

Cottoclinus canops, a New Genus and Species of Blenny (Perciformes: Labrisomidae) from the Galápagos Islands

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We describe *Cottoclinus* new genus, type species *C. canops* novum, from two specimens from Española Island, Galápagos Islands. The new genus is assigned to the labrisomid tribe Mnierpini Hubbs. The tribe is redefined and considered sister to the Labrisomini. It is united by nine synapomorphies: 1) body elongate to moderately elongate (depth 13%–22% of standard length); 2) spinous dorsal fin with no incision in outline, anterior rays soft and flexible; 3) anal fin rays all thickened, and fleshy at tips; 4) head blunt with upper jaw projecting; 5) lower lip interrupted by a pair of grooves outlining a frenum on chin; 6) lips thick and inflated; 7) scales expanded posteriorly forming pockets; 8) membrane of anal fin rays incised almost to base of rays; 9) belly and pectoral base naked. The two currently recognized monotypic genera in the tribe, *Dialommus* Gilbert 1891 and *Mnierpes* Jordan and Evermann 1896, are considered synonyms. The name Mnierpini is retained for the tribe. *Cottoclinus* differs from *Dialommus* in that there is no fleshy pigmented vertical bar across the eye separating two flat windows, and the posterior mandibular teeth are not abruptly smaller and set lower than the anterior teeth. *C. canops* is considered the basal member of the clade leading to *D. fuscus* and *D. macrocephalus*.

In 1964 Boyd W. Walker and Edmund S. Hobson of the University of California, Los Angeles, participated in a University of California expedition to the Galápagos Islands aboard the M/V *Golden Bear*, operated by the California Maritime Academy. They were able to make large collections of fishes at a number of the islands. Included in the material that they returned with were two specimens of a labrisomid blenny from a tidepool on Española (Hood Island), the southernmost Galápagos Island. Until recently, these two undistinguished-looking specimens had languished on a shelf with other unidentified material. Eventually they were brought to the attention of one of us (JSS). In concert with the other two authors of this paper, it was determined that they represented an undescribed genus and species. It is the purpose of this paper to describe the genus and species and to present a hypothesis of relationships.

MATERIALS AND METHODS

Type specimens of the new species are deposited in the Department of Ichthyology of the California Academy of Sciences (CAS), San Francisco. Measurements are straight-line (point to point) and made with dial calipers and recorded to the nearest 0.1 mm. Length of specimens is given as standard length (SL), the distance from the front of the upper lip to the base of the caudal fin. Body depth is measured vertically from the origin of the anal fin; body width is taken just posterior to the gill opening. Head length (HL) is measured from the front of the upper lip to the pos-

* The order of authorship was randomly determined.

terior end of the opercular membrane, and snout length is from the upper lip to the fleshy edge of the orbit. Orbit diameter is the greatest fleshy diameter, and interorbital width is the least fleshy width.

***Cottoclinus* McCosker, Stephens, and Rosenblatt, new genus**

Type species *Cottoclinus canops*, new species.

DIAGNOSIS.— That of the single included species.

ETYMOLOGY.— From the generic names *Cottus* and *Clinus*, in reference to the cottid-like appearance of this blenny. Gender masculine.

***Cottoclinus canops* McCosker, Stephens, and Rosenblatt, new species**

Figs. 1–4, Table 1

MATERIAL EXAMINED.— Holotype: CAS 217107 (formerly W64–35), an immature male, 45.2 mm SL, from a low tidepool on the south side of Punta Suarez, Isla Española (Hood), Galápagos Islands, collected on 18 Feb. 1964 by M. Castro. Paratype: CAS 217108, an immature female, 54.4 mm SL, collected with the holotype.

DIAGNOSIS.— A moderate-sized mniierpin labrisomid blenny with the following characteristics: body moderately elongate (depth 4.4–5.1 in SL); head bulbous, slightly depressed; lips fleshy; posterodorsal corner of maxillary slips into a cheek pouch; nasal, orbital, and nuchal cirri small and fimbriate; breast and belly scaleless; scales membranously expanded posteriorly to form pockets; spinous dorsal fin rays nearly level, lower and less numerous than dorsal fin soft rays; one anal fin spine; interradiial membrane of anal fin incised almost to base of each ray; all fin-rays unbranched; cornea convex, eyeball lacking a vertical bar and heavy pigmentation; teeth conical, stout, slightly recurved; medial teeth of dentary notably larger than lateral teeth; vomerine teeth present, palatine teeth absent.

DESCRIPTION.— Meristic values listed are those of the holotype, those for the paratype are in parentheses. (We have selected the larger of the two specimens to be the paratype in that it is bent and in poorer condition.) Counts: D XXI, 10 (XX, 10); A I, 19; P₁ xiii; P₂ I, 3; C xiii; branchiostegal rays 6, pored lateral line scales 47; vertebrae 10 + 25. Body depth about 4.5–5.1 in length. Head roughly quadrangular when viewed from front; its depth about 90% of width. Eyes set high, entering dorsal profile, cornea not divided. Lips fleshy, lower lip with a free ventral flap attached to a medial frenum. Mouth short; maxilla, which slips into cheek pouch, ends at level of posterior margin of pupil.

Premaxilla with a small, conical symphyseal tooth, followed by an outer row of 10 conical teeth that decrease in size posteriorly. A few vomerine teeth, palatine teeth absent. An interior patch of setiform teeth at head of premaxillary. Dentary of holotype with a pair of enlarged incisors at



FIGURE 1. Lateral and dorsal views of holotype of *Cottoclinus canops*, CAS 217107, 45.2 mm SL.

symphysis, followed by 5 conical recurved teeth, increasing in size posteriorly; sixth tooth about 1/3 length of fifth, followed by a row of small, increasingly flattened teeth. A small medial patch of villiform teeth near symphysis. Dentition of paratype somewhat different: symphyseal teeth not so conspicuously enlarged; second through fifth teeth about 3/4 as long as symphyseals, then teeth 6 and 7 are conspicuously enlarged, about twice as long as symphyseal teeth, with teeth 8 through 11 similar in size to teeth 2 to 5.

Posterior nostril with a raised rim, anterior nostril with a short tube surmounted by a palmate tentacle with about

7 fimbriae. A small fimbriated supraorbital cirrus dorsally on the eyeball, and a pair of fimbriated nuchal cirri arising from a common base on the nape on either side of the first dorsal fin spine.

Dorsal fin spines 1–20 subequal, but spines 18–20 decrease in length, resulting in a distinct notch between the spinous dorsal fin and the soft dorsal fin. Margin of soft dorsal fin rounded, 2nd through 5th rays longest. Last dorsal fin ray free from caudal peduncle. Anal fin spine 1/3 (1/2) as long as first soft-ray. Anal fin soft-rays thickened, their membranes incised almost to the base, except for the last 6 rays. Pectoral fan-shaped, rays 7–9 longest; rays 9–13 thickened. Pelvic spine splint-like, soft-rays one and two stout, soft ray 3 slender, but almost as long as second.

Body scaled except for breast, belly, an area anterior to pectoral fin, and an area at nape extending back along first 4 or 5 dorsal fin spines. Scales with posterior membranous caudal expansions, forming pockets, particularly on lower sides. Lateral-line scales pored, the pore openings being located along the mid-dorsal scale margins; posteriorly, pores become obsolete.

Cephalic sensory pores (Fig. 2) mostly minute, numerous, many appearing as skin prickles. The following is based on the condition of the holotype. Mandibular (M) series with six pores on each side, the first along the symphysis, the following four evenly spaced, the last more separated. Six preopercular (PO) pores closely following the posteri-

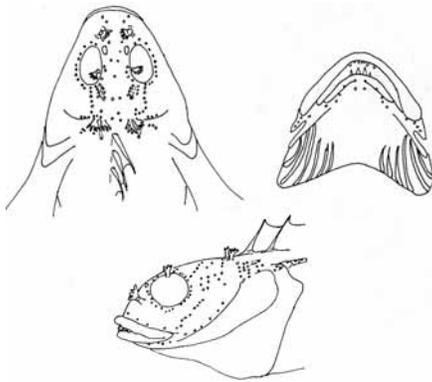


FIGURE 2. Lateral (left), dorsal (right) and ventral (below) views of cephalic sensory pores of holotype of *Cottoclinus canops*, CAS 217107, 45.2 mm SL.

TABLE 1. Measurements in millimeters of the holotype and paratype of *Cottoclinus canops*, new species.

	<i>Holotype</i>	<i>Paratype</i>
Standard length	45.2	55.4
Head length	15.0	16.8
Head width	10.3	13.3
Head depth	7.2	9.1
Orbit	3.3	3.4
Preanal distance	23.0	29.2
Longest pectoral ray	13.2	14.3
Body depth at anal origin	8.8	12.2
Caudal peduncle depth	4.3	4.9
Longest dorsal fin spine	5.1	—
Longest caudal ray	9.8	11.7

most mandibular pore. A series of four pores above maxilla, followed by an upward-arching row of approximately eight small pores. Two pores above upper lip in advance of the anterior nostril, followed by three pores (the middle pore lacking on left side of holotype above the anterior frontal region). A single median interorbital or commissural (C) pore is followed by a pore pair, then a single median supratemporal (MST) pore that is closely followed by another pore pair. The orbits are surrounded by numerous minute infraorbital (IO), postorbital (PO), and supraorbital (SO) pores. Additional rows of minute pores are located between the POP and PO regions. There are few preorbital pores, although two nasal pores (N) lie between, and just medial to, the anterior and posterior nostrils. A row of minute pores

passes from the mid-PO region to form a "T"-shaped juncture alongside the ST pores. Several minute pores lie distal to the nuchal cirri, which are followed by a large lateral supratemporal (ST) pore.

Body coloration in isopropyl alcohol tan, with a suggestion of 3 or 4 diffuse bars. Head of holotype profusely spotted with brown flecks, these less conspicuous in the paratype. Upper lip with a brown mark at the corner of mouth and another near midline, the latter one continued on lower lip. Middle and lower pectoral rays brown. Caudal fin of holotype with the suggestion of 3 vague bars. Eyeball pigmented dorsally, but no suggestion of a pigmented vertical bar across eye.

ETYMOLOGY.— From the Greek *kanon*, rule or standard, and *ops*, eye, in reference to the normal structure of the cornea.

RELATIONSHIPS.— Hubbs (1952) established the tribe Mnierpida (*sic*) within his subfamily Labrisominae (now Labrisomidae) for the reception of the genera *Mnierpes* and *Dialommus*. The tribe was defined by: 1) "a fleshy bar runs vertically across pupil of eye; 2) body elongate (depth 13%–17% of standard length); 3) spinous dorsal fin with anterior rays soft and flexible, with no incision in outline; 4) anal fin rays all enlarged and fleshy at tips; 5) head blunt with upper jaw projecting." To these we can add: 6) posterior dentary teeth abruptly smaller and set lower than the anterior teeth; 7) lower lip interrupted by a pair of grooves outlining a frenum on chin; 8) lips thick and inflated; 9) scales expanded posteriorly forming pockets; 10) membrane of anal fin rays incised almost to base of rays; and 11) belly and pectoral base naked. Although no cladistic analysis of relationships of all labrisomid genera has been attempted, the classification of Stepien et al. (1993, 1997) based on molecular data indicates that the tribe Labrisomini (genera *Malacoctenus* and *Labrisomus*) is sister to the tribe Mnierpini (*sensu* Hubbs). The above 11 character states are synapomorphies of the Mnierpini with respect to the Labrisomini.

Cottoclinus shares all of these synapomorphies except 1 and 6. (Although *C. canops* is not as elongate as *D. fuscus* and *D. macrocephalus* — body depth 19.5% and 22% in holotype and paratype respectively — it is still relatively elongate in comparison to other labrisomids.) Relationships are best indicated by placing *Cottoclinus* as the basal member of the clade leading to *Mnierpes* and *Dialommus* (Fig 3). Those genera were separated by Hubbs on the basis of number of anal fin spines (1 versus 2), presence or absence of a supraorbital, and meristic and proportion-

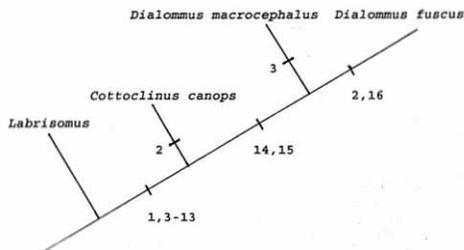


FIGURE 3. Cladogram of hypothesized relationships within the Mnierpini. Characters are: 1) orbital cirri present; 2) 1 anal fin spine; 3) 2 anal fin spines; 4) body elongate (depth 19–22% of SL); 5) anterior spinous dorsal fin rays flexible, without incision; 6) anal fin rays enlarged, tips fleshy; 7) head blunt, upper jaw projecting; 8) posterior dentary teeth smaller and lower than anterior; 9) chin frenum present; 10) lips thick and inflated; 11) posterior scale pockets; 12) membrane of anal rays incised; 13) belly and pectoral base naked; 14) body very elongate (depth 13–17% of SL); 15) a vertical fleshy bar across pupil; 16) orbital cirri absent.

al characters more suitable for the distinction of species than genera. *Dialommus* then would be characterized by the presence of 1 anal fin spine and the lack of an orbital cirrus (an autapomorphy), and *Mnierpes* by the presence of a supraorbital cirrus and 2 anal fin spines. One anal fin spine and no orbital cirri are each apomorphic features within the Labrisomidae. However, *Cottoclinus* shares one apomorphic and one plesiomorphic character state with each.

Inasmuch as *Cottoclinus* has 1 anal fin spine, and if the phylogeny diagrammed in Figure 3 is valid, two hypotheses can be erected. Either the common ancestor of *Dialommus* and *Mnierpes* had one anal fin spine and an anal fin spine was gained in *Mnierpes* as a reversal, or the common ancestor had two anal fin spines and an anal fin spine was lost independently in *Cottoclinus* and *Dialommus*.

In either case, the synapomorphies of the complex corneal modifications (Graham and Rosenblatt 1970) and the condition of the mandibular dentition would have been present in the common ancestor of *Dialommus* and *Mnierpes*. The anal fin spine-pterygiophore relationship in *Mnierpes* is essentially identical to the plesiomorphic condition in *Labrisomus* and *Malacoctenus*, and both *Cottoclinus* and *Dialommus* have lost the first spine but retained the first pterygiophore (Fig. 4). (The phylogeny as diagramed in figure 3 reflects the independent loss of an anal fin spine.) Therefore, we cannot reject either hypothesis on the basis of available evidence.

The common possession of the dentition and corneal specializations in the monotypic genera *Dialommus* and *Mnierps* indicates common ancestry and the species *D. fuscus* and *M. macrocephalus* should therefore be regarded as congeneric. *Dialommus* Gilbert 1891 (type species *D. fuscus* Gilbert 1891) is senior to *Mnierpes* Jordan and Evermann 1896 (type species *Clinus macrocephalus* Günther 1861), and *Mnierpes* is a junior synonym of *Dialommus*.

REMARKS.— The membranous posterior prolongation of the scales to form pockets and the separation and thickening of the anal fin rays have been hypothesized as adaptations to amphibious life; the former would hold water, and the latter would aid in clinging to sloping surfaces and in terrestrial locomotion (Clark 1932; Graham 1970). These modifications are already present in *Cottoclinus*, indicating that the ancestor of the fuscus-macrocephalus clade must have attained considerable terrestriality even before the modifications of the eye had developed.

In January 2002, JMc and JSS returned to Española and collected in tidepools contiguous with the type locality of *C. canops*. They were unable to access the pool sampled in 1962 but were able to collect from two pools within a km of that site. In general, the pools were devoid of large fish. The following species were collected: one each of *Muraena lentiginosa*, *Echidna nocturna* and *Uropterygius macrocephalus*; several *Scorpaena mystes*, *Acanthemblemaria castroi*, *Starksia galapagensis* and *Ogilbia deroyi*; numerous *Dialommus fuscus* (in the 1962 collection, 24 *D. fuscus* were collected from the same pool as the two *C. canops*) and *Malacoctenus zonogaster*; and hundreds of small *Tomicodon chilensis*.

Recent El Niño events (1982–1983 and 1997–1998) have had strong effects on tidepool and shallow subtidal species at the Galápagos. For example, the abundant shallow-water chaenopsid, *Acanthemblemaria castroi*, had largely disappeared following the most recent El Niño (JMc and C. C. Baldwin, personal observations), but it is once again abundant, and the conspicuous midwater pomacentrid, *Azurina eupalama*, has not been seen at Galápagos since 1977. We consider the possibility that *Cottoclinus canops* might be a naturally-occurring casualty of a recent El Niño event.

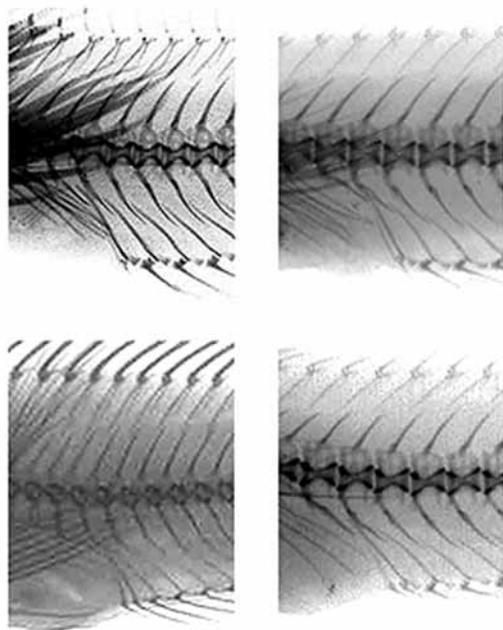


FIGURE 4. Lateral view of radiographs of anterior anal fin and supporting elements. (Images have been slightly enlarged or reduced to facilitate comparison.) Upper left, *Cottoclinus canops*, holotype, CAS 217107, 45.2 mm SL. Upper right, *Dialommus fuscus*, CAS 23754, 68 mm SL. Lower left, *Labrisomus dendriticus*, CAS 46577, 88.5 mm SL. Lower right, *Dialommus macrocephalus*, CAS 213855, 63 mm SL.

The known distribution of *Dialommus macrocephalus* is from Cape San Lucas to the Bay of Panama and *D. fuscus* is widely distributed within the Galápagos archipelago and Cocos Island (Costa Rica). *Cottoclinus canops* is known only from the Galápagos. Based on the basal position of *C. canops*, it could be argued that the tribe evolved on the Galápagos and that the progenitor of *D. macrocephalus* invaded the mainland from there or from Cocos Island.

The tribal name Mnierpini, based on a generic junior synonym, is retained in accordance with Article 40.1 of the Code of Zoological Nomenclature: “When the name of a type genus of a nominal family-group taxon is considered to be a junior synonym of the name of another nominal genus, the family-group name is not to be replaced on that account alone” (International Commission on Zoological Nomenclature 1999).

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