

- 41(40). Elytra entirely dark reddish brown or dark reddish brown except sharply or diffusely paler at sides and apex; nearly glabrous; head and pronotum shining, not dull and granulate appearing 41a
- Elytra entirely reddish brown; pronotal disc and scutellum blackish; head black; head and pronotum dull and granulate appearing, micropunctate; elytra 0.9–1.1 mm long; male protibia with 2 small stalked discs on medial face of apical portion of protibia; Brazil *granulata* Miller
- 41a(41). Head black, pronotum and elytra dark reddish brown; male protibiae with 2 broad, flat, slanting setae on medial face; male genitalia sigmoid in lateral view; Brazil *brasilia* Miller
- Head black or dark reddish brown; pronotum dark reddish brown; elytra uniformly reddish-brown or reddish-brown at base and distinctly testaceous apically (extending obliquely about to elytral midlength); male protibiae without broad, flat, slanting setae or suckerlike setae on medial face; male genitalia not sigmoid in lateral view 41b
- 41b(41a). Elytra black with abruptly testaceous apices; male genitalia with broad median lobe (Fig. 12); Ecuador *andrea* n. sp.
- Elytra uniformly reddish-brown; male genitalia with bifurcate median lobe (Fig. 14); Ecuador *milleri* n. sp.

When the new species *C. milleri* is keyed through the first rubric of Miller's (1974) key (i.e., to the North American species), it keys to couplet 22 where it may be separated from *C. atra* by its South American distribution and the following characters: male protibia not "elbowed," male protibia with single large spine on medial face, and different shape of male genitalia.

The distinctive single large spine on the medial face of the male protibia will distinguish *C. milleri* from all other species of *Chaetarthria* from South America except *C. andrea*, new species. From the Ecuadorian *C. andrea*, new species, *C. milleri*, new species is easily recognized by its uniformly reddish-brown elytra instead of having black elytra with abruptly testaceous apices. Also, the male genitalia of *C. milleri*, new species, has a bifurcate median lobe (Fig. 14); whereas, the median lobe of *C. andrea*, new species, is a broad lobe (Fig. 12).

The new species *C. milleri* fits into Miller's *glabra* group along with *C. glabra* Sharp, *C. hintoni* Miller, *C. laeticula* Miller, *C. truncata* Miller, and *C. andrea*, new species, because they all share the characters for the group given under the description of *C. andrea*, new species. Consequently, *C. milleri* is the sixth species in this group, and it is the second species of the group known from South America.

In Miller's proposed phylogeny for the New World species of

Chaetarthria, *C. milleri* should be placed next to *C. glabra* with which it is very similar in being smooth, shining, and almost completely without punctures or vestiture. However, *C. milleri*, new species, has the sides of the elytra very coarsely, densely punctate; whereas, on *C. glabra* these punctures are much finer and sparser. Also, *C. milleri* is known only from South America and *C. glabra* only from Central America. Furthermore, the male genitalia of *C. milleri* has a bifurcate median lobe, and *C. glabra* has a broad, undivided median lobe.

Acknowledgments

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Literature Cited

- Miller, D. R. 1974. Revision of the New World *Chaetarthria* (Coleoptera: Hydrophilidae). *Entomologica Americana* 49(1):1-123.

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TWO NEW SPECIES OF *COLOBOMATUS* (COPEPODA:
CYCLOPOIDA) PARASITIC ON PACIFIC FISH

Roger F. Cressey

The two new species of *Colobomatus* described below were discovered and given to me for study by Drs. Victor Springer and Bruce Collette. In appreciation for bringing these interesting parasites to my attention the copepods are named for their discoverers.

The species reported here bring the total known species of *Colobomatus* to 30. The rather secretive habits of these parasites, dwelling in the lateral line canals of the hosts, lead me to believe that careful examination of this microhabitat would produce many more new species.

I thank Hillary Boyle for assisting in the preparation of the figures and Dr. Robert Lavenberg of the Los Angeles County Museum for sending me additional specimens of infested *Cryptotrema corallinum* Gilbert.

Colobomatus springeri, new species
Figs. 1-4

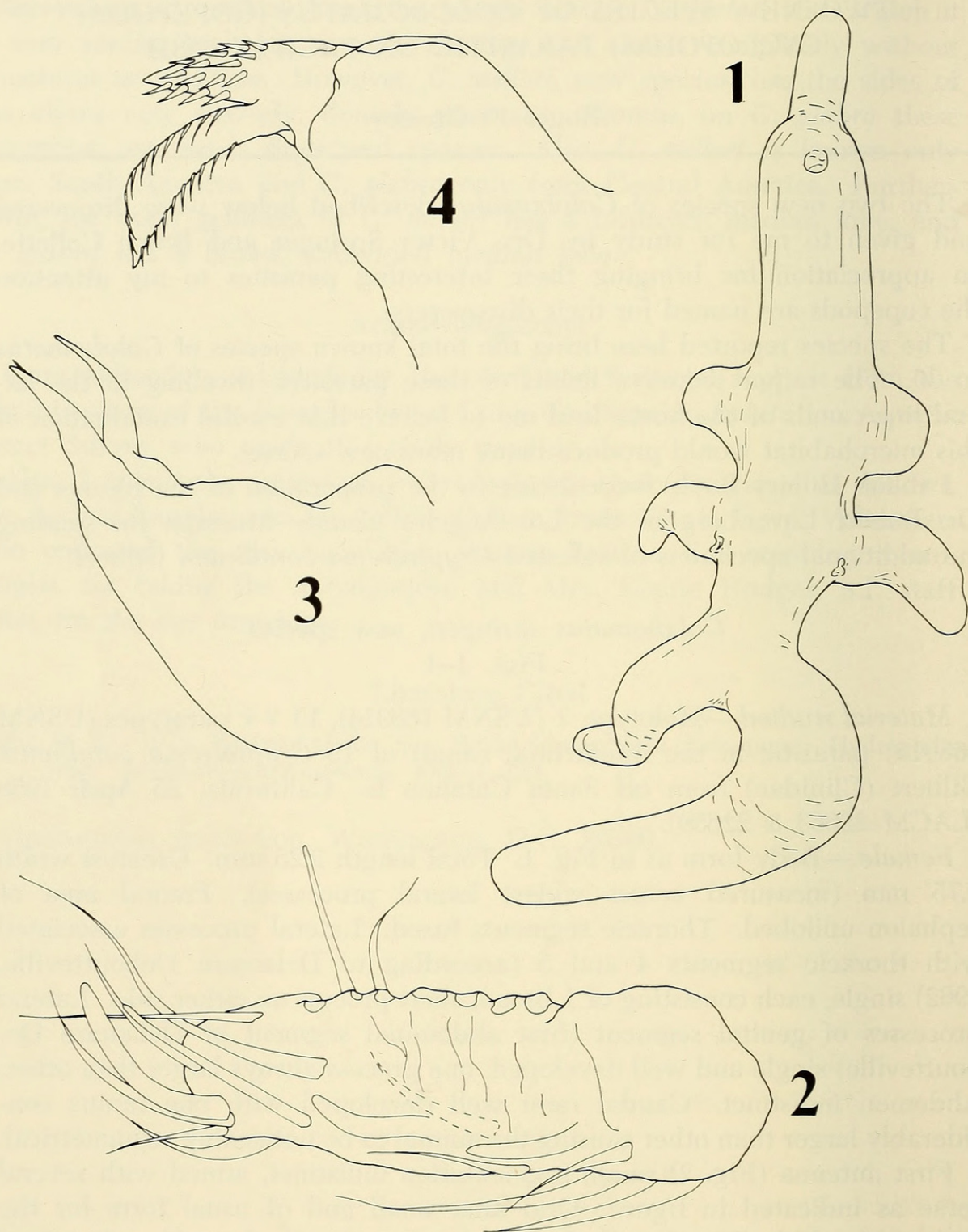
Material studied.—Holotype ♀ (USNM 168914), 13 ♀ ♀ paratypes (USNM 168915) parasitic in the interorbital canals of 15 *Cryptotrema corallinum* Gilbert (Clinidae) from off Santa Catalina Is., California, 25 April 1958 (LACM 22663 & 22659).

Female.—Body form as in Fig. 1. Total length 2.25 mm. Greatest width 0.75 mm (measured across widest lateral processes). Preoral area of cephalon unilobed. Thoracic segments fused. Lateral processes associated with thoracic segments 4 and 5 (according to Delamare Deboutteville, 1962) single, each consisting of 1 broad, short process on either side. Lateral processes of genital segment (first abdominal segment of Delamare Deboutteville) single and well developed, one process always larger than other. Abdomen indistinct. Caudal rami well developed with one ramus considerably larger than other causing the animal to be noticeably asymmetrical.

First antenna (Fig. 2) small, segmentation indistinct, armed with several setae as indicated in figure. Oral area small and of usual form for the genus. Mandible (Fig. 3) a fleshy lobe bearing distally 2 weakly sclerotized processes. First maxilla, if present, not seen. Second maxilla (Fig. 4) somewhat more sclerotized than mandible; consisting of a basal segment and a short terminal segment armed with 2 spinose processes; shorter process covered with stout spinules; longer process armed with 2 rows of fine spinules. Maxilliped absent.

No other appendages could be seen.

Egg sacs long; easily broken when copepod removed from host.



Figs. 1-4. *Colobomatus springeri*, female: 1, Ventral; 2, First antenna; 3, Mandible; 4, Second maxilla.

Male.—unknown.

Etymology.—The copepod is named for Dr. Victor Springer who brought this interesting new species to my attention.

Remarks.—The peculiar asymmetrical form of this species easily separates

it from all known species of *Colobomatus*. The single anterior cephalic lobe further separates it from all species except *C. goodingi* Cressey & Collette and *C. muraenae* (Richiardi). *Colobomatus springeri* can be separated from *C. goodingi* by the absence of a posterior lobe between the caudal rami (present in *C. goodingi*). It can be separated from *C. muraenae* as well as all other described species by the nature of the first pair of lateral processes. In all known species except *C. springeri* the first pair of lateral processes are bifurcate (each bearing 2 horns). In *C. springeri* these processes are without the usual anterior/posterior horns. In all other described species the lateral processes of the genital segment are smaller than those of the thoracic segment. Those of *C. springeri* are larger and, as in the case of the caudal rami, they are unequal in size.

Colobomatus collettei, new species

Figs. 5-9

Material studied.—Holotype ♀ (USNM 168916) and 4♀♀ paratypes (USNM 168917), parasitic in the interorbital canals of 5 *Hemiramphus robustus* Gunther (USNM 212041) collected by J. E. McCosker, 17 Dec. 1972 from McCluer Gulf off New Guinea (2°30'S, 132°30'E).

Female.—Body form as in Fig. 5. Total length 2.63 mm. Greatest width 0.88 mm (measured across widest lateral processes). Preoral area bilobed (Fig. 6). Oral area projecting ventrally on a conical base. Two pairs of lateral processes associated with thoracic segments 4 and 5, anterior pair smaller than posterior. Lateral processes of genital segment well developed. Posterior abdominal lobe projecting well beyond caudal rami.

First antenna (Fig. 7) 33 μ m long, indistinctly segmented, armed with setae as indicated in the figure, several setae long and hairlike.

Oral area very small (60 μ m wide) with second maxilla visible within (Fig. 8), bearing a toothed terminal process, a shorter distal seta, and a small patch of setules on basal segment. Details of other oral appendages could not be seen.

Leg 1 (Fig. 9), scarcely visible under highest magnification (1,500 \times), appearing to be uniramous, 2-segmented and bearing setae as indicated in figure. No other thoracic appendages could be seen.

Egg sacs of usual form, easily broken when removed from host.

Male.—Unknown.

Etymology.—This species is named for Dr. Bruce Collette who discovered the parasite during his studies on the halfbeak host.

Remarks.—This new species can be separated from all known species of *Colobomatus* except *C. haeckeli* (Richiardi), *C. goodingi* Cressey and Collette, and *C. exilis* Izawa by the presence of a prominent posterior lobe between the caudal rami on the new species. *Colobomatus goodingi* is unilobed anteriorly separating it from *C. collettei*. It can be separated from *C.*



1977. "Two new species of Colobomatus (Copepoda: Cyclopoida) parasitic on Pacific fish." *Proceedings of the Biological Society of Washington* 90, 579–583.

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