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POLYCHAETOUS ANNELIDS COLLECTED OFF THE  
WEST COAST OF KAMCHATKA

II. NOTES ON SPECIES FOUND IN THE COLLECTION OF 1959<sup>1)</sup>

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*With Plates XII-XV, 2 Tables and 1 Text-fig.*

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This study continues the surveys off the west coast of Kamchatka Peninsula begun in 1957 and 1958 (IMAJIMA, 1961). They were continued in 1959 by the "Hokuho-maru", a chartered ship of the Hokkaido Regional Fisheries Research Laboratory. Again I had an opportunity to examine the polychaetous annelids in the region. The collections were made at 72 stations by dredging and the worms were found at 29 stations (see Text-fig. 1 and Table 1). These surveys were made to provide data on oecological relationships existing between the benthic fauna and the king crab, *Paralithodes camtschatica* (TILESUS).

The polychaete collection comprises the following 49 species; two represent new subspecies; they are *Maldane sarsi borealis* and *Acrocirrus heterochaetus okotensis*, described below.

Family Polynoidae

1. *Arcteobia anticostiensis* (MCINTOSH)
2. *Gattyana cirrosa* (PALLAS)
3. *Eunoë spinicirris* ANNENKOVA
4. *Harmothoë extenuata* (GRUBE)
5. *Harmothoë imbricata* (LINNAEUS)

Family Amphinomidae

6. *Euphrosine borealis* OERSTED

Family Phyllodocidae

7. *Anaitides groenlandica* (OERSTED)
8. *Eumida tubiformis* MOORE

Family Syllidae

9. *Autolytus prismaticus* (FABRICIUS)

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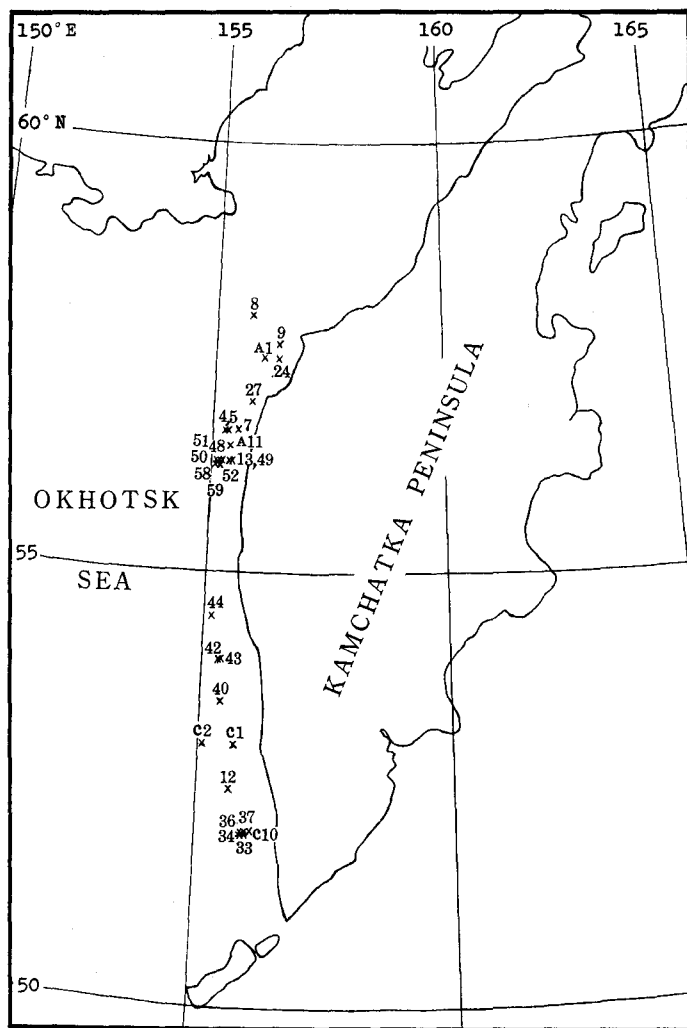


Fig. 1. Map of Kamchatka Peninsula showing stations.

10. *Syllis sclerolaema* EHLERS

11. *Typosyllis fasciata* (MALMGREN)

Family Nereidae

12. *Nereis pelagica* LINNAEUS

Family Nephtyidae

13. *Nephtys caeca* (FABRICIUS)

14. *Nephtys ciliata* (MÜLLER)

15. *Nephtys discors* EHLERS

16. *Nephtys longosetosa* OERSTED

17. *Nephtys paradoxa* MALM

18. *Nephtys punctata* HARTMAN

Table 1. List of station data for the samples collected in 1959.

Station No.	Date	Station		Depth (m)	Time
		Lat. N.	Long. E.		
A 1	May 22	57°30'	156°08'	85	9.46 - 9.56
4	May 28	56°40'	155°15'	100	9.25 - 9.35
5	May 28	56°42'	155°16'	95	11.27 - 11.37
7	May 29	56°43.5'	155°30'	50	10.50 - 11.00
13	May 31	56°21'	155°20'	42	14.27 - 14.37
24	June 12	57°30.5'	156°25'	62	8.50 - 9.00
27	June 15	57°00'	155°50'	69	14.26 - 14.36
C 1	June 20	53°00'	155°40'	58	—
C 2	June 20	53°00'	155°06'	129	8.55 - 9.05
C 10	June 21	52°00'	156°05'	60	23.34 - 23.44
33	June 22	52°00'	156°00.5'	60	9.12 - 9.22
34	June 22	52°00'	156°01'	60	10.51 - 11.01
36	June 22	52°00.5'	156°00'	60	12.54 - 13.04
37	June 22	52°00'	155°59'	65	14.09 - 14.19
40	June 24	53°32'	155°20'	70	13.40 - 13.50
42	June 25	54°00'	155°18'	70	12.25 - 12.35
43	June 25	53°59'	155°18.5'	70	13.57 - 14.07
44	June 26	54°30'	155°10'	75	12.45 - 12.55
S 8	Aug. 1	58°08'	156°50'	92	14.20 - 14.30
S 9	Aug. 2	57°42'	156°26'	98	14.30 - 14.40
S 12	Aug. 3	52°32'	155°37'	60	8.15 - 8.25
A 11	Aug. 4	56°30'	155°21'	64	0.30 - 0.40
48	Aug. 5	56°22'	155°15'	65	8.48 - 8.58
49	Aug. 5	56°23'	155°22'	56	11.40 - 11.50
50	Aug. 6	56°21'	155°11'	65	8.03 - 8.13
51	Aug. 6	56°21'	155°13'	61	9.30 - 9.40
52	Aug. 6	56°22.5'	155°10'	65	11.40 - 11.50
58	Aug. 18	56°17.5'	155°08'	65	9.56 - 10.06
59	Aug. 18	56°15'	155°09'	65	13.03 - 13.13

Family Sphaerodoridae

19. *Sphaerodorum gracilis* (RATHKE)

Family Onuphidae

20. *Nothria iridescens* (JOHNSON)  
 21. *Onuphis cirrobranchiata* MOORE  
 22. *Onuphis parva striata* USCHAKOV

Family Lumbrineridae

23. *Lumbrineris fragilis* (MÜLLER)

Family Orbiniidae

24. ? *Haploscoloplos elongatus* (JOHNSON)

## Family Chaetopteridae

- 25.
- Chaetopterus variopedatus*
- (RENIER)

## Family Cirratulidae

- 26.
- Acrocirrus heterochaetus okotensis*
- n. subsp.

- 27.
- Cirratulus cirratus*
- (MÜLLER)

## Family Opheliidae

- 28.
- Ammotrypane aulogaster*
- RATHKE

- 29.
- Travisia brevis*
- MOORE

## Family Sternaspidae

- 30.
- Sternaspis scutata*
- (RANZANI)

## Family Maldanidae

- 31.
- Axiothella catenata*
- (MALMGREN)

32. ?
- Axiothella rubrocincta*
- (JOHNSON)

- 33.
- Axiothella*
- sp.

- 34.
- Maldane sarsi*
- MALMGREN

- 35.
- Maldane sarsi borealis*
- n. subsp.

- 36.
- Nicomache personata*
- JOHNSON

- 37.
- Rhodine*
- sp.

## Family Oweniidae

- 38.
- Owenia fusiformis*
- DELLE CHIAJE

## Family Sabellaridae

- 39.
- Idanthysus armatus*
- KINBERG

## Family Ampharetidae

- 40.
- Amphicteis scaphobranchiata*
- MOORE

## Family Terebellidae

- 41.
- Amphitrite cirrata*
- MÜLLER

- 42.
- Pista cristata*
- (MÜLLER)

- 43.
- Proclea*
- sp.

## Family Sabellidae

- 44.
- Chone infundibuliformis*
- KRÖYER

- 45.
- Euchone analis*
- (KRÖYER)

- 46.
- Potamilla neglecta*
- (SARS)

## Family Serpulidae

- 47.
- Crucigera zygophora*
- (JOHNSON)

- 48.
- Dexiospira spirillum*
- (LINNAEUS)

- 49.
- Laeospira medius*
- (PIXELL)

Among the specimens dealt with here, 20 species came from Station S 8 (see Table 2); they were embedded in a large mass of *Crucigera zygophora*, mainly in interstices between the tubes and on their surfaces. Maldanidae were chiefly collected at Stations 48, 49, 50, 51, 52, 58 and 59. The bottom materials of these stations consist of sand or mud (MAEDA, 1958, p. 103).

I want to express my hearty thanks to Mr. Isam TAKEUCHI of Hakodate Branch of Hokkaido Regional Fisheries Research Laboratory for his kindness in giving me the opportunity to study these specimens and to members of "Hokuho-maru" for their kind cooperation in collecting and sorting the materials. Thanks are due to Dr. Olga HARTMAN of the Allan Hancock Foundation of University of Southern California for her kind help in reading the manuscript.

### Description of the Species

#### Family POLYNOIDAE

##### 1. *Arcteobia anticostiensis* (MCINTOSH) 1874

(Pl. XII, figs. 1-6)

*Arcteobia anticostiensis* ANNENKOVA, 1937, p. 149, pl. 3, figs. 26, 27, text-fig. 2; PETTIBONE, 1954, pp. 225-226; USCHAKOV, 1955, p. 146, fig. 32, g, d.

*Occurrence*: St. 34, (1); St. 48, (2); St. 51, (1); St. 58, (1); St. 95, (1); St. A 11, (2).

Eight specimens were collected from 6 stations; seven were found commensal in tubes of *Axiiothella catenata*. The body is 22 to 30 mm long and consists of 34 to 36 setigerous segments. The bilobed prostomium (fig. 1) is wider than long and has prominent cephalic peaks. There are two pairs of eyes with the anterior pair at anterolateral edges of the prostomium. Palpi are thick, tapering and about as long as the median antenna. Lateral antennae are shorter than the length of the prostomium. Tentacular cirri are about as long as the median antenna. The 15 pairs of elytra are reniform and their surface has a crescent of brown pigment. The elytral margin is smooth.

Notosetae are of two kinds: thicker, superior setae (fig. 2) have entire tips and are slenderer; inferior setae (fig. 3) have capillary tips. Neurosetae in the upper part of the fascicle are slenderest, they have spinous rows and terminate in capillary tips (fig. 4); those in the middle part of the fascicle are distally bidentate and have coarse, spinous rows along the cutting edge (fig. 5), and inferior ones are bidentate with shorter spinous regions (fig. 6).

Nephridial papillae are present from the 5th parapodium.

*Distribution*: Eastern Canada; north Japan Sea; Bering Sea; east coast of North America.

##### 2. *Gattyana cirrosa* (PALLAS) 1766

*Gattyana cirrosa* PETTIBONE, 1953, pp. 41-43, pl. 20, figs. 174-184; 1954, pp. 226-228, fig. 26, b; USCHAKOV, 1955, p. 143, fig. 31, a-z.

*Occurrence*: St. S 8, (1).

A single complete specimen was obtained from a mass of tubes of *Crucigera zygophora*; it measures 19 mm long for 36 segments. The prostomium has prominent cephalic peaks. The two anterior eyes are located ventrally, beneath the peaks, and the posterior ones are on the dorsal surface. Elytra number 15 pairs; they are oval to reniform; their surface is covered with small simple, two-, to four-pointed tubercles. The elytral margin is fringed with long papillae. Notosetae are of two kinds: thicker, superior setae have blunt tips, and slenderer inferior setae have tapering ends. Neurosetae are distally unidentate.

*Distribution*: North Atlantic Ocean; Arctic Ocean; Bering Sea; north Japan Sea; Okhotsk Sea.

### 3. *Eunoë spinicirrus* ANNENKOVA, 1937

*Eunoë spinicirrus* USCHAKOV, 1955, p. 152, fig. 34, a-d; IMAJIMA, 1961, p. 85, text-fig. 2.

*Occurrence*: St. S 8, (1)

The single specimen measures 55 mm long and 12 mm wide including parapodia.

*Distribution*: North-west coast of Japan Sea; Okhotsk Sea; Bering Sea.

### 4. *Harmothoë extenuata* (GRUBE) 1840

*Harmothoë extenuata* PETTIBONE, 1953, pp. 31-32; IMAJIMA, 1961, pp. 83-84.

*Occurrence*: St. S 8, (34).

All specimens were collected from a mass of tubes of *Crucigera zygophora* (JOHNSON). The bilobed prostomium is wider than long and has prominent cephalic peaks. There are two pairs of eyes; the anterior pair is at the midlateral edges of the prostomium. The 15 pairs of elytra are oval to reniform.

*Distribution*: Mediterranean Sea; Bering Sea to southern California; north Atlantic and Arctic Oceans; Okhotsk Sea.

### 5. *Harmothoë imbricata* (LINNAEUS) 1767

*Harmothoë imbricata* FAUVEL, 1923, p. 55, fig. 18, f, l; PETTIBONE, 1953, pp. 32-36, pl. 13, figs. 114-20, pl. 14, figs. 121-31, pl. 15, figs. 132-37, pl. 16, figs. 138-46; USCHAKOV, 1955, p. 154, fig. 38, a-d.

*Occurrence*: St. 12, (1); St. A 1, (1); St. C 1, (1).

The largest, complete specimen, from St. A 1, measures 28 mm long for 39 setigerous segments. The prostomium has well defined peaks. The anterior eyes are situated ventrally, beneath the peaks. The elytra are grayish brown in alcohol.

*Distribution*: Great Britain; cosmopolitan.

### Family AMPHINOMIDAE

#### 6. *Euphrosine borealis* OERSTED, 1843

(Pl. XII, figs. 7-9)

*Euphrosyne borealis* AUGENER, 1928, p. 671, pl. 11, fig. 1; USCHAKOV, 1955, pp. 223-224, fig. 71, g-z.

*Occurrence*: St. S 8, (2).

The larger individual measures 14 mm long for 26 segments. The caruncle reaches to the 5th setigerous segment. Branchiae are present from the first setigerous segment; they are usually simple except for the dorsalmost one, which is bifid or simple; they number 7 in a row in the median region of the body (fig. 7). Dorsal cirri are subequal or slightly shorter than their accompanying branchiae. In a median segment the lateral dorsal cirrus is located between the third and fourth branchiae, counting from middorsum. Notosetae are of two kinds; the shorter ones are deeply cleft and laterally serrated (fig. 8), whereas the longer ones are furcate and have a small subterminal spur (fig. 9).

*Distribution*: Greenland; Arctic Ocean; Okhotsk Sea; Bering Sea.

### Family PHYLLODOCIDAE

#### 7. *Anaitides groenlandica* (OERSTED) 1843

(Pl. XII, fig. 10)

*Phyllodoce groenlandica* FAUVEL, 1923, pp. 153-154, fig. 54, f-i.

*Phyllodoce (Anaitides) groenlandica* BERKELEY and BERKELEY, 1948, p. 46, fig. 66; USCHAKOV, 1950, p. 170.

*Anaitides groenlandica* HARTMAN, 1948, p. 19.

*Occurrence*: St. 36, (1); St. 48, (1); St. 59, (1).

A specimen from St. 48 was found in the tube of *Axiothella catenata*; it measures about 70 mm long for 184 setigerous segments. The body is greenish and the dorsum is marked with a blackish longitudinal band. The prostomium is cordiform; it has a posterior cleft and a spherical nuchal papilla. The everted proboscis has a distal cirlet of 17 papillae and its basal half has 6 rows of papillae on each side, with 12 to 14 papillae in a row. Four pairs of tentacular cirri are inserted on the first three segments; the tentacular setal formula is  $1 + O \frac{1}{1} + S \frac{1}{N}$ . Dorsal cirri (fig. 10) are large and subrectangular in the median region of the body. Ventral cirri terminate in an inferior acuminate projection.

*Distribution*: Greenland; Arctic Ocean; north-west coast of Japan Sea; Okhotsk Sea; Bering Sea; west coast of North America.



8. *Eumida tubiformis* MOORE, 1909

(Pl. XII, fig. 11)

*Eumida tubiformis* MOORE, 1909, pp. 342-344, pl. 16, figs. 22, 23.*Eulalia (Eumida) tubiformis* USCHAKOV, 1955, p. 99, fig. 6, a-b.*Occurrence*: St. S 8, (1).

A single individual measures 27 mm long for 105 setigerous segments; it is dark green. The prostomium is broader than long; it has two pairs of frontal antennae and a median one arising between the two large eyes. The proboscis is smooth. The first segment is dorsally reduced and has a pair of tentacular cirri and a setal fascicle of composite spinigers located at the base of the ventral cirri. Dorsal cirri (fig. 11) are nearly triangular, lanceolate. Ventral cirri are small, lanceolate and extend distally beyond the tips of the setigerous lobes.

*Distribution*: Southern California; north Japan Sea; Okhotsk Sea.

## Family SYLLIDAE

*Autolytus prismaticus* (FABRICIUS) 1780

(Pl. XII, fig. 12)

*Autolytus prismaticus* PETTIBONE, 1954, pp. 249-252, fig. 29, a,b; USCHAKOV, 1955, p. 193.*Occurrence*: St. S 8, (3).

Three somewhat damaged, atokous specimens were examined. The largest one measures 10 mm long and 0.7 mm wide and consists of 73 setigerous segments. The dorsum has three longitudinal black bands; those of the posterior region are indistinct. The prostomium is broader than long and has two pairs of eyes in trapezoidal arrangement. Three antennae may be distally incomplete; the median one arises between the anterior eyes and the lateral ones are at the anterior margin of the prostomium. Two nuchal epaulettes arise from the hinder margin of the prostomium and extend through only the first segment. The pharynx is distally surrounded by 9 soft papillae. The trepan (fig. 12) has 9 large and 9 small teeth arranged in alternate series. The proventriculus extends from setigerous segment 6 to 10. All dorsal cirri except on some anterior segments are about half the width of their respective segments. Parapodia are bluntly conical and provided with setal fascicles emerging from between the two lobes. Each seta has a large subdistal, secondary tooth that is larger than the terminal one. A bayonet seta is present only in posterior parapodia, located in the superiormost part of the fascicle.

*Distribution*: Greenland; Arctic Ocean; Bering Sea; north Japan Sea; Okhotsk Sea.

10. *Syllis sclerolaema* EHLERS, 1901

*Syllis sclerolaema* EHLERS, 1901, pp. 86-88, pl. 10, figs. 1-2; HARTMAN, 1953, pp. 20-21, fig. 2, a-f.

*Occurrence*: St. S 8, (2)

The larger of two anterior fragments measures 17 mm long and 2 mm wide for 53 setigerous segments. The body is pale yellow and there are no color markings in preserved specimens. The prostomium is depressed pentagonal and has two pairs of eyes. Palpi are conspicuously large, thick and broadly triangular. The median antenna arises between the posterior eyes. Lateral antennae are inserted in front of the anterior eyes. The pharynx is distally surrounded by 10 soft papillae and armed with a sharp, subterminal middorsal tooth. The proventriculus extends from segment 14 to 25. Parapodia have dorsal cirri alternating 46 and 35 annulations in the anterior region of the body. A normal parapodium is bluntly conical and has a setal fascicle of simple or pseudo-compound setae; these are distally bifid and subdistally thickened. The ventral cirrus is digitate and slightly longer than the setigerous lobe.

*Distribution*: Southern South America; western Canada; Okhotsk Sea.

11. *Typosyllis fasciata* (MALMGREN) 1867

*Syllis fasciata* MALMGREN, 1867, p. 43, pl. 8, fig. 47, pl. 9, fig. 52; BERKELEY and BERKELEY, 1948, p. 74.

*Syllis* (*Typosyllis*) *fasciata* USCHAKOV, 1955, p. 180, figs. 46, 51.

*Occurrence*: St. S 8, (3).

The body measures 18 to 20 mm long for 98 to 109 setigerous segments. The prostomium is broader than long, the width about twice that of the length; there are two pairs of eyes in trapezoidal arrangement. The median antenna arises between the posterior eyes and has 20-27 annulations. Two lateral antennae are inserted at the anterior margin of the prostomium. Palpi are slightly fused at their bases. The pharynx has a middorsal, subdistal tooth in the inner wall. Dorsal cirri are slender and distinctly annulated; they are slightly alternating long and short throughout. The parapodium has a fascicle of unidentate, compound setae with coarse serrations along the cutting margin. Posterior parapodia have a simple seta, located in the superiormost part of the fascicle. The pygidium has two long anal cirri.

*Distribution*: North Atlantic Ocean; Arctic Ocean; Bering Sea to southern California; Okhotsk Sea; north Japan Sea; Yellow Sea.

## Family NEREIDAE

12. *Nereis pelagica* LINNAEUS, 1761

*Nereis pelagica* FAUVEL, 1923, pp. 336-337, fig. 130, a-f; IMAJIMA, 1961, pp. 85-87.

*Occurrence*: St. S 8, (17); St. S 9, (2).

Most specimens were collected from between tubes of *Crucigera zygophora*. The largest one measures 90 mm long and 13 mm wide for 66 setigerous segments.

*Distribution*: Cosmopolitan.

## Family NEPHTYIDAE

### 13. *Nephtys caeca* (FABRICIUS) 1780

*Nephtys caeca* FAUVEL, 1923, pp. 365-366, fig. 142, a-1; USCHAKOV, 1950, p. 185.  
*Nephtys caeca* IMAJIMA, 1961, pp. 88-89, text-fig. 4.

*Occurrence*: St. 42, (1); St. 43, (1); St. 49, (2); St. 59, (1).

The largest specimen is 155 mm long and 12 mm wide including parapodia; it consists of 124 setigerous segments. Interramal cirri are first present from setigerous segment 4 or 5 and continue to the posterior end of the body.

*Distribution*: Greenland; Atlantic, Pacific and Arctic Oceans; Bering Sea; Okhotsk Sea.

### 14. *Nephtys ciliata* (MÜLLER) 1789

*Nephtys ciliata* FAUVEL, 1923, p. 371, fig. 145; USCHAKOV, 1950, p. 185.  
*Nephtys ciliata* PETTIBONE, 1954, p. 270, fig. 30, n; IMAJIMA, 1961, p. 91.

*Occurrence*: St. 7, (1); St. S 9, (1); St. 24, (2); St. 33, (1); St. 34, (1); St. 37, (1); St. 49, (1).

Eight specimens were collected, and only two were complete; they are 170 mm long for 112 setigerous segments and 70 mm long for 84 segments. Interramal cirri are first present on setigerous segment 5 to 7, and reduced on the last 20 parapodial pairs.

*Distribution*: Denmark; north Atlantic, Arctic and Pacific Oceans; Okhotsk Sea; Bering Sea.

### 15. *Nephtys discors* EHLERS, 1868

*Nephtys discors* PETTIBONE, 1954, pp. 270-271, fig. 30, m; IMAJIMA, 1961, pp. 89-90, text-fig. 6.

*Occurrence*: St. S 9, (1); St. 48, (6); St. 49, (1); St. 50, (2); St. 52, (2); St. 58, (2); St. 59, (2); St. A 11, (3).

Only one of 19 specimens from eight stations is complete.

*Distribution*: Maine; Point Barrow; Bay of Fundy; Okhotsk Sea.

16. *Nephtys longosetosa* OERSTED, 1843

*Nephtys longosetosa* FAUVEL, 1923, pp. 367-369, fig. 143, f-h; USCHAKOV, 1950, p. 185.

*Nephtys longosetosa* PETTIBONE, 1954, p. 268, fig. 30, l; IMAJIMA, 1961, pp. 87-88, text-fig. 3.

*Occurrence*: St. A 11, (1); St. 40, (1); St. 42, (2); St. 44, (2); St. 59, (1).

All specimens except one were lacking the posterior region.

*Distribution*: North Atlantic Ocean; Arctic and Pacific Oceans; Bering Sea; Okhotsk Sea.

17. *Nephtys paradoxa* MALM, 1874

(Pl. XII, fig. 13)

*Nephtys paradoxa* FAUVEL, 1923, p. 375, fig. 146, f-i; USCHAKOV, 1950, p. 185.

*Nephtys paradoxa* PETTIBONE, 1954, p. 271, fig. 30, j, k.

*Occurrence*: St. 13, (1); St. 59, (1).

The larger of two anterior fragments consists of 67 setigerous segments. The prostomium is wider than long and has two pairs of short antennae. The proboscis has 22 longitudinal rows of subdistal papillae, with 5 to 6 in each row; there is no middorsal one. It terminates in 20 forked processes and two simple ones. Acicular lobes of notopodia and neuropodia are distally entire. Noto- and neuropodial postacicular lobes are not as conspicuous as the acicular lobes; notopodial ones are dorsally expanded and they are slightly divided by an incision into two asymmetrical lobes. Interramal cirri are first present from the 9th or 10th setigerous segment; they are short and somewhat foliaceous.

*Distribution*: Off western Europe; north Atlantic and Arctic Oceans; Bering Sea; Okhotsk Sea; north-west coast of Japan Sea.

18. *Nephtys punctata* HARTMAN, 1938

*Nephtys punctata* HARTMAN, 1938, pp. 155-156, fig. 67; IMAJIMA, 1961, p. 89, text-fig. 5.

*Occurrence*: St. 13, (4); St. 52, (1); St. A 11, (1).

The largest complete specimen measures 75 mm long for 102 setigerous segments. Interramal cirri are first present on setigerous segment 7 to 9, and reduced on the last 20 to 30 parapodial pairs. Neuropodial, postacicular lobes are well developed in the median region of the body. Acicular lobes of notopodia and neuropodia are deeply incised distally, and those in posterior segments are slightly incised or entire.

*Distribution*: Cache Bay, Alaska to California; Okhotsk Sea.

## Family SPHAERODORIDAE

19. *Sphaerodorum gracilis* (RATHKE) 1843

*Ephesia gracilis* FAUVEL, 1923, pp. 377-379, fig. 148, a-f; USCHAKOV, 1955, p. 220, fig. 70, a-b.

*Occurrence*: St. S 8, (18).

The largest individual measures 19 mm long and 1.5 mm wide for 95 setigerous segments. The prostomium is very small and indistinct; it has four cirriform tentacular papillae. Dorsal cirri are represented by spherical capsules with a minute terminal process. Setigerous lobes are uniramous, conical and covered with oval papillae. Setae number 2 or 3 in a fascicle; they have a thick shaft and distally curved tips with a subdistal thickness.

*Distribution*: Pacific coast of North America; Atlantic and Arctic Oceans; north Japan Sea; Okhotsk Sea.

## Family ONUPHIDAE

20. *Nothria iridescens* (JOHNSON) 1901

(Pl. XIII, figs. 14, 15)

*Nothria iridescens* JOHNSON, 1901, p. 408, pl. 8, figs. 86, 87, pl. 9, figs. 88-89.

*Nothria iridescens* HARTMAN, 1944, pp. 87-88, pl. 5, figs. 99-104.

*Occurrence*: St. C 2, (1).

An anterior fragment measures 41 mm long for 52 setigerous segments. The dorsum is brown; there is no pigmental band. The prostomium is small and has 2 frontal antennae; the 5 occipital tentacles are distally slender and the inner lateral pair extends back to the 14th setigerous segment. The ceratophores of median tentacles have 8 rings and those of lateral ones have 14 rings. Branchiae are present from the first setiger as a simple, slender filament. The postsetal lobes of anterior parapodia are longer and slenderer (fig. 14) than those farther back (fig. 15). The first four pairs of parapodia have 3 to 6 tridentate, pseudo-compound hooded setae and some capillary setae; these are replaced by limbate capillary setae farther back. Bidentate, hooded subacicular hooks occur from the 13th parapodium. Ventral cirri are cirriform through 5 setigers and padlike thereafter. Maxillary plate II has 8 teeth left and 8 right, III has 9 teeth left; IV has 5 teeth left and 7 teeth right.

*Distribution*: Pacific coast of North America; Okhotsk Sea.

21. *Onuphis cirrobranchiata* MOORE, 1903

(Pl. XIII, figs. 16-18)

*Onuphis cirrobranchiata* MOORE, 1903, pp. 451-453, pl. 25, figs. 60-63; IZUKA, 1912, pp. 105-106, pl. 12, figs. 4-6; USCHAKOV, 1955, p. 237, fig. 77, a-g.

*Occurrence*: St. 40, (1); St. 49, (2); St. 59, (2).

The five specimens lack posterior ends; the largest one measures 42 mm long and 6 mm wide including parapodia for 48 setigerous segments. Each segment of the anterior region has a transverse brown band. The prostomium is small and has 2 frontal antennae and 5 occipital tentacles. The median tentacle extends back to the fourth setigerous segment and the lateral one to the eighth; their ceratophores have 4 or 5 nearly equal rings and a longer distal one. Eyes are present at the bases of the lateral tentacles. Branchiae are first present as a single filament from setigerous segment 15 or 16; they are bifid on parapodia 18 to 23 and their branches increase posteriorly. The first three pairs of parapodia are directed anteriorly and have slender ventral cirri; thereafter they are padlike. Limbate capillary setae occur in all parapodia and bidentate pseudo-compound hooded setae (figs. 16, 17) are present through parapodia 4. Subacicular hooks (fig. 18) occur from parapodia 11-12; they number 2 in a ramus. Maxillary plate II has 10 teeth left and 9 right; III has 8 teeth; IV has 6 teeth left and 7 right.

*Distribution*: Japan; Okhotsk Sea.

## 22. *Onuphis parva striata* USCHAKOV, 1950

(Pl. XIII, fig. 19)

*Onuphis parva striata* USCHAKOV, 1950, p. 193, fig. 25; 1955, p. 234, figs. 74, b, 77, k.

*Occurrence*: St. 58, (1); St. 59, (5); St. A 11, (1); St. C 2, (1).

All individuals lack posterior ends. Segments have a transverse, brown purple band extending over the parapodial bases. Branchiae are first present from setigerous segment 6 to 8 as a simple filament, and increase to 2 or 3 in the 15th setiger. They are best developed with 4 filaments between the 18th and the 27th setiger, and branchiae disappear on segments 36 to 47. The first three parapodia have limbate capillary setae and bidentate pseudo-compound setae (fig. 19) with long, distally pointed hoods. Ventral cirri of the first three parapodia are cirriform, thereafter they are padlike. Bidentate subacicular setae are first present from the 10th or 11th setigerous segment. Maxillary plate II has 9 teeth left and 10 right; III has 9 teeth; IV has 5 teeth left and 8 right.

*Distribution*: Okhotsk Sea; Bering Sea.

## Family LUMBRINERIDAE

### 23. *Lumbrineris fragilis* (MÜLLER) 1776

(Pl. XIII, figs. 20-26)

*Lumbriconereis fragilis* FAUVEL, 1923, p. 430, fig. 171, k, l; USCHAKOV, 1950, p. 194.  
*Lumbrineris fragilis* PETTIBONE, 1954, pp. 275-276, fig. 31, h-n.

*Occurrence*: St. S 8, (1); St. S 9, (1); St. 27, (1); St. 34, (1); St. 37, (5); St. 48, (1); St. 59, (1); St. A 11, (1); St. C 2, (1); St. C 10, (1).

All specimens except two were lacking a posterior end; two complete ones consist of 163 and 198 setigerous segments. The prostomium is triangular and acutely pointed. Anterior parapodia (fig. 20) have nearly truncate presetal and postsetal lobes; the two subequal. Far back the postsetal lobes are erect whereas the presetal ones are obtusely conical (fig. 21). Simple, limbate capillary setae (fig. 22) are present from the first setiger and continue through setigerous segment 75 to 84. Simple hooded hooks (figs. 23, 24) are first present from parapodium 9 to 22, and continue to the posterior end; they have 8 to 9 short teeth at the tips. Acicula are black and number 3 to 4 in a fascicle. On the maxillae (fig. 25) the forceps are falcate; II has 4 teeth on either side; III and IV have each a single tooth. The paired mandibles (fig. 26) are subequal and as long as the forceps; they have a large incision on their anterior margin.

*Distribution*: Denmark; Mediterranean Sea; Arctic Ocean; Bering Sea; north Japan Sea.

#### Family ORBINIIDAE

#### 24. ? *Haploscoloplos elongatus* (JOHNSON) 1901

(Pl. XIV, figs. 27, 28)

*Scoloplos elongata* JOHNSON, 1901, pp. 412-413, pl. 10, figs. 105-110; HARTMAN, 1948, p. 30; 1957, pp. 273-275, pl. 26, figs. 1-11; BERKELEY and BERKELEY, 1952, pp. 97-98, fig. 200.

*Occurrence*: St. C 2, (2).

The two are anterior fragments consisting of 65 and 70 setigerous segments. The prostomium is acutely pointed; there are no eyes. The thoracic region consists of 18 setigerous segments. In the anterior thorax the notopodial postsetal lobes are short and nearly triangular, and the neuropodial ones are padlike, with a small, median postsetal conical lobe (fig. 27). Branchiae as a minute triangular papilla are first present from the 16 setigerous segment; they gradually enlarge and continue back to the end of the fragment. In the abdominal region the notopodial postsetal lobes (fig. 28) are asymmetrically foliaceous and about half as long as the branchiae in the anterior region. Neuropodia are unequally bifid and are more conspicuously developed than the notopodial ones. A foliaceous flange extends considerably below the neuropodial postsetal lobe. Abdominal notopodia have only pointed setae with transverse rows of spinelets, similar to the thoracic setae; there are no furcate setae. The present specimens are questionably referred to *Haploscoloplos elongatus* (JOHNSON) because the abdominal notopodia have no furcate setae, such as described for specimens

from Puget Sound, Washington, Alaska, central and southern California (HARTMAN, 1957) which have two to five furcate setae in a setal fascicle of abdominal notopodia, accompanying the pointed setae.

*Distribution*: Pacific coast of North America; Alaska.

### Family CHAETOPTERIDAE

#### 25. *Chaetopterus variopedatus* (RENIER) 1804

*Chaetopterus variopedatus* OKUDA, 1935, pp. 83-93, pl. 5, figs. a-c, textfigs. 1-5; USCHAKOV, 1955, p. 291, figs. 104, 105.

*Occurrence*: St. S 9, (1); St. 36, (1).

The two anterior fragments consist of 10 and 13 setigerous segments. The peristomium is broader than long and has two short palpi. Parapodia in the anterior region are uniramous and have capillary setae and paddle-shaped setae. The modified fourth parapodium has 12 to 14 thick, brown modified setae. In one individual similar modified setae occur also on the seventh parapodium and number 4 in a fascicle. The first median segment has a long aliform notopodium and a fascicle of capillary setae.

Though fragments, these specimens are referred to this species because (1) the anterior region consists of 9 parapodia, (2) the peristomium has one pair of short palpi, (3) the first median segment has a long notopodium, and (4) there is similarity in the form of the modified setae. The species has been previously reported from the Okhotsk Sea (USCHAKOV, 1955).

*Distribution*: Mediterranean Sea; Pacific, Indian and Atlantic Oceans; cosmopolitan.

### Family CIRRATULIDAE

#### 26. *Acrocirrus heterochaetus okotensis* new subspecies

(Pl. XIV, figs. 29-32)

*Occurrence*: St. S 8, (1).

A single individual, posteriorly incomplete, measures 15 mm long for 27 setigerous segments. The paired palpi and four pairs of tentacular cirri have been lost. The body is dark grey; there is no pigment pattern. The prostomium terminates in a short palpode at its anterior end and slightly projects posteriorly. Tentacular cirri are inserted on the 2nd, 3rd, 4th (1st setigerous) and 5th segments. Neuropodia first appear from the fourth segment and the following nine neuropodia have a fascicle of composite hooks, each with a falcate appendage that terminates distally in a single strong tooth and a delicate sheath (fig. 29). The following neuropodia except those on the eleventh modified segment have



simple, recurved hooks (fig. 30) accompanied by acicular spines. The modified eleventh segment has single heavy, simple hooks (fig. 31) in neuropodia. Notopodial tufts first appear from the third setigerous or the sixth segment and the setae have minute transverse rows of fine spines. Parapodial ridges have transverse series of small conical papillae (fig. 32).

The subspecies is distinguished from the stem, *A. heterochaetus* ANNENKOVA (1934), from Bering Sea in that: (1) the first notopodial tuft is present from the 3rd setigerous (=6th) instead of the 2nd setigerous (=5th) segment (HARTMAN, 1948, p. 39, and USCHAKOV, 1955, p. 304); (2) the neuropodial composite hooks are replaced by simple ones from the 10th parapodium, instead of having composite hooks only.

### 27. *Cirratulus cirratus* (MÜLLER) 1776

*Cirratulus cirratus* FAUVEL, 1927, p. 94, fig. 33, a-g; BERKELEY and BERKELEY, 1952, pp. 31-32, figs. 58, 59.

*Occurrence*: St. S 8, (3).

The largest specimen measures 55 mm long for 135 setigerous segments. The prostomium is a blunt cone and has paired transverse series of eyes numbering 8 on a side. All grooved dorsal tentacles are damaged. The lateral branchiae are first present from the first setigerous segment. Neuropodial acicular spines are first present from the 14th setigerous segment, and the first notopodial spines farther back.

*Distribution*: Cosmopolitan.

## Family OPHELIIDAE

### 28. *Ammotrypane aulogaster* RATHKE, 1843

*Ammotrypane aulogaster* FAUVEL, 1927, p. 133, fig. 47, a-e; OKUDA, 1936, pp. 149-150, figs. 2, 3; BERKELEY and BERKELEY, 1952, p. 92, figs. 186, 187; USCHAKOV, 1955, p. 320, fig. 118, a-g.

*Occurrence*: St. 43, (1).

The single specimen measures 58 mm long for 54 setigerous segments; it has a deep ventral and a pair of lateral grooves extending throughout the body. The prostomium has a pair of nuchal organs at the sides. Most cirriform branchiae have been lost. Parapodia have a short setigerous lobe, a fascicle of capillary setae, and a small ventral cirrus. The anal aperture is ventral and its margin is fringed with slender papillae; other papillae located at the base of the pygidium have been lost.

*Distribution*: Cosmopolitan.

29. *Travisia brevis* MOORE, 1923

*Travisia brevis* MOORE, 1923, pp. 220-221; BERKELEY and BERKELEY, 1952, pp. 90-91, fig. 183; IMAJIMA, 1961, p. 91.

*Occurrence*: St. 36, (1); St. 49, (1); St. C 2, (2).

The body measures 16 to 21 mm long and 7 mm wide at greatest diameter; it consists of the prostomium, 24 setigerous and 4 achaetous segments, and the pygidium. Segments 3 to 18 are distinctly triannulated. The prostomium is small and pointed in front. Anterior parapodia are rudimentary and biramous; at about the 15th setigerous segment the notopodial and neuropodial lappets begin as triangular lobes and they continue to the 24th setigerous segment. Branchiae are present on the setigerous segments 2 to 23; they are cirriform. Setae are all smooth and capillary. Lateral sensory pits are present on all the segments. The pygidium is surrounded by about 10 cirri in which their bases are fused.

*Distribution*: Pacific coast of North America; Alaska; Okhotsk Sea.

## Family STERNASPIDAE

30. *Sternaspis scutata* (RANZANI) 1807

*Sternaspis scutata* OKUDA, 1936, pp. 151-152, fig. 5; USCHAKOV, 1955, p. 352, fig. 131, b-d; IMAJIMA, 1961, pp. 94-95, fig. 10.

*Occurrence*: St. 48, (2); St. 49, (1); St. 50, (2), St. 51, (5); St. 59, (1).

The largest specimen measures 13 mm long and 9 mm wide at the upper part of the ventral shield.

*Distribution*: Arctic, Atlantic, Pacific and Indian Oceans; cosmopolitan.

## Family MALDANIDAE

31. *Axiothella catenata* (MALMGREN) 1865

*Axiothella catenata* WESENBERG-LUND, 1948, pp. 44-47, figs. 22, 23; USCHAKOV, 1955, p. 341, fig. 124, e-z.

*Axiothella* sp. IMAJIMA, 1961, pp. 92-94, textfigs. 8, 9.

*Occurrence*: St. A 11, (10); St. S 9, (1); St. 33, (1); St. 42, (1); St. 44, (1); St. 48, (10); St. 49, (3); St. 50, (2); St. 51, (3); St. 52, (4); St. 58, (4); St. 59, (2).

The number of specimens from each station was based on complete individuals and anterior fragments. The largest one measures about 140 mm long; it consists of 18 setigerous, and 4 preanal achaetous segments. The pygidium has an anal funnel fringed by 15 to 23 cirri which vary greatly in length; its midventral cirrus is much the longest. The anus is located in the center of the funnel.

In a previous paper (IMAJIMA, 1961) individuals of *Axiothella* sp. may be referred to the present species.

This seems to be one of the most abundant species in the Kamchatka region.

*Distribution*: North Atlantic and Arctic Oceans; Bering Sea; north Japan Sea; Okhotsk Sea.

### 32. ? *Axiothella rubrocincta* (JOHNSON) 1901

(Pl. XIV, figs. 33, 34)

*Clymenella rubrocincta* JOHNSON, 1901, pp. 418-419, pl. 13, figs. 128-133.

*Axiothella rubrocincta* BERKELEY and BERKELEY, 1952, pp. 51-52, figs. 105, 106.

*Occurrence*: St. 27, (1); St. 59, (4).

The largest of five anterior fragments measures 18 mm long and 1.5 mm wide for 8 setigerous segments. The cephalic plate is oblong; the rim is well developed and divided by two lateral, and one posterior notch. The median cephalic keel is developed, so as to extend to the front of the posterior notch. The nuchal grooves run parallel with the cephalic keel and are about two-thirds as long as the keel. There is a short collar on the anterior margin of the 4th setigerous segment. Farther back the segments have a well developed dorsal glandular belt including the setigerous lobe of each segment (fig. 33). Neuro-podial hooks are in single rows and present from the first setigerous segment; each hook is surmounted by 3 or 4 small teeth over a main fang (fig. 34). Notopodial setae are smooth, slender limbate capillaries.

These anterior fragments are questionably referred to this species because the anal plaque is unknown.

*Distribution*: Pacific coast of North America; ? Okhotsk Sea.

### 33. *Axiothella* sp.

(Pl. XIV, figs. 35-37)

*Occurrence*: St. 51, (1).

An anterior fragment measures 44 mm long and about 5 mm wide for 8 setigerous segments. The cephalic plate is obliquely truncated; the rim is divided into four parts by a mid-dorsal and a pair of lateral notches (fig. 35). The cephalic keel is about two-thirds as long as the plate. Nuchal grooves are as long as the keel and slightly curved. The first six setigerous segments are subequal in width and length, and the following segments are about twice as long as the former. The fourth and sixth segments have a broad glandular area on the postsetal part of each segment; they are triangular on the dorsal side (fig. 36). The first setigerous segment has a row of 10 neuropodial hooks on each side; each hook terminates distally in a main fang surmounted by 4

small teeth (fig. 37). Notopodial capillary setae are of 2 kinds: fringed and limbate.

Though the present specimen resembles *Clymenura* VERRILL in having glandular areason the segments, it is distinguished in the absence of the acicular setae in anterior segments.

No complete description of the present specimen can be given for lack of a posterior end.

#### 34. *Maldane sarsi* MALMGREN, 1865

(Pl. XV, figs. 38-40)

*Maldane sarsi* WESENBERG-LUND, 1948, pp. 48-50, figs. 24, 25; USCHAKOV, 1955, p. 344, fig. 126, a-g.

*Occurrence*: St. 4, (3); St. 48, (2); St. 51, (2); St. 52, (2); St. 59, (68).

Thirteen of the 77 specimens were complete; the largest one measures 46 mm long and 1.5 mm wide. The cephalic rim is divided into 3 sections by a pair of shallow lateral incisions. The cephalic median keel is strongly arched (fig. 38). Nuchal grooves are short and divergent (fig. 39). The first setigerous segment has only notopodial capillary setae. The pygidium (fig. 40) has a slightly oblique plaque and its rim is notched on each side; the ventral section of the rim is smooth or slightly crenate. The anal aperture is dorsal to the plaque.

*Distribution*: North-western Europe; Atlantic, Arctic, Pacific and Indian Oceans; west coast of North America; Bering Sea; Okhotsk Sea; cosmopolitan.

#### 35. *Maldane sarsi borealis* new subspecies

(Pl. XV, figs. 41-43)

*Occurrence*: St. 50, (1).

A single specimen measures 50 mm long and 1.3 mm wide; it consists of 18 setigerous, and preanal achaetous, segments. The anterior several segments are distinctly biannulated (fig. 41). The prostomium and some following segments are reddish brown. The cephalic rim is divided into three parts by a pair of lateral incisions. The cephalic median keel is strongly arched and ends in a blunt, conical process above the mouth. Nuchal grooves are short and divergent. Notopodial setae are of two kinds: short, limbate setae with slender distal tips, and long, limbate setae with minutely spinous distal tips. Neuropodial hooks are first present in the second setigerous segment. The hooks of the first 3 segments number 4 or 6 and the following segments have 10 to 13 hooks in a row. The pygidium (figs. 42, 43) has an oblique plaque incised ventrally, whereas the dorsal margin is smooth. The rim has a pair of lateral incisions.

The tube consists of a thin membrane covered with green mud.

The subspecies, *borealis*, is distinguished from the stem, *Maldane sarsi*, in having a ventrally incised anal plaque instead of an entire one.

### 36. *Nicomache personata* JOHNSON, 1901

*Nicomache personata* JOHNSON, 1901, pp. 419-420, pl. 13, figs. 134-139; HARTMAN, 1948, pp. 41-42, fig. 11, d-g; BERKELEY and BERKELEY, 1952, p. 54, figs. 109-110.

*Occurrence*: St. S 8, (2).

A single anterior end and two posterior fragments were taken. The anterior end is reddish brown. Nuchal grooves are slightly S curved. The first three neuropodia have one or two yellow, thick acicular spines and the fourth neuropodia have each three transitional rostrate hooks, with 3 apical teeth on the main fang. In more posterior segments the neuropodial hooks number 24 to 28 in a row and are strongly rostrate. There is one preanal achaetous segment. The pygidium has a circlet of 24 or 26 short, triangular papillae.

*Distribution*: Washington; Vancouver Island; Alaska.

### 37. *Rhodine* sp.

(Pl. XV, figs. 44-48)

*Occurrence*: St. A 11, (1).

An anterior fragment measures 20 mm long by 3 mm wide; it consists of 8 setigerous segments. The head is directed ventrally at an angle and has a narrow, transverse ridge on the dorsal side (fig. 44). The cephalic median ridge is well developed and has a pair of nuchal grooves on the lateral sides; they are short and straight. The mouth is widely open. Each of the second and third setigerous segments have a collar located at the anterior margin of the segments; the former is low and entire, and the latter is about half as high as that on the 2nd setigerous segment; it is lacking ventrally (fig. 45) (perhaps damaged or imperfect). Notopodial setae are of two kinds: long, smooth capillary (fig. 46) and short ones with fringed limbate margin (fig. 47). Neuro-podial hooks (fig. 48) are first present from the 5th setigerous segment in double rows; they have a single large tooth surmounted by a series of small apical teeth and an intermediate tooth that does not project beyond the tip of the large tooth.

The specific name was not determined because the posterior region of the body is lacking.

## Family OWENIIDAE

### 38. *Owenia fusiformis* DELLE CHIAJE, 1841

*Owenia fusiformis* OKUDA, 1937, pp. 252-253, fig. 27; USCHAKOV, 1955, p. 346, fig. 128, a-d; IMAJIMA, 1961, p. 94.

*Occurrence*: St. A 11, (1); St. 52, (1); St. 58, (1); St. 59, (1); St. C 2, (2).

All specimens except one were lacking the posterior end. Tubes are fusiform, coated with coarse sand attached at an edge.

*Distribution*: Mediterranean Sea; Atlantic, Pacific and Indian Oceans; cosmopolitan.

### Family SABELLARIDAE

#### 39. *Idanthysus armatus* KINBERG, 1867

(Pl. XV, figs. 49, 50)

*Idanthysus armatus* OKUDA, 1938, pp. 242-245, figs. 4-5; USCHAKOV, 1955, pp. 351-352, fig. 130, a-i.

*Occurrence*: St. S 8, (3).

The largest individual measures 45 mm long including the cauda. Paleae of the opercular peduncle number 24 pairs in the outer row, and 12 pairs in the inner one. Outer paleae (fig. 49) have a nearly straight shaft and about 10 lateral teeth directed outward, while the inner paleae (fig. 50) are smooth and taper distally. There are three parathoracic segments; each notopodium has transverse row of 9 paddleshaped setae terminating in a brushlike tip.

*Distribution*: Pacific coast of South and North America; Bering Sea; Okhotsk Sea; Japan.

### Family AMPHARETIDAE

#### 40. *Amphicteis scaphobranchiata* MOORE

*Amphicteis scaphobranchiata* MOORE, 1906, pp. 255-257, pl. 12, figs. 54-61; IMAJIMA, 1961, pp. 95-96, textfig. 11.

*Occurrence*: St. 44, (1); St. 49, (1).

Two anterior fragments were examined.

*Distribution*: Pacific coast of North America; Okhotsk Sea.

### Family TERESELLIDAE

#### 41. *Amphitrite cirrata* MÜLLER, 1771

*Amphitrite cirrata* FAUVEL, 1927, pp. 251-252, fig. 86, i-o; BERKELEY and BERKELEY, 1952, p. 86, fig. 175; USCHAKOV, 1955, p. 392, fig. 147, z.

*Occurrence*: St. S 8, (1).

The single individual measures 38 mm long and consists of 17 thoracic setigerous, and 38 abdominal segments. Branchiae number 3 pairs; each consists of a tuft of simple filaments arising from a thick, low stalk. Notosetae are limbate capillaries with finely denticulated tips. Uncini are in double rows from the 7th to 16th uncinigerous segments.

*Distribution*: North Atlantic and Arctic Oceans; Pacific coast of North America; Bering Sea; Okhotsk Sea; Japan.

#### 42. *Pista cristata* (MÜLLER) 1776

*Pista cristata* FAUVEL, 1927, p. 266, fig. 93, a-g; BERKELEY and BERKELEY, 1952, pp. 78-79, figs. 158, 159.

*Occurrence*: St. C 2, (1).

An anterior fragment measures 34 mm long for 24 setigerous segments. Each of the one pair of branchiae is a club-shaped mass consisting of spirally arranged short branches; they are located on the second segment only. The tube is a thin membrane covered with green mud.

*Distribution*: Cosmopolitan.

#### 43. *Proclea* sp.

*Occurrence*: St. 59, (1).

A single, anterior fragment consists of 11 setigerous segments and measures 26 mm long. Branchiae and peristomial eyespots are absent. Thoracic notopodial setae are of two kinds: smooth and denticled. Uncini are first present from the 3rd setigerous segment and arranged in a single row through the 7th setigerous segment; thereafter they are in double rows.

### Family SABELLIDAE

#### 44. *Chone infundibuliformis* KRÖYER

*Chone infundibuliformis* BERKELEY and BERKELEY, 1952, p. 123, figs. 252, 253; IMAJIMA, 1961, pp. 98-99, text-figs. 13, 14.

*Occurrence*: St. 40, (1); St. 42, (1).

A complete specimen measures 45 mm long by 2 mm wide and an anterior fragment is 78 mm long by 8 mm wide. The branchial crown consists of 13 pairs of radioles in the first and 34 pairs in the second. Each radiole is connected by a thin webbed membrane for about three-fourths of the length.

*Distribution*: North Atlantic and Arctic Oceans; Bering Sea to California; Okhotsk Sea; north Japan Sea.

45. *Euchone analis* (KRÖYER) 1856

*Euchone analis* BERKELEY and BERKELEY, 1952, pp. 121-122, figs. 250, 251; PETTIBONE, 1954, pp. 339-340, fig. 39, m, n.

*Occurrence*: St. C 2, (2).

Two complete specimens measure 30 and 51 mm long including branchial crown; they consist of 36 and 38 setigerous segments. The branchial crown consists of 14 or 17 pairs of radioles; each radiole is connected by a thin webbed membrane for the greater part of its length. The collar is 2-lobed and has an entire margin. The segments are most distinctly biannulate on the ventral sides. There are eight thoracic setigerous segments. The ventral anal depression extends through the last 14 or 15 segments. These specimens have 14 or 17 pairs of radioles, instead of about 10 pairs (BERKELEY and BERKELEY, 1952) or 10 pairs up to 14 (PETTIBONE, 1954). Also they have a ventral anal depression extending through the last 14 or 15 segments, instead of 10 to 11 or 10 to 12 posterior segments.

*E. longifissurata* USCHAKOV (1950, p. 229), from Okhotsk Sea, is chiefly characterized in having an anal depression extending through 15 posterior segments and the branchial crown with about 20 radioles.

The number of radioles and the length of the anal depression may be variable. Tubes are membranous and covered with greyish mud.

*Distribution*: North Atlantic and Arctic Oceans; Pacific coast of North America; Bering Sea; north Japan Sea.

46. *Potamilla neglecta* (SARS) 1851

*Potamilla neglecta* EHLERS, 1908, pp. 154-156, pl. 22, figs. 5-17; BERKELEY and BERKELEY, 1952, p. 116, fig. 238; USCHAKOV, 1955, p. 408; IMAJIMA, 1961, p. 98, textfig. 12.

*Occurrence*: St. 5, (1); St. S 8, (3); St. 12, (1).

Three complete specimens and two anterior fragments were examined; the complete ones measure 60 to 65 mm long including the tentacular crown. The tentacular crown is pale except one or two broad, brown bands in alcohol. Radioles number 13 to 22 pairs; there is no connecting web except at the base of crown and there are no eyes. The collar is 2-lobed; it ends in a triangular lobe ventrally; it has no lateral incisions.

*Distribution*: North Atlantic and Arctic Oceans; Bering Sea; Okhotsk Sea; north Japan Sea.

## Family SERPULIDAE

47. *Crucigera zygophora* (JOHNSON) 1901



- Serpula zygophora* JOHNSON, 1901, pp. 433-434, pl. 19, figs. 205-208.  
*Crucigera zygophora* BERKELEY and BERKELEY, 1952, p. 127, fig. 260.  
*Serpula (Crucigera) zygophora* USCHAKOV, 1955, p. 425, fig. 160, e.

*Occurrence*: St. S 8, (many).

Many specimens were collected from a colony of tubes measuring about 30 cm across. The operculum consists of a cylindrical peduncle and a funnel-shaped cup with about 30 radii, there are three rounded processes at the base of the cup. The thoracic collar is trilobed; the ventral lobe is large and entire, and the lateral ones are continuous with the thoracic membrane. Collar setae are of two kinds: smooth capillaries and bayonet-shaped setae with 2 spines at the base of the blade. Other thoracic segments have simple limbate setae on the notopodia, and uncini have 4 to 7 teeth. Abdominal neuropodia have trumpet-shaped setae with serrated distal margin.

*Distribution*: Pacific coast of North America; Bering Sea; Okhotsk Sea; north Japan Sea.

#### 48. *Dexiospira spirillum* (LINNAEUS) 1758

(Pl. XV, figs. 51-53)

- Spirorbis (Dexiospira) spirillum* FAUVEL, 1927, pp. 392-393, fig. 132, f-p; OKUDA, 1934, pp. 437-439, figs. 1-3; BERKELEY and BERKELEY, 1952, p. 133, figs. 272-274.  
*Dexiospira spirillum* HARTMAN, 1948, p. 51.

*Occurrence*: St. S 8, (15).

Tubes were attached to *Eudendrium* and *Dynamena* (hydroids); they are smooth, white and dextrally spiralled. Collar setae (fig. 51) are geniculate with serrated blades. The second and third setigers have limbate capillary setae (figs. 52, 53).

*Distribution*: Cosmopolitan.

#### 49. *Laeospira medius* (PIXELL) 1912

- Spirorbis (Laeospira) medius* BERKELEY and BERKELEY, 1952, pp. 135-136, figs. 280-283; USCHAKOV, 1955, p. 431, fig. 163, z-k.

*Occurrence*: St. S 8, (5).

Tubes were attached to tubes of *Crucigera zygophora* (see above).

*Distribution*: Western Canada; Alaska; north Japan Sea.

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**EXPLANATION OF PLATES XII-XV**

PLATE XII

*Arctobia anticostiensis* (MCINTOSH), figs. 1-6.

1, anterior end in dorsal view, first elytral pair and left palpus removed,  $\times 18$ ; 2, superior notoseta,  $\times 195$ ; 3, inferior notoseta,  $\times 195$ ; 4, superior neuroseta,  $\times 195$ ; 5, median neuroseta,  $\times 195$ ; 6, inferior neuroseta,  $\times 195$ .

*Euprosine borealis* OERSTED, figs. 7-9.

7, section of left half of body showing branchiae and cirri from median region, d.c. . . . dorsal cirrus, v.c. . . . ventral cirrus,  $\times 18$ ; 8, 9, notosetae,  $\times 270$ .

*Anaitides groenlandica* (OERSTED), fig. 10.

10, fiftieth parapodium, in anterior view,  $\times 36$ .

*Eumida tubiformis* MOORE, fig. 11.

11, thirty-fifth parapodium, in anterior view,  $\times 50$ .

*Autolytus prismaticus* (FABRICIUS), fig. 12.

12, part of pharyngeal trepan,  $\times 620$ .

*Nephtys paradoxa* MALM, fig. 13.

13, thirtieth parapodium, in anterior view,  $\times 25$ .

PLATE XIII

*Nothria iridescens* (JOHNSON), figs. 14, 15.

14, third parapodium, in anterior view,  $\times 36$ ; 15, fifteenth parapodium, in anterior view,  $\times 36$ .

*Onuphis cirrobranchiata* MOORE, figs. 16-18.

16, 17, distal ends of bidentate pseudo-compound hooded setae from third parapodium,  $\times 390$ ; 18, subacicular hook,  $\times 140$ .

*Onuphis parva striata* USCHAKOV, fig. 19.

19, bidentate pseudo-compound hooded seta from first parapodium,  $\times 390$ .

*Lumbrineris fragilis* (MÜLLER), figs. 20-26.

20, thirty-eighth parapodium, in posterior view,  $\times 63$ ; 21, 150th parapodium, in anterior view,  $\times 63$ ; 22, limbate capillary seta from twentieth parapodium,  $\times 195$ ; 23, simple hooded hook from same parapodium,  $\times 390$ ; 24, same hook from thirty-eighth parapodium,  $\times 390$ ; 25, maxillae,  $\times 36$ ; 26, mandible,  $\times 36$ .

PLATE XIV

?*Haploscoloplos elongatus* (JOHNSON), figs. 27, 28.

27, eleventh parapodium, in anterior view,  $\times 52$ ; 28, twenty-seventh parapodium, in anterior view,  $\times 36$ .

*Acrocirrus heterochaetus okotensis*, new subspecies, figs. 29-32.

29, composite neuroseta from fifth parapodium,  $\times 140$ ; 30, simple hooked neuroseta and acicular seta from tenth parapodium,  $\times 140$ ; 31, modified hook from eleventh neuropodium,  $\times 93$ ; 32, fourteenth parapodium, showing conical papillae of parapodial ridge,  $\times 36$ .

? *Axiothella rubrocincta* (JOHNSON), figs. 33, 34.

33, anterior body, in lateral view, g.a. . . . glandular area,  $\times 13$ ; 34, distal end of neuropodial hook from first setiger,  $\times 580$ .

*Axiothella* sp., figs. 35-37.

35, cephalic plate, in frontal view,  $\times 3$ ; 36, anterior body, in lateral view, g.a. . . . glandular area,  $\times 3$ ; 37, distal end of neuropodial hook from first setiger,  $\times 390$ .

## PLATE XV

*Maldane sarsi* MALMGREN, 38-40.

38, anterior end showing cephalic median keel, in lateral view,  $\times 18$ ; 39, cephalic plate, in frontal view,  $\times 18$ ; 40, pygidium,  $\times 18$ .

*Maldane sarsi borealis* new subspecies, figs. 41-43.

41, anterior body, in lateral view,  $\times 13$ ; 42, pygidium, in lateral view,  $\times 13$ ; 43, same, in ventral view,  $\times 13$ .

*Rhodine* sp., figs. 44-48.

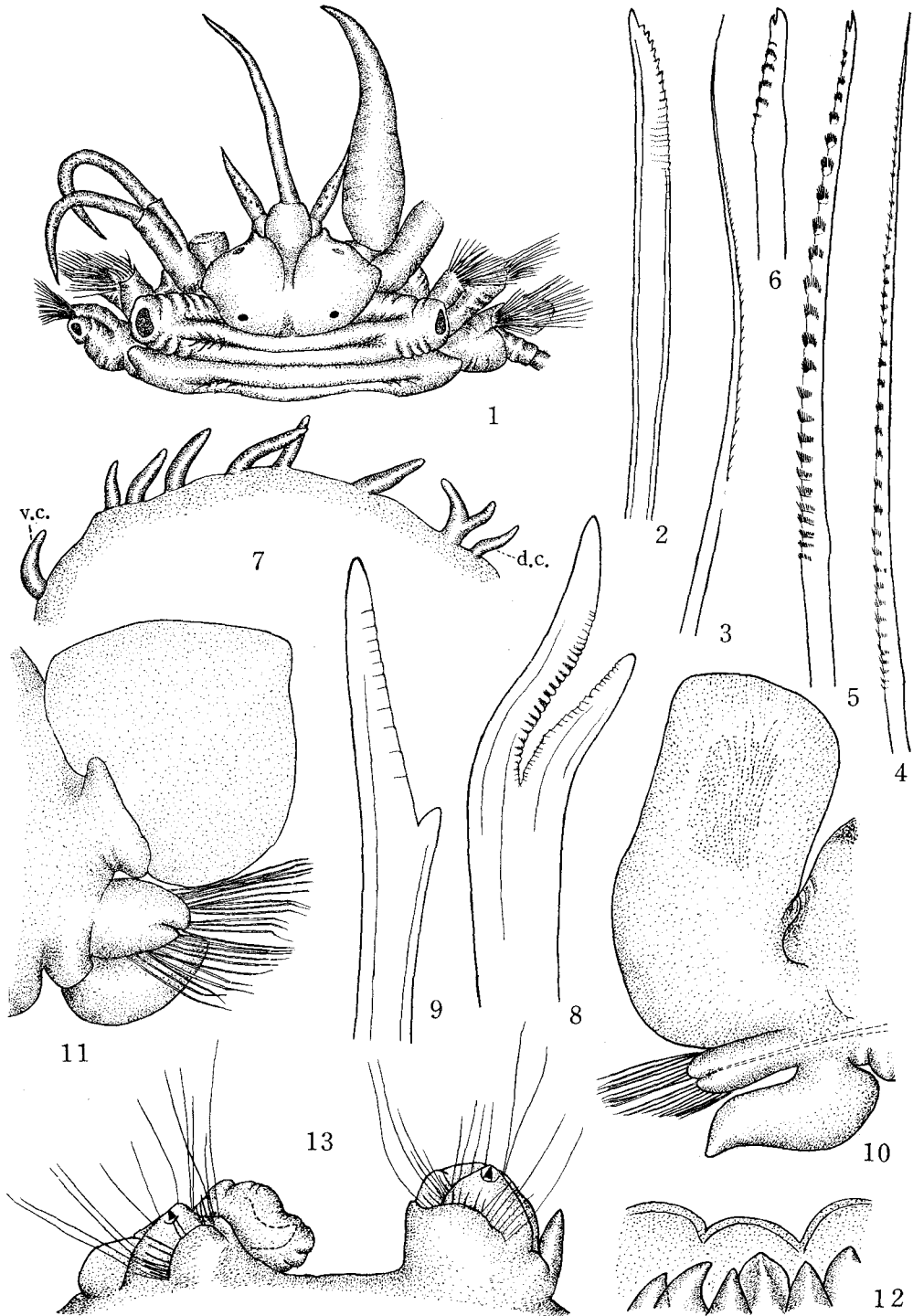
44, anterior body, in dorsolateral view,  $\times 5$ ; 45, same, in ventral view,  $\times 5$ ; 46, long, smooth notoseta,  $\times 25$ ; 47, short, limbate notoseta,  $\times 270$ ; 48, neuropodial hook,  $\times 390$ .

*Idanthyrus armatus* KINBERG, figs. 49-50.

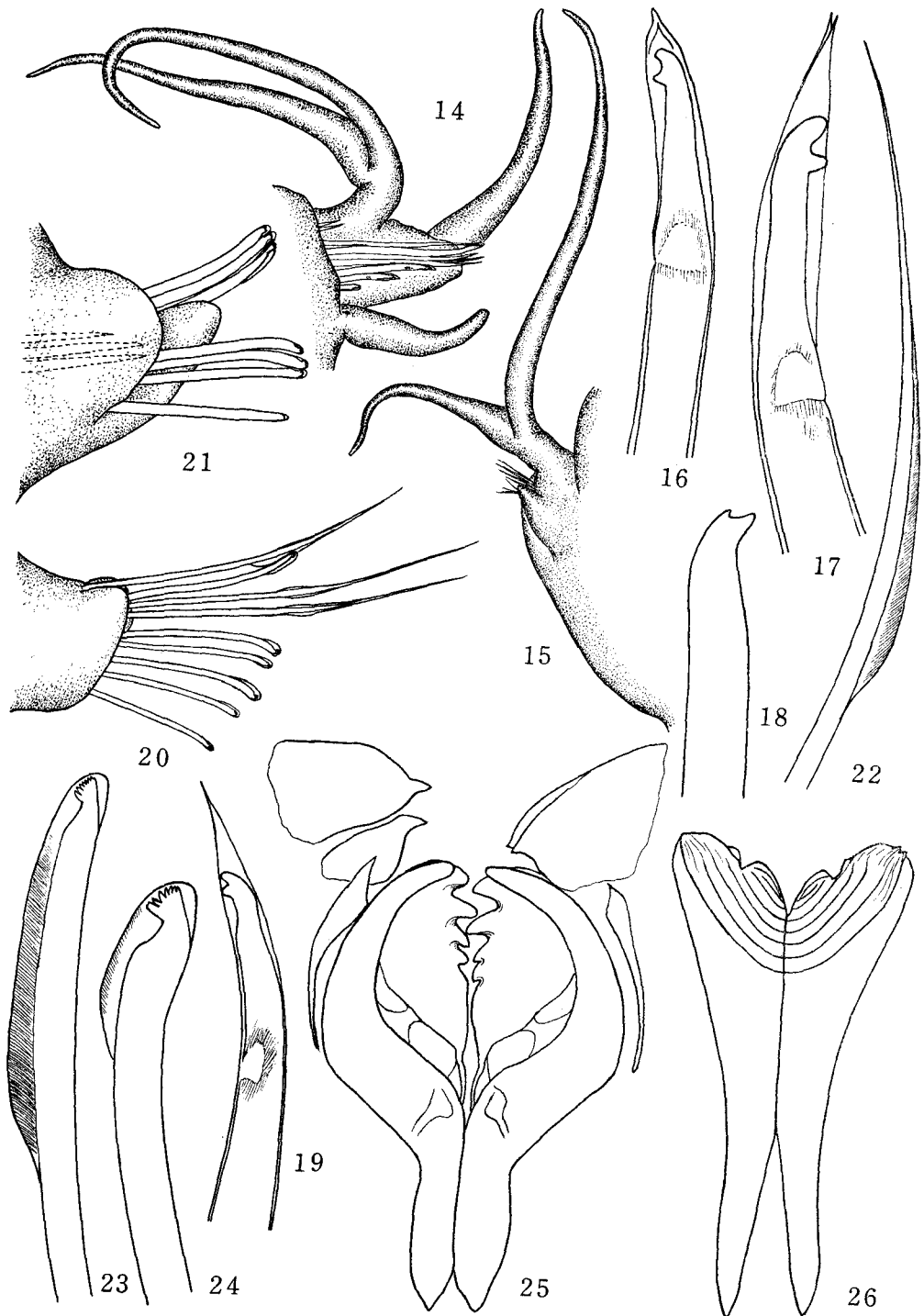
49, outer opercular palea,  $\times 63$ ; 50, inner opercular palea,  $\times 63$ .

*Dexiospira spirillum* (LINNAEUS), figs. 51-52.

51, collar seta,  $\times 580$ ; 52, second thoracic setae,  $\times 580$ .

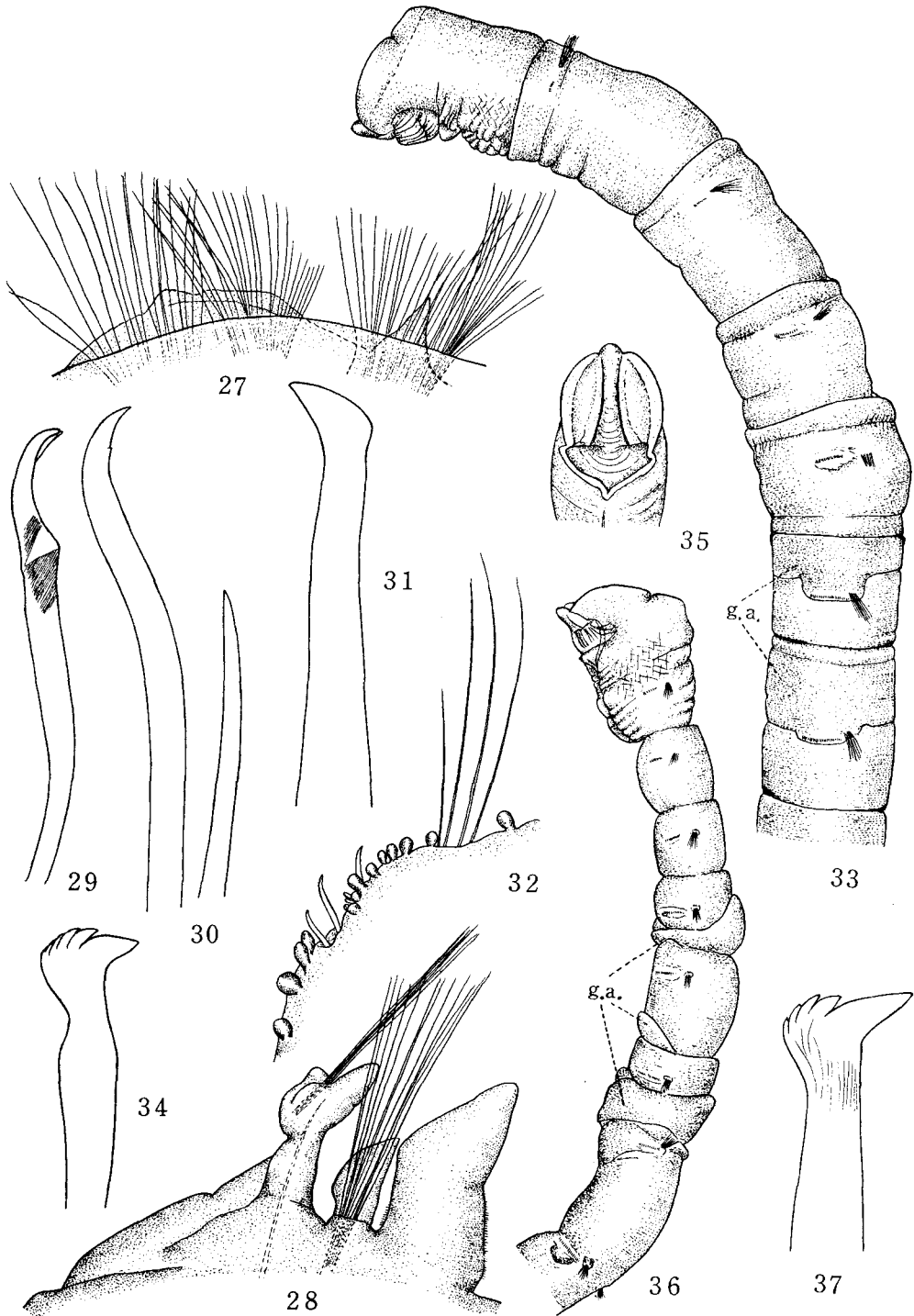


M. IMAJIMA: POLYCHAETOUS ANNELIDS COLLECTED OFF KAMCHATKA, II.

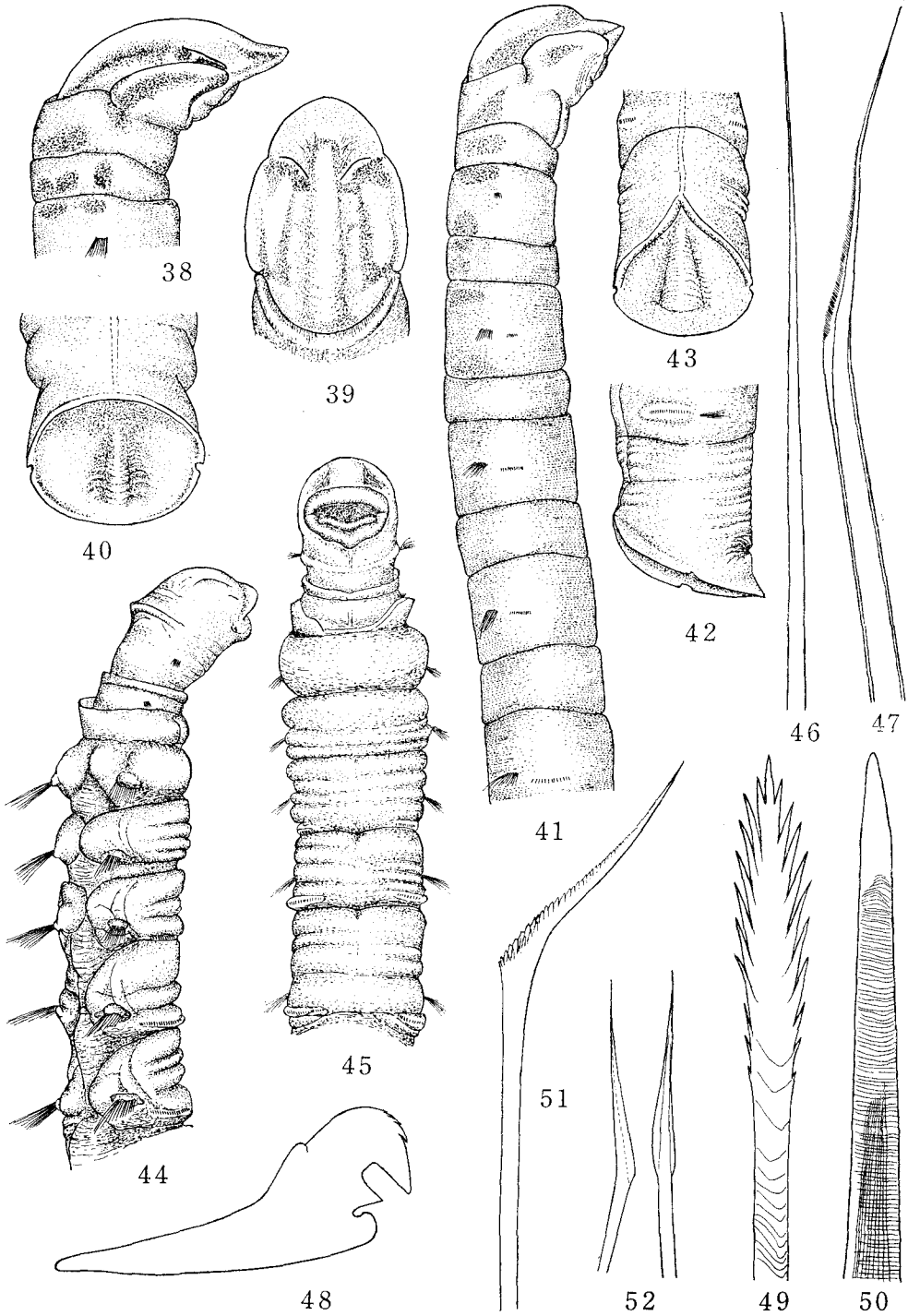


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