, pl. 113 (fig. 3). Type locality: Ganges, Jumna, and Indus rivers; Delhi, India. Syntypes and/or Day specimens: AMS B.7541 (1, syntype) Indus River, NMW 45328 (1), RMNH 2770 (1), ZMB 18041 (1) Delhi. Apparently a replacement name for *Pimelodus nangra* Hamilton 1822; if so, the type locality is Ganges River at Patna, India. Roberts & Ferraris (1998) did not regard as a strict replacement name and consider specimens from several localities as syntypes.

Distribution: Indus, Ganges and Bramhputra drainages, Pakistan, India, Bangladesh and Nepal (Roberts & Ferraris, 1998).

Nangra ornata Roberts & Ferraris 1998

Nangra ornata Roberts & Ferraris 1998: 341, fig. 19. Type locality: Gowain River and Khal at Gowainghat [Meghna drainage], n. Sylhet Prov. (Surma or Meghna watershed), Bangladesh. Holotype: UMMZ 233236. Paratypes: UMMZ 208746 (5).

Distribution: Meghna drainage, Bangladesh (Roberts & Ferraris, 1998).

Nangra robusta Mirza & Awan 1973

Nangra robusta Mirza & Awan 1973: 145, fig. 1. Type locality: Indus River at Jinnah Barrage near Kalabagh, Pakistan. Holotype: GCM No. 9. Paratypes: (10) GCM (?9), ZMA 114758 (1).

Distribution: Indus drainage, Pakistan (Mirza, 1976; Roberts & Ferraris, 1998; Rafique, 2000).

Sisor Hamilton, 1822
Fig. 13

Sisor Hamilton, 1822: 208, 379. (Type species *Sisor rabdophorus* Hamilton, 1822, by monotypy). Gender masculine.

Diagnosis: Series of bony plates extending from dorsal fin to base of caudal fin; spine in adipose fin; uppermost caudal-fin ray long, more than half length of body; branchiostegal membranes broadly fused to isthmus; outer and inner mental barbels widely separated, with origin of outer barbels anterior to origin of inner barbels; minute teeth in lower jaw, dentition essentially consisting of roughened plate; large serrations on anterior margin of pectoral spine; well-developed maxillary barbel membrane; palatal teeth absent.

Sisor is distinguished from erethistids and all other sisorids by having a series of bony plates extending from the dorsal fin to the base of the caudal fin, and an adipose fin with a spine. It is distinguished from all other Sisorinae by having the uppermost caudal-fin ray long (vs. short), more than half the length of the body; outer and inner mental barbels widely separated, with the origin of the outer barbels anterior to the origin of the inner barbels (vs. nearly in a straight line in *Gagata*, origin of inner mental barbels anterior to origin of outer mental barbels in *Bagarius* and *Gogangra*, and either nearly in a straight line or origin of inner mental barbels anterior to origin of outer mental barbels in *Nangra*), by having minute teeth in the lower jaw (dentition essentially consisting of a roughened plate vs. teeth of the lower jaw markedly heterodont in *Bagarius*, and small and conical in *Gagata*, *Gogangra*, and *Nangra*), and by having large serrations on the anterior margin of the pectoral spine (vs. no serrations in *Bagarius*, *Gagata*, and *Nangra*, and small serrations in *Gogangra*).

Sisor is further distinguished from *Bagarius*, *Gogangra* and *Nangra* by having the branchiostegal membranes broadly fused to the isthmus (vs. free from the isthmus). *Sisor* is further distinguished from *Gagata* and *Gogangra* by having a well-developed maxillary barbel membrane, and from *Nangra* by its lack of palatal teeth and short maxillary barbel not reaching the pectoral-fin base (vs. barbel reaching to at least the pelvic-fin base).

Description: Dorsal fin with 1 spine, 5–6 dorsal rays; pectoral fin with 1 spine, 9–11 rays; 6–8 pelvic-fin rays; 4–6 anal-fin rays. Head moderately narrow, strongly depressed. Body extremely narrow, strongly depressed. Eyes small, dorsolateral, subcutaneous. Maxillary barbel not extending posteriorly beyond head; barbel with well-developed membrane, stiff base. Coracoid process present but short. Pectoral-fin spine strongly serrate anteriorly and posteriorly. Dorsal-fin spine finely serrate anteriorly, smooth posteriorly. No thoracic adhesive apparatus. Paired fins non-plaited.

Distribution: Indus drainage, Pakistan, east to the Ganges and Brahmaputra drainages, India (Ng, 2003; Vishwanath & Darshan, 2005).

FIGURE 13. *Sisor rabdophorus*, UMMZ 2440013, 63.8 mm SL. Photograph by H. H. Ng.

Sisor barakensis Vishwanath & Darshan 2005

Sisor barakensis Vishwanath & Darshan 2005: 1952, image 1. Type locality: River Barak, Jiri, Manipur, India. Holotype: MUMF 3131. Paratypes: MUMF 9007/1-9007/3 (3).

Distribution: Barak River, Brahmaputra drainage, Manipur, India (Vishwanath & Darshan, 2005).

Sisor chennuah Ng & Lahkar 2003

Sisor chennuah Ng & Lahkar 2003: 2876, figs. 2a, 4a, 5. Type locality: Brahmaputra River drainage, Dibrugarh, from aquarium trade, Assam State, India. Holotype: NRM 40420. Paratype: NRM 40423 (1).

Distribution: Brahmaputra drainage, Assam State, India (Ng, 2003).

Sisor rabdophorus Hamilton 1822

Sisor rabdophorus Hamilton 1822: 208, 379. Type locality: Bhagirathi River at crossing point between Kalna (Barddhaman Dist.) and Nisinghapur (Nadia Dist.), 23°13'33"N, 88°32'41.4"E [Ganges drainage], West Bengal State, India. Neotype: ZRC 45829. Neotype designated by Ng (2003).

Distribution: Ganges drainage, West Bengal States, India (Ng, 2003).

Remarks: This species has been reported many times from the Indus drainage in Pakistan (Mirza & Hameed, 1974; Mirza, 1974; Tandon & Gupta, 1975; Mirza, 1976; Jayaram & Singh, 1977; Jayaram, 1981; Talwar & Jhingran, 1991; Jayaram, 1999; Menon, 1999; Karmakar, 2000). Ng (2003) was unable to examine any specimens of *Sisor* from the Indus drainage, and was unable to confirm the conspecificity of this population with *S. rabdophorus*.

Sisor rheophilus Ng 2003

Sisor rheophilus Ng 2003: 2877, figs. 2c, 4c, 6. Type locality: Kali Nadi River, near Muzaffarnagar [Ganges drainage], Uttar Pradish State, India. Holotype: UMMZ 189651. Paratypes: CAS 211745 (27).

Distribution: Ganges drainage, Bihar and Uttar Pradesh States, India (Ng, 2003).

Sisor torosus Ng 2003

Sisor torosus Ng 2003: 2878, figs. 2d, 4d, 7. Type locality: Ganges River at Patna, Bihar State, India. Holotype: CAS 96629. Paratypes: AMS B7821 (1), CAS 211744 (9), RMNH 8806 (1).

Distribution: Ganges drainage, Bihar and Delhi States, India (Ng, 2003).

B. Glyptosterninae Gill, 1872; Glyptothoracini de Pinna, 1996

Glyptothorax, the only genus in this clade, is easily distinguished from other clades of sisorids by having an adhesive apparatus on the thorax with grooves parallel or oblique to the longitudinal axis of the body. Osteological traits used by de Pinna (1996) to diagnose Glyptothoracini include distal portion of premaxilla detached (convergent in Bagariini; data missing for Glyptosternina), and lateral arms of vomer long and thin, extending underneath whole length of articular process of lateral ethmoid.

Glyptothorax Blyth, 1860

Fig. 14

Glyptothorax Blyth, 1860: 154. (Type species: Glyptosternon striatus McClelland, 1842, by subsequent designation by Bleeker (1863: 105). Gender masculine.

Aglyptosternon Bleeker, 1862 (in Bleeker, 1862-63): 12. (Type species: *Silurus cous* Linnaeus, 1766, by original designation). Gender neuter. *Silurus cous*, the type species of *Aglyptosternon*, was placed in the genus *Glyptothorax* by Coad (1979). Li (1986) listed *Aglyptosternon* Bleeker, 1862 in the synonymy of *Glyptothorax*.

Euclyptosternum Günther, 1864: 183. (Type species: *Silurus cous* Linnaeus, 1766, apparently an unjustified emendation of *Aglyptosternon* Bleeker, 1862, which Günther spelled as *Aclyptosternon*). Gender neuter. Hora (1923b) synonymized *Euclyptosternum* Günther, 1864 with *Glyptothorax* but did not consider it to be the same as *Aglyptosternon* Bleeker, 1862.

Pteroglanis Fowler, 1934a: 92. (Type species: *Pteroglanis horai* Fowler, 1934, by original designation. Preoccupied by *Pteroglanis* Eigenmann & Pearson, 1924, in fishes, replaced by *Pteropsoglanis* Fowler, 1934). Gender masculine.

Pteropsoglanis Fowler, 1934b: 351. (Type species: *Pteroglanis horai* Fowler, 1934, by being a replacement name. Replacement name for *Pteroglanis* Fowler, 1934; preoccupied by *Pteroglanis* Eigenmann & Pearson, 1924, in fishes). Gender masculine. Li (1986) listed *Pteroglanis* Fowler, 1934 in the synonymy of *Glyptothorax*. Ferraris & Britz (2005) placed *Pteroglanis horai*, the type species of *Pteropsoglanis* in the genus *Glyptothorax*.

Sundagagata Boeseman, 1966: 243. (Type species: *Sundagagata robusta* Boeseman, 1966, by original designation). Gender feminine. Kottelat *et al.* (1993) considered *Sundagagata robusta* to be based on an abnormal specimen of *Glyptothorax platypogon* and the genus *Sundagagata* to be a synonym of *Glyptothorax*.

Paraglyptothorax Li, 1986: 524. (Type species: *Glyptosternum pallozonum* Lin, 1934, by original designation. Originally proposed as a subgenus of *Glyptothorax*). Gender masculine.

Superglyptothorax Li, 1986: 524. (Type species: *Glyptothorax coheni* Ganguly, Datta & Sen, 1972, by original designation. Originally proposed as a subgenus of *Glyptothorax*). Gender masculine.

Diagnosis: Thoracic adhesive apparatus with grooves parallel or oblique to longitudinal axis of body (vs. grooves transverse to longitudinal axis of body or thoracic adhesive apparatus absent).

Glyptothorax is distinguished from all other sisorid genera by having an adhesive apparatus on the thorax with with grooves parallel or oblique to the longitudinal axis of the body (vs. thoracic adhesive grooves transverse to the longitudinal axis of the body in *Pseudecheneis*, and thoracic adhesive apparatus absent in all other genera).

Description: Dorsal fin with strong spine, 5–7 rays; pectoral fin with strong spine, 6–11 rays; 6 pelvic-fin rays, 7–14 anal-fin rays. Head small, depressed; snout conical; body elongate, moderately or greatly depressed. Skin smooth or tuberculate. Eyes small, dorsal. Lips thick, fleshy, often papillate. Teeth villiform, in bands; palatal teeth present or absent. Maxillary barbel with well-developed membrane, soft base. Gill openings wide, branchiostegal membranes narrowly connected with isthmus. Coracoid very short, extends at most barely past pectoral-fin base, often not visible externally. Pectoral-fin spine serrated anteriorly. Dorsal-fin spine smooth or serrate on anterior edge, smooth or finely serrated on posterior edge. Thoracic adhesive apparatus present, groves parallel or oblique

to longitudinal axis of body. Paired fins plaited and modified to form an adhesive apparatus (Fig. 15), or non-plaited.

FIGURE 14. *Glyptothorax buchanani*, INHS 93660, 63.4 mm SL; lateral and ventral views.

FIGURE 15. Plaited adhesive organs on pectoral fin of *Pareuchiloglanis gongshanensis*, CAS 214865, 87.4 mm SL. Plaited adhesive organs are present on paired fins of all genera of Glyptosternina, *Pseudecheneis*, and some species of *Glyptothorax*.

Distribution: Black Sea basin, northern Turkey, south and east to the Yangtze River drainage in China and south throughout Indo-China to Java, Indonesia (Coad & Delmastro, 1985; Chu *et al.*, 1999; Ng, 2005a)

Glyptothorax alaknandi Tilak 1969

Glyptothorax alaknandi Tilak 1969: 42, figs. 8–11. Type locality: Alaknanda River, near Srinagar [Ganges drainage], dist. Pauri Garhwal, Uttar Pradesh, India. Holotype: ZSI F6154/2.

Distribution: Ganges drainage, India (Tilak, 1969; Jayaram, 1999; Karmakar, 2000).

Remarks: May be a synonym of *G. brevipinnis* (Ng, 2005a).

Glyptothorax anamalaiensis Silas 1951

Glyptothorax anamalaiensis Silas 1951: 370. Type locality: Stream in Anamalai Hills [Ponnani drainage], Western Ghats, India. Holotype: ZSI F629/2. Paratypes: ZSI F630/2 (1).

Distribution: Ponnani drainage, Western Ghats, peninsular India (Silas, 1951; Easa & Shaji, 1997; Jayaram, 1999).

Glyptothorax annandalei Hora 1923

Glyptothorax annandalei Hora 1923b: 14, pl. 1 (fig. 3). Type locality: Nierolay stream, Bhavani River, at the base of Nilgiri Hills [Cauvery drainage], Nilgiri dist., Tamil Nadu, India. Holotype: ZSI F10135/1.

Distribution: Cauvery and Godavary drainages, Western Ghats, peninsular India, and Ganges drainage, northern India (Hora, 1923b; David, 1963; Motwani & David, 1957; Misra, 1976; Jayaram, 1999). Recorded from the Brahmaputra drainage, northeast India and China (Chu *et al.*, 1999; Karmakar, 2000).

Glyptothorax armeniacus (Berg 1918)

Glyptosternum armeniacum Berg 1918: 146. Type locality: Mukhlassi-darasi River, Upper Euphrates River system, Turkey. Syntypes: (5) ZMT (?4), ZSI [ex ZIN 20806] F11319/1 (1), ZIN 20806 (5, now 4).

Distribution: Tigris and Euphrates basin, Turkey (Berg, 1918; Berg, 1931; Coad, 1979; Coad & Delmastro, 1985). Coad & Delmastro (1985) tentatively assigned a specimen from the Yesil Irmak, which is part of the Black Sea basin in Turkey, to this species.

Glyptothorax botius (Hamilton 1822)

Pimelodus botius Hamilton 1822: 192, 378. Type locality: Hooghly River at Kalna, 23°13'30.0"N, 88°22'39.0"E. Neotype: ZRC 50223. Neotype designated by Ng (2005).

Distribution: Ganges drainage, India (Ng, 2005a).

Glyptothorax brevipinnis Hora 1923

Glyptothorax brevipinnis Hora 1923b:16, pl. 1 (fig. 4). Type locality: Unknown locality [probably India]. Syntypes: ZSI F10134/1 (4).

Distribution: Probably Ganges drainage, India (Tilak & Hussain, 1973; Ng, 2005a).

Glyptothorax buchanani Smith 1945

Glyptothorax buchanani Smith 1945: 402, fig. 89. Type locality: Metum, small swift affluent of the Mechem, trib. of Meping [Chao Phraya drainage], n. Thailand. Holotype: USNM 117754. Paratypes: MCZ 37287 [ex USNM 119824] (1), USNM 119824 (2, now 1).

Distribution: Chao Phraya drainage, Thailand (Smith, 1945; Kottelat, 1989).

Glyptothorax burmanicus Prashad & Mukerji 1929

Glyptothorax burmanicus Prashad & Mukerji 1929: 184, pl. 7 (fig. 3); fig. 5. Type locality: Sankha, a large hill-stream, midway between Kamaing and Mogaung [Irrawaddy drainage], Myitkyina dist., Upper Myanmar [Burma]. Holotype: ZSI F10877/1.

Distribution: Irrawaddy Salween drainages, China and Myanmar (Prashad & Mukerji, 1929; Chu *et al.*, 1999).

Remarks: This species has been considered a synonym of *G. cavia*, but it is a valid species (H. H. Ng, Pers. comm. 2005).

Glyptothorax callopterus Smith 1945

Glyptothorax callopterus Smith 1945: 400, fig. 87. Type locality: Waterfall stream on Kao Chong, near Trang, peninsular Thailand. Holotype: USNM 109820. Paratypes: USNM 109819 (2).

Distribution: Peninsular Thailand (Smith, 1945).

***Glyptothorax cavia* (Hamilton 1822)**

Pimelodus cavia Hamilton 1822: 188, 378. Type locality: Rivers of n. Bengal [Ganges drainage]. No types known.

Euglyptosternum lineatum Day 1877a: 500, pl. 116 (fig. 7). Type locality: Jamna [Jamuna], Suddya, n. Assam, India. ZSI F1312. Possible types and/or Day specimens: AMS B.7509 (1, syntype) Sudoya [Suddya], ASI F1312 (1). Synonymized with *Glytothorax cavia* by Hora & Menon (1949).

Distribution: Indus, Ganges and Brahmaputradrainages,Pakistan, India, Bangladesh, Nepal, (Nath, 1984; Lipton, 1985; Shrestha, 1990; Sen, 1995; Jayaram, 1999; Mirza, 2000; Karmakar, 2000; Rafique, 2000; Shahjehan & Marwat, 2001).

Remarks: *G. burmanicus* has been considered a synonym, but it is a valid species (H. H. Ng, Pers. comm. 2005). Records from the Irrawaddy and Salween drainages are referable to *G. burmanicus.*

***Glyptothorax conirostre* (Steindachner 1867)**

Glyptosternum conirostre Steindachner 1867: 532 [16], pl. 6 (fig. 2). Type locality: Simla [Ganges drainage], Himachal Pradesh, nw. India. Holotype: not found at NMW.

Distribution: Ganges drainage, India (Ng, 2005a).

Remarks: Nearly all refereces of this species since the original description appear to be based on a species that does not have the outermost rays of the pectoral fins plaited and modified to form an adhesive apparatus; however, Steindachner's original description clearly indicates this condition in the species. Reports of this species from the Indus drainage are referable to *Glyptothorax punjabensis* (Mirza & Kashmiri, 1971).

***Glyptothorax cous* (Linnaeus 1766)**

Silurus cous Linnaeus 1766: 504. Type locality: Syria. Syntypes: ?BMNH 1955.6.25.2 (1) coll. Russell.

Distribution: Tigris-Euphrates basin, Iraq and Syria (Günther, 1864; Coad, 1979; Coad & Delmastro, 1985).

***Glyptothorax davissinghi* Manimekalan & Das 1998**

Glyptothorax davissinghi Manimekalan & Das 1998: 87, figs. 1–3. Type locality: Karim Puzha, Maancheri, Nilambur Reserve Forest [Beypore River drainage], Kerala, India. Holotype: ZSIC 6008.

Distribution: Beypore River drainage, Western Ghats, peninsular India (Manimekalan & Das, 1998).

Glyptothorax deqinensis Mo & Chu 1986

Glyptothorax deqinensis Mo & Chu 1986: 345 [English p. 350], fig. 6. Type locality: Upper part of Lancangjiang [= Mekong] River, Dequin Co., 28°30'N, 99°00'E, Yunnan, China. Holotype: KIZ 748621. Paratypes: KIZ (32).

Distribution: Mekong drainage, Yunnan, China (Mo & Chu 1986; Chu *et al.*, 1999).

Glyptothorax dorsalis Vinciguerra 1890

Glyptothorax dorsalis Vinciguerra 1890: 246, pl. 7 (fig. 4). Type locality: Meetan [Salween drainage], Upper Myanmar [Burma]. Holotype: MSNG 14417.
Glyptothorax minutus Hora 1921: 180, fig. 1. Type locality: Imphal stream near Karong [= Kameng] [Irrawaddy drainage], Manipur Valley, India. Syntypes: ZSI (4).

Distribution: Irrawaddy and Salween drainages, Myanmar and China. (Hora, 1921a; Kottelat, 1989; Chu *et al.*, 1999).

Remarks: This species has been considered a synonym of *G. platypogonoides* by many authors. We consider this species valid and tentatively consider all records of *G. platypogonoides* from India and Myanmar to be based on *G. dorsalis*.

Glyptothorax exodon Ng & Rachmatika 2005

Glyptothorax exodon Ng & Rachmatika 2005: 251, figs. 1–2. Type locality: Sungai Tekelan [Kapuas drainage], Kalimantan Barat, Borneo. Holotype: MZB 9940. Paratypes: BMNH 19823.29.190 (1), CAS 49419 (1), RMNH 28907 (1).

Distribution: Kapuas drainage, Borneo (Ng & Rachmatika, 2005).

Remarks: This species has been misidentified as *G. platypogonides* in Borneo.

Glyptothorax fokiensis (Rendahl 1925)

Glyptosternum fokiensis Rendahl 1925: 307. Type locality: Lan-Hao, Lien-Cheng-Hsien, Fokien [Fujian] [Yangtze drainage], s. China. Syntypes: NRM 10018 (2).
Glyptosternon punctatum Nichols 1941: 1, figs. 1–2. Type locality: Kiating (Loshan) [Yangtze drainage], Szechwan Prov., China, elev. 1100 ft. Holotype: AMNH 15218. Paratypes: AMNH

20927 (1). Considered a valid subspecies of *Glyptothorax fokiensis* by Li (1984a) but a synonym of *Glyptothorax fukiensis fukiensis* (= *Glyptothorax fokiensis fokiensis*) by Chu *et al.* (1999).

Distribution: Yangtze drainage, China (Li, 1984a; Chu *et al.*, 1999; Fu et. al., 2003).

Glyptothorax fuscus Fowler 1934

Glyptothorax fuscus Fowler 1934a: 89, figs. 31–33. Type locality: Chantaboon [Chantabun] [Chanthaburi drainage], se. Thailand. Holotype: ANSP 59358 (not separated, in jar with paratypes). Paratypes: ANSP 59359-65 (8).

Distribution: Chao Phraya, Chanthaburi and Mekong drainages, Thailand, Laos and Cambodia (Fowler, 1934a; Kottelat, 1989; Rainboth, 1996; Kottelat, 2001a).

Glyptothorax garhwali Tilak 1969

Glyptothorax garhwali Tilak 1969: 37, figs. 1–4. Type locality: Alaknanda River, near Srinagar [Ganges drainage], dist. Pauri Garhwal, Uttar Pradesh, India. Holotype: ZSI F6152/2. Paratypes: ZSI F6153/2 (1).

Distribution: Ganges drainage, India (Tilak, 1969; Talwar & Jhingran, 1991).

Glyptothorax gracilis (Günther 1864)

Glyptosternum gracile Günther 1864: 186. Type locality: Nepal. Holotype: BMNH 1845.1.9.846.
Glyptothorax dakpathari Tilak & Husain 1976: 229, figs. 1–8. Type locality: Yamuna River, below Barrage [Ganges drainage], Dakpathar, District Dehra Dun, Uttar Pradesh, India. Holotype: NRS (ZSI) V-988. Paratypes: NRS (ZSI) V-989 (2), V-990 (4). Tentatively considered a synonym of *Glyptothorax gracilis* by Ng (2005a).

Distribution: Ganges and Brahmaputra drainages, India and Nepal (Tilak & Hussain, 1973; Jayaram, 1999; Menon, 1999; Karmakar, 2000; Ng, 2005a).

Glyptothorax hainanensis (Nichols & Pope 1927)

Glyptosternon hainanensis Nichols & Pope 1927: 333, fig. 7. Type locality: Nodoa, Hainan Island, China. Holotype: AMNH 8362. Paratypes: AMNH 10263 (1).

Distribution: Hainan Island, China (Li, 1984a; Chu *et al.*, 1999).

Glyptothorax honghensis Li 1984

Glyptothorax honghensis Li 1984a: 66 [English p. 69]. Type locality: Hekou [town], Weishan [town], Nanjian [town], Hong River [= Yuan River?] basin, Yunnan Prov., China. Syntypes: KIZ 6440430 (1), 6440474 (1), 6507022 (1), 6507133 (1), 6507134 (1), 6507137 (1).

Distribution: Red River drainage, Vietnam, Laos and China (Li, 1984a; Chu *et al.*, 1999; Kottelat, 2001a; Kottelat, 2001b).

Glyptothorax horai (Fowler 1934)

Pteroglanis horai Fowler 1934a: 92, figs. 37–40. Type locality: Sop Lao, in Maun Luang [Salween drainage], se. Shan States, Myanmar [Burma]. Holotype: ANSP 59462.

Distribution: Salween drainage, Myanmar (Fowler, 1934a).

Glyptothorax housei Herre 1942

Glyptothorax housei Herre 1942: 117, fig. 1. Type locality: Mountain stream rapids, Anamallai Hills, 4 mi. east of Valparai [Ponnani drainage], Pollachi dist., s. India. Holotype: SU 36531. Paratypes: FMNH 40899-901 (3), SU 36532 (orig. 50, now 51).

Distribution: Ponnani drainage, Western Ghats, peninsular India (Silas, 1951; Jayaram, 1999).

Glyptothorax indicus Talwar 1991

Glyptothorax horai Shaw & Shebbeare 1936: 188, pl. Type locality: Streams of Terai [Ganges drainage], n. Bengal. Holotype: ZSI F11376/1. Subjectively invalid; secondarily preoccupied in *Glyptothorax* by *Pteroglanis horai* Fowler 1934, replaced by *Glyptothorax indicus* Talwar 1991.

Glyptothorax indicus Talwar in Talwar & Jhingran 1991: 654, fig. 210. Type locality: Streams of Terai [Ganges drainage], n. Bengal. Holotype: ZSI F11376/1. Replacement name for *Glyptothorax horai* Shaw & Shebbeare 1936, secondarily preoccupied in *Glyptothorax* by *Pteroglanis horai* Fowler 1934.

Distribution: Ganges drainage, India and Nepal (Talwar & Jhingran, 1991; Jayaram, 1999; Menon, 1999).

Glyptothorax interspinalum (Mai 1978)

Glyptosternon interspinalum Mai 1978: 271, fig. 120. Type locality: Creeks in n. Vietnam. ?DVZUT.

Glyptothorax merus Li 1984: [English p. 86], fig. 2. Type locality: Yunnan, China. Holotype: KIZ 737159. Paratypes: KIZ (14). Listed as a synonym of *Glyptothorax interspinalum* by Chu *et al.* (1990).

Distribution: Red River drainage, Vietnam and China (Li, 1984b; Chu *et al.*, 1999; Kottelat, 2001a).

Glyptothorax jalalensis Balon & Hensel 1970

Glyptothorax jalalensis Balon & Hensel 1970: 160, fig. 1. Type locality: Kabul River trib., near Jalal-Abad [Jalalabad] [Indus drainage], Afghanistan. Holotype: SNMB RY 2176.

Distribution: Indus drainage, Afghanistan and Pakistan (Balon & Hensel, 1970; Coad, 1981b; Mirza, 1989).

Glyptothorax kashmirensis Hora 1923

Glyptothorax kashmirensis Hora 1923b: 22, fig. 2. Type locality: Kashmir Valley [Indus drainage], India. Syntypes: ZSI F10270/1 (2).

Distribution: Indus drainage, India and Pakistan (Mirza & Hameed, 1974; Mirza & Janjua, 1985; Mirza *et al.* 1993; Rashida *et al.* 1996; Rafique, 2000).

Glyptothorax kurdistanicus (Berg 1931)

Glyptosternum kurdistanicum Berg 1931: 1267, pl. 1 (fig. 2); fig. 1. Type locality: Serdesht, at Little Zab [Tigris and Euphrates basin] (36°N), elev. 1500 m, Iran. Holotype: ZIN 20780.

Distribution: Tigris and Euphrates basin, Iraq and Iran (Berg, 1931; Coad, 1979; Coad & Delmastro, 1985).

Glyptothorax lampris Fowler 1934

Glyptothorax lampris Fowler 1934a: 91, figs. 34–36. Type locality: Chieng Mai [Chao Phraya drainage], n. Thailand. Holotype: ANSP 59357.

Distribution: Chao Phraya and Mekong drainages, China, Laos, Thailand and Cambodia (Kottelat, 1989; Rainboth, 1996; Chu *et al.* 1999; Kottelat, 2001a).

Glyptothorax laosensis Fowler 1934

Glyptothorax laosensis Fowler 1934a: 88, figs. 28–30. Bua Yai [Mekong drainage], e. Thailand. Holotype: ANSP 59412. Paratypes: ANSP 59413 (1).

Distribution: Chao Phraya and Mekong drainages, China, Laos and Thailand (Kottelat, 1989; Rainboth, 1996; Chu *et al.* 1999; Kottelat, 2001a). Freyhof *et al.*, (2000) reported this species from the Dong Nai drainage, South Vietnam.

Glyptothorax lonah (Sykes 1839)

Bagrus lonah Sykes 1839: 164. Type locality: Deccan, India. Holotype: ?BMNH 1860.3.19.756.
Glyptosternum sykesi Day 1873a: Type locality: Deccan, India. Holotype (unique): ?BMNH 1860.3.19.756.
Glyptosternum dekkanense Günther 1864: 187. Type locality: Deccan, India. Holotype: BMNH 1860.3.19.757.

Distribution: Chalakudy, Krishna, Cauvery and Godavari drainages, Western Ghats, peninsular India (Hora, 1938; David, 1963; Ajith Kumar *et al.*, 1999; Biju *et al.*, 1998).

Glyptothorax longicauda Li 1984

Glyptothorax longicauda Li 1984b: [English p. 87], fig. 3. Type locality: Tengchong [Irrawaddy drainage], Yunnan, China. Holotype: KIZ 764126. Paratypes: KIZ (9).

Distribution: Irrawaddy drainage, Yunnan, China (Li, 1984b; Chu *et al.*, 1999).

Glyptothorax longjiangensis Mo & Chu 1986

Glyptothorax longjiangensis Mo & Chu 1986: 344 [English p. 349], fig. 5. Type locality: Longjiang River, upper trib. of Irrawaddy River, Tengchong Co. (25°00'N, 98°30'E), Yunnan, China. Holotype: KIZ 764246. Paratypes: KIZ 764241 (1).

Distribution: Irrawaddy drainage, Yunnan China (Mo & Chu 1986; Chu *et al.*, 1999).

Glyptothorax macromaculatus Li 1984

Glyptothorax macromaculatus Li 1984b: 82 [English p. 88], fig. 7. Type locality: Yangbi Xian [Mekong drainage], Yunnan, China. Holotype: KIZ 748804. Paratypes: KIZ.

Distribution: Mekong drainage, China and Laos (Li, 1984b; Chu *et al.*, 1999; Kottelat, 2001a).

Glyptothorax madraspatanum (Day 1873)

Glyptosternum madraspatanum Day 1873b: 526. Type locality: Bowany [Bhavani] River, Neilgherries [Nilgiris] [Cauvery drainage], Madras State, India. Syntypes and/or Day specimens: (5) AMS B.7759 (1, syntype?), B.8004 (1, syntype?); NMW 46582083 (2); RMNH 2739 (1); ZMB 10798 (1), 10829 (1), 11208 (1); ZSI F1235 (1), F1313 (1).

Distribution: Cauvery, Chalakudy and Tamirabarani River drainages, Western Ghats, peninsular India (Misra, 1976; Ajith Kumar *et al.*, 1999; Arunachalam & Sankaranarayanan, 1999a; Arunachalam & Sankaranarayanan, 1999b).

Glyptothorax major (Boulenger 1894)

Akysis major Boulenger 1894: 246. Type locality: Senah River, Tagora River and Baram River, Sarawak state, Borneo, East Malaysia. Syntypes: BMNH 1892.9.2.59 (1), 1892.10.7.26 (1), 1893.3.6.173–178 (6?).

Glyptosternum kuekenthali Steindachner 1901: 448, pl. 18 (fig. 5-a). Type locality: Baram River, Borneo. Holotype: SMF 752.

Distribution: We have examined specimens only from Borneo. This species has been reported from Sumatra and the Malay Peninsula (Wirjoatmodjo, 1987; Roberts, 1989; Lim *et al.*, 1990; Zakaria Ismail, 1993).

Remarks: We consider *Glyptosternum kuekenthali* to be a synonym of *G. major* based on examination of a photograph of the type of *G. kuekenthali*.

Glyptothorax manipurensis Menon 1955

Glyptothorax manipurensis Menon 1955: 23, fig. Type locality: Barak River at Karong, Naga Hills [Meghna drainage], Manipur State, Assam, India. Holotype: ZSI F738/2. Paratypes: ZSI F739/2 (6).

Distribution: Meghna, Brahmaputra and Irrawaddy drainages, India (Jayaram, 1981; Vishwanath *et al.*, 1998; Jayaram, 1999; Keishing & Vishwanath, 1999; Karmakar, 2000; Kosygin & Vishwanath, 2005).

Glyptothorax minimaculatus Li 1984

Glyptothorax minimaculatus Li 1984b: [English p. 87], fig. 5. Type locality: Tengchong Xian [Irrawaddy drainage], Yunnan, China. Holotype: KIZ 764336. Paratypes: (16).

Distribution: Irrawaddy drainage, Yunnan, China (Li, 1984b; Chu *et al.*, 1999).

Glyptothorax naziri Mirza & Naik 1969

Glyptothorax naziri Mirza & Naik 1969: 123, figs. 1–2. Type locality: Zhob River [Indus drainage], Baluchistan, Pakistan. Holotype: GCM No. 6.

Distribution: Indus drainage, Afghanistan and Pakistan (Mirza & Hameed, 1974; Mirza, 1975; Mirza, 1989; Rafique, 2000).

Glyptothorax nelsoni Ganguly, Datta & Sen 1972

Glyptothorax nelsoni Ganguly, Datta & Sen 1972: 341, figs. 1–2. Subarnarekha River, Chotanagpur Plateau, Bihar, India. Holotype: USNM 205611. Paratypes: Calcutta Univ. (2).

Distribution: Subarnarekha drainage, India (Ganguly *et al.*, 1972; Jayaram, 1999).

Glyptothorax nieuwenhuisi (Vaillant 1902)

Glyptosternon nieuwenhuisi Vaillant 1902: 72, 162, figs. 14–15. Type locality: Borneo. Syntypes: MNHN 1891-0484 to 0487 (4) Sebroeang, MNHN 1903-0189 (1) Le Bloeoe.

Distribution: Borneo (H. H. Ng, Pers. Comm. 2005). We have examined specimens from Borneo.

Remarks: This species is usually considered a synonym of *G. major*, but it is a valid species (H. H. Ng, Pers. comm. 2005).

Glyptothorax obscura Li 1984

Glyptothorax obscura Li 1984b: [English p. 86], fig. 1. Type locality: Jingdon Xian [Red River drainage], Yunnan, China. Holotype: KIZ 737197. Paratypes: KIZ.

Distribution: Red River drainage, Yunnan, China (Li, 1984b).

Remarks: May be a synonym of *G. quadriocellatus*. (Chu *et al.*, 1999; Kottelat, 2001b).

***Glyptothorax pallozonum* (Lin 1934)**

Glyptosternum pallozonum Lin 1934: 228, figs. 7–8. Type locality: Loh-Fau Shan, Kwangtung [Dong drainage], China. Holotype: Fish. Exp. Sta., Canton G10. Paratypes: Mus. Lingnan Univ. (1).

Distribution: Dong drainage, China (Chu *et al.*, 1999). Yen (1985) lists it as present in northern Vietnam.

***Glyptothorax panda* Ferraris & Britz 2005**

Glyptothorax panda Ferraris & Britz 2005: 376, figs. 1–2 [Ichthyol. Explor. Freshwaters]. Upper Irrawaddy River drainage, hill stream 8 mi. from Kamaing on road to Tanai, vicinity of Myitkyina, Kachin State, Myanmar. Holotype: USNM 384824. Paratypes: BMNH 2005.7.4.1–10 (10); USNM 384825 (13).

Distribution: Irrawaddy drainage, Myanmar (Ferraris & Britz, 2005).

***Glyptothorax pectinopterus* (McClelland 1842)**

Glyptosternon pectinopterus McClelland 1842: 587. Type locality: Simla Mts. [Ganges drainage], India. Possible syntypes: AMS B.7562 (1).

Distribution: Indus and Ganges drainages, Pakistan and India (Hora, 1923b; Hora & Mukerji, 1936; Mirza & Hameed, 1974; Shrestha, 1990; Rafique, 2000).

***Glyptothorax platypogon* (Valenciennes 1840)**

Pimelodus platypogon Valenciennes (ex Kuhl & van Hasselt) in Cuvier & Valenciennes 1840: 152. Type locality: Java, Indonesia. Syntypes or possible syntypes: BMNH 1863.12.11.153 (1); MNHN B-0196 (2), 2903 (2), 2904 (2); RMNH; ?SMF 649 [ex RMNH in 1829] (2).

Pimelodus cyanochloros Bleeker 1847: 11. Type locality: Java, Indonesia. Syntypes: SMNS 10569 (6). Synonomized with *Pimelodus platypogon* (= *Glyptothorax platypogon*) by Bleeker (1858).

Sundagagata robusta Boeseman 1966: 243, fig. 1. Type locality: Near Buitenzorg (Bogor), Java, Indonesia. Holotype: RMNH 25264. Considered by Kottelat *et al.* (1993) to be an abnormal specimen of, and synonym of *Glyptothorax platypogon*.

Distribution: We have examined specimens only from Java. This species has also been reported from Sumatra, Borneo and Malay Peninsula (Hora & Gupta, 1941b; Kottelat, 1989; Roberts, 1989; Kottelat *et al.*, 1993).

Glyptothorax platypogonides (Bleeker 1855)

Pimelodus platypogonides Bleeker 1855: 272. Type locality: Lahat, Palembang Prov., Sumatra, Indonesia. Syntypes: (4) BMNH 1863.12.11.154 (1) Sumatra, ?RMNH 6912 (4) Lahat, ?RMNH 15289 (3).

Distribution: Sumatra and Western Borneo (Roberts, 1989; Talwar & Jhingran, 1991; Kottelat *et al.*, 1993).

Remarks: Reports of this species from India and Myanmar are referable to *G. dorsalis*. All records of this species from the Indus drainage are referable to *G. stocki*. Reports of this species from peninsular Thailand are probably *G. siamensis.*

Glyptothorax poonaensis Hora 1938

Glyptothorax conirostre var. *poonaensis* Hora 1938: 368, pl. 7 (figs. 5–6). Type locality: Mula Mutha River at Poona [Krishna drainage], Maharashtra, Bombay State, India. Holotype: ZSI F12126/1.

Distribution: Krishna drainage, peninsular India (Jayaram, 1999).

Glyptothorax prashadi Mukerji 1932

Glyptothorax prashadi Mukerji 1932: 281, fig. 1.). Type locality: Kyenchaung River, Mergui Dist., lower Myanmar [Burma]. Holotype: ZSI F11334/1.

Distribution: Peninsula Myanmar and Thailand (Misra, 1976; Talwar & Jhingran, 1991).

Glyptothorax punjabensis Mirza & Kashmiri 1971

Glyptothorax punjabensis Mirza & Kashmiri 1971: 88, fig. 1. Rawal Dam, Rawalpindi [Indus drainage], Pakistan. Holotype: GCM No. 7. Paratypes: (5) Mirza priv. coll. (4?), ZMA 114764 (1).

Distribution: Indus drainage, Pakistan and India (Mirza & Kashmiri, 1971; Mirza, 1973; Mirza & Hameed, 1974; Coad, 1981b; Rafique, 2000).

Glyptothorax quadriocellatus (Mai 1978)

Glyptosternon quadriocellatum Mai 1978: 272, fig. 121. Fast-running creeks, n. Vietnam. ?DVZUT.

Glyptosternon minutum Mai 1978: 274, fig. 122. Type locality: Fast-running creeks, n. Vietnam. ?DVZUT. Subjectively invalid; secondarily preoccupied by *Glyptothorax minutus* Hora 1921 in *Glyptothorax*, replaced by *Glyptothorax spectrum* Kottelat 2001. Also, Kottelat (2001b) serves as first reviser selecting *Glyptosternon quadriocellatum* Mai 1978 over *Glyptosternon minutum* Mai 1978.

Glyptothorax spectrum Kottelat 2001b: 55. Replacement name *for Glyptosternon minutum* Mai 1978, secondarily preoccupied by *Glyptothorax minutus* [*minutum*]Hora 1921 in *Glyptothorax*. Considered by Kottelat (2001b) to be a synonym of *Glyptothorax quadriocellatus*.

Distribution: Red River drainage, China and Vietnam (Yen, 1985; Chu *et al.*, 1999).

Glyptothorax saisii (Jenkins 1910)

Glyptosternum saisii Jenkins 1910: 128, fig.; pl. 6 (fig. 6). Type locality: Sita Nullah stream, Paresnath Hills [Hooghly River drainage], Bihar, w. Bengal, elev. 2150 ft. Holotype: ZSI F2583/1. Paratypes: ZSI F3260/1 (1), F3261/1 (1).

Glyptothorax coheni Ganguly, Datta & Sen 1972: 342, figs. 3–4. Type locality: Subarnarekha River, Chotanagpur Plateau [Subarnarekha drainage], Bihar, India. Holotype: USNM 205612. Paratypes: USNM 205613 (1, not 2), Zool. Dept. Calcutta Univ. (7). Synonomized with *Glyptothorax saisii* by Tilak & Husain (1978).

Distribution: Hooghly River and Subarnarekha drainages, India (Tilak & Husain, 1978; Jayaram, 1999).

Glyptothorax schmidti (Volz 1904)

Callomystax schmidti Volz 1904: 470. Simbolon Gebirge, cent. Sumatra, Indonesia, elev. 1400 m. Syntypes: (5) MHNG 683.22 (1), NMBA 2827 (1).

Distribution: Sumatra (H. H. Ng, Pers. Comm. 2005). We have examined specimens from Sumatra.

Remarks: This species usually is misidentified as *G. major* in Sumatra.

Glyptothorax siamensis Hora 1923

Glyptothorax siamensis Hora 1923a: 168, pl. 12 (figs. 1–3). Type locality: Nakon Sritamarat Hills, Thailand. Holotype: ZSI F10548/1.

Distribution: Peninsular Thailand (Hora, 1923a; Ng & Rachmatika, 2005).

Glyptothorax silviae Coad 1981

Glyptothorax silviae Coad 1981a: 291, figs. 1–3. Type locality: Stream 3 km south of Bagh-e Malek, Khuzestan [Tigris and Euphrates basin], Iran, 31°29'00"N, 49°54'30"E, elev. 660 m. Holotype: NMC 79-0390A. Paratypes: NMC 79-0280 (1), 79-0389 (1), 79-0390B (1).

Distribution: Tigris and Euphrates basin, Iran (Coad, 1981a; Coad & Delmastro, 1985).

Glyptothorax sinensis (Regan 1908)

Glyptosternum sinense Regan 1908: 110, pl. 4 (fig. 3). Type locality: Tunting [Tungting] [Yangtze drainage], China. Holotype: BMNH 1907.11.26.4.

Distribution: Irrawaddy and Yangtze drainages, Myanmar and China (Chu *et al.*, 1999; Jayaram, 1999; Keishing & Vishwanath, 1999; Fu *et al.*, 2003; Kosygin & Vishwanath, 2005).

Glyptothorax steindachneri (Pietschmann 1913)

Glyptosternum steindachneri Pietschmann 1913: 93. Type locality: Tigris River, Mosul, Iraq. Syntypes: (2).

Distribution: Tigris and Euphrates basins, Iraq (Berg, 1931; Coad, 1981a; Coad & Delmastro, 1985).

Glyptothorax stocki Mirza & Nijssen 1978

Glyptothorax stocki Mirza & Nijssen 1978: 79, fig. 1. Type locality: Bhed Nullah, small stream on G.T. road to Rawalpindi, 7 mi. from Lahore [Indus drainage], Pakistan. Holotype: ZMA 114763. Paratypes: GCM No. 15 (1), ZMA 115027 (1), ZSD 1782 F (5).

Distribution: Indus drainage, Pakistan (Mirza & Nijssen, 1978; Jayaram, 1999).

Remarks: Reports of *G. platypogonoides* from the Indus drainage are referable to this species.

Glyptothorax stolickae (Steindachner 1867)

Glyptosternum stolickae Steindachner 1867: 533 [17], pl. 6 (fig. 1). Type locality: Simla [Ganges drainage], Himachal Pradesh, nw. India. Syntypes: NMW 76606 (3).

Glyptosternum modestum Day 1872: 714 [12]. Type locality: Upper portion of Jumna River [Ganges drainage], India. Syntypes and/or Day specimens: (numerous) AMS B.7562 (1, syntype), B.7564 (1, syntype); ZMB 2765 (1).

Distribution: Indus and Ganges drainages, Pakistan and India (Menon, 1999; Karmakar, 2000).

Remarks: Ng (2005a) tentatively considered both *Glyptothorax stolickae and G. modestum* to be synonyms of *G. gracilis*.

Glyptothorax striatus (McClelland 1842)

Glyptosternon striatus McClelland 1842: 587, pl. 6 (figs. 1–2). Type locality: Kasyah [Kashya, Khasi] Hills [Meghna drainage], Meghalaya, India. Holotype: BMNH 1860.3.19.95.

Distribution: Meghna and Brahmaputra drainages, India (Motwani *et al.*, 1962; Misra, 1976; Sen, 1995; Karmakar, 2000).

Glyptothorax sufii Asghar Bashir & Mirza 1975

Glyptothorax telchitta sufii Asghar Bashir & Mirza 1975: 96, fig. 1. Type locality: Sutlej River [Indus drainage], Lahore dist., Kanganpur, Pakistan. Holotype: GCM F. 13. Paratypes: (6).

Distribution: Indus drainage, Pakistan (Jayaram, 1999; Mirza, 2000).

Glyptothorax telchitta (Hamilton 1822)

Pimelodus telchitta Hamilton 1822: 185, 378. Type locality: Hooghly River at Kalna, 23°13'30.0"N, 88°22'39.0"E. Neotype: UMMZ 244946. Neotype designated by Ng (2005).

Distribution: Ganges drainage, India (Ng, 2005a).

Remarks: Has been reported from the Brahmaputra drainage in India (Mamnur Rashid *et al.*, 1997) and also from the Ganges drainage in Bangladesh and Nepal (Lipton, 1985; Datta Munshi & Srivastava, 1988 (in part); Talwar & Jhingran, 1991 (in part); Sen, 1995 (in part); Jayaram, 1999 (in part); Menon, 1999 (in part)). It is uncertain whether these reports are based on *G. telchitta* or *G. botius*. Ng (2005a) only examined specimens from the Hooghly River, India. All reports of this species from the Indus drainage are referable to *G. sufii*.

Glyptothorax trewavasae Hora 1938

Glyptothorax trewavasae Hora 1938: 373, pl. 7 (figs. 3–4). Type locality: Yenna Valley [Kristna drainage], Satara dist., Maharashtra, India. Holotype: ZSI F9723/1.

Distribution: Kristna drainage, peninsular India (Menon, 1999).

Glyptothorax trilineatus Blyth 1860

Glyptothorax trilineatus Blyth 1860: 154. Type locality: Tenasserim [Sittang drainage], Myanmar [Burma]. Syntypes: ZSI F10380/1 (2).

Glyptothorax trilineatoides Li 1984b: [English p. 87], fig. 5. Type locality: Tengchong Xian [Salween drainage], Yunnan, China. Holotype: KIZ 764336. Paratypes: (16). Synonomized with *Glyptothorax trilineatus* by Mo & Chu (1986).

Distribution: Irrawaddy, Sittang and Salween drainages, India, Myanmar and China (Blyth, 1860; Vishwanath *et al.*, 1998; Chu *et al.*, 1999; Keishing & Vishwanath, 1999; Karmakar, 2000). Shrestha (1990) reported this species from the Ganges drainage in Nepal.

Glyptothorax zanaensis Wu, He & Chu 1981

Glyptothorax zanaensis Wu, He & Chu 1981: 74 (English p. 79), fig. 1 (1-b). Type locality: Qinghai-Xizang plateau region, China. Syntypes: Inst. Hydrobiol. Acad. Sin. 606164-66 (3), 606168 (1), 606170-74 (5), 606178 (1), 6006651-53 (3).

Glyptothorax longinema Li 1984b: [English p. 88], fig. 6. Type locality: Lushui Xian [Salween drainage], Yunnan, China. Holotype: KIZ 741097. Paratypes: KIZ (3). Synonomized with *Glyptothorax zanaensis* by Mo & Chu (1986).

Glyptothorax rubermentus Li 1984b: [English p. 88], fig. 8. Type locality: Baoshan Xian [Salween drainage], Yunnan, China. Holotype: KIZ 749356. Paratypes: KIZ (28). Synonomized with *Glyptothorax zanaensis* by Mo & Chu (1986).

Distribution: Mekong and Salween drainages, Yunnan, China (Chu *et al.*, 1999; Kottelat, 2001a).

Glyptothorax zhujiangensis Lin 2003

Glyptothorax zhujiangensis Lin 2003: 159 [English p. 161], figs. 1–2. Type locality: Baishuidai Stream basin, Yaxi Town, 22°15'N, 112°59'25"E, Xinhui City [Xijiang drainage], middle-southern Guangdong Prov., China, elev. 30 m. Holotype: Inst. Hydrobiol. Wuhan ZX970901. Paratypes: (19 specimens) Inst. Hydrobiol. Wuhan ZX 970902-10 (9); Zhuhai City Fish. Sci. Res. Inst. ZX 991001-10 (10).

Distribution: Xijiang drainage, China (Lin, 2003).

Species *inquirendae*

Glyptosternum laak Popta 1904: 190. Type locality: Howong River, Borneo. Syntypes: RMNH 7562 (3).

Glyptosternum tiong Popta 1904: 191. Type locality: Kajan River, central Borneo. Syntypes: RMNH 7564 (2).

C. Glyptosterninae Gill, 1872, Pseudecheneidina de Pinna, 1996

Pseudecheneis, the only genus in this clade, is easily distinguished from other clades of Sisoridae by having an adhesive apparatus on the thorax with grooves transverse to the longitudinal axis of the body. Osteological traits used by de Pinna (1996) to diagnose Pseudecheneidina include endopterygoid surrounding metapterygoid dorsally, sphenotic not contacting supraoccipital, first epibranchial expanded anteriorly, and dorsal expansion on first pleural rib.

Pseudecheneis Blyth, 1860

Fig. 16

Pseudecheneis Blyth, 1860: 154. (Type species: *Glyptothorax sulcatus* McClelland, 1842, by monotypy). Gender feminine.

Parapseudecheneis Hora, in Hora & Chabanaud, 1930: 216. (Type species: *Pseudecheneis paviei* Vaillant, 1892, by monotypy). Gender feminine. Synonomized with *Pseudecheneis* by Chu (1982).

Propseudecheneis Hora, 1937: 348. (Type species: *Propseudecheneis tchangi* Hora, 1937, by original designation). Gender feminine. Synonomized with *Pseudecheneis* by Chu (1982).

Diagnosis: Thoracic adhesive apparatus with grooves transverse to longitudinal axis of body (vs. grooves parallel or oblique to longitudinal axis of body, or thoracic adhesive apparatus absent).

Pseudecheneis is distinguished from all other sisorid genera by having an adhesive apparatus on the thorax with grooves transverse to the longitudinal axis of the body (vs. thoracic adhesive apparatus with grooves parallel or oblique to the longitudinal axis of body in *Glyptothorax*, and the thoracic adhesive apparatus absent in all other genera).

Description: Dorsal fin with 1 spine, 5–7 branched rays; pectoral fin with 1 spine, 11–16 rays; 6 pelvic-fin rays, 4–13 anal-fin rays. Head short, anteriorly depressed; snout sharp; body elongate, moderately or greatly depressed. Eyes small, dorsal. Skin smooth. Mouth small. Lips thick, fleshy, papillate. Jaw teeth somewhat flattened with truncate apices in small patches on jaws; palatal teeth absent. Eyes small, dorsal. Maxillary barbel very short, barbel, with well-developed membrane, soft base. Mandibular barbels papillate. Gill openings narrow; branchiostegal membranes confluent with isthmus. Coracoid process not visible externally. Thoracic adhesive apparatus present, grooves transverse to longitudinal axis of body. Paired fins plaited (Fig. 15) to form an adhesive apparatus.

Distribution: Ganges and Brahmaputra drainages, northern India and Nepal, east to the Red River drainage, Vietnam (Ng & Edds, 2005b).

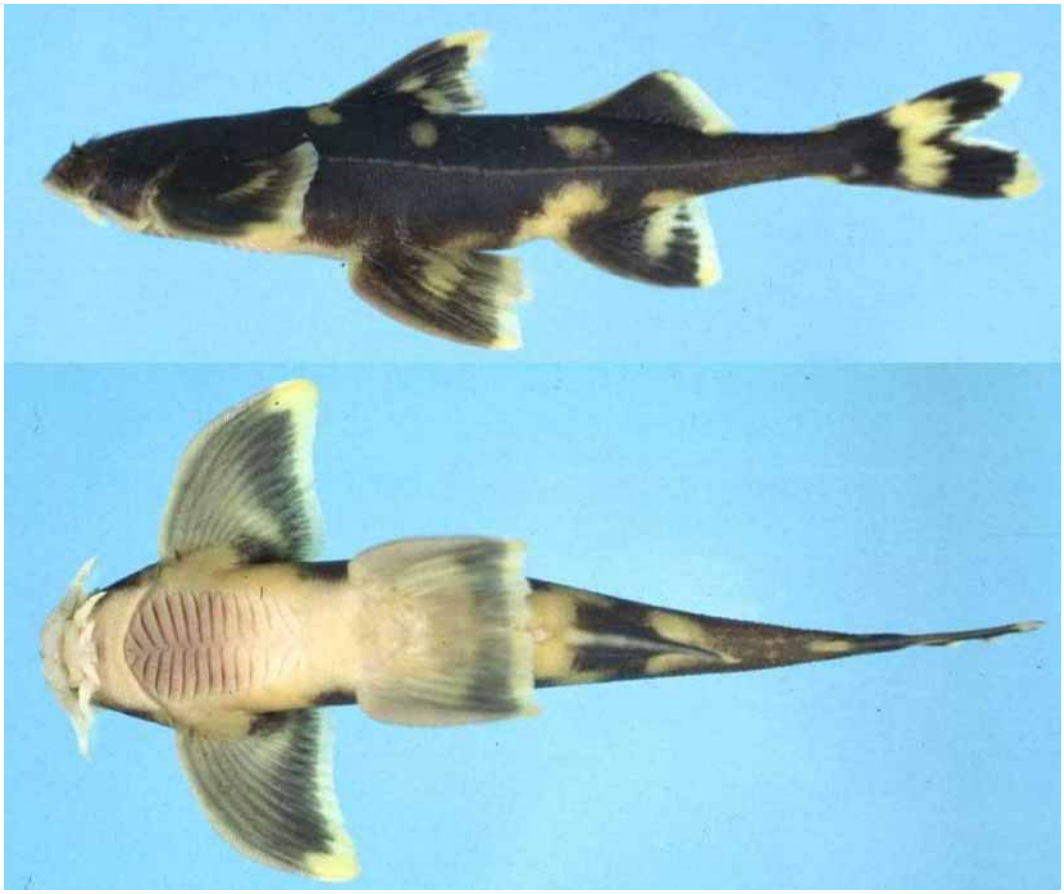

FIGURE 16. *Pseudecheneis sympelvica*, lateral and ventral views. Photographs by M. Kottelat.

Pseudecheneis crassicauda Ng & Edds 2005

Pseudecheneis crassicauda Ng & Edds 2005b: 2, fig. 1. Type locality: Mewa Khola (river) [Ganges drainage], Dhankuta Dist., 27°00'N, 87°20'E, Nepal. Holotype: BMNH 1958.9.1.8. Paratypes: BMNH 1958.9.1.9 (1), BMNH 1970.12.14.230 (1).

Distribution: Kosi River system, Ganges drainage, Nepal (Ng & Edds, 2005b).

Pseudecheneis eddsi Ng 2006

Pseudecheneis eddsi Ng 2006b: 51, fig. 4. Type locality: Seti River (Ganges River drainage), Tanahun, Khairenitar, 28°2'0.0”N, 84°4’0.0”E, Nepal. Holotype: KU 36872. Paratypes: CAS 44188 (3), CAS 50306 (30), KU 29084 (3), KU 29629 (5).

Distribution: Ganges drainage, Nepal (Ng, 2006b).

Pseudecheneis immaculata Chu 1982

Pseudecheneis immaculata Chu 1982: 428 [English p. 437], fig. 1. Type locality: Baijixun, upper Lancang River [=Mekong], Weixi Co., Yunnan, China. Holotype: KIZ 748742. Paratypes: KIZ 748738 (1), KIZ (17).

Distribution: Mekong drainage, China (Chu, 1982; Chu *et al.*, 1999).

Pseudecheneis paviei Vaillant 1892

Pseudecheneis paviei Vaillant 1892: 126 [2]. Type locality: Near Lai Chau [Red River drainage], Tonkin, n. Vietnam. Holotype: MNHN 1892-0049.

Pseudecheneis intermedius Chu 1982: 430 [English p. 437], fig. 2. Type locality: Stream at upper Babian River, Red River drainage, Dongbao, Jingdong Co., Yunnan, China. Holotype: KIZ 737173. Paratypes: KIZ (10).

Distribution: Red River drainage, Vietnam (Hora & Chabanaud, 1930; Yen, 1985; Ng & Edds, 2005b).

Remarks: *P. intermedius* is considered a synonym of *P. paviei* following Ng & Edds (2005b)

Pseudecheneis serracula Ng & Edds 2005

Pseudecheneis serracula Ng & Edds 2005b: 6, figs. 3, 5. Type locality: Mugu/Bajura, Jhugala Karnali R., purchased at Jhugala [Ganges drainage], 29°31'18.0"N, 81°46'48.0"E, Nepal. Holotype: KU 29554. Paratypes: BMNH 1985.9.16.50-51(2); KU 28669 (5), KU 29038 (1), KU 35545 (2); OSUS 15703 (4), OSUS 15718 (9), OSUS 15729 (3), OSUS 15736 (6), OSUS 16340 (1), OSUS 16609 (1), OSUS 16637 (15), OSUS 16695 (1), OSUS 17179 (1).

Distribution: Ganges drainage, Nepal (Ng & Edds, 2005b).

Pseudecheneis stenura Ng 2006

Pseudecheneis stenura Ng 2006b: 57, figs. 2b, 5). Type locality: Longchuanjiang at Lianmengjie bridge (Irrawaddy River drainage), Baoshan Prefecture, Yunnan, China. Holotype: KIZ 199811999. Paratypes: CAS 219177 (55).

Distribution: Irrawaddy drainage, China (Ng, 2006b).

Pseudecheneis sulcatoides Zhou & Chu 1992

Pseudecheneis sulcatoides Zhou & Chu 1992: 111 [English p. 115], figs. 1–3. Type locality: Yangbi, 25°40'N, 99°57'E [Mekong drainage], Yunnan Prov., China. Holotype: KIZ 839059. Paratypes: (19) KIZ.

Distribution: Mekong drainage, Yunnan, China (Zhou & Chu, 1992).

Pseudecheneis sulcata (McClelland 1842)

Glyptosternon sulcatus McClelland 1842: 587, pl. 6 (figs. 1–3). Type locality: Kasyah [Khasi] Hills, Meghalaya, India. Possible holotype: BMNH 2005.5.17.5.

Distribution: Brahmaputra drainage, India (Ng, 2006b).

Pseudecheneis sympelvica Roberts 1998

Pseudecheneis sympelvicus Roberts 1998: 290, fig. 1. Type locality: Nam Veo, trib. of Nam Phao, 25 km east of Lak Sao, Nam Theun watershed, Mekong basin, Laos. Holotype: ZRC 40359. Paratypes: ZRC 40360 (1).

Distribution: Nam Theun watershed, Mekong drainage (Roberts, 1998; Kottelat, 2001a).

Pseudecheneis tchangi (Hora 1937)

Propseudecheneis tchangi Hora 1937: 348, fig. 11. Type locality: Red River system, Yunnan, China.

Distribution: Red River drainage, Yunnan, China (Hora, 1937).

Remarks: Ng & Edds (2005b) tentatively follow Zhou & Chu (1992) in considering this species a synonym of *P. sulcata*.

D. Glyptosterninae Gill, 1872; Glyptosternina Gill, 1872

Glyptosternina is distinguished from other clades of sisorids by the combination of no adhesive apparatus on the thorax and the presence of plaited adhesive organs on the paired fins (Fig. 15). Osteological traits used by de Pinna (1996) to diagnose Glyptosternina include maxilla dorsoventrally flat and strongly expanded distally; interopercle narrow and elongate, its laminar portion reduced; proximal pectoral radials 2 and 3 flared at distal

tip; and external arm of basipterygium abruptly expanded distally.

He (1996b), using mostly osteological characters, found Glyptosternina to be a monophyletic group defined by the following 12 apomorphies: 1) Posterior tip of lateral ethmoid prolonged and extended to the margin of the cranium. 2) Anterior part of frontal very narrow, its width far smaller than that of the posterior part. 3) Tooth band in upper jaw narrow, without posterolateral extensions (plesiomorphic in *Glyptosternon* and *Euchiloglanis*). 4) Articular very short and small, wedge-like, attaching to the posterior end of the dentary (plesiomorphic in *Exostoma* and *Glaridoglanis*). 5) Autopalatine enormously developed, broad, strong and spatulate at both ends. 6) Interoperculum long and thin, as long as the length from the anterior tip of the dentary to its posterior end). 7) Dorsal neural spine of the 4th vertebra undeveloped, plate-like, single, not connected to the proximal radial of the dorsal fin; no distinction between the 4th neural spine and the bony ridge of the skull. 8) Absence of an arch on the ventral side of the abdominal vertebra centrum (plesiomorphic in *Glyptosternon*, *Glaridoglanis*, *Exostoma*, *Pareuchiloglanis sinensis* and *P. anteanalis*). 9) Post-haemapophysis of the 5th vertebra developed. 10) 5th parapophysis undeveloped and far shorter than the 4th parapophysis. 11) Pectoral spine soft and enveloped in the skin of the fin. 12) 2nd proximal of dorsal fin without wide lateral process.

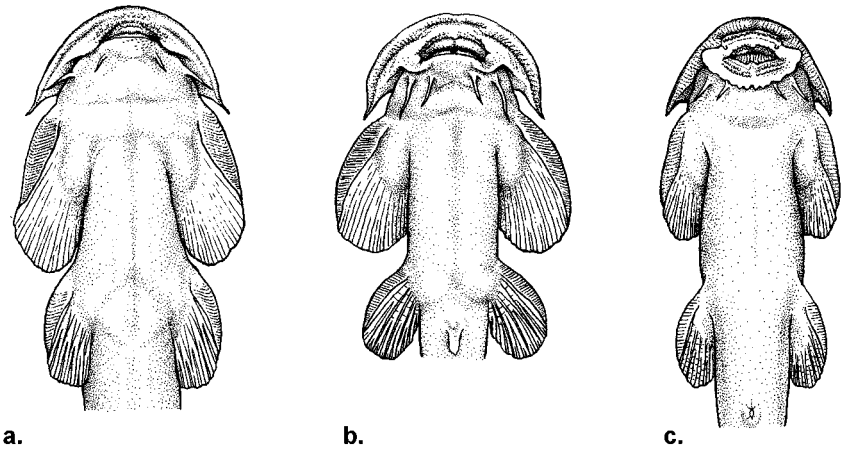

FIGURE 17. Variation in the development of the post-labial groove on the lower jaw in genera of Glyptosternina. a, Groove absent in *Parachiloglanis*; b, Groove interrupted as in *Euchiloglanis*, *Glaridoglanis*, *Glyptosternon*, and *Pareuchiloglanis*; c, Groove continuous as in *Exostoma*, *Myersglanis*, *Oreoglanis*, and *Pseudexostoma*. Drawn by J. Bourque, after Hora & Silas (1952a).

Following the review of published data and the examination of specimens, we recognize nine genera of Glyptosternina. Traits used to diagnose these genera include the development of the post-labial grove on the lower jaw (Fig. 17), the degree to which the gill openings extend onto the venter, dentition of the upper and lower jaws, and the number of branched pectoral rays (Tables 5–7). In Table 5, genera are separated into three phenetic

groups based on the development of the post-labial groove. In Table 6, characters are given to differentiate genera with an interrupted post-labial groove on the lower jaw, and in Table 7, characters are used to differentiate genera with a continuous post-labial groove on the lower jaw. Although these traits may result in the over-splitting of Glyptosternina genera, they do successfully diagnose the genera currently recognized by most authors. However, it should be noted that He (1996b) concluded that *Pareuchiloglanis*, as currently defined, is monophyletic only when species currently assigned to *Pseudexostoma* and *Oreoglanis* are included.

Euchiloglanis Regan, 1907

Fig. 18

Chimarrichthys Sauvage, 1874: 332. (Types species: *Chimarrichthys davidi* Sauvage, 1874, by monotypy). Gender masculine.

Euchiloglanis Regan, 1907: 158. (Types species: *Chimarrichthys davidi* Sauvage, 1874, by being a replacement name. Proposed as a replacement for *Chimarrichthys* Sauvage,1874, then considered to be preoccupied by *Cheimarrichthys* Haast, 1874 in fishes). Gender masculine.

Coraglanis Hora & Silas, 1952b: 12. (Type species: *Euchiloglanis kishinouyei* Kimura,1934, by original designation). Gender masculine. Synonomized with *Euchiloglanis* by Chu (1981).

Diagnosis (based, in part, on Chu 1981)**:** Interrupted post-labial groove; gill openings not extending onto venter; homodont dentition; pointed teeth in both jaws; tooth patches in upper jaw joined into cresent-shaped band; 12–14 branched pectoral rays.

Euchiloglanis is distinguished from *Oreoglanis*, *Pseudexostoma*, *Exostoma*, *Myersglanis*, and *Parachiloglanis* by having an interrupted post-labial groove (Table 5). *Euchiloglanis* is distinguished from *Pareuchiloglanis* by having a crescent-shaped tooth patch in the upper jaw. i.e., a band that curves posteriorly at the sides (vs. not curved posteriorly). It is distinguished from *Glyptosternon* by having the gill openings not extending onto the venter, and from *Glaridoglanis* by having small pointed teeth in both jaws (vs. strong, distally flattened teeth).

Description: Dorsal fin with 7 rays; pectoral fin with 12–14 branched rays; 6 pelvic-fin rays; 6 anal-fin rays. Head depressed; snout broadly rounded; body elongate, flattened ventrally to pelvic fins. Eyes small, dorsal, subcutaneous. Lips thick, fleshy, papillated. Post-labial groove broadly interrupted at middle. Upper jaw teeth pointed, tooth patches in upper jaw joined into cresent-shaped band. Maxillary barbel with well-developed membrane, soft base, striated pad of adhesive skin. Gill openings narrow, not extending below pectoral-fin base. Branchiostegal membranes confluent with isthmus. Coracoid process not externally visible. No thoracic adhesive apparatus. Paired fins plaited to form an adhesive apparatus.

Distribution: Yangtze drainage, China (Chu, 1981; He, 1995; Fu et. al., 2003).

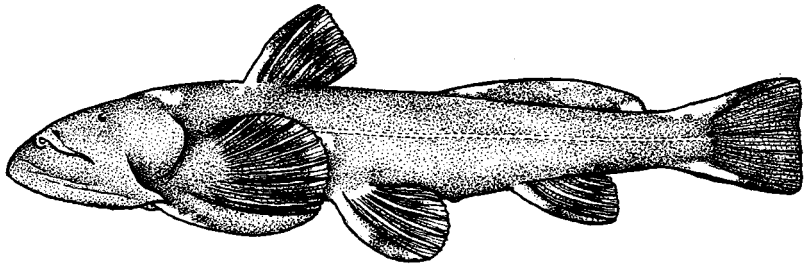

FIGURE 18. *Euchiloglanis davidi*. Drawn by J. Bourque, after Chu *et al.* (1999).

TABLE 5. Development of the post-labial groove on the lower jaw in genera of Glyptosternina.

Post-labial groove on lower jaw	Genera
Absent; lower lip contiguous with isthmus without demarcation (Fig. 17a)	*Parachiloglanis*
Interrupted (Fig. 17b)	*Glyptosternon* *Euchiloglanis* *Glaridoglanis* *Pareuchiloglanis*
Continuous (Fig. 17c)	*Myersglanis* *Oreoglanis* *Exostoma* *Pseudexostoma*

TABLE 6. External traits diagnostic for genera of Glyptosternina with an interrupted post-labial groove on the lower jaw.

	Glyptosternon	*Euchiloglanis*	*Glaridoglanis*	*Pareuchiloglanis*
Gill openings extend onto venter	Yes	No; not extending below pectoral fin base	No; not extending below pectoral fin base	No; not extending below pectoral fin base
Teeth in upper and lower jaws	Homodont; small, pointed	Homodont; small, pointed	Homodont: strong, distally flattened	Homodont; small, pointed
Tooth patches in upper jaw	Joined, forming a crescent-shaped band	Joined, forming a crescent-shaped band	Joined, forming a slightly crescent-shaped band	Joined, not produced posteriorly at sides
Branched pectoral fin rays	10–12	12–14	10–11	13–16

TABLE 7. External traits diagnostic for genera of Glyptosternina with a continuous post-labial groove on the lower jaw.

	Myersglanis	*Oreoglanis*	*Exostoma*	*Pseudexostoma*
Teeth in lower jaw	Homodont: pointed	Heterodont; spatulate at front, pointed at rear	Homodont: oar-shaped, flatted distally	Heterodont: spatulate at front, pointed at rear
Tooth patches in upper jaw	Joined, appearing united, not produced posteriorly at sides	Joined, appearing united, rounded laterally	Separated	Separated
Teeth in upper jaw	Homodont: pointed	Homodont: pointed	Homodont: oar-shaped, flatted distally	Heterodont: teeth spatulate at front, pointed at rear
Branched pectoral fin rays	10, 16–19	16–18	10–11	16–18

Euchiloglanis davidi (Sauvage 1874)

Chimarrichthys davidi Sauvage 1874: 333. Type locality: Yao-Tchy, Tibet, China. Syntypes: BMNH 1923.3.13.1 [ex MNHN] (1), MNHN 6273-74 (3, 3).

Euchiloglanis kishinouyei Kimura 1934: 178, pl. 6. Type locality: Kwan-hsien, Szechwan [Sichuan] Prov., China. Holotype: whereabouts unknown.

Distribution: Yangtze drainage, China (Chu, 1981; He, 1995; Fu et. al., 2003). Chaudhuri (1913) reported this species from the Brahmaputra drainage in India. Reported from the Ganges drainage in Nepal as *Coraglanis kishinoui* (Datta, 1962; Shrestha, 1990).

Remarks: *E. kishinouyei* is considered a synonym of *E. davidi* following Guo *et al.*, (2004).

Exostoma Blyth, 1860

Fig. 19

Exostoma Blyth, 1860: 155. (Type species: *Exostoma berdmori* Blyth, 1860, by subsequent designation, by Bleeker (1863: 105). Gender neuter.

Diagnosis: Continuous post-labial groove; gill openings not extending onto venter; homodont dentition; oar-shaped, distally flattened teeth in both jaws; tooth patches separated in upper jaw; 10–11 branched pectoral rays.

Exostoma is distinguished from *Glyptosternon*, *Glaridoglanis*, *Pareuchiloglanis*, *Euchiloglanis* and *Parachiloglanis* by having a continuous post-labial groove (Table 5). *Exostoma* is distinguished from *Pseudexostoma* and *Oreoglanis* by having homodont (vs. heterodont) dentition in the lower jaw. It is further distinguished from *Oreoglanis* by having oar-shaped, distally flattened (vs. pointed) teeth in the upper jaw, and from *Pseudexostoma* by having homodont (vs. heterodont) teeth in the upper jaw. *Exostoma* is distinguished from *Myersglanis* by having tooth patches separated in the upper jaw and oar-shaped, distally flattened teeth in both jaws (vs. tooth patches juxtaposed and pointed teeth in both jaws). *Exostoma* is further distinguished from *Pseudexostoma* and *Oreoglanis* by having 10–11 branched pectoral rays (vs. 16–18).

Description: 6–7 dorsal rays; 10–11 branched pectoral-fin rays; 6 pelvic-fin rays; 5–8 anal-fin rays. Head depressed; snout broadly rounded; body elongate, flattened ventrally to pelvic fins. Eyes minute, dorsal, subcutaneous. Lips thick, fleshy, papillated. Teeth small to large, moveable, oar-shaped, flattened distally and directed posteriorly in distinct patches. Maxillary barbel with well-developed membrane, soft base, and striated pad of adhesive skin. Gill openings narrow, not extending below pectoral-fin base. Branchiostegal membranes confluent with isthmus. Coracoid process not externally visible. No thoracic adhesive apparatus. Paired fins plaited to form an adhesive apparatus.

Distribution: Brahmaputra drainage, northeast India, east and south to the Salween drainages, Myanmar (Kottelat, 1989; Chu *et al.*, 1999; Jayaram, 1999).

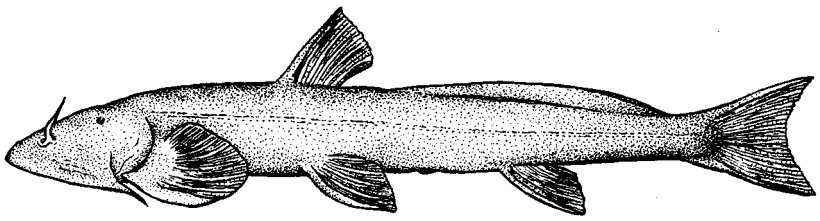

FIGURE 19. *Exostoma labiatum.* Drawn by J. Bourque, after Chu *et al.* (1999).

Exostoma berdmorei Blyth 1860

Exostoma berdmorei Blyth 1860: 155. Type locality: Tenasserim [Sittang River drainage], Myanmar [Burma]. Syntypes: ZSI [Asiatic Soc. Bengal 597] (2), ? also spec. no. 600.

Distribution: Sittang and Salween drainages, Myanmar (Blyth, 1860; Kottelat, 1989).

***Exostoma labiatum* (McClelland 1842)**

Glyptosternon labiatus McClelland 1842: 588. Type locality: Mishmee Hills, Meghalaya, India. Holotype: BMNH 1860.3.19.97.

Distribution: Brahmaputra drainage, northeast India (Hora & Silas, 1952b; Chu *et al.*, 1999; Jayaram, 1999). Reported from the Salween drainage, Myanmar (Kottelat, 1989) and the Irrawaddy drainage, China (Chu *et al.*, 1999).

***Exostoma stuarti* (Hora 1923)**

Glyptosternum stuarti Hora 1923b: 39, pl. 2 (figs. 4–6). Type locality: Nam-Yak River at Tanja [Irrawaddy drainage], n. frontier, Myanmar [Burma]. Holotype: ZSI F9742/1.

Distribution: Irrawaddy drainage, Myanmar and India (Hora & Silas, 1952b; Selim & Vishwanath, 1998; Keishing & Vishwanath, 1999).

***Exostoma vinciguerrae* (Regan 1905)**

Exostoma vinciguerrae Regan 1905: 184. Type locality: Khakhyen Hills [Irrawaddy drainage], upper Myanmar [Burma]. Holotype: BMNH 1893.2.16.17.

Glyptosternum chaudhurii Hora 1923b: 41, fig. 7. Type locality: Putao Plains, n. frontier, Myanmar [Burma]. Holotype: ZSI F9741/1. Synonomized with *Exostoma vinciguerrae* by Norman (1925).

Distribution: Irrawaddy drainage, Myanmar and India (Hora & Silas, 1952b; Vishwanath *et al.*, 1998; Jayaram, 1999; Vishwanath & Kosygin, 1999).

***Glaridoglanis* Norman, 1925**
Fig. 20

Glaridoglanis Norman, 1925: 574. (Type species: *Exostoma andersonii* Day, 1870, by monotypy). Gender masculine.

Diagnosis: Interrupted post-labial groove; gill openings not extending onto venter; homodont dentition; strong, distally flattened teeth in both jaws; slightly crescent-shaped tooth patch in upper jaw; 10–11 branched pectoral rays.

Glaridoglanis is distinguished from *Oreoglanis*, *Pseudexostoma*, *Exostoma*, *Myersglanis*, and *Parachiloglanis* by having an interrupted past-labial groove (Table 5). *Glaridoglanis* is distinguished from *Glyptosternon*, *Euchiloglanis*, and *Pareuchiloglanis*

by having strong, distally flattened teeth in both jaws (vs. small pointed teeth). *Glaridoglanis* is further distinguished from *Pareuchiloglanis* and *Euchiloglanis* by having 10–11 branched pectoral rays (vs. 13–16 in *Pareuchiloglanis* and 12–14 in *Euchiloglanis*). It is further distinguished from *Glyptosternon* by having the gill openings not extending onto the venter.

Description: 6 dorsal rays; 10–11 branched pectoral-fin rays; 6 pelvic-fin rays; 7–8 anal-fin rays. Head depressed; body elongate, flattened ventrally to s. Eyes minute, dorsal. Lips thick, fleshy, papillated. Post-labial groove broadly interrupted medially. Teeth flattened, strong, blunt; tooth patches in upper jaw joined, formeding a slightly crescent-shaped band. Maxillary barbel with well-developed membrane, soft base, and striated pad of adhesive skin. Gill openings narrow, not extending below pectoral-fin base. Branchiostegal membranes confluent with isthmus. Coracoid process not externally visible. No thoracic adhesive apparatus. Paired fins plaited to form an adhesive apparatus.

Distribution: Irrawaddy drainage, Myanmar and China (Day, 1870b; Hora & Silas, 1952b; Chu *et al.*, 1999).

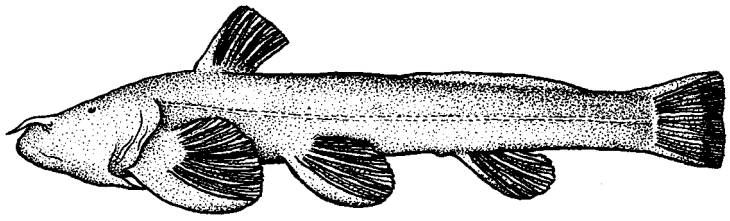

FIGURE 20. *Glaridoglanis andersonii*. Drawn by J. Bourque, after Chu *et al.* (1999).

Glaridoglanis andersonii (Day 1870)

Exostoma andersonii Day 1870b: 524. Type locality: Hotham [=Hotha] and Ponsee, China. Syntypes: (4) ZSI F9173-74/1 [? = A.595] (2), A.596 (2, lost); ?AMS B.8081 (1).

Distribution: Irrawaddy drainage, Myanmar and China (Day, 1870b; Hora & Silas, 1952b; Chu *et al.*, 1999). Recorded from the Brahmaputra drainage, China (Chu *et al.*, 1999).

Glyptosternon McClelland, 1842
Fig. 21

Glyptosternon McClelland, 1842: 584. (Type species: *Glyptosternon reticulatum* McClelland, 1842, by subsequent designation by Bleeker (1862-63: 12).) Gender neuter.
Glyptosternum Agassiz, 1846: 164. (Type species *Glyptosternon reticulatum* McClelland, 1842.

Unjustified emendation of *Glyptosternon* McClelland, 1842). Gender neuter.

Parexostoma Regan, 1905: 182. (Type species: *Exostoma stoliczkae* Day, 1877, by subsequent designation, apparently by Jordan (1920). Gender neuter. Synonomized with *Glyptosternum* (=*Glyptosternon*) by Hora (1923b).

Diagnosis: Interrupted post-labial groove; gill openings extending onto venter; homodont dentition; pointed teeth in both jaws; crescent-shaped tooth patch in upper jaw; 10–12 branched pectoral rays.

Glyptosternon is distinguished from all other genera of Glyptosternina by having gill openings extending onto the venter. *Glyptosternon* is further distinguished from *Oreoglanis*, *Pseudexostoma*, *Exostoma*, *Myersglanis*, and *Parachiloglanis* by having an interrupted post-labial groove (Table 5). It is further distinguished from *Glaridoglanis* by having small pointed teeth in the upper and lower jaws (vs. strong, distally flattened teeth), and from *Pareuchiloglanis* by having tooth patches joined into a crescent-shaped band in the upper jaw (vs. tooth patches in the upper jaw joined into a band not produced posteriorly at the sides) and 10–12 (vs. 13–16) branched pectoral-fin rays.

Description: 6–7 dorsal rays; 10–12 branched pectoral-fin rays; 6 pelvic-fin rays; 6–8 anal-fin rays. Head depressed; snout broadly rounded; body elongate, flattened ventrally to pelvic fins. Eyes minute, dorsal, subcutaneous. Lips thick, fleshy, papillated. Post-labial groove broadly interrupted medially. Teeth in both jaws pointed, tooth patches in upper jaw joined, forming a band produced posteriorly at sides (crescent-shaped). Maxillary barbel with well-developed membrane, soft base, and striated pad of adhesive skin. Branchiostegal membranes confluent with isthmus. Coracoid process not externally visible. No thoracic adhesive apparatus. Paired fins plaited to form an adhesive apparatus.

Distribution: Indus drainage; Afghanistan, Pakistan, India, Uzbekistan, Tajikistan and China, east to Irrawaddy drainage, Myanmar (Coad, 1981b; Talwar & Jhingran, 1991; Rafique, 2000)

FIGURE 21. *Glyptosternon reticulatum*, USNM 118392, 63.4 mm SL.

Glyptosternon akhtari Silas 1952

Glyptosternum akhtari Silas in Hora & Silas 1952b: 11, pl. 1 (figs. 4–6). Type locality: Bamian River, Oxus watershed, Afghanistan. Holotype: ZSI F643/2. Paratypes: ZSI F644/2 (1).

Distribution: Bamian River, Oxus Watershed, Indus drainage, Afghanistan (Hora & Silas, 1952b; Coad, 1981b).

Glyptosternon maculatum (Regan 1905)

Parexostoma maculatum Regan 1905: 183. Type locality: Lhasa, Tibet [Brahmaputra drainage]. Syntypes: BMNH 1904.12.28.87–88 (2).

Distribution: Brahmaputra drainage, India and China (Hora & Silas, 1952b; Chu *et al.*, 1999; Jayaram, 1999).

Glyptosternon malaisei Rendahl & Vestergren 1941

Glyptosternon malaisei Rendahl & Vestergren 1941: 213. Type locality: Kambaiti, Kachin State, Ayeyarwaddy [Irrawaddy] River drainage, ne. Myanmar [Burma], 7000 ft. elev. Holotype: NRM 10721.

Distribution: Irrawaddy drainage, Myanmar (Rendahl & Vestergren, 1941; Talwar & Jhingran, 1991). Only known from type.

Glyptosternon reticulatum (McClelland 1842)

Glyptosternon reticulatus McClelland 1842: 584, pl. 6. Type locality: Sir-i-Chusma, source of Kabul River [Indus drainage], Afghanistan. No types known.

Exostoma stoliczkae Day 1877b: 782. Type locality: Upper waters of the Indus River Syntypes and/or Day specimens: AMS I.122 (1, syntype) Indus River; ZSI F497 (1), 1196-98 (3, lost).

Exostoma oschanini Herzenstein 1889: 70 [120]. Type locality: Upper Amu-Darya River (country uncertain), upper Syr-Derya River basin [Indus drainage](Ugam River, Tashkent), Uzbekistan. Syntypes: BMNH 1888.11.24.1 [ex ZIN] (1); ZIN 8055-57 (1, 1, 2).

Exostoma gracile Gratzianov 1907: 58. Type locality: Naryn River drainage, upper Syr-Darya River basin [Indus drainage], Namanganskaya Obl., Uzbekistan. Holotype: ZMMU P-785.

Exostoma labrax Gratzianov 1907: 59. Type locality: Garm dist., moutain spring Kartveng at kishlak Shulmak, Garmskaya Obl., Tadzhikistan [=Tajikistan]. Syntypes: ZMMU P-2034 (2).

Distribution: Indus drainage; Afghanistan, Pakistan, India, Uzbekistan, Tajikistan and China (Norman, 1923; Hora & Silas, 1952b; Ahmad & Mirza, 1963; Mirza, 1973; Mirza

& Hameed, 1974; Coad, 1981b; Rafique, 2000).

Remarks: *Exostoma stoliczkae*, *E. oschanini*, *E. gracile* and *E. labrax* were synonomized with *Glyptosternon reticulatum* by Hora (1932).

Myersglanis Hora & Silas, 1952

Fig. 22

Myersglanis Hora & Silas, 1952b: 19. (Type species: *Exostoma blythii* Day, 1869, by original designation). Gender masculine.

Diagnosis (based, in part, on Vishwanath & Kosygin 1999)**:** Continuous post-labial groove; gill openings not extending onto venter; homodont dentition; pointed teeth in both jaws; tooth patches in upper jaw joined and not produced posteriorly at the sides; 10 or 16–19 branched pectoral rays.

Myersglanis is distinguished from *Glyptosternon*, *Glaridoglanis*, *Euchiloglanis*, *Pareuchiloglanis* and *Parachiloglanis* by having a continuous post-labial groove (Table 5). *Myersglanis* is distinguished from *Exostoma* and *Pseudexostoma* by having tooth patches joined (vs. separated) in the upper jaw. It is further distinguished from *Exostoma* by having pointed teeth in both jaws (vs. teeth oar-shaped, flatted distally). *Myersglanis* is distinguished from *Oreoglanis* and *Pseudexostoma* by having homodont dentition in the upper and lower jaws (vs. heterodont dentition in the lower jaw in *Oreoglanis* and heterodont dentition in the upper and lower jaws in *Pseudexostoma*).

FIGURE 22. *Myserglanis jayarami*, MUMF 2138, holotype, 82.0 mm SL. Photograph by W. Vishwanath.

Description: 7 dorsal rays; 10 or 16–19 branched pectoral-fin rays; 6 pelvic-fin rays; 8 anal-fin rays. Head depressed; body elongate, depressed anteriorly. Eyes minute, dorsal, subcutaneous. Lips thick, fleshy, papillated. Teeth pointed; tooth patches in upper jaw joined, ovoid-shaped; that in lower jaw divided medially, pointed posteriorly at sides. Maxillary barbel with well-developed membrane, soft base, and striated pad of adhesive skin. Gill openings narrow, not extending below pectoral-fin base. Branchiostegal

membranes confluent with isthmus. Coracoid process not externally visible. No thoracic adhesive apparatus. Paired fins plaited to form an adhesive apparatus.

Distribution: Ganges and Irrawaddy drainages, India and Nepal (Vishwanath & Kosygin, 1999).

Myersglanis blythi (Day 1870)

Exostoma blythii Day 1870b: 525. Type locality: Pharping, Nepal. Syntypes: ZSI [ex Asiatic Soc. Bengal 599] (2), 2361 (1).

Distribution: Ganges drainage, Nepal (Vishwanath & Kosygin, 1999).

Myersglanis jayarami Vishwanath & Kosygin 1999

Myersglanis jayarami Vishwanath & Kosygin 1999: 291, pl. 1 (figs. 1–2). Type locality: Laniye River at Jessami, Manipur, India, 94°32'E, 25°38'N. Holotype: MUMF 2138. Paratypes: MUMF 2105 (1), 2139-44 (6).

Distribution: Irrawaddy drainage, India (Vishwanath & Kosygin, 1999).

Oreoglanis Smith, 1933
Fig. 23

Oreoglanis Smith, 1933: 70. (Type species: *Oreoglanis siamensis* Smith, 1933, by original designation. Gender masculine.

Paroreoglanis Pellegrin, 1936: 244. (Type species: *Paroreoglanis delacouri* Pellegrin, 1936, by monotypy). Gender masculine. Synonomized with *Oreoglanis* by Chu (1979).

Diagnosis (based, in part, on Ng & Kottelat 1999): Continuous post-labial groove; gill openings not extending onto venter; homodont dentition in upper jaw; heterodont dentition in lower jaw characterized by inner row of pointed teeth and outer row of short, spatulate (shovel-like) teeth; upper jaw teeth pointed, in two patches, joined into a continuous band; 16–18 branched pectoral rays.

Oreoglanis is distinguished from *Glyptosternon*, *Glaridoglanis*, *Euchiloglanis*, *Pareuchiloglanis* and *Parachiloglanis* by having a continuous post-labial groove (Table 5). It is distinguished from *Pareuchiloglanis*, *Glyptosternon*, *Euchiloglanis*, *Myersglanis*, and *Parachiloglanis* by having heterodont dentition in the lower jaw characterized by an inner row of pointed teeth and an outer row of short, spatulate (shovel-like) teeth (vs. a single band of conical teeth). *Oreoglanis* is distinguished from *Pseudexostoma* by having upper jaw teeth pointed, in two patches, joined into a continuous band (vs. heterodont

dentition in two separated patches). It is distinguished from *Exostoma* by having the upper jaw teeth pointed, in two patches, joined into a continuous band (vs. having oar-shaped, distally flatted teeth in two separated patches), and 16–18 (vs. 10–11) branched pectoral rays.

Description: 6–7 dorsal rays; 16–18 branched pectoral-fin rays; 6 pelvic-fin rays; 4–7 anal-fin rays. Head and body moderately broad, strongly depressed. Skin smooth dorsally. Eyes minute, dorsolateral, and subcutaneous. Lips thin, papillated. Teeth in upper jaw pointed, in large broad band with small median indentation and rounded sides. Maxillary barbel with well-developed membrane, soft base, rounded tip, with striated pad of adhesive skin. Gill openings narrow, not extending below pectoral-fin base. Branchiostegal membranes confluent with isthmus. Coracoid process not externally visible. No thoracic adhesive apparatus. Paired fins plaited to form an adhesive apparatus.

Distribution: Irrawaddy drainage, Mayanmar, east to the Lam River drainage, central Vietnam (Ng & Freyhof, 2001; Ng & Rainboth, 2001).

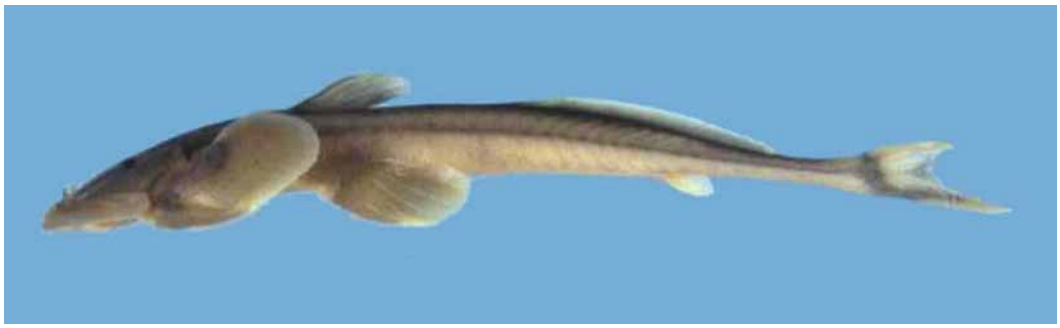

FIGURE 23. *Oreoglanis delacouri*. Photograph by M. Kottelat.

Oreoglanis delacouri (Pellegrin 1936)

Paroreoglanis delacouri Pellegrin 1936: 244. Type locality: Xieng Khouang, Laos. Lectotype: MNHN 1936-0031 (103.4 mm SL). Paralectotypes: MNHN 1936-0031 (? 1 of 2).

Distribution: Mekong drainage, Laos (Kottelat, 1989; Kottelat, 2001a; Ng & Rainboth, 2001).

Oreoglanis frenatus Ng & Rainboth 2001

Oreoglanis frenatus Ng & Rainboth 2001: 7, fig. 6. Type locality: Nam Ka basin, Houay Kheua at Hwy 7 bridge, 19°38'N, 103°28'E, Xieng Khouang Prov., Laos. Holotype: UMMZ 236811. Paratypes: UMMZ 236812 (17), ZRC 45707 (4).

Distribution: Nam Ka River drainage, northeastern Laos (Ng & Rainboth, 2001).

Oreoglanis hypsiurus Ng & Kottelat 1999

Oreoglanis hypsiurus Ng & Kottelat 1999: 376, fig. 1. Type locality: Upper Nam Theun, ca. 1 km upstream of confluence with Houay Nuok Lan, 18°04'09"N, 105°29'44"E, Khammouan Prov., Laos. Holotype: ZRC 40440. Paratypes: CMK 12367 (26), 12774 (9); LARRI uncat. (4); NRM 44296 (5); ZRC 40441 (6).

Distribution: Nam Theun River, Mekong drainage, Laos (Ng & Kottelat, 1999; Kottelat, 2001a; Ng & Rainboth, 2001).

Oreoglanis infulatus Ng & Freyhof 2001

Oreoglanis infulatus Ng & Freyhof 2001: 1165, figs. 1–3. Type locality: Stream at Son Kim, a trib. of Song Lam, 18°24'25"N, 105°11'10"E, Ha Tinh Prov., Viet Nam. Holotype: ZFMK 35719. Paratypes: UMMZ 238025 (6); ZFMK 35720-25 (6).

Distribution: Lam River drainage, central Vietnam (Ng & Freyhof, 2001).

Oreoglanis insignis Ng & Rainboth 2001

Oreoglanis insignis Ng & Rainboth 2001: 15, fig. 8. Type locality: Longchuanjiang and Dajiang, near Qushi [Irrawaddy drainage], Baoshan prefecture, Yunnan Prov., China. Holotype: KIZ 9810191. Paratypes: CAS 205600 (16); NRM 25111 (3), 25113 (3).

Distribution: Irrawaddy and Salween drainages, Myanmar and China (Ng & Rainboth, 2001).

Oreoglanis lepturus Ng & Rainboth 2001

Oreoglanis lepturus Ng & Rainboth 2001: 17, fig. 10. Type locality: Nam Phao ca. 2 km from Vietnam border, 18°23'N, 105°19'E, Bolikamsai Prov., Laos. Holotype: UMMZ 236814. Paratypes: UMMZ 236816 (8), ZRC 45708 (2).

Distribution: Nam Phao River, Mekong drainage, Laos (Ng & Rainboth, 2001).

Oreoglanis macronemus Ng 2004

Oreoglanis macronemus Ng 2004b: 209, fig. 1. Type locality: Xieng Khouang, Laos. Holotype: BMNH 1933.8.19.51. Paratypes: BMNH 1933.8.19.52-54 (3).

Distribution: Xieng Khouang region, Laos (Ng, 2004b)

Oreoglanis macropterus (Vinciguerra 1890)

Oreoglanis macropterus (Vinciguerra 1890): 253, pl. 8 (fig. 5). Type locality: Khahyen Hills, Upper Myanmar [Burma]. Syntypes: BMNH 1893.2.16.18 (1) Karen Hills, MSNG 14410 (3) Catcin Cauri, NMW 46488 (1),RMNH 10236 (1), USNM 44805 (1) Mti. Catcin.

Distribution: Irrawaddy and Salween drainages, Myanmar and China (Chu *et al.*, 1999; Ng & Rainboth, 2001).

Oreoglanis setiger Ng & Rainboth 2001

Oreoglanis setiger Ng & Rainboth 2001: 23, fig. 12. Type locality: Nam Ma Oun, 21°05'N, 101°04'E, Louang Namtha Prov., Laos. Holotype: UMMZ 236813. Paratypes: ZRC 46109 (2).

Distribution: Mekong drainage, China and Laos (Ng & Rainboth, 2001).

Oreoglanis siamensis Smith 1933

Oreoglanis siamensis Smith 1933: 72, pl. 3 (figs. 1–2); fig. 4. Type locality: Kang River near base of Doi Angka, n. Thailand. Holotype: ZSI F12233/1 or KUMF 0172.

Distribution: Chao Phraya drainage, Thailand (Hora & Silas, 1952a; Hora & Silas, 1952b; Ng & Rainboth, 2001).

Parachiloglanis Wu, He & Chu, 1981
Fig. 24

Parachiloglanis Wu, He & Chu, 1981: 76, 79. (Type species *Glyptosternum hodgarti* Hora, 1923, by original designation). Gender masculine.

Diagnosis: No post-labial groove, lower lip continuous with isthmus without demarcation; gill openings not extending onto venter; homodont dentition; pointed teeth in both jaws; tooth patches joined into a crescent-shaped band in upper jaw; 13–16 branched pectoral rays.

Parachiloglanis is distinguished from all other genera of Glyptosternina by having no post-labial groove; the lower lip is continuous with the isthmus without demarcation (vs. having either a continuous or medially interrupted post-labial groove). It is further

distinguished from *Oreoglanis* and *Pseudexostoma* by having homodont (vs. heterodont) dentition in the lower jaw, and from *Pseudexostoma* by having homodont (vs. heterodont) dentition in the upper jaw, and from *Glyptosternon* by not having the gill openings extending onto the venter.

Description: 7 dorsal rays; 13–16 branched pectoral-fin rays; 6 pelvic-fin rays; 5–7 anal-fin rays. Head depressed; body elongate, depressed anteriorly. Skin smooth dorsally, but often tuberculate ventrally. Eyes minute, dorsal, subcutaneous. Lips thick, fleshy, papillated. Teeth pointed; tooth patches in upper jaw joined into a crescent-shaped band. Maxillary barbel with well-developed membrane, soft base. Gill openings narrow, not extending below pectoral-fin base. Branchiostegal membranes confluent with isthmus. Coracoid process not externally visible. No thoracic adhesive apparatus. Paired fins plaited to form an adhesive apparatus.

Distribution: Ganges and Brahmaputra drainages, India, Bangladesh, Nepal and China (Hora & Silas, 1952b; Talwar & Jingran, 1991; Chu *et al.*, 1999).

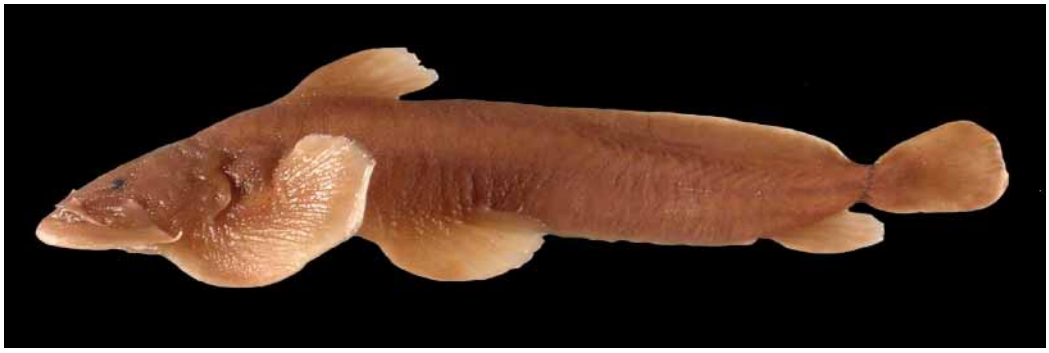

FIGURE 24. *Parachiloglanis hodgarti*, CAS 44187, 49.5 mm SL.

Parachiloglanis hodgarti **(Hora 1923)**

Glyptosternum hodgarti Hora 1923b: 38, pl. 2 (figs. 1–3). Type locality: Pharping, Nepal. Holotype: ZSI F1553/1.

Distribution: Ganges and Brahmaputra drainages, India, Bangladesh, Nepal and China (Hora & Silas, 1952b; Talwar & Jingran, 1991; Chu *et al.*, 1999).

Pareuchiloglanis **Pellegrin, 1936**

Fig. 25

Pareuchiloglanis Pellegrin, 1936: 245. (Type species: *Pareuchiloglanis poilanei* Pellegrin, 1936, by monotypy). Gender masculine.

Diagnosis (based, in part, on Chu 1981 and Ng 2004a): Interrupted post-labial groove; gill openings not extending onto venter; homodont dentition; pointed teeth in both jaws; tooth patches in upper jaw joined into a band and not produced posteriorly at sides; 13–16 branched pectoral rays.

Pareuchiloglanis is distinguished from *Oreoglanis*, *Pseudexostoma*, *Exostoma*, *Myersglanis*, and *Parachiloglanis* by having an interrupted post-labial groove (Table 5). It is distinguished from *Glyptosternon*, *Parachiloglanis* and *Euchiloglanis* by having tooth patches in the upper jaw joined into a band and not produced posteriorly at the sides (vs. joined into a crescent-shaped band). *Pareuchiloglanis* is distinguished from *Glyptosternon* and *Glaridoglanis* by having 13–16 (vs. 10–12) branched pectoral rays, from *Glaridoglanis* by having small pointed teeth (vs. strong, distally flattened teeth), and from *Glyptosternon* by having the gill openings not extending onto the venter.

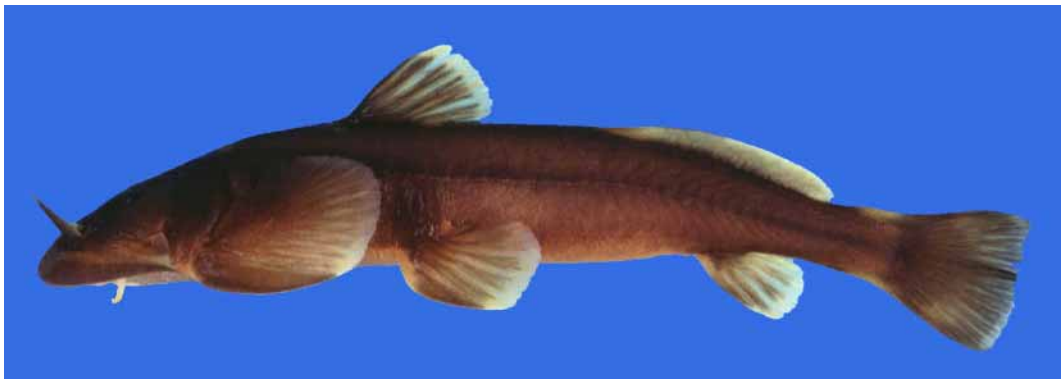

FIGURE 25. *Pareuchiloglanis nebulifer.* Photograph by M. Kottelat.

Description: 7 dorsal rays; 13–16 branched pectoral-fin rays; 6 pelvic-fin rays; 5–7 anal-fin rays. Head depressed; body elongate, depressed anteriorly. Skin smooth dorsally, but often tuberculate ventrally. Eyes minute, dorsal, subcutaneous. Lips thick, fleshy, papillated. Post-labial groove broadly interrupted. Pointed teeth in both jaws; tooth patches in upper jaw joined into a band and not produced posteriorly at sides. Maxillary barbel with well-developed membrane, soft base, striated pad of adhesive skin. Gill openings narrow, not extending below pectoral-fin base. Branchiostegal membranes confluent with isthmus. Coracoid process not externally visible. No thoracic adhesive apparatus. Paired fins plaited to form an adhesive apparatus.

Distribution: Brahmaputra drainage, India, east and south to the Yangtze drainage, China and Annam drainages, southern Vietnam (Kottelat, 1989; Chu *et al.*, 1999; Fu et. al., 2003; Ng 2004a).

Pareuchiloglanis anteanalis Fang, Xu & Cui 1984

Pareuchiloglanis anteanalis Fang, Xu & Cui 1984: 209 (English p. 211), fig. 1. Type locality: Wudu Co. [Yangtze drainage], Gansu Prov., China. Holotype: Shaanxi Inst. Zool. 82VI9565. Paratypes: KIZ 82VI-9567 (1), 9651 (1), 9652 (1), 82X-1479 (1), 1480 (1), 1481 (1); Shaanxi Inst. Zool. 82VI-1420 (1), 9645 (1), 9649-50 (1, 1), 9653 (1), 9566 (1).

Distribution: Yangtze drainage, China (Fang *et al.*, 1984; Chu *et al.*, 1999; Fu et. al., 2003).

Pareuchiloglanis feae **(Vinciguerra 1890)**

Exostoma feae Vinciguerra 1890: 256, pl. 8 (fig. 6). Type locality: Myanmar [Burma]. Syntypes: BMNH 1893.2.16.19–20 (2); MSNG 14411-12 (4, 3); MSNM 38 [ex MSNM 5117 and ex MSNG] (1); NMW 9064-65 (2); RMNH 10237 (3); USNM 44743 (3).

Distribution: Salween drainage, Myanmar (Hora & Silas, 1952b; Kottelat, 1989; Jayaram, 1999). Has been reported from the Yangtze drainage, China (Chu *et al.*, 1999; Fu et. al., 2003).

Pareuchiloglanis gongshanensis **Chu 1981**

Pareuchiloglanis gongshanensis Chu 1981: 28 [English P. 31], fig. 2. Type locality: Gongshan Xian, a county at the upper reaches of Lantsang River [Salween drainage], Yunnan, China. Holotype: KIZ 731202. Paratypes: KIZ (5).

Distribution: Salween drainage, Yunnan, China (Chu, 1981; Chu *et al.*, 1999; Ng 2004a).

Pareuchiloglanis gracilicaudata **(Wu & Chen 1979)**

Euchiloglanis gracilicaudata Wu & Chen 1979: 294 [English p. 296], fig. 4. Type locality: Za-Qu, upper Lancang Jiang [=Mekong], Nangqen, Qinghai, China. Syntypes: Qinghai Inst. Biol. (12).

Distribution: Mekong drainage, China (Wu & Chen, 1979; Chu *et al.*, 1999).

Pareuchiloglanis kamengensis **(Jayaram 1966)**

Euchiloglanis kamengensis Jayaram 1966: 85, fig. 1. Type locality: Norgum River at Kalaktang, Kameng Frontier Division, Nefa, elev. 1372 m. Holotype: ZSI F2105/2. Paratypes: ZSI F2106/2 (6).

Distribution: Brahmaputra drainage, India (Chu *et al.*, 1999 (in part); Jayaram, 1999; Vishwanath & Kosygin, 1999; Ng, 2004a).

***Pareuchiloglanis longicauda* (Yue 1981)**

Euchiloglanis longicauda Yue in Zheng 1981: 183, fig. 151. Type locality: Panyang River (Hong-Shui River system), Bama Co., Guangxi Prov., China. Holotype: 750443. Paratypes: 750440 (1), 750441 (1), 750442 (1), 750469 (1). [Holotype and paratypes deposited in ASIZB and Fish. Res. Inst., Guangxi Zhuangzu Autonomous Region.]

Distribution: Xijiang drainage, China (Zheng, 1981; Chu *et al.*, 1999).

***Pareuchiloglanis macropterus* Ng 2004**

Pareuchiloglanis macropterus Ng 2004a: 3, fig. 1. Type locality: Ca. 5 km to Liuku on Yongping-Liuku road, 25°50'18.6"N, 98°53'46.8"E, Laowo River, a tributary of the Salween River (Nujiang), Salween River drainage, Yunnan Prov., China. Holotype: ZRC 49124. Paratypes: BMNH 1987.9.17.31–32 (2), UMMZ 232108 (2).

Distribution: Irrawaddy and Salween drainages, China. (Ng, 2004a). May also be present in the Mekong drainage (Ng, 2004a).

***Pareuchiloglanis macrotrema* (Norman 1925)**

Euchiloglanis macrotrema Norman 1925: 570. Type locality: Ngoi-Tio, Col des Nuages, Tonkin, Vietnam, elev. 4500–6500 ft. Syntypes: BMNH 1925.2.19.5–6 (2).

Distribution: Red River drainage, Vietnam (Hora & Silas, 1952b; Chu *et al.*, 1999).

***Pareuchiloglanis myzostoma* (Norman 1923)**

Euchiloglanis myzostoma Norman 1923: 562. Type locality: Yunnan, China. Syntypes: BMNH 1923.2.21.40–49 (10).

Distribution: Mekong drainage (Hora & Silas, 1952a; Hora & Silas, 1952b; Chu *et al.*, 1999). Has also been reported from the Yangtze drainage, China (Kimura, 1934).

Pareuchiloglanis nebulifer Ng & Kottelat 2000

Pareuchiloglanis nebulifer Ng & Kottelat 2000: 11, fig. 4. Type locality: Small creek, trib. of Houai Siam, upstream of Ban Kangpabong, Houaphan Prov., Laos, 20°19'36"N, 104°25'01"E. Holotype: ZRC 45706. Paratypes: CMK 15447 (1), 15342 (1); LARRI uncat. (1).

Distribution: Nam Xam and Ma drainage, Laos (Ng & Kottelat, 2000; Kottelat, 2001a).

Pareuchiloglanis poilanei Pellegrin 1936

Pareuchiloglanis poilanei Pellegrin 1936: 246. Type locality: Annam [Vietnam]. Syntypes: MNHN 1935-0005 to 0014 (10, now 7) Song Ko River, 1936-0015 to 0018 (4) Confluent of Song Tan River and Do River, 1936-0019 to 0020 (5) Song Tan River.

Distribution: Annam drainages, southern Vietnam (Kottelat, 1989).

Pareuchiloglanis rhabdurus Ng 2004

Pareuchiloglanis rhabdurus Ng 2004a: 7, fig. 3. Type locality: Cao Bo stream (Bac Trao river) near camp 1, 22°45'18.0"N. 104°52'11.4"E, Vi Xuyen dist., Red River (Song Hong) drainage, Ha Giang prov., Vietnam. Holotype: AMNH 211153.

Distribution: Red River drainage, northern Vietnam (Ng, 2004a).

Pareuchiloglanis robusta Ding, Fu & Ye 1991

Pareuchiloglanis robusta Ding, Fu & Ye 1991: 369 (English p. 374), fig. 1. Type locality: Qing Yijing steam, Sichuan, China. Holotype: SPNRI 8801. Paratypes: (24): 8804(1), 6-0466 (1), 6-1297-8 (2), 6-1506-7 (2), 0098-102 (5), 8802-3 (2), 8812-25 (14) Types in Sichuan Provincial Natural Resources institute, Kunming Institute of Zoology, Academica Sinica and Sichuan Agricultural Univ., but publication does not distinguish which types are where.

Distribution: Yangtze drainage, China (Ding *et al.*, 1991; Fu et. al., 2003).

Pareuchiloglanis sichuanensis Ding, Fu & Ye 1991

Pareuchiloglanis sichuanensis Ding, Fu & Ye 1991: 371 (English p. 374), fig. 2. Type locality: Baoxing, Sichuan, China. Holotype: Sichuan Agric. Univ. 6-1481. Paratypes: KIZ 840561 (1), Sichuan Agric. Univ. 6-1488-91 (4), KIZ 850150 (1), SPNRI 40562-72 (11).

Distribution: Yangtze drainage, China (Ding *et al.*, 1991; Fu et. al., 2003).

***Pareuchiloglanis sinensis* (Hora & Silas 1952)**

Euchiloglanis sinensis Hora & Silas 1952b: 17, fig. 2. Type locality: China, possibly Yunnan. Holotype: ZSI F12208/1.

Distribution: Yangtze drainage, China (Chu *et al.*, 1999; Fu et. al., 2003).

***Pareuchiloglanis songdaensis* Nguyen & Nguyen 2001**

Pareuchiloglanis songdaensis Nguyen & Nguyen 2001: 67, fig. 1. Type locality: Da River [Red River drainage], Muong Te, Lai Chau Town, Vietnam. Holotype: LM. 2001.01H. Paratypes: LM. 2001.02P (1), LM. 2001.03P (1), LM. 2001.04P (1), L08060101 (1); L08060102 (1), L08060103(1).

Distribution: Red River drainage, northern Vietnam (Nguyen & Nguyen, 2001).

***Pareuchiloglanis songmaensis* Nguyen & Nguyen 2001**

Pareuchiloglanis songmaensis Nguyen & Nguyen 2001: 68, fig. 2. Type locality: Ma River [Song Ma drainage], Song Ma District, Son La Province. Holotype: LM. 2001.02H. Paratype: LM. 2001.05P (1).

Distribution: Song Ma drainage, northern Vietnam (Nguyen & Nguyen, 2001).

***Pareuchiloglanis tianquanensis* Ding & Fang 1997**

Pareuchiloglanis tianquanensis Ding & Fang 1997: 17, fig. 1. Type locality: Tianquan County [Yangtze drainage], Shichuan, China. Holotype: Mus. Sichuan Inst. Nat. Res. 920185. Paratypes: Mus. Sichuan Inst. Nat. Res. 920177-184 (8), 920186-205 (20).

Distribution: Yangtze drainage, China (Ding & Fang, 1997).

***Pseudexostoma* Chu, 1979**
Fig. 26

Pseudexostoma Chu, 1979: 78, 81. (Type species: *Glyptosternum yunnanensis* Tchang, 1935, by original designation). Gender neuter.

Diagnosis: Continuous post-labial groove; gill openings not extending onto venter;

heterodont dentition in both jaws; outer teeth shovel-shaped and sparsely arranged in one or two rows, inner teeth conical and numerous; tooth patches separated in upper jaw; 16–18 branched pectoral rays.

Pseudexostoma is distinguished from *Glyptosternon*, *Glaridoglanis*, *Euchiloglanis*, *Pareuchiloglanis* and *Parachiloglanis* by having a continuous post-labial groove (Table 5). *Pseudexostoma* is distinguished from *Myersglanis*, *Exostoma*, *Oreoglanis* by having heterodont dentition in the upper jaw (vs. homodont = pointed in *Myersglanis* and *Oreoglanis*, and homodont = oar-shaped in *Exostoma*), and from *Myersglanis* and *Exostoma* by having heterodont dentition in the lower jaw (vs. homodont = pointed in *Myersglanis*, and homodont = oar-shaped in *Exostoma*). It is further distinguished from *Exostoma* by having 16–18 (vs. 10–11) branched pectoral rays, and from *Myersglanis* and *Oreoglanis* by having tooth patches separated in the upper jaw.

Description: 5–6 dorsal rays; 16–18 branched pectoral-fin rays; 6 pelvic-fin rays; 3–6 anal-fin rays. Head depressed; body elongate, depressed anteriorly. Eyes minute, dorsal, subcutaneous, dorsal. Lips thick, fleshy, papillated. Teeth of two distinct types in two well-separated patches in both jaws; outer teeth shovel-shaped and sparsely arranged in one or two rows, inner teeth conical and numerous. Maxillary barbel with well-developed membrane, soft base, striated pad of adhesive skin. Gill openings narrow, extending only to a point above pectoral-fin base. Branchiostegal membranes confluent with isthmus. Coracoid process not externally visible. No thoracic adhesive apparatus. Paired fins plaited to form an adhesive apparatus.

Distribution: Irrawaddy and Salween drainages, Yunnan, China (Chu *et al.*, 1999).

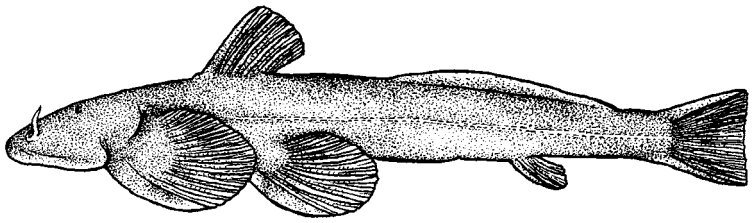

FIGURE 26. *Pseudexostoma yunnanensis*. Drawn by J. Bourque, after Chu *et al.* (1999).

Pseudexostoma brachysoma Chu 1979

Pseudexostoma yunnanensis brachysoma Chu 1979: 78 [English p. 81], fig. 3. Type locality: Hill stream running into the Nu River, near Laowo, Yunlong Xian, Yunnan, China. Holotype: KIZ 742093. Paratypes: KIZ (17).

Distribution: Salween drainage, China (Chu, 1979; Chu *et al.*, 1999).

Glyptosternum yunnanensis Tchang 1935: 174, fig. 1. Type locality: Yunnan, China. Holotype: ASIZB [= ZMFMIB 12027]. Paratypes (other specimens examined): ASIZB [= ZMFMIB] 12018 (1), 12020-26 (7), 12028 (1).

Distribution: Irrawaddy drainage, Yunnan, China (Chu *et al.*, 1999).

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Appendix I. Material examined

Ayarnangra estuarius: Irrawaddy drainage: UF 148530 (6; 35.9–40.5). ***Conta conta***: Meghna drainage: CAS 93881 (2; 45.0–48.4), CAS 93882 (1; 45.5). ***Erethistes filamentosa***: Irrawaddy drainage: USNM 372475 (1; 28.1). Rangoon drainage: USNM 372480 (1; 24.8). Sittang drainage: CAS 61339 (23; 26.1–30.0), USNM 372477 (9; 22.6–27.8). ***Erethistes hara***: Brahmaputra drainage: FMNH 93597 (3; 44.0–47.7), UMMZ 208748 (15; 32.9–45.8), UMMZ 208994 (1; 41.6). Irrawaddy drainage: USNM 346169 (1; 48.4). ***Erethistes pusillus***: Brahmaputra drainage: UMMZ 208907 (1; 31.7), UMMZ 208991 (1; 31.3). ***Erethistoides*** sp.: Ganges drainage: CAS 50191 (2; 17.8–26.7), CAS 50257 (2; 13.5–18.3). ***Pseudolaguvia kapuri***: Ganges drainage: CAS 50194 (44; 13.8–27.5), CAS 50196 (1; 24.7), CAS 50268 (2; 22.1–24.9), CAS (1; 20.4), CAS 50294 (52; 12.9–25.3); KU 28611 (2; 21.0–21.7), USNM 165090 (1; 26.0). ***Pseudolaguvia tenebricosa***: Sittang drainage: USNM 374987 (7; 26.3–29.8, paratypes). ***Bagarius bagarius***: Chao Phraya drainage: USNM 103215 (1; 184.0), USNM 103216 (1; 194.0), USNM 109628 (1; 114.0), USNM 109629 (1; 128.4). Mekong drainage: CAS 61923 (2; 138.0–170.0), CAS 93904 (6; 75.2–183.0), CAS 96580 (8; 83.3–152.2), CAS 96641 (1; 129.0), CAS 97005 (3; 76.4–95.9), CAS 97024 (1; 69.9), USNM 288670 (1; 90.0). Cambodia: CAS 94273 (2; 151.7–181.0). Thailand: CAS 96871 (3; 114.6–133.0). ***Bagarius rutilus***: Red River drainage: CAS 94941 (4; 110.5–121.1), CAS 216827 (1; 202.0), CAS 216831 (10; 85.8–174.0), CAS 216833 (1; 135.3), CAS 216835 (2; 123.5–136.1). CAS 216836 (1; 167.0), CAS 216837 (2; 94.0–104.7), MNHN 1934-0286-0290 (5; 90.3–116.0), MNHN 1939-0236 (1; 138.9). ***Bagarius suchus:*** Chao Phraya drainage: INHS 93565 (1; 52.0), INHS 93715 (2; 39.2–72.4). Mekong drainage: CAS 91538 (1; 243.0), CAS 95030 (7; 82.4–101.0). ***Bagarius yarrelli:*** Ganges drainage: CAS 92441 (1; 63.1), FMNH 91294 (1; 189.0), KU 29117 (1; 238.0), KU 29586 (2; 117.1–146.0). USNM 232553 (1; 177.0). Mae Klong drainage: USNM: 103217 (1; 339.0). Mekong drainage: CAS 55888 (2; 129.4–130.3), CAS 61923 (2; 156.0–159.0), CAS 94627 (1; 88.4), CAS 96639 (1; 140.0), CAS 96882 (2; 131.8–150.8), CAS 97036 (1; 57.9), INHS 93673 (1; 138.7), MNHN 1967-0470 (5; 100.8–208.0). Kelantan drainage: CAS 94564 (1; 119.5). Kapuas drainage: CAS 44189 (1; 139.6). ***Euchiloglanis davidi***: Yangtze drainage: AMNH 15259 (1; 122.7), FMNH 43762 (2; 66.1–68.3), FMNH 43763 (1; 65.7), FMNH 43764 (1; 175.0), FMNH 43765 (1; 146.8), FMNH 43766 (1; 133.4), USNM 120365 (5; 119.8–128.5). China: BMNH 1923.3.13.1 (1; 117.5, syntype),USNM 130182 (4; 106.0–130.0). ***Exostoma labiatum***: Myanmar: BMNH 1860.319.97 (1; 71.0, holotype). ***Exostoma vinciguerrae***: Irrawaddy drainage: BMNH 1893.2.16.17 (1; 67.1, holotype). Myanmar: MNHN 1893-0141-0143 (2; 62.2–65.3). ***Gagata cenia***: Ganges drainage: AMNH 58392 (3; 48.8–54.6). ***Gagata gasawyuh***: Irrawaddy drainage: AMNH 13776 (1; 66.7); USNM 345151 (5; 58.5–82.6, paratypes). Tenasserim drainage: (1; 102.1). ***Gagata itchkeea***: Krishna drainage: FMNH 2396 (1; 39.2). ***Glyptosternon maculatum***: Brahmaputra drainage: BMNH 1904.12.28.87 (2; 173.0–222.0, syntypes). ***Glyptosternon reticulatum***: Indus drainage: BMNH 1888.11.24.1 (1; 136.0, syntype of *Exostoma oschanini*), FMNH 73391 (1; 109.4), USNM 118392 (1; 108.3). ***Glyptothorax buchanani***: Chao Phraya drainage: ANSP 178708 (5; 39.4–42.4), ANSP 178712 (15; 38.5–73.7), INHS 93545 (5; 40.2–41.5), INHS 93660 (14 + 1 c&s; 38.0–67.1), USNM 119824 (1; 37.3), USNM 229341 (1; 37.0). ***Glyptothorax burmanicus:*** Irrawaddy drainage: USNM 372563 (6; 59.4–70.0). Myanmar: (1; 120.4). ***Glyptothorax callopterus***: Muar drainage: SU 31003 (1; 40.6). Malaysia: USNM 229263 (1; 48.3), USNM 229305 (1, 48.8). Peninsular Thailand: ANSP 59373 (1; 42.2), ANSP 76834 (48 + 4 c&s; 33.9–56.1), USNM 109609 (1; 61.7), USNM 109819 (2; 47.4–48.2, paratypes). ***Glyptothorax cavia***: Ganges drainage: CAS 50230 (3; 114.5–210.0), KU 29015 (1; 147.0), KU 29444 (1; 118.0). ***Glyptothorax conirostre***: Ganges drainage: SU 61433 (3; 75.7–91.4). ***Glyptothorax cous***: Tigris-Euphrates basin: BMNH 1955.6.25.2 (1; 195.0, holotype). ***Glyptothorax dorsalis***:

Salween drainage: USNM 109608 (2; 65.1–70.2). ***Glyptothorax exodon***: Kapuas drainage [Borneo Island]: CAS 49419 (1; 58.6). ***Glyptothorax fokiensis***: Yangtze drainage: AMNH 11141 (5; 56.0–60.1), MNHN 1994-0562 (2; 69.4–84.9), USNM 85947 (1; 68.2), USNM 89371 (2; 59.4–71.5). ***Glyptothorax fuscus***: Chao Phraya drainage: UF 79613 (1; 89.5 mm SL), USNM 103106 (1; 85.0), USNM 103109 (2, 79.2–81.6), USNM (9; 55.3–68.7). ***Glyptothorax garhwali***: Ganges drainage: KU 29029 (1; 62.0). ***Glyptothorax gracilis***: Ganges drainage: CAS 53370 (1; 81.0), KU 28753 (1; 101.6), KU 29082 (2; 108.9–117.5), KU 29411 (1; 99.1), KU 29601 (74.9–79.0). ***Glyptothorax honghensis***: Red River drainage: MNHN 1934-0266 (1; 70.5). ***Glyptothorax housei***: Ponnani drainage [Western Ghats, India]: (3; 78.3–84.6, paratypes), SU 36532 (12; 39.8–101.1, paratypes). ***Glyptothorax indicus***: Ganges drainage: KU 28884 (2; 49.5–51.2), KU 29577 (2; 70.7–73.1), USNM 165065 (2; 90.5–92.5). ***Glyptothorax interspinalum***: Vietnam: AMNH 231695 (1; 77.5). ***Glyptothorax kashmirensis***: Indus drainage: SU 41998 (1; 68.4), USNM 316692 (1; 43.0). ***Glyptothorax lampris***: Mai Klong drainage: INHS 93646 (2 + 1 c&s; 77.9–86.3). Chao Phraya drainage: ANSP 59161 (14; 34.6–57.2), ANSP 59198 (24 + 3 c&s; 40.2–59.0), ANSP 59241 (16; 44.6–56.9), INHS 93547 (4 + 1 c&s; 47.6–51.5), INHS 93717 (1; 31.2). Bangpakong drainage: INHS 93531 (1; 62.0). ***Glyptothorax laosensis***: Mai Klong drainage: INHS 93645 (1; 92.2). Southeast Thailand: INHS 93516 (2; 43.5–58.2). ***Glyptothorax lonah***: India [Western Ghats]: BMNH 1860.3.19.756 (1; 125.6, holotype), BMNH 1860.3.19.757 (1; 68.6, holotype of *Glyptothorax dekkanense*), SU 41999 (2; 86.9–99.3). ***Glyptothorax longicauda***: Salween drainage: CAS 214876 (2; 64.2–78.8). ***Glyptothorax major***: Baram drainage [Borneo Island]: ANSP 166868 (19; 30.9–44.2), ANSP 166869 (2; 88.5–97.4), ANSP 176570 (1; 31.9), ANSP 177509 (1; 32.3), BMNH 1892.10.7.26 (1; 74.5, syntype), SMF 752 (1, holotype of *Glyptosternum kuekenthali*) (photograph examined). ***Glyptothorax minimaculatus***: Irrawaddy drainage: CAS 89286 (2; 87.5–119.1), USNM 372489 (7; 47.7–114.7), USNM 372500 (3; 74.5–86.9). ***Glyptothorax nieuwenhuisi***: Borneo: MNHN 1891-0484 to 0487 (4, 31.8–53.4, syntypes), MNHN 1903-0189 (1, 61.3, syntype). Kapuas drainage [Borneo Island]: CAS 49416 (1, 45.6), USNM 230305 (1, 46.5). ***Glyptothorax pectinopterus***: Indus drainage: USNM 165061 (1; 45.9). ***Glyptothorax platypogon***: Java: MNHN 2903 (2; 67.1–71.2, syntypes), MNHN 2904 (2; 69.1–83.0, syntypes), MNHN b-0196 (2; 50.9-62.9, syntypes), USNM 72545 (2; 65.2–71.3), USNM 72546 (1; 71.9). ***Glyptothorax platypogonoides***: Sumatra: BMNH 1863.12.11.154 (1; 62.5, syntype?), USNM 193006 (2; 40.2–47.5). ***Glyptothorax saisii***: Ganges drainage: USNM 205613 (1; 70.7, paratype of G. coheni***). Glyptothorax schmidti***: Sumatra: MHNG 683.22 (1; syntype) (photograph examined), UF 161444 (13; 24.5–51.5), UF 161614 (9; 24.4–54.9), UF 161617 (5; 39.5–59.6), UF 161617 (8; 40.2-5.8). ***Glyptothorax sinense***: Yangtze drainage: AMNH 10265 (49; 37.8–57.1), AMNH 10277 (1, 46.4), BMNH 1907.11.26.4 (1; 55.9, syntype). ***Glyptothorax striatus***: Brahmaputra drainage: BMNH 1860.3.19.95 (1; 78.5, syntype). ***Glyptothorax telchitta***: Ganges drainage: CAS 92583 (2; 44.6–49.1). ***Glyptothorax zanaensis***: Salween drainage: CAS 214860 (3; 40.0–50.4), CAS 214861 (1; 69.6), CAS 214866 (1; 64.5). ***Glyptothorax zhujiangensis***: Xijiang drainage: FMNH (1, 71.8). ***Gogangra viridescens***: Ganges drainage: CAS 95572 (2; 29.1–30.6). ***Nangra nangra***: Ganges drainage: FMNH 93598 (10; 27.8–30.8). ***Oreoglanis hypsiurus***: Mekong drainage: NCSM 36385 (3; 73.6–91.2). ***Oreoglanis insignis***: Irrawaddy drainage: CAS 205600 (11; 32.6–81.9). Salween drainage: FMNH 112232 (1; 62.1). ***Oreoglanis macropterus***: Myanmar: BMNH 1893.2.16.18 (1; 58.4, syntype). ***Oreoglanis siamensis***: Chao Phraya: USNM 109655 (3; 59.2–92.3). ***Parachiloglanis hodgarti***: Ganges drainage: CAS 44187 (2; 49.5–55.0). ***Pareuchiloglanis feae***: Myanmar: BMNH 1893.2.16.19–20 (2; 68.5–108.2, syntypes). ***Pareuchilogalanis gongshanensis***: Salween drainage: CAS 214865 (3; 39.7–87.4). ***Pareuchiloglanis macropterus***: Irrawaddy drainage: BMNH 1987.9.17.31–32 (2; 151.6–175, paratypes). ***Pareuchiloglanis macrotrema***: Red River drainage: BMNH 1925.2.19.5–6 (2; 94.8–147.5, syntypes). ***Pareuchiloglanis myzos-***

toma: Mekong drainage: BMNH 1923.2.21.40–42 (3; 65.4–105.0, syntypes). ***Pareuchiloglanis poilanei***: Southern Vietnam: MNHN 1936-005 (1; 104.5, syntype), MNHN 1936-007 (1; 112.8, syntype), MNHN 1936-009 (1; 96.1, syntype), MNHN 1936-011 (1; 86.3, syntype), MNHN 1936-015 (1; 84.2, syntype), MNHN 1936-017 (1; 60.9, syntype), MNHN 1936-019 (1; 65.9, syntype), MNHN 1936-020 (1; 58.2–70.8, syntypes). ***Pareuchiloglanis robusta***: Yangtze drainage: USNM 86900 (4; 96.4–125.0). ***Pseudecheneis sulcatus***: India: BMNH 2005.5.17.5 (1; 76.5, holotype?). ***Pseudecheneis* sp.**: Ganges drainage: FMNH 99630 (4; 31.2–45.1). Brahmaputra drainage: AMNH 15306 (1; 58.6). Myanmar: USNM 44738 (2; 52.0–100.0). Unknown: USNM 12635 (1; 97.5). ***Pseudecheneis paviei***: Red River drainage: MNHN 1982-0049 (1; 105.3, holotype). ***Pseudexostoma brachysoma***: Salween drainage: BMNH 1987.9.17.37 (1). ***Pseudexostoma yunnanensis***: Irrawaddy drainage: BMNH 1987.9.17.36 (1). ***Sisor torosus***: India: CAS 217799 (2; 123.7–126.5).

