

ZOOLOGY—A new species of *Haloptilus* (Copepoda: Calanoida) from equatorial and subtropical waters of the east-central Pacific Ocean¹. GEORGE D. GRICE,² Woods Hole Oceanographic Institution, Woods Hole, Mass. (Communicated by Paul L. Illg.)

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The new species of *Haloptilus* described below was found while examining a series of plankton samples which had been collected by the U. S. Fish and Wildlife Service as part of their oceanographical and marine biological studies in the Pacific Ocean.

***Haloptilus austini*, n. sp.**

Figs. 1-18

Localities and materials.—Latitude 28°00'N., longitude 159°03'W. (U. S. Fish and Wildlife Service *Hugh M. Smith* Cruise 27, station 67, February 19, 1955, 100-0 m depth of tow, 1 female); latitude 00°11'S., longitude 119°58'W. (*Hugh M. Smith* Cruise 31, station 94-2, November 7, 1955, 146-72 m depth of tow, 2 females). Physical oceanographic and other data for Cruise 27 are summarized by McGary and Stroup (1958) and that for Cruise 31 by King, Austin, and Doty (1957).

Types.—All three specimens have been deposited in the U. S. National Museum. A female from Cruise 31 was selected as the holotype (U.S.N.M. no. 102742). Paratype numbers are as follows: U.S.N.M. no. 102744 (1 female, Cruise 31) and U.S.N.M. no. 102743 (1 female, Cruise 27).

Description.—Female (Figs. 1-18). The cephalothorax is much longer than the abdomen, the ratio of these two body parts being approximately 8 to 1 (Fig. 1). The head is rounded and considerably produced anteriorly (Figs. 1 and 2). A convex protrusion is present on each side at a point adjacent to the origin of the second antennae. The rostral filaments (Figs. 2 and 3) arise from two small elevations which are situated a short distance in front of the origin of the first antennae.

The abdomen (Figs. 4, 5, and 6) consists of 4 segments. The genital segment is longer than the combined lengths of the succeeding 3 segments.

¹Contribution No. 116 Hawaii Marine Laboratory, University of Hawaii.

²Fellow of the John Simon Guggenheim Memorial Foundation, 1958-1959.

The first antennae of all three specimens are broken off at segment 22. When held against the body, segment 20 reaches to approximately the end of the caudal furcae. The endopod of the second antennae (Fig. 7) is a little less than twice the length of the exopod. The exopod consists of 7 segments. Segment 1 has 2 setae. Segments 2 through 6 are furnished with a single seta. There are 4 setae on segment 7. The first segment of the endopod has 2 setae situated just beyond the mid-point of this segment. The external lobe of the second endopodal segment has 6 large and 1 minute seta. The internal lobe has 8 setae, 4 of which are notably small.

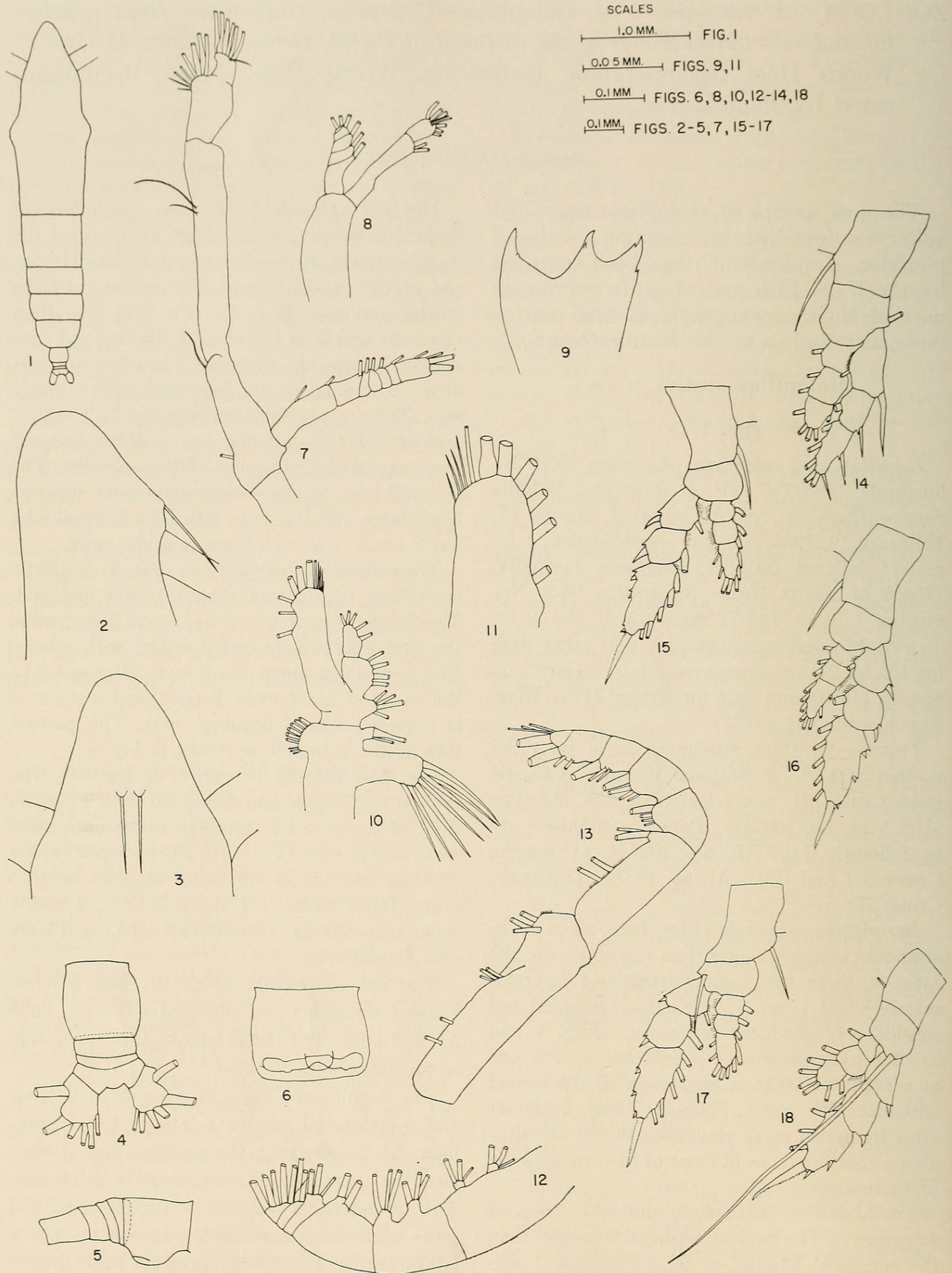
The exopod of the mandible (Fig. 8) is a little more than one-half the length of the endopod. The former apparently consists of 5 segments, the first 4 of which are furnished with a seta. The terminal segment has 2 setae. Segment 1 of the endopod has 2 setae distally, and segment 2 is provided with 8 terminal setae. The gnathal lobe of the mandible is shown in Fig. 9.

The first maxilla is shown in Fig. 10. The exopod is elongate and furnished with 11 setae. Four of the setae on the distal margin are quite small and slender (Fig. 11). The endopod carries 5 setae, and the second basal segment bears 4 setae. Inner lobes 1, 2 and 3 bear 7, 2 and 4 setae, respectively. The external lobe has 6 large and 3 small setae.

The second maxilla (Fig. 12) has 6 lobes. Lobes 1 through 4 and lobe 6 have 3 setae. Lobe 5 has 2 setae. The distal part of this appendage is furnished with 7 setae.

The maxilliped (Fig. 13) consists of 2 basal and 5 endopodal segments. The first basal segment has 2 setae near the proximal end, 3 setae near the center, and 3 setae near the distal end. The second basal segment is furnished with 2 setae near the center and 2 setae on the distolateral corner. Endopodal segments 1 and 2 have 4 setae and segments 3 and 4 have 3 setae. The fifth segment is furnished with 1 seta and 3 bristles.

The first to fourth pairs of swimming feet are



FIGS. 1-18.—*Hatoptilus austini*, n. sp., female: 1, Dorsal; 2, forehead, lateral view; 3, forehead, ventral view; 4, abdomen, dorsal view; 5, abdomen, lateral view; 6, genital segment, ventral view; 7, second antenna; 8, mandibular palpus; 9, gnathal lobe of mandible; 10, first maxilla; 11, terminal part of exopod of first maxilla; 12, second maxilla; 13, maxilliped; 14, first foot; 15, second foot; 16, third foot; 17, fourth foot; 18, fifth foot. Fig. 11 drawn from paratype. All other figures drawn from holotype.

shown in Figs. 14 through 17. The first pair of feet is smaller than the succeeding 3 pairs. There is 1 seta on the internal margin of basipodal segment 1 and 1 seta on the external margin of basipodal segment 2. Both exopod and endopod consist of 3 segments. Segments 1 and 2 of the exopod have 1 long external spine and 1 internal seta. Segment 3 has 2 external spines and 4 internal and 1 terminal seta. Endopodal segment 1 has 1, segment 2 has 2, and segment 3 has 5 setae.

The second, third, and fourth pairs of feet are similar. Basipodal segment 1 has an internal seta. Basipodal segment 2 of the second and third feet is naked. This segment of the fourth feet is furnished with an external seta. Segments 1 and 2 of the exopod have a small external spine and a single internal seta. The third exopodal segment has a terminal, finely serrate spine. There are 3 small external spines and 5 internal setae on this segment. In the second and fourth pairs of feet, endopodal segment 1 has 1 seta, segment 2 has 2 setae, and segment 3 has 7 setae. In the third pair of feet the numbers of setae on these respective segments of the endopod are 1, 2, and 8.

The fifth pair (Fig. 18) of feet is smaller than the preceding 3 pairs. Basipodal segment 1 has 1 internal seta. Basipodal segment 2 is furnished with 1 seta which exceeds the tip of the terminal exopodal spine. Exopodal segment 1 has 1 external spine, segment 2 has 1 external and 1 internal spine, and segment 3 has 2 external and 1 terminal spine. Segment 3 is also furnished with 3 internal setae. Endopodal segments 1, 2, and 3 are provided with 1, 1, and 6 setae, respectively.

Total length of the three specimens is as follows: 3.33 mm (holotype), 3.16 mm (paratype, Cruise 31) and 3.06 mm (paratype, Cruise 27).

No male has been found.

Remarks.—This species resembles *H. chier-*

chiaie (Giesbrecht) but may readily be distinguished from it by the shape of the head and the structure of the first maxillae and fifth pair of feet. The head of *H. austini* is considerably more produced anteriorly. In regard to the first maxilla of *H. austini*, the second basal segment has 4 setae, the exopod has 11 setae, and the endopod has 5 setae. The corresponding parts of the first maxilla of *H. chierchiaie*, as figured by Giesbrecht (1892) and Sars (1924), have 5 setae, 8 setae, and 7 setae. The seta on the second basal segment of the fifth pair of legs of *H. austini* exceeds the tip of the terminal exopodal spine. In *H. chierchiaie* this seta, as figured by Sars (1924), does not reach the distal end of the second exopodal segment. This new copepod is named in honor of Thomas S. Austin, oceanographer, Honolulu Biological Laboratory, U. S. Fish and Wildlife Service.

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They will tell you to try to prove you are right; I tell you to try to prove you are wrong.—LOUIS PASTEUR.



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