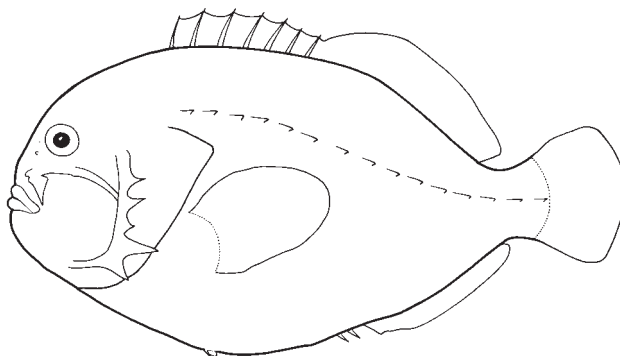


CARACANTHIDAE

Orbicular velvetfishes (coral crouchers)

by S.G Poss

Diagnostic characters: Small fishes (typically under 4 cm standard length); **body rounded, compressed, although not greatly so.** Head moderate to large, 37 to 49% of standard length. Eyes small to moderate, 8 to 12% of standard length. Snout 8 to 13% of standard length. Mouth moderate to large, upper jaw 12 to 21% of standard length. Numerous small conical teeth present on upper and lower jaws, none on vomer or palatines. **Lacrimal movable, with 2 spines, posteriormost largest directed ventrally.** All species with a narrow extension of the third infrorbital bone (second suborbital) extending backward and downward across the cheek and usually firmly bound to preopercle. No postorbital bones. Branchiostegal rays 7. **Skin over gill covers strongly fused to isthmus.** Dorsal fin with VII or VIII (rarely VI) short spines and 12 to 14 branched soft rays. Anal fin usually with II short spines, followed by 11 or 12 branched soft rays. Caudal fin rounded, never forked. Pelvic fins small, difficult to see, with I stout spine and 2 or 3 (rarely 1) rays. Pectoral fins with 14 or 15 thickened rays. **Scales absent, except for lateral line, but body densely covered with tubercles.** Lateral-line scales present; usually 11 to 19 tubed scales. All species possess extrinsic striated swimbladder musculature. Vertebrae 24. **Colour:** orbicular velvetfish are either pale pinkish white with numerous small black spots, or light brown or greenish and with orange spots or reticulations.



Habitat, biology, and fisheries: Velvetfishes live within the branches of *Acropora*, *Poecilopora*, and *Stylophora* corals, rarely venturing far from the coral head. Other than their close association with corals, little is known of their biology.

Similar families occurring in the area

Gobid fishes of the genus *Gobiodon* also occur among coral heads and are easily mistaken for caracanthids. However, these fishes lack the suborbital stay that extends back to the preopercle, the large moveable lacrimal spines, and the large preopercular spines.

Key to the species of Caracanthidae occurring in the area

- 1a. No deep notch between spinous and soft-rayed parts of dorsal fin, fin membrane relatively continuous; relatively uniformly light brown or grey, without distinct spots or mottling; lacrimal with 1 large spine and 2 small blunt spines *Caracanthus unipinna*
- 1b. A deep notch between spinous and soft-rayed parts of dorsal fin; body with either spots or with reticulate pattern dorsally; lacrimal with 1 long spine and 1 small blunt knob → 2
- 2a. Body covered with numerous black spots *Caracanthus maculatus*
- 2b. Body with reticulate pattern over dorsum *Caracanthus madagascariensis*
(Indian Ocean; not yet recorded from the area)

List of species occurring in the area

- Caracanthus maculatus* (Gray, 1831)
- Caracanthus unipinna* (Gray, 1831)

Reference

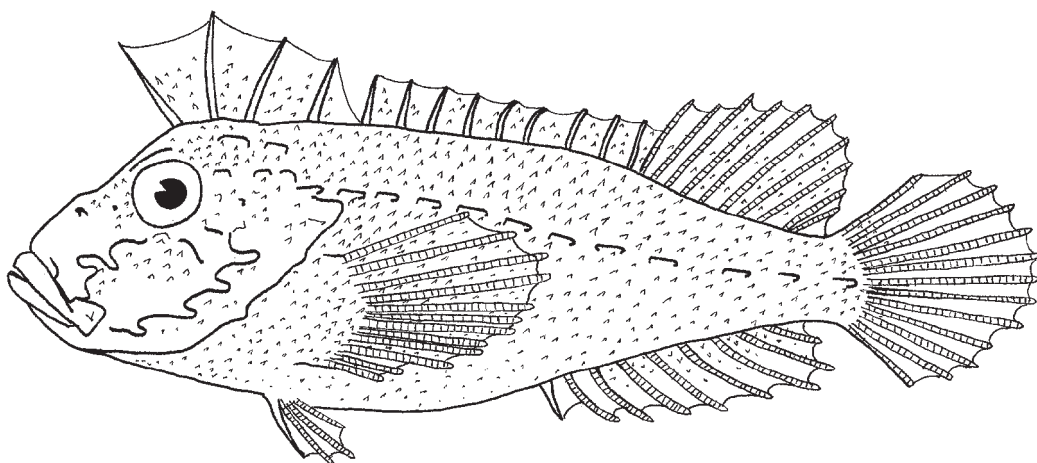
Smith, J.L.B. 1958. Fishes of the families Tetrarogidae, Caracanthidae, and Synanceiidae from the Western Indian Ocean with further notes on scorpaenid fishes. *Ichthyol. Bull. Rhodes Univ.*, 12:167-181.

APLOACTINIDAE

Velvetfishes

by S.G. Poss

Diagnostic characters: Small fishes (typically under 5 cm standard length); body usually compressed, although usually not greatly so. Head moderate to large, 26 to 42% of standard length. Eyes small to relatively large, 5 to 11% of standard length. Snout often prominent, 6 to 14% of standard length. Mouth moderate to large, upper jaw 7 to 18% of standard length. Numerous small conical teeth present on upper and lower jaws, with those on vomer usually present and those on palatine always absent. Branchiostegal rays typically 7 (rarely 6). Gill rakers usually small or moderate, 0 to 6 on upper limb of first gill arch, and 3 to 11 on lower limb (including raker at angle between upper and lower limb). **Most species with a fleshy papillae at end of isthmus**, but with skin over gill covers fused to isthmus in some species. Pseudobranch with 0 to 18 filaments. **No branched rays in fins. Dorsal fin with IX to XVI spines, usually blunt at their tip, and 7 to 16 soft rays.** Anal fin usually with 0 to 5 usually weak or blunt spines, followed by 5 to 16 soft rays. Caudal fin moderate to large (21 to 38% standard length) and rounded, never forked. Pectoral fins usually large, with 9 to 16 rays. Pelvic fins with I strong spine and 2 or 3 (rarely 1) soft rays. **Scales in most species irregular and forming highly modified tack-like structures** (some without scales, except for lateral line). Lateral-line scales present, with usually 9 to 16 tubed scales. All species with an extension of the third infraorbital bone (second suborbital) extending backward across the cheek and usually firmly bound to preopercle. **Most species with numerous, usually blunt head spines, with those on movable lacrimal, usually most prominent.** All species possess striated swimbladder musculature that is extrinsic in nearly all species, with musculature present even in those without swimbladders. Pyloric caecae 1 to 16. Vertebrae 21 to 33. **Colour:** most species strongly camouflaged and brown, reddish brown, or greenish; usually with barred or mottled colour patterns, typically darker dorsally than ventrally.



Habitat, biology, and fisheries: Velvetfishes live in or on the bottom, where they are often found under or between rocks or vegetation. Although most are taken at shallow depths, a few species in the area range into deeper waters (to 510 m). Most species are extremely well camouflaged. They are of no importance to fisheries.

Similar families occurring in the area

Scorpaenidae: have a suborbital stay but scales, if present, do not form spinous points (except in *Taenianotus*); dorsal fin originates before eye in waspfishes (tetragone scorpaenids), but in these species all spines are sharp and there is no fleshy extension on the anteriormost part of the isthmus; pelvic fins with I spine and 3 to 5 segmented rays (I spine and 2 or 3 segmented rays in Aploactinidae); caudal-fin rays always branched (except in *Coccotropsis* and *Minous*); other fins, except pectoral fins, usually with branched rays (all segmented rays unbranched in Aploactinidae); eyes on top of head or lower pectoral-fin rays detached in some species (never true of Aploactinidae).

Key to the species of Aploactinidae occurring in the area

Note: in the anticipation that they may be recorded in the future from the area, some species known from adjoining seas are included in the key, with their distribution indicated in parenthesis.

- 1a.** Gill membranes not broadly united to isthmus → **2**
- 1b.** Gill membranes broadly united to isthmus → **26**
- 2a.** No fleshy papillae at anterior end of isthmus *Eschmeyer nexis*
(incertae sedis)
- 2b.** A fleshy papillae at anterior end of isthmus → **3**
- 3a.** Frontals, parietals, and infraorbital bones heavily armored; with a wide depression in interorbit; pelvic-fin insertion well behind pectoral-fin base *Peristrominous dolosus*
- 3b.** Frontals, parietals, and infraorbital bones not heavily armored; depression in interorbit narrow or non-existent; pelvic-fin insertion anterior or just behind pectoral-fin base → **4**
- 4a.** Anus just behind pelvic fins, far forward of anal-fin origin *Prosoproctus pataecus*
- 4b.** Anus slightly before anal-fin origin → **5**
- 5a.** Three dorsal fins, scales on body form expanded spinous points; each scale forms a blade-like ridge *Neaploactis tridorsalis*
- 5b.** One or 2 dorsal fins, scales on body absent or form spinous points that are not expanded or blade-like → **6**
- 6a.** Anteriormost 3 dorsal-fin spines form small fin that originates over or immediately behind eye and is widely separated from remainder of fin → **7**
- 6b.** Dorsal fin continuous or nearly so, without small, separate fin over eye → **10**
- 7a.** Body smooth, covered with numerous elongate cirri, especially anteriorly; lacrimal weakly ossified, without spine *Sthenopus mollis*
- 7b.** Body covered with numerous scales that form spinous points; lacrimal with 2 strong sharp spines (*Xenaploactis*)
- 8a.** Interorbit with ridges nearly parallel; body depth less than 1/3 of standard length; dorsal fin with III spines, followed by IX spines and 8 or 9 soft rays (based on limited material; some variation to be expected) *Xenaploactis cautes*
- 8b.** Interorbit with ridges divergent anteriorly, convergent over middle of orbit, divergent posteriorly; body depth equal to or greater than 1/3 of standard length; dorsal fin with III spines, followed by X spines and 8 or 9 soft rays (based on limited material; some variation to be expected) → **9**
- 9a.** Second infraorbital bone with 1 or 2 spines; pore of infraorbital lateral-line canal at second infraorbital bone a simple obscure pore; body depth greater than 1/3 of standard length; no finger-like cirri above uppermost preopercular lateral-line pores; dorsal fin with III spines, followed by X spines and 9 soft rays; anal fin with I spine and 10 soft rays (based on limited material; some variation to be expected) *Xenaploactis asperrima*
- 9b.** Second infraorbital bone without spines; pore of infraorbital lateral-line canal at second infraorbital bone a prominent elongate slit; body depth equal to 1/3 of standard length; finger-like cirri present above uppermost preopercular lateral-line pores; dorsal fin with III spines, followed by X spines and 8 soft rays; anal fin with I spine and 9 soft rays (based on limited material; some variation to be expected) *Xenaploactis anopta*
- 10a.** Pelvic fins with I spine and 3 soft rays → **11**
- 10b.** Pelvic fins with I spine and 2 (1) soft rays → **19**

- 11a.** Interorbital ridges run in parallel or converge posteriorly (*Cocotropus*) → 12
- 11b.** Interorbital ridges diverge strongly posteriorly (*Paraploactis*) → 16
- 12a.** Total dorsal-fin elements 24 (i.e. XIII spines and 11 soft rays); pectoral-fin rays 11 (based on limited material; some variation to be expected); prickles on body greatly reduced and widely spaced *Cocotropus echinatus*
- 12b.** Total dorsal-fin elements less than 24 (i.e. XII to XIII spines plus 8 to 10 soft rays); pectoral-fin rays 12 to 14; prickles on body relatively large, densely covering head and body → 13
- 13a.** Upper jaw relatively short, 10 to 11% of standard length; a stubby fleshy cirrus near distal end of maxilla; anal fin with I spine and 8 or 9 soft rays *Cocotropus altipinnis*
(Lord Howe Island, Kermadec Islands; not yet recorded from the area)
- 13b.** Upper jaw relatively long, 12 to 14% of standard length; no stubby fleshy cirrus near distal end of maxilla; anal fin with II spines and 7 to 9 soft rays → 14
- 14a.** First dorsal-fin spine relatively short, 20 to 21% of standard length; second dorsal-fin spine relatively short, 19 to 20% standard length *Cocotropus dermacanthus*
- 14b.** First dorsal-fin spine relatively long, 22 to 31% of standard length; second dorsal-fin spine relatively short, 23 to 26% standard length → 15
- 15a.** Dorsal fin with XIII spines and 9 or 10 soft rays; anal fin with II spines and 8 or 9 soft rays; snout in lateral profile notably concave; numerous short dark streaks along body, particularly between lateral-line scales *Cocotropus larvatus*
- 15b.** Dorsal fin with XII spines and 9 soft rays; anal fin with II spines and 7 soft rays; snout in lateral profile notably convex; few, if any, dark streaks on body *Cocotropus masudai*
(Hatizyo Island, Izu Islands; not yet recorded from the area)
- 16a.** Ventral surface of lower jaw smooth, not covered with prickles or papillose villi; mandibular cirri almost confined to outer margin → 17
- 16b.** Ventral surface of lower jaw covered with numerous prickles or papillose villi and with cirri on both inner and outer margins → 18
- 17a.** Minute cirri on snout, those in larger patch on tip of snout across lacrimal bone about equal in size to those in smaller patch on nasal bone; fleshy pad on isthmus with its width about 1/4 to 1/3 of its length *Paraploactis trachyderma*
- 17b.** Large, fleshy, and extensively branched cirri on snout; those in larger patches on tip of snout and across lacrimal bone large, those in smaller patch on nasal bone smaller; fleshy pad on isthmus with its width about 1/2 to 3/4 of its length *Paraploactis pulvinus*
- 18a.** No fleshy pad on isthmus *Paraploactis kagoshimensis*
- 18b.** Fleshy pad present on isthmus, its width about 1/4 to 1/3 of its length *Paraploactis intonsa*
- 19a.** Dorsal fin originates over dorsal ramus of preopercle *Adventor elongatus*
- 19b.** Dorsal fin originates over or before eye → 20
- 20a.** Lacrimal with 2 sharp spines, second large and extends down over maxilla; preopercle with 4 sharp spines; pelvic fins in front of pectoral-fin base (*Erisphex*) → 24
- 20b.** Lacrimal spines, if present, blunt, never sharp; preopercle with 4 or 5 blunt spines; pelvic fins just under or just behind pectoral-fin base → 21
- 21a.** Head 28 to 38% of standard length; body elongate; dorsal fin with XIII or XIV spines and 11 to 15 soft rays; anal fin usually with I spine and 11 to 14 soft rays *Aploactis aspera*
- 21b.** Head 35 to 40% of standard length; body oblong or gibbous; dorsal fin with XII or XIII spines and 8 to 10 soft rays; anal fin with I or II spines and 8 or 9 soft rays (*Kanekonia*) → 22

- 22a.** Body gibbous; greatest body depth 37 to 40% standard length; body covered with highly modified scales each of which forms a small spinous point; interorbital ridges thick and fused in middle of interorbit; dorsal margin of operculum inclined about 35° above horizontal *Kanekonia queenslandica*
- 22b.** Body oblong; greatest body depth 29 to 33% standard length; body without modified scales, except for a few at base of pectoral fins, on cheek, and sometimes on caudal peduncle; interorbital ridges thin and do not fuse in middle of interorbit; dorsal margin of operculum inclined about 15° above horizontal → **23**
- 23a.** Head bones not strongly sculptured; dorsal profile of head sloping at about 40° to 45° from horizontal, not notably rounded; interorbital ridges converge and just meet posteriorly; space between ridges not expanded posteriorly; interorbital bones usually with only fine striations *Kanekonia florida*
(Japan; not yet recorded from the area)
- 23b.** Head bones, especially infraorbital series, strongly sculptured; dorsal profile of head notably rounded; interorbital ridges converge posteriorly but do not meet, notably sculptured; space between ridges narrow but expanded anteriorly and posteriorly *Kanekonia pelta*
- 24a.** Dorsal-fin rays 14 to 16; anal-fin rays 13 to 15; vertebrae 30 to 31 *Erisphex philippinus*
- 24b.** Dorsal-fin rays 9 to 13; anal-fin rays 9 to 11; vertebrae 27 to 29 (rarely 30) → **25**
- 25a.** Head and body densely covered with modified scales, the largest of which forms a point that is about 3 to 6 times as long as wide at base; knob on second infraorbital bone almost always forms 2 blunt spines, one above the other *Erisphex potti*
(China, Korea, Japan; not yet recorded from the area)
- 25b.** Head and body covered with modified scales, the largest of which forms a point that is about 1 to 2 times as long as wide at base; knob on second infraorbital bone almost always forms a single spine (blunt in larger specimens). *Erisphex aniarus*
- 26a.** Body somewhat elongate, not compressed; dorsal fin with II spines, followed by VI spines and 6 soft rays; pelvic fin with I spine and 1 soft ray; vertebrae 21. *Matsubarichthys inusitatus*
- 26b.** Body notably compressed; dorsal fin with XI to XV spines and 7 to 9 soft rays → **27**
- 27a.** Anal fin with I or II spines and 6 to 8 soft rays *Acanthosphex leurynnis*
- 27b.** Anal fin with III or IV spines and 5 to 9 soft rays (*Bathyploactis*) → **28**
- 28a.** Anal fin with III spines and 8 or 9 soft rays; pectoral-fin rays 10; 2 pairs of barbels on lower jaw *Bathyploactis curtisensis*
- 28b.** Anal fin with IV spines (rarely V) and 5 to 7 soft rays; pectoral-fin rays 11 or 12 (rarely 10); lower jaw without barbels or with a single pair of barbels. *Bathyploactis ornatissima*

List of species occurring in the area

A question mark indicates that presence in the area is uncertain.

Acanthosphex leurynnis (Jordan and Seale, 1905)

Adventor elongatus (Whitley, 1952)

Aploactis aspera (Richardson, 1844)

Bathyploactis curtisensis Whitley, 1933

Bathyploactis ornatissima Whitley 1933

? *Cocotropus altipinnis* Waite, 1903

Cocotropus dermacanthus (Bleeker, 1852)

Cocotropus echinatus (Cantor, 1850)

Cocotropus larvatus Poss and Allen, 1987

? *Cocotropus masudai* Matsubara, 1943

- Erisphex aniarus* (Thompson, 1967)^{1/}
Erisphex philippinus (Fowler, 1938)
 ? *Erisphex pottii* (Steindachner, 1896)
Erisphex simplex Chen, 1981
Eschmeyer nexus Poss and Springer, 1983 (insertae sedis)
 ? *Kanekonia florida* Tanaka, 1915
Kanekonia pelta Poss, 1982
Kanekonia queenslandica Whitley, 1952
Matsubarichthys inusitatus Poss and Johnson, 1991
Neaploactis tridorsalis Eschmeyer and Allen, 1978
Paraploactis hongkongiensis (Chan, 1966)
Paraploactis intonsa Poss and Eschmeyer, 1978
Paraploactis kagoshimensis (Ishikawa, 1904)^{2/}
Paraploactis obbesi (Weber, 1913)
Paraploactis pulvinus Poss and Eschmeyer, 1978
Paraploactis trachyderma Bleeker, 1865
Peristrominous dolosus Whitley, 1952
Prosoproctus pataecus Poss and Eschmeyer, 1979
Sthenopus mollis Richardson, 1848
Xenaploactis anopta Poss and Eschmeyer, 1980
Xenaploactis asperrima (Günther, 1860)
Xenaploactis cautes Poss and Eschmeyer, 1980

Reference

- Poss, S.G. and W.N. Eschmeyer. 1978. Two new Australian velvetfishes, genus *Paraploactis* (Scorpaeniformes: Aploactinidae), with a revision of the genus and comments on the genera and species of the Aploactinidae. *Proc. Calif. Acad. Sci.*, 41(18):401-426.

1/ May be a complex of species including *Erisphex simplex* (Taiwan Province of China).

2/ May be a complex of species including *Paraploactis obbesi* and *P. hongkongiensis*.