University of California publications in zoology
Berkeley, University Press, 1906-
https://www.biodiversitylibrary.org/bibliography/42552

v.18 (1917-1919): https://www.biodiversitylibrary.org/item/95517

Article/Chapter Title: New species of Amphinomidae from the Pacific coast
Author(s): Christine Essenberg
Subject(s): Annelida, Amphinomidae, taxonomy
Page(s): Page 61, Page 62, Page 63, Page 64, Page 65, Page 66, Page 67, Page 68, Page 69, Page 70, Page 72, Illustration, Text, Page 74, Illustration, Text

Holding Institution: Smithsonian Libraries and Archives
Sponsored by: Smithsonian

This page intentionally left blank.

UNIVERSITY OF CALIFORNIA PUBLICATIONS
IN
ZOOLOGY

Vol. 18, No. 4, pp. 61-74, plates 4-5 October 17, 1917

NEW SPECIES OF *AMPHINOMIDAE* FROM THE PACIFIC COAST

BY
CHRISTINE ESSENBERG

CONTENTS

INTRODUCTION

The present paper is a continuation of two previous papers on the polychaetous annelids. The study of these annelids was begun and carried on for some time in the Zoological Laboratory of the University of California at Berkeley and was completed at the Scripps Institution for Biological Research at La Jolla.

ACKNOWLEDGMENTS

The writer avails herself of the opportunity to express her hearty thanks to Professor Charles A. Kofoid for his encouragement and for his valuable suggestions and criticisms in this work.

The material used in this work was obtained largely from the annelid collection of the Zoological Museum of the California University at Berkeley, of which a revision is being made, and from private collections.

GENERAL DESCRIPTION

The Amphinomidae are interesting in many ways. They have been a problem to the various workers as to their place in the polychaeta group and the question has not been definitely settled yet. Some authors as Quatrefage (1865), have separated this family from the Aphroditidae by the Palmiridae, Leodocidae and Lumbrinereidae. Others, as McIntosh (1900), disapprove of this division, claiming that anatomical differences are not sufficient to justify it. Further disagreement prevails among the various workers as to the classification of this group. Some, as Ehlers (1864), deal with the Amphinomidae as one family. A number of other workers treat them as two independent families, Amphinomidae and Euphrosinidae. McIntosh in his first work (1885) treats the Amphinomidae as two independent families, but in his later volume (1900) he places the subfamilies Amphinomina and Euphrosynina under the one family Amphinomidae. I am inclined to follow the latter plan of classification. Besides the various other characteristics common to both subfamilies of the Amphinomidae, the presence of a dorsal caruncle and the location of the mouth, which is removed ventrally from the usual position at the tip of the snout, distinguish the Amphinomidae from all other families of the Polychaeta.

The chief characteristics pertaining to both subfamilies are as follows: The body is oblong or ovate-oblong. The cephalic lobe is rounded or compressed and coalesced with the caruncle. The caruncle extends over several segments. Of the two pairs of eyes both pairs may be situated dorsally, or one pair may be situated ventrally and the other dorsally. In the family Amphinomidae, there are two lateral tentacles and one median. The latter, however, may be absent. The mouth is removed from the anterior end ventrally and is surrounded by specially modified segments. The proboscis is protrusible, devoid of papillae and of chitinous jaws. The parapodia are biramous and peculiarly modified. The notopodium extends on the dorsum and is coalesced with the latter. It bears setae, branchiae and cirri, arranged in transverse rows, frequently covering the entire dorsum of the worm, except a narrow mid-dorsal line. The setae are usually of two or more kinds; they are tubular, calcareous, very brittle, simple, capillary, unequally bifurcate or serrate. The branchiae are arborescent or pinnate; dorsal in Euphrosynina, marginal in Amphinomina. The ventral cirri are single, the dorsal, single or double.

The members of the family Amphinomidae are confined mostly to tropical and subtropical waters, but a few species of *Eurithoë* have been reported from the lower boreal regions, and some species of *Euphrosynina* have been found in the temperate zones.

The species in the collection of the Zoological Museum of the University of California are from the waters of the coasts of California, except two specimens, of which one is from the Hawaiian waters, the other one from the sub-boreal waters. The Amphinomidae have a varied bathymetrical distribution, ranging from the littoral zones to depths of 2000 fathoms. They have been found on the surface of the water attached to buoyant substances such as logs or weeds. They are frequently found on kelp between tide-marks. Some of the species live as commensals on sponges and are noted for their remarkable adaptive coloration (McIntosh, 1900).

DESCRIPTION OF NEW SPECIES

The species of Amphinomidae of the University collection have been enumerated by Treadwell (1914). On the following pages the following new species are described which may be added to his list: *Euphrosyne calypta, Euphrosyne multibranchiata, Eurythoë spirocirrata,* and *Euphrosyne kyllosetosa.*

To the list of the Amphinomidae in the annelid collection of the University of California may also be added *Chloeia pinnata* (Moore), of which fourteen specimens were found in the Survey of San Francisco Bay on October 21, 1912, at Station D5788, near Farallone, lat. 11° 30′ N., at a depth of 68 to 60 fathoms, in very fine green sand.

1. **Euphrosyne calypta** sp. nov.

Pl. 4, figs. 1–3, 6–7, 13–14

Diagnosis.—Body elongated, rounded at both ends. Dorsum slightly arched with segmentations definitely marked on dorsal and ventral surfaces. Caruncle bilobed, extending to the fourth segment. Six pairs of three- to four-lobed branchiae. Dorsal cirrus between second and third gill-trunks.

Description.—The species is comparatively small in size. The two specimens, type and paratype, measure 10 and 11 mm. in length, respectively, and 6 mm. in width. The body is ovate-oblong, uniform in width, rounded at both ends. The slightly arched dorsum is covered

with transverse rows of branchiae and setae except a narrow mid-dorsal bare line. The ventral surface is convex. The segmentation is well marked by transverse folds. The corresponding numbers of segments of the two specimens are 20 and 28. The caruncle (pl. 4, fig. 1) is coalesced with the prostomium and is dorso-ventrally bilobed. The posterior free end of the caruncle extends almost to the posterior margin of the fourth segment. The anterior end of the caruncle bears a tentacle consisting of a heavy basal portion and a prominent style, about the same length. At the base of the tentacle is a pair of large dorsal eyes. Another pair of smaller eyes is situated ventrally between the peristomial parapodia (pl. 4, fig. 7).

The parapodia are of the usual kind. The dorsal and ventral rami are distinctly separated. The dorsal ramus or notopodium merges into the dorsum, extending nearly to the mid-dorsal line, covering with its numerous setae and branchiae the greater part of the dorsum. There are three cirri, one ventral and two dorsal. The ventral cirrus is inserted between the ventral setae, its distal end reaching to the tips of the ventral setae. One of the two dorsal setae occurs on the dorsum immediately posteriad of the first dorsal trunk of branchiae. The second cirrus is situated between the second and third gill-trunks (counting from the dorsal extremities of the series). The dorsal cirri are stout, slightly tapering toward the distal ends. They are of about equal length with the branchiae, and about one-half of the length of the dorsal setae.

There are six main trunks of branchiae on each parapodium. Each trunk is subdivided into three or four finger-like projections (pl. 4, figs. 13–14). Anterior to each transverse row of branchiae is a row of numerous brown, forked setae (pl. 4, fig. 2). They are bifid, long, tubular, and hollow, with the distal end of the longer projection slightly tapered and the tip slightly curved. One type of dorsal setae only is present, although the setae vary in size. The ventral setae are similar in shape to the dorsal. They are long, one-half the width of the body, hollow, brittle, with the tips obtusely rounded (pl. 4, fig. 3). The setae and the branchiae incline anteriorly near the anterior portion of the body (pl. 4, fig. 1), and posteriorly on the posterior portion of the body.

The buccal region extends to the fifth segment (pl. 4, fig. 7). The caudal cirri (pl. 4, fig. 6) are fleshy and obtusely rounded.

Comparison.—This species has been previously classified by Treadwell as *Euphrosyne aurantiaca* Johnson. It resembles the latter at

first sight in the general appearance, but differs from it in some essential characteristics. The setae in the two species differ in color and in structure. The setae are brown and only of one kind in *Euphrosyne calypta;* they are white in *Euphrosyne aurantiaca,* and the dorsal setae are of two distinct kinds. Further differences are in the location of the cirri. In *E. calypta* the mid-dorsal cirrus is between the second and third gill-trunks; in *E. aurantiaca* the cirrus is between the third and the fourth gill-trunks, counting from the dorsal line. *E. calypta* has six pairs of three- to four-lobed branchiae on each segment; *E. aurantiaca* has seven pairs of seven-lobed branchiae on each segment.

Occurrence.—The type is a dark gray color in alcohol. It has been found in the channel off Santa Barbara. Further data lacking. The other specimen is tan-brown in color. Its locality is unknown.

2. **Euphrosyne multibranchiata** sp. nov.

Pl. 4, figs. 4–5, 8–12

Diagnosis.—Comparatively large-sized worm. Body elongated obtusely rounded at both ends. Dorsal and ventral surfaces convex; setae long and brittle; caruncle bilobed and long, extending to the seventh segment.

Description.—The classification of this species is based on a single specimen. It is a large worm, for this genus. The length of the body is 40 mm., the width in the widest part of the body (between segments 26 and 29) 13 mm., exclusive of the setae. From these segments the width of the body decreases towards both ends. The body is elongated, slightly wider in the center, very gradually decreasing in width toward the ends, which are obtusely rounded. The dorsal and the ventral surfaces are convex and the segmentation is well indicated on both sides by transverse ridges. The number of the segments in this specimen is 45. Except for the narrow mid-dorsal bare line, the dorsum is covered with rows of branchiae and setae. The color of the worm is grayish-brown with ventral setae light yellow, almost white.

The prostomium is deeply sunken between the peristomial parapodia and fused with the dorsally located bilobed caruncle. The caruncle (pl. 4, fig. 11) is long with its free end extending to the seventh segment. It is bilobed dorso-ventrally. The dorsal lobe is grooved and evidently longer than the ventral, for it is coiled in a

zig-zag line. The median tentacle consists of a long, heavy basal portion and a short style about one-fourth the length of the former. At the base of the tentacle on each side of it are a pair of eyes partly covered by the tentacle when the latter is bent posteriorly. The ventral eyes (pl. 4, fig. 12) are small, flanked on each side by very small antennae. The palpi are broad and flat, divided longitudinally by a median cleft. The mouth (pl. 4, fig. 12) is bordered posteriorly by the fifth segment.

The parapodia are typical of the genus, with the notopodium merging into the dorsum. The setae are of two kinds. The ventral setae (pl. 4, fig. 4) are long, one-third of the width of the body, slender, hollow, and very brittle, of straw color with a subterminal spur. The dorsal setae are similar in shape (pl. 4, fig. 5) but they are much shorter and stouter than the ventral, slightly surpassing the length of the branchiae (pl. 4, fig. 10).

There are ten to eleven pairs of branchiae on each segment. The main trunks of branchiae (pl. 4, figs. 8, 9, 10) are subdivided into smaller finger-like projections, the number of which may vary according to the size of the trunk. The finger-like ramifications are usually about 10 to 12 on a trunk, but some of the gill-trunks of the anterior end have only about 5 or 6 ramifications.

There are two dorsal cirri and one ventral. The short and heavy ventral cirrus (pl. 4, fig. 12) is situated at the posterior edge of the neuropodium on the ventral surface. The two dorsal cirri are short, stout, attenuating toward the end, terminating bluntly (pl. 4, fig. 10). The dorsal cirrus is posteriad of the last dorsal gill-trunk. The lateral cirrus is between the fifth and the sixth gill-trunks, counting from the mid-dorsal line. It is short, reaching only halfway the length of the branchiae.

The single specimen in the collection is from Kodiak Island, Alaska. Further data unknown.

3. **Eurythoë spirocirrata** sp. nov.

Pl. 4, figs. 15–17; pl. 5, figs. 18–23

Diagnosis.—Body long, slender, gray in alcohol. Dorsal surface slightly convex. Ventral surface strongly convex. Sides between parapodia vertical and flat. Branchiae marginal. Two cirri on each parapodium. Caruncle broad, smooth, extending to fourth segment.

Description.—The species is a typical representative of the genus *Eurythoë*. The body is long, somewhat uniform in width, very grad-

ually attenuating toward the posterior end and with both ends obtusely rounded. The dorsal surface is almost straight and only slightly arched. The ventral surface is strongly convex. The length of the body is 55 mm., the width, in the widest part of the body (about segments 29 and 30), 13 mm. The segmentation is well shown on the dorsal and the ventral surfaces, as well as on the vertical sides. The number of segments is 66. The caruncle (pl. 5, fig. 18) is coalesced with the prostomium. It is broad and smooth without any grooves and extends to the fourth segment. It has one short median tentacle. The posterior end of the caruncle is narrow and cleft. The prostomium bears two pairs of cirri. No eyes are visible on this specimen. The buccal region extends to the fifth segment (pl. 5, fig. 19). The cirri are spirally constricted. The parapodia (pl. 4, fig. 17) are made up of two widely separated rami. The ventral ramus bears a spirally constricted cirrus and a fascicle of comparatively short setae about one-half the length of the cirri (pls. 4 and 5, figs. 17, 19). The ventral setae (pl. 5, figs. 22, 23) are light yellow, hollow, brittle, with a subterminal prong, ending bluntly. The dorsal division bears a ramose gill (pl. 4, figs. 15, 16, 17). The gill-branches increase in complexity toward the median and posterior portions of the body. The dorsal setae are of two types. One type (pl. 5, fig. 20) is strongly serrated, ending bluntly; the other, very fine, straight, the distal end slender and pointed, with very minute serrations above the prong (pl. 5, fig. 21).

Comparisons.—The worm was labelled as *Eurythoë californica.* It differs from *E. californica* Johnson by the shape of the caruncle, which is narrow and twisted in the latter species, with the prostomium bounded anteriorly by a peculiar crescent-shaped margin. In *Eurythoë spirocirrata* the caruncle is smooth and broad. Further differences are evident in the setae, which are entirely different in the two species. The ventral setae differ in shape, and the two kinds of serrated dorsal setae present in *E. spirocirrata* are represented in *E. californica* by perfectly smooth, straight setae without any serrations. The cirri are spirally twisted in *Eurythoë spirocirrata;* they are straight in *E. californica.* Comparing the illustrations as well as the specimens of both species, one can see at once the characteristic differences.

Eurythoë spirocirrata resembles *E. pacifica* Kinberg more in general appearance and in the shape of the body. It differs from the latter in the broad shape of the caruncle, by the spirally twisted cirri,

by the absence of eye-spots and by the shape of the setae. In *Erythoë pacifica* the ventral setae are more strongly bifurcated with a few serrations on the concave side of the longer fork.

The habitat of the worm is unknown. Most probably it comes from the vicinity of San Diego.

4. **Euphrosyne kyllosetosa** sp. nov.

Pl. 5, figs. 24–31

Diagnosis.—Body ovate-oblong. Dorsum arched and covered with branchiae and setae. Naked mid-dorsal line about one-fifth of the width of the body. Caruncle bilobed, long, extending to the fifth segment. Branchiae 6 to 7 pairs on each segment. Dorsal setae of two kinds, unevenly bifurcate smooth; and strongly bifurcate serrate.

Description.—It is a comparatively small worm measuring 11 mm. in length and 6 mm. in width including setae. The respective number of segments in the two specimens, type and cotype, are 31 and 32. The dorsum is convex, densely covered with branchiae and setae, except a narrow mid-dorsal line about one-fifth of the width of the body which is bare. The prostomium is coalesced with the peristomium and is partly concealed by the long bilobed caruncle dorsally. The crest of the caruncle (pl. 5, fig. 24) is marked by longitudinal grooves. The median tentacle consists of a long basal portion and a style of equal length. The whole tentacle is about one-half of the length of the caruncle. At the base of the tentacle is a pair of eyes. The caruncle is comparatively long, with its free end extending to the fifth segment. The palpi are broad, flattened pads (pl. 5, fig. 25). continuous by their anterior ends with the peristomial parapodia. The mouth is bounded anteriorly by the palps, and posteriorly by a V-shaped furrowed lip. The buccal region extends to the fourth segment. The ventral eyes (pl. 5, fig. 25) are small. The biramous parapodia are of the kind characteristic to the genus. The notopodia are sessile, merging into the dorsum; the neuropodia lateral, slightly projecting lamellae. The cirri are about equal to the gills in length, stout, slightly tapered. The notocirrus is situated mediad of the setae palisade and a little anterior to the branchiae. The lateral or middle cirrus is in line with the notocirrus and is between third and fourth gill-trunks, on the anterior segments, between the second and third gill-trunks (counting from the dorsum). The neurocirrus is similar in shape, situated within the postero-ventral margin of the neuropodial fascicle of the setae.

Branchiae occur on all setigerous segments, usually six pairs on a segment, but there may be only five pairs on the few extreme anterior segments, and seven pairs on the median segments. Each gill-trunk consists of a stem dividing dichotomously several times. The gills vary in size, the individual projections ranking from four to eight in number on each gill-trunk (pl. 5, figs. 31, 32).

The notopodial setae (pl. 5, figs. 26, 28, 29) are arranged in a long palisade of two rows along the entire length of the gill-series. They all are hollow, calcareous, translucent and yellowish-white. They are comparatively short, some projecting slightly beyond tips of the gills. The serrated bifid dorsal setae (pl. 5, figs. 28, 29) are narrow, enlarging near the place of forcation. Both forks are slightly bent, strongly serrated along the inner borders, and are covered with fine asperities. The serrated dorsal setae are more numerous on the anterior portion than on the rest of the body. The dorsal setae of the second row (pl. 5, fig. 26) are of the simple form, incompletely bifid, one of the forks being much longer, about three times the length of the shorter fork, with almost straight, smooth tips. The neuropodial setae (pl. 5, figs. 27, 30) arise in several rows from an elliptical area. They are similar to the smooth dorsal setae but are much stouter and longer than the latter. The length of the ventral setae varies, those in the dorsal part of the fascicle being the longest (about 1 mm.), the setae decreasing in length as they proceed ventrad.

Comparison.—The species resembles somewhat *Euphrosyne dumosa* Moore (1911), but differs from it in the lesser number of gill-trunks and in the shape of the setae. *Euphrosyne dumosa* has 10–11 pairs of branchiae on each segment; *E. kyllosetosa*, 6–7 pairs. The setae differ considerably in the two species. The distal ends of the notosetae as well as of the neurosetae are more slender in *E. dumosa* than they are in *E. kyllosetosa*, and the shorter fork of the non-serrated setae is very short, almost rudimentary, in *E. dumosa*. Other minor differences may be found in the shape of the branchiae and in other characteristics.

The two specimens, type and cotype, were collected between tide-marks from drifting kelp near La Jolla, California, and were kindly presented to me by the collector, Mr. H. O. Falk. They are now in the annelid collection of the University of California in Berkeley. Five specimens of *E. limbata* Moore have been given to me by the same collector and are now in the annelid collection of the Zoological Museum of the University of California at Berkeley. They were collected on December 4, 1915, from kelp holdfasts off La Jolla.

LITERATURE CITED

EHLERS, E.

1864–1869. Die Borstenwürmer. Annelida Chaetopoda nach systematischen und anatomischen Untersuchungen dargestellt (Leipzig, Englemann), 1–748, pls. 1–24.

1887. Reports on the results of dredging in the U. S. Coast Survey Steamer "Blake." Mem. Mus. Comp. Zool. Harvard, **15**, 1–335, pls. 1–60.

JOHNSON, H. P.

1897. A preliminary account of the marine annelids of the Pacific Coast with descriptions of new species. Proc. Calif. Acad. Sci., (3) **1**, 153–193, 5 pls.

1901. The Polychaeta of the Puget Sound Region. Proc. Bost. Soc. Nat. Hist., **29**, 381–437, 19 pls.

KINBERG, J. G. H.

1857. Nya slagten och arter af annelider. Ofv. K. Sv. Vet. Akad. Forh., **14**, 11–14.

MCINTOSH, W. C.

1885. Reports on the scientific results of the voyage of H. M. S. "Challenger" Expedition. **12**, 1–554, pls. 1–55, 1A–39A, 1 map.

1900. Monograph of the British annelids. Part II, Polychaeta, Amphinomidae to Sigalionidae (London, Ray Society), 216–442, pls. 24–26, 26A, 27–42.

MOORE, J. P.

1911. The polychaetous annelids dredged by the U. S. S. "Albatross" off the coast of Southern California in 1904. Proc. Acad. Nat. Sci. Phila., **63**, 234–318, pls. 15–21.

TREADWELL, A. L.

1914. Polychaetous annelids of the Pacific Coast in the collections of the Zoological Museum of the University of California. Univ. Calif. Publ. Zool., **13**, 175–238, pls. 11-12, 7 figs. in text.

EXPLANATION OF PLATES

(All figures drawn with camera lucida)

PLATE 4

Fig. 1. Dorsal view of anterior portion of *Euphrosyne calypta*. × 10.

Fig. 2. Tip of dorsal seta of *Euphrosyne calypta*. × 160.

Fig. 3. Tip of ventral seta of the same. × 160.

Fig. 4. Tip of ventral seta of *Euphrosyne multibranchiata*. × 160.

Fig. 5. Tip of dorsal seta of *Euphrosyne multibranchiata*. × 160.

Fig. 6. Posterior segments of *Euphrosyne calypta*, showing caudal cirri. × 10.

Fig. 7. Ventral view of anterior end of *Euphrosyne calypta*.

Fig. 8. Branchiae of *Euphrosyne multibranchiata*. × 20.

Fig. 9. A branch of the gills of *Euphrosyne multibranchiata*. × 20.

Fig. 10. Three gill-branches of *Euphrosyne multibranchiata*, showing the dorsal cirrus and the setae in their relative positions. × 20.

Fig. 11. Caruncle of *Euphrosyne multibranchiata*. × 10.

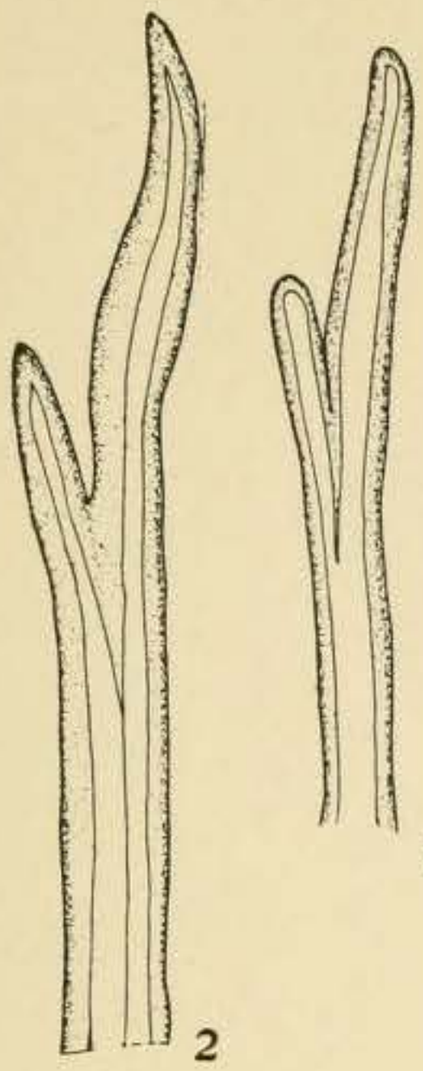
Fig. 12. Ventral view of anterior end of *Euphrosyne multibranchiata*. × 10.

Figs. 13–14. Branchiae of *Euphrosyne calypta*. × 75.

Fig. 15. Branchiae of *Eurythoë spirocirrata*. × 10.

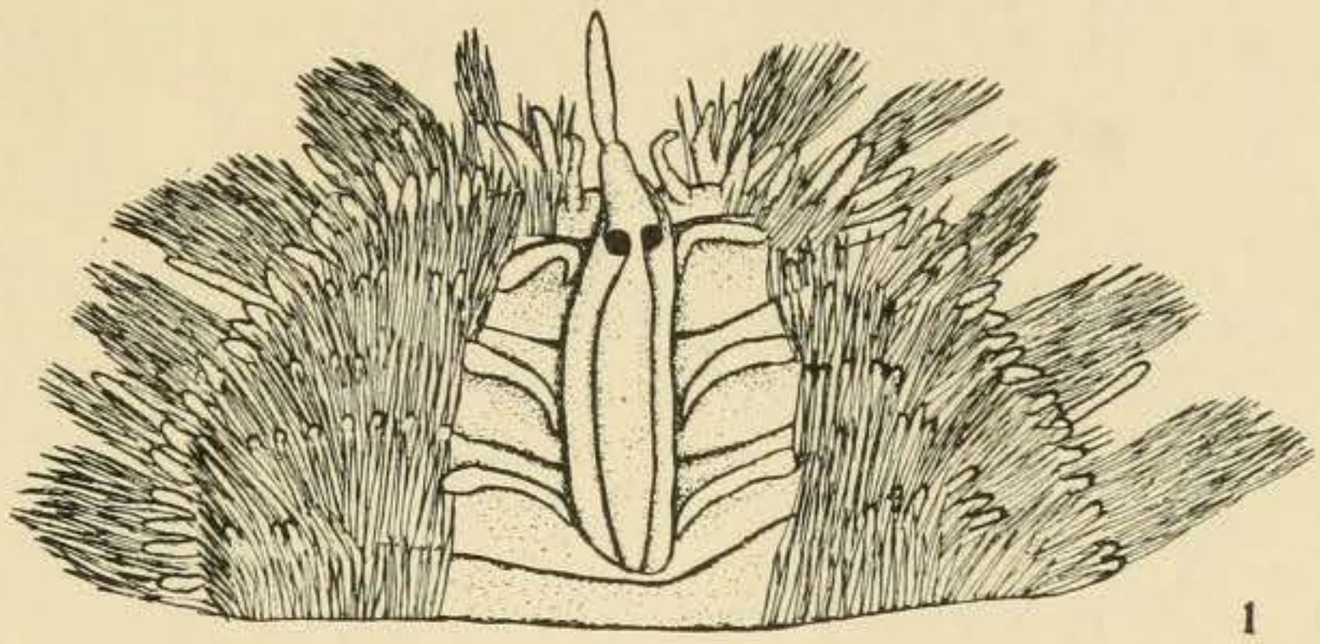
Fig. 16. A branchlet of the preceding. × 20.

Fig. 17. Twentieth parapodium of *Eurythoë spirocirrata*. × 20.



2

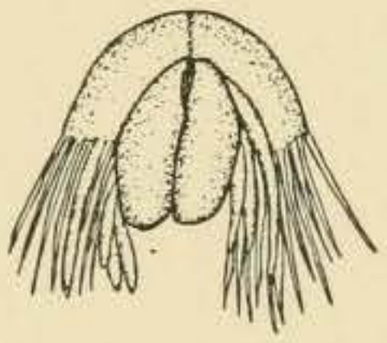
3



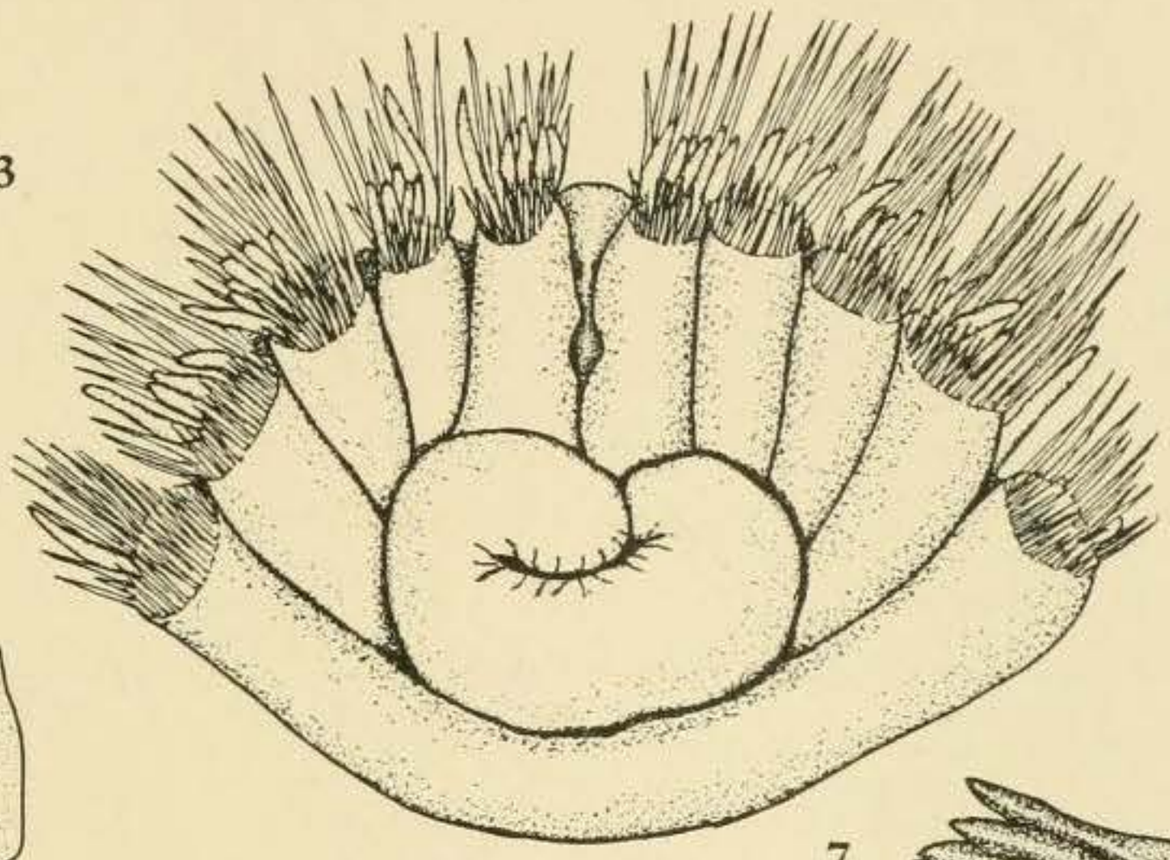
1

4

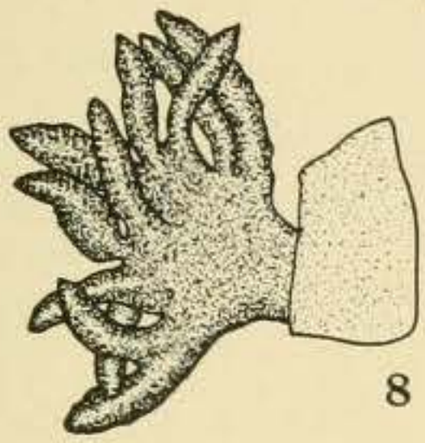
5



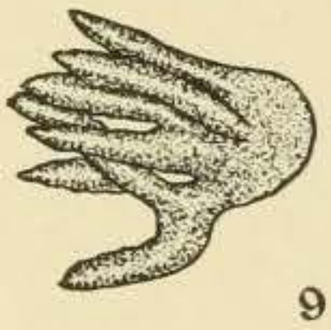
6



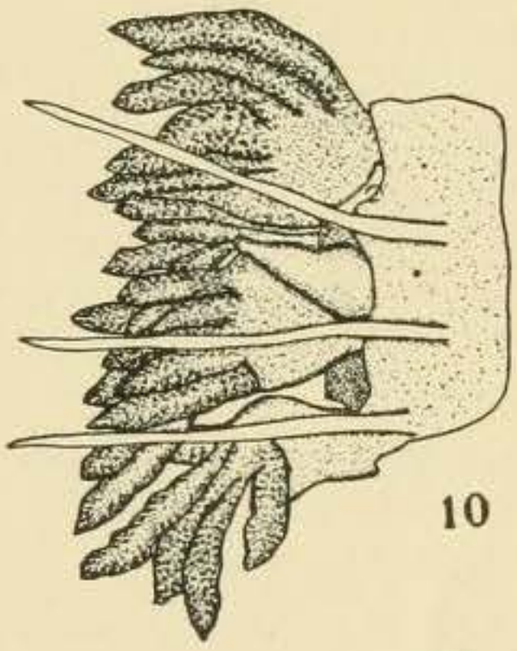
7



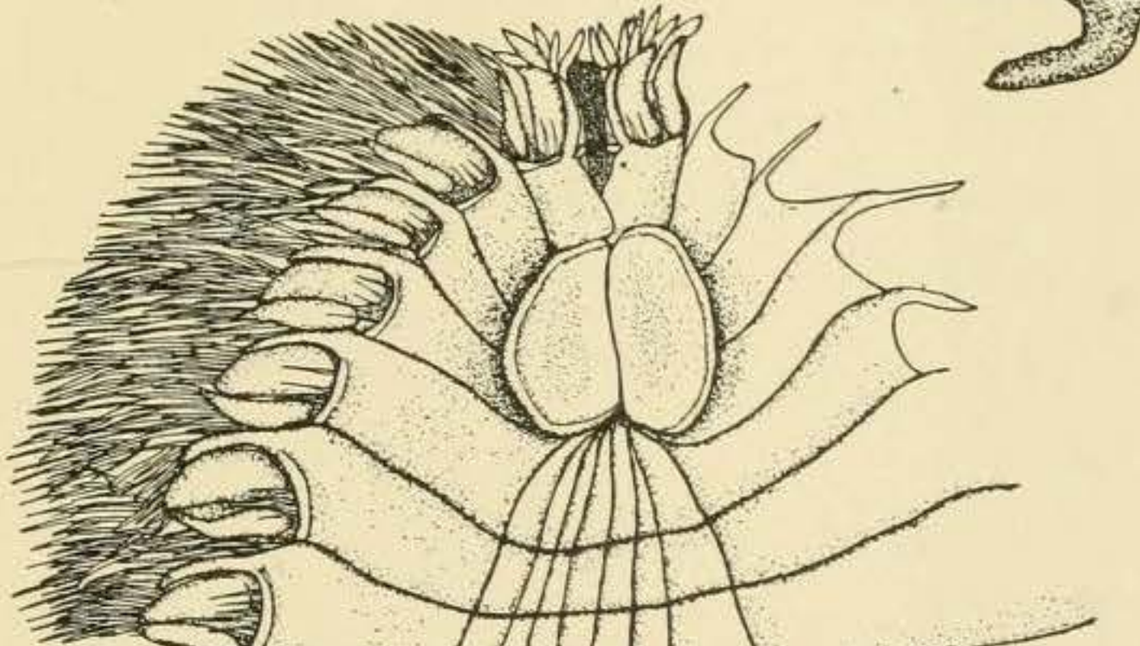
8



9



10

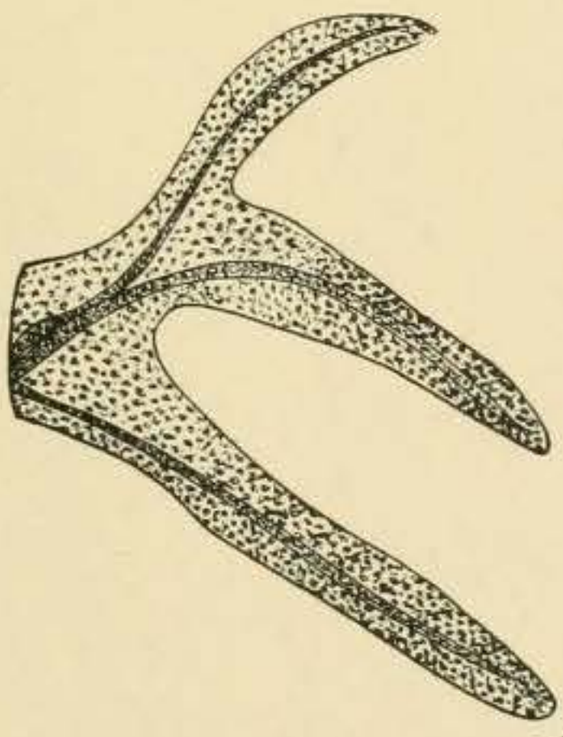


12

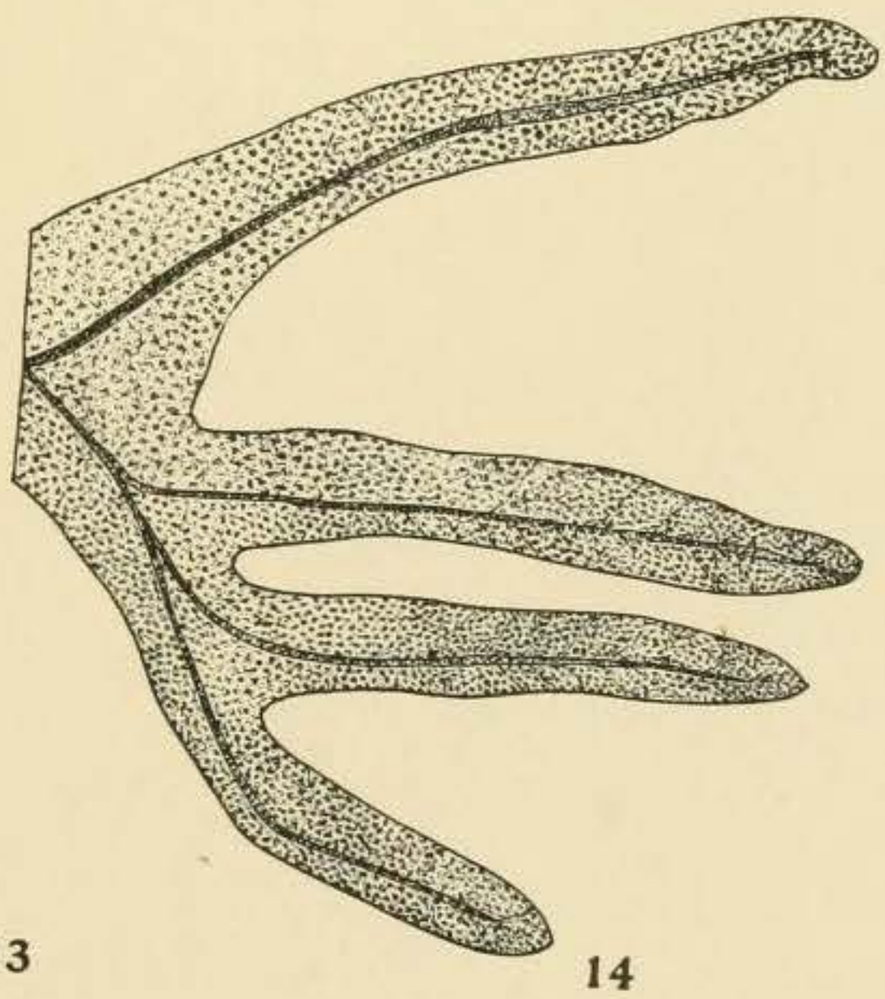
11

15

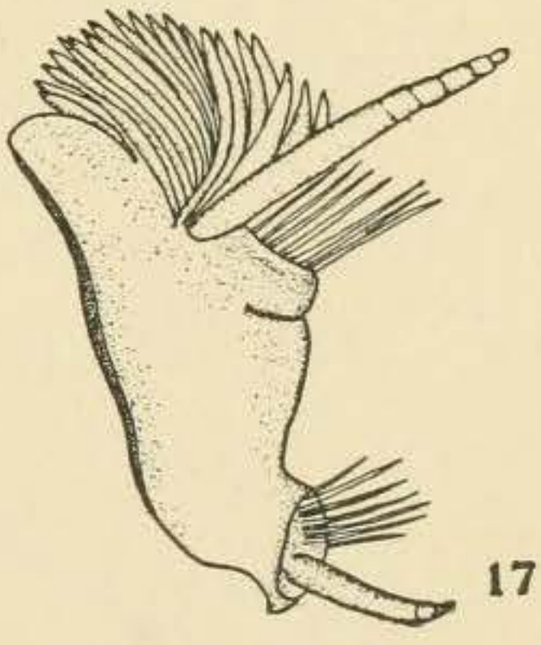
16



13



14



17

PLATE 5

Fig. 18. Dorsal view of anterior portion of *Eurythoë spirocirrata*, showing relative position of caruncle. × 10.

Fig. 19. Anterior ventral view of *Eurythoë spirocirrata*. × 10.

Fig. 20. Tip of stout, serrated dorsal seta of *Eurythoë spirocirrata*. × 160.

Fig. 21. Tip of fine dorsal seta of *Eurythoë spirocirrata*. × 160.

Fig. 22. Tip of smaller ventral seta of *Eurythoë spirocirrata*. × 160.

Fig. 23. Tip of stouter ventral seta of *Eurythoë spirocirrata*. × 160.

Fig. 24. Caruncle of *Euphrosyne kyllosetosa*. × 20.

Fig. 25 Ventral view of anterior end of same. × 10.

Fig. 26. Tip of dorsal seta of *Euphrosyne kyllosetosa*. × 320.

Fig. 27. Tip of ventral seta of *Euphrosyne kyllosetosa*. × 320.

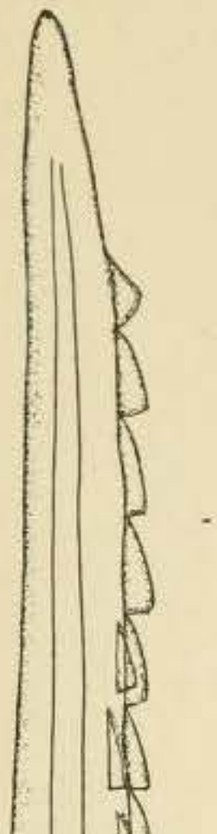
Fig. 28. Tip of serrated dorsal seta of same. × 320.

Fig. 29. Same.

Fig. 30. Tip of ventral seta of *Euphrosyne kyllosetosa*. × 320.

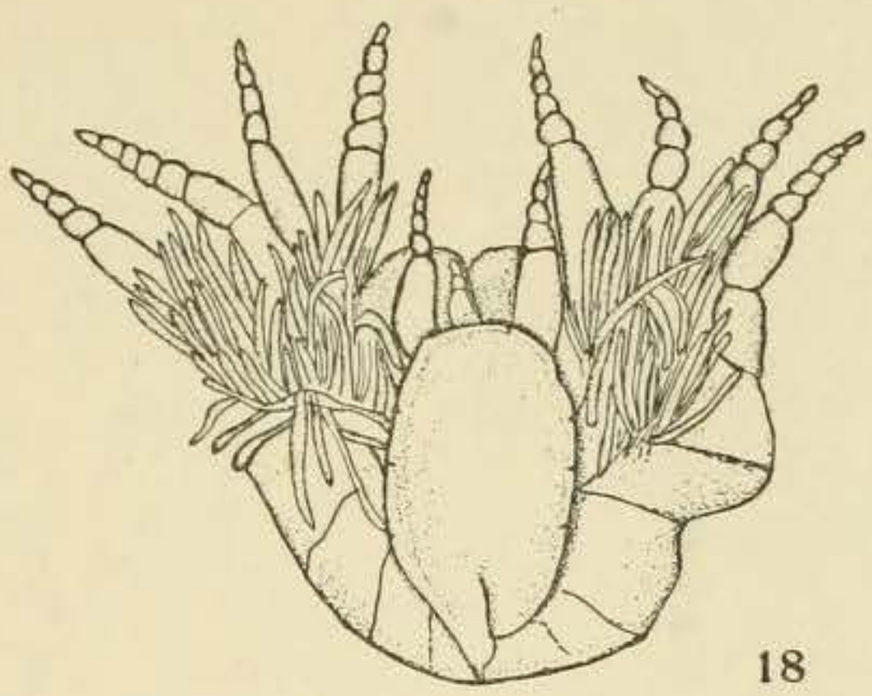
Fig. 31. Branchiae of the same. × 40.

Fig. 32. Branchlets of the same. × 40.

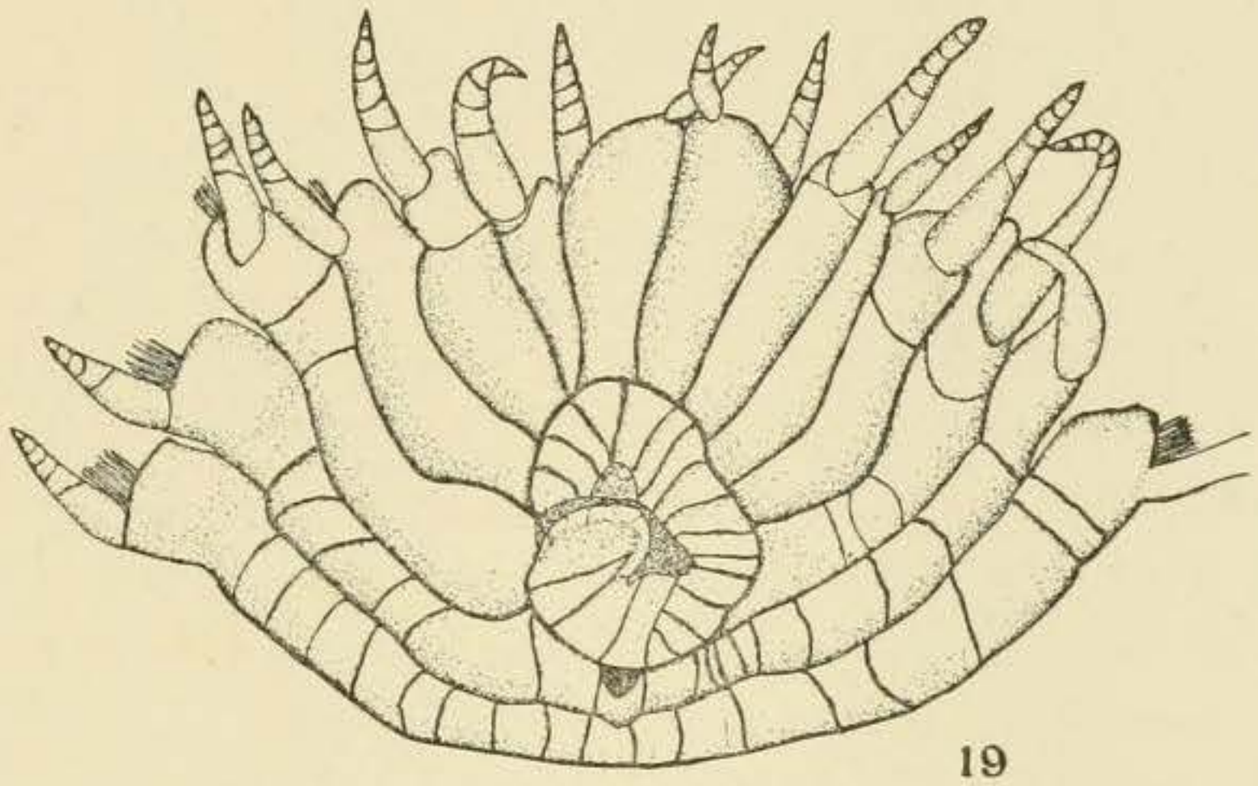


20

21

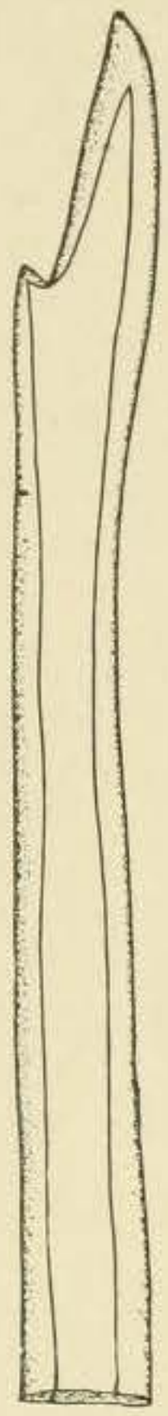


18

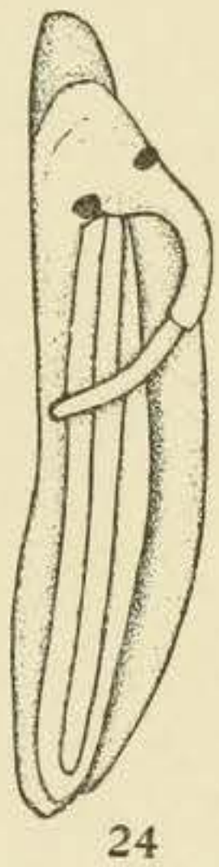


19

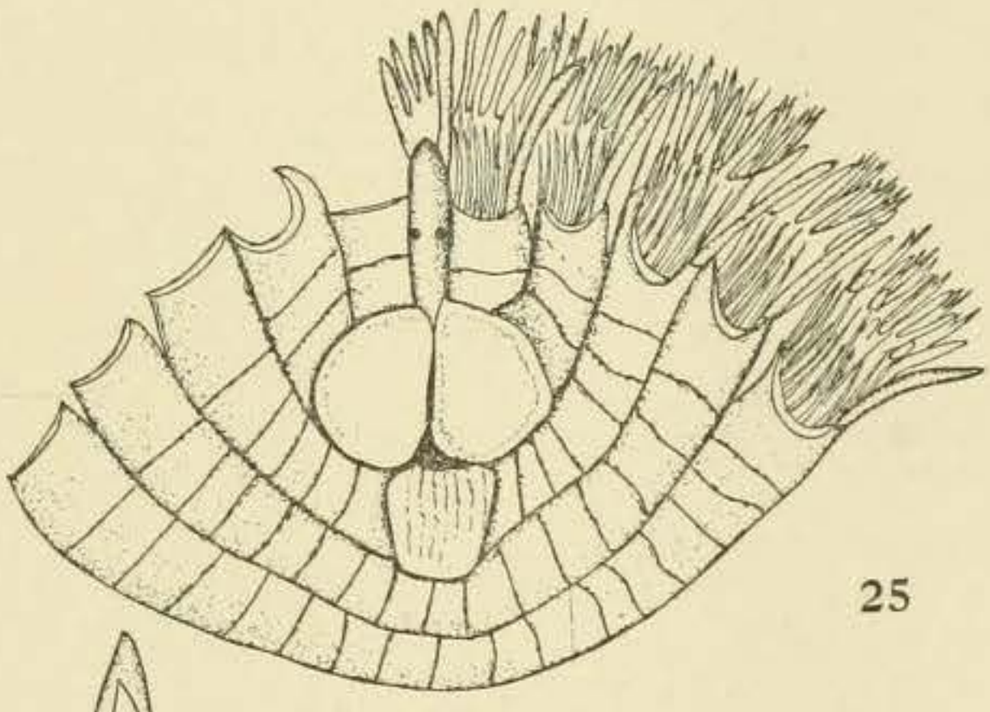
22



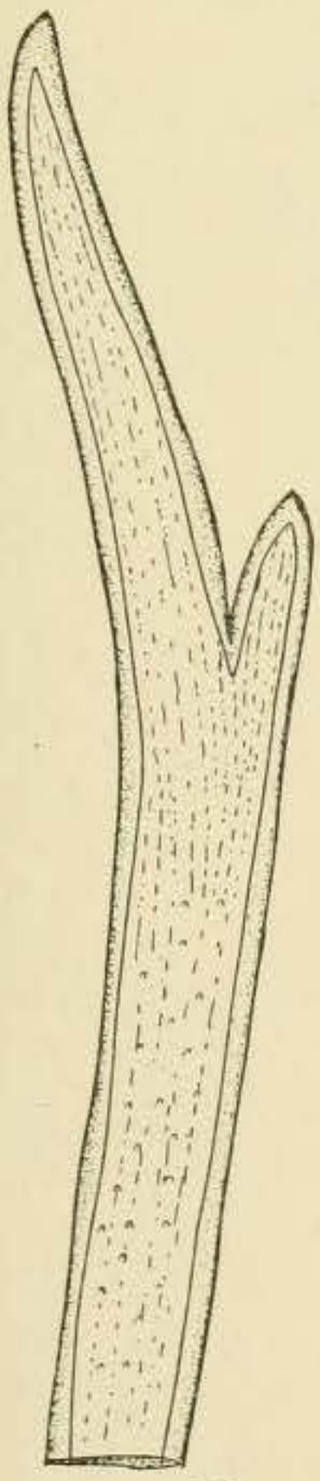
23



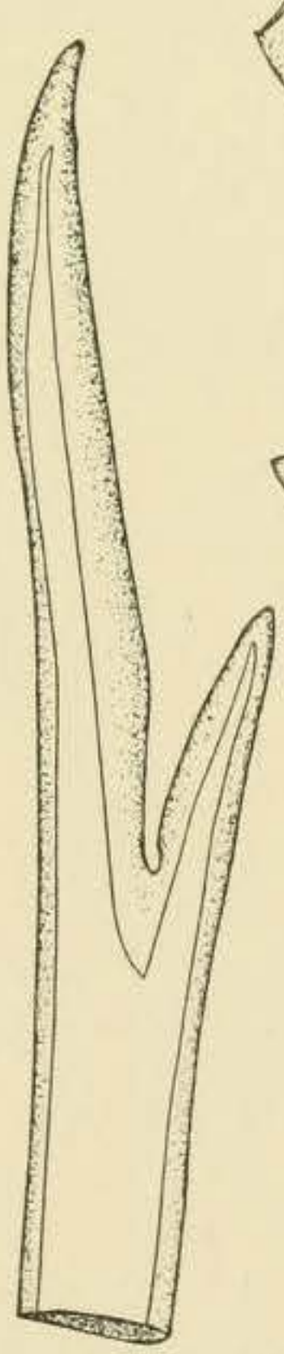
24



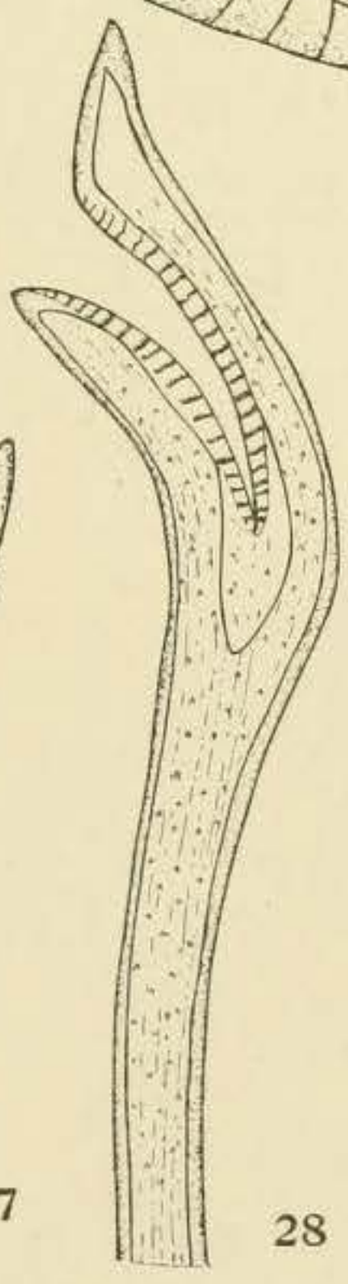
25



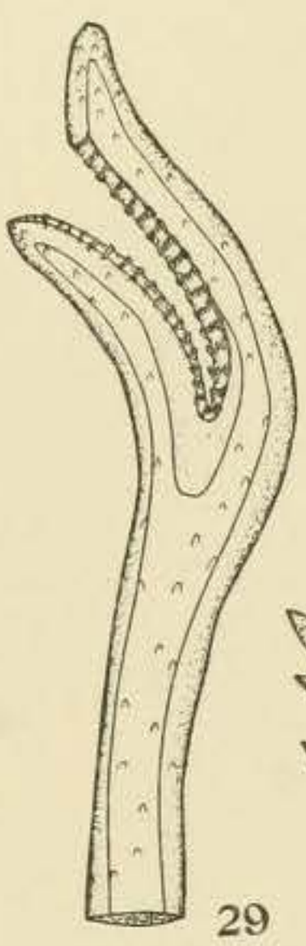
26



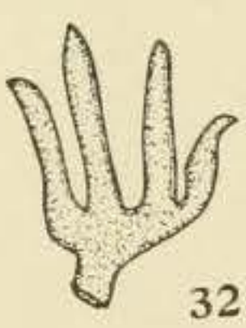
27



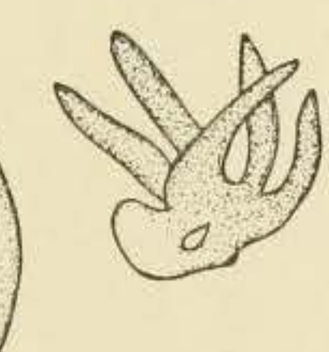
28



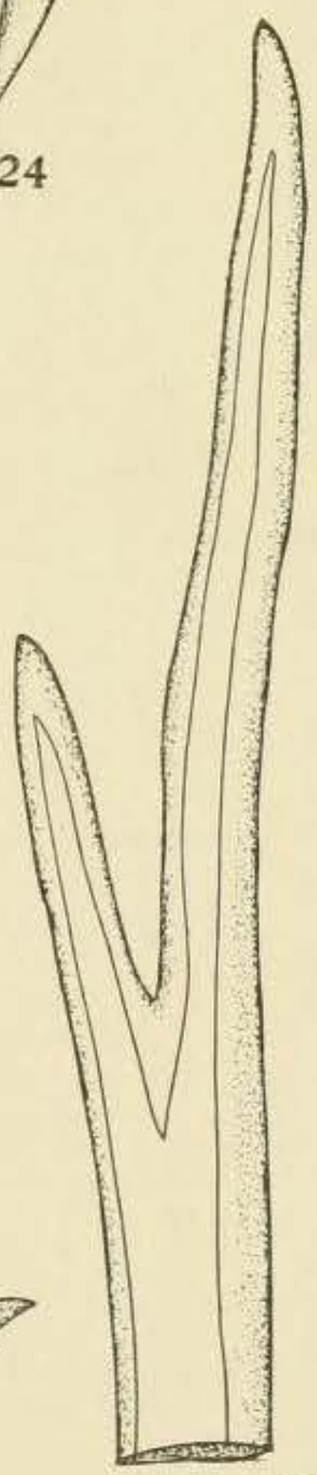
29



32



31



30