

ON SOME ISOPODS OF THE FAMILY DAJIDÆ FROM
THE NORTHWEST PACIFIC OCEAN, WITH DESCRIPTIONS
OF A NEW GENUS AND TWO NEW SPECIES.

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The following descriptions are of some Dajidæ which were collected by the U. S. Bureau of Fisheries steamer *Albatross* during its cruise to the northwest Pacific Ocean in the summer of 1906. A new genus is added to the family, and *Holophryxus giardi* and *Holophryxus californiensis*, new species, are described.

The number of Dajidæ genera is rapidly increasing, so that the family now contains the following: *Dajus* Krøyer, *Notophryxus* Sars, *Aspidophryxus* Sars, *Heterophryxus* Sars, *Branchiophryxus* Caullery, *Prodajus* Bonnier, *Zonophryxus* Richardson, *Holophryxus* Richardson, and *Arthropryxus*, new genus.

LIST OF REFERENCES.

- BONNIER, JULES. Sur deux types nouveaux d'Épicarides parasites d'un Cumacé et d'un Schizopode, *Comptes Rendus*, CXXXVI, 1903, pp. 102-103. Paris.
- CAULLERY, MAURICE. *Branchiophryxus nyctiphane*, n. g., sp., Épicaride nouveau de la famille des Dajidæ, *Journ. R. Micr. Soc. London*, 1897, Pt. 3, p. 204. Also in *Zool. Anzeiger*, XX, 1897, pp. 88-92. Leipsic.
- KRØYER, HENRIK. Voyages en Scandinavie, en Laponie, au Spitsberg et aux Férøe, *Zoologie, Crustacea*. (Published under the direction of M. Paul Gaimard.) Atlas, pl. xxviii, figs. 1-2, pl. xxix, fig. 1. Paris, 1849.
- RICHARDSON, HARRIET. Isopods collected at the Hawaiian Islands by the U. S. Fish Commission steamer *Albatross*, *Bull. U. S. Fish Commission*, 1903, pp. 51-53. Washington.
- Isopods of the Alaska Salmon Investigation, *Bull. U. S. Bureau of Fisheries*, XXIV, 1904, pp. 220-221. Washington, 1905.
- SARS, GEORGE O. *Crustacea of Norway*, II, 1899, pp. 223-224. Bergen.
- *Crustacea of the Norwegian North Atlantic Expedition, 1876-1878*. Christiania, 1883.
- Report on the Schizopoda, *Challenger Report*, XIII, 1885, Pt. 37, pp. 220-221. London.
- TATTERSALL, W. M. The Marine Fauna of the Coast of Ireland, Pt. 5, Isopoda, *Fisheries, Ireland, Sci. Invest.*, 1904, II, 1905, pp. 77-78, pl. xi, figs. 1-4.

HOLOPHRYXUS GIARDI, new species.

Body of female oblong-ovate, 17 mm. by 39 mm., without any trace of segmentation. (See fig. 1.) Color uniformly light yellow.

Head represented by a bilobed prominence, which is surrounded by a wide, squarish ridge projecting anteriorly and laterally. Eyes wanting.

The thorax is wider anteriorly than posteriorly, being gradually restricted posteriorly. The lateral parts are not greatly swollen. There are no traces of segmentation on the dorsal surface.

The abdomen is narrower than the thorax, and tapers to a rounded extremity. There is no trace of segmentation, but a slight incision on either side indicates the place of coalescence of the first segment.

The abdomen is devoid of appendages, both uropoda and pleopoda being entirely wanting.

On the ventral side the oral area is not contracted behind. It is bounded anteriorly by the projecting ridge and mouth parts, and laterally by the two rows of coxal plates. Situated just within the two rows of coxal plates are five pairs

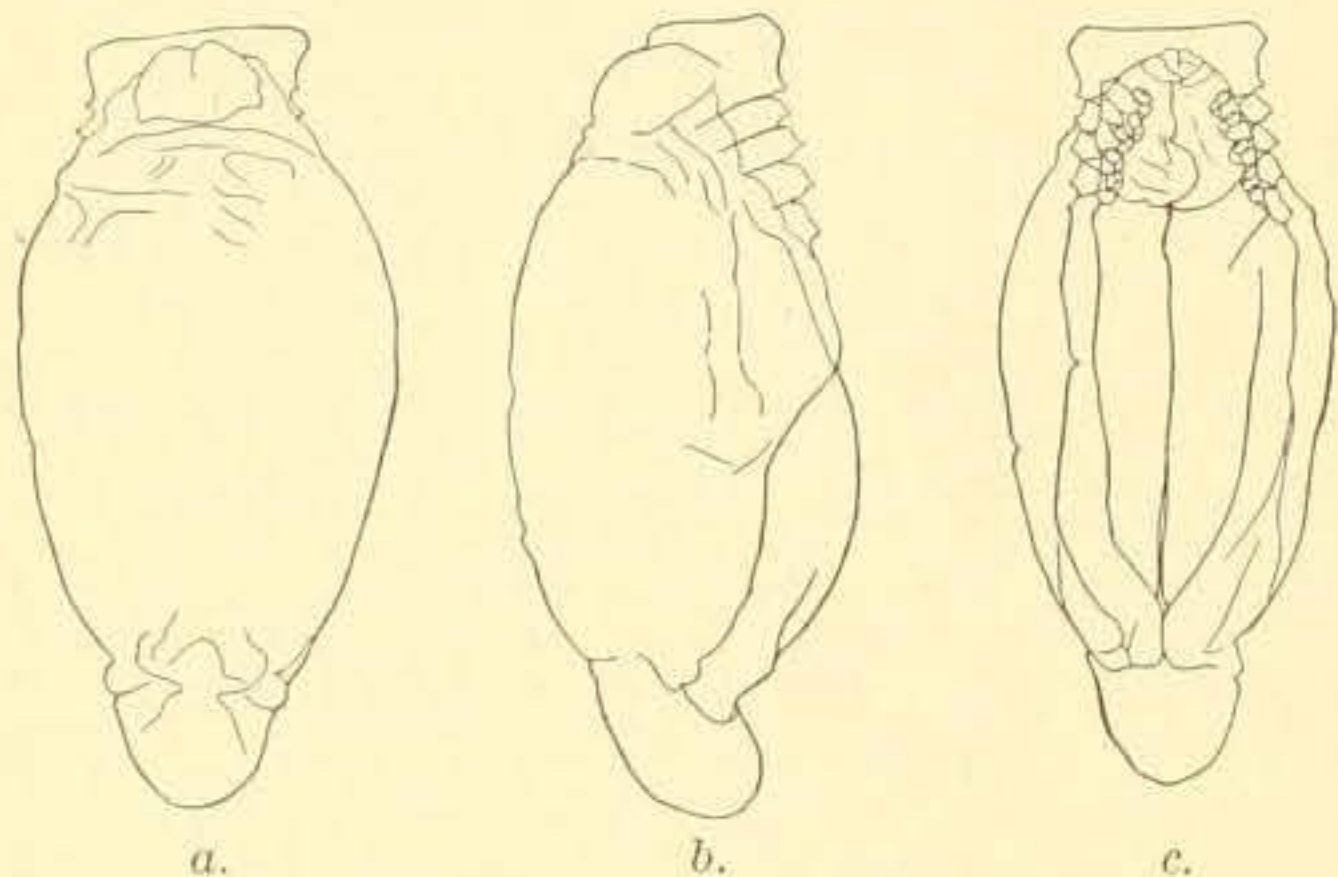


FIG. 1.—HOLOPHRYXUS GIARDI. ADULT FEMALE. a. DORSAL VIEW. b. LATERAL VIEW. c. VENTRAL VIEW. $\times 2\frac{1}{2}$.

of legs, surrounding the oral area. From the bases of the five pairs of legs arise five pairs of incubatory plates. Only the first and fifth pairs are visible, the other three pairs being hidden by the overlapping fifth pair. The fifth pair of plates are the largest, and meet along the middle ventral line of the body; they extend almost the entire length of the thorax.

In a lateral view four segments of the thorax are represented by four coxal plates, bounding the outer extremity of the oral area. The first coxal plate is coalesced with the cephalic ridge, but is indicated on either side at the posterior extremity of the ridge by a little pointed projection.

One adult female was taken by the U. S. Bureau of Fisheries steamer *Albatross* at Station 4793, Toporkov Island, Harbor of Nikol'ski, Bering Island, north 58° east, 44 miles ($54^{\circ} 48'$ north, $164^{\circ} 54'$ east), at a depth of 2,700 fathoms.

Description of immature female.—The body is oblong-ovate, 3 mm. by 8 mm., decreasing gradually in width from the anterior to the posterior extremity. (See fig. 3.)

The head is large and is surrounded anteriorly and laterally by a wide marginal border or ridge. There are no eyes. The three divisions of the body—the head, thorax, and abdomen—are well defined. The segments of the thorax are also well marked, the coxal plates occupying the lateral margins. There are six distinct segments, with six pairs of coxal plates. The first segment is coalesced with the head. The first coalesced segment bears the first pair of legs. The following five segments bear each a pair of legs, so that altogether there are six pairs of legs. The last free (sixth) segment bears a pair of modified appendages.^a

The abdomen is narrower than the thorax, and tapers to a rounded extremity. It is unsegmented and is devoid of appendages.

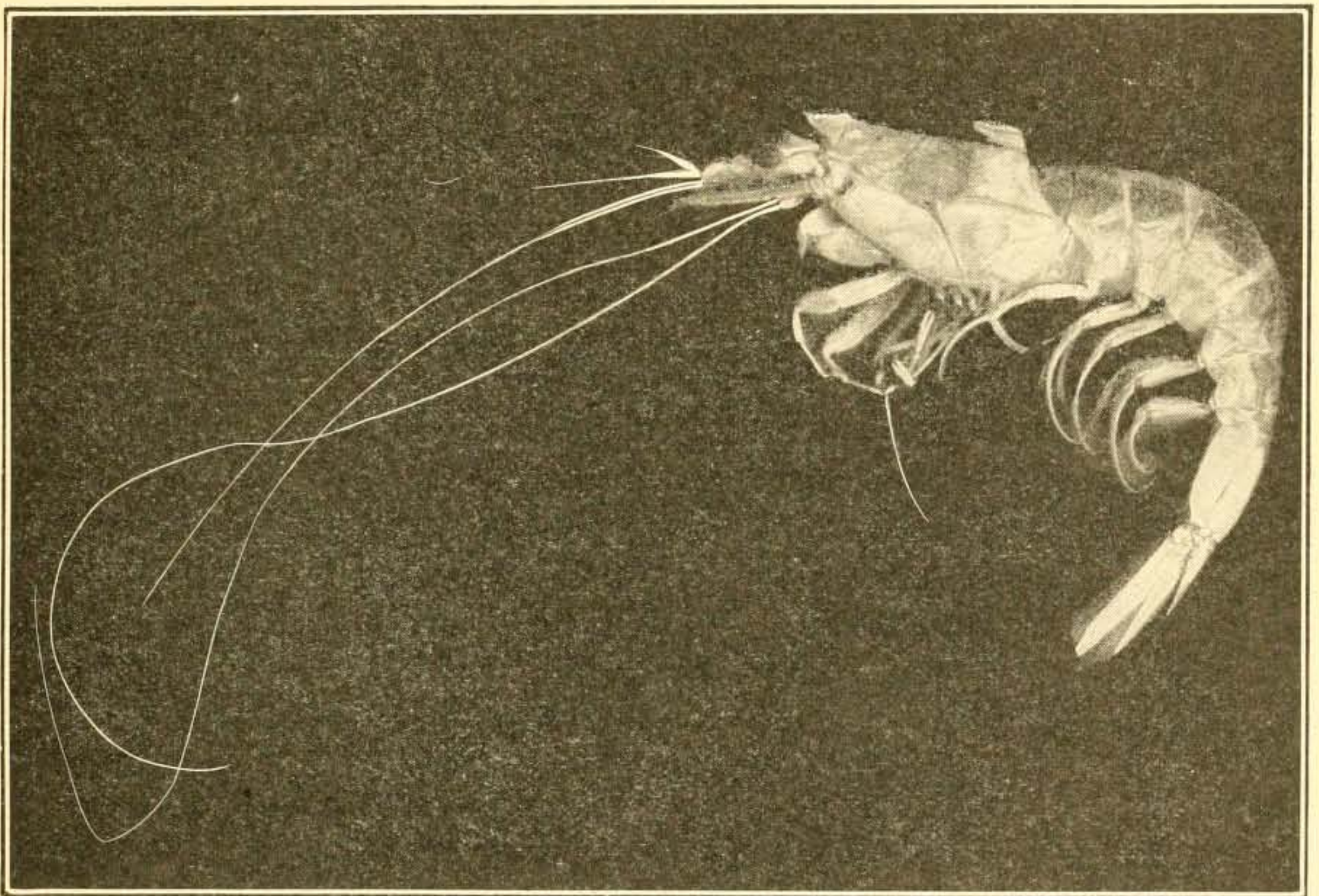


FIG. 2.—HOLOPHRYXUS GIARDI. IMMATURE FEMALE AND HOST.

Only one immature female was taken at Station 4793, Toporkov Island, Harbor of Nikolski, Bering Island, north 58° east, 44 miles ($54^{\circ} 48'$ north, $164^{\circ} 54'$ east), at a depth of 2,700 fathoms. It was attached to the dorsal surface of the carapace of the host, *Gennadas borealis* Rathbun, with the head directed posteriorly. The photograph (fig. 2) is of the immature female and its host.

^a They may be analogous to or homologous with the fifth pair of appendages of *Heterophryxus appendiculatus* Sars. (*Challenger Report*, XIII, 1885, Pt. 37, pp. 220-221, pl. XXXVIII, figs. 8-14.) See Tattersall for description and figures of this form. (*Fisheries, Ireland, Sci. Invest.*, 1904, II, 1905, pp. 77-78, pl. XI, figs. 1-4.) Or, this segment may be considered the first abdominal segment with its appendages.

The adult female is about four and a half times longer than the immature female. The stage represented by the immature female must be a stage younger than the one described by G. O. Sars,^a for *Dajus mysidis* Krøyer. It must be a stage intermediate between that and the cryptoniscian stage, because of the presence of the six pairs of legs. The stage represented by Sars has only five pairs of legs, as in the two succeeding stages and in the adult stage.

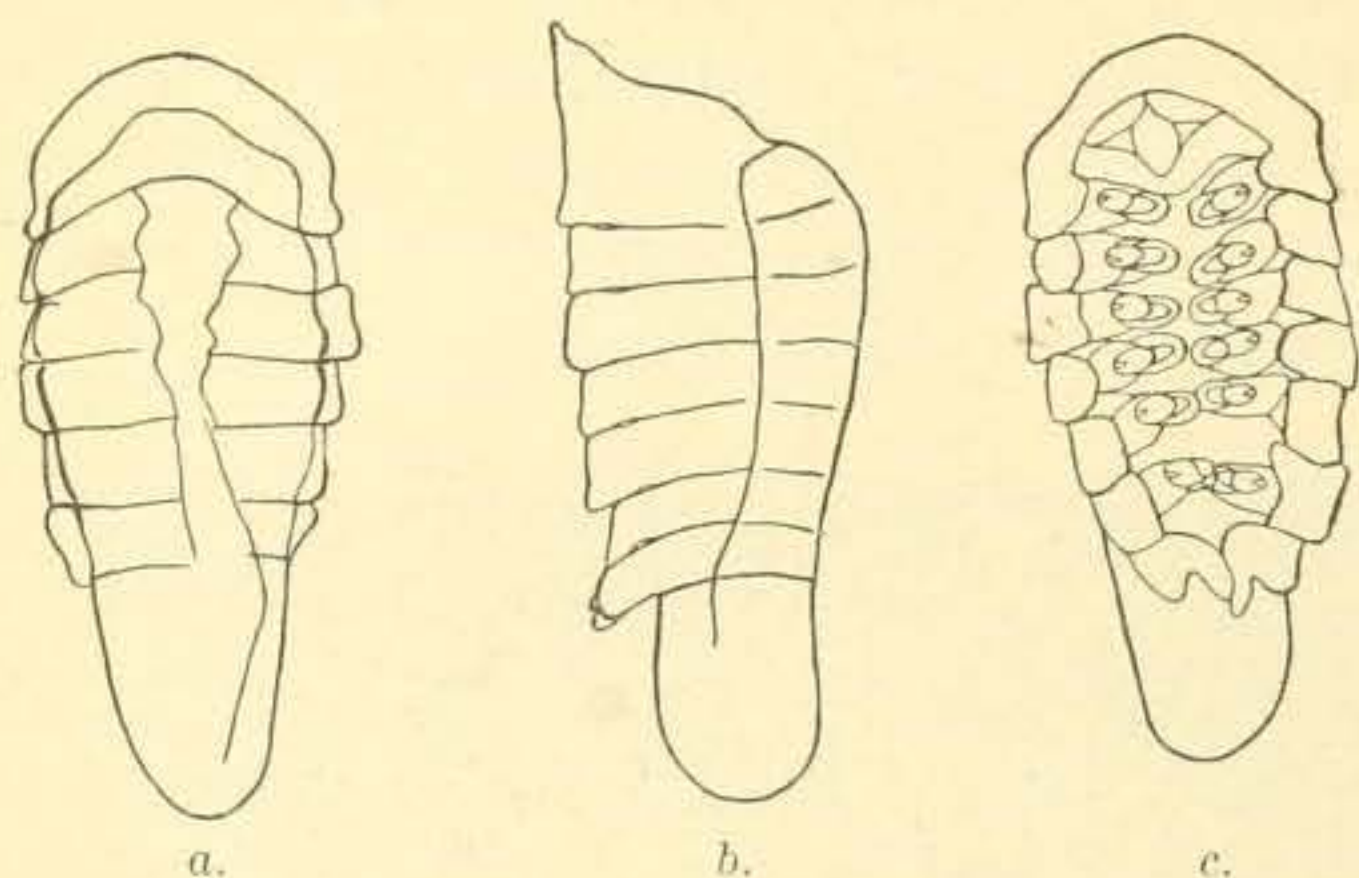


FIG. 3.—HOLOPHRYXUS GIARDI. IMMATURE FEMALE. *a.* DORSAL VIEW. *b.* LATERAL VIEW. *c.* VENTRAL VIEW. $\times 14\frac{1}{2}$.

that species; in having the head surrounded by a wide marginal squarish ridge or border anteriorly and laterally; in the difference in the shape and the position of the marsupial plates; and in having the first segment of the abdomen indicated by a slight incision on either side of the terminal segment.

The species is named for Prof. Alfred Giard.

The type from Toporkov Island, Bering Island, is in the U. S. National Museum, Cat. No. 38337.

HOLOPHRYXUS CALIFORNIENSIS, new species.

Locality.—One fine specimen of this interesting species was collected in Santa Barbara Channel, California, in green mud at a depth of 280 fathoms. It is described on the label which accompanies it as a parasite, but the host is not given. Its color in life is mentioned as being canary yellow.

Another specimen comes from Station 4753 on the way from Yes Bay to Seattle at Bushby Point at a depth of 150–280 fathoms. This adult female was attached. The photograph (fig. 4) shows the parasite attached to the dorsal side of the carapace of the host, *Pasiphaea pacifica* Rathbun with the head directed posteriorly. This species is similar to the preceding species in the elongated form of the body, but differs in lacking the wide anterior ridge, and in not

No males were found. After the photograph was made the parasite was removed from the host for the purpose of study.

This species differs from the type species of the genus, *Holophryxus alasensis* Richardson, in the form of the body, which is more tapering, the thorax not being so greatly swollen and the abdomen not so abruptly narrower, as in

^aCrustacea of Norway, II, 1899, pp. 223–224, pl. xciv, ♀ juv.²

having the first abdominal segment indicated by incisions in the lateral margins. It also has the anterior part of the body more strongly convex and not so depressed as in *H. giardi*.

One male accompanies the specimen from Santa Barbara Channel.

Description of male.—The male is about three times longer than wide, being 2 mm. in width and 6 mm. in length. The head is very

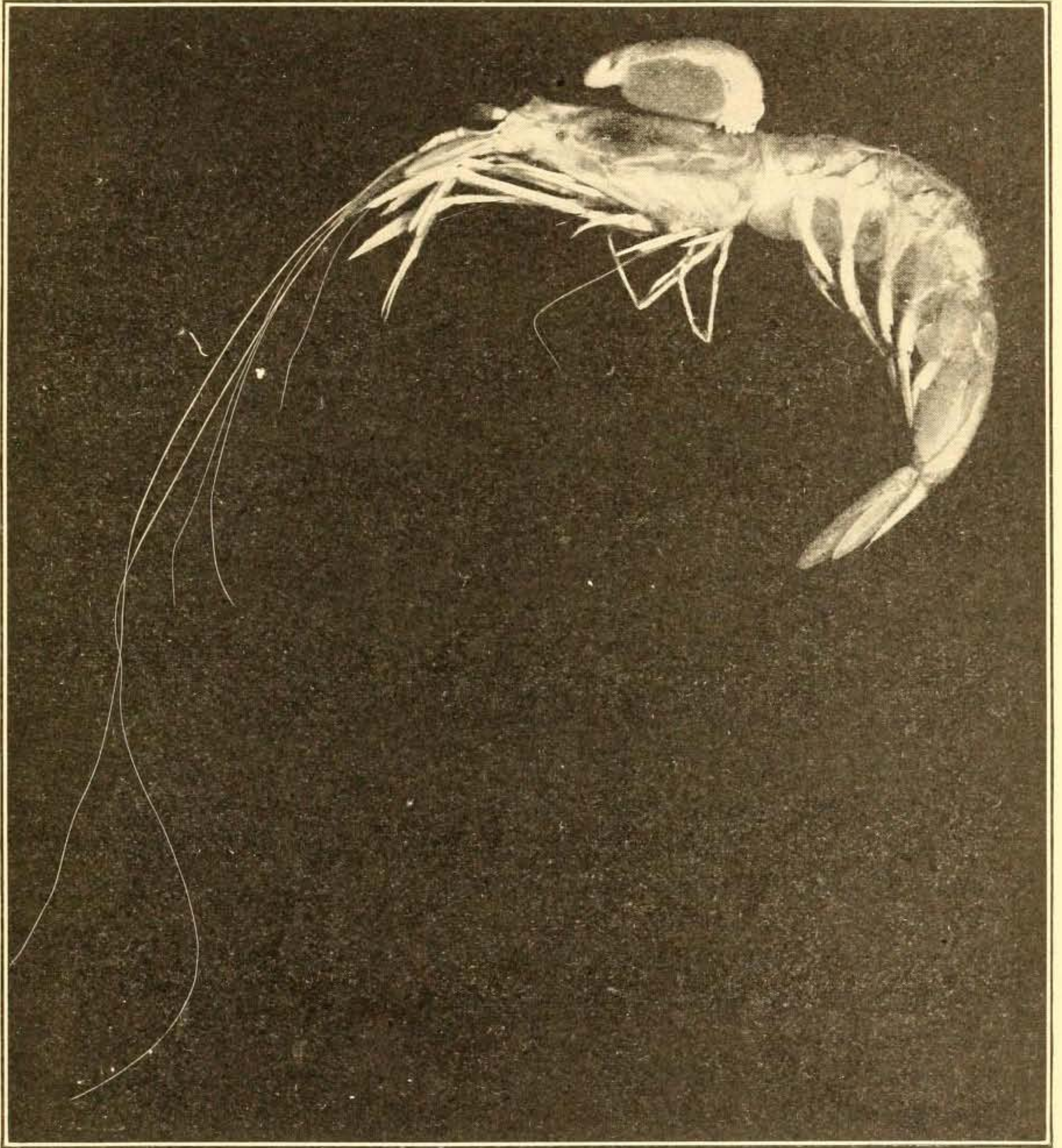


FIG. 4.—HOLOPHRYXUS CALIFORNIENSIS. ADULT FEMALE AND HOST.

large, rounded in front and completely fused with the first thoracic segment. There are no eyes. The first pair of antennæ are small and composed of only a few articles. The second pair of antennæ are rather long, extending to the posterior margin of the head, and are composed of about seven articles. The antennæ are inconspicuous from a dorsal view.

The six free segments of the thorax are distinctly separated from each other, are subequal in length, and are produced at the sides in rounded lobes. The seven pairs of legs are prehensile.

The abdomen is narrow, elongate, about twice as long as wide, with all the segments completely fused. There are no uropoda and no pleopoda. (See fig. 5.)

The type from Station 4753 has Cat. No. 38527, U.S.N.M.

The fact that these Dajidæ are found parasitic on shrimps, decapodous crustacea, and not on Schizopoda, the hosts on which they have previously been found, gives additional evidence, in respect to the relation of host and parasite, showing that families founded on such a basis, as well as genera and species, cannot be maintained. Giard and Bonnier have arranged a classification of the Epicaridea whereby the families of parasites are restricted to certain orders of hosts, but Sars

has already pointed out the error of such an arrangement. The evidence furnished herein proves that one family of parasite can infest two different orders of host.

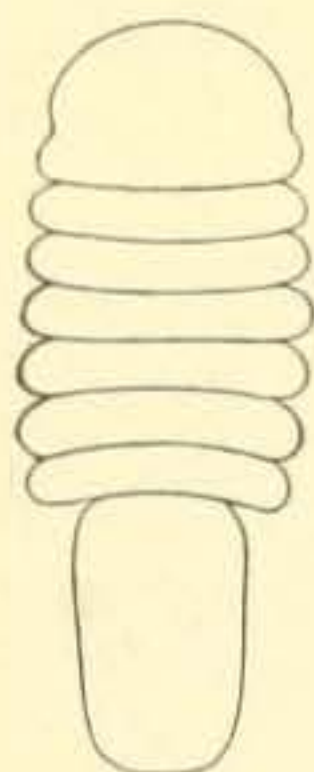


FIG. 5.—HOLOPHRYXUS CALIFORNIENSIS. MALE. $\times 20\frac{1}{2}$.

ARTHROPHRYXUS, new genus.

Body of adult female irregular in outline, with lateral parts expanded, and not projecting in front of the head.

Head large and well defined from the thorax.

The middle part of the dorsal surface of the thorax segmented into five rather distinct segments.

The abdomen is also distinctly segmented into five segments, the terminal one being posteriorly triangular in shape.

There are no uropoda or pleopoda.

The oral area is small, rounded, but not greatly contracted behind. The five pairs of legs are closely crowded together, and are bounded by the five pairs of coxal plates. There are five pairs of incubatory lamellæ, the last pair being the largest, the two plates meeting along the middle ventral line.

The adult male has the head large, without eyes, the thorax composed of six distinct segments, the first being fused with the head. There are seven pairs of legs. The abdomen is indistinctly segmented into about six segments, the last one of which is minute and posteriorly triangular. The body is hunched and the abdomen considerably curved under the thorax.

There are no uropoda, and the pleopoda seem to be wanting.

The type of the genus is *Arthrophryxus beringanus*, the description of which follows:

ARTHROPHRYXUS BERINGANUS, new species.

The body of the adult female (fig. 6) is irregular in outline, oblong oval in shape, broadest in front, and slightly narrower behind. It is 14 mm. long and 9 mm. wide at its greatest breadth. The lateral parts of the body are expanded, but do not project beyond the head.

The head is very large, with the anterior margin irregular in outline and with a transverse fold about the middle. It is well defined from the thorax. There are no eyes.

The middle portion of the dorsal surface of the thorax is distinctly segmented into five segments.

The abdomen is distinctly segmented into five segments, the terminal one being minute and triangular in shape posteriorly.

There are no uropoda or pleopoda.

On the ventral side of the body the oral area is small, rounded, but not contracted behind. There are five pairs of legs, on the outside of which are the five pairs of coxal plates. Issuing from the bases of the five pairs of legs are the five pairs of incubatory lamellæ, partly overlapping each other, the last pair being the largest, meeting along the middle ventral line of the body.

The adult male has the head large, without eyes, the thorax divided into six distinct segments, the first being fused with the head. There are seven pairs of prehensile legs, the first pair being attached to the first segment, which is coalesced with the head. The abdomen is indistinctly divided into about six segments, the last segment being minute and triangular posteriorly. (Fig. 7.)

There are no uropoda and apparently no pleopoda. Owing to the fact that the body is hunched and the abdomen is curved under the thorax, it was difficult to place the male in a position to draw the dorsal surface.

Only the female and one male were taken at Station 4793, Toporkov Island, harbor of Nikolski, Bering Island, north 58° east, 44 miles (54° 48' north, 164° 54' east), at a depth of 2,700 fathoms. It is parasitic on *Eucopia australis* Dana.

The type is in the U. S. National Museum. Cat. No. 38338.

In the segmental character of the abdomen of the male this genus is closer to *Aspidophryxus* Sars than to any other of the Dajidæ

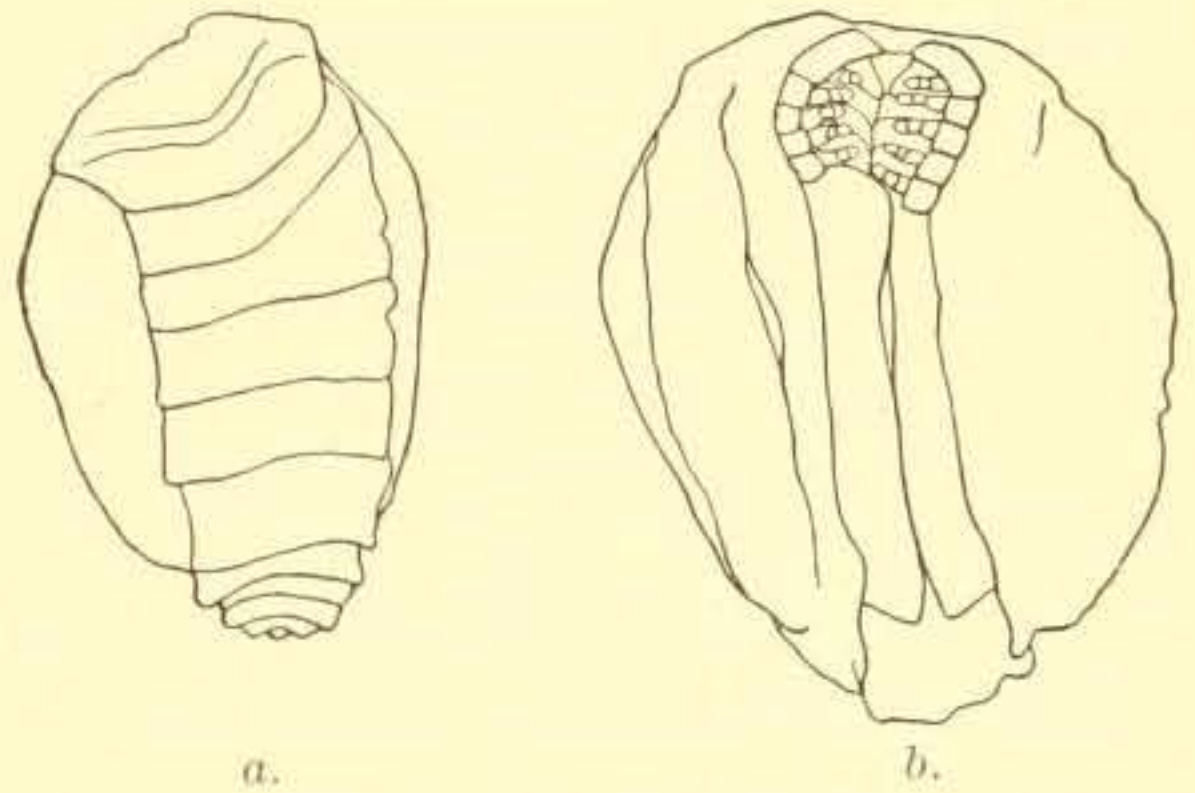


FIG. 6.—ARTHROPHRYXUS BERINGANUS. ADULT FEMALE. a. DORSAL VIEW. b. VENTRAL VIEW. $\times 6\frac{1}{2}$.

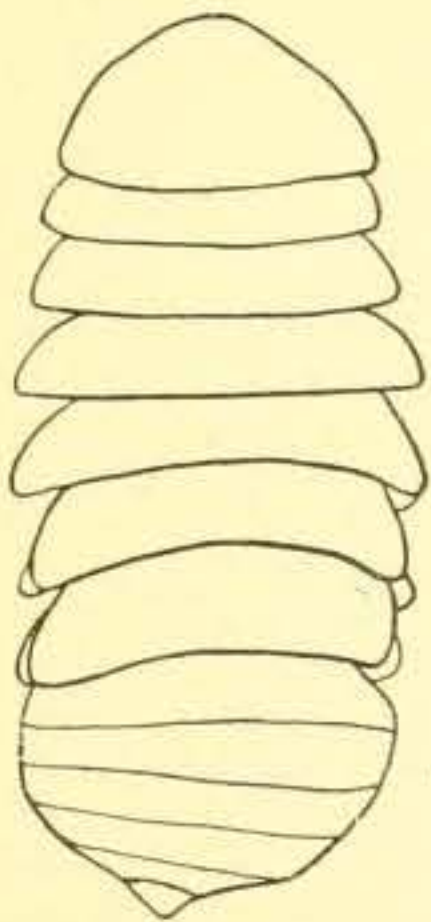


FIG. 7.—ARTHROPHRYXUS BERINGANUS. ADULT MALE. $\times 41$.

genera. The female differs from the female of *Aspidophryxus* in having the abdomen segmented, in the larger and differently shaped head, in not having the lateral parts of the thorax projecting in front of the head, and in having five pairs of incubatory plates, there being only one pair distinctly developed in *Aspidophryxus*.

Bonnier says of the male of *Prodajus lobiancoi* that the abdomen is "à peine segmenté sur les bords et terminé par une paire de longs uropodes digitiformes." Uropoda are also present in the male of *Aspidophryxus* Sars. The male of *Arthropryxus* is without uropoda.