A new species of the deepwater cardinalfish *Epigonus* (Perciformes: Epigonidae) from the Galápagos Islands

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Abstract A new species of deepwater cardinal fish, *Epigonus merleni*, is described from a specimen found floating at the sea surface as a result of the eruption of Fernandina Volcano, Isla Fernandina, Galápagos Islands. It differs from all known *Epigonus* in having the greatest number of lateral line scales (57) and the fewest gill rakers (17), as well as in several other characters.

Key words. — Epigonidae; *Epigonus merleni*; Galápagos.

The deepwater cardinalfishes of the speciose genus *Epigonus* live in nearly all oceans, typically along continental margins between 120–1400 m depth. Most are small, however some are desirable as food fish. They have variously been assigned to the Apogonidae, Epigoninae (Fraser, 1972), Cheilodipteridae, and most recently to the Epigonidae (Johnson, 1984, 1993). The species of *Epigonus* were first reviewed by Mayer (1974, 1975) who recognized 12 valid species, and subsequently by Abramov (1992) who recognized 25. Mayer and Tortonese (1977) resurrected *E. constanciae* and included *E. trewavasae* in its synonymy. Mochizuki and Shirakihara (1983) resurrected *E. atherinoides*, a species which Mayer (1974) and others had synonymized with *E. occidentalis*. Subsequent authors (Mochizuki and Shirakihara, 1983; Gon, 1985; Parin and Abramov, 1986a, b; Abramov, 1987; Abramov and Manilo, 1987) have added an additional 12 nominal species, and to that we add a fourth eastern Pacific species.

The holotype of our new species was found floating at the sea surface by Godfrey Merlen of the Charles Darwin Research Station during the 1995 eruption and coastal inflow of Fernandina Volcano off the Galápagos Islands (see Merlen, 1995, and McCosker et al., in press). Later that year the senior author observed but was unable to capture specimens of *Epigonus* while he was conducting an inventory of the deep slope Galápagos ichthyofauna from the submersible *Johnson Sea-Link*. Merlen's capture resulted in the only known specimen, and we take pleasure in naming it after him.

Materials and Methods

Measurements follow those of Mayer (1974: 148–149). Measurements are straight-line, made either with a 300 mm ruler with 0.5 mm gradations (for total length, trunk length, and tail length) and recorded to the nearest 0.5 mm, or with dial calipers (all other measurements) and recorded to the nearest 0.1 mm. Vertebral counts (which include the hypural) and rib examination were made from radiographs. The type specimen is deposited at the California Academy of Sciences (CAS) in San Francisco. Institutional abbreviations follow the Standard Symbolic Codes for Institutional Research Collections in Herpetology and Ichthyology (Leviton et al., 1985). Abbreviations are: SL, standard length; HL, head length.

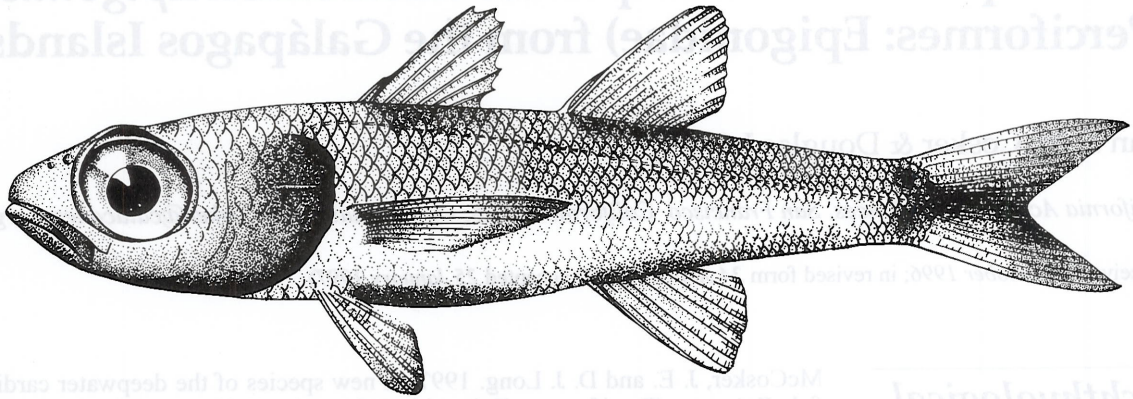

Fig. 1. Holotype of *Epigonus merleni*, CAS 86581, 146 mm SL.

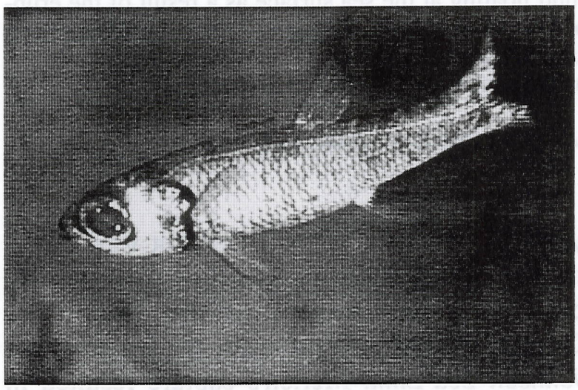

Fig. 2. *Epigonus*, presumably *E. merleni*, photographed from the submersible *Johnson Sea-link* at 900 m depth on 17 November 1995 off Cabo Douglas, Isla Fernandina, Galápagos Islands. The specimen was not collected.

Epigonus merleni sp. nov.
(Figs. 1–3)

Holotype. CAS 86581, 146 mm SL, an unripe male, found floating at the surface offshore of Cabo Hammond, Isla Fernandina, Galápagos Islands (00°28′S, 91°37′W), by Godfrey Merlen during February 1995.

Diagnosis. *Epigonus merleni* is distinguished from its congeners as follows: dorsal fin VIII+I, 9; opercular spine weak; 8th pleural rib below 10th vertebra; head length 2.6 in SL; body depth 4.5 in SL; 17 total gill rakers; 57 pored lateral line scales; and 5 pyloric caeca.

Measurements (in mm) of the holotype: standard length 146; head length 55.5; head height 24; snout to anus 85; eye 21.7; bony interorbital width 15.5; pectoral length 31; pectoral base 6; pelvic length 23; snout to first dorsal origin 57; first dorsal base 16.5; first dorsal spine 2.1; second dorsal spine 18; third dorsal spine 20; snout to second dorsal origin 85; anal fin base 12.5; lower jaw 17.5; snout 11.2; maxillary length 19; body depth 32; caudal peduncle depth 15.2; caudal peduncle width 7; caudal peduncle length 34.5.

Description. Body elongate, anterodorsal profile convex, rising without interruption (nearly smoothly) from tip of snout to first dorsal fin. Body depth 22% of SL; depth at caudal peduncle 10% of SL; length of caudal peduncle 24% of SL. Head length 38% of SL; snout blunt, 47% of HL; angle of gape moderate, approximately 40° above horizontal level of body; jaws equal. Maxilla reaching to approximately 25% of eye length; posteriormost part of maxilla reaches the ventral margin of the orbit. Eye nearly round, 39% of HL; anterodorsal rim of orbit reaching dorsal profile; bony interorbital width 28% of HL and 11% of SL. Head flat across bony interorbital.

Dorsal rays VIII+I,9; the first spine minute, the third the longest. Anal rays I, 9; the fourth the longest. Pectoral rays 17. Principal caudal rays 9+8.

Teeth conical, sharp and recurved, their bases not abutting each other. Premaxillary teeth 27 left and 28 right, a wide gap at the symphysis. Mandibular teeth similar in appearance and condition to those of the premaxillary, becoming

larger posteriorly, 22 on left, those of right side damaged. Teeth on vomer similar to those of jaws in size and appearance, arranged in a small chevron, 9 total, arranged along the perimeter. Palatine teeth inconspicuous, 3 on each side, closely spaced in a single row. Tongue edentulate.

Opercular spine weak, beneath 5 inconspicuous serrae, and not extending to posterior margin of opercular membrane. Angle of preopercle rounded; subopercle and interopercle not ornamented. Gill rakers 17, 4 above the angle, simple and awl-like. Gill filaments reduced (but damaged), shorter than rakers. Pyloric caeca 5, very elongate. Vertebrae 11+14. Ribs difficult to discern: epipleural ribs apparently 7, inserting on vertebrae 3–9; pleural ribs apparently 8, inserting on vertebrae 3–10. Pored lateral line scales 57.

All scales notably ctenoid. Two scale rows between lateral line and first dorsal fin; 7 scale rows between lateral line and anal origin; 12 predorsal scales.

Body color in ethyl alcohol brown, paler above and below the lateral midline. Skin beneath scales with a fine brown speckling throughout. Base of caudal peduncle darker dorsally and ventrally, with a narrow vertical band at its anterior edge. Fin membranes dark gray to black except pectoral which is gray. Snout, jaws, throat and posterior gill cover black; a dark smudge along ventral midline from pelvic base to anal fin origin. Peritoneum, mouth and branchial regions black. Intestine pale. Color in life (based on videotape of *in situ* specimen at 900 m depth) darker dorsally, flanks silver/gray, vent pale. Lateral line, cheeks, and ventral fin bases reflective (Fig. 2). Snout, interorbital, nape, opercular margin, and posterior half of caudal fin dark (cf. Fig. 3). Two dark spots, followed by pale patches, above and below the lateral line at the caudal peduncle.

Etymology. Named in honor of Godfrey Merlen, Galápagos naturalist.

Remarks. Adult *Epigonus*, presumably *E. merleni*, were seen and videotaped (see Figs. 2–3) by the senior author and R. Grant Gilmore of the Harbor Branch Oceanographic Institution during a November 1995 expedition to the Galápagos Islands. While diving aboard the submersible *Johnson Sea-Link*, McCosker and Gilmore observed but were unable to capture *Epigonus* on two occasions along the southwest shore of Isla Fernandina, off Cabo Douglas (00°14.6′S, 91°26.6′W), at approximately 900 m depth. The fish were approximately the size of the holotype and hovering or swimming slowly about 2–3 m above a steeply sloping sediment-coated volcanic bottom that fell off rapidly into deeper water. Temperature at the site was 6.8°C; salinity was 34.12 ppt. Our life-color description is based on those observations and videotapes that were taken.

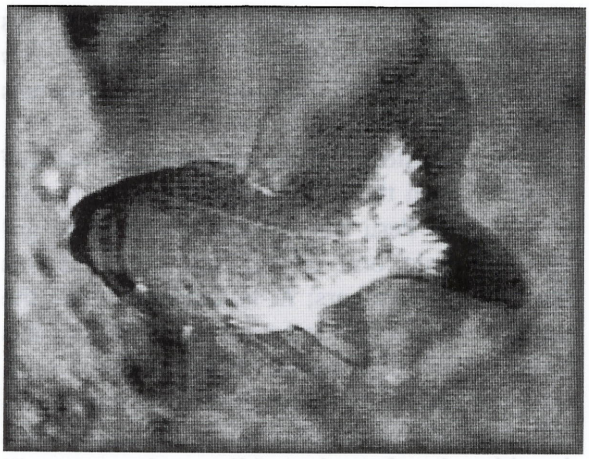

Fig. 3. *Epigonus*, presumably *E. merleni*, swimming away from the submersible *Johnson Sea-link* at 900 m depth on 17 November 1995 off Cabo Douglas, Isla Fernandina, Galápagos Islands, demonstrating the coloration of the caudal fin. The specimen was not collected.

Epigonus merleni differs from all its known congeners in possessing the greatest number of pored lateral line scales and the fewest gill rakers. As well, it differs in a combination of characters as described in Abramov's (1992) table 1. The new species is most closely related to Abramov's (1992: 100) "*E. telescopus* (species) group" which contains the largest species within *Epigonus*, all of which have eight spines on the first dorsal fin. The species in that group, which includes *E. angustifrons*, *E. macrops*, *E. notacanthus*, and *E. telescopus*, differ from *E. mer-*

leni in having more pyloric caeca, pectoral rays and segmented dorsal rays. Only *E. telescopus* and *E. merleni* have 11+14 vertebrae, whereas the others have 10+15.

From its eastern Pacific congeners, *E. merleni* is separable in the following manner: *E. crassicaudus* from Peru has a deeper body, more gill rakers, a pale oral cavity, and gill filaments longer than the rakers; *E. notacanthus* from the Nazca and Sala y Gomez submarine ridges has fewer lateral line scales, more pectoral rays, more gill rakers, and more pyloric caeca; *E. elegans* from the Nazca and Sala y Gomez submarine ridges has fewer lateral line scales, more gill rakers, and 8 as opposed to 9 total dorsal spines; and *E. atherinoides* from the Nazca and Sala y Gomez submarine ridges, as well as from off Japan, has a pungent opercular spine, fewer lateral line scales, and more pectoral rays and gill rakers.

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