

# A new genus, *Leptomelanosoma*, for the polynemid fish previously known as *Polydactylus indicus* (Shaw, 1804) and a redescription of the species

Hiroyuki Motomura<sup>1</sup> and Yukio Iwatsuki<sup>2</sup>

<sup>1</sup> *Miyazaki University, the United Graduate School of Agricultural Sciences, Kagoshima University, 1-1 Gakuen-kibanadai-nishi, Miyazaki 889-2192, Japan (e-mail: a02113u@cc.miyazaki-u.ac.jp)*

<sup>2</sup> *Faculty of Agriculture, Miyazaki University, 1-1 Gakuen-kibanadai-nishi, Miyazaki 889-2192, Japan (e-mail: yuk@cc.miyazaki-u.ac.jp)*

Received: September 19, 1999 / Revised: June 9, 2000 / Accepted: July 10, 2000

---

## Ichthyological Research

©The Ichthyological Society of Japan 2001

Ichthyol Res (2001) 48: 13–21

**Abstract** A new genus, *Leptomelanosoma*, is proposed for the polynemid fish, *Polydactylus indicus* (Shaw, 1804). The genus differs from all other genera in the family Polynemidae by the following combination of characters: anterior one-third of lower jaw with small teeth extending onto lateral surface, adjacent portion of lip poorly developed; ethmoid not covered dorsally by frontals; sphenotics visible dorsally between anterior margins of parietal and pterotic; upper and lower caudal fin lobes very long, filamentous; swimbladder with many appendages inserted into lateral walls of abdominal cavity; grayish-black body. The type species, *Polydactylus indicus*, is redescribed as *Leptomelanosoma indicum*.

**Key words** Polynemidae · New genus · Redescription · *Leptomelanosoma indicum*

The circumtropical family Polynemidae, a common inhabitant of coastal, brackish or fresh waters (Smith, 1949; Munro, 1955, 1967; Menon, 1974; Menon and Babu Rao, 1984; Feltes, 1991, 1993; Nelson, 1994), is characterized by 3 to 16 detached lower threadlike pectoral fin rays. This unique character has been considered to operate as a sense organ, enabling polynemids to search for food in muddy waters (Marshall, 1964; Munro, 1967; Smith, 1986; Grove and Lavenberg, 1997).

Feltes (1991, 1993) recognized seven genera, *Eleutheronema* (Bleeker, 1862), *Filimanus* (Myers, 1936), *Galeoides* (Günther, 1860), *Parapolynemus* (Feltes, 1993), *Pentanemus* (Günther, 1860), *Polydactylus* (Lacepède, 1803) and *Polynemus* (Linnaeus, 1758), with a total of 33 species in the family. About half the members were included in *Polydactylus*, characterized by the following combination of characters: large eye, tooth plate on vomer simple or absent, width of tooth band on upper and lower jaws wider than space separating tooth bands on opposing premaxilla, basisphenoid in contact with prootic, pectoral fin insertion well below midline on lateral body, length of uppermost pectoral filaments less than standard length (except *P. macrophthalmus*), pectoral fin base (including base of pectoral filaments) less than upper jaw length and swimbladder not extending beyond anal fin origin (Feltes, 1993).

*Polydactylus indicus* (Shaw, 1804), which is widely distributed in the Indo-Australian Archipelago, shares these characters. However, it is herein considered as a monotypic new genus, on the basis of morphological characters including body coloration. The type species of the new genus is also redescribed.

## Methods

Methods for counts and measurements generally followed Hubbs and Lagler (1947) and Feltes (1991), being made on the left side wherever possible. In addition, dermal eye opening was taken as the greatest distance between the fleshy margins of the eye. The length of the pectoral fin base was measured from the base of the uppermost pectoral fin ray to the base of the lowermost pectoral filament, and those of the upper and lower caudal fin lobes from middle of the posterior margin of the hypural plate to the posterior tip of the longest caudal fin ray of the upper and lower lobes, respectively. Gill raker counts were made on the first arch, the upper count being given first (lower counts including a raker at angle). Standard length is expressed as SL.

Osteological examinations were based on specimens stained in alizarin red-S and radiographs, in 27 species, representing the seven polynemid genera being ex-

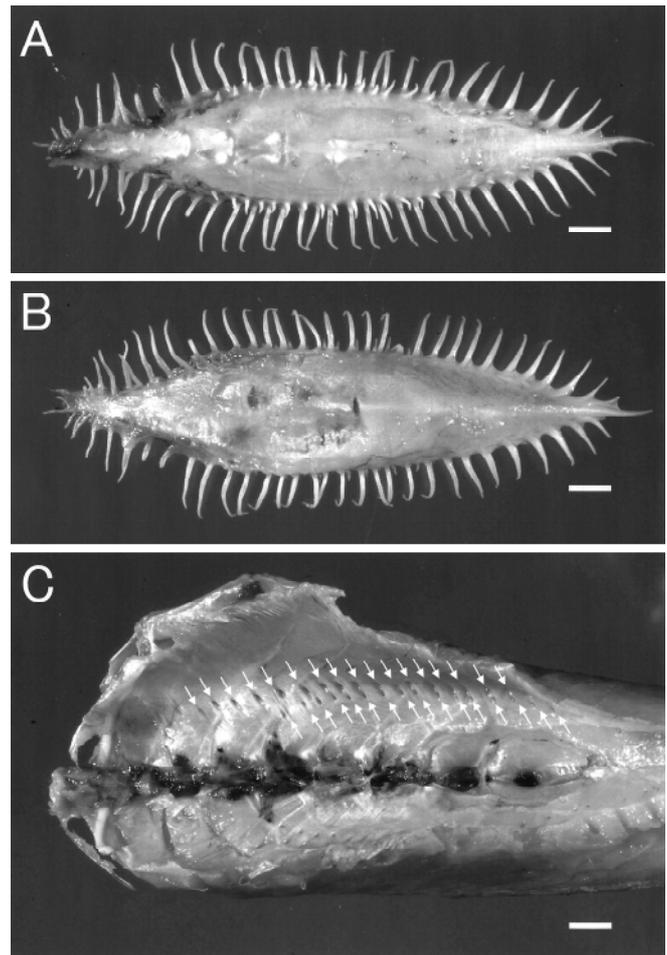
amined overall (see Comparative material examined). Osteological terminology generally followed Rojo (1991). In addition, terminology of the supraneural bones follows Mabee (1988), and the formula for configuration of the supraneural bones, anterior neural spines and anterior dorsal fin pterygiophores, Ahlstrom et al. (1976). Institutional codes followed Leviton et al. (1985), with additional institutional abbreviations as follows: Fisheries Science Course, Department of Animal Sciences, Miyazaki University, Japan (MUFS); Phuket Marine Biological Center, Thailand (PMBC); Shanghai Fisheries University, China (SFU).

### *Leptomelanosoma* gen. nov.

**Type species.** *Polynemus indicus* Shaw, 1804: 155 [type locality: Vizagapatnam, India, based on “Maga Booshee” of Russell (1803: 68, fig. 184)].

**Diagnosis.** A genus of Polynemidae with the following combination of characters: swimbladder with many appendages inserted into lateral walls of abdominal cavity (Fig. 1); anterior one-third of lower jaw with small teeth extending onto lateral surface, adjacent portion of lip poorly developed (Fig. 2); tooth plate of vomer oval (Fig. 3); ethmoid not covered dorsally by frontals (Fig. 4); sphenotics visible dorsally between anterior margins of parietal and pterotic (Fig. 4); upper and lower caudal fin lobes very long, filamentous (Fig. 5); grayish-black body (Fig. 5).

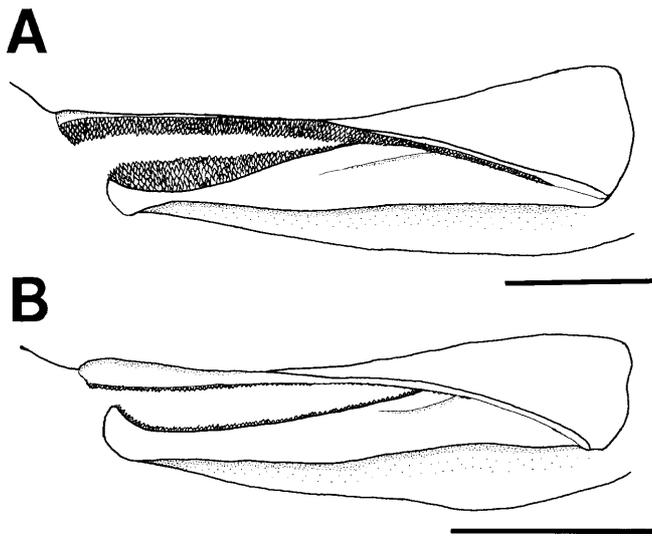
**Remarks.** Although the new genus, *Leptomelanosoma*, shares many characters given by Feltes (1993) for *Polydactylus*, the former differs from *Polydactylus* and other polynemid genera in having a conspicuous swimbladder with many appendages (Fig. 1A,B). In all other polynemid genera, the swimbladder is simple or absent (Table 1). *Leptomelanosoma* has numerous appendages in two rows along the entire and vicinity of middle of lateral surface of the swimbladder (Cuvier in Cuvier and Valenciennes 1829: p. 385; this study: Fig. 1A). The appendages arising along the entire lateral surface are longer than those in the other row, restricted to the vicinity of middle of the swimbladder (Fig. 1A). The appendages of both rows were fully inserted into the lateral walls of the abdominal cavity (Fig. 1C). Such a character has never before been reported in other fishes, although the swimbladder of sciaenid and sillaginid fishes varies in configuration with species (Sasaki, 1989; McKay, 1992). Character condition of swimbladder with many appendages of *Leptomelanosoma* is derivative among the family Polynemidae because other genera of the family and most percoids possess a simple, carrot-shaped swimbladder (Sasaki, 1989; this study).



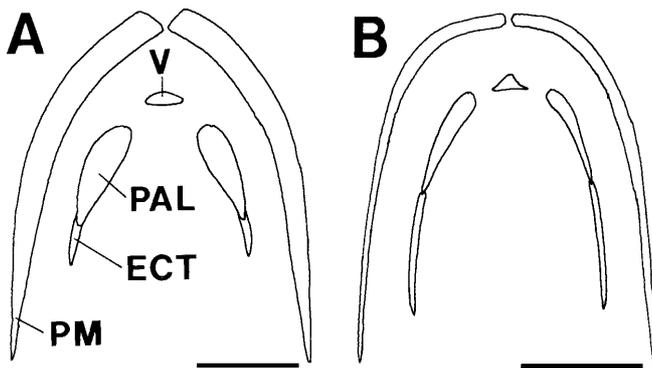
**Fig. 1.** Swimbladder and abdominal cavity of *Leptomelanosoma indicum*, URM-P 12700, 198 mm SL. **A** Swimbladder in dorsal view. **B** Swimbladder in ventral view. **C** Abdominal cavity in ventral view (arrows indicate holes into which the swimbladder appendages were inserted). Anterior to left in each case. Bars 5 mm

The anterior portion of the lower jaw lip of *Leptomelanosoma* and *Parapolyneustes* (specimen over ca. 70 mm SL) are poorly developed, and the adjacent teeth extend onto the lateral surface of the dentary (Fig. 2A; Table 1). In the remaining genera of the family, except *Eleutheronema*, the lower jaw lip is well developed and the dentary teeth restricted to the dorsal surface (Fig. 2B; Table 1). The lower jaw lip in *Eleutheronema* occurs only on the posterior one-third of the jaw (Table 1).

The vomerine tooth plate of *Leptomelanosoma*, especially in adults, is oval, compared with semicircular or triangular in other polynemids (Fig. 3A,B; Table 1), except for *Eleutheronema*, in which it is triangular in outline with smaller deciduous tooth plates on either side (Marathe and Bal, 1958: Fig. 5a; Feltes, 1993; this study).



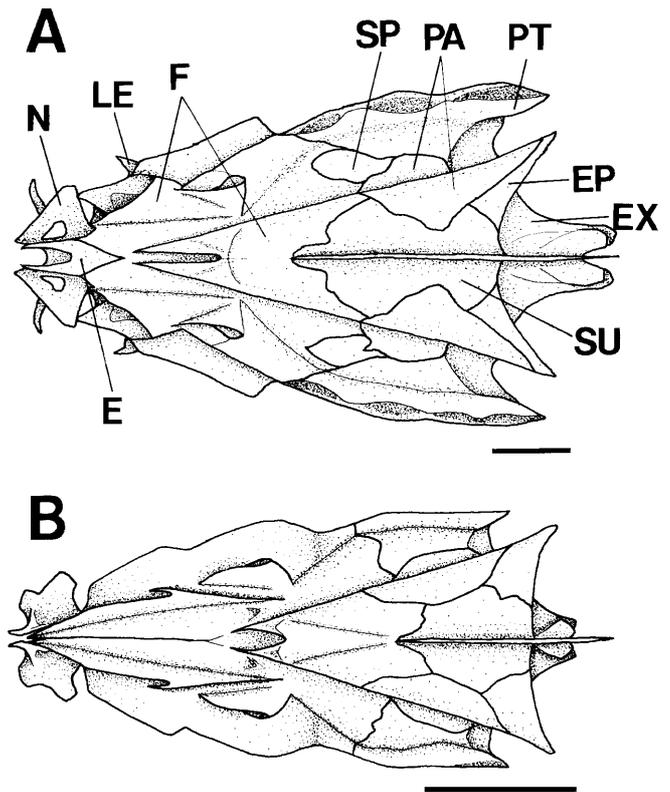
**Fig. 2.** Left lateral view of upper and lower jaws. **A** *Leptomelanosoma indicum*, URM-P 29076, 129 mm SL. **B** *Polydactylus virginicus*, CAS 104888, 92 mm SL. Bars 5 mm



**Fig. 3.** Ventral view of dentition of premaxilla and roof of oral cavity. **A** *Leptomelanosoma indicum*, URM-P 29076, 129 mm SL. **B** *Polydactylus virginicus*, CAS 104888, 92 mm SL. *ECT*, ectopterygoid; *PAL*, palatine; *PM*, premaxilla; *V*, vomer. The numerous tiny teeth are not illustrated. Bars 5 mm

Furthermore, the tooth plates of the palatines and ectopterygoids of *Leptomelanosoma* are wider and shorter than those of *Polydactylus* (Fig. 3A,B).

In most polynemids, the ethmoid is covered dorsally by the frontals (Fig. 4B; Table 1), whereas in *Leptomelanosoma*, it is dorsally exposed between the nasals on either side (Marathe and Bal, 1958: fig. 2b; this study: Fig. 4A; Table 1). Furthermore, the sphenotics of *Leptomelanosoma* are dorsally exposed between the anterior margins of the parietal and pterotic (Marathe and Bal, 1958: fig. 2b; this study: Fig. 4A; Table 1), but the sphenotics of other polynemid genera are covered by the frontals (Fig. 4B; Table 1). The sphenotics of all polynemid genera

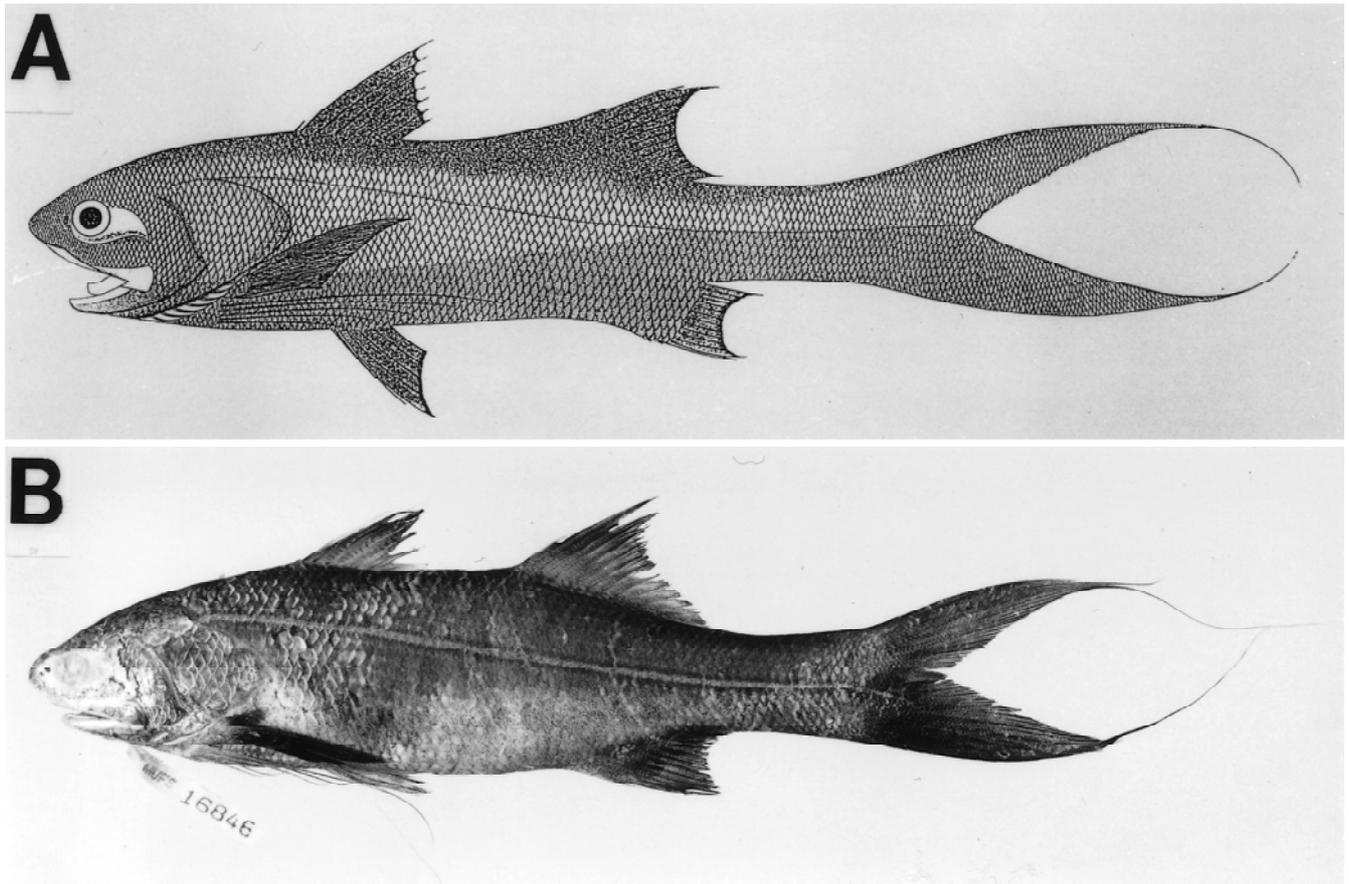


**Fig. 4.** Dorsal view of neurocranium. **A** *Leptomelanosoma indicum*, URM-P 12700, 198 mm SL. **B** *Polydactylus virginicus*, CAS 104888, 92 mm SL. *EP*, epiotic; *E*, ethmoid; *EX*, exoccipital; *F*, frontal; *LE*, lateral ethmoid; *N*, nasal; *PA*, parietal; *PT*, pterotic; *SP*, sphenotic; *SU*, supraoccipital. Bars 5 mm

including *Leptomelanosoma* are laterally exposed, being similar to that of the majority of percoids (e.g., Sasaki, 1989; Heemstra and Randall, 1993).

The upper and lower caudal fin lobes of both *Leptomelanosoma* and *Parapolyneumus* are extremely long and filamentous (Table 1), although they are easily damaged at the tips. This character is not found in other polynemid genera (Table 1). Despite this similarity, *Leptomelanosoma* differs from *Parapolyneumus* in having shorter pectoral fin rays (less than head length vs greater than head length in latter), shorter pectoral filaments (less than SL vs much greater than SL), five pectoral filaments (vs six or seven, usually seven), five infraorbitals (vs three), basisphenoid present (vs absent) and greater adult size (attaining ca. 100 cm SL vs ca. 10 cm SL).

The characters of lower jaw and caudal fin lobes in *Leptomelanosoma* and *Parapolyneumus* are considered to be the homoplasy because each genus belongs to a different lineage in the Polynemidae. There are two major lineages in the family (Feltes, 1991; this study): one, including *Parapolyneumus* and *Polynemus*, is characterized



**Fig. 5.** Drawing (A) of the “Maga Booshee” of Russell (1803) and *Leptomelosoma indicum* (B), MUFS 16846, 262 mm SL, Kalairt fish landing port, Chennai, India

by a reduction of the size of the orbit and modification of the associated structures (see Feltes, 1993: Fig. 5) and the pectoral fin insertion relatively high on the body; the other, including *Eleutheronema*, *Filimanus*, *Galeoides*, *Leptomelosoma*, *Pentanemus* and *Polydactylus*, has a moderate to large orbit and the pectoral fin insertion relatively low on the body.

The body color of *Leptomelosoma* is blackish, compared with that of other genera, in which it is silver or silvery-golden. The genus is currently represented by a single species.

**Etymology.** From the Greek “*lepto*” meaning slender, “*melano*” black and “*soma*” body, in reference to the slender body tinged with black. The gender is neuter.

### *Leptomelosoma indicum* (Shaw, 1804)

(English name: Indian threadfin)  
(Figs. 1A–C, 2A, 3A, 4A, 5A, B)

*Polynemus indicus* Shaw, 1804: 155 [type locality: Vizagapatnam, India, based on “Maga Booshee” of Russell (1803: 68, fig. 184)]; Cantor, 1849: 1011 (Malay Peninsula); Bleeker, 1854: 427 (India); Günther, 1860: 326 (east Indian

Ocean and Australia); Day, 1876: 179 (India); Weber and de Beaufort, 1922: 205 (Indo-Australian Archipelago); Munro, 1955: 97 (Ceylon); Kagwade, 1970: 5, Fig. 2 (India); Menon, 1974: POLYN Poly 1 (eastern Indian Ocean and western central Pacific Ocean); Jayaram, 1981: 348 (India); Menon and Babu Rao, 1984: POLYN Poly 1 (western Indian Ocean). *Polynemus sele* Hamilton, 1822: 226 (type locality: estuaries of Ganges, India).

*Polynemus uronemus* Cuvier in Cuvier and Valenciennes, 1829: 385 (type locality: unknown, new name for *P. indicus* Shaw, 1804); Bleeker, 1849: 58 (Surabaya, Java, Indonesia).

*Polynemus gelatinosus* McClelland, 1843: 181, pl. 6 (type locality: Bengal, India, new name for *P. sele* Hamilton, 1822).

*Trichidion indicum*; Bleeker, 1868: 293 (Bintan, Indonesia); Bleeker, 1983: 22, pl. 454, fig. 1 (locality unknown, originally Polynemat pl. 2, unpublished plate by P. Bleeker).

*Trichidion indicus*; Fowler, 1905: 501 (mouth of Baram River, Kalimantan, Malaysia).

*Polydactylus indicus*; Smith, 1949: 327 (South Africa); Smith, 1986: 721, fig. 233.2 (South Africa); Talwar and Jhingran, 1992: 910 (India); Mansor et al., 1998: 87, pl. 92, fig. 270 (South China Sea).

**Materials (31 specimens, 97–710 mm SL).** AMS B. 8136, 211 mm SL, Chennai (=Madras), India; AMS I. 27630-004, 27630-034, 2 specimens, 149–160 mm SL, Kuala Kurau, Malaysia (5° N, 100°25' E); ANSP 88347, 205 mm SL, Mumbai

**Table 1.** Comparison of genera in the family Polynemidae

	Swimbladder	Teeth and lip of lower jaw	Tooth plate of vomer	Ethmoid and sphenotics	Tips of caudal fin
<i>Eleutheronema</i>	Absent	Teeth extending onto lateral surface of anterior two-thirds, adjacent portion of lip absent	Dentate, large, triangular in outline with smaller deciduous tooth plates on either side	Not dorsally exposed	Not filamentous
<i>Filimanus</i>	Present, simple	Teeth restricted to dorsal surface, lip well-developed	Dentate, small, triangular	Not dorsally exposed	Not filamentous
<i>Galeoides</i>	Present, simple	Teeth restricted to dorsal surface, lip well-developed	Edentate	Not dorsally exposed	Not filamentous
<i>Leptomelanosoma</i> gen. nov.	Present, with appendages	Teeth extending onto lateral surface of anterior one-third, adjacent portion of lip poorly developed	Dentate, large, oval	Dorsally exposed	Filamentous
<i>Parapolynemus</i>	Absent	Teeth restricted to dorsal surface, lip well-developed but, in larger specimens (over ca. 70 mm SL), teeth extending onto lateral surface of anterior one-third, adjacent portion of lip poorly developed	Edentate	Not dorsally exposed	Filamentous
<i>Pentanemus</i>	Present, simple	Teeth restricted to dorsal surface, lip well-developed	Edentate	Not dorsally exposed	Not filamentous
<i>Polydactylus</i>	Present, simple	Teeth restricted to dorsal surface, lip well-developed	Edentate or dentate, large, semicircular or triangular	Not dorsally exposed	Not filamentous
<i>Polynemus</i>	Absent	Teeth restricted to dorsal surface, lip well-developed	Edentate or dentate, small, semicircular	Not dorsally exposed	Not filamentous

(=Bombay), India; FSKU 96814, 182 mm SL, Tawau, Sabah, Malaysia (dissected following counts and measurements); MNHN 4347, 2 specimens, 139–164 mm SL, Mumbai (=Bombay), India; MNHN 1977-0240, 317 mm SL, Kuala Lumpur, Malaysia; MNHN A.3034, 2 specimens, 97–104 mm SL, Mumbai (=Bombay), India; MNHN A.3035–3036, 2 specimens, 101–189 mm SL, Ganges River, India; MNHN A.3037, 2 specimens, 240–254 mm SL, Pondicherry, India; MNHN A.3047, 235 mm SL, Mumbai (=Bombay), India; MUFS 16846, 262 mm SL, Kalairt fish landing port, Chennai (=Madras), India; MUFS 17010, 215 mm SL, Chinatown market, Singapore; PMBC 6742, 2 specimens, 161–248 mm SL, Myanmar, north Andaman Sea (15°18.3' N, 97°13.8' E); QM I. 26191, 103 mm SL, Pagan Island, Indonesia; UMMZ 225574, 3 specimens, 112–122 mm SL, Songkhla, Thailand; URM-P 12700, 198 mm SL, Samyan market, Bangkok, Thailand (dissected following counts and measurements); URM-P 13776, 294 mm SL, Samyan market, Bangkok, Thailand; URM-P 29076, 129 mm SL, Bangkok, Thailand; USNM 201807, 710 mm SL, Pakistan (23° N, 68°08' E); USNM 345342, 215 mm SL, Myanmar, north Andaman Sea (15°15' N, 95°15' E); USNM 357732, 338 mm SL, Palk Bay, Sri Lanka (9°29' N, 79°28–47' E); USNM 357761, 2 specimens, 200–243 mm SL, India (22°45' N, 68°24' E).

**Description.** Counts and proportional measurements as percentages of SL of *Leptomelanosoma in-*

*dicum* are given in Table 2. Characters given in the generic diagnosis are not repeated.

Body oblong, compressed; obtusely conical snout projecting strongly beyond upper jaw, its length slightly greater than orbit diameter; eye covered with adipose eyelid; upper lip absent; maxilla covered with deciduous scales; posterior margin of preopercle serrated; villiform tooth in broad bands on vomer, palatines and ectopterygoids; posterior margin of maxilla extending far beyond posterior margin of adipose eyelid; all pectoral fin rays unbranched; tip of longest pectoral filament extending far beyond posterior margin of pelvic fin; origin of second dorsal fin base in advance of that of anal fin base; second dorsal fin base longer than anal fin base; anal fin base shorter than upper jaw length; second spine of first dorsal fin very strong in adults; dorsal, anal and caudal fin bases covered with scales; lateral line extending from upper end of gill opening to upper end of lower caudal fin lobe; caudal peduncle depth 2.0–2.3 in caudal peduncle length; highly developed foramina present on pterotic; lower tip of seventh proximal pterygiophore of first dorsal fin directed forward; formula for configura-

**Table 2.** Counts and measurements for *Leptomelanosoma indicum*, expressed as percentages of standard length ( $n = 31$ )

Standard length (mm)	97–710
Fork length (mm)	110–761
Counts (modes)	
Dorsal fin rays	VIII-I, 12–13 (13)
Anal fin rays	III, 10–11 (11)
Pectoral fin rays	12–14 (14)
Pectoral filaments	5
Pelvic fin rays	I, 5
Pored lateral line scales	69–72 (70)
Scales above/below lateral line	7–8 (8)/9–12 (10)
Gill rakers	8–9 (8) + 10–12 (11) = 18–21 (19)
Measurements (means)	
Head length	30–34 (32)
Body depth	22–25 (23)
Second body depth	21–26 (23)
Body width at pectoral fin base	11–15 (13)
Snout length	5–7 (6)
Dermal eye opening	3–5 (4)
Orbit diameter	4–6 (5)
Interorbital width	7–9 (8)
Postorbital length	21–23 (22)
Upper jaw length	14–15 (15)
Pre-1st dorsal fin length	35–37 (36)
Pre-2nd dorsal fin length	58–63 (61)
Pre-anal fin length	64–69 (67)
First dorsal fin origin to anal fin origin	38–43 (40)
Pelvic fin base to anal fin base	28–33 (31)
Second dorsal fin base length	15–18 (17)
Anal fin base length	13–16 (14)
Longest pectoral fin length (3rd or 4th)	19–22 (21)
Longest pectoral filament length (5th)	28–45 (37)
Pectoral fin base length	8–10 (8)
Longest pelvic fin ray length (1st)	13–16 (14)
Longest 1st dorsal fin spine length (3rd)	17–19 (18)
Second dorsal fin spine length	7–10 (9)
Longest 2nd dorsal fin ray length (2nd)	18–21 (19)
Longest anal fin spine length (3rd)	7–11 (9)
Longest anal fin ray length (2nd)	15–19 (17)
Caudal peduncle length	21–25 (23)
Caudal peduncle depth	10–12 (11)
Upper caudal fin lobe length <sup>a</sup>	39–71 (58)
Lower caudal fin lobe length <sup>a</sup>	36–78 (60)

<sup>a</sup> Includes broken caudal fin lobes

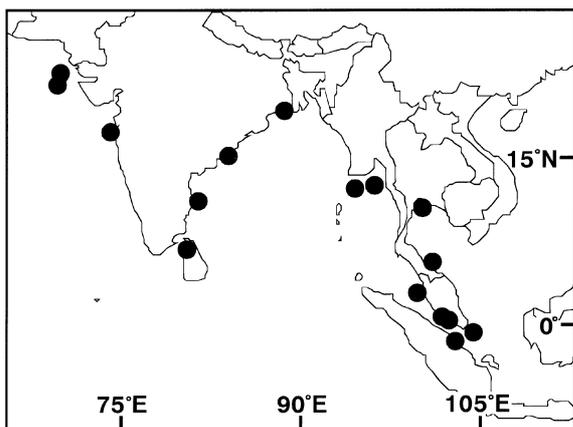
tion of supraneural bones, anterior neural spines and anterior dorsal fin pterygiophores /0/0+2/1+1/1/1/1+1/; vertebrae 10 + 14; six epipleural ribs.

**Fresh color notes.**—Based on color transparencies of MUFS 16846, 262 mm SL (Chennai, India) and MUFS 17010, 215 mm SL (Singapore): head and upper sides of trunk tinged slightly blackish-brown, becoming deep black on lower sides; snout and abdominal regions blackish; membranes of first and second dorsal fins and caudal fin blackish, distal part of these fins black; pectoral fin membrane deep black; origin of pectoral filaments

dusky-yellowish, grading to blackish posteriorly; pelvic fin origin dusky-yellowish, other parts dusky-white.

**Color of preserved specimens.**—Origin of pectoral filaments and pelvic fin white; other body colors lighter than in fresh specimens.

**Distribution.** *Leptomelanosoma indicum* is widely distributed in the Indo-West Pacific, being currently known from South Africa (Smith, 1949, 1986), Mozambique, Madagascar, Mauritius, western India, and Sri Lanka (Menon and Babu Rao, 1984), and eastern India, Bangladesh, Myanmar, Thailand, Malaysia,



**Fig. 6.** Localities of specimens of *Leptomelosoma indicum* examined in this study

Singapore, Indonesia, southern New Guinea, and northern Australia (Menon, 1974). Localities of specimens of the species examined in this study are indicated in Fig. 6.

**Ecological note.** Collection sites of the specimens examined indicated that the species occurs in coastal waters and estuaries, being similar habitats to those occupied by other polynemids. Underwater observations (at Underwater World Aquarium, Singapore) of *Leptomelosoma indicum* indicated that the species usually spread the pectoral filaments, but may also remain motionless on the substrata. Observations (by the authors) were of a specimen in a dimly lit artificial cave.

**Remarks.** *Leptomelosoma indicum* (Shaw, 1804) can be easily distinguished from other polynemid species by the combination of five pectoral filaments, long caudal fin lobes and a grayish-black body. *Polynemus indicus*, the oldest available name for a polynemid species having the above characters, was proposed by Shaw (1804), for the “Maga Booshee” of Russell (1803), whose description of the species included a correct figure (Fig. 5A) but lacked a formal scientific name and gave no indication of any type specimens. Although the description of *P. indicus* by Shaw (1804) and that earlier by Russell (1803) were very poor, Russell’s drawing clearly indicates five pectoral filaments, long caudal fin lobes and a grayish-black body.

Subsequently, Hamilton (1822) described *Polynemus sele* as a new species from estuaries of the Ganges River, India. This description also gave no indication of any type specimens. In fact, the present whereabouts of all of Hamilton’s (1822) types, including the holotype of *P. sele*, are unknown; they are not held in BMNH and related British and Indian museums (Hora, 1929; A.-M. Hine, personal communication). However, the diagnostic characters of five pectoral filaments and long caudal fin lobes given in the original description of *P. sele* are consistent with those of *L. indicum* (Shaw, 1804). An initial unpub-

lished plate of *P. sele* Hamilton, 1822, subsequently published by McClelland (1843, pl. 6), also shows five pectoral filaments, long caudal fin lobes and a grayish-black body. Furthermore, Hamilton (1822) wrote “The Maga booshee [= *P. indicus* Shaw, 1804] of Russell has certainly a strong resemblance to the Sele [= *P. sele*] of the Ganges.” Although *P. sele* was said to differ from the “Maga Booshee” of Russell (1803) in having seven first dorsal fin spines (vs eight spines in the latter) and 14 second dorsal fin rays (vs 15 rays), the first spine of the first dorsal fin was apparently overlooked by Hamilton (1822) because of its very small size.

Cuvier in Cuvier and Valenciennes (1829) described *Polynemus uronemus*, being a new name for *P. indicus* Shaw, 1804. Furthermore, McClelland (1843) described *P. gelatinosus*, from Bengal, India, being a new name for *P. sele* Hamilton, 1822, at that time including Hamilton’s (1822) unpublished plate. Both new names, *P. uronemus* and *P. gelatinosus*, have no standing in nomenclature because the names do not have taxonomic priority.

Bleeker (1868, 1983) and Fowler (1905) assigned *Polynemus indicus* to *Trichidion* (Klein), published in 1749. Being a pre-Linnaean name, however, it has no standing in nomenclature. Although Walbaum, in 1792, republished Klein’s *Trichidion*, the International Commission on Zoological Nomenclature (ICZN, Opinion 21) declared the reprinted names of Klein to be unavailable under the Code (Myers, 1936).

**Comparative material examined.** An asterisk indicates that the specimens were dissected. All specimens were X-rayed, except for *Filimanus heptadactyla*, NTM S. 14784–007, *F. sealei*, AMS IB. 1462–1463, *Galeoides decadactylus*, ZMB 569, and *Polydactylus sextarius*, ZMB 565. *Eleutheronema tetradactylum*: FRLM 23412, 228 mm SL; MUFS \*14465, 14484, 2 specimens, 164–167 mm SL; MUFS \*14479, 227 mm SL; MUFS 14997, 213 mm SL; SFU 3837, 194 mm SL; URM-P 10904, 153 mm SL. *Filimanus heptadactyla*: NTM S. 14784–007, 2 specimens, 112–113 mm SL. *F. perplexa*: PMBC 5913, 111 mm SL. *F. sealei*: AMS IB. 1462–1463, 2 specimens, 130–147 mm SL; USNM 57844 (holotype of *Polydactylus opercularis* Seale & Bean, 1907), 123 mm SL. *F. similis*: URM-P 12605, \*12611, 12639, 3 specimens, 104–115 mm SL. *F. xanthonema*: FRLM 15716, 62 mm SL. *Galeoides decadactylus*: CAS 98606, 126 mm SL; USNM \*348379, 2 specimens, 108–110 mm SL; ZMB 569 (holotype of *Polynemus decadactylus*), 175 mm SL. *Parapolynemus verekeri*: AMS I. 2770 and I. 2771 (lectotype and paralectotype), 2 specimens, 54–72 mm SL; MUFS \*18281, 75 mm SL; MUFS 18282–18286, 5 specimens, 63–92 mm SL; NTM S. 14487–005, 10 specimens, 61–82 mm SL. *Pentanemus quinquarius*: CAS \*50055, 2 specimens, 135–143 mm SL; ISH 1089–1964 at ZMH, 137 mm SL; ISH 1275–1964 at ZMH, 131 mm SL; ISH 130–1977 at ZMH, 136 mm SL; ISH 1493–1964 at ZMH, 2 specimens, 107–137 mm SL; ISH 158–1962 at ZMH, 7 specimens, 86–170 mm SL; ISH 159–1962 at ZMH, 123 mm SL; ISH 177–1963 at ZMH, 2 specimens, 142–167 mm SL; ISH 307–1959 at ZMH, 2 specimens, 108–184 mm SL; USNM 348378, 2 specimens, 94–110 mm SL.

- Polydactylus approximans*: USNM 65621, 153 mm SL. *P. macrochir*: QM I. \*25090, 580 mm SL. *P. microstomus*: MUFS 14159, 154 mm SL. *P. multiradiatus*: FRLM 23414–23417, 4 specimens, 130–144 mm SL; FRLM 23471–23474, 4 specimens, 136–168 mm SL. *P. nigripinnis*: FRLM 21472, 139 mm SL; FRLM 23413, 161 mm SL. *P. octonemus*: USNM 739 (syntypes), 2 specimens, 62–79 mm SL; USNM 155666, 130 mm SL. *P. oligodon*: NSMT-P 54096–54107, 11 specimens, 104–174 mm SL; USNM \*300465, 122 mm SL. *P. opercularis*: USNM 41054, 184 mm SL; USNM 119740, 138 mm SL. *P. plebeius*: FRLM 1624, 178 mm SL; MUFS \*14124, \*14298, 2 specimens, 165–175 mm SL; SFU 3832, 171 mm SL; URM-P 24672, 132 mm SL; YCM-P 25293, 3 specimens, 103–150 mm SL. *P. quadrifilis*: ISH 298–1959 at ZMH, 214 mm SL. *P. sexfilis*: URM-P 36431–36433, 3 specimens, 62–72 mm SL. *P. sextarius*: MUFS \*14486, 131 mm SL; MUFS 15628–15630, 3 specimens, 128–145 mm SL; ZMB 565 (holotype of *Polynemus sextarius*), 125 mm SL. *P. virginicus*: CAS \*104888, 2 specimens, 92–105 mm SL; USNM 133675, 225 mm SL. *Polynemus dubius*: URM-P 13930, 138 mm SL. *P. hornadayi*: USNM 100632 (holotype), 193 mm SL. *P. melanochir*: FSU 21007–21008, 2 specimens, 116–137 mm SL; URM-P 29087, 147 mm SL. *P. multifilis*: NSMT-P 54112, 145 mm SL. *P. paradiseus*: BSKU \*21200, 139 mm SL; NSMT-P 21776, 132 mm SL; URM-P 10847, 165 mm SL.
- Acknowledgments** We express our sincere thanks to S. Kimura (FRLM) and T. Yoshino (URM) for critical reading of early version of the manuscript and for providing advice, information and specimens for our study. We greatly appreciate the following persons and institutions for specimen loans: W.G. Saul (ANSP); Y. Machida and K. Sasaki (BSKU); W.N. Eschmeyer and T. Iwamoto (CAS); H. Ida (FSKU); K. Matsuura and G. Shinohara (NSMT); H.K. Larson (NTM); S. Bussarawit and U. Satapoomin (PMBC); H.-L. Wu (SFU); D.W. Nelson (UMMZ); J. Finan, S.L. Jewett, G.D. Johnson, L. Palmer, S.J. Raredon and J.T. Williams (USNM); M. Hayashi (YCM); H. Wilkens (ZMH). We are most grateful to M. McGrouther (AMS) for a loan of the lectotype and paralectotype of *Parapolynemus verekeri*, A.-M. Hine (BMNH) for information on the type of *Polynemus sele*, S.L. Jewett, L. Palmer and J.T. Williams (USNM) for opportunities to examine the syntypes of *P. octonemus*, the holotype of *Polydactylus opercularis* Seale & Bean and the holotype of *Polynemus hornadayi*, and H.-J. Paepke (ZMB) for his provision of type data and photographs of *P. decadactylus* and *P. sextarius*. We thank V. Lhek Nim and P. Pholpunthin (Faculty of Science, Prince of Songkhla University, Thailand), M.N. Venugopal and A. Chakraborty (Department of Fishery Biology, College of Fisheries, India), and A. Choochern (Bangkok, Thailand) for their assistance in field work at various times. Lastly, we thank Y. Motomura (Miyazaki, Japan) for her assistance and G.S. Hardy (Thames, New Zealand), who read the initial manuscript and offered helpful comments. This study was supported in part by grants awarded to the first author by the Fujiwara Natural History Foundation (Tokyo, Japan), the Sasakawa Scientific Research Grant from the Japan Science Society (Tokyo, Japan) and the Ito Foundation for the Advancement of Ichthyology (Tokyo, Japan).
- Literature Cited**
- Ahlstrom EH, Butler JL, Sumida BY (1976) Pelagic stromateoid fishes (Pisces, Perciformes) of the eastern Pacific: kinds, distributions, and early life histories and observations on five of these from the Northwest Atlantic. *Bull Mar Sci* 26:285–402
- Bleeker P (1849) Bijdrage tot de kennis der Percoiden van den Malayo-Molukschen Archipel met beschrijving van 22 nieuwe soorten. *Verh Batav Gen* 22:1–64
- Bleeker P (1854) *Specierum piscium javanensium novarum vel minus cognitarum diagnoses adumbratae*. *Nat Tijdschr Ned-Indië* 7:415–448
- Bleeker P (1862) Notice ichthyologique (I–X). *Versl Akad Amsterdam* 14:123–141
- Bleeker P (1868) Sixième notice sur la faune ichthyologique de l'île de Bintang. *Versl Akad Amsterdam Ser 2* 2:289–294
- Bleeker P (1983) *Atlas ichthyologique des Indes Orientales Néerlandaises*. Plates for planned tomes 11–14. Smithsonian Institution Press, Washington, DC, 22 pp, 143 pls
- Cantor TE (1849) *Catalogue of Malayan fishes*. *J Asiatic Soc Bengal* 18:xii + 981–1443, 14 pls
- Cuvier G, Valenciennes A (1829) *Histoire naturelle des poissons*, vol 3. Levrault, Paris, xxviii + 500 pp, pls 41–71
- Day F (1876) *The fishes of India, being a natural history of the fishes known to inhabit the seas and fresh waters of India, Burma, and Ceylon*. Part 2. William Dawson & Sons, London, pp 169–368, pls 41–78
- Feltes RM (1991) Revision of the polynemid fish genus *Filimanus*, with the description of two new species. *Copeia* 1991:302–322
- Feltes RM (1993) *Parapolynemus*, a new genus for the polynemid fish previously known as *Polynemus verekeri*. *Copeia* 1993:207–215
- Fowler HW (1905) Some fishes from Borneo. *Proc Acad Nat Sci Phila* 57:455–523
- Grove JS, Lavenberg RJ (1997) *The fishes of the Galápagos Islands*. Stanford University Press, Stanford, xlv + 863 pp
- Günther A (1860) *Catalogue of the acanthopterygian fishes in the collection of the British Museum (Natural History)*, vol 2. Squamipinnes, Cirrhitidae, Triglidae, Trachinidae, Sciaenidae, Polynemidae, Sphyrænidae, Trichiuridae, Scombridae, Carangidae, Xiphiidae. *British Museum, London*, xxi + 548 pp
- Hamilton F (1822) *An account of the fishes found in the River Ganges and its branches*. Archibald Constable and Company, London, xii + 405 pp
- Heemstra PC, Randall JE (1993) *FAO species catalogue, vol 16. Groupers of the world*. An annotated and illustrated catalogue of the grouper, rockcod, hind, coral grouper and lyretail species known to date. *FAO Fish Synop* no 125, vol 16, Rome, 382 pp, 31 pls
- Hora SL (1929) An aid to the study of Hamilton Buchanan's "Gangetic Fishes." *Mem Indian Mus* 9:169–192, pls 13–23
- Hubbs CL, Lagler KF (1947) *Fishes of the Great Lakes region*. *Bull Cranbrook Inst Sci* 26:i–xi + 1–213, 44 pls
- Jayaram KC (1981) *The freshwater fishes of India, Pakistan, Bangladesh, Burma and Sri Lanka—a handbook*. *Zoological Survey of India, Calcutta*, xxii + 475 pp, 13 pls
- Kagwade PV (1970) *The polynemid fishes of India*. *Bull Centr Mar Fish Res Inst* 18:1–69
- Lacepède BGE (1803) *Histoire naturelle des poissons*, vol 5. Plassan, Paris, lxxviii + 803 pp, 21 pls
- Leviton AE, Gibbs RH Jr, Heal E, Dawson CE (1985) *Standards in herpetology and ichthyology: part I*. Standard

- symbolic codes for institutional resource collections in herpetology and ichthyology. *Copeia* 1985:802–832
- Linnaeus C (1758) *Systema naturae*, 10th edn, vol 1. Laurentii Salvii, Holmiae, 824 pp
- Mabee PM (1988) Supraneural and predorsal bones in fishes: development and homologies. *Copeia* 1988:827–838
- Mansor MI, Kohno H, Ida H, Nakamura HT, Aznan Z, Abdullah S (1998) Field guide to important commercial marine fishes of the South China Sea. SEAFDEC MFRDMD/SP/2, Kuala Terengganu, xiii + 287 pp 121 pls
- Marathe VB, Bal DV (1958) A brief comparative account of the axial skeleton of six polynemids from Bombay waters. *J Univ Bombay* 26:139–151
- Marshall TC (1964) *Fishes of the Great Barrier Reef and coastal waters of Queensland*. Angus and Robertson, Sydney, xvi + 566 pp, 72 color pls, 64 black and white pls
- McClelland J (1843) On East Indian Isinglass, its introduction to, and manufacture for, the European market. *J Nat Hist Calcutta* 3:157–188
- McKay RJ (1992) *FAO species catalogue*, vol 14. Sillaginid fishes of the world (Family Sillaginidae). An annotated and illustrated catalogue of the sillago, smelt or Indo-Pacific whiting species known to date. FAO, Rome, vi + 87 pp
- Menon AGK (1974) Polynemidae. In: Fischer W, Whitehead PJP (eds) *FAO species identification sheets for fishery purposes—eastern Indian Ocean and Western Central Pacific*. Fishing area 57 and 71, vol 3. FAO, Rome, pp 1–2, “POLYN Eleu 1” to “POLYN Poly 5.”
- Menon AGK, Babu Rao M (1984) Polynemidae. In: Fischer W, Bianchi G (eds) *FAO species identification sheets for fishery purposes—western Indian Ocean*. Fishing Area 51, vol 3. FAO, Rome, pp 1–2 + “POLYN Eleu 1” to “POLYN Poly 7.”
- Munro ISR (1955) *The marine and freshwater fishes of Ceylon*. Dept External Affairs, Halstead Press, Canberra and Sydney, xvi + 351 pp, 56 pls
- Munro ISR (1967) *The fishes of New Guinea*. Dept. Agric Stock and Fish, Port Moresby, xxxvii + 650 pp, 78 pls
- Myers GS (1936) A new polynemid fish collected in the Sadong River, Sarawak by Dr. William T. Hornaday. *J Wash Acad Sci* 26:376–382
- Nelson JS (1994) *Fishes of the world*, 3rd edn. Wiley, New York
- Rojo AJ (1991) *Dictionary of evolutionary fish osteology*. CRC Press, Boca Raton
- Russell P (1803) *Descriptions and figures of two hundred fishes; collected at Vizagapatam on the coast of Coromandel*, vol 2. W. Bulmer & Co., London, 85 + iv pp, 108 pls
- Sasaki K (1989) Phylogeny of the family Sciaenidae, with notes on its zoogeography (Teleostei, Perciformes). *Mem Fac Fish Hokkaido Univ* 36:1–137
- Shaw G (1804) *General zoology or systematic natural history*, vol 5. G. Kearsley, London, 250 pp
- Smith JLB (1949) *The sea fishes of southern Africa*. Central News Agency Ltd, Cape Town, xvi + 550 pp, 105 pls
- Smith MM (1986) Polynemidae. In: Smith MM, Heemstra PC (eds) *Smiths’ sea fishes*. Macmillan South Africa, Johannesburg, pp 720–721
- Talwar PK, Jhingran AG (1992) *Inland fishes of India and adjacent countries*, vol 2. A. A. Balkema, Rotterdam, pp 543–1097
- Weber M, de Beaufort LF (1922) *The fishes of the Indo-Australian Archipelago*, vol 4. Heteromi, Solenichthyes, Syentognathi, Percosoces, Labyrinthici, Microcyprini EJ Brill, Leiden, xiii + 410 pp