

DROPLETS FROM THE PLANKTON NET¹⁾

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XIII. Emergence of a Dense Patch of Chaetognaths near the Laboratory.

When Mr. S. URA, the collector of our Laboratory, was walking about the southern beach near the Laboratory on February 25 of this year, he found a small part of the water coloured reddish near a certain spot of the rocky area. There he tried several hauls by KITAHARA's plankton net, a HENSEN's net modified on a small scale and used most frequently in Japan, and brought me that catch. Mingled with a large amount of fragments of ctenophores, I found many chaetognaths in the sample. They are about a thousand in number and comprise the following 13 species.

Species	Individual number	Percentage
1. <i>Sagitta hexaptera</i>	1	—
2. <i>Sagitta lyra</i>	44	4
3. <i>Sagitta enflata</i>	61	5
4. <i>Sagitta bipunctata</i>	1	—
5. <i>Sagitta robusta</i>	10	1
6. <i>Sagitta bedoti</i>	5	—
7. <i>Sagitta serratodentata pacifica</i>	677	61
8. <i>Sagitta serratodentata atlantica</i> f. <i>pseudo-serratodentata</i>	17	2
9. <i>Sagitta regularis</i>	29	3
10. <i>Sagitta minima</i>	79	7
11. <i>Pterosagitta draco</i>	181	16
12. <i>Spadella cephaloptera</i>	1	—
13. <i>Krohnitta pacifica</i>	6	1

1112

Sag. serratodentata pacifica occupies the most part of the material, next *Pt. draco*

1) Contributions from the Seto Marine Biological Laboratory, No. 226.

and followed by *Sag. minima*, *Sag. enflata* and *Sag. lyra*. The present composition seems to differ considerably from the general constitution of the chaetognath fauna along the Pacific coast of middle Japan. For instance, the material collected during a year from May 1936 to April 1937 from the surface water of Sagami Bay off the Laboratory of the Mitsui Institute of Marine Biology near Simoda is composed of 18 species in the following proportion.

Species	Individual number	Percentage
1. <i>Sagitta hexaptera</i>	27	0.3
2. <i>Sagitta lyra</i>	71	0.9
3. <i>Sagitta enflata</i>	1527	18.5
4. <i>Sagitta bipunctata</i>	103	1.2
5. <i>Sagitta ferox</i>	395	4.8
6. <i>Sagitta robusta</i>	152	1.8
7. <i>Sagitta bedoti</i>	1309	15.9
8. <i>Sagitta pulchra</i>	23	0.3
9. <i>Sagitta serratodentata pacifica</i>	867	10.5
10. <i>Sagitta serratodentata atlantica</i> f. <i>pseudo-serratodentata</i>	106	1.3
11. <i>Sagitta neglecta</i>	848	10.3
12. <i>Sagitta regularis</i>	581	7.0
13. <i>Sagitta minima</i>	733	8.9
14. <i>Sagitta decipiens</i>	6	—
15. <i>Pterosagitta draco</i>	194	2.4
16. <i>Eukrohnia hamata</i>	44	0.5
17. <i>Krohnitta subtilis</i>	13	0.2
18. <i>Krohnitta pacifica</i>	63	0.8
19. Damaged individuals or juv.	1182	14.3

8244

Sag. enflata and *Sag. bedoti* are the commonest ones, next *Sag. serratodentata pacifica* and *Sag. neglecta*, followed by *Sag. minima* and *Sag. regularis*.

We can learn from the comparison between the two compositions, mentioned above, the distribution of chaetognaths in "Kurosio" is not uniform, but frequently some species may occur in unusual denseness.

XIV. Record of a Scyllarid *Phyllosoma* near Seto.

(Plates XLI-XLIII; Figs. 14, 15)

I have had chances to examine three specimens of a Scyllarid *Phyllosoma*, all collected along the shore near our Laboratory. Two (Nos. 1 and 2) of the three specimens are considered to belong to the same stage of the development, while the other (No. 3) seems to be younger than others.

No. of Specimen	Date	Carapace	
		Length	Breadth
1	Dec. 28, 1953	30 mm	32 mm
2	May 12, 1952	30	33
3	"	23	26

DESCRIPTIONS ON NOS. 1 AND 2

Carapace well developed; nearly quadrate in outline, with rounded corners, bearing a large sinus in the middle of the anterior side and a pair of slight sinuses along the posterior side and covers the most part of thorax leaving the last thoracic segment and the posterior part of the preceding segment out of it (Fig. 14). There is a stout spine at each side of the anterior sinus on the dorsal surface, in rear of which a crest runs backward to the posterior margin of carapace. Each longitudinal crest is divided into anterior and posterior parts, which are nearly equal in length and both slightly convex outwards; posterior parts marked with 10-11 serrations in No. 1 and with 11-12 ones in No. 2. These serrations are all pointed anteriorly. An oblong prominence (Pl. XLI, fig. 6) on the dorso-median line between the pair of stout spines mentioned above, with a spinule at each side of the anterior edge. Liver diverticula number 57-61 in No. 1; two anterior branches are issued from the point near the base on each side: the outer branch ramified outwards into a considerable number of diverticula, while the inner one, thinner than the other, reaches near the antennal gland (Fig. 15 Ant. gl.; Pl. XLI, fig. 3 ANT GL.) without any ramification on its way.

Thorax is about $1/2.5$ of carapace in length and slightly larger than $1/3$ of carapace in breadth (Fig. 15).

Abdomen consists of 7 segments, the articulation between the thorax and the first abdominal segment is not yet completed. It is 16 mm long in specimen No. 1. Pleura of 1-5 abdominal segments protrude laterally (Pl. XLI, fig. 7); ending in 1 abd. seg. in an acute tip, obtuse, but with a spine at the tip and several teeth along

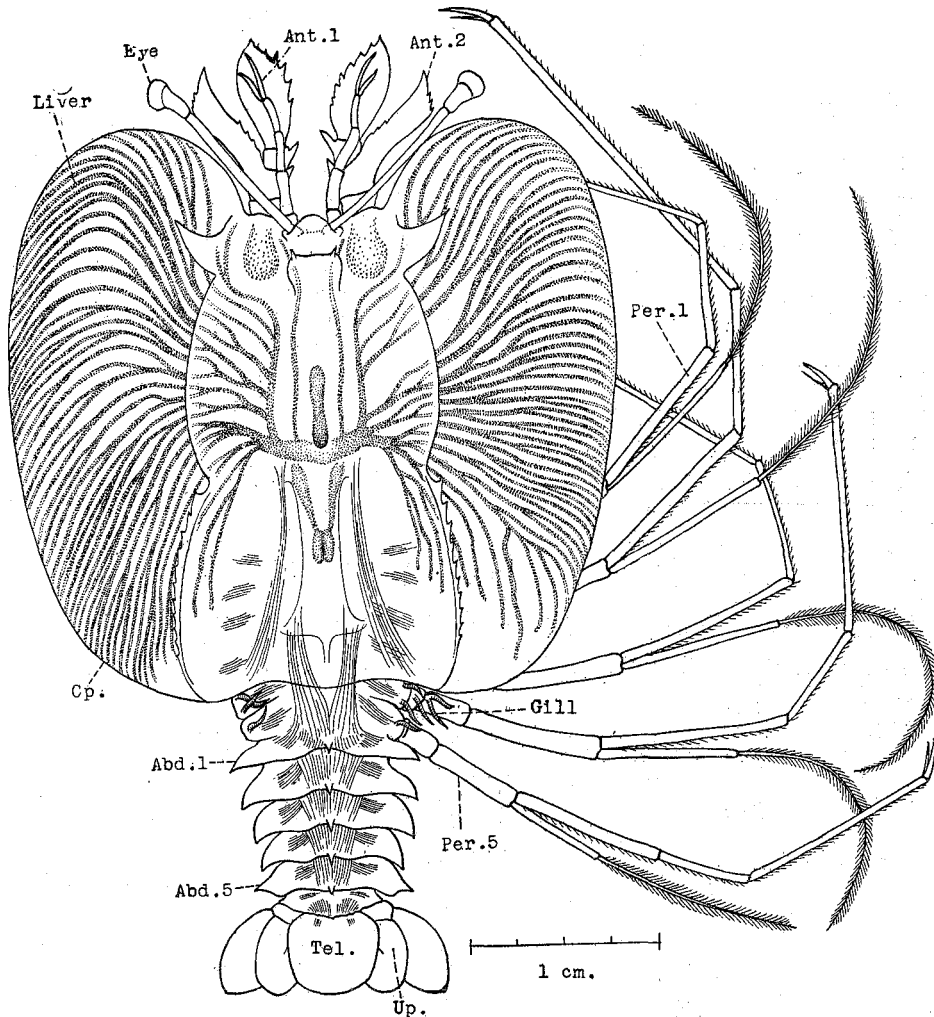


Fig. 14. *Phyllosoma utivaebi* nov. Dorsal side.

the posterior margin in 2 and 3 abd. seg., truncate and with a spinule at each antero- and postero-distal corner and several teeth along the posterior margin in 4 abd. seg., like the preceding pleuron, but with a large spine at the postero-distal corner in 5 abd. segment. A dorsal spine is found at the middle of the posterior margin of each of 1-5 abd. segments; that on the 5 abd. segment is largest. The 6 abd. seg. is furnished with about a dozen serrations along the posterior margin and provided with a small spine at each postero-distal end. Telson broader than long, with a seta near the middle of each lateral side. Both thorax and abdomen are sprinkled with minute papillae on the ventral surface.

Appendages: Eye (Pl. XLI, fig. 1) 11 m long including the stalk in No. 1 speci-

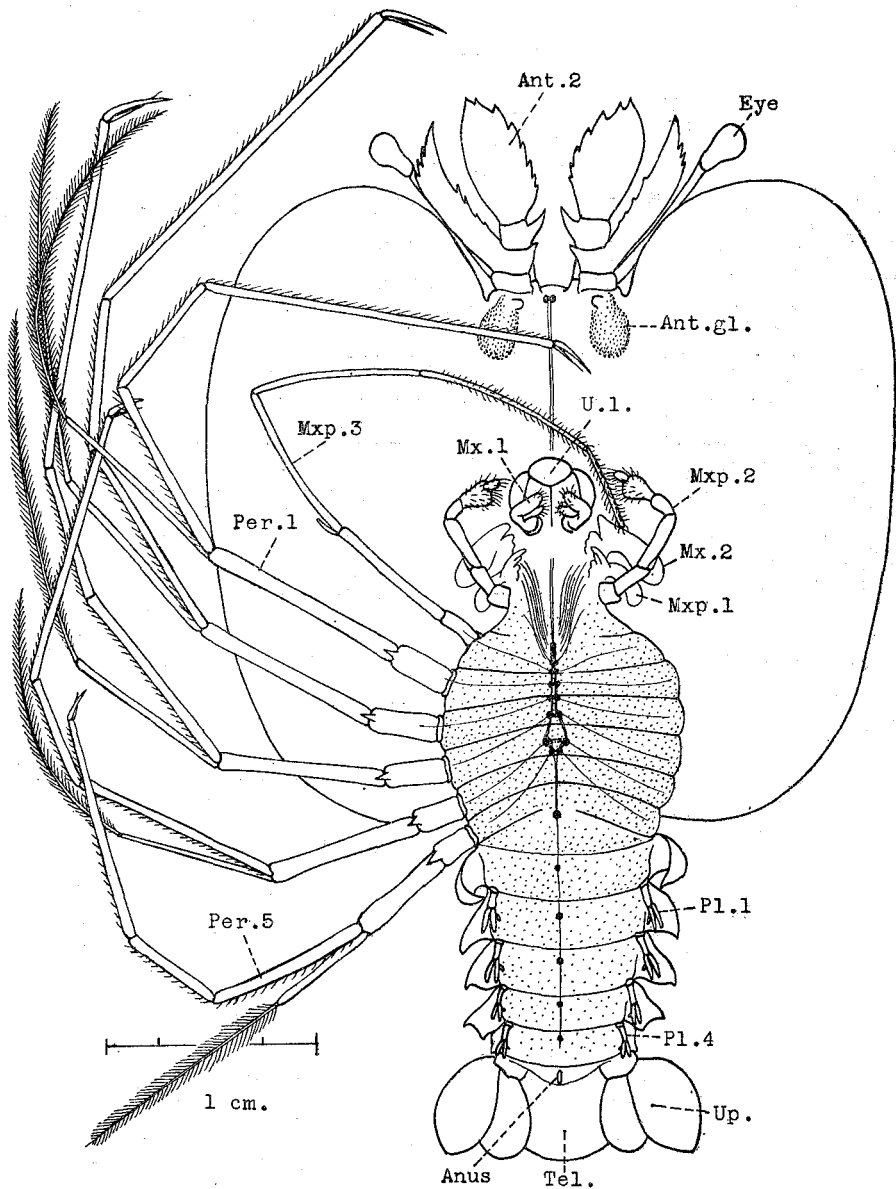


Fig. 15. *Phyllosoma utivaëbi* nov. Ventral side.

men; antennule 10 mm and antenna 9 mm. Length of each segment of 1-5 pereopods is shown in p. 365. Length of other appendages and proportion of each segment may be measured on figures which are all drawn by ABBE's drawing apparatus.

Antennule: (Pl. XLI, fig. 2) The peduncle consists of 3 segments, the basal segment is longest and the distal one is shortest. Flagellum slightly shorter than

inner ramus.

Antenna: (Pl. XLI, figs. 3 and 4) Four segmented. The inner distal end of the second segment and the inner side of the third segment form respectively a stout spine. The outer side of the second segment prominently protrudes antero-laterally; this prominence is slightly longer than the 4th segment. The distal end bears 4 stout teeth and several spinules; also several small spines along the antero-basal edge of this prominence. The 4th segment roughly oval in form and with 7 stout teeth along the inner edge. Four minute setae on the third segment and two ones on the second segment on the ventral surface.

Upper lip: (Pl. XLI, fig. 5, U. L.) Somewhat rounded elevation.

Mandible: (Pl. XLI, fig. 5, MD.; Pl. XLIII, figs. 7-9) About 40 short bristles along the blade edge, the anterior end of which is thickened like a chisel and the posterior end forms a papillated conical prominence. There is an obtuse prominence near the middle of the anterior margin, the neighbourhood of which is coloured faintly purplish-brown.

Lower lip: (Pl. XLI, fig. 5 Low. L.,; Pl. XLIII, fig. 10) Each lip roughly oblong in outline and furnished with fine hairs along the anterior part of the inner margin.

Maxillula: (Pl. XLI, fig. 5 MX 1; Pl. XLIII, fig. 11) Biramous, both rami unsegmented; the outer ramus has a seta at the middle of the outer side besides 15-20 ones at the distal end.

Maxilla: (Pl. XLII, fig. 8) Consists of a short but broad appendage and a large leaf-like lobe. The distal end of the appendage is provided with three knob-like prominences; the anterior end of the lobe is bluntly pointed, while the posterior end is rounded.

1st Maxilliped: (Pl. XLII, fig. 9) A finger-shaped appendage with an oval lobe at the basal portion of the outer side. There are a slender protuberance at the inner base of the finger-shaped portion and two rounded prominence below the preceding protuberance, of which the lower one is rather inconspicuous.

2nd Maxilliped: (Pl. XLII, fig. 10) Consists of 6 segments, of which the terminal one forms a thick dactylus. There is a short appendix articulated to the distal end of the basis outwards the 3rd segment, which corresponds apparently with the rudimentary exopodite. The 3rd segment with several short setae along the outer margin. The 5th segment thickly furnished with bristles.

3rd Maxilliped: (Pl. XLII, fig. 11) Very long, slender and 6-segmented. There is a short rudimentary exopodite at the outer distal edge of the long basis. The 5th and the terminal segments are both thickly setose.

Pereiopod: (Pl. XLII, fig. 12) Five pairs of pereiopods are 6-segmented, each has a well developed exopodite (Pl. XLII, fig. 13) which is articulated to the outer

distal edge of basis, consists of the basal segment and the plumose distal segment and plays the rôle to keep the animal floating by its natatory movement. The third to the 5th segments are furnished with bristles along the outer side, the 5th segment has a long spine at the inner edge of the distal end. The terminal dactylus curves slightly and with a thin spine near the middle of its convex margin. The distal end of each coxa protrudes into a spine on the ventral surface.

No. of Pereiopod	Length of Coxa	Basis	3rd Seg.	4th Seg.	5th Seg.	Dactylus	Exopodite	
							Basal Seg.	Distal Seg.
1	3 mm	10 mm	9 mm	6.5 mm	17 mm	2.5 mm	9.5 mm	17 mm
2	3.5	9	10	7.5	19	3	9.5	18
3	3	8	10	6.5	17	3	8.5	17
4	2.5	7.5	10	5.5	13	2	7.5	14
5	2	5	8	5	11	2	5.5	11

(Specimen No. 1)

1	3	10	9	7	17	2.5	10	17
2	3	9	10	6.5	18	2.5	9.5	17
3	2.5	7.5	10	6	17	2.5	9	16.5
4	2.5	7	10	5.5	14	2	7.5	14.5
5	2.5	5.5	8	4.5	11	2	6	12

(Specimen No. 2)

Gill: Occur in the following number as tabulated below :

Appendages	Pleurobranchia	Arthrobranchia	Podobranchia
2nd Maxilliped	—	1	1 (bifid)
3rd Maxilliped	1	1	1 (")
1 Pereiopod	1	1	1 (")
2 " "	2	1	1 (")
3 " "	2	1	1 (")
4 " "	2	1	1 (")
5 " "	1	—	—

Pleopod: (Pl. XLII, fig. 14) Four pairs of pleopods occur on 2-5 abd. segments. Each pleopod consists of 2 segmented basipodite and unsegmented exo- and endopodites.

A short appendix interna is found near the middle of the inner side of the endopodite.

Uropod: (Pl. XLII, fig. 15) Both inner and outer leaves fan-shaped, the margin furnished with many minute setae.

Thoracic ganglion: The second to the 8th ganglions are discernible clearly, 2 and 3 ganglions (G. 1 and G. 2 in figure) are smaller than 4-8 ganglions (G. 3-G. 7 in figure). The distance between parallel longitudinal cords is very large between 6 (G. 5) and 7 (G. 6) ganglions as shown in Pl. XLIII, fig. 1.

DESCRIPTIONS ON NO. 3 SPECIMEN

This specimen resembles so closely Nos. 1 and 2 that I can find merely the following differences. (1) The body is smaller, the total length is 34 mm. (2) There are 5-8 serrations on each posterior part of the longitudinal crests on the carapace. (3) The distal end of the large outer projection of the 2nd segment of antenna bears distally 5 stout teeth, the 4th segment with 5 stout and 2 minute serrations along the inner margin. (4) The anterior end of the blade edge of mandible (Pl. XLIII, figs. 2 and 2') forms a spine-like protuberance, the posterior end swells slightly, but not forming a distinct prominence; a blunt spine on the outer margin is very prominent. (5) Lower lip (Pl. XLIII, fig. 3) is not yet furnished with fine hairs along the edge. (6) There is only one rounded prominence below the slender protuberance at the inner base of the finger-shaped portion of 1st maxilliped (Pl. XLIII, fig. 6). The length of each segment of pereopods is shown below:

No. of Pereiopod	Length of Coxa	Basis	3rd Seg.	4th Seg.	5th Seg.	Dactylus	Exopodite	
							Basal Seg.	Distal Seg.
1	2 mm	6.5 mm	6.5 mm	3.5 mm	11 mm	1.5 mm	6 mm	11 mm
2	2	5	6.5	4.5	13	2	6	10.5
3	1.5	5	7	3.5	11	2	5.5	11
4	1.5	4	6	3	8.5	1.2	5	9.5
5	1.2	3.5	5.5	2.5	6.5	1	4	7.5

(Specimen No. 3)

Gills occur as in Nos. 1 and 2, except for the second maxilliped which bears merely a podobranchia, that on the left side is bifid, while that on the right is simple.

For the differences mentioned above, the specimen No. 3 may be considered to belong to the stage earlier than that of Nos. 1 and 2. Lastly, it is very possible that this large *Phyllosoma* belongs to *Ibacus ciliatus* (v. SIEBOLD) which is found rather

commonly in this district, because the shape of the antenna and the existence of a pair of longitudinal crests on the carapace in this *Phyllosoma* are very like those in that scyllarid. Here, for the convenience to record the material, the present *Phyllosoma* is named provisionally *Phyllosoma utiwaëbi* (*Utiwaëbi* is the Japanese name of *Ibacus ciliatus*).

The most closely related one with the present form is *Phyllosoma guerini* DE HAAN described and figured in v. SIEBOLD's "Fauna Japonica". In *Ph. guerini* of 1½" long, antenna 5-segmented, the inner sides of 2-4 seg. are protruded respectively into a stout spine and 5 seg. of each pereopod has a longitudinal furrow along the median line on each side. These features, at least the last one, are possibly regarded as artefacts, because the sole individual of *Ph. guerini* was a dried specimen. However, the ultimate decision must be given solely by re-examination of the type specimen of *Ph. guerini*.

ABBREVIATIONS

Abd. 1-5.....Abdominal segments	Mxp. 1-3.....Maxillipeds
Ant. 1Antennule	Per. 1-5Pereopods
Ant. 2Antenna	Pl. 1-4.....Pleopods
Ant. gl.Antennal gland	Tel.Telson
Cp.Carapace	U. 1.....Upper lip
Mx. 1Maxillula	Up.Uropod
Mx. 2Maxilla	

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EXPLANATION OF PLATES XLI-XLIII

PLATE XLI

Phyllosoma utivaëbi nov. Specimen No. 1.

- Fig. 1. Eye and eye stalk.
 Fig. 2. Right antennule, dorsal.
 Fig. 3. Right antenna and antennal gland, ventral.
 Fig. 4. Right antenna of Specimen No. 3, ventral.
 Fig. 5. Mouth part.
 Fig. 6. Median dorsal prominence near the anterior end of the carapace.
 Fig. 7. Abdomen, dorsal.

ABD. 1-6Abdominal segments
 ANT. GL.Antennal gland
 GL. AP.....Aperture of antennal gland
 LOW. L.....Lower lip
 MD.Mandible
 MX. 1.....Maxillula
 U. L.Upper lip

PLATE XLII

Phyllosoma utivaëbi nov. Specimen No. 1.

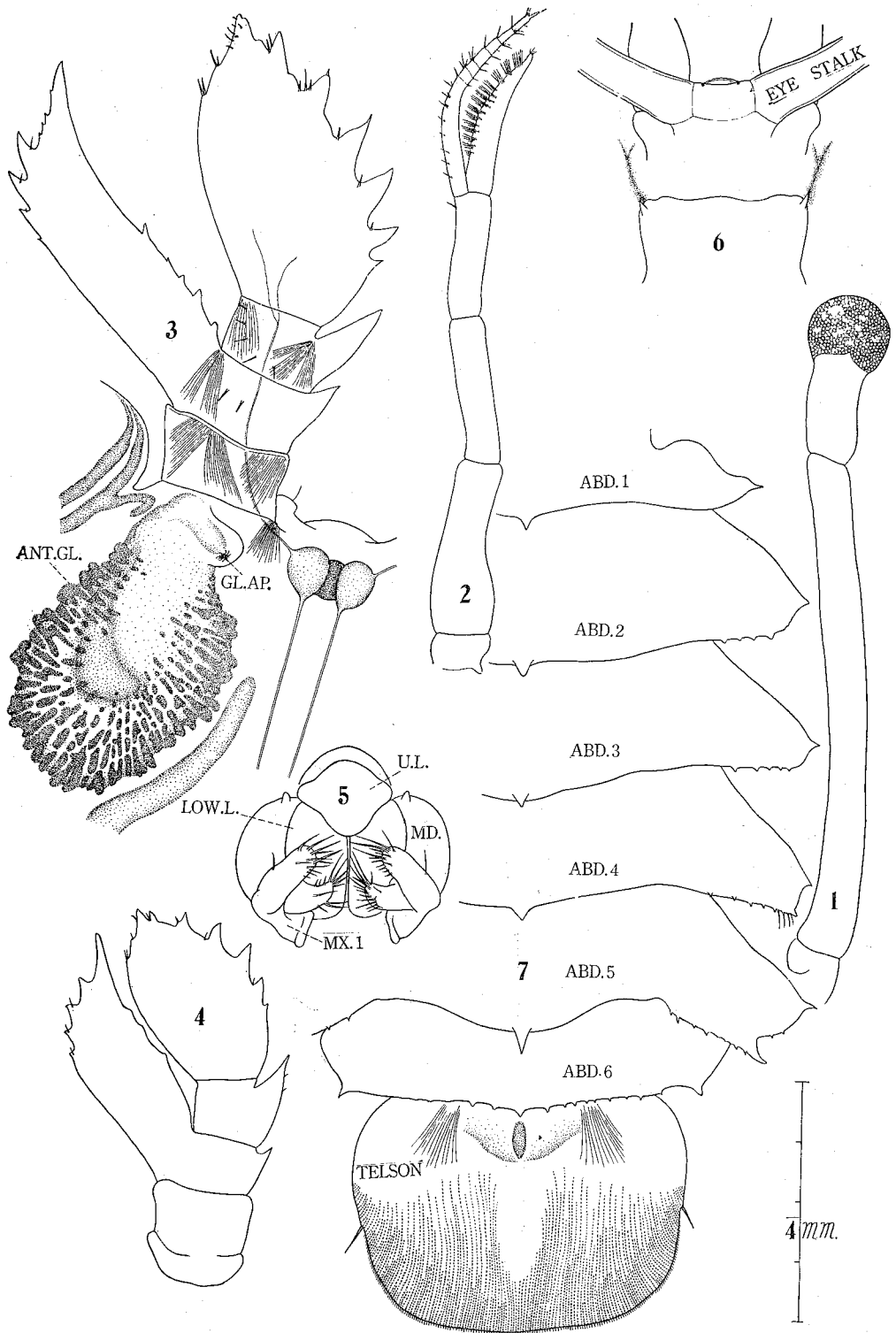
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| Fig. 8. Maxilla. | Fig. 12. Right 4th pereopod, dorsal. |
| Fig. 9. 1st Maxilliped. | Fig. 13. Exopodite of the same leg. |
| Fig. 10. 2nd Maxilliped. | Fig. 14. Left 1st pleopod, ventral. |
| Fig. 11. 3rd Maxilliped. | Fig. 15. Left uropod, dorsal. |

AP. INT.Appendix interna
 EXP.Exopodite

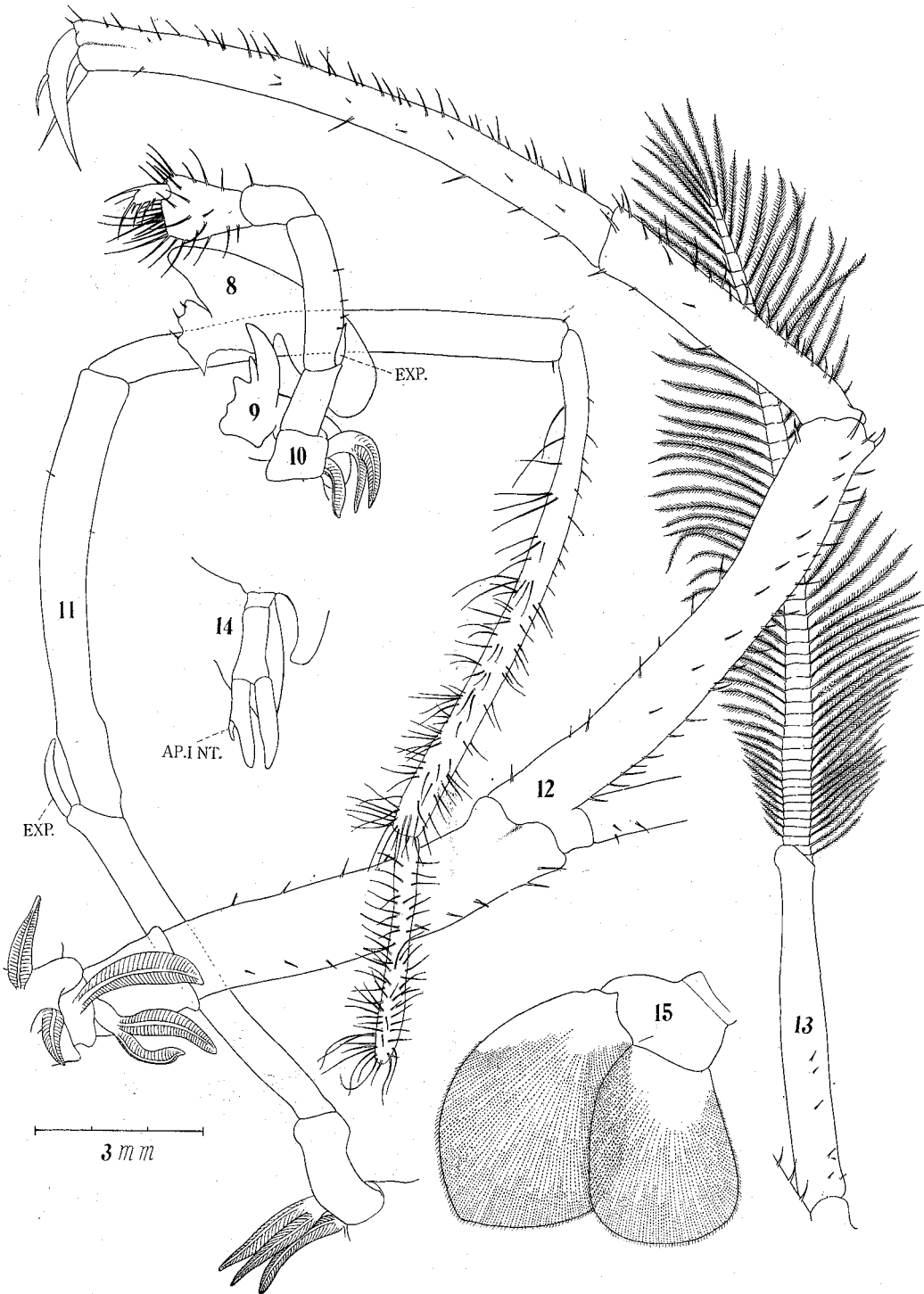
PLATE XLIII

Phyllosoma utivaëbi nov.

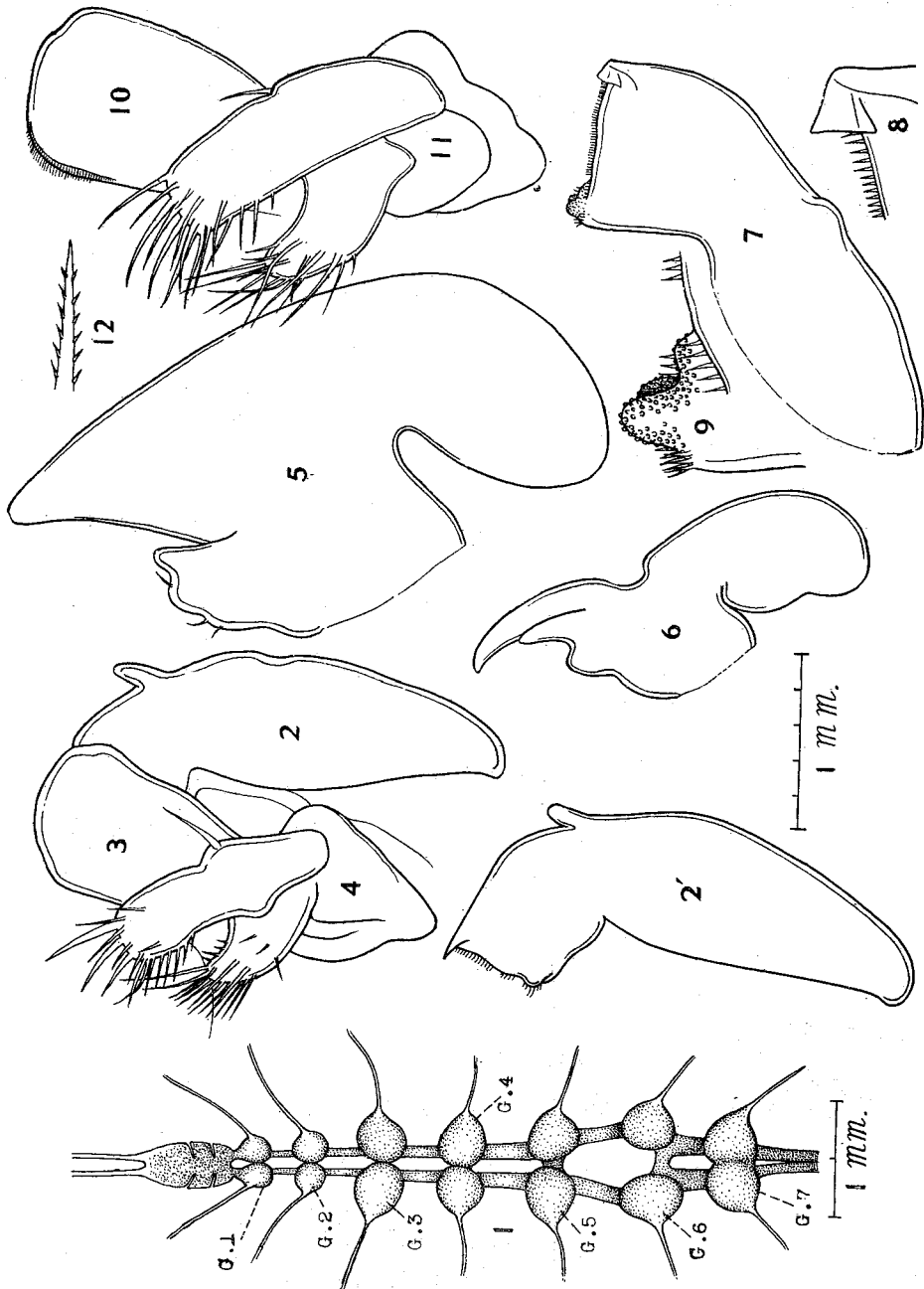
- Fig. 1. Specimen No. 1.
 Figs. 2-7. Specimen No. 3.
 Figs. 8-12. Specimen No. 2.
- Fig. 1. Thoracic ganglions, G. 1 (2nd thoracic ganglion)-G. 7 (8th thoracic ganglion).
 Figs. 2, 2'. Mandible.
 Fig. 3. Lower lip.
 Fig. 4. Maxillula.
 Fig. 5. Maxilla.
 Fig. 6. 1st Maxilliped.
 Fig. 7. Mandible.
 Fig. 8. Anterior end of blade edge of mandible, magnified.
 Fig. 9. Posterior end of blade edge of mandible, magnified.
 Fig. 10. Lower lip.
 Fig. 11. Maxillula.
 Fig. 12. A seta from maxillula, highly magnified.



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