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Nemerteans of the Hawaiian and Marshall Islands

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NEMERTEANS OF HAWAII

It has been concluded from the reports of collectors that the nemertean fauna of the intertidal zone and off-shore waters of the Hawaiian Islands is represented by a sparse population both in numbers of species and of individuals. In my paper on "New nemerteans from Hawaii" (3)[2] only six species are mentioned, including two for which specific identification could not be made. For this reason a small collection procured from the intertidal zone at Halape, Hawaii, by Dr. Robert W. Hiatt, containing two new species is of some interest, although both are members of well-known genera. Only three species were obtained at that locality: one specimen of *Baseodiscus cingulatus* (Coe), four of *Lineus hiatti,* new species, and three of *Nemertopsis exilis,* new species.

None of the species thus far found on or near the Hawaiian Islands has been reported from any other part of the world, although all of them belong to widely distributed genera, found on the coasts of California, Japan, the Mediterranean, and elsewhere. They include three species of *Baseodiscus,* two of *Lineus* and one of *Nemertopsis,* as well as a yet unidentified species of *Drepanophorus* from the off-shore waters. A personal communication from A. E. Verrill mentions a species of *Tetrastemma* from Lihue, Kauai. This and *Baseodiscus edmondsoni* were the only nemerteans that he found in several weeks of collecting in the intertidal zone. The fact that the five genera and seven species mentioned are the only ones that have been reported from these

[1] Contributions from the Scripps Institution of Oceanography, New Series, No. 346.
[2] Numbers in parentheses refer to Literature Cited, p. 106.

islands presumably indicates how little attention has been devoted to the collection and identification of this group of worms. As no less than 24 genera and 69 species have already been reported from the coast of California, it seems probable that many additional species will be found on the islands.

Baseodiscus cingulatus (Coe), B. P. Bishop Mus., Occ. Papers **10** (18) : 6-7, 1934.

Taeniosoma cingulatum Coe, U. S. Fish Comm. Bull. **23** (3) : 981-986, pl. 1, figs. 3-7, 1906.

Individuals of this species are among the most common and conspicuous of the nemerteans found on or near the islands. They are easily distinguished by their large size when fully grown and by the light-colored body with many narrow rings of reddish-brown pigment. A brown dorsal longitudinal stripe is sometimes present, but this disappears after preservation. In some individuals most of the rings encircle the body but are narrower on the ventral surface, whereas in others many of the rings are interrupted ventrally. Large individuals may exceed a meter in length and have more than 100 rings. The body is slender, usually only 1 to 4 mm. in diameter, but of such firm consistency that it is not easily broken. On each anterolateral margin of the head are 35 to 50 minute black ocelli, but these are not visible when the head is strongly contracted and the tip withdrawn into the more posterior portion of the head.

B. cingulatus was previously dredged from depths of 40 to 80 meters in the channel between Maui and Lanai, and collected near the low-water level on Oahu at Kahala, Malaekahana, and Kaaawa, and at Necker Island. One specimen was collected by Dr. Hiatt beneath a rock at the low-water level on the outer coast at Halape.

Baseodiscus edmondsoni Coe, B. P. Bishop Mus., Occ. Papers **10** (18) : 3-5, fig. 1, 1934.

Body is pale yellowish or flesh color, with a broad transverse band of reddish brown on head above brain and a broad median dorsal stripe of the same brown pigment extending from posterior portion of head to posterior end of body. Transverse cephalic band is separated from main dorsal stripe by a colorless area about half as long as the width of head. Except near its anterior end the stripe is more or less interrupted at each pseudosegment by a transverse band of darker color. In some specimens the median longitudinal stripe is narrow, with 20 to 30 transverse bands of darker color extending laterally on each side. There are commonly 30 to 40 or more small black ocelli on each side of head, each group extending from tip of head to brain region, but these are not distinctly visible when head is strongly contracted.

B. edmondsoni is known only from Wake Island; from Kaaawa and Kahala, Oahu; and from Lihue, Kauai.

Baseodiscus univittatus (Coe), B. P. Bishop Mus., Occ. Papers **10** (18) : 6, fig. 2, 1934.

Taeniosoma univittatum Coe, U. S. Fish Comm., Bull. **23** : 978-981, pl. 1, figs. 1-2, 1906.

Body is pale or colorless, with a single narrow longitudinal dorsal stripe of dark reddish brown. The stripe is continuous from tip of head to posterior extremity of body. Body is slender, reaching a length of 100 mm. or more, with a diameter of only 1.5 to 3 mm.

This species was collected at the low-water level on the reefs at Kaaawa and Waikiki, Oahu, and dredged from depths of about 250 meters off the southern coast of Molokai and north of Maui.

Lineus albifrons Coe, B. P. Bishop Mus., Occ. Papers **10** (18) : 8, fig. 4, 1934.

Body is deeply pigmented anteriorly, with a sharply demarcated broad band of white on tip of head on both dorsal and ventral surfaces. The precise color of the pigment in life has not been recorded. Back of anterior third of body the pigment gradually decreases and posterior half of body is much paler. Ocelli are inconspicuous or absent.

L. albifrons is known from only a single specimen collected at Kahala, Oahu. This individual measured 14 mm. in length and 1.5 mm. in diameter after preservation.

Lineus hiatti, new species.

Body slender, rounded or slightly flattened; head slender, much narrower than adjacent portion of body, pointed at extremity. Cephalic grooves long and deep. Mouth large and elongated or small and rounded, according to state of contraction; when body is strongly contracted mouth may be protruded and margins extended to form an opening more than half diameter of body. In common with most of the other species of the genus, body is fragile and the worm usually fragments when captured.

Size: of the four specimens available for study, the largest was 4 mm. in width, 3 mm. in thickness and 100 to 150 mm. in length.

Ocelli: absent or inconspicuous.

Color: brown in life, becoming darker and almost black after preservation. Margins of cephalic grooves and extreme tip of head pale gray. Proboscis gray or pale brown.

This species is found beneath stones and matted algae near low-water level. At present it is known only from Halape, Hawaii. Types are deposited in Bishop Museum.

Individuals of this species have a superficial resemblance to those of *L. nigricans* Bürger from the Mediterranean and to *L. alborostratus*

Takakura from Japan but differ in having the head with less distinct anterior white or colorless margin.

Nemertopsis exilis, new species.

Body filiform, usually twisted and tangled, but not coiled; 20 to more than 60 mm. in length but only 0.5 to 1.5 mm. in diameter or even less when fully extended. Very firm and not easily broken. Mouth and proboscis opening united or in close contact. Proboscis sheath about one-third as long as body. Proboscis short but large in comparison with diameter of body; in some portions diameter of proboscis is more than half the width of entire body; armed with slender central stylet and slender basis, with two pouches of accessory stylets. There are 10 proboscidial nerves. Cerebral sense organs large in comparison with size of head, situated anterior to brain. Intestinal caecum ends far back of brain.

Color: one of the three specimens collected was recorded as red in life but color was entirely lost after preservation. The other two were presumably paler.

BPBM cat. No G183

N. exilis lives beneath stones in the intertidal zone near low-water level. At present it is known only from Halape, Hawaii. Types are in the collection of Bishop Museum.

This species resembles *N. tenuis* Bürger of the Mediterranean and Atlantic coast of France but differs in character of cerebral sense organs and presumably in other anatomical details. Individuals of this species are among the most slender of all the nemerteans but the tissues are so strong that the body is not easily ruptured.

NEMERTEANS OF THE MARSHALL ISLANDS

During his investigations on the marine organisms at Bikini and Eniwetok Atolls in connection with the atomic bomb tests in the summer of 1946, Dr. Martin W. Johnson, of the Scripps Institution of Oceanography, obtained three species of nemerteans in the intertidal zone. Each of these had been reported from other Pacific islands, but the present record adds greatly to their previously known distribution. The finding of *Gorgonorhynchus* so far from its original place of discovery is of much interest. The fact that the two known species of that genus are found on opposite sides of the world justifies the conclusion that the remarkable modification of the proboscis characteristic of the genus must have been of ancient origin and not a recently acquired specialization as has been suggested by Wheeler (6).

Baseodiscus delineatus (Delle Chiaje).

Polia delineata Delle Chiaje, Animali sense Vert., Mem. **3,** Napoli, 1825.

This specimen is about 30 cm. long after preservation and 4 to 5 mm. in diameter. The general color was dark reddish brown, consisting of about 50 fine longitudinal lines, alternating with an equal number of fine gray lines. This pattern covers the entire body both dorsally and ventrally, with only an occasional interruption of one of the lines. In this respect this specimen differs from the more common color varieties in which there is more or less complete interlacing and interruption of the lines.

One individual of this widely distributed species was collected in the intertidal zone at Bogoni Island, Eniwetok Lagoon.

The species has previously been reported from the Marianas and Fiji Islands and is widely distributed in both the Northern and Southern Hemispheres, from the Mediterranean to the Cape Verde Islands, coasts of Africa, Mauritius, East Indies, West Indies, Bermuda, and Gulf of California. The distribution of *B. curtus,* with lighter and less regular color patterns is generally coextensive with that of *B. delineatus.* The species which Yamaoka (*7*) has reported from Japan as *B. curtus* is obviously *B. princeps* (Coe, 1).

Gorgonorhynchus repens Dakin and Fordham, Nature **128**: 796, fig. 1, 1931; Zool. Soc. London, Proc. (1-2): 461-483, pls. 1-5, figs. 1-6, 1936.

Individuals of this genus differ from all other nemerteans in having the proboscis dichotomously branched. This organ has a cephalic attachment as in other Heteronemertea, but the short basal portion divides into 32 or 64 branches, each of which is capable of eversion like the finger of a glove. At the base of each branch is a valve-like structure which allows each branch or division of branches to be everted separately and withdrawn again by hydrostatic pressure. As in some species of *Cerebratulus* and a few nemerteans of other families, the proboscis has no retractor muscle.

One specimen of this peculiar nemertean was collected in the intertidal zone of the outside reef at Namu Island, Bikini Atoll.

This species was first recorded from New South Wales and later from tropical islands of the Great Barrier Reef. The same or a very similar species has been found on the coast of India. Another species, *G. bermudiensis* Wheeler (6) is not uncommon at Bermuda.

With the exception of the highly specialized proboscis, the genus is similar to other genera of the family Lineidae, particularly to *Cerebratulus,* in anatomical features as so fully described and illustrated by Dakin and Fordham (5). Members of the genus also resemble *Cerebratulus* in external appearance and habits. Individuals of both genera are adapted for swimming, although they usually remain in burrows or hidden beneath stones.

Drepanophorus crassus (Quatrefages).

Cerebratulus crassus Quatrefages, Ann. Sci. Nat., Zool. **6**: 379-381, 1846.

One specimen measuring 68 mm. in length and 4 to 7 mm. in width, collected in the intertidal zone at Eniirikku Island, Bikini Atoll, is referred to this most widely distributed of all nemertean species. The identification cannot be positive, however, because of the absence of the proboscis. The species has previously been reported from Samoa and Tonga, as well as from the Mediterranean and other European coasts, Madeira, Mauritius, the West Indies, Panama, the west coast of Mexico, Peru, and even from shores in both the Arctic and Antarctic Oceans.

LITERATURE CITED

1. Coe, Wesley R., Nemerteans of the west and northwest coasts of America, Mus. Comp. Zoöl., Bull. **47**: 1-319, 1905.

2. Coe, Wesley R., Nemerteans of the Hawaiian Islands, collected by the steamer Albatross in 1902, U. S. Fish Comm., Bull. **23** (3): 975-986, 1906.

3. Coe, Wesley R., New nemerteans from Hawaii, B. P. Bishop Mus., Occ. Papers **10** (18): 1-9, 1934.

4. Dakin, W. J., and Fordham, M. G. C., A new and peculiar nemertean from the Australian coast, Nature **128**: 796, 1931.

5. Dakin, W. J., and Fordham, M. G. C., The anatomy and systematic position of Gorgonorhynchus repens, gen. n., sp. n., a new genus of nemertines characterized by a multi-branched proboscis, Zool. Soc. London, Proc. (1-2): 461-483, 1936.

6. Wheeler, J. F. G., The discovery of the nemertean Gorgonorhynchus and its bearing on evolutionary theory, American Naturalist **76**: 470-493, 1942.

7. Yamaoka, Teiichi, The fauna of Akkeshi Bay. IX. Nemertini. Faculty Sci. Hokkaido Imp. Univ., Jour. VI, Zool. **7**: 205-263, 1940.