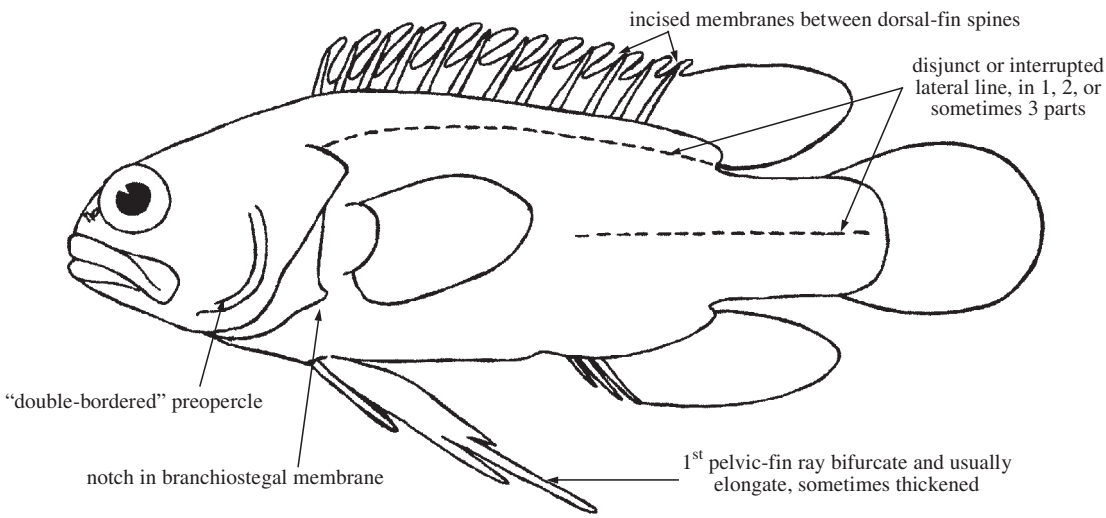
PLESIOPIDAE

Roundheads (prettyfins, longfins)

by R.D. Mooi

Diagnostic characters: Small to medium-sized fishes (3 to 30 cm total length); body elongate to oblong. Snout short. **Preopercular sensory canal open** (except in *Beliops* and *Acanthoplesiops*), **giving the preopercle a "double-bordered" appearance (not always obvious externally)**. No opercular spines. **Notch in the posterolateral margin of branchiostegal membranes just dorsal to third branchiostegal ray** (not obvious in *Calloplesiops*). A single dorsal fin with IX to XXVI spines and 2 to 11 segmented rays, **some species with deeply incised fin membranes between the spines** (not in *Assessor* or *Calloplesiops*); anal fin with III to XVI spines and 2 to 11 segmented rays; caudal fin usually rounded, sometimes elongate to lanceolate or forked; **pelvic fins with I spine and 2 or 4 segmented rays, the first ray bifurcate, often elongate and sometimes considerably thickened**; pectoral fins with 14 to 30 rays; Branchiostegal rays 6. Scales often cycloid anteriorly and ctenoid posteriorly; scales in lateral series 23 to more than 100; **lateral line disjunct and in 2 or more parts, with a more anterior dorsal lateral line running near dorsal-fin base, a posterior lateral line running midlaterally onto caudal peduncle, and occasionally a ventral lateral line as well** (except *Steeneichthys* with a single pored lateral-line scale and the remainder almost wholly replaced by scales with sensory papillae, and *Acanthoplesiops* with a single dorsal lateral line). Parasphenoid keel present; **dorsal-fin pterygiophores articulate with spines via closed bony ring** (except in some species of *Paraplesiops*); each pelvic bone with a well-developed subpelvic shelf as well as a subpelvic concavity posterior to subpelvic processes visible in ventral view; extensor proprius pelvicus muscle inserts onto second to fourth pelvic-fin rays (except in the subfamily Acanthoclininae where the muscle is absent); hypurals 1 and 2 (and sometimes parhypural) fused into autogenous plate, hypurals 3 and 4 fused to each other and to urostylar complex. **Colour:** variable, even changeable for individuals from solid or spotted body colour to barred, but usually dark background colour on body (although *Fraudella* is orange); dorsal-fin spines often with yellow or red tips.



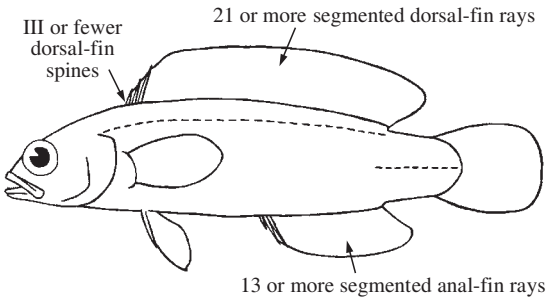
Habitat, biology, and fisheries: On coral reefs and tide pools; occur near the surface in the surf zone to a depth of 30 m, sometimes deeper. Some species mostly nocturnal, feeding on crustaceans and molluscs. Can be schooling in caves and overhangs, in loose aggregations or schools around coral heads, or mostly solitary. Eggs with hair-like filaments that either entangle with one another to form a mass or adhere eggs to a hard surface; eggs are guarded by male in a crevice or cave, or are mouthbrooded. No commercial catch, although some of the larger Australian species take baited line. Some species, particularly the comet or marine betta (*Calloplesiops*), are popular in the aquarium trade and have been successfully bred in captivity.

Remarks: Two of the listed species (*Acanthoplesiops psilogaster* and *Beliops batanensis*) have been reported just north of the area at Batan Island, Philippines, but are included because they might occur. Based on colour variation, some authors have suggested that there are 2 species of *Calloplesiops: C. altivelis* (figured here) with larger spots which do not merge into longitudinal stripes on the dorsal and anal fins, and *C. argus* with smaller spots which merge to produce longitudinal stripes on the dorsal and anal fins. These colour morphs co-occur, and an indepth study has yet to be undertaken to determine specific status; such information might be important for conservation of this popular aquarium fish.

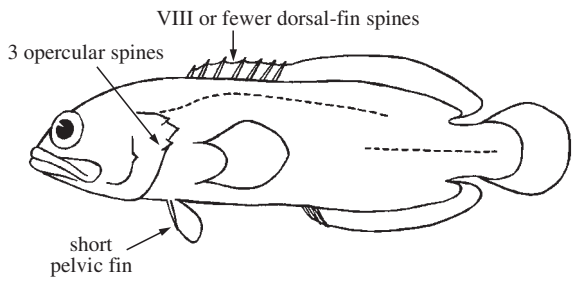
Similar families occurring in the area

Pseudochromidae: superficially similar in having a disjunct lateral line or lateral line reduced to a single anterior pored scale, some members with a reduced number of pelvic-fin rays and with pelvic fins frequently elongate. But this family is markedly different in having 3 or fewer dorsal-fin spines, and these often weak; 21 or more segmented dorsal-fin rays and 13 or more segmented anal-fin rays.

Serranidae: 3 opercular spines; lateral line complete, except some members of the tribe Grammistini (*Pseudogramma, Aporops, Suttonia*). The latter have been misidentified as Plesiopidae, but differ in having VIII or fewer dorsal-fin spines, short pelvic fins with I spine and 5 rays, 3 opercular spines, and 1 preopercular spine.



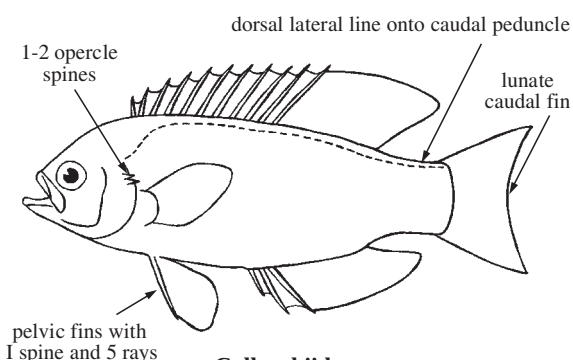
Pseudochromidae



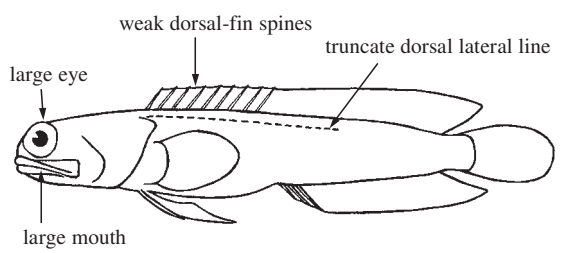
Serranidae (tribe Grammistini)

Callanthiidae: somewhat similar in having a dorsally placed lateral line which runs near base of the dorsal fin and can continue along dorsal margin of caudal peduncle, with a series of posterior midlateral scales with sensory papillae giving the appearance of a disjunct lateral line in 2 parts. Readily differentiated by pelvic fins with I spine and 5 segmented rays which are not elongate; caudal fin lunulate; 1 or 2 opercular spines; tubed lateral line short (*Grammatonotus*, 14 to 18 scales) or extending beyond dorsal-fin base onto dorsal portion of caudal peduncle (*Callanthias*).

Opistognathidae: lateral line high on body, close to dorsal-fin base and ending below middle of fin, pelvic fins with I spine and 5 segmented rays but outer 2 unbranched, hence giving appearance of 4 branched rays only. Otherwise easily distinguished from Plesiopidae by the following: head and mouth large, with maxilla extending well beyond eye, eyes relatively large and high on head, dorsal fin with weak spines.



Callanthiidae



Opistognathidae

Key to the species of Plesiopidae occurring in the area

1a. Dorsal fin with more than XV spines; anal fin with more than VI spines . . . . . → ***2***

1b. Dorsal fin with fewer than XV spines; anal fin with III spines . . . . . → ***6***

2a. Three lateral lines with tubed scales: 1 dorsal line near base of dorsal fin, 1 midlateral, and 1 ventral line near base of anal fin (Fig. 1); body pale to dark brown with a number of narrow dark bars, opercle with a dark brown ocellus, head dark brown dorsally and sharply delimited through the eye and bordered by a white stripe or merging with the pink to red cheeks and throat, dorsal and anal fins red or brown with pale tips (Fig. 1) . . . . . ***Belonepterygion fasciolatum***

2b. One or 2 lateral lines with tubed scales: 1 dorsal line near base of dorsal fin and 1 midlateral line (Fig. 2) . . . . . → ***3***

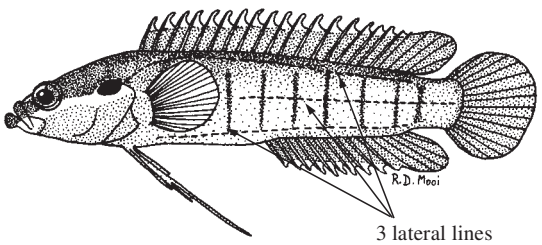


Fig. 1 ***Belonepterygion fasciolatum***

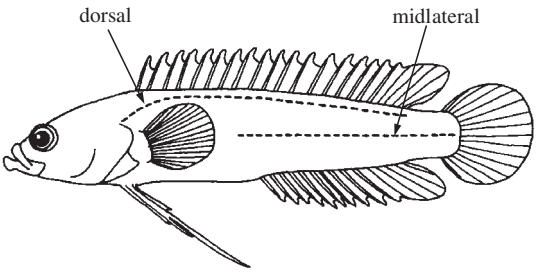


Fig. 2 possible positions of lateral line

3a. Two lateral lines with tubed scales, the dorsalmost extending from upper angle of opercle to base of last dorsal-fin ray, the midlateral line extending forward from middle of caudal-fin base to about level of anus; body scales with membranous central lobe without cteni (Fig. 3a); no pale spot on pectoral-fin base; live coloration unknown (Fig. 4) . . . . . ***Beliops batanensis***

3b. Single lateral line with tubed scales extending form upper angle of opercle to no more than half-way along dorsal-fin base; body scales without central lobe or, if present, supported by elongate cteni (Fig. 3b); pectoral-fin base with pale spot (*Acanthoplesiops*) . . . . . → ***4***

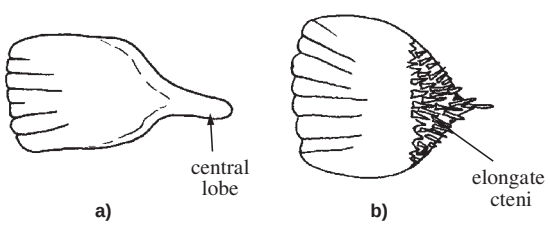


Fig. 3 body scales

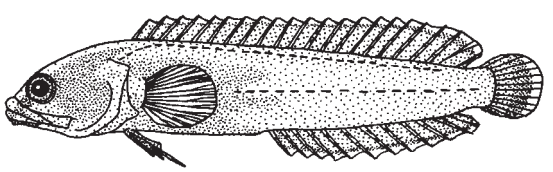


Fig. 4 ***Beliops batanensis***

4a. Dark band of about eye diameter originating on upper jaw, continuing through eye to middle of spinous dorsal fin, giving appearance of a mask; most scales on posterior half of body with a flap-like lobe supported by elongate cteni (Fig. 3b), and at least some midlateral scales bilobed; belly completely scaled; live coloration unknown (Fig. 5) . . . . . ***Acanthoplesiops echinatus***

4b. Body uniformly dark laterally, without dark stripe through eye; scales on posterior half of body typically ctenoid, without flap-like lobes; belly completely scaled or anterior two-thirds of belly unscaled . . . . . → ***5***

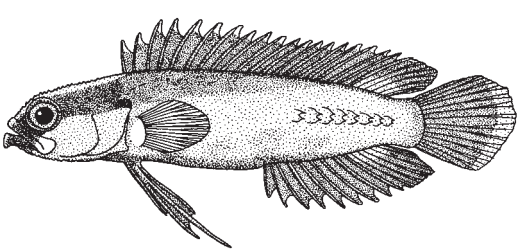
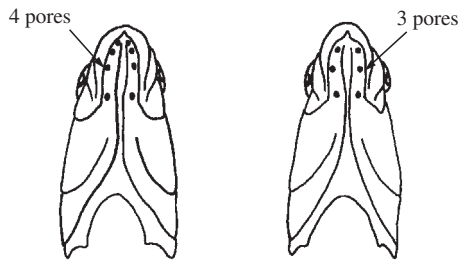


Fig. 5 ***Acanthoplesiops echinatus***

5a. Belly completely scaled; symphysis of lower jaw with terminal pair of pores (each dentary with 4 pores) (Fig. 6a); live coloration unknown (Fig. 7) . . . . . ***Acanthoplesiops hiatti***

5b. Anterior two-thirds of belly unscaled; symphysis of lower jaw without terminal pair of pores (each dentary with 3 pores) (Fig. 6b); body olive-grey, dorsal, anal, and pelvic fins olive-grey with yellow-orange tips, caudal-fin grey with yellow-orange margin; colour in ethanol similar to *Acanthoplesiops hiatti* . . . . . ***Acanthoplesiops psilogaster***



a) ***Acanthoplesiops hiatti*** **b)** ***Acanthoplesiops psilogaster***

Fig. 6 ventral view of head

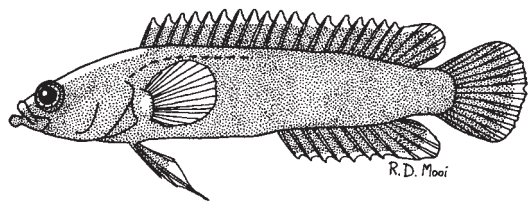


Fig. 7 ***Acanthoplesiops hiatti***

6a. Dorsal fin with IX spines; a single tubed lateral-line scale at upper end of operculum (Fig. 8) . . . . ***Steeneichthys plesiopsus***

6b. Dorsal fin with XI to XIII spines; 2 disjunct lateral lines with tubed scales, 1 from upper end of operculum to last dorsal-fin ray, the other midlateral on caudal peduncle . . . . . → ***7***

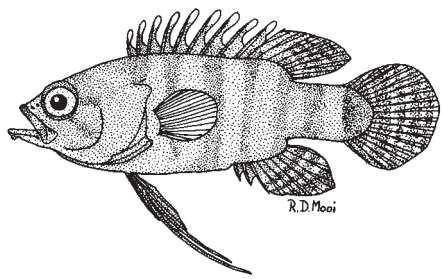


Fig. 8 ***Steeneichthys plesiopsus***

7a. Head scaled forward to, but not onto, snout; maxilla scaled; caudal fin forked; vomer toothless . . . . . (***Assessor***) → ***8***

7b. Head scaled only to occiput; maxilla unscaled; caudal fin rounded or elongate; vomer toothed . . . . . → ***9***

8a. Head, body, and all fins except pectoral fins dark blue; total gill rakers on first gill arch 33 to 36, of which 23 to 24 on lower limb (Fig. 9) . . . . . ***Assessor macneilli***

8b. Head, body, and all fins except pectoral fins bright yellow, with an orange stripe from eye to opercular angle, dorsal and anal fins with submarginal orange stripe and black margin; total gill rakers on first gill arch 23 to 27, of which 16 to 19 on lower limb (Fig. 10) . . . . ***Assessor flavissimus***

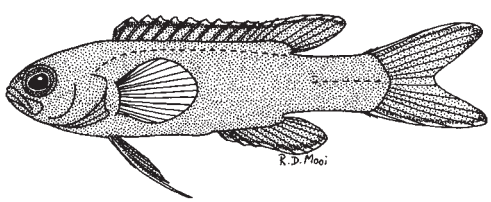


Fig. 9 ***Assessor macneilli***

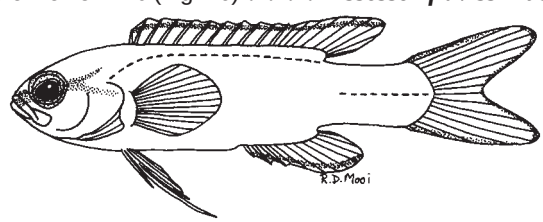


Fig. 10 ***Assessor flavissimus***

9a. Preopercular margin serrated with numerous teeth along its length; dorsal fin with XIII spines (sometimes XII); teeth on tongue; body orange (Fig. 11) . . . ***Fraudella carassiops***

9b. Preopercular margin smooth, or at most denticulate at angle (overlying skin sometimes fimbriate giving appearance of serration, but bone is smooth); dorsal fin with XII or fewer spines; tongue without teeth in all remaining genera except *Paraplesiops* . . . . . → ***10***

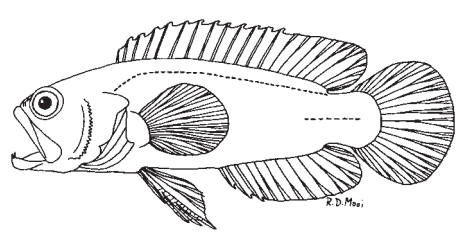


Fig. 11 ***Fraudella carassiops***

10a. Head, body, and fins (except pectoral fins) black with white spots; posterior rays of dorsal fin with black ocellus bordered by yellow; dorsal-fin membranes weakly incised; no teeth on tongue (Fig. 12) . . . . . ***Calloplesiops altivelis***

10b. Head, body, and fins often dark, but never black; posterior rays of dorsal fin never with ocellus; membranes between dorsal-fin spines deeply incised; tongue with or without teeth . . . . . → ***11***

11a. Tongue with teeth; upper lateral-line scales 28 to 40; scales with normal circulae and radiating lines in anterior field only (Fig. 13a); segmented dorsal-fin rays 9 or 10 (rarely 9) . . . . . **(*Paraplesiops*)** → ***12***
(Great Barrier Reef only)

11b. Tongue without teeth; fewer than 24 upper lateral-line scales; scales with distinctive unmarked centres and radiating lines in all fields (Fig. 13b); segmented dorsal-fin rays 7 or 8 . . . . . **(*Plesiops*)** → ***13***

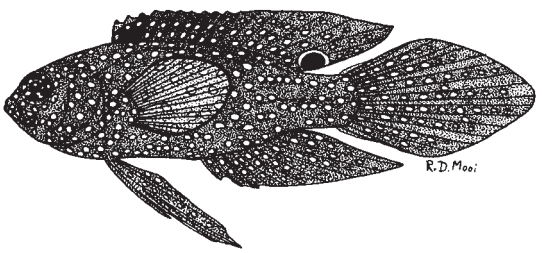


Fig. 12 ***Calloplesiops altivelis***

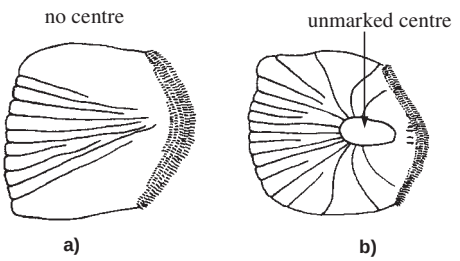


Fig. 13

12a. Body dark brown with 8 to 10 narrow black vertical bands, wider than interspaces; head with several blue spots smaller than pupil diameter on cheek and opercle, and a larger blue ocellus of pupil diameter ventrally on operculum; upper lateral line with 28 to 32 tubed scales; 7 to 12 predorsal scales (Fig. 14) . . . . . ***Paraplesiops poweri***

12b. Body with 4 broad black bands, interspace bands white; head with numerous small iridescent blue spots smaller than pupil diameter; small iridescent blue spots along bases of dorsal and anal fins; pectoral and caudal fins yellow; upper lateral line with 34 to 40 tubed scales; 20 to 29 predorsal scales (Fig. 15) . . . . . ***Paraplesiops bleekeri***

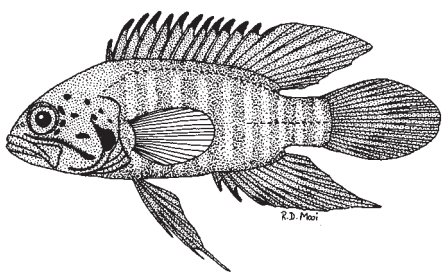


Fig. 14 ***Paralesiops poweri***

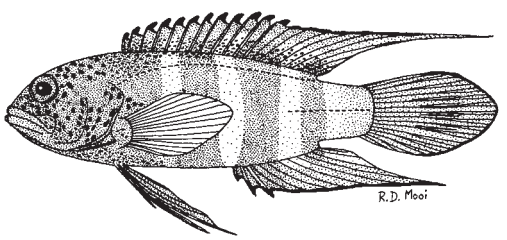


Fig. 15 ***Paralesiops bleekeri***

13a. Dark blue ocellus of slightly less than eye diameter on ventral portion of opercle; head, body, and caudal fin with small blue spots (Fig. 16) . . . . . ***Plesiops corallicola***
(throughout area except far east, New Caledonia, and Great Barrier Reef)

13b. No ocellus on opercle; occasionally pale spots scattered on head, but no spots on body or caudal fin . . . . → ***14***

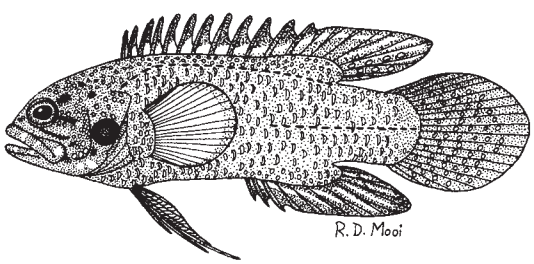


Fig. 16 ***Plesiops corallicola***

14a. Dorsal fin with XI spines (very rarely X or XII, but always only 1 supernumerary spine on first pterygiophore); total number of branches on 6 ventralmost pectoral-fin rays fewer than 15, usually 12 (very rarely more than 15) . . . . . → ***15***

14b. Dorsal fin with XII spines (very rarely XI or XIII, but always 2 supernumerary spines on first pterygiophore); total number of branches on 6 ventralmost pectoral-fin rays usually more than 15 . . . . . → ***16***

15a. Pectoral fins with 19 to 24 rays; total gill rakers on first gill arch usually 11 or 12 (sometimes 15); 6 to 8 predorsal scale rows (very rarely 5) (Fig. 17) . . . . . ***Plesiops coeruleolineatus***

15b. Pectoral fins with 26 to 28 rays; total gill rakers on first gill arch 13 to 18; 5 or 6 predorsal scale rows (usually 5) (Fig. 18) . . . . . ***Plesiops polydactylus***

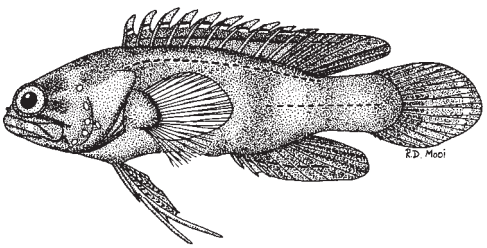


Fig. 17 ***Plesiops coeruleolineatus***

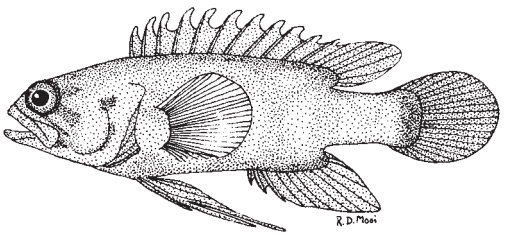


Fig. 18 ***Plesiops polydactylus***

16a. Pectoral fins with 25 to 27 rays; 4 to 6 predorsal scale rows (usually 5); dark spot at dorsal angle of opercle (Fig. 19) . . . . . ***Plesiops auritus***

16b. Pectoral fins with 24 or fewer rays (very rarely 25); 6 to 11 predorsal scale rows (infrequently 6); no dark spot at dorsal angle of opercle . . . . . → ***17***

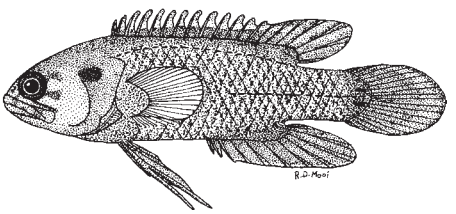


Fig. 19 ***Plesiops auritus***

17a. Three or more posterior upper lateral-line scales with anterior pore not covered by preceding scale (Fig. 20); pectoral-fin rays 17 to 19 (sometimes 20); number of dentary pores on 1 side usually fewer than 20, always fewer than 25 . . . . . → ***18***

17b. Three or fewer upper lateral-line scales with anterior pore not covered by preceding scale; pectoral-fin rays usually 20 or more (sometimes 19); usually more than 20 dentary pores on 1 side when greater than 3.5 cm standard length . . . . . → ***20***

18a. Anterior part of head densely speckled with small brown spots; sensory pores on head sparse and large, especially those of the interorbital (about 1 mm); only 5 large pores on each dentary (Fig. 21) . . . . . ***Plesiops facicavus***

18b. Anterior part of head not speckled; sensory pores relatively numerous and small, especially in the interorbital area; 6 or more dentary pores (very rarely 5) . . . . . → ***19***

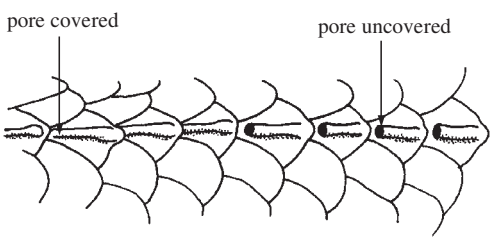


Fig. 20 lateral-line scales

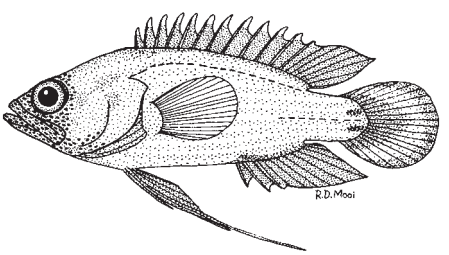


Fig. 21 ***Plesiops facicavus***

19a. Predorsal scale rows 9 to 11 (usually 10 or 11); cheek scale rows 4 or 5 (usually 5); 5 to 9 sensory pores on each dentary (rarely more than 7); anteroventral preopercular sensory pore enlarged (Figs 22a, 23) . . . . . ***Plesiops gracilis***

19b. Predorsal scale rows 6 to 8; cheek scale rows 3 or 4; 5 to 23 sensory pores on each dentary (usually more than 7); anteroventral preopercular sensory pore not enlarged (Figs 22b, 24) . . . . . ***Plesiops cephalotaenia***

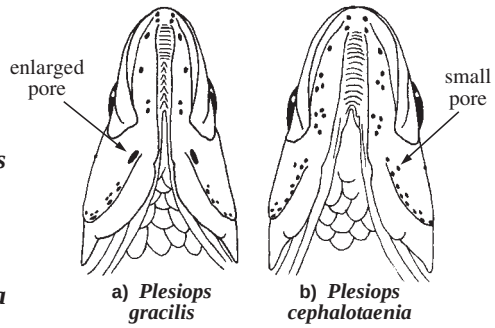


Fig. 22 ventral view of head

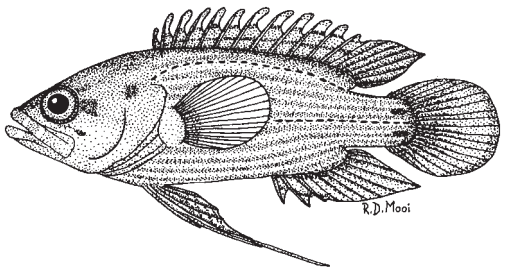


Fig. 23 ***Plesiops gracilis***

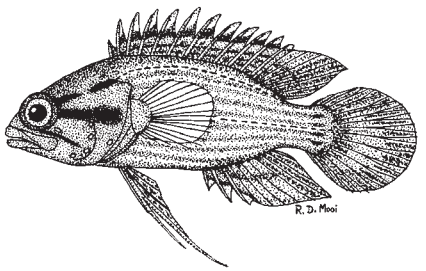


Fig. 24 ***Plesiops cephalotaenia***

20a. Nape with a mottled or dendritic pattern; body usually pale with dark spots, often congregated to form 4 to 6 bands, 4 on body and 2 on caudal peduncle (body sometimes dark); tips of dorsal-fin spines yellow; pectoral fins with 19 to 21 rays (usually 20); predorsal scale rows 8 to 11 (usually 9 or 10) (Fig. 25) . . . . . ***Plesiops oxycephalus***

20b. Nape without a mottled or dendritic pattern; body usually dark without bars; tips of dorsal-fin spines red or pale, not yellow; pectoral fins with 20 to 24 rays (rarely 19 or 25), usually 22 or more; predorsal scale rows 6 to 8 (usually 7) . . . . . → ***21***

21a. Tips of dorsal-fin spines red (except in specimens 3 cm standard length); total number of branches on ventral 6 pectoral-fin rays rarely more than 20 (usually 12); branches on ventralmost pectoral-fin ray 1 or 2 (very rarely 3) (Fig. 26) . . . . . ***Plesiops verecundus***

21b. Tips of dorsal-fin spines pale, but not red; total number of branches on ventral 6 pectoral-fin rays 20 to 35, very rarely fewer than 20; branches on ventralmost pectoral-fin ray 2 to 5 (usually 3 or 4) . . . . . → ***22***

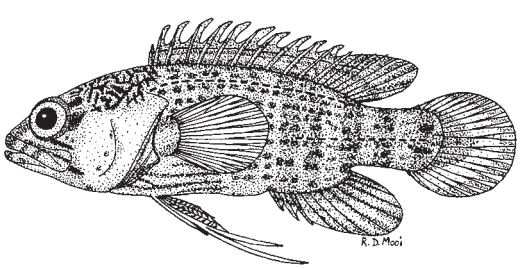


Fig. 25 ***Plesiops oxycephalus***

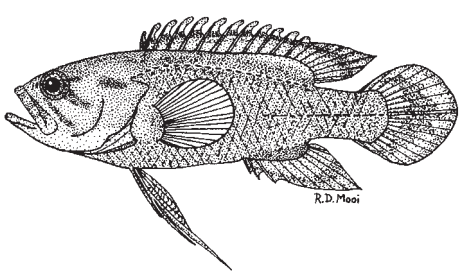


Fig. 26 ***Plesiops verecundus***

22a. Skin bearing sensory pores posterior to eye and on skin of preopercle not expanded (Fig. 27a); cheek scale rows 5 (4 to 6), visible as far anteriorly as posterior tip of maxilla; few sensory pores immediately posterior to tip of maxilla, suborbital sensory pore series not continuous with those of preopercle or dentary (Fig. 28) . . . . . ***Plesiops insularis***

22b. Skin bearing sensory pores posterior to eye and on skin of preopercle expanded, resulting in a smaller area of visible cheek scales (Fig. 27b); cheek scale row 4 (3 to 5), not visible as far anteriorly as posterior tip of maxilla; many sensory pores present immediately posterior to maxilla, resulting in a continuous preopercular, dentary, and suborbital pore series (Fig. 29) . . . . . ***Plesiops genaricus***

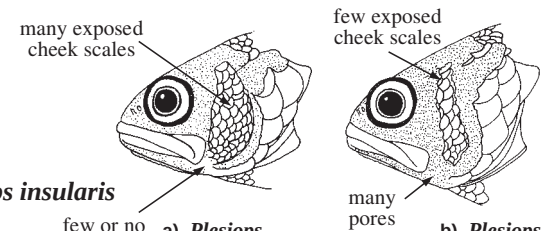


Fig. 27

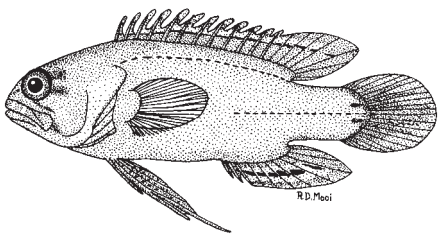


Fig. 28 ***Plesiops insularis***

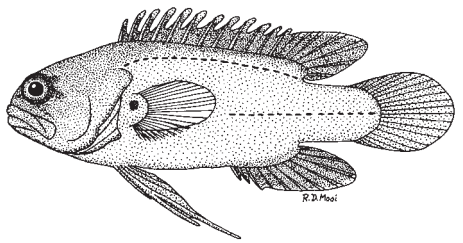


Fig. 29 ***Plesiops genaricus***

List of species occurring in the area

Acanthoplesiops echinatus Smith-Vaniz and Johnson, 1990
Acanthoplesiops hiatti Schultz, 1953
Acanthoplesiops psilogaster Hardy, 1985

Assessor flavissimus Allen and Kuiter, 1976
Assessor macneilli Whitley, 1935

Beliops batanensis Smith-Vaniz and Johnson, 1990

Belonepterygion fasciolatum (Ogilby, 1889)

Calloplesiops altivelis (Steindachner, 1903)

Fraudella carassiops Whitley, 1935

Paraplesiops bleekeri Günther, 1861
Paraplesiops poweri Ogilby, 1908

Plesiops auritus Mooi, 1996
Plesiops cephalotaenia Inger, 1955
Plesiops coeruleolineatus Rüppell, 1835
Plesiops corallicola Bleeker, 1853
Plesiops facicavus Mooi, 1996
Plesiops genaricus Mooi and Randall, 1991
Plesiops gracilis Mooi and Randall, 1991
Plesiops insularis Mooi and Randall, 1991
Plesiops oxycephalus Bleeker, 1855
Plesiops polydactylus Mooi, 1996
Plesiops verecundus Mooi, 1996

Steeneichthys plesiopsus Allen and Randall, 1985

References

Mooi, R.D. 1993. Phylogeny of the Plesiopidae (Pisces: Perciformes) with evidence for the inclusion of the Acanthoclinidae. *Bull. Mar. Sci.*, 52(1):284-326.

Mooi, R.D. 1996. Revision, phylogeny, and discussion of biology and biogeography of the fish genus *Plesiops* (Perciformes: Plesiopidae). *Roy. Ontario Mus. Life Sci. Contrib.*, (159):108 p.

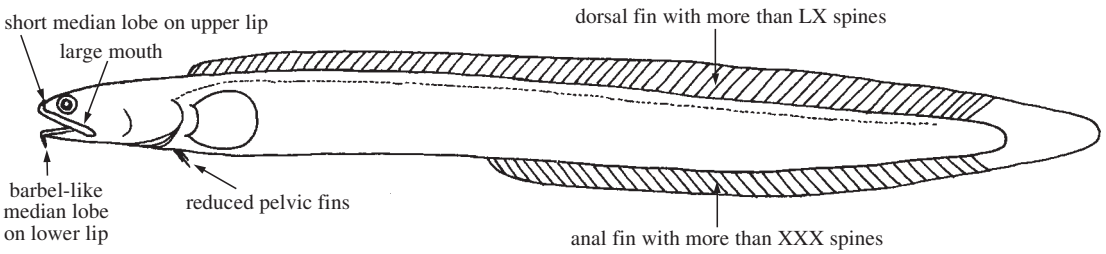
Smith-Vaniz, W. and G.D. Johnson. 1990. Two new species of Acanthoclininae (Pisces: Plesiopidae) with a synopsis and phylogeny of the subfamily. *Proc. Acad. Natl. Sci. Philadelphia*, 142:211-260.

NOTOGRAPTIDAE

Bearded eelblennies

by R.D. Mooi

Diagnostic characters: Body elongate, eel-like (to about 20 cm total length). Head somewhat flattened and long, with eye appearing to be far forward. **Mouth large, with maxilla extending well beyond posterior margin of eye**. Teeth small and conical, forming broad toothed surfaces on palatines and jaws. **Upper and lower lips complete (i.e. not interrupted at symphysis), each with a median lobe, the lower of which is elongate and barbel-like**. Branchiostegal rays 6. **Gill rakers absent**. **Dorsal, anal, and caudal fins confluent; dorsal fin with LXII to LXIX spines and 1 or 2 segmented rays; anal fin with XXXVII to XLIII spines and 1 or 2 segmented rays**; spines in dorsal and anal fins increase in stoutness posteriorly; **caudal-fin rays reduced to a single unsegmented ray dorsally and ventrally and 6 dorsal and 5 ventral segmented rays**; **pelvic fins with I spine and 2 segmented rays, usually unbranched** (often incorrectly reported as 1 branched ray). Lateral line of enlarged dermal ossicles high on body along length of dorsal fin; remaining scales very small and cycloid, deeply embedded in skin. Skeleton highly modified; median ethmoid laterally compressed and plate-like, extending anterior of vomer; most suspensorial bones horizontally elongate, with palatine extending far posteriorly beneath ectopterygoid; hyomandibula weakly associated with remainder of suspensorium; only 4 infraorbital bones; gill arches reduced, remaining bones elongate; no supraneural bones; dorsal-fin pterygiophores insert in 1:1 ratio with interneural spaces; all spine-bearing dorsal- and anal-fin pterygiophores articulate with spines via a complete, interlocking bony ring; **71 to 75 total vertebrae**; epineural ribs confined to first 3 vertebrae, pleural ribs usually confined to vertebrae 3 to 6; caudal elements reduced, parhypural and hypurals 1 and 2 fused into a single element, hypurals 3 and 4 fused to each other and to urostylar complex, there are no free uroneurals, hypural 5 absent, epurals absent, free caudal cartilages absent. Gut a simple tube. **Colour:** variable, from pale with numerous spots to dark-bodied.



Habitat, biology, and fisheries: Inshore reefs, rocky crevices, and sand-weed areas. Seldom seen. At least some species appear to specialize on alpheid shrimps. Eggs with long filaments from hook-like protuberances, a similar morphology to other reef groups that exhibit egg-guarding, suggesting that notograptids might share this behaviour. No commercial catch, and not encountered frequently enough to be important for the aquarium trade.

Remarks: There are 5 nominal species, *Notograptus gregoryi, N. guttatus, N. kauffmani, N. livingstonei,* and *Blanchardia maculata.* The latter was considered a synonym of *N. guttatus* by Ogilby, and this status will be maintained here; the family contains only a single genus, *Notograptus.* The validity of the remaining species has not been recently investigated. *N. kauffmani* is based on a small specimen that differs only in colour, and is very likely a juvenile of *N. guttatus*. Recognition of *N. livingstonei* is based on what appear to be minor colour differences from *N. guttatus. N. gregoryi* is not recorded from the area (presently known only from Western Australia), but is included in the key because accurate distribution data for these seldomly encountered fishes are not available. The family is found on the coasts of southern Papua New Guinea and northern Australia.

Similar families occurring in the area

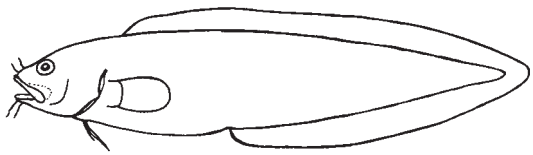
Pseudochromidae: members of the pseudochromid subfamily Congrogadinae resemble notograptids in having an elongate, eel-like body form, long dorsal and anal fins that are confluent with the caudal fin in some species, and reduced (often absent) pelvic fins. Congrogadines are easily distinguished by the 2 or fewer spines in the dorsal fin, lack of spines in the anal fin, a smaller mouth which does not reach the posterior margin of eye or extends only slightly beyond, a short, toothless palatine, and no barbel-like median lobes on the lips.

Congrogadinae

Pholidichthyidae: superficially similar to notograptids with an elongate, eel-shaped body, reduced pelvic fins, long dorsal and anal fins confluent with caudal fin. They are readily differentiated by their lack of dorsal- or anal-fin spines (segmented rays only), smaller mouth, single nostril on each side (rather than 2), presence of gill rakers, lack of palatine teeth, and no barbel-like median lobes on the lips.

Ophidiidae and Bythitidae: elongate with long dorsal and anal fins that can be confluent with the caudal fin; pelvic fins reduced and often far forward, even under chin; some species with true barbels in pairs, not associated with lips as in notograptids; dorsal and anal fins without spines; body shape less eel-like than in notograptids.

Pholidichthyidae



Ophidiidae

Blenniidae: conceivably, some elongate members of this family with long dorsal and anal fins (e.g. *Xiphasia*) could be confused with notograptids, but all differ in having II or fewer spines in the anal fin, dorsal-fin spines are usually flexible, and barbel-like median lobes on the lips absent.

Key to the species of Notograptidae occurring in the area

1a. Body a uniform chocolate brown without spots; median fins also dark except for pale margins; paired fins yellowish; head paler with cheeks and opercle with a few oblong spots (Fig. 1) . . . . . ***Notograptus gregoryi***
(Western Australia; not yet recorded from the area)

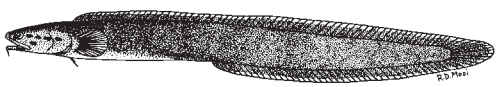


Fig. 1 ***Notograptus gregoryi***

1b. Body spotted or with wide longitudinal stripes . . . . . → ***2***

2a. Body with 2 dark wide stripes or bands on a paler background: a dorsal band extending from top of head onto dorsal fin to caudal fin, and a lateral band extending from eye gradually angling downward onto anal fin to caudal fin; head without spots, a small bar from ventral eye onto maxilla and lower lip (Fig. 2) . . . . . ***Notograptus kauffmani***

2b. Body spotted; numerous oblong spots on cheek and dorsal portion of head . . . . . → ***3***

3a. Dorsal fin without spots or with spots only on anterior membranes (Fig. 3) . . . ***Notograptus guttatus***

3b. Dorsal fin with spots over entire length . . . . . ***Notograptus livingstonei***

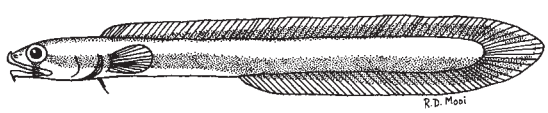


Fig. 2 ***Notograptus kauffmani***

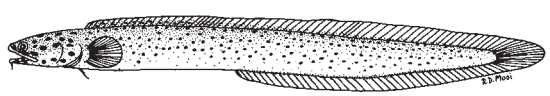


Fig. 3 ***Notograptus guttatus***

List of species occurring in the area

Notograptus guttatus Günther, 1867
Notograptus kauffmani Tyler and Smith, 1970
Notograptus livingstonei Whitley, 1931

Reference

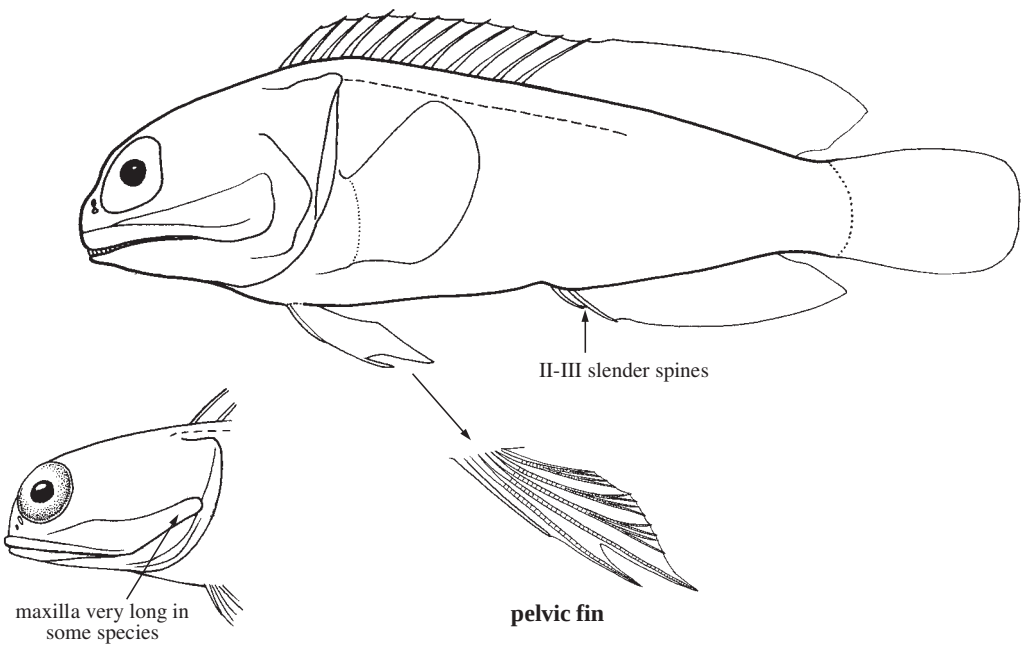
Gill, A.C. and R.D. Mooi. 1993. Monophyly of the Grammatidae and of the Notograptidae, with evidence for their phylogenetic positions among perciforms. *Bull. Mar. Sci.*, 52(1):327-350.

OPISTOGNATHIDAE

Jawfishes

by W.F. Smith-Vaniz

Diagnostic characters: Generally small, moderately elongate fishes (most under 12 cm total length, a single species to about 50 cm), **with a tapering narrow body. Head bulbous.** Eyes relatively large and high on head. **Mouth large**; in some species the maxilla extends to or well beyond posterior margin of gill flap. Moderate canine-like teeth in a single row along sides of jaws; several rows of smaller teeth may also be present anteriorly. **Dorsal fin shallowly notched (if at all) between spinous and soft portions, with IX to XII usually flexible spines** and 10 to 22 segmented rays; anal fin with II or III slender spines and 10 to 20 segmented rays; caudal fin rounded, the middle 12 to 14 rays branched in most species; **pelvic fins positioned anterior to pectoral fins**, with I spine and 5 segmented rays, the **outer 2 segmented rays unbranched and stout, the inner rays branched and weaker**. Lateral line high on body, incomplete, and usually ending below about middle of dorsal fin; **lateral-line tubes or canals usually embedded in skin**, rather than occurring on scales. Scales cycloid (smooth), usually absent from cheeks. **Colour:** most species mottled with various shades of brown; a black spot on spinous dorsal fin often present.



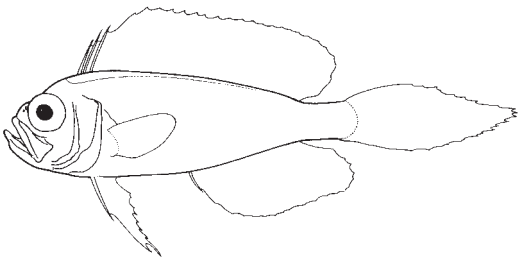
Habitat, biology, and fisheries: Most jawfishes occur in relatively shallow depths (2 to 30 m) on sandy substrates adjacent to coral reefs, but some species have been trawled in depths exceeding 200 m. Jawfishes live in burrows, which they construct themselves, and usually are found with only their heads protruding from the burrow. They normally venture from their burrows only a short distance to feed on crustaceans, zooplankton, and/or other invertebrate prey, or to defend their territories from conspecific intruders. When treatened by potential predators they nearly always back tail first into their burrows. Some species are solitary but most live in small colonies. All species are mouth brooders and their eggs, which clump together in a sticky egg ball, can be set down in the burrow by the parent during brief feeding forays; once the eggs hatch no additional care is provided. Jawfishes are not of commercial importance, although they are occasionally caught by hook-and-line fishermen, taken in trawls, or by spear fishermen. They are reported to be good to eat.

Remarks: No key to species of *Opistognathus* is given here because there are 16 undescribed species known from the area that are currently under study. These new species will be treated in a separate publication by the present author. The 12 species of *Stalix* are all small (22 to 60 mm standard length) and rare, with fewer than 35 total collections known.

Similar families occurring in the area

The arrangement of the pelvic-fin rays, consisting of I spine and 5 segmented rays (the outer 2 unbranched and stout, inner 3 branched and weak), will distinguish the jawfishes from all other families. Additional distinguishing characters of the superficially similar Cepolidae are the following:

Cepolidae (including Owstoniidae): dorsal-fin spines 0 to IV (IX to XII in Opistognathidae); caudal fin moderately to strongly lanceolate (rounded in Opistognathidae).



Cepolidae

Key to the genera of Opisthognathidae occurring in the area

1a. First 5 to 9 dorsal-fin spines transversely forked distally (posteriorly spines successively less deeply and more narrowly forked); skin covering spinous dorsal fin forming a broad dorsal hood to accommodate transversely forked spines (Fig. 1) . . . . . ***Stalix***

1b. Anterior dorsal-fin spines not transversely forked; skin covering spinous dorsal fin not forming a broad dorsal hood (Fig. 2) . . . . . ***Opistognathus***

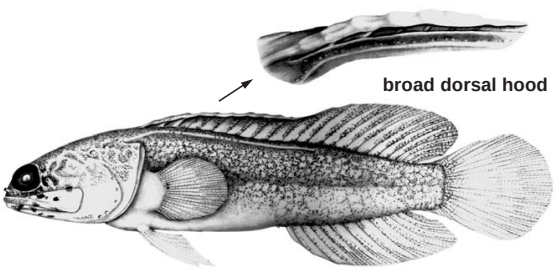


Fig. 1 ***Stalix moenensis*** (3.9 cm standard length)

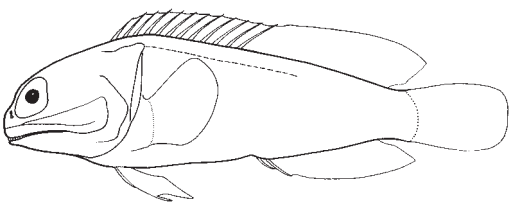


Fig. 2 ***Opistognathus***

List of species occurring in the area

Opistognathus castelnaui Bleeker, 1859
Opistognathus darwinensis Macleay, 1878
Opistognathus decorus Smith-Vaniz and Yoshino, 1972
Opistognathus dendriticus (Jordan and Richardson, 1908)
Opistognathus evermanni (Jordan and Snyder, 1902)
Opistognathus eximus (Ogilby, 1908)
Opistognathus jacksoniensis Macleay, 1881
Opistognathus latitabundus (Whitley, 1937)
Opistognathus macrolepis Peters, 1866
Opistognathus nigromarginatus Rüppell, 1830
Opistognathus papuensis Bleeker, 1868
Opistognathus reticulatus (McKay, 1969)
Opistognathus solorensis Bleeker, 1853

Stalix dicra Smith-Vaniz, 1989
Stalix eremia Smith-Vaniz, 1989
Stalix histrio Jordan and Snyder, 1902
Stalix immaculata Xu and Zhan, 1980
Stalix moenensis (Popta, 1922)
Stalix versluysi (Weber, 1913)

References

Smith-Vaniz, W.F. 1989. Revision of the jawfish genus *Stalix* (Pisces: Opistognathidae), with descriptions of four new species. *Proc. Acad. Nat. Sci. Phila.*, 141:375-407.

Smith-Vaniz, W.F. and T. Yoshino. 1985. Review of Japanese jawfishes of the genus *Opistognathus* (Opistognathidae) with description of two new species. *Japan. J. Ichthyol.*, 32(1):18-27.