

PROCEEDINGS
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NEW SPECIES OF PARASITIC COPEPODS FROM THE
MASSACHUSETTS COAST.

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By Permission of the Secretary of the Smithsonian Institution.

It is desirable that the following new species of parasitic copepods be included in the list of Crustacea about to be published by the Boston Society of Natural History, since they are very common along the Massachusetts coast.

For this reason a brief preliminary description is herewith presented, to be followed in the near future by a more detailed account, accompanied by suitable drawings.

Gloiopotes ornatus sp. nov.

Type from Woods Holl, Massachusetts. No. 6209 U. S. National Museum.

Female.—Carapace elliptical; frontal plates well defined; no lunules. Posterior sinuses large and well rounded; median lobe less than half the entire width, not projecting behind the lateral lobes, its posterior margin concave. Thoracic area very large and oblong, divided by secondary grooves into quarters, each variously ornamented by elevations and depressions of the surface. There are also small spines along either side of the median lobe, while the outer margin of the lateral lobe is ornamented with a row of long wavy hairs, which extend forward about to the center of the carapace. Free segment short and wide, covered dorsally by two broad plates which extend out over the basal joints of the fourth legs. Genital segment horse-shoe shaped, about half as wide as the carapace, and prolonged backward in a curved lobe on either side of the abdomen. This segment carries

spines on its dorsal surface and lateral margins. On the outer margin also, at about the center of the posterior lobe, is fastened a triangular projection, nearly as long as the lobe itself and toothed on its inner margin. Abdomen cylindrical and two-jointed; basal joint wider than terminal and about half as long; terminal joint with spherical swelling at its center, ornamented dorsally and laterally with spines.

This species differs from the two already described in the genus (*G. hygomianus*, Stp. & Ltk. and *G. hullomi*, Thompson) chiefly in the size and shape of the dorsal plates on the free segment, in the grooving on the dorsal surface of the carapace, in the fringe of long hairs on the lateral margin of the carapace, and in minor details of the appendages, especially the first maxillae and furca. The first maxillae are three-parted, the outer prong broad and spatulate, the two inner ones shorter and acute. The furca has bifid branches, the outer ones extending nearly at right angles to the base of the central sinus, the inner ones slightly divergent, with a broad U-shaped sinus between them. Color a uniform yellowish gray, somewhat darker where the surface is raised in ornamentation.

Total length, 11 mm.; width, 4.6 mm.

Outside surface of swordfish.

(*ornatus*, ornamented.)

Alebion gracile sp. nov.

Type from Vineyard Sound, Massachusetts. No. 8122 U. S. National Museum.

Female.—Carapace elliptical, projecting somewhat at the center. Posterior sinuses broad, somewhat enlarged at the base and dividing the carapace into nearly even thirds. Both median and lateral lobes squarely truncated. Free segment nearly as wide as genital segment and carrying a pair of dorsal plates whose outer margins are strongly convex. Genital segment a little more than half as wide as the carapace, widest at the center and prolonged posteriorly on either side into a stout conical spine which reaches beyond the tips of the anal laminae. Abdomen two-jointed; first joint larger than second, and extending backward on either side of the latter in a blunt conical projection similar to those on the genital segment. The terminal segment is strongly constricted at its base and is only about half the width of the basal segment. Anal papillae large, nearly as long as the terminal segment, and curved in toward each other at the tip.

Of the appendages, the first maxillae are reduced to mere semicircular plates attached flatly to the ventral surface of the carapace, while the second pair are also flat laminae but considerably larger. The exopods of the first three pairs of swimming legs carry the stout corneous claws peculiar to this genus, and the fourth pair are so rudimentary as to be invisible in dorsal view. The fifth pair is entirely lacking.

Male.—The most noticeable difference between the male and female is in the proportion of the different body regions. The carapace is orbicular rather than elliptical while the rest of the body is strongly narrowed, making the contrast between the two very striking. The free segment lacks the plates on its dorsal surface but carries on either side a rounded protub-

erance which represents the rudiments of a plate. The genital segment is small and spindle-shaped without a trace of the posterior spines found in the female. The fifth legs are plainly visible on the ventral surface of this segment. The abdomen is very narrow and made up of two spindle-shaped segments of about the same size; the anal papillae are like those in the female. The second antennae are much larger and stronger than in the opposite sex, the terminal claws are branched like a stag's horn and are evidently used for clasping organs. The other appendages are like those of the female with the exception of the second swimming legs which have a long conical sexual appendage in place of the large claws of the female.

Total length of female, 10 mm.; width of carapace, 4.9 mm. Total length of male, 6 mm.; width of carapace, 3.2 mm. The entire animal is a clear horn color like the finger nails, so transparent as to be invisible on the fish's body.

This species is very common on the outside surface of the smooth dog-fish, almost every fish yielding one or more specimens.

(*gracilis*, graceful, slender.)

Alebion glabrum sp. nov.

Type from Woods Holl, Massachusetts. No. 8123 U. S. National Museum.

Female.—Carapace orbicular, squarely truncated posteriorly. Frontal plates well defined. Posterior sinuses broad and deeper than in *gracilis*, the lateral lobes relatively wider and rounded instead of truncate posteriorly. Free segment narrow and carrying a pair of dorsal plates which are nearly circular in outline, in strong contrast to those of *gracilis*. Genital segment half the width of the carapace, oblong in shape, with nearly parallel sides and smooth rounded angles. The entire surface and the margins of this segment are smooth without a trace of the fringe of spines to be found in other species. The abdomen is two-jointed, the joints about the same size. On either side of the first joint a semicircular wing or thin fold of integument projects laterally from the dorsal surface, the combined width of joint and wings being half that of the genital segment. Terminal segment slightly spindle-shaped and tipped with small anal papillae.

The egg-strings are wider and longer than those in *gracilis*, being once and a half the length of the body. The appendages present many differences in detail which are of minor value, the chief distinction of the species lying in the relative size and shape of the body regions.

Male.—Carapace distinctly longer than wide and obovate, with the widest portion very far back. Posterior sinuses triangular and flaring widely. Free segment long and narrow, less than half the width of the genital segment, and without a trace of the dorsal plates. Genital segment narrow and spindle-shaped, squarely truncated posteriorly with a small spine at each posterior corner. The fifth legs are plainly visible on the lateral margins of this segment near its center. Abdomen made up of two nearly equal segments without the wings which appear in the female. Anal laminae very much larger than in the female and armed with long and slender setae.

Total length of female, 12 mm.; width of carapace, 5.9 mm. Total length of male, 7.6 mm.; width of carapace, 3.1 mm. A grayish horn color, nearly uniform throughout; not quite as transparent as in *gracilis*. Very common on the outside surface of the sand shark, and also frequently found on the smooth dog-fish in company with the preceding species.

(*glabrum*, smooth.)

Nesippus alatus sp. nov.

Type from Buzzards Bay, Massachusetts.*

Female.—Carapace transversely elliptical, the width once and three-quarters the length. Frontal plates distinct and, with a portion of the cephalic area, projecting in a half circle from the anterior margin. Posterior lobes short and wide; thoracic area quadrilateral and raised a little above the rest of the dorsal surface. Eye distinctly tripartite. Only the first thoracic segment fused with the head, the others free. Second and third segments fused inter se and carrying a single rectangular plate on either side. Fourth segment free, considerably narrower than the first two and covered dorsally with a pair of fused plates. These plates are much larger than in other species, circular in outline, and they overlap the genital segment for some little distance. Genital segment elliptical with evenly rounded outlines, the length to the breadth in the proportion of 8 to 5. Abdomen very small, triangular in shape, and attached about its own length in front of the posterior margin of the genital segment, on the ventral surface of the latter. It is thus invisible in dorsal view, but the two large anal laminae show up for their entire size. The appendages closely resemble those in *N. orientalis* Heller, and *N. crypturus* Heller, with an impartial distribution of the similarity. Thus the first antennae are like those in both species; the second pair show most resemblance to those of *orientalis*; the second maxillae are like those of *crypturus*; the first maxillipeds like *orientalis*, the second pair most like *crypturus*. But in the present species the second maxillipeds are much more massive than any heretofore described and approach closely the condition seen in *Pandarus*. There are also sucking disks or pads at the base of both pairs of antennae very similar to those in *Pandarus*.

Male.—Carapace semi-elliptical, a trifle wider than long, squarely truncated posteriorly, with a long and narrow lobe at each of the posterior corners. Free thoracic segments of about the same length but diminishing regularly in width, none of them fused and none carrying dorsal plates. Genital segment small, a little narrower than the preceding segment and of about the same length and width, with reëntrant corners. Abdomen very short, the basal joint scarcely visible beneath the posterior border of the genital segment; anal laminae no larger than in the female but with much longer setae.

Total length of female, 7 mm.; width of carapace, 3.8 mm. Total length of male, 4.55 mm.; width of carapace, 2.3 mm.

*The types of this species and the next will be eventually placed in the U. S. National Museum.

Color of female a light yellowish white, fairly transparent, the egg-strings almost pure white. The male is darker in color and usually becomes brown in preservatives.

The females of this species are found upon the gill arches of the common sand-shark, rarely on the floor or roof of the mouth. The male is found on the outside surface of the body in company with both sexes of the preceding species. It can not be regarded as abundant since it is rare to find more than one female on the same fish, but it is fairly common.

(*alatus*, furnished with wings.)

***Eudactylina nigra* sp. nov.**

Type from Buzzards Bay, Massachusetts.

Female.—Body elongated, largest at the anterior end and tapering regularly to a blunt point at the posterior end. The six free thoracic segments diminish regularly in width but are of very different lengths, the first one being the shortest, and the fifth one the longest. The carapace covers the head and projects more or less over the first free segment, sometimes nearly hiding it in dorsal view. It is of about the same length and width, with rounded corners and a deeply emarginate posterior border; the sides also are often more or less emarginate.

The first antennae are very prominent at the anterior margin, and their basal joints appear like the frontal plates in the *Caligidae*. Both pairs of maxillipeds project beyond the lateral margin of the carapace and stand out prominently in a dorsal view. Each of the first four thorax segments carries a pair of biramous swimming legs; on the last two segments the legs are rudimentary and consist of a basal joint only, without rami. On the sixth segment they can be seen plainly only on immature females and apparently disappear in the adult.

The egg-sacks are attached to the sides of the sixth (genital) segment; each is fully as wide as the genital segment, considerably more than half as long as the entire body, and contains from eight to twelve eggs. The abdomen is very small and two-jointed, with minute anal laminae. Of the appendages, the second maxillae differ from those in other species by being much longer and more slender, and are plumose for their entire length. The second maxillipeds also are larger than in any described species, and stand out more prominently in dorsal view. These two particulars will at once distinguish the present species from all others.

Total length, 2.4 mm.; length of carapace, 0.5 mm.; width of carapace, 0.4 mm.; length of egg-strings, 1.3 mm.

General color a dark brown or black, the brown shade due to the two long and irregular ovaries, the black to the contents of the intestine. The eggs are very large and also dark brown in color, so that the living copepod shows well against the red background of the gills.

This species is found abundantly on the gills of the sand shark, being firmly fastened by its second maxillipeds to the gill filaments. Many hundreds may often be secured from a single shark.

(*nigra*, black.)