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NEW SPECIES OF POLYCHAETOUS ANNELIDS FROM HAWAII

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Cirratulidae

AUDOUINIA QUATREFAGES

Audouinia branchiata, new species

Figures 1 to 3

A considerable number collected at Pearl Harbor in May, 1925. On this date some females were with eggs. All were very much coiled so that accurate measurements of length were impossible, but the type specimen, which is larger than the others, is approximately 40 mm. long. The gills are numerous and heavy and with the tentacles form a dense mass of filaments over the dorsal surface of the anterior part of the body. In the posterior part of the body the gills are fewer and smaller. The posterior third of the body of the type is narrower than the anterior two-thirds, but this is not the case in all specimens. In the type and in some others there is a row of pigment along the anterior margin of the prostomium with a short linear patch on either side posterior to the outer end of this row. This is not apparent in most specimens. The prostomium is 1 mm. wide, but there is a rather rapid widening in the anterior somites so that at the 6th somite the body width is 6 mm. This is in the type, other specimens being smaller. Somite boundaries are clear in most of the body but dim in the head region. Apparently there are three non-setigerous and six setigerous ones in front of the tentacles, and the gills on these anterior somites are smaller than elsewhere. In anterior regions the distance from gill to notopodium is about one-half of that between the neuro- and notopodia. In the middle of the body the gills are definitely farther removed from the notopodium.

The prostomium (Fig. 1) is a blunt cone, its sides continuing posteriorly to form a straight line with the sides of the first somites, later somites widening rapidly to full body width. The neuropodial setae are all slender, much elongated and very sharp-pointed (Fig. 2). In width those of the same somite vary considerably, but there are more in a bundle, and some are wider, in posterior than in anterior somites. The neuropodia are of two kinds; the hooks (Fig. 3) are similar in form throughout the body and approximately six in number in each bundle. In each bundle is also one very slender seta whose general form is like that of the notopodial.

The type is No. 3260 in the collections of

The American Museum of Natural History,
Department of Invertebrates.

Chaetopteridae

PHYLLOCHAETOPTERUS GRUBE

Phyllochaetopterus verrilli, new species

Figures 4 to 8

A few imperfect specimens marked as collected at Oahu in May, 1937. The anterior regions are well enough preserved to make accurate diagnoses possible, but not much of the third body region is retained in any of the material. One specimen measured 6 mm. to the end of the second body region, another was shorter but thicker, this probably being a matter of a different degree of contraction. The tentacles belonging to animals of this size were 10 mm. long.

The tentacles are rather thick and are separated at their bases by a distance equal to about one-half their diameters. From a dorsal view they cover the greater part of the prostomium which may be seen as an oval body lying between the tentacle bases (Fig. 4). Figure 4 gives only the general outlines of the tentacles and does not attempt to represent a deep longitudinal furrow which occurs on the dorsal surface of each. The peristomium extends laterally on either side but on the dorsal surface is largely covered by the tentacles. Ventrally (Fig. 5) it shows a median marginal depression above which may be seen the end of the prostomium. This depression prevents the peristomium from having the horse-foot outline so generally characteristic of this genus. The secondary tentacles (Fig. 4) are one on either side, each a cylindrical, rather stiff appearing body which is not long enough to reach the anterior peristomial margin.

There are nine somites (not counting the peristomium) in the first body section and two in the second. All those of the first section have pointed parapodia, each with long, sharp-pointed setae. In the fourth setigerous somite are fewer of the slender setae, but there is on either side a vertical row of heavy, blunt-pointed ones. One specimen had three of these on either side; another had three with smaller ones above and below them. They are very black in color and easily seen on the sides of the somite. The median body section has two somites, each of which carries on its dorsal surface a broad flap,



Figs. 1-3. *Audouinia branchiata*, new species. Fig. 1, anterior end ($\times 10$); Fig. 2, slender seta ($\times 370$); Fig. 3, neuropodial hook ($\times 370$).

Figs. 4-8. *Phyllochaetopterus verrilli*, new species. Fig. 4, anterior end ($\times 5$); Fig. 5, ventral view of head ($\times 5$); Fig. 6, notopodium of posterior region ($\times 5$); Fig. 7, seta of first region ($\times 255$); Fig. 8, diagram showing arrangement of uncini in two rows, much enlarged.

Figs. 9-13. *Laonome arenosa*, new species. Fig. 9, ventral view of collar ($\times 5$); Fig. 10, dorsal view of collar ($\times 5$); Fig. 11, uncinus ($\times 187$); Fig. 12, smaller seta ($\times 187$); Fig. 13, thoracic seta ($\times 187$).

Fig. 14, 15. *Vermiliopsis hawaiiensis*, new species. Fig. 13, operculum with part of stalk ($\times 23$); Fig. 15, seta ($\times 250$).

Figs. 16, 17. *Vermiliopsis torquata*, new species. Fig. 16, side view of head ($\times 18$); Fig. 17, seta ($\times 185$).

the two being more or less fused across the median line. On the ventral surface each has a transverse lobe which in the anterior of the two somites is definitely bilobed but in the posterior is less so or not at all. In the third body section the first somite is the longest, the second and later somites being much shorter. Since the posterior body somites had been lost, this statement applies only to the foremost somites of this section. Each somite has a transversely placed flap on its postero-ventral face. The notopodium is a club-shaped body with a spherical head and thick stem, the whole being about as long as one-quarter of the body width (Fig. 6).

Potts (1914, pp. 987-990) reaches the conclusion that seta characters vary so much in *Phyllochaetopterus* as to be of little value in species diagnosis, but for what they are worth I am recording them here. There are two kinds of setae in the first body section. The first are long and slender and have pointed apices, the others vary from lanceolate to obovate with minute pointed tips (Fig. 7, a lanceolate form). The surface is marked with longitudinal striations. In the third body section each notopodium carries two slender setae similar to the first mentioned as occurring in the first section, each extending from the base of the notopodial stalk to near the center of its head (Fig. 6). The uncini of the third body section are very small flat plates, each with a rounded basal and five sharp teeth, the apical being the smallest. They lie alternately in two closely compacted rows (diagrammatically represented in Fig. 8).

The tube is composed of an organic base to which are attached small particles of white sand.

The type is No. 3261 in the collections of The American Museum of Natural History, Department of Invertebrates.

Sabellidae

LAONOME MALMGREN

Laonome arenosa, new species

Figures 9 to 14

The body of the type is 30 mm. long and in the thoracic region is 4 mm. wide. The collar is prominent, its ventral ends extending into bluntly rounded conical lobes, the lobes from the two sides widely overlapping (Fig. 9). At the apices of the lobes the height is 2 mm., but at about two-thirds of the distance to the lateral body line the height is 1.5 mm. The dorso-lateral lobes are about as high as the ventral (Fig. 10), but the dorso-median ones are much shorter than these. The two dorso-median lobes are separated by a narrow space.

There are eight thoracic somites (seven uncinigerous). The gills are uniformly brown in color and carry no eyes. There is a very short basement membrane. The first three or four of the ventral gills are short, the others longer and about

uniform in length. The tentacles are colored like the gills and are rather long and narrow. In the type, just ventral to the mouth, are two large whitish bodies each about 1 mm. in length which evidently are some abnormal growth.

The thoracic uncini are in a single row. Each uncinus has one large tooth (Fig. 11), with an apical arrangement of small spines or, more properly called, striations, as even under a magnification of 500 diameters no protruding points can be seen. The base is prolonged into a sharp point. The setae vary from long and slender with a very narrow wing (Fig. 12) to shorter ones which are definitely geniculate and carry a broad wing at the bend (Fig. 13). Some that are more or less intermediate between these two occasionally appear. In the abdomen the uncinal rows are shorter than in the thorax, but the uncini are essentially alike in the two places. Abdominal setae are essentially like those of the thorax but are predominantly of the broad-winged type. There are no uncini in the collar somite and the setae are the same as in the rest of the thorax.

The tube is composed of fine gray sand with a thin light-brown organic base.

The specimens were collected in Hawaii by A. E. Verrill. The type is No. 3262 in the collections of The American Museum of Natural History, Department of Invertebrates.

Serpulidae

VERMILIPSIS ST. JOSEPH

Vermilipsis hawaiiensis, new species

Figures 14, 15

The most prominent feature of the animal is the large black operculum on the end of a prominent stalk. In the type the body is 4.5 mm. long, while the operculum with stalk is 3 mm. In the preserved material the gills are much contracted and in that condition are 1 mm. long.

The base of the opercular stalk is about one-quarter as wide as is the body at its second somite. This gradually widens to twice that width at the apex. Under a low magnification it shows a wrinkled surface (Fig. 14), but apparently not a true jointing. On the dorsal surface is a narrow notch. The apical pseudojoint is much larger than any of the others. The broad rounded base of the operculum is attached to this terminal pseudojoint, and its apical portion is a cone, colored an intense black. In some of the material the apex of the operculum showed a depression, but it is probable that this is an artefact and that the normal form is that of the blunt apex of a cone. There is no indication of jointing in the operculum.

The collar is four-lobed, the dorso-lateral lobes larger than the others and widely separated on the dorsal margin. The ventro-lateral lobes are in contact ventrally. The gill radioles are about

eight on a side, the stalks rather heavy and with naked apices.

In the thorax are six uncinatè somites and in the abdomen about forty, though, because of poor preservation, the latter number is somewhat difficult to determine definitely. The thoracic setae (Fig. 15) are slender and have a slight dilation toward the apex but no true wing. Along the margin of the convex part of this dilation is a row of spines. In the thorax are twelve or more of these setae. In the collar (first thoracic setae) the number is smaller, and they are smaller in size. The apices are sharp-pointed, but so far as I could determine there are no marginal spines. The thoracic uncini are plates packed tightly in a single row, each plate with about twenty sharp teeth and a very much larger bifid basal one, each half of the tooth bluntly rounded. The abdominal uncini are similar to the thoracic. Aside from an occasional broken stalk I was unable to find any abdominal elongated setae. The shell is relatively heavy with prominent longitudinal ridges.

The specimens were collected in Hawaii by A. E. Verrill. The type is No. 3263 in the collections of The American Museum of Natural History, Department of Invertebrates.

Vermiliopsis torquata, new species

Figures 16, 17

The body length is about 9 mm., with a width of 0.5 mm. The operculum has a heavy, jointed stem. In both specimens at my disposal the operculum had been badly preserved, but as indicated in the larger specimen its outline must originally have been a pointed oval with a series of dark, pigmented rings on its outer half. In one specimen these rings can be seen, although the terminal half of the oval has collapsed into the basal. There are about twelve gills on a side, each branchiole having a relatively long naked portion at the tip. In the preserved material the gills are contracted into a compact mass about as long as the operculum. The collar is very prominent. Dorsally it has two large lobes, one shown in lateral view in Fig. 16.

These are almost rectangular in outline, and one of them covers over the base of the opercular stalk. The ventral margin of each lobe extends nearly to the ventral body line, and on either side they extend postero-dorsally nearly to the end of the thorax. What appear to be the ventral collar lobes are transverse fleshy structures ventral to the mouth (shown at left in the figure).

There are seven thoracic somites. In the first (collar) somite there are about twelve slender setae, most of which were broken in my material but apparently all were long, slender and sharp-pointed. Those of other somites are similar to these, but some have marginal roughnesses which may be minute teeth but which probably are artefacts. In the posterior thoracic somites are a few of these slender ones, but most are limbate toward the apices, the wing having marginal spines, and the row of marginal spines is continued along the stalk beyond the end of the wing (Fig. 17). Those beyond the end of the wing are larger than those on its margin. These resemble the "soie de Apomatus" of Fauvel (1927, Fig. 24n) except that the marginal structures are fine spines instead of mere indentations as figured by Fauvel. In the limited amount of material at my disposal I was unable to get any good preparations of abdominal setae, all that remained being broken stalks. The thoracic uncini are of the typical form, each with a marginal row of sharp teeth and larger teeth at the base. They are set in a single closely packed row.

Only two specimens are in the collection, of which the smaller is much the better preserved. I have marked them as cotypes because the structure of the operculum is better shown in the larger specimen, while other characters are best seen in the smaller.

Collected in Hawaii by A. E. Verrill. The cotypes are numbered 3264 in the collections of The American Museum of Natural History, Department of Invertebrates.

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