

2. SYSTEMATIC CATALOGUE

2.1 Diagnostic Features of the Family Polynemidae

FAO Names: **En** - Threadfins; **Fr** - Barbures; **Sp** - Barbudos.

Diagnostic Features: Body elongate to moderately deep, compressed. Snout obtusely conical, overhanging. Adipose eyelid (firm transparent gelatinous tissue) covering eye; 5 infraorbitals (3 in *Parapolynemus*). Mouth ventral, near-horizontal and large; lip on upper jaw absent or poorly developed; maxilla extending beyond level of posterior margin of eye; supramaxilla absent; teeth villiform in broad bands on jaws, vomer, palatines and ectopterygoids (vomerine teeth absent in some species); canine, molariform or incisiform teeth absent. Posterior margin of preopercle serrated (without serrations in *Parapolynemus* and *Pentanemus*); 7 branchiostegal rays, 1 ray present on epiphyal. Two well-separated dorsal fins; first dorsal fin with VIII spines (VII spines in 2 *Polynemus* species); second dorsal fin with I spine and 11 to 18 soft rays; anal fin with III spines and 10 to 18 soft rays (II spines in 2 *Polynemus* species and 24 to 30 soft rays in *Pentanemus*; the last dorsal- and anal-fin soft rays usually split to their base but counted as a single ray); pectoral fins divided into an upper part with 12 to 19 rays joined by membrane and a lower part with 3 to 11 separate rays (pectoral filaments) (14 to 16 separate rays in 1 *Polynemus* species); pelvic fin with I spine and 5 soft rays; scaly process (axillary scale) present at base of pelvic fin; caudal fin deeply forked; small scales covering most of dorsal, pectoral, anal and caudal fins; trisegmental pterygiophores absent. Scales weakly ctenoid, extending onto head; lateral line simple, extending from upper end of gill opening to posterior margin of caudal-fin membrane (lateral line bifurcating on caudal-fin base in 5 *Polydactylus* species and divided into 3 on caudal-fin base and membrane in 2 *Eleutheronema* species). Vertebrae 10 precaudal and 14 caudal (15 caudal in *Eleutheronema* and *Polynemus*); supraneural bones 0 to 3.

The family Polynemidae, as here constituted, comprises 8 genera: *Eleutheronema*, *Filimanus*, *Galeoides*, *Leptomelanosoma*, *Parapolynemus*, *Pentanemus*, *Polydactylus* and *Polynemus*.

2.2 Notes on the Identification of Polynemids

Because of the similarities in morphology and colour pattern of many polynemid species, correct identifications are often difficult. Unlike typical reef fishes, most polynemid fishes are not easily identified on the basis of live or fresh colours, although a few species have a distinct large black spot on the lateral body surface (e.g. *Polydactylus malagasyensis*, *P. mullani* and *P. sextarius*) and several dark stripes along the longitudinal scale rows above and below the lateral line (e.g. *Polydactylus bifurcus* and *P. plebeius*). Live coloration of most polynemids, except e.g. *Polydactylus plebeius* and *P. sexfilis*, has never been reported and the fresh colour of several species (e.g. *Eleutheronema tridactylum* and *P. siamensis*) is also still unknown. Although the number and length of pectoral filaments is distinctive enough for identification of a few species, most polynemids can only be identified by a combination of morphological and meristic characters, such as fin-ray scale and gill-raker counts, and proportional measurements. The keys provided in this catalogue are based as much as possible on simple morphological and meristic characters, and proportional measurements.

Fin-ray counts are usually done with a bright light shining through the fin, which is fleshy and scaly in most polynemids. Pectoral-fin counts are more easily made on the inner side of the fin. The last dorsal- and anal-fin rays are split to their base but counted as a single ray. Pored lateral-line scale counts are facilitated by lying the fish on its right side (head pointing left) and directing a bright light at a low angle to the body surface. They may be assisted by using cyanin blue solution in 70% ethyl alcohol.

2.3 Illustrated Key to the Genera of Polynemids

- 1a. Pectoral-fin insertion well below midline of body; eye diameter variable, 1.3 or less in snout length (Fig. 10) → **2**
- 1b. Pectoral-fin insertion near midline of body; eye diameter 1.3 or more in snout length (Fig. 11) → **7**

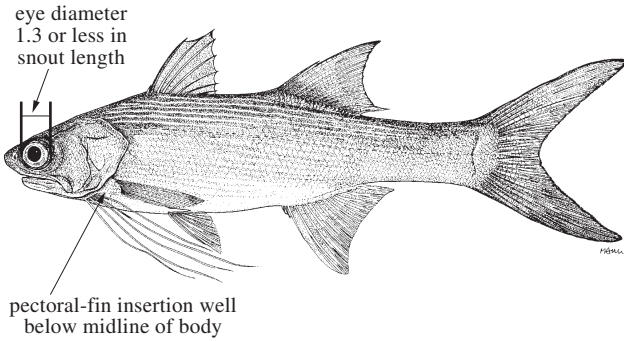


Fig. 10 *Polydactylus bifurcus*

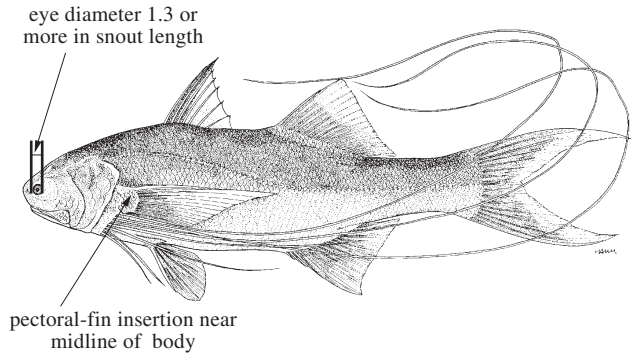


Fig. 11 *Polynemus paradiseus*

- 2a. Anterior part of lower jaw with small teeth extending onto lateral surface, adjacent portion of lip absent (Fig. 12) ***Eleutheronema***
(Persian Gulf to Japan and Australia)
- 2b. Lip present (well or poorly developed) on anterior part of lower jaw (Fig. 13) → **3**

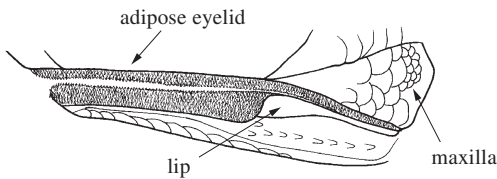


Fig. 12 Left lateral view of upper and lower jaws of *Eleutheronema tetradactylum* (after Motomura *et al.*, 2002a)

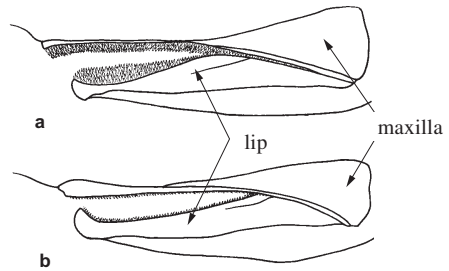


Fig. 13 Left lateral view of upper and lower jaws of a) *Leptomelosoma indicum* and b) *Polydactylus virginicus* (after Motomura and Iwatsuki, 2001a)

- 3a. Anal-fin base length greater than head length; anal-fin rays 24 to 30 (Fig. 14) ***Pentanemus***
(west coast of Africa)
- 3b. Anal-fin base length less than head length; anal-fin rays 10 to 18 (Fig. 15) → **4**

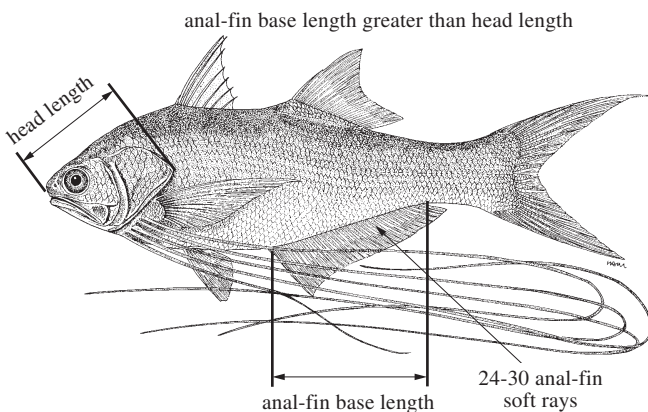


Fig. 14 *Pentanemus quinquarius*

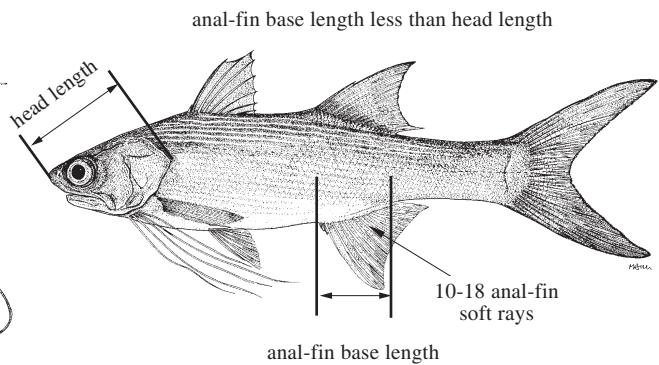


Fig. 15 *Polydactylus bifurcus*

- 4a. Pectoral-fin base length (including pectoral-filament base) greater than or equal to upper-jaw length (Fig. 16); lateral line simple, extending to lower end of upper caudal-fin lobe (Fig. 17); swimbladder present, extending beyond anal-fin origin **Galeoides**
(west coast of Africa)
- 4b. Pectoral-fin base length (including pectoral-filament base) less than upper-jaw length (Fig. 18); lateral line simple, extending to upper end of lower caudal-fin lobe or middistal margin of caudal fin, or bifurcated on caudal-fin base, extending to posterior margins of upper and lower caudal-fin lobes (Fig. 19); swimbladder absent, or if present, not extending beyond anal-fin origin → **5**

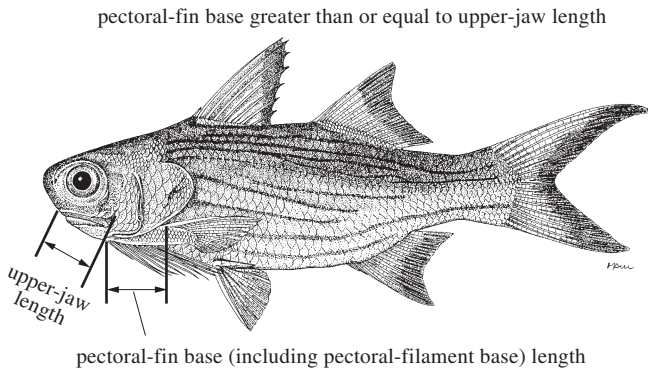


Fig. 16 *Galeoides decadactylus*

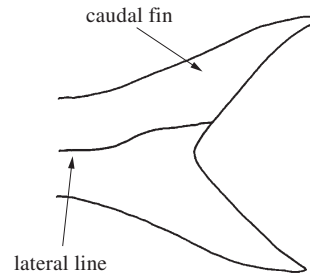


Fig. 17 Lateral-line squamation on caudal-fin membrane of *Galeoides decadactylus*

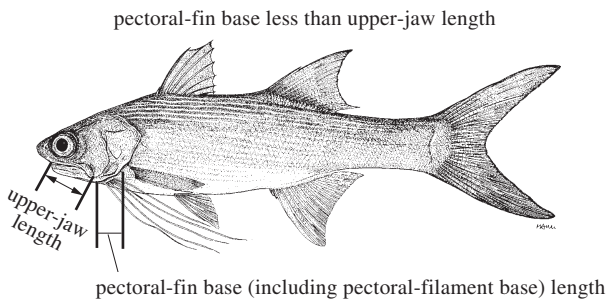


Fig. 18 *Polydactylus bifurcus*

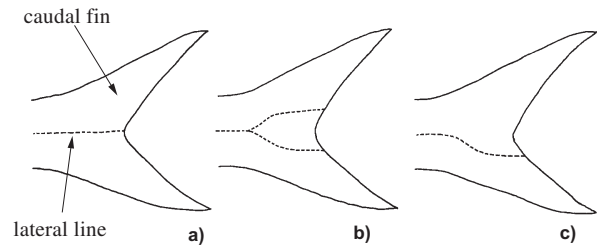


Fig. 19 Lateral-line squamation patterns on caudal-fin membrane of a) *Filimanus perplexa*, b) *Polydactylus bifurcus* and c) *Polydactylus plebeius*

- 5a. Space separating premaxillary teeth bands 2 or more times width of each band (Fig. 20); basisphenoid not in contact with prootic (Fig. 21) **Filimanus**
(Pakistan to Solomon Islands)
- 5b. Space separating premaxillary teeth bands less than width of each band (Fig. 22); basisphenoid in contact with prootic (Fig. 23) → **6**

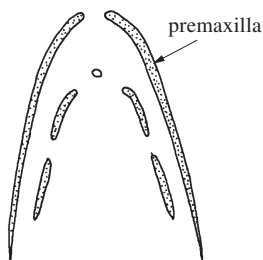


Fig. 20 Ventral view of dentition of premaxilla and roof of oral cavity of *Filimanus*

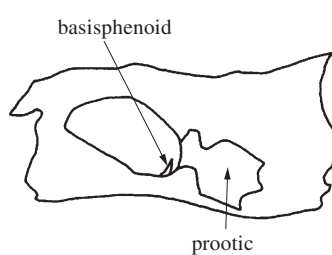


Fig. 21 Lateral view of cranium of *Filimanus* (after Feltes, 2001)

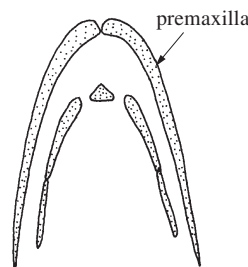


Fig. 22 Ventral view of dentition of premaxilla and roof of oral cavity of *Polydactylus virginicus*

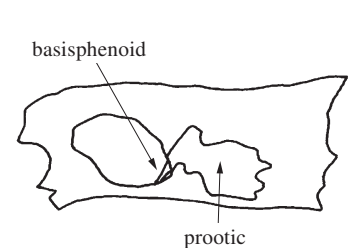


Fig. 23 Lateral view of cranium of *Polydactylus* (after Feltes, 2001)

- 6a. Tips of upper and lower caudal-fin lobes filamentous (Fig. 24); sphenotics exposed dorsally between anterior margins of parietal and pterotic (Fig. 25); swimbladder with many appendages inserted into lateral walls of abdominal cavity (Fig. 26) . . . **Leptomelanosoma** (Pakistan to Indonesia)
- 6b. Tips of upper and lower caudal-fin lobes not filamentous (Fig. 27); sphenotics not exposed dorsally (Fig. 28); swimbladder absent or present (without appendages) . . . **Polydactylus** (worldwide)

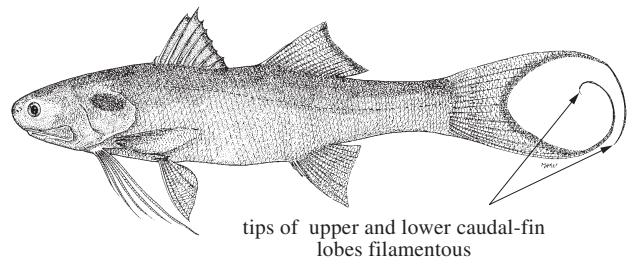


Fig. 24 *Leptomelanosoma indicum*

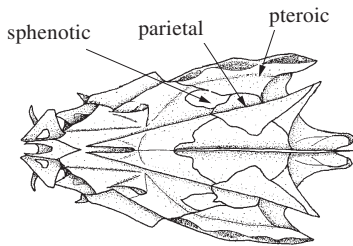


Fig. 25 Dorsal view of cranium of *Leptomelanosoma indicum*

(from Motomura and Iwatsuki, 2001a)

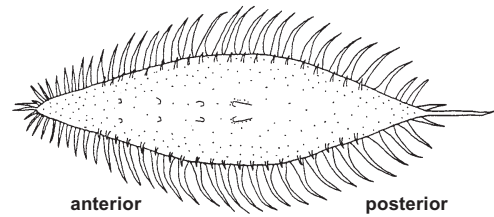


Fig. 26 Dorsal view of swimbladder of *Leptomelanosoma indicum*

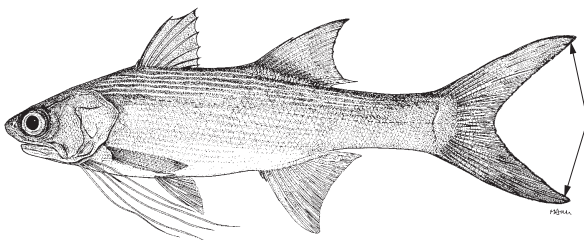


Fig. 27 *Polydactylus bifurcus*

tips of upper and lower caudal-fin lobes not filamentous

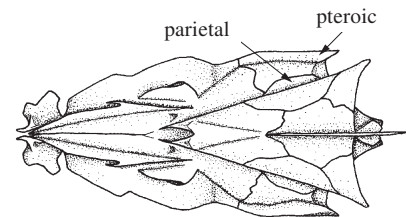


Fig. 28 Dorsal view of cranium of *Polydactylus virginicus*

(from Motomura and Iwatsuki, 2001a)

- 7a. Posterior margin of preopercle serrated (Fig. 29) . . . **Polynemus** (India to Viet Nam and Indonesia)
- 7b. Posterior margin of preopercle unserrated (Fig. 30) . . . **Parapolynemus** (southern Papua New Guinea and northern Australia)

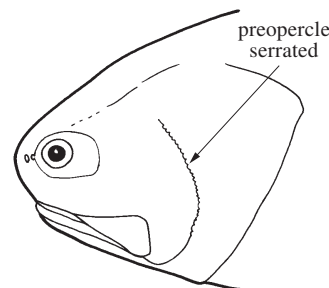


Fig. 29 Head of *Polynemus paradiseus*

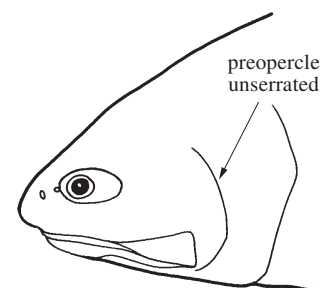


Fig. 30 Head of *Parapolynemus verekeri*