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NOTES ON CALIFORNIA ISOPODS OF THE GENUS
ARMADILLONISCUS, WITH THE DESCRIPTION
OF ARMADILLONISCUS CORONACAPITALIS N.SP.

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The California species of *Armadilloniscus* which have been examined agree in every detail with the description of the genus given by Verhoeff, 1916, pp. 162-163. Verhoeff lists four segments to the flagellum of the second antennae. Van Name (1936, p. 101), on the other hand, writes "flagellum of second antennae described as having four articles, but apparently with also a rudimentary fifth article." Harger (see Van Name 1936, p. 103) in his description of *Actoniscus ellipticus* [= *Armadilloniscus ellipticus* (Harger)] lists in addition to the four articles "another minute rudimentary terminal segment." Blake's drawing (1930, fig. 3) of the second antenna clearly shows five distinct segments. Holmes and Gay (1909, p. 377), in describing *A. tuberculatus* (= *A. holmesi* Arcangeli), also found a "minute terminal fifth joint." None of the specimens of the species examined by the writer has a second antenna with a flagellum composed of more than four articles. The designation "fifth article" of previous writers is apparently due to a misinterpretation of the attachment of the terminal hairs as a separate segment.

All California species agree in habitat, being found under stones, decaying *Zostera*, or debris along the edges of bays and estuaries at the high tide mark. The substratum varies from clay, sand, pebbles, and rock to debris. The species, although small and at times difficult to see, are abundant in their habitat.

The following pages give the description of a proposed new species, *Armadilloniscus coronacapitalis*, and brief diagnoses of *A. lindahli* and *A. holmesi*, as well as a key to the species of the genus from California.

A KEY TO THE CALIFORNIA SPECIES OF ARMADILLONISCUS

- A'. Median projection of head truncate when viewed from above. Ocelli 4. Capable of rolling up into a compact ball.....*A. lindahli* (Richardson)
- A''. Median projection of head pointed when viewed from above. Ocelli 5(6?). Not capable of rolling up into a compact ball.
- B'. Body of female covered with large elevated tubercles. Penultimate segment of peduncle of second antenna equals the preceding segment in length. Posterior border of body segments with a fringe of evenly spaced minute tubercles giving the border a beaded appearance.....*A. coronacapitalis* n. sp.
- B''. Body of female appears smooth. Penultimate segment of peduncle of second antenna 1.5 times the length of preceding segment. Posterior border of segments of body even and smooth.....*A. holmesi* Arcangeli

Family: **Scyphacidae** Chilton, 1901

Genus: **Armadilloniscus** Uljanin, 1875

Armadilloniscus coronacapitalis Menzies, new species

Plates 23-25, figures 1-16.

Many descriptive details are obviated by the drawings here presented and this description is merely intended to emphasize certain details deemed important by the writer. Generic characteristics are omitted in that the species agrees in detail with the description of the genus given by Verhoeff 1916, pp. 162-163.

Eyes compound, with six visible ocelli. Body covered with characteristic large elevated tubercles which are best developed on the head and least developed on the telson. Lateral lobes of head broad and truncate at tip; median lobe pointed in dorsal view. Telson with truncate posterior margin. Posterior border of all body segments excluding telson and epimeral portions with minute, evenly spaced tubercles giving the border a beaded appearance. Peduncle of second antenna with penultimate segment as long as preceding segment and with hooked flange on lateral border. In male specimens the carpus of seventh peraeopod has a large compressed lobe on posterior part of dorsal border and a spine, which is larger and longer than ciliated spine, at ventro-distal angle. Exopodite of Plp-1 of male as wide as long; endopodite thick and coming to a point only after bending sharply near tip. The species is not capable of rolling up into a

compact ball. The epimeral parts of the perion are not posteriorly produced but extend laterally and have a truncate border. Body tuberculations much reduced in males. Males much smaller and narrower than females.

Measurements of types: Female holotype-length 4.6 mm., width 2.5 mm.; male allotype-length 3.1 mm., width 1.5 mm. The specimens were measured from the frontal margin to the posterior edge of the telson at the median line for the length, and at the widest part of the second perion segment for the width.

Location of types: The California Academy of Sciences, Golden Gate Park, San Francisco, California. Dept. Paleo. Type Coll. No. 9502 (Holotype ♀) and No. 9502a (Allotype ♂).

Type locality: The cove opposite Hog Island on the east side of Tomales Point, **Tomales Bay, Marin Co., California**. The types were collected by the writer from under rocks at the high tide line on August 3, 1946. The substratum consisted of coarsely grained granite sand.

Paratypes have been deposited in the collections of the following institutions: Allan Hancock Foundation, University of Southern California, Los Angeles, California, 2 males and 2 females; American Museum of Natural History, New York, 2 males and 2 females; California Academy of Sciences, San Francisco, California, 3 males and 1 female; Pacific Marine Station, Dillon Beach, California, 11 females and 29 males; United States National Museum, Washington, D.C., 6 males and 6 females.

Material examined: 78 females and 66 males from Tomales Bay, Marin Co., California.

***Armadilloniscus lindahli* (Richardson, 1905)**

Plate 26, figures 17-26.

Actoniscus lindahli RICHARDSON, 1905, pp. 635-636, figs. 679-680.

Armadilloniscus lindahli (RICHARDSON), VAN NAME, 1936, pp. 104-105, fig. 47.

Diagnosis: Eyes compound, with four ocelli. Body covered with small sharp tubercles. Lateral lobes of head narrow and truncate at tip; median lobe truncate when viewed from above. In frontal view median lobe of head pointed, but not sharply so. Telson with posterior margin rounded. Posterior border of all body segments smooth. Peduncle of second antenna with penultimate segment devoid of hooked flange on lateral border and approximately 1.5 times the length of preceding segment. In male specimens the carpus of seventh peraeopod lacks compressed lobe on dorsal border; no spine on ventral border exceeds ciliated spine in length. Endopodite of Plp-1 of male thick but tapers gradually to a point bending slightly and gradually near tip. The species

is capable of rolling up into a compact ball. Epimeral portions of perion specially constructed to permit rolling up, being posteriorly produced and narrow near tip.

Measurements of type: length 4.5 mm., width 2.0 mm., sex not given (Richardson 1905, p. 635). Specimens other than the type: large female—length 3.4 mm., width 1.6 mm.; large male—length 3.0 mm., width 1.5 mm.

Location of types: Museum of the Cincinnati Society of Natural History. Cat. No. 16365. (Richardson 1905, p. 636).

Type locality: Oakland, California. (Richardson 1905, p. 636).

The hypotypes on which the additions to the description of this species were based are deposited in the collections of the Pacific Marine Station. Specimens have been sent to the institutions receiving types of *A. coronacapitalis*.

Material examined: 73 females (19 ovigerous), 69 males—Mission Bay, San Diego Co., California; 59 females (8 ovigerous), 3 males—Mouth of San Dieguito River, San Diego Co., California; 19 females, 5 males—Cardiff Slough, San Diego Co., California; 53 females (34 ovigerous), 10 males, 6 juveniles—Upper Newport Bay, Orange Co., California; 37 females (22 ovigerous), 1 male—Tomales Bay, Marin Co., California.

***Armadilloniscus holmesi* Arcangeli, 1933**

Plate 27, figures 27–36.

Actoniscus tuberculatus HOLMES AND GAY, 1909, pp. 377–378, fig. 5.

Armadilloniscus tuberculatus (HOLMES AND GAY), VAN NAME, 1936, pp. 103–104, fig. 46.

Armadilloniscus holmesi ARCANGELI, 1933, p. 59, new name; VAN NAME, 1940, p. 132.

Diagnosis: Eyes compound, with five (six?) ocelli. Body covered with large, low, evenly rounded tubercles. Lateral lobes of head broad and truncate at tip; median lobe pointed when viewed from above. Telson with posterior margin rounded. Posterior border of all body segments smooth. Peduncle of second antenna with penultimate segment devoid of hooked flange on lateral border and approximately 1.5 times the length of preceding segment. In male specimens carpus of seventh peraeopod lacks compressed lobe on dorsal border; no spine on ventral border exceeds length of ciliated spine. Endopodite of Plp-1 of male thick and tapering to a point bending gradually near tip. The species is not capable of rolling up into a compact ball. Epimeral portions of perion not produced posteriorly but extended laterally and truncate.

Measurements of type: Length 3.25 mm.; width and sex not given. (Holmes and Gay 1909, p. 378). Specimens other than the type: large female—length 3.9 mm., width 2.0 mm.; large male—length 2.2 mm., width 1.2 mm.

Location of type: The United States National Museum, Cat. No. 39048. (Holmes and Gay 1909, p. 378).

Type locality: San Diego, California, on moist ground near the seashore. (Holmes and Gay 1909, p. 378).

The hypotypes on which the additions to the description of this species were based are deposited in the collections of the Pacific Marine Station. Specimens have been sent to the institutions receiving types of *A. coronacapitalis*.

Material examined: 117 females (6 ovigerous), 56 males, 2 juveniles—Mission Bay, San Diego Co., California; 42 females (3 ovigerous), 14 males—Upper Newport Bay, Orange Co., California; 92 females (49 ovigerous), 19 males, 9 juveniles—Tomales Bay, Marin Co., California.

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PLATE 22

Fig. 1. *Armadilloniscus coronacapitalis* n. sp., dorsal view, female holotype.

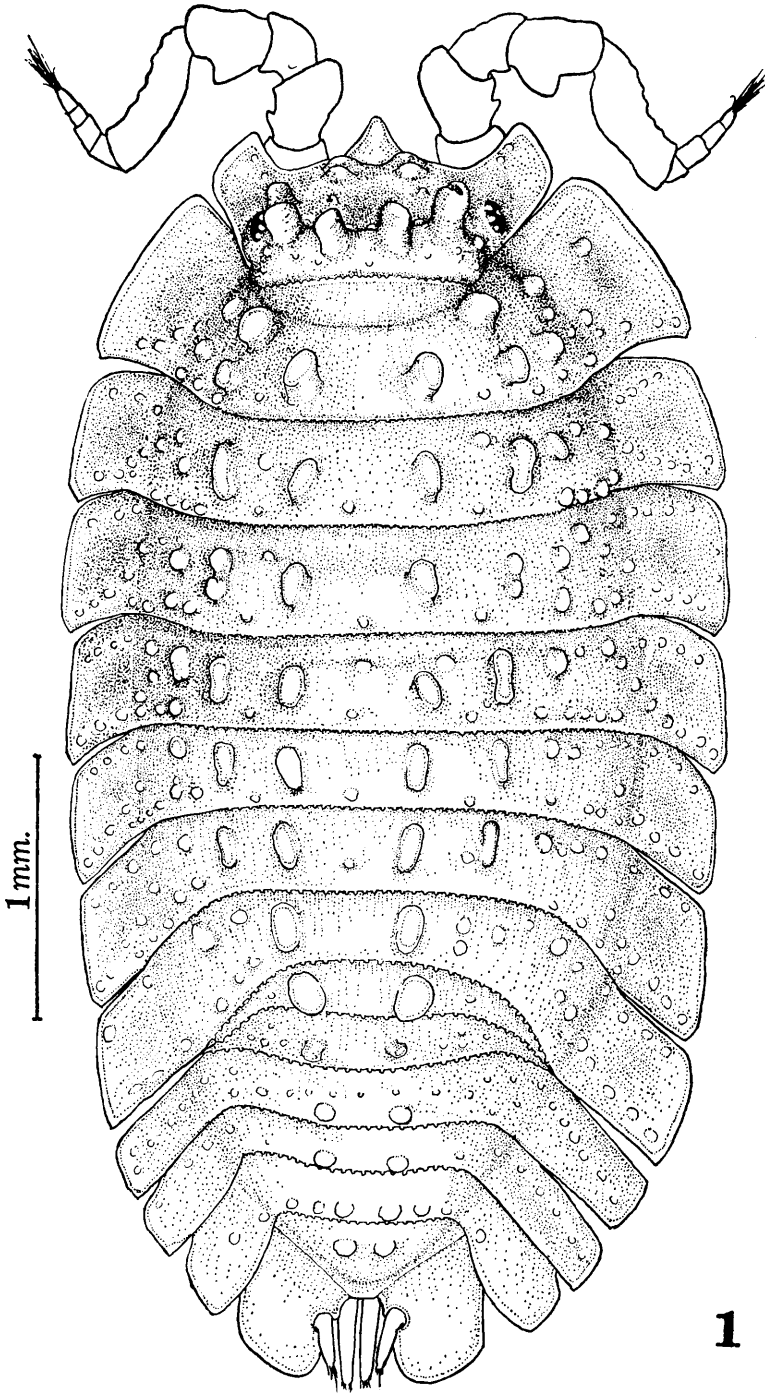


PLATE 23

- Fig. 2. *Armadilloniscus coronacapitalis* n. sp., mandible, male.
Fig. 3. *Armadilloniscus coronacapitalis* n. sp., eye, female.
Fig. 4. *Armadilloniscus coronacapitalis* n. sp., posterior edge of first perion segment, female.
Fig. 5. *Armadilloniscus coronacapitalis* n. sp., maxilliped, male.
Fig. 6. *Armadilloniscus coronacapitalis* n. sp., second antenna, male.
Fig. 7. *Armadilloniscus coronacapitalis* n. sp., antennule, male.
Fig. 8. *Armadilloniscus coronacapitalis* n. sp., tip of first maxilla, outer branch, interior view, male.
Fig. 9. *Armadilloniscus coronacapitalis* n. sp., outer branch of first maxilla, interior view, male.

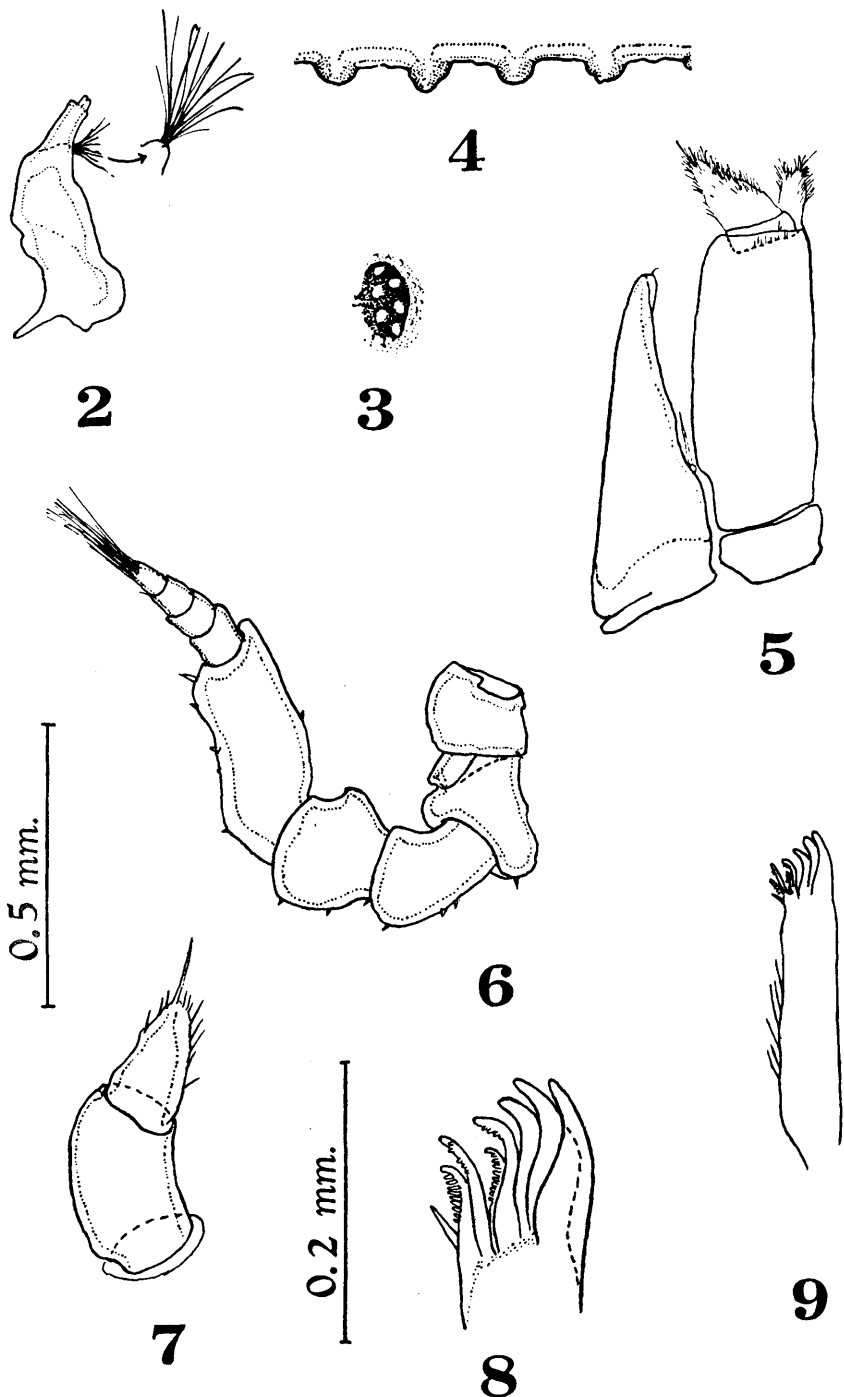
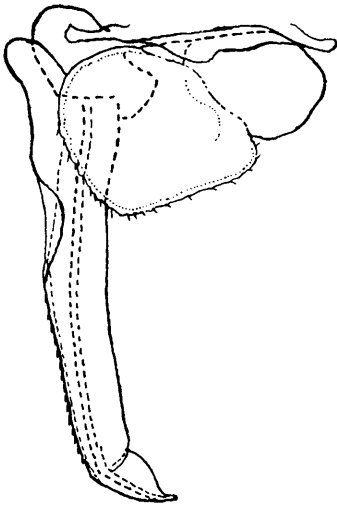
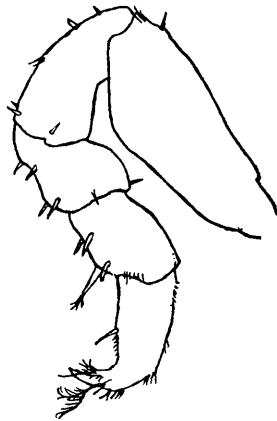


PLATE 24

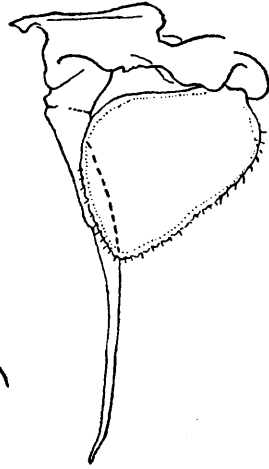
- Fig. 10. *Armadilloniscus coronacapitalis* n. sp., first pleopod (Plp-1), male.
Fig. 11. *Armadilloniscus coronacapitalis* n. sp., first peraeopod, male.
Fig. 12. *Armadilloniscus coronacapitalis* n. sp., Plp-2, male.
Fig. 13. *Armadilloniscus coronacapitalis* n. sp., Plp-1, female.
Fig. 14. *Armadilloniscus coronacapitalis* n. sp., Plp-2, female.
Fig. 15. *Armadilloniscus coronacapitalis* n. sp., seventh peraeopod, male.
Fig. 16. *Armadilloniscus coronacapitalis* n. sp., dactylus of seventh peraeopod, male.



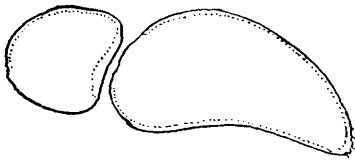
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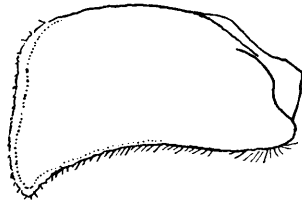
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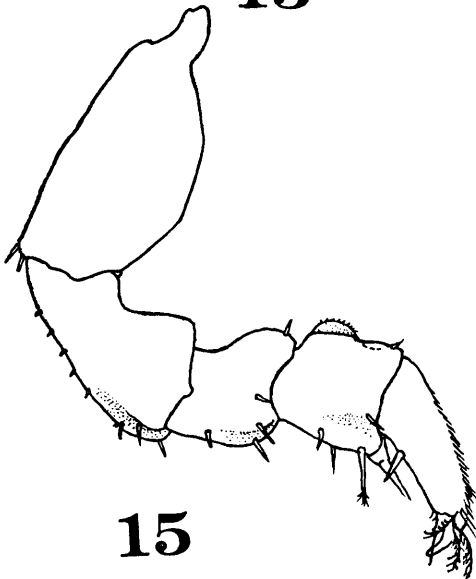
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PLATE 25

Fig. 17. *Armadilloniscus lindahli* (Richardson), posterior edge of first perion segment, female.

Fig. 18. *Armadilloniscus lindahli* (Richardson), eye, female.

Fig. 19. *Armadilloniscus lindahli* (Richardson), head, fronto-dorsal view, female.

Fig. 20. *Armadilloniscus lindahli* (Richardson), seventh peraeopod, male.

Fig. 21. *Armadilloniscus lindahli* (Richardson), Plp-1, male.

Fig. 22. *Armadilloniscus lindahli* (Richardson), second antenna, male.

Fig. 23. *Armadilloniscus lindahli* (Richardson), first peraeopod, male.

Fig. 24. *Armadilloniscus lindahli* (Richardson), Plp-2, male.

Fig. 25. *Armadilloniscus lindahli* (Richardson), Plp-2, female.

Fig. 26. *Armadilloniscus lindahli* (Richardson), Plp-1, female.

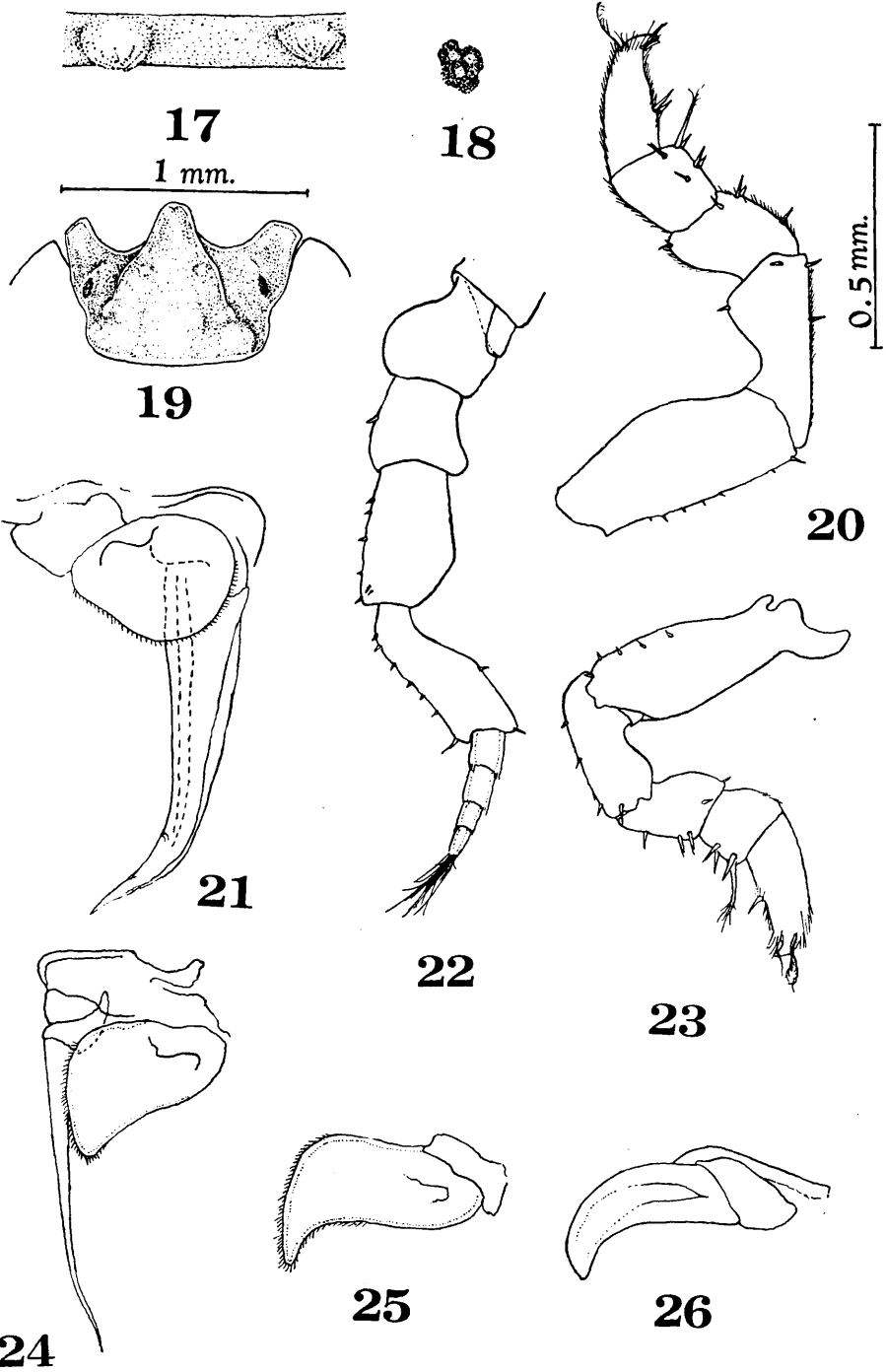


PLATE 26

- Fig. 27. *Armadilloniscus holmesi* Arcangeli, posterior edge of first perion segment, female.
- Fig. 28. *Armadilloniscus holmesi* Arcangeli, eye, female.
- Fig. 29. *Armadilloniscus holmesi* Arcangeli, head, dorsal view, female.
- Fig. 30. *Armadilloniscus holmesi* Arcangeli, seventh peraeopod, male.
- Fig. 31. *Armadilloniscus holmesi* Arcangeli, P1p-1, male.
- Fig. 32. *Armadilloniscus holmesi* Arcangeli, second antenna, male.
- Fig. 33. *Armadilloniscus holmesi* Arcangeli, first peraeopod, male.
- Fig. 34. *Armadilloniscus holmesi* Arcangeli, P1p-2, male.
- Fig. 35. *Armadilloniscus holmesi* Arcangeli, P1p-1, female.
- Fig. 36. *Armadilloniscus holmesi* Arcangeli, P1p-2, female.

