



## ***Enneapterygius niue*, a new species of triplefin from Niue and Samoa, southwestern Pacific Ocean (Teleostei: Tripterygiidae)**

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### **Abstract**

A new species of triplefin, *Enneapterygius niue*, is described on the basis of three specimens from Niue and Samoa. The new species is a medium-sized species of barred *Enneapterygius*, characterized by 13–15 spines in the second dorsal fin, 18–20 anal-fin soft rays, 14–19 + 16–20 lateral-line scales, 33–36 total lateral scale rows, eye diameter 94–128, preorbital 50–75, body depth 176–206, preanal fin length 483–538 (last four measures in thousandths of SL), sides of body with a pattern of two short and five complete bars, pectoral-fin base with a vertical dark bar, preorbital with an oblique dark band, dorsal fins pale except for a dusky base, anal fin dark grey in male and with four oblique brown bands in female, pelvic fins white, and caudal fin pale. The new species is compared with similar species. A revised key to the species of *Enneapterygius* in the Indo-Australian Archipelago and the western Pacific is presented.

**Key words:** taxonomy, ichthyology, systematics, coral-reef fishes, Indo-Pacific Ocean, identification key.

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## Introduction

Tripterygiid fishes (common name of triplefins or threefin blennies) are a group of mostly benthic-living blenniiform fishes (Nelson *et al.* 2016), characterized by having scales on the sides of the body and three dorsal fins. They inhabit cold, temperate, subtropical, and tropical sea shores and offshore islands and are usually associated with hard substrates. Most species live subtidally on rocky or coral reefs or in intertidal rock pools, while a few species occur deeper on the continental shelf and slopes down to at least 550 m depth. The use of intensive collecting techniques, such as rotenone collections, has revealed that Tripterygiidae comprises a speciose and abundant group of fishes. A total of 30 genera and at least 150 species is known worldwide. All species are small; the largest does not exceed 150 mm SL (*Blennodon dorsale* from New Zealand), while the smallest attains a maximum size of only 20 mm SL (Fricke 1997). The western and central Pacific species of the family were revised by Fricke (1997), who also provided a worldwide checklist which listed 30 valid genera and 140 valid species, 46 of which occur in the Indo-West Pacific.

Subsequently, Holleman (2005) revised the western Indian Ocean *Enneapterygius* and described four new species: *E. elaine* Holleman, 2005 from Rodrigues; *E. genamaculatus* Holleman, 2005 from Saint Brandon's Shoals; *E. gruschikai* Holleman, 2005 from the Comores, Seychelles, and Mascarenes to Chagos Archipelago; and *E. kosiensis* Holleman, 2005 from South Africa. In addition, Motomura *et al.* (2005) described *E. senoui* Motomura, Harazaki & Hardy, 2005 from the Izu and Ogasawara Islands. Chiang & Chen (2008) revised the genus from Taiwan and described *E. shaoi* Chiang & Chen, 2008 and *E. sheni* Chiang & Shen, 2008. They also reinstated *Enneapterygius cheni* Wang, Shao & Chen, 1996; *E. hsiojenae* Shen, 1994; and *E. leucopunctatus* Shen, 1994. Holleman & Bogorodsky (2012) described *E. qirmiz* Holleman & Bogorodsky, 2012 from Yemen, Red Sea, and reinstated *E. altipinnis* Clark, 1980 from the Red Sea. Most recently, Motomura *et al.* (2015) described *E. phoenicosoma* Motomura, Ota & Meguro, 2015 from Japan, the Caroline Islands, and Vanuatu.

The genus *Enneapterygius* was originally described by Rüppell (1835), with *Enneapterygius pusillus* Rüppell, 1835 as the type species. *Enneapterygius* is characterized within the family Tripterygiidae by a discontinuous lateral line, with an anterior series of 6–22 tubular pored scales and a posterior series of 13–27 notched scales; the first dorsal fin with 3 spines; the anal fin with 1 spine; the pelvic fin with 1 spine and 2 soft rays; scaleless head, operculum, pectoral-fin base, and abdomen; and hypural 5 small or absent.

A new species of *Enneapterygius* that was discovered during recent fieldwork at Niue and Samoa is described in the present paper.

## Materials and Methods

Type specimens are deposited in the Senckenberg Forschungsinstitut und Naturmuseum Frankfurt/Main (SMF) and the Fish Collection of the Hebrew University, Jerusalem (HUJ). Comparative materials are listed after the Discussion. Abbreviations of museum collections follow Fricke & Eschmeyer (2017a).

Methods follow Fricke (1997); fin-ray counts follow Fricke (1983); values for the holotype presented first followed by the range for paratypes in parentheses. Fin spines are presented as uppercase Roman numerals, segmented branched soft rays with Arabic numerals, segmented unbranched soft rays with lowercase Roman numerals, and unsegmented unbranched soft rays, such as the procurrent rays of the caudal fin, with lowercase Roman numerals in parentheses; in the fin-ray formula, different types of fin rays in the same fin are separated by commas. The formula for scale rows gives the number of vertical scale rows on the sides of the body, plus the number of scales (usually one) on the caudal-fin base. Transverse scale rows are counted on the level of the end of the anterior lateral line; the formula gives the number of scale rows above the anterior lateral line, plus the number of rows between the lateral lines, plus the number of rows below the lateral line. For lateral-line counts, both sides were counted; the formula gives the number of upper pored lateral-line scales, plus the number of notched lateral-line scales in the posterior row. The mandibular-pore formula gives the number of pores under the left dentary + number of median pore(s) + number of pores under the right dentary (e.g. 3 + 1 + 3). The starting point for length measurements is the middle of the upper lip. The standard length (measured from the tip of the upper lip to the

middle of the urohyal/caudal fin base) is abbreviated SL. The predorsal (1) length is measured from the middle of the upper lip to the base of the first spine of the first dorsal fin; the predorsal (2) length correspondingly to the base of the first spine of the second dorsal fin, and the predorsal (3) length to the base of the first ray of the third dorsal fin. The last ray of the third dorsal and anal fins is always divided at its base and counted as a single ray. Proportional measurements are expressed as thousandths of SL.

Species classification is based on Fricke (1997). Nomenclature follows Eschmeyer *et al.* (2017). References and journals are cited according to Fricke (2017) and Fricke & Eschmeyer (2017b).

## *Enneapterygius niue*, n. sp.

### Redbar Triplefin

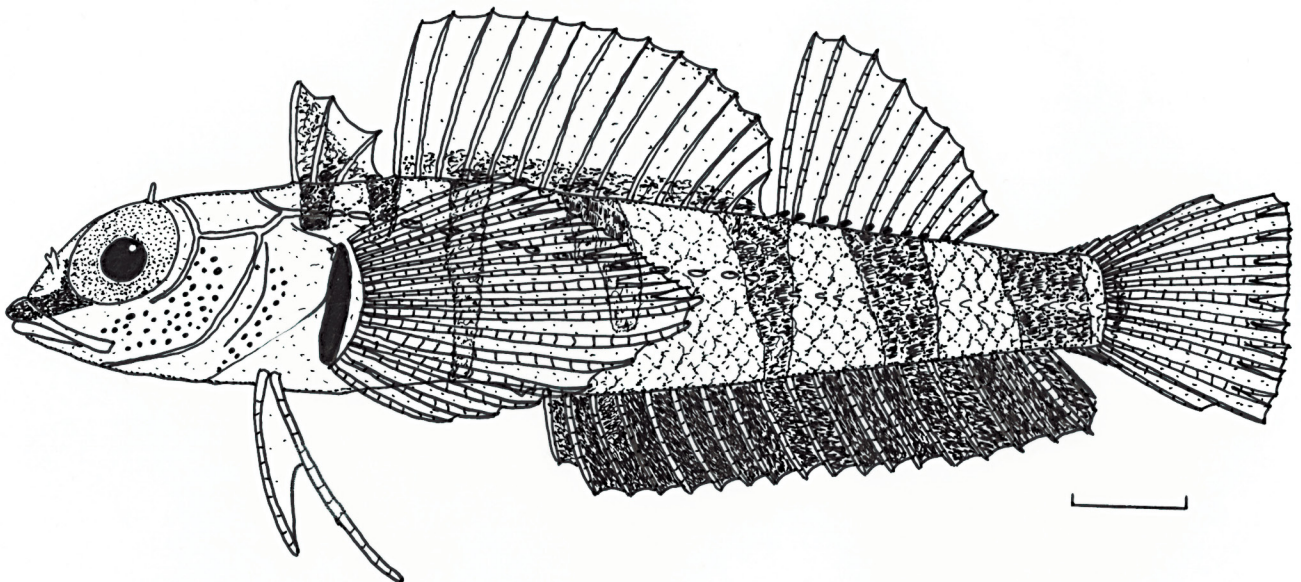
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Figures 1–4.

**Holotype.** SMF 35952, 19.6 mm SL, male, Niue, Limu, 18°58'30.12" S 169°53'58.9" W, intertidal, Mark V. Erdmann, 31 August 2016.

**Paratypes.** HUI 20568, 2 females, 18.8–23.5 mm SL, Niue, Limu, ca. 18°58'28" S 169°53'49" W, 3 m depth, Mark V. Erdmann, 27 August 2015; SMF 35953, male, 18.0 mm SL, same data as holotype; SMF 35954, female, 11.9 mm SL, American Samoa, Upolu Island, Fagaloa Bay, 13°55'59.14" S 171°31'52.8" W, 6 m depth, Mark V. Erdmann, 19 August 2015.

**Diagnosis.** A medium-sized species of barred *Enneapterygius* with 13–15 spines in the second dorsal fin, 18–20 anal-fin soft rays, 14–19 + 16–20 lateral-line scales, 33–36 total lateral scale rows, eye diameter 94–128, preorbital 50–75, body depth 176–206, preanal fin length 483–538, sides of body with a pattern of two short and five complete bars, pectoral-fin base with a vertical dark bar, preorbital with an oblique dark band, dorsal fins pale except for a dusky base, anal fin dark grey in male and with four oblique brown bands in female, pelvic fins white, caudal fin pale.



**Figure 1.** *Enneapterygius niue*, holotype, SMF 35952, 19.6 mm SL, male, Niue (preserved for one year); scale bar=2 mm (R. Fricke).



**Figure 2.** *Enneapterygius niue*, fresh, HUI 20568 (specimen 1), 23.5 mm SL, female, Niue (M.V. Erdmann).

**Description.** D1 III (III); D2 XIV (XIII–XV); D3 ix,1 (ix,1); A I,xvii,1, total 19 (I,xvii–xix,1, total 19–21); P1 ii,8,vii, total 17 (ii–iii,7,vii–viii, total 16–17); P2 I,ii (I,ii); C (vii),ii,9,ii,(vi) ((vi–viii),ii,9,ii,(vi–vii)). Scale rows 33 + 1 (33–36 + 1); transverse-scale rows 5 + 1 + 5 (4–5 + 1 + 5); lateral-line scales 14–15 + 18–20 (16–19 + 16–18); mandibular-pore formula 4 + 1 + 4 (3–4 + 1 + 3–4).

Proportional Measurements (in thousandths of SL): head length 276 (244–285); eye diameter 112 (94–128); supraorbital tentacle 5 (0–8); interorbital distance 31 (33–42); preorbital length 51 (50–75); upper-jaw length 87 (78–101); posttemporal lateral-line branch crescent-shaped. Head lateral-line system moderately complex. Body depth 184 (176–206); body width 143 (109–156). Lateral line consisting of an anterior series of 14–15 (16–19) tubular pored scales, reaching to below posterior one-fourth of second dorsal-fin base, continuing one-half to one rows lower with a posterior series of 18–20 (16–18) notched scales. Caudal-peduncle length 107 (83–140); caudal-peduncle depth 82 (67–94). Maximum size 23.5 mm SL.



**Figure 3.** *Enneapterygius niue*, underwater photograph of live specimen, Niue (M.V. Erdmann).

TABLE 1

*Enneapterygius niue*, n. sp., Niue and Samoa, holotype and paratypes  
(actual measurements in mm)

	Holotype	Paratypes			
		NIUE		SAMOA	
	SMF 35952	SMF 35953	HUJ 20568	HUJ 20568	SMF 35954
Sex	male	male	female	female	female
Standard length	19.6	18.0	23.5	18.8	11.9
Caudal-fin length	3.4	3.5	4.7	4.0	2.3
Predorsal(1) length	5.1	4.5	5.7	5.3	3.2
Predorsal(2) length	6.9	6.8	7.8	6.8	4.4
Predorsal(3) length	13.6	12.6	15.9	13.0	7.9
Preanal length	9.6	8.7	12.0	9.1	6.4
Prepelvic fin length	4.6	4.5	5.5	3.9	2.9
Prepectoral fin length	6.1	6.1	7.3	5.3	3.7
Head length	5.4	5.1	6.7	5.1	2.9
Body depth	3.6	3.7	4.6	3.7	2.1
Body width	2.8	2.8	3.6	2.4	1.3
Orbit diameter	2.2	2.3	2.5	2.1	1.0
Preorbital length	1.0	0.9	1.4	1.4	0.7
Bony interorbital	0.6	0.6	0.9	0.7	0.5
Supraorbital tentacle length	0.1	0.1	0.2	0.1	--
Caudal peduncle length	2.1	1.5	3.3	2.3	1.3
Caudal peduncle depth	1.6	1.4	2.2	1.7	0.8
Upper-jaw length	1.7	1.4	2.0	1.6	1.2
Length of first spine of first dorsal fin	1.9	1.5	2.6	2.4	1.1
Length of second spine of first dorsal fin	1.5	1.2	2.1	2.2	1.0
Length of third spine of first dorsal fin	1.1	1.0	1.8	1.3	0.8
Length of first spine of second dorsal fin	3.0	2.7	3.1	3.1	1.9
Length of fifth spine of second dorsal fin	3.2	3.0	3.5	3.3	2.0
Length of first ray of third dorsal fin	3.4	3.2	4.0	3.4	2.2
Length of fifth ray of third dorsal fin	2.3	2.1	2.9	2.2	1.5
Length of anal-fin spine	1.2	1.2	1.4	1.2	0.9
Length of first anal-fin ray	1.7	1.6	2.2	1.8	1.4
Length of fifth anal-fin ray	1.8	1.7	2.4	1.9	1.5
Pectoral-fin length	6.4	5.7	7.2	5.8	3.6
Length of first pelvic-fin ray	3.4	2.4	3.2	2.8	2.0
Length of second pelvic-fin ray	4.2	3.3	4.6	4.2	2.6



**Figure 4.** *Enneapterygius niue*, underwater photograph of live specimen, SMF 35954, Samoa (M.V. Erdmann).

First dorsal fin low; first spine 97 (83–128), second spine 76 (67–117), third spine 56 (56–77); predorsal (1) length 260 (242–282); first spine of second dorsal fin 153 (132–165), fifth spine 163 (149–176); predorsal (2) length 352 (332–378); first ray of third dorsal fin 173 (170–185), fifth ray 117 (117–126); predorsal (3) length 694 (664–700); anal fin beginning below vertical through seventh or eighth membrane of second dorsal fin (below tenth or eleventh lateral-line pore); anal-fin spine 61 (60–76), first ray 87 (89–118), fifth ray 92 (94–126); preanal-fin length 490 (483–538); pectoral fin reaching about to base of sixth or seventh anal-fin membrane; pectoral-fin length 326 (302–317); prepectoral-fin length 311 (282–339); first ray of pelvic fin 174 (133–168), second ray 214 (183–223); prepelvic-fin length 235 (207–250); caudal-fin length 173 (193–213).

**Color in life.** (Figs. 2–4) Head and anterior body cream, light blue posteriorly, with dark-brown (males) or reddish-brown (females) vertical bars in characteristic arrangement: first bar short, reaching from base of first dorsal fin to above lateral line; second bar also short, reaching from end of first dorsal fin or beginning of second dorsal fin to one scale row below lateral line; third bar reaching vertically from below base of third and fourth membranes of second dorsal fin to abdomen; fourth bar reaching obliquely from below bases of sixth to eighth membranes of second dorsal fin to three scale rows below lateral line, ending above fourth anal-fin membrane; fifth bar reaching obliquely from below end of second or beginning of third dorsal fin about to base of ninth anal-fin membrane; sixth bar wider, reaching from bases of fourth to seventh membranes of third dorsal fin to anal-fin base; seventh bar also wide, reaching across caudal peduncle. Vertical midline of interspaces between third and sixth bars with orange pigment dorsally and yellow pigment ventrally. Pectoral-fin base with a narrow orange bar densely covered with melanophores. Preorbital with a dark brown streak reaching from eye to tip of upper jaw; side of head with two broad bands of scattered large melanophores on cheek and opercle; occiput orange; eye bright orange, narrow yellow ring around pupil, posterior inferior quadrant of iris may be dark brown. First dorsal fin translucent, first membrane whitish with orange pigment; second and third dorsal fins translucent, dark gray basally, spines and fin rays reddish brown basally, membranes of second dorsal fin posteriorly with scattered whitish blotches; anal fin dark grey in male, but whitish with four oblique reddish-brown bands continuing from the body bars in females; caudal fin translucent; pelvic fin white; pectoral fin translucent.

**Color in preservative.** Similar to live coloration, but yellow and orange fading to pale; males with bars on body dark brown, eye grey; females overall more red, body bars bright red; anal fin pale, with 4 oblique reddish brown bars.

**Etymology.** We are delighted to name this beautiful species *niue* in honor of the friendly people and magnificent culture of the stunning island which is the type locality of the species. The specific epithet is here used as a noun in apposition.

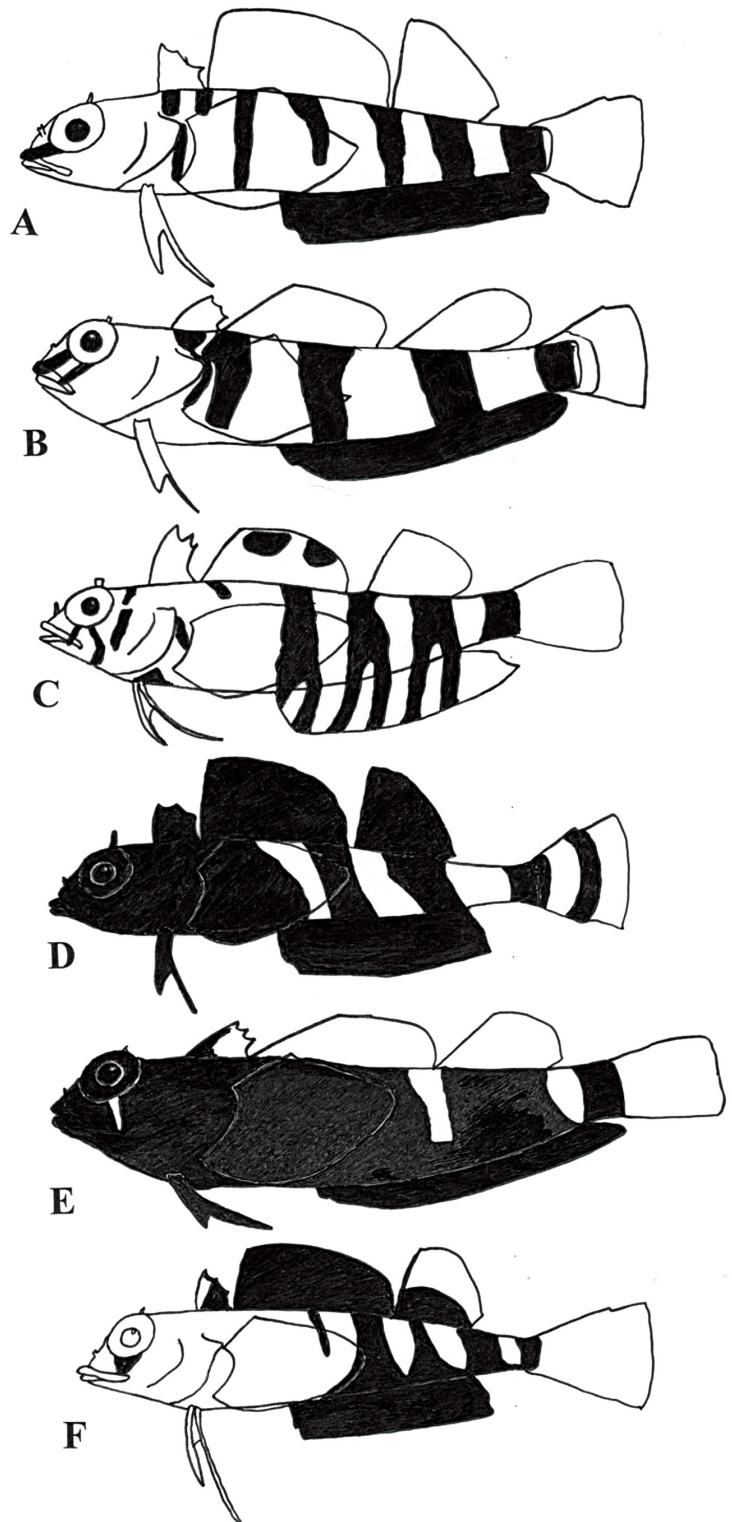
**Distribution.** The new species is known only from the intertidal and shallow coral-reef habitats in Niue and Samoa, southwestern Pacific Ocean.

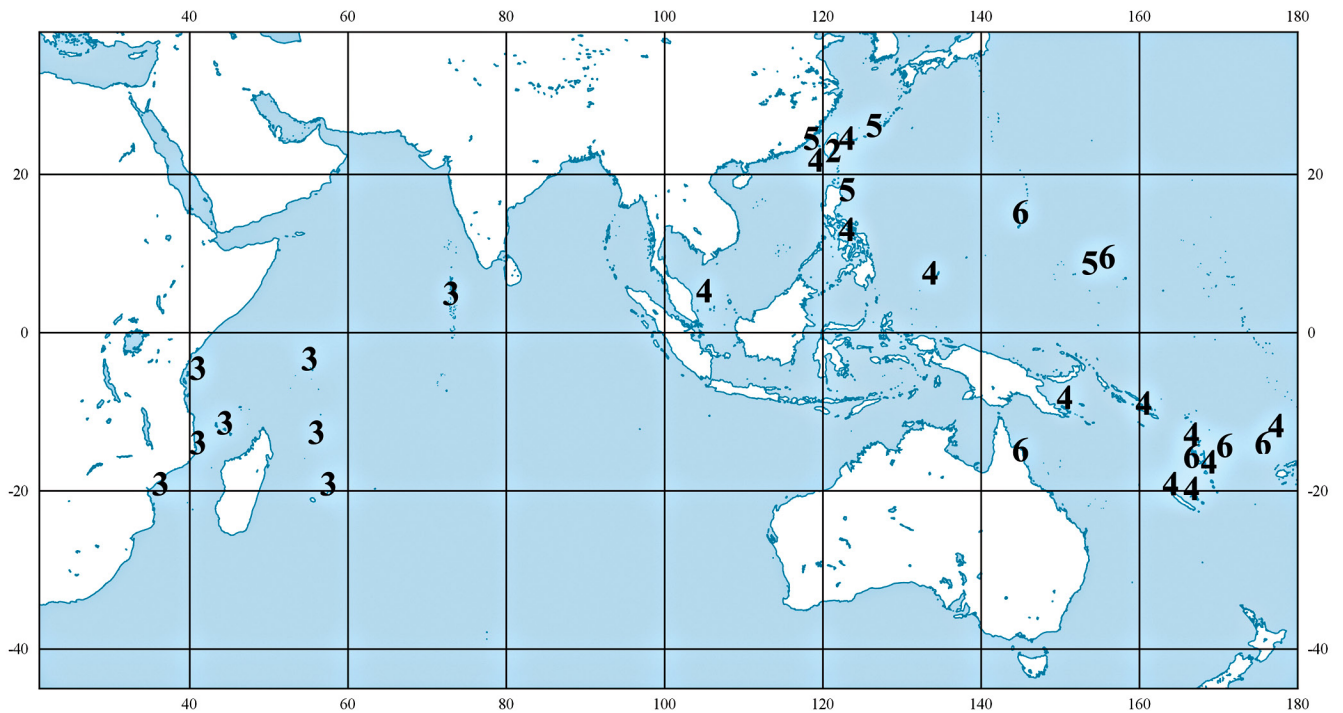
**Comparisons.** *Enneapterygius niue*, n. sp. is most similar to other species of *Enneapterygius* with broad, uninterrupted bars on the sides of the body (see Fig. 5). The new species is distinguished from *E. shaoi* (Taiwan) by the barring pattern on the sides of the body (two short and five complete vs. one short and four complete), caudal-fin pattern (uniform pale vs. a distal vertical dark bar), and second-dorsal-fin spines (XIII–XV vs. XII). It is distinguished from *E. clarkae* (Western Indian Ocean) by the barring pattern (two short and five complete vs. one short and four complete bars with ventral forking), second-dorsal-fin pattern (pale vs. two distal black blotches), anal-fin pattern (uniform grey in males, four wide bars in females vs. six narrow bars), anal-fin soft rays (18–20 vs. 16–17), second-dorsal-fin spines (XIII–XV vs. XI–XII), anterior pored lateral-line scales (14–19 vs. 11–12), and total lateral scale rows (33–36 vs. 30–31).

It is distinguished from *E. rhabdotus* (widespread in the western and South Pacific) by the barring pattern (two short and five complete vs. anterior body black and three bars), dorsal-fin pattern (pale vs. black), and symphyseal-mandibular pores (one vs. 3–4). It is distinguished from *E. cheni* (Taiwan to Micronesia) by the barring pattern (two short and five complete vs. black, with a white suborbital streak and two posterior white bars), pelvic-fin pattern (pale vs. black), second-dorsal-fin spines (XIII–XV vs. XI–XII), and the mandibular-pore formula (4 + 1 + 4 vs. 6 + 1 + 6). It is distinguished from *E. pyramis* (widespread in the western Pacific) by the barring pattern (two short and five complete vs. one short and four complete, all posterior), second-dorsal-fin pattern (pale vs. black), pectoral-fin length (to the base of the 6–7th anal-fin membrane vs. the 8–10th), and caudal-fin length (273–313 vs. 210–253).

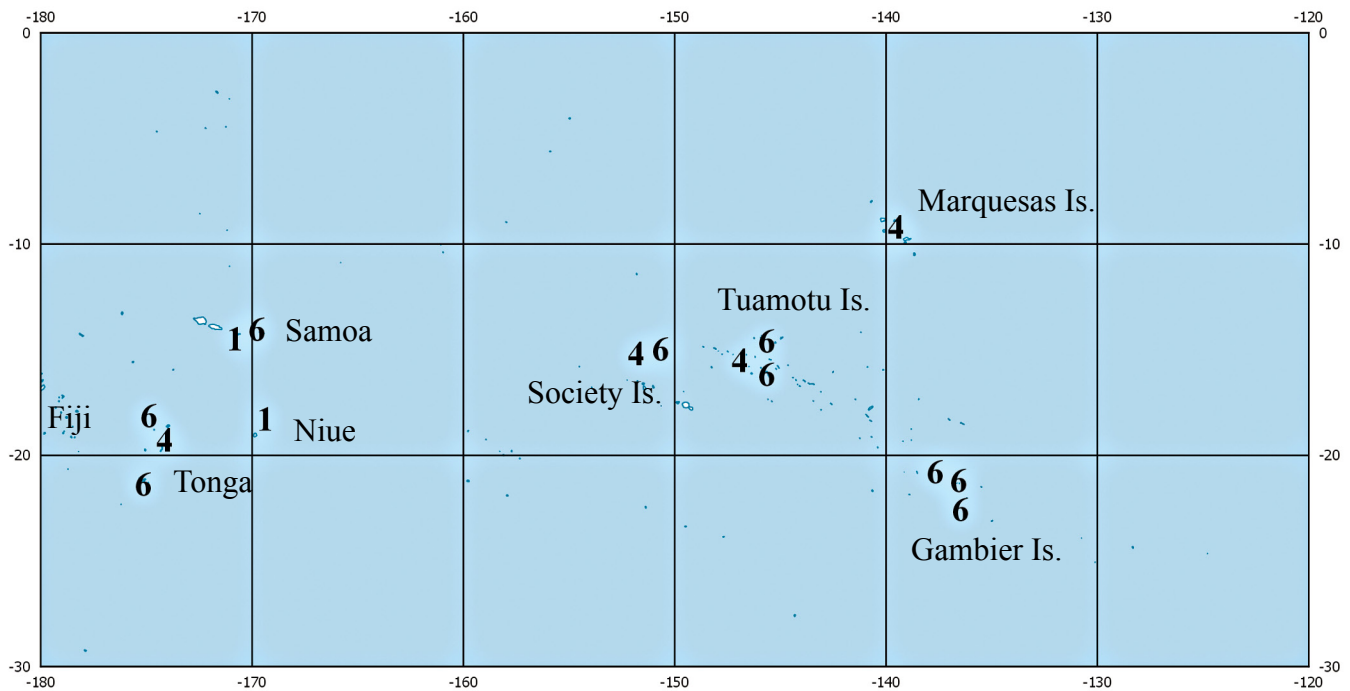
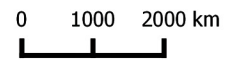
The geographic distribution of the barred species of *Enneapterygius* in the Indo-West Pacific (A) and South Pacific (B) is presented in Fig. 6.

**Figure 5.** Comparative markings of preserved male specimens of species of *Enneapterygius* with a pattern of broad, unbroken bands on the sides of the body: A) *Enneapterygius niue*, B) *E. shaoi*, C) *E. clarkae*, D) *E. rhabdotus*, E) *E. cheni*, F) *E. pyramis*.

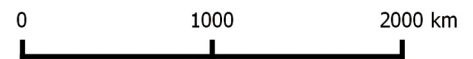




**A**



**B**



**Figure 6.** Geographic distribution of species of *Enneapterygius* with a pattern of broad, unbroken bars on the sides of the body, in the Indo-West Pacific (A) and South Pacific (B): 1) *Enneapterygius niue*, 2) *E. shaoi*, 3) *E. clarkae*, 4) *E. rhabdotus*, 5) *E. cheni*, 6) *E. pyramis*.



## Key to the Species of the Genus *Enneapterygius* in the Indo-Australian Archipelago and Western Pacific Ocean

This key applies to preserved specimens only; the live coloration of several species may be different from the pattern described in the key.

1a.	Tubular pored lateral line scales in the anterior series 5–13 .....	2
1b.	Tubular pored lateral line scales in the anterior series 14–23 .....	17
2a.	Symphyseal mandibular pores 1 (total pores 5–13) .....	3
2b.	Symphyseal mandibular pores 2–8 (total pores 6–22) .....	11
3a.	Caudal fin black in males .....	4
3b.	Caudal fin pale or spotted in males .....	7
4a.	Anal fin pale in males ..... <i>Enneapterygius clea</i> [Queensland, Australia]	
4b.	Anal fin black in males .....	5
5a.	Pelvic fins black in males ..... <i>Enneapterygius philippinus</i> [Indo-West Pacific]	
5b.	Pelvic fins pale in males .....	6
6a.	Posterior two-thirds of body in males black without markings .....	
	..... <i>Enneapterygius flavoccipitis</i> [Taiwan to N. Australia]	
6b.	Posterior two-thirds of body in males pale, with vertical black streaks and triangles above anal-fin bases ..	
	..... <i>Enneapterygius howensis</i> [Lord Howe Island]	
7a.	Anal fin plain black or half black in males .....	8
7b.	Anal fin pale, spotted, striped, or barred in males .....	9
8a.	Anal fin plain black in males; posterior two-thirds of body black in males .....	
	..... <i>Enneapterygius flavoccipitis</i> [Taiwan to N. Australia]	
8b.	Anal fin half black in males; posterior one-third of body black in males .....	
	..... <i>Enneapterygius hemimelas</i> [Taiwan to N. Australia, east to Samoa & Tonga]	
9a.	Anal fin black in males ..... <i>Enneapterygius unimaculatus</i> [Taiwan, East Indies, Palau]	
9b.	Anal fin pale, spotted, striped, or barred in males .....	10

10a.	Anal fin pale, often with 7–8 basal black spots; pelvic fin pale .....	
	..... <i>Enneapterygius fasciatus</i> [East Africa to Taiwan & Solomon Islands]	
10b.	Anal fin striped with 7–10 black bands; pelvic fin spotted with dark brown .....	
	..... <i>Enneapterygius zieglerei</i> [East Indies]	
11a.	Caudal fin black in males .....	<i>Enneapterygius bahasa</i> [S. Japan to N. Australia]
11b.	Caudal fin pale or barred in males .....	12
12a.	Posterior half of anal fin black in males .....	
	..... <i>Enneapterygius hemimelas</i> [Taiwan to N. Australia, east to Samoa & Tonga]	
12b.	Anal fin pale, spotted, striped, or barred in males .....	13
13a.	First dorsal fin higher than second dorsal fin .....	14
13b.	First dorsal fin lower than second dorsal fin .....	15
14a.	First spine of first dorsal fin relatively low, not much longer than longest spine of second dorsal fin, its length 143–161; pectoral fin relatively short, at most reaching third dorsal-fin origin, its length 302–341; body with irregular dark streaks, but no black spot behind anal-fin base or third-dorsal-fin base; predorsal (1) length 210–261; upper jaw relatively short, its length 88–134; first dorsal fin light or dusky, without streaks .....	<i>Enneapterygius tutuilae</i> [Red Sea & Indo-Pacific to Samoa]
14b.	First spine of first dorsal fin very long, filamentous, about twice the length of the longest spine of the second dorsal fin, its length 253–291; pectoral fin very long, reaching base of 3rd or 4th ray of third dorsal fin, its length 376–432; body with a black spot each behind anal-fin base and third-dorsal-fin base; predorsal (1) length 186–210; upper jaw long, its length about 143–145; first dorsal fin with dark streaks on first membrane .....	<i>Enneapterygius mirabilis</i> [Papua New Guinea & Queensland to Vanuatu]
15a.	Anal fin barred .....	<i>Enneapterygius zieglerei</i> [East Indies]
15b.	Anal fin pale .....	16
16a.	Body pale, head with a black mask .....	
	..... <i>Enneapterygius nanus</i> [Taiwan to N. Australia east to Marshall & Loyalty Islands]	
16b.	Body black or barred, head black .....	<i>Enneapterygius niger</i> [New Caledonia & Vanuatu]
17a.	Caudal fin black or dark grey in males (at least half black) .....	18
17b.	Caudal fin pale, spotted, or barred in males .....	32

18a.	Basal half of caudal fin black in males, distal half pale .....	
	..... <i>Enneapterygius signicauda</i> [Vanuatu & American Samoa]	
18b.	Caudal fin plain black or dark grey in males .....	19
19a.	Anal fin black or dark grey in males (at least posterior half) .....	20
19b.	Anal fin pale, spotted, striped, or barred in males .....	28
20a.	Pelvic fins black in males .....	21
20b.	Pelvic fins pale in males .....	23
21a.	Membranes of second dorsal fin pale in males .....	
	..... <i>Enneapterygius fuscoventer</i> [Taiwan, East Asia to Society Islands]	
21b.	Membranes of second dorsal fin dusky or blackish in males .....	22
22a.	Tubular pored lateral-line scales in anterior series 10–15 ... <i>Enneapterygius philippinus</i> [Indo-West Pacific]	
22b.	Tubular pored lateral-line scales in anterior series 17–22 ... <i>Enneapterygius kermadecensis</i> [Kermadec Isl.]	
23a.	Lower sides of body with triangular black blotches above the anal-fin base .....	24
23b.	No triangular black blotches above the anal-fin base .....	26
24a.	Triangular black blotches and streaks only above anal-fin base; some streaks reaching third-dorsal-fin base ..... <i>Enneapterygius howensis</i> [Lord Howe Island]	
24b.	Triangular black blotches on abdomen before anal fin, but not extending to third-dorsal-fin base .....	25
25a.	Body depth 189–208; lateral line scales 15–19 (mean 16.7) .....	
	..... <i>Enneapterygius fuscoventer</i> [Taiwan, East Asia to Society Islands]	
25b.	Body depth 166–184; lateral line scales 17–22 (mean 18.8) .....	<i>Enneapterygius randalli</i> [Austral Islands]
26a.	Posterior half of anal fin black in males, anterior half pale .....	
	..... <i>Enneapterygius similis</i> [East Asia to New Caledonia]	
26b.	Anal fin plain black in males .....	27
27a.	Third dorsal fin blackish in male; sides of body with 2 rows of white blotches .....	
	..... <i>Enneapterygius pallidoserialis</i> [western Pacific Ocean]	
27b.	Third dorsal fin only basally dusky in males; posterior two-thirds of body black without markings .....	
	..... <i>Enneapterygius flavoccipitis</i> [Taiwan to N. Australia]	

28a.	Caudal peduncle pale in males .....	<i>Enneapterygius nigricauda</i> [western & central Pacific Ocean]	
28b.	Caudal peduncle black or striped in males .....		29
29a.	Body all pale except for black head mask and caudal peduncle .....		30
29b.	Body blackish or barred, not pale .....		31
30a.	Third dorsal fin black in males .....	<i>Enneapterygius clea</i> [Queensland, Australia]	
30b.	Third dorsal fin pale in males .....	<i>Enneapterygius bahasa</i> [S. Japan to N. Australia]	
31a.	First and second dorsal fins black in males .....	<i>Enneapterygius niger</i> [New Caledonia & Vanuatu]	
31b.	First and second dorsal fins pale in males .....	<i>Enneapterygius ornatus</i> [Henderson Island, Pitcairn Group]	
32a.	Anal fin black or dark grey in males (at least posterior half) .....		33
32b.	Anal fin pale, spotted, striped, or barred in males .....		52
33a.	Symphyseal mandibular pores 1 (total pores 5–12) .....		34
33b.	Symphyseal mandibular pores 2–4 (total pores 6–12) .....		45
34a.	Posterior half of anal fin black in males, anterior half pale .....	<i>Enneapterygius hemimelas</i> [Taiwan to N. Australia, east to Samoa & Tonga]	
34b.	Anal fin plain black in males .....		35
35a.	Third dorsal fin plain black in males .....		36
35b.	Third dorsal fin pale, barred, or at most basally dusky in males .....		37
36a.	Cheek in males with a suborbital blue streak; pored scales in anterior lateral line 14–20 .....	<i>Enneapterygius williamsi</i> [Loyalty Islands, Vanuatu & Tonga]	
36b.	Cheek in males without a suborbital blue streak; pored scales in anterior lateral line 20–21 .....	<i>Enneapterygius senoui</i> [Izu & Ogasawara Islands, Japan]	
37a.	Second dorsal fin plain black or dark grey in males .....		38
37b.	Second dorsal fin pale, barred, or at most basally dusky in males .....		40
38a.	Sides of body light in males, with large triangular dark blotches reaching from the anal-fin base towards the dorsal-fin bases .....	<i>Enneapterygius rhabdotus</i> [Taiwan, East Asia to Marquesas Islands]	
38b.	Sides of body dark in males, with 3 horizontal series of white blotches .....		39

39a.	Head without a dark mask in males, only a few melanophores; supraoccipital sensory canal straight .....	.....
	.....	<i>Enneapterygius triserialis</i> [E. Australia to Tonga & Samoa]
39b.	Head with a dark mask in males; supraoccipital sensory canal forming a curve .....	.....
	.....	<i>Enneapterygius sheni</i> [Taiwan]
40a.	Posterior two-thirds of body black in males .....	<i>Enneapterygius flavoccipitis</i> [Taiwan to N. Australia]
40b.	Body light in males, often with dark bars .....	41
41a.	Anal-fin base with a series of black spots and black head mask complete in males .....	.....
	.....	<i>Enneapterygius larsonae</i> [Papua New Guinea to N. Australia]
41b.	Anal-fin base without a series of black spots and black head mask interrupted by a light area in males ....	42
42a.	Body plain black with two broad oblique light bars in posterior half in males .....	.....
	.....	<i>Enneapterygius cheni</i> [Taiwan to Micronesia]
42b.	Body with 4–6 oblique brown bars in males .....	43
43a.	Sides of body with 5–8 narrow oblique stripes; caudal fin with 6–7 vertical dark bars; preorbital and suborbital regions in males with a plain dark head mask.....	.....
	.....	<i>Enneapterygius unimaculatus</i> [Taiwan, East Indies, Palau]
43b.	Sides of body with 4 broad oblique dark-brown bars; caudal fin with 0–1 distal vertical dark bars; preorbital and anterior suborbital region in males with two dark bands separated by an oblique white or light blue stripe .....	44
44a.	Sides of body with 4 vertical bars; caudal fin with a vertical dark bar; second dorsal fin with 12 spines ....	.....
	.....	<i>Enneapterygius shaoi</i> [Taiwan]
44b.	Sides of body with 5 vertical bars; caudal fin pale, without a vertical dark bar; second dorsal fin with 13–15 spines .....	<i>Enneapterygius niue, n. sp.</i> [Niue & Samoa]
45a.	Posterior half of anal fin black and anterior half pale in males .....	.....
	.....	<i>Enneapterygius hemimelas</i> [Taiwan to N. Australia, east to Samoa & Tonga]
45b.	Anal fin plain black in males .....	46
46a.	Third dorsal fin plain black in males .....	47
46b.	Third dorsal fin pale, barred, or at most basally dusky in males .....	49
47a.	Caudal fin with a central black bar; body with posterior bars in males; symphyseal mandibular pores 3–4 .....	<i>Enneapterygius rhabdotus</i> [Taiwan, East Asia to Marquesas Islands]
47b.	Caudal fin pale without markings; body plain black in males; symphyseal mandibular pores 1–2 .....	48

48a.	Cheek in males with a suborbital blue streak; pored scales in anterior lateral line 14–20 .....	
	.....	<i>Enneapterygius williamsi</i> [Loyalty Islands, Vanuatu & Tonga]
48b.	Cheek in males without a suborbital blue streak; pored scales in anterior lateral line 20–21 .....	
	.....	<i>Enneapterygius senoui</i> [Izu & Ogasawara Islands, Japan]
49a.	Second dorsal fin pale, at most basally dusky, in males .....	
	.....	<i>Enneapterygius larsonae</i> [Papua New Guinea to N. Australia]
49b.	Second dorsal fin plain black in males .....	50
50a.	Head black in males .....	<i>Enneapterygius etheostomus</i> [Japan to Vietnam]
50b.	Head pale, with minute dark spots, in males .....	51
51a.	First dorsal fin lower than second dorsal fin and body light, with large triangular dark blotches reaching from anal-fin base to dorsal-fin base, in males .....	<i>Enneapterygius pyramis</i> [W. & S. Pacific Islands]
51b.	First dorsal fin higher than second dorsal fin and anterior half of body with narrow vertical dark streaks not reaching anal-fin nor dorsal-fin base, in males .....	
	.....	<i>Enneapterygius paucifasciatus</i> [Grande Terre, New Caledonia]
52a.	Symphyseal mandibular pores 1 (total pores 5–19) .....	53
52b.	Symphyseal mandibular pores 2–4 (total pores 6–12) .....	57
53a.	Second dorsal fin black in males (at least distal half) .....	54
53b.	Second dorsal fin pale (rarely spotted) in males .....	63
54a.	Pelvic fins striped .....	<i>Enneapterygius zieglerei</i> [East Indies]
54b.	Pelvic fins pale, not striped .....	55
55a.	Body greyish, with 3 horizontal series of white blotches in males .....	
	.....	<i>Enneapterygius triserialis</i> [E. Australia to Tonga & Samoa]
55b.	Body either plain black or barred in males .....	56
56a.	Second-dorsal-fin spines 9–12; head with a vertical white suborbital streak in males .....	
	.....	<i>Enneapterygius niger</i> [New Caledonia & Vanuatu]
56b.	Second-dorsal-fin spines 13–16; head black in males .....	<i>Enneapterygius miyakensis</i> [Izu Islands, Japan]

57a.	Large black saddle behind the pectoral-fin base in males .....	.....
	..... <i>Enneapterygius vexillarius</i> [Ryukyu Islands, Taiwan & Hong Kong]	
57b.	No black saddle behind the pectoral-fin base .....	58
58a.	Caudal peduncle with a dark hourglass marking (in specimens from Rotuma and Tonga, the ventral blotch may be faint or absent) .....	..... <i>Enneapterygius elegans</i> [Indo-West Pacific Ocean]
58b.	Caudal peduncle without a dark hourglass marking (but may have a vertical dark streak or an oblique bar) .....	59
59a.	Body pale, caudal peduncle blackish (red in life) in males .....	..... <i>Enneapterygius rubicauda</i> [W. Pacific Islands]
59b.	Body pale or barred, caudal peduncle not blackish (not red in life) in males .....	60
60a.	Black head mask leaving maxillary area white in males .....	..... <i>Enneapterygius rufopileus</i> [S.W. Pacific Islands]
60b.	Head mask uniform black in male, including maxillary area, in males .....	61
61a.	Body pale, often with 10–12 dorsal narrow bars .....	..... <i>Enneapterygius atriceps</i> [Hawaii to Midway]
61b.	Body with 3–6 broad dark bars .....	62
62a.	Anal-fin base with a row of black spots; total lateral scale rows 28–34 (mean 31.3) .....	..... <i>Enneapterygius fasciatus</i> [East Africa to Solomon Islands, north to Taiwan]
62b.	Anal-fin base without black spots; total lateral scale rows 32–38 (mean 35.0) .....	..... <i>Enneapterygius namarrgon</i> [Northern Territory, Australia]
63a.	Pelvic fins striped .....	..... <i>Enneapterygius zieglerei</i> [East Indies]
63b.	Pelvic fins pale, not striped .....	55
64a.	Second dorsal fin pale or spotted .....	65
64b.	Second dorsal fin blackish .....	66
65a.	Dark head mask in male leaving upper two-third of pectoral-fin base pale; sides of body pale; pored scales in anterior lateral line series 10–15; median mandibular pores 2 .....	..... <i>Enneapterygius nanus</i> [Taiwan to N. Australia, east to Marshall & Loyalty Islands]
65b.	Dark head mask in males covering complete pectoral-fin base; sides of body with a series of five double brown bars; pored scales in anterior lateral line series 16–19; median mandibular pores 1 .....	..... <i>Enneapterygius phoenicosoma</i> [Japan to Caroline Islands, Vanuatu]

- 66a. Head and body blackish; head with a vertical white suborbital streak in males .....  
 .....*Enneapterygius niger* [New Caledonia & Vanuatu]
- 66b. Head and body not blackish, head may have a black mask, but no suborbital white streak, in males .....67
- 67a. First dorsal fin higher than second dorsal fin and anterior half of body with narrow vertical dark streaks not reaching anal-fin nor dorsal-fin base, in males .....  
 .....*Enneapterygius paucifasciatus* [Grande Terre, New Caledonia]
- 67b. First dorsal fin lower than second dorsal fin; body coloration not as described in 67a .....68
- 68a. Caudal peduncle with a vertical black bar from dorsal to ventral surface; caudal fin uniform pale .....  
 .....*Enneapterygius atrogulare* [E. Australia, Coral Sea, Tonga]
- 68b. Caudal peduncle without a vertical black bar; caudal fin striped dorsally and ventrally .....  
 .....*Enneapterygius rhothion* [New Caledonia, Vanuatu]

**Discussion.** This is an interesting finding of a barred species of *Enneapterygius* from Niue and Samoa, quite distinct from the other barred species in the region, *E. rhothion*. The species with the most similar color pattern is found in Taiwan, *E. shaoi*. There is another species pair in *Enneapterygius* with a disjunct distribution in the South Pacific and the northwestern Pacific, namely *E. niger* (New Caledonia to Vanuatu) and *E. cheni* (Taiwan to Ryukyu Islands and Micronesia). Speciation in these cases probably occurred relatively recently when a species living in the equatorial region during glacial periods was separated by rising water temperatures to disjunct antiequatorial distribution patterns.

The number of species in *Enneapterygius* now rises to a total of 60. The genus is by far the most speciose in the family Tripterygiidae, which now comprises a total of 175 valid species (according to Eschmeyer & Fong [2016], updated).

#### **Comparative material (*Enneapterygius* species with bars on the sides of the body):**

*Enneapterygius cheni* Wang, Shao & Shen, 1996: USNM 137881 (2), Simulac, Tataan, Philippines; USNM 223113 (1), Pohnpei, Micronesia; USNM 224337 (1), Pohnpei, Micronesia; USNM 287878 (1), south shore of Taiwan.

*Enneapterygius clarkae* Holleman, 1982: BPBM 27314 (1), Malindi, Kenya; ROM 67474 (1), Comores; ROM 67752 (1), Comores; USNM 231380 (1 paratype), Chesterfield Island, Madagascar; USNM 231382 (3 paratypes), Saint Brandon's Shoals; USNM 357598 (4), Saint Brandon's Shoals; USNM 357609 (1), Saint Brandon's Shoals.

*Enneapterygius fasciatus* (Weber, 1909): ZMA 112.507 (1 syntype); Savu Island, Nusa Tenggara Timur, Indonesia; ZMA 112.508 (2 syntypes), Kepulauan Talaud, Sulawesi Utara, Indonesia; ANSP 171360 (9), Sri Lanka; ANSP 171361 (11), Sri Lanka; ANSP 171362 (5), Sri Lanka; ANSP 171363 (3), Sri Lanka; ANSP 171377 (1), Mahé, Seychelles; ANSP 171383 (1), Curieuse Island, Seychelles; ANSP 175270 (5), Sri Lanka; BPBM 16027 (6), Guadalcanal, Solomon Islands; BPBM 36501 (1), Flores, Nusa Tenggara Timur, Indonesia; BPBM 36587 (1), Watubela Islands, Maluku, Indonesia; BPBM 36596 (1), Watubela Islands, Maluku, Indonesia; BPBM 32691 (1), Madang, Papua New Guinea; CAS 49172 (1), Chumphon, Thailand; CAS 49176 (1), Chumphon, Thailand; CAS 49178 (1), Rayong, Thailand; LACM 31617-27 (1), Manda, Kenya; ROM uncat. (7), Thailand, Andaman Sea; SAIAB 60609 (1), Ibo, Mozambique; SAIAB 60610 (1) Mocimboa da Praia, Mozambique; SAIAB 60682 (1), Shimoni, Kenya; SAIAB 60683 (2), Zanzibar, Tanzania; USNM 259175 (1), Palawan, Philippines; USNM 279813 (1), south shore, Taiwan; USNM 297706 (2), Seribu Islands, Java Barat, Indonesia; USNM 344610 (39), Bawean, Java Timur, Indonesia.



*Enneapterygius gruschkai* Holleman, 2005: BPBM 16287 (5), Réunion; BPBM 16341 (1), Mauritius; BPBM 16355 (1), Mauritius; BPBM 21787 (1), Mauritius; BPBM 21815 (4), Mauritius; BPBM 21841 (1), Mauritius; BPBM 35600 (1 paratype), Seychelles; SMNS 21106 (4), Réunion); USNM uncat. (1), Saint Brandon's Shoals.

*Enneapterygius larsonae* Fricke, 1994: NTM S.10809-026 (holotype), Dampier Archipelago, Western Australia; AMS IB.337-339 (3), Shark Bay, Western Australia; AMS IB.7243 (1), Keppel Group, Queensland, Australia; AMS I.5088 (1), Green Island, Queensland, Australia; AMS I.6184-I.6189 (6), Gulf of Carpentaria, Queensland, Australia; AMS I.19111-015 (5), One Tree Island, Queensland, Australia; AMS I.20776-036 (6), Cape York, Queensland, Australia; AMS I.20786-005 (1), Wangetti Beach, Queensland, Australia; AMS I.20787-000 (1), Linnet Reef, Queensland, Australia; AMS I.212606-022 (4), Cape Tribulation, Queensland, Australia; AMS I.22054-010 (7), Cape Kimberley, Queensland, Australia; AMS I.22574-040 (5), Escape Reef, Queensland, Australia; AMS I.22628-028 (10), Escape Reef, Queensland, Australia; AMS I.22732-012 (2), Lizard Island, Queensland, Australia; NTM S.10004-042 (1 paratype), Cobourg Peninsula, Northern Territory, Australia; NTM S.10461-003 (1 paratype), Cobourg Peninsula, Northern Territory, Australia; NTM S.10809-035 (25 paratypes), Dampier Archipelago, Western Australia; NTM S.10814-036 (7 paratypes), Dampier Archipelago, Western Australia; NTM S:11315-038 (4), Scott Reef, Western Australia; NTM S:11315-054 (3), Scott Reef, Western Australia; NTM S:11364-067 (3), Scott Reef, Western Australia; NTM S:11382-004 (1), Scott Reef, Western Australia; SMNS 14025 (2 paratypes), Exmouth Gulf, Western Australia; SMNS 14575 (3 paratypes), Onslow, Western Australia; SMNS 14611 (5 paratypes), Onslow, Western Australia; SMNS 14657 (3 paratypes), Shark Bay, Western Australia; SMNS 14855 (11), Magnetic Island, Queensland, Australia; USNM 279866 (2), Muschu Island, Papua New Guinea; USNM 279871 (1), opposite Baibesiga Island, Papua New Guinea; USNM 330366 (1), Kiriwina, Papua New Guinea; WAM P.6781-001 (1), Northwest Cape, Western Australia; WAM P.10993-001 (1), Dampier Archipelago, Western Australia; WAM P.25111-000 (2), Dampier Archipelago, Western Australia; WAM P.25117-030 (2), Dampier Archipelago, Western Australia; WAM P.25195-022 (1), Cape Naturaliste, Western Australia; WAM P.25308-014 (1 paratype), Abrolhos Islands, Western Australia; WAM P.25317-011 (2 paratypes), Abrolhos Islands, Western Australia; WAM P.25813-045 (1), South Murion Island, Western Australia; WAM P.26066-007 (2), Abrolhos Islands, Western Australia; WAM P.26071-014 (1), Abrolhos Islands, Western Australia; WAM P.26668-011 (5 paratypes), Shark Bay, Western Australia; WAM P.27065-015 (3), Bagara, Queensland, Australia; WAM P.27662-044 (2), Rowley Shoals, Western Australia; WAM P.28025-038 (9), Rowley Shoals, Western Australia; WAM P.28035-035 (3), Rowley Shoals, Western Australia; WAM P.28416-029 (2 paratypes), Gantheaume Point, Western Australia; WAM P.28420-013 (4), Rowley Shoals, Western Australia; WAM P.29042-027 (2 paratypes), Ashmore Reef, West Timor Sea; WAM P.29057-014 (1), Ashmore Reef, West Timor Sea; WAM P.29624.073 (5), Madang, Papua New Guinea; WAM P.29883-004 (1 paratype), Abrolhos Islands, Western Australia; WAM P.29884-015 (1 paratype), Abrolhos Islands, Western Australia; WAM P.29885-011 (1), Abrolhos Islands, Western Australia; WAM P.29887-006 (1 paratype), Abrolhos Islands, Western Australia.

*Enneapterygius pyramis* Fricke, 1994: USNM 283069 (holotype), Rotuma, Fiji; AMS I.22582-048 (1 paratype of *Helcogramma springeri* Hansen 1986), Escape Reef, Queensland, Australia; BPBM 13550 (7), Mangareva, Gambier Islands; BPBM 13588 (7), Mangareva, Gambier Islands; BPBM 16486 (1), Oeno, Pitcairn Group; BPBM 16537 (2), Oeno, Pitcairn Group; BPBM 16916 (6), Pitcairn; BPBM 16923 (12), Pitcairn; BPBM 16948 (4), Pitcairn; BPBM 16957 (5), Pitcairn; BPBM 16972 (14), Pitcairn; BPBM 16985 (7), Pitcairn; BPBM 16998 (1), Pitcairn; BPBM 17002 (6), Pitcairn; BPBM 17003 (3), Pitcairn; BPBM 17026 (3), Pitcairn; BPBM 17028 (2), Pitcairn; BPBM 17534 (2), Tutuila, American Samoa; CAS 49689 (3), Bora Bora, Society Islands; CAS 49690 (3), Tahiti, Society Islands; UG 5855 (1), Guam; USNM 220071 (23), Tutuila, American Samoa; USNM 223124 (8), Pohnpei, Micronesia; USNM 224390 (1), Pohnpei, Micronesia; USNM 228974 (5), Rangiroa, Tuamotu Archipelago; USNM 283080 (11), Rotuma, Fiji; USNM 283088 (2), Rotuma, Fiji; USNM 283107 (9 paratypes), Rotuma, Fiji; USNM 283111 (3 paratypes), Rotuma, Fiji; USNM 283116 (4), Rotuma, Fiji; USNM 283123 (4), Rotuma, Fiji; USNM 283415 (2), Rotuma, Fiji; USNM 283426 (8), Rotuma, Fiji; USNM 283429 (5), Rotuma, Fiji; USNM 283442 (12 paratypes), Rotuma, Fiji; USNM 283449 (9), Rotuma, Fiji; USNM 283452 (2), Rotuma, Fiji; USNM 287097 (1), Rotuma, Fiji; USNM 287098 (1), Rotuma, Fiji; USNM 331033 (72), E'ua, Tonga; USNM 343974 (1), Erromango, Vanuatu; USNM 343080 (1), Vava'u, Tonga; USNM 343081 (2), Vava'u, Tonga;

USNM 343148 (1), Tongatapu, Tonga; USNM 343975 (1), Tanna, Vanuatu; USNM 343976 (1), Shepherd Islands, Vanuatu; USNM 343977 (6), Shepherd Islands, Vanuatu; USNM 344086 (2), Erromango, Vanuatu; USNM uncat. (6 paratypes), Rotuma, Fiji.

*Enneapterygius rhabdotus* Fricke, 1994: AMS I.21773-009 (holotype), Nuku Hiva, Marquesas Islands; AMS I.14317-001 (1 paratype), Vanuatu; AMS I.17490-061 (1 paratype), Savo, Solomon Islands; AMS I.21773-014 (2 paratypes), Nuku Hiva, Marquesas Islands; BPBM 8335 (3), Tahiti, Society Islands; BPBM 8648 (1), Tahiti, Society Islands; BPBM 11022 (11), Ua Pou, Marquesas Islands; BPBM 11714 (2), Fatu Hiva, Marquesas Islands; BPBM 12109 (2 paratypes), Hiva Oa, Marquesas Islands; BPBM 12393 (2), Nuku Hiva, Marquesas Islands; BPBM 12585 (10 paratypes), Nuku Hiva, Marquesas Islands; CAS 95954 (1), Chumphon Province, Thailand; CAS 95961 (2), Palau; USNM 228947 (1), Kiriwina, Papua New Guinea; USNM 259133 (9), Palawan, Philippines; USNM 259176 (32), Palawan, Philippines; USNM 259177 (9), Taiwan; USNM 279809 (1), Taiwan; USNM 279867 (1), Taiwan; USNM 283124 (4), Rotuma, Fiji; USNM 283422 (7), Rotuma, Fiji; USNM 287110 (1), Rotuma, Fiji; USNM 293702 (1), Batanes, Philippines; USNM 293728 (2), Batanes, Philippines; USNM 293910 (4), Batanes, Philippines; USNM 293954 (2), Batanes, Philippines; USNM 296270 (2), Nuku Hiva, Marquesas Islands; USNM 297726 (1), Kiriwina, Papua New Guinea; USNM 325704 (3), Batanes, Philippines; USNM 330370 (1), Kiriwina, Papua New Guinea; USNM 343064 (6), Vava'u, Tonga; USNM 343968 (2), Erromango, Vanuatu; USNM 343969 (5), Erromango, Vanuatu; USNM 343970 (1), Tanna, Vanuatu; USNM 343971 (6), Tanna, Vanuatu; USNM 343973 (17), Shepherd Islands, Vanuatu.

*Enneapterygius shaoi* Chiang & Chen, 2008: NTOU-P 2008-06-304 (holotype), Taiwan.

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