

Article

Redescription of *Xenaploactis asperrima* (Günther 1860) (Teleostei: Aploactinidae), based on a specimen from New Ireland, Papua New Guinea

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Abstract

The rough velvetfish, *Xenaploactis asperrima* (Günther 1860), is redescribed on the basis of a specimen trawled in 2014 off northwestern New Hanover, Papua New Guinea, on a steep volcanic rock bottom slope at a depth of 155-120 m. Identification keys to the genera of Aploactinidae, and the species of *Xenaploactis* Poss & Eschmeyer 1980, are presented.

Keywords: Velvetfishes, Aploactinidae, Redescription, Depth range, Identification key.

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Introduction

The family Aploactinidae is a group of unusual scorpaenoid fishes with the dorsal fin originating far forward on the cranium, the head invested with knob-like lumps, and the body usually covered with modified, prickly scales (hence, the name velvetfishes) (Poss and Eschmeyer 1978). Though closely related to the Scorpaenidae, aploactinids show a loss of pungent spines. The group was reviewed by Poss and Eschmeyer (1978), and an identification key to genera together with a list of species in the Western Pacific was presented by Poss (1999). The family includes 49 valid species arranged in 17 genera (Poss and Eschmeyer 1978; Poss and Johnson 1991; Poss 1999; Eschmeyer and Fong 2016, Eschmeyer et al. 2016). It is confined to the Indo-West Pacific.

Xenaploactis Poss & Eschmeyer 1980 (Poss and Eschmeyer 1980: 288; type *Prosopodasys asperrimus* Günther 1860 by original designation), is a group of relatively small-sized species characterized by having the spinous dorsal fin separated in two parts, first three spines forming a separate fin, widely separated from the fourth spine; rather pungent head spines, including two prominent preorbital spines and a strong spine on lateral face of third infraorbital bone; head and body densely covered with modified scales; mouth strongly upturned; dorsal fin III, IX-X, 8-10 (last double); anal fin III, XI, 8-10 (last double); pelvic fin I, 3; pectoral fin 13-14; vertebrae 27-28; branchiostegal rays 6; teeth on jaws and vomer, none on palatines (Poss and Eschmeyer 1980). Poss and Eschmeyer (1980) recognized 3 species in the genus: *Xenaploactis anopta* Poss & Eschmeyer 1980 [Poss and Eschmeyer 1980: 290, figs. 3, 4 (upper), Luzon Island, Philippines, depth 64-81 m], *X. asperrima* (Günther 1860) (Günther 1860: 140, East Indies, as *Prosopodasys asperrimus*), and *X. cautes* Poss & Eschmeyer 1980 [Poss and Eschmeyer 1980: 291, figs. 4 (lower), 5, Gulf of Thailand (type locality) and Andaman Sea, depth 33-73 m]. Very little is known about the ecology of the species. The few specimens of *X. anopta* and *X. cautes* were trawled, the latter apparently on muddy sand bottom, on the upper continental shelf at depths of 33-81 m.

During the expedition “KAVIENG 2014” around northern New Ireland, Papua New Guinea, the R/V “Alis” trawled a single specimen of *X. asperrima* from off northwestern New Hanover. This is a surprising finding, 170 years after the only other known specimen that was probably collected in 1844 and labelled “East Indies” without additional locality or habitat data. In the present paper, the new record is reported, and the species is redescribed.

Material and Methods

Methods follow Eschmeyer (1969), except for the counting of bony sensory tubes (including all elements on the line) and measurement of the lachrymal length (from anterior tip of maxilla to posterior tip of second/posterior lachrymal spine) which follows Imamura and Shinohara (2003). Fin rays are counted using the method given by Fricke (1983). The standard length is abbreviated SL. The key to species of *Xenaploactis* is based on Poss and Eschmeyer (1980: 288-289), but modified according to recent findings. The distribution map is composed with QGIS 2.12.2.

Institutional acronyms are quoted according to Leviton et al. (1985); the fish collection of the National Taiwan University Museum, Taipei is abbreviated NTUM.

Results

Systematic ichthyology: The present paper follows the classifications provided by Nelson (2006) and Laan et al. (2014):

Class Actinopterygii

Subclass Neopterygii

Division Teleostei

Subdivision Euteleostei

Superorder Acanthopterygii

Order Scorpaeniformes Risso 1827

Suborder Scorpaenoidei Risso 1827

Family Aploactinidae Jordan & Starks 1904

Genus *Xenaploactis* Poss & Eschmeyer 1980

Xenaploactis asperrima (Günther 1860)

(Figs. 1-4)



Figure 1. *Xenaploactis asperrima* (Günther 1860), NTUM 11319, 1 specimen, 45.6 mm SL, northwest of New Hanover, New Ireland Province, Papua New Guinea. Lateral view (preserved specimen).

Common name: Rough velvetfish

Prosopodasys asperrimus Günther 1860: 140-141 (East Indies). Poss and Eschmeyer (1978: 405).

Xenaploactis asperrima: Poss and Eschmeyer 1980: 289-290, figs. 1-2 (East Indies; known only from holotype). Poss (1999: 2358).

Material: BMNH 1979.5.5.1, holotype, 40.2 mm SL, East Indies, E. Belcher, HMS Samarang, probably 1844. NTUM 11319, 1 specimen, 45.6 mm SL, western Pacific Ocean, Papua New Guinea, New Ireland Province,



Figure 2. *Xenaploactis asperrima* (Günther 1860), NTUM 11319, 1 specimen, 45.6 mm SL, northwest of New Hanover, New Ireland Province, Papua New Guinea. Head, ventral view (preserved specimen).



Figure 3. *Xenaploactis asperrima* (Günther 1860), NTUM 11319, 1 specimen, 45.6 mm SL, northwest of New Hanover, New Ireland Province, Papua New Guinea. Head, dorsal view (preserved specimen).



Figure 4. *Xenaploactis asperrima* (Günther 1860), NTUM 11319, 1 specimen, 45.6 mm SL, northwest of New Hanover, New Ireland Province, Papua New Guinea. Lateral view (fresh specimen).

northwest of New Hanover, 2°24.64'S 149°58.74'E – 2°25.32'S 149°57.79'E, 155-120 m depth, hard substrate with gorgonians, trawl, R/V Alis, St. CP4490-23 (PNG 3456), 6 Sept. 2014, 09:30-10:00 h.

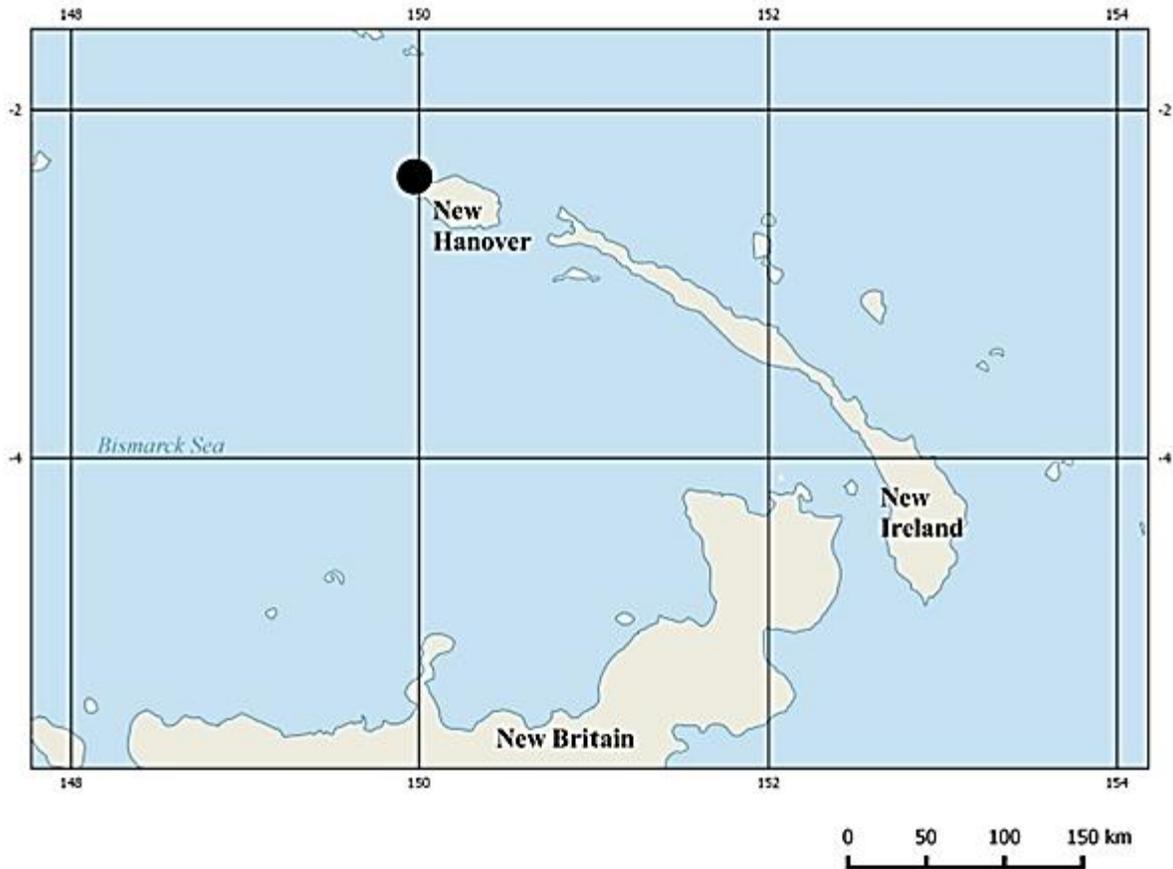


Figure 5. Distribution of *Xenaploactis asperrima* (Günther 1860) (circle) in the eastern Bismarck Sea, Papua New Guinea, western Pacific Ocean.

Description: D III + X, ix; A I, ix (I, x in the holotype); P1 xiii (missing on right side) (xiii-xiv in the holotype); P2 I, iii; C (ii), vi + vi, (ii). Gill rakers 2 + 6 = 8, some of them rudimentary. Lateral-line scales 9 (right) to 10 (left) (10-11 in the holotype). Vertebrae 27.

Head length 33.1% of SL. Snout strongly upturned, nearly vertical. Snout length (preorbital length) 8.6% of SL, 26.2% of head length. Orbit diameter 8.6% of SL, 26.2% of head length. Interorbital with ridges divergent anteriorly, convergent over middle of orbit, divergent posteriorly (Fig. 2). Postorbital spine appearing as a sculptured ridge, weakly connected to supraorbital ridge. Parietal spine lump-like. Pterotic spine forming a strong, slightly curved ridge. Posttemporal spine lump-like, followed by a small supracleithral spine. Dorsal posterior border of cleithrum forming a ridge, ending in a blunt spine. Upper jaw length 14.2% of SL, 46.8% of head length. First sensory pores of lower jaw widely separated. Position of anterior tip of isthmus opposite 4th sensory pore. Interorbital width 5.0% of SL, 16.6% of head length. Second infraorbital bone with 1 spine; third infraorbital bone with a large downward projected spine. Preopercular lateral-line pores simple, with small cirri present above the upper pores. Ventral surface of dentary without distinct cirri; one short cirrus present below posterior edge of dentary. Body depth 28.7% of SL. Body width 14.9% of SL. Preanus length 56.1% of SL. Head and body densely covered with prickly scales; sides of body with cirri. Each lateral-line scale anteriorly with two laterally projecting spinules; last lateral-line scale on caudal-fin base. Caudal peduncle length 11.4% of SL. Caudal peduncle depth 10.3% of SL.

Predorsal (1) length 16.8% of SL. First dorsal fin high anteriorly. Length of 1st dorsal spine 5.3% of SL, 2nd dorsal spine 6.1% of SL, 3rd dorsal spine 4.2% of SL. Predorsal (2) length 28.9% of SL. Length of 1st spine of second dorsal fin 3.1% of SL. Length of second dorsal fin base 57.9% of SL. Last dorsal-fin soft ray double. Preanal length 63.4% of SL. Length of anal spine 3.6% of SL. Length of anal fin base 30.9% of SL. Last anal-fin soft ray double. Pectoral fin length 20.0% of SL. Pelvic fin length 9.9% of SL (right pelvic fin; left fin damaged). Caudal fin bearing 3 median filaments.

Colour of fresh specimen (Fig. 4): Head and body dark brown, suborbital region, throat and belly beige to yellowish. Eye yellowish brown, pupil black. Lateral-line scales whitish. Vertical fins dark brown, speckled with white.

Colour in alcohol (Fig. 1): Similar to life colouration.

Distribution (Fig. 5): *Xenaploactis asperrima* is known only from northwest of New Hanover (New Ireland Province, Papua New Guinea), where a single specimen was trawled from a hard substrate with gorgonians at 155-120 m depth. The holotype and only other known specimen was labelled 'East Indies' without additional locality or ecological information.

Relationships: *Xenaploactis asperrima* is distinguished from *X. cautes* by the interorbital with concave ridges diverging anteriorly, convergent over middle of orbit, divergent posteriorly, and 10 spines in the second dorsal fin (interorbital with nearly parallel ridges, and 9 spines in the second dorsal fin in *X. cautes*); and from *X. anopta* by its second infraorbital bone with 1-2 spines, and dorsal-fin soft rays 9-10 (second infraorbital bone without spines, and dorsal-fin soft rays 8 in *X. anopta*). Keys to the genera of Aploactinidae, and species of the genus *Xenaploactis*, are presented below.

Key to the genera of Aploactinidae

- 1 Gill membranes not broadly united to isthmus 2
- Gill membranes broadly united to isthmus 15
- 2 Frontals, parietals, and infraorbital bones heavily armored; with a wide depression in interorbital; pelvic-fin insertion well behind pectoral-fin *Peristrominous* Whitley 1952
- Frontals, parietals, and infraorbital bones not heavily armored; depression in interorbital narrow or non-existent; pelvic-fin insertion anterior or just behind pectoral-fin base 3
- 3 Anus just behind pelvic fins, far forward of anal-fin origin *Prosoproctus* Poss & Eschmeyer 1979
- Anus slightly before anal-fin origin 4
- 4 Three dorsal fins, scales on body form expanded spinous points; each scale forms a blade-like ridge *Neoaploactis* Eschmeyer & Allen 1978
- One or two dorsal fins, scales on body absent or form spinous points that are not expanded or blade-like 5
- 5 Antermost 3 dorsal-fin spines form small fin that originates over or immediately behind eye and is widely separated from remainder of fin 6
- Dorsal fin continuous or nearly so, without small, separate fin over eye 7
- 6 Body smooth, covered with numerous elongate cirri, especially anteriorly; lacrimal weakly ossified, without spine *Sthenopus* Richardson 1848
- Body covered with numerous scales that form spinous points; lacrimal with 2 strong sharp spines *Xenaploactis* Poss & Eschmeyer 1980
- 7 Pelvic fins with I spine and 3 soft rays 8
- Pelvic fins with I spine and 2 (1) soft rays 10
- 8 Dorsal-fin soft rays 14-15; anal-fin soft rays 10-13; dorsal fin inserting anterior to orbit; vertebrae 30-32 *Pseudopataecus* Johnson 2004
- Dorsal-fin soft rays 7-11; anal-fin soft rays 5-10; dorsal fin inserting above orbit; vertebrae 24-28 9
- 9 Interorbital ridges run in parallel or converge posteriorly *Cocotropus* Kaup 1858
- Interorbital ridges diverge strongly posteriorly *Paraploactis* Bleeker 1864
- 10 Dorsal fin originates over dorsal ramus of preopercle *Adventor* Whitley 1952

- Dorsal fin originates over or before eye 11
- 11 Lachrymal with 2 sharp spines; pelvic fins in front of pectoral-fin base 12
- Lachrymal spines, if present, blunt, never sharp; pelvic fins just under or just behind pectoral-fin base 13
- 12 Sides of body with small, prickly scales; pectoral fin rays 11-13; anal-fin soft rays 9-15 *Erisphex* Jordan & Starks 1904
- Sides of body scaleless except for pored lateral line scales; pectoral fin rays 9-10; anal-fin soft rays 4-7 *Ptarmus* Smith 1947
- 13 Anterior 3-4 spines of dorsal fin much higher than remainder of fin; dorsal fin with 11-15 soft rays 14
- Anterior part of dorsal fin not much higher than remainder of fin; dorsal fin with 8-10 soft rays *Kanekonia* Tanaka 1915
- 14 Pectoral fin with 13 rays; first to third spines of dorsal fin higher than remainder of fin, distance between third and fourth spines about double of distance between fourth and fifth spines *Aploactis* Temminck & Schlegel 1843
- Pectoral fin with 10-11 rays; first to fourth spines of dorsal fin higher than remainder of fin, distance between third and fourth spines not greater than between fourth and fifth spines *Aploactisoma* Castelnau 1872
- 15 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 *Matsubarichthys* Poss & Johnson 1991
- Body notably compressed; dorsal fin with XI to XV spines and 7 to 9 soft rays; pelvic fin with I spine and 2-3 soft rays 16
- 16 Anal fin with I or II spines and 6 to 8 soft rays *Acanthosphex* Fowler 1938
- Anal fin with III or IV spines and 5 to 9 soft rays *Bathyaploactis* Whitley 1933

Key to the species of *Xenaploactis* Poss & Eschmeyer 1980

- 1 Interorbital with nearly parallel ridges; dorsal-fin spines III, IX *Xenaploactis cautes* Poss & Eschmeyer 1980
- Interorbital with concave ridges diverging anteriorly, convergent over middle of orbit, divergent posteriorly; dorsal-fin spines III, X 2
- 2 Second infraorbital bone with 1-2 spines; dorsal-fin soft rays 9-10 *Xenaploactis asperrimus* (Günther 1860)
- Second infraorbital bone without spines; dorsal-fin soft rays 8 *Xenaploactis anoapta* Poss & Eschmeyer 1980

Discussion

The holotype of *Prosopodasys asperrima* Günther 1860 was collected by Sir Edward Belcher and said to originate from the “East Indies”, without further details. The term “East Indies” here obviously refers to the expedition of HMS Samarang (1843-1846) that was sent for exploratory work in the greater region. A report on the fishes (Richardson 1848) included materials from the South China Sea, Borneo, Japan and the “Malay Archipelago”. According to Adams (1850: v-vi), during three journeys the Samarang visited islands, including northern Sulawesi, Ternate and Ambon, which have steep volcanic slopes similar to the habitat at the collecting locality of NTUM 11319. It is highly probable that the holotype (BMNH 1979.5.5.1) was either collected at Ambon or Ternate, as these volcanic offshore islands are in similar close proximity to New Guinea.

The holotype is slightly more compressed than the NTUM specimen from off New Hanover. However, as the holotype was formerly dried (Poss and Eschmeyer 1980: 289) and probably stored between sheets of paper, it was probably compressed during that procedure. It is now stored in ethanol. When the mouth is opened at an angle comparable to the New Hanover fish, head proportions are very similar in the two specimens.

While the other two species of *Xenaploactis* were collected in relatively shallower water at depths of 33-81 m, and *X. cautes* apparently on muddy sand bottom, the New Hanover specimen of *X. asperrima* was collected significantly deeper, at 155-120 m depth, on a hard substrate with gorgonians. Small fishes in this habitat are extremely difficult to collect, as they are cryptic, the habitat is below regular scuba-diving depth, and dredges or trawls can usually not be used on volcanic rock. This is probably the reason why this species escaped detection for a very long time.

The species of *Xenaploactis* are distributed in the central Indo-West Pacific (Fig. 6). While *X. anoapta* (Philippines) and *X. cautes* (Andaman Sea and Gulf of Thailand) occur north of the equator between 10°N and 20°N and from off Dampier, northwestern Australia and Gulf of Carpentaria, Queensland (Johnson 2004: 186-188). *Xenaploactis asperrima* has been collected south of the equator, off New Hanover. The type locality of

X. asperrima remains unknown, but most probably situated west of New Guinea, either at Ambon or at Ternate. Additional dredge or trawl collections on volcanic slopes are needed to get a better picture of the distribution range of that species.

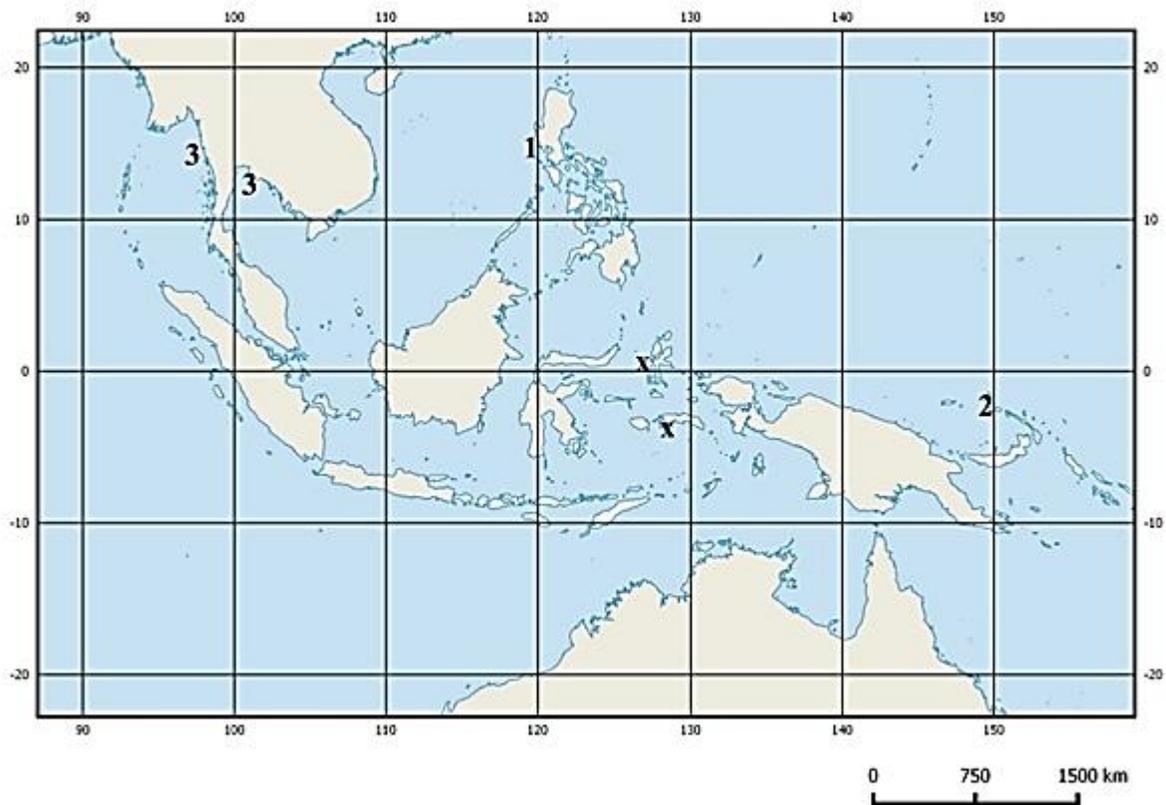


Figure 6. Distribution of the species of *Xenaploactis* Poss & Eschmeyer 1980 in the Indo-West Pacific. 1. *X. anopta*, 2. *X. asperrima*, 3. *X. cautes* and X. Possible sites of type locality of *X. asperrima*.

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