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A new species of the genus *Bellator* (Pisces: Triglidae), with comments on the trigloids of the Galápagos Islands

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Abstract.—A new, endemic species, *Bellator farrago*, is described from the Galápagos Islands. It differs from its congeners by a combination of characters including absence of a supplemental preopercular spine, short first dorsal fin spine, produced rostral spines, and lack of scales on the breast and interpelvic area. The Galápagos trigloid fauna comprises: *B. farrago*, *Prionotus miles*, *Pr. stephanophrys*, and *Peristedion crustosum*.

The fishes of the New World genus *Bellator* were revised by Miller & Richards (1991); they treated four Atlantic species and three eastern Pacific species. Recent collecting in and around the Galápagos by the submersible *Johnson Sea-Link* revealed the presence of an undescribed species. The submersible captured one specimen and another was found in the California Academy of Sciences Fish Collection. Prior to this study only one *Bellator* was known from the Galápagos based on Gruchy (1970), who added *Prionotus loxias* (=*Bellator loxias*) to the Galápagos fauna. A re-examination of the Gruchy specimens reveals that they also are this undescribed species and not *B. loxias*. This new species is diagnosed and described, and details of its habitat are provided based on observations made from the submersible. The submersible also captured three specimens of *Peristedion crustosum* Garman which is a new record of this species from the Galápagos.

Methods.—Counts and measurements follow Miller & Richards (1991).

Bellator farrago, new species
(Figs. 1–3, Tables 1–3)

[non] *Prionotus loxias:* Gruchy 1970:526 (misidentification). Miller & Richards 1991:646 (distribution, following Gruchy 1970). Bussing 1995:1646 (distribution).

Material examined.—Holotype: CAS 54562 (103.9 mm SL), southeastern Pacific, Ecuador, Galápagos Islands, Isla Santa Cruz, Academy Bay, R/V *Te Vega* Field No. TV24-VIII-68. 24 Aug 1968. Paratypes: CAS 86564 (96.2 mm SL), southeastern Pacific Ocean, Ecuador, Galápagos Islands, Isla Genovesa (Tower). 0°21.8′S, 89°58.2′W, JSL dive 3974, 462 m, coll. J. E. McCosker et al., 24 Nov 1995. NMC 69-78, 2 (75.5–112.4 mm SL), southeastern Pacific Ocean, Ecuador, Galápagos Islands, Isla Isabella, mouth of Tagus Cove, coll. Barr et al. 8 Mar 1968.

Diagnosis.—A species of *Bellator* with opercular spine short, breast and interpelvic area lacking scales, belly scaled, first dorsal spine shorter than second, supplementary preopercular spine weak or absent, anal rays 11, pored lateral line scales 50–52.

Description.—Morphometric data are in Table 1, meristic data in Table 2, and comparison with other eastern Pacific *Bellator* in Table 3. Head moderate with produced rostrum with small spines on distal edge; small spines on lateral edge of first, second, and third infraorbital bones; no nasal spine,

Fig. 1. Lateral view and dorsal view of head of *Bellator farrago*, new species, paratype CAS 86564, 96 mm SL. Illustration by Molly Brown.

although all head bones with very small spines giving rough texture; prominent spines on anterior and posterior edge of orbit; prominent nuchal, parietal, opercular and preopercular spines, but supplemental preopercular spine absent in three specimens and very weakly developed in one. Cleithral spine short, not prominent. First spine of the first dorsal fin shorter than second spine, serrate anteriorly. Base of first ray of second dorsal fin with serrate anterior edge. Teeth present on premaxillaries, dentaries, head of vomer, extending posteriorly from head of vomer on palatines. Nape, prepectoral area, opercle, breast, interpelvic area scaleless. Belly with scales. Lateral line with 50–52 scales bearing pores, body scales small, with cteni, with 10 rows above the lateral line and 24–34 rows below. Gill rakers on first arch include small rudiments on epibranchial and hypobranchial with short rakers on epibranchial and ceratobranchial (Table 2). First dorsal, second dorsal and anal fins with 11 elements each. Pectoral fin with 12–13 connected rays, 3 free rays. (Connected pectoral rays difficult to count.) Vertebrae 26 (9 + 17 on holotype and paratype CAS 86564). Swimbladder with extrinsic and intrinsic musculature. One papilla present on each eye at one o'clock on the following specimens: CAS 86564, NMC 69-78 (right eye only of 112.4 mm SL specimen). No papillae on eyes of holotype. Mandible with flat ridge about ⅔ its length.

Coloration.—Two prominent dark saddles below each dorsal fin and less distinct dark area on dorsal surface of caudal peduncle. Small, irregular, dark spots on dorsal surface of head. Dark areas on margin of interspinous membrane of first dorsal fin; dark margin on anterior edge of membrane of second dorsal fin. Trunk area below lateral line, and anal and caudal fins lack any dark areas, being basically pale. Pectoral fin with middle rays dark from base to tip. From color photograph of a specimen approximately 1 hour after death (Fig. 2): specimen bright red with dorsal saddles appearing as deep red, margin of first few interspinous membranes of first dorsal black, as well as ventral edge of caudal peduncle extending onto lower caudal rays. Dorsal fins and anal fin red with scattered yellow

Figs. 2–3. 2, Photograph of a paratype of *Bellator farrago*, new species (CAS 86564), taken approximately one hour after death. 3, Photograph of *Peristedion crustosum* taken form submersible *Johnson Sea-Link* at 486 m, seamount SE of Isla San Cristobal, Galápagos.

spots on second dorsal fin. Dark spots not visible on head but faint indication of yellow spots. Medial rays of caudal also yellowish. Pectoral fin with black medial rays extending to tip. Lower flank and bottom of head white.

Etymology.—From the Latin *farrago*, a medley or mixture, in reference to the new species' combination of its congeners' characters, here considered a noun in apposition.

Discussion.—This new species is endem-

Table 1.—Morphometric characters of *Bellator farrago*, new species.

Character	Specimens CAS 54562 (mm)	CAS 54562 %SL	CAS 54564 (mm)	CAS 54564 %SL	NMC 69-78 (mm)	NMC 69-78 %SL	NMC 69-78 (mm)	NMC 69-78 %SL
Standard length	103.9		96.2		112.5		75.5	
Head length	37.5	36.1	33.7	35.0	38.8	34.5	24.8	32.8
Rostral length	3.1	3.0	2.8	2.9	1.9	1.7	2.1	2.8
Rostral width	4.0	3.8	3.9	4.1	3.6	3.2	3.1	4.1
Snout length	16.5	15.9	15.8	16.4	14.3	12.7	9.3	12.3
Premaxillary length	15.5	14.9	12.7	13.2	15.3	13.6	9.8	13.0
Orbit length	10.4	10.0	8.3	8.6	11.3	10.0	7.0	9.3
Orbit depth	10.9	10.5	7.5	7.8	11.6	10.3	6.0	7.9
Interorbital width	3.9	3.8	3.8	4.0	4.9	4.4	3.8	5.0
Cheek height	8.7	8.4	8.5	8.8	8.9	7.9	5.6	7.4
Opercular spine length	10.1	9.7	9.8	10.2	11.3	10.0	7.2	9.5
Preopercular spine length	9.9	9.5	9.0	9.4	9.2	8.2	7.2	9.5
Cleithral spine length	8.3	8.0	7.9	8.2	7.6	6.8	7.0	9.3
1st Dorsal spine length	8.3	8.0	8.2	8.5	10.4	9.2	8.0	10.6
2nd Dorsal spine length	13.3	12.8	12.2	12.7	13.2	11.7	10.5	13.9
3rd Dorsal spine length	14.4	13.9	13.8	14.3	17.3	15.4	11.2	14.8
2nd Dorsal fin base length	25.5	24.5	25.7	26.7	28.4	25.2	18.5	24.5
Anal fin base length	30.9	29.7	29.3	30.5	33.2	29.5	22.6	29.9
Pectoral fin length	34.7	33.4	31.8	33.1	34.5	30.7	24.2	32.1
1st Free pectoral ray length	32.8	31.6	24.2	25.2	32.5	28.9	19.1	25.3
2nd Free pectoral ray length	28.1	27.0	21.5	22.3	28.6	25.4	16.9	22.4
3rd Free pectoral ray length	25.4	24.4	19.0	19.8	24.5	21.8	13.2	17.5
Pelvic fin length	30.6	29.5	28.1	29.2	32.2	28.6	21.9	29.0
Body depth	28.9	27.8	23.6	24.5	27.2	24.2	19.1	25.3
Least depth of caudal peduncle	7.3	7.0	7.1	7.4	8.4	7.5	6.1	8.1
Gill raker length	2.8	2.6	2.4	2.5	4.4	3.9	1.8	2.4
Snout angle (degrees)	43.0		28.0		34.0		33.0	

Table 2.—Meristic characters of *Bellator farrago* new species.

Character	Specimens CAS 54562	CAS 54564	NMC 69-78	NMC 69-78
Std. length (mm)	103.9	96.2	112.5	75.5
1st Dorsal fin rays	11	11	11	11
2nd Dorsal fin rays	11	11	11	11
Anal rays	11	11	11	11
Pectoral fin rays	13+3	12+3	12+3	12+3
Gill rakers				
Epibranchials	2r	2r	1+1r	1+1r
Ceratobranchials	7+3r	10+1r	10	10
Hypobranchials	3r	3r	3r	3r
Total gill rakers	7	10	11	11
Squamation				
Lateral line scales	52	52	52	50
Scale rows above lateral line	10	9	10	10
Scale rows below lateral line	30	27	34	24

Table 3.—Characters for distinguishing the eastern Pacific species of *Bellator*.

Characters	Species			
	gymnostethus	*loxias*	*xenisma*	*farrago*
Supplemental preopercular spine	present	absent	present	absent
First dorsal spine	shorter than 2nd	longer than 2nd	longer than 2nd	shorter than 2nd
Breast & interpelvic area	naked	scaled	scaled	naked
Rostral spines	produced	not produced	produced	produced

ic to the Galápagos Islands and is easily distinguished from its congeners. Its possesses character states present in other Pacific *Bellator* (see Table 3); however, in combination it differs from each. Its coloration is most like that of *B. loxias* Jordan (in Gilbert 1896) and it has a similar but notably different preopercular spine condition, but differs in squamation and rostral spine condition. The new species' reduced first anterior dorsal spine is like that of *B. gymnostethus* Gilbert 1891, from which if differs in its coloration and preopercular spine condition. *Bellator farrago* is similar to *B. xenisma* (Jordan & Bollman, 1890) in coloration and in its rostral spine condition, but differs in its preopercular spine state, its first dorsal spine condition, and in lacking scales on the breast. Its exact relationship to other species of *Bellator* cannot be determined at this time as character polarity for the genus has not been developed nor have cladistic analyses been made. It is premature to speculate further.

A paratype of the new species (CAS 86564) was collected by the junior author while aboard the submersible (JSL). It was captured using the submersible's suction device and photographed at the surface soon after its death (Fig. 2). The water depth at the collection site was 462 m, temperature 8.58°C, and the bottom was largely black volcanic rock overlain with sand patches and small boulders partially encrusted with a thin cover of stony corals and sponges.

As a result of our studies, we conclude that the Galápagos trigloid fauna comprises: *Bellator farrago, Prionotus miles*, and *Pr. stephanophrys* of the family Triglidae and *Peristedion crustosum* Garman, 1899 of the Family Peristediidae. As stated in the introduction, the previous record of *B. loxias* (as *Prionotus loxias*, Gruchy 1970) from the Galápagos was based on material which we describe herein as *B. farrago. Bellator loxias* reaches offshore to the Cocos Island area as noted by Bussing (1995) and a specimen collected by the *Albatross* (MCZ 30779, 81.0 mm SL) which was identified by the senior author. The species of *Prionotus* reported from the Galápagos also deserve explanation. *Prionotus miles* Jenyns, 1842 is an endemic species and has been captured at several locations throughout the islands. Galápagos records of *P. albirostris* Jordan & Bollman (1890) (Gruchy 1970, Bussing 1995, Grove & Lavenberg 1997) are based on misidentifications of *P. stephanophrys* Lockington (1881), as confirmed by the senior author after examination of Gruchy's specimens. Other erroneous records of Galápagos triglids are explained by Gruchy (1970:526): including Jordan & Evermann's (1896:2172) listing of *P. horrens* Richardson (1845) from Galapagos and Teague's (1951:26) mistake in listing the type locality of *P. quiescens* Jordan & Bollman (1890) as the Galápagos Islands rather than the Gulf of Panama.

Grove & Lavenberg (1997:302–303) reported upon a poorly preserved specimen (LACM 20838, 138.5 mm SL) of *Peristedion crustosum* Garman 1899 taken off Daphne Minor, Galápagos, in 1938 by the Allan Hancock Expedition. They suggested that "*Peristedion crustosum* may prove to be a mainland species, which would make the population in the Galápagos a new species." Four specimens of *Peristedion* were

collected by the junior author on JSL dives and after comparison with the type material of the two eastern Pacific *Peristedion* by the senior author, we find that the JSL specimens are *P. crustosum.* The specimens are: CAS 86565, 151.6 mm SL, Galápagos Islands, Isla Genovesa (Tower Island), 0°21.8′S, 89°58.2′W, JSL Dive 3974, sand bottom strewn with small volcanic rocks, 372 m; and CAS 86562, 103.1 and 108.8 mm SL, Galápagos Islands, 1°06′S, 89°12.2′W, seamount SE of Isla San Cristobal, JSL Dive 3934, volcanic rock and boulder bottom with sand channels, 486 m (Fig. 3). Other specimens were observed at Isla Fernandina, off Cabo Douglas (JSL Dive 3957, 0°17.5′S, 91°38.9′W), at 431 m resting on a 60° sand slope, and off Isla Floreana (JSL Dive 3944, 1°13′S, 90°23′W), above a flat sand bottom at 305 m, the single specimen collected and deposited at the Instituto Nacional de Pesca in Quayaquil.

Collection records for both species of *Peristedion* are unknown other than the material upon which Garman based his original description. *Peristedion crustosum* was illustrated by Garman in color, but the other species, *P. barbiger*, was not. The two species can be easily separated by the nature of the chin and lip barbels and rostral spine shape. In *P. barbiger* the barbels are unusually thick and closely spaced giving a thick bearded appearance. In *P. crustosum* the barbels are slimmer and fewer in number. *Peristedion crustosum* has a well developed nasal spine but this spine is weak or absent in *P. barbiger.* The striking difference is the form of the rostral spines. In *P. crustosum* these spines project forward nearly parallel, wherein *P. barbiger* these spines project forward in a convergent direction, though their tips do not touch. There were indications of thickening of these bones which possibly could be hyperostosis, a condition found in a few trigloid fishes.

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