Vol. 1, No. 3 THE JOURNAL OF THE SIGENKAGAKU KENKYUSYO July 1944

Polycladida of Japan[1)]

By

KOJIRO KATO

Succeeding to the studies of such authorities as STIMPSON, BOCK, YERI and KABURAKI, the present writer has made a systematic study of Japanese polyclads in these ten years. In this report he should like to summarize the result of his study as well as to describe 28 new species from the coasts of Japan proper.

Before proceeding to the taxonomic description, it seems desirable to give a brief account of the previous records on Japanese polyclads.

The first description is due to STIMPSON (1855) who recorded six species in "New marine Invertebrates from the Chinese and Japanese seas": *Eurelepta interrupta, Eurelepta guttato-marginata, Eurelepta fulminata, Stylochus reticulatus, Leptoplana sparsa, Leptoplana collaris.*

Two years afterwards (1857), he recorded 19 more forms adding to above mentioned species, in "Prodromus descriptionis animalium evertebratorum": *Proceros albicornis, Eurelepta coccinea, Eurelepta nigra, Eurelepta japonica, Elasmodes tenellus, Leptoplana oblonga, Leptoplana humilis, Leptoplana punctata, Pachyplana lactea, Prosthiostomum grande, Prosthiostomum constipatum, Prosthiostomum cribrarium, Prosthiostomum crassiusculum, Diplonchus marmoratus, Stylochus obscurus, Callioplana marginata, Stylochopsis conglomeratus, Stylochopsis limosus, Trachyplana tuberculosa.*

Although YERI and KABURAKI (1918) reidentified afterwards five species of them mentioned below, it seems to be very difficult to identify STIMPSON's species, as the diagnosis of each species is very meagre, moreover, accompanying with no figure: *Callioplana marginata, Prosthiostomum grande, Leptoplana humilis* as *Notoplana humilis, Stylochus reticulatus* as *Planocera reticulata, Stylochus obscurus* as *Pseudostylochus obscurus.*

In 1918, YERI and KABURAKI recorded 26 species, including five STIMPSON's species, in "Description of some Japanese polyclad turbellaria"; this is the first certain work on Japanese Polyclads. It comprises the following species: *Discocelis japonica, Stylochus rutilus, Stylochus ijimai, Bergendalia diversa, Notoplana humilis, Notoplana delicata, Hoploplana ornata, Neoplanocera*

1) Contribution of the Zoological Department of the Sigenkagaku Kenkyusyo, No. 33.

elongata, Planocera reticulata, Planocera purpurea, Paraplanocera misakiensis, Pseudostylochus takeshitai, Pseudostylochus fulvus, Pseudostylochus obscurus, Callioplana marginata, Thysanozoon brocchii, Pseudoceros reticulatus, Pseudoceros lacteus?, Pseudoceros luteomarginatus, Pseudoceros nigromarginatus, Cycloporus papillosus, Prosthiostomum siphunculus, Prosthiostomum grande, Prothiostomum marmoratum, Prosthiostomum awaense, Prosthiostomum rubropunctatum.

Later, they recorded two more species in "Notes on two new species of Japanese polyclads (1920)": *Neostylochus fulvopunctatus, Prosthiostomum trilineatum.*

In 1923, KABURAKI recorded two species, *Yungia sasakii* and *Eurelepta punctata* in "Notes on Japanese Polyclad turbellarians".

BOCK who visited in Japan during the year 1914, collected many interesting forms of polyclads; he described these species in the following four papers. *Chromoplana bella* and *Amyella lineata* in "Two new cotylean genera of polyclads from Japan and remarks on some other cotyleans (1922)"; *Plehnia japonica* and *Cryptocelis ijimai* in "Two new acotylean polyclads from Japan (1923)"; *Boninia mirabilis* in "*Boninia*, a new polyclad genus from the Pacific (1923)"; *Stylochoplana pusilla* in "Eine neue *Stylochoplana* aus Japan (1924)".

The total number of the valid species in Japan recorded by the above-mentioned workers is forty-three. This takes no account of 13 species of STIMPSON. To this number about 78 forms have been added by the present writer and in this paper 28 species are newly described. Thus, so far as the writer investigated up to now, the polyclad fauna of Japan consists of 19 families, 40 genera and 149 species, almost all the species being endemic to that territory except the following seven species: *Discoplana gigas, Paraplanocera oligoglena, Hoploplana villosa, Callioplana marginata, Cestoplana rubrocincta, Thysanozoon brocchii, Pseudoceros flavomarginatus.*

Here follows a list of the new species represented in this paper:

ACOTYLEA

Craspedommata

Discocelis fulva sp. nov.
Stylochus uniporus sp. nov.
Stylochus hamanensis sp. nov.
Stylochus miyadii sp. nov.
Stylochus izuensis sp. nov.
Cryptophallus japonicus sp. nov.
Ilyplanoides mitsuii gen. et sp. nov.
Amemiyaia pacifica gen. et sp. nov.

Schematommata

Stylochoplana aberrans sp. nov.
Zygantroplana clepeasta sp. nov.
Hoploplana schizoporellae sp. nov.
Hoploplana rubra sp. nov.
Planocera multitentaculata sp. nov.
Planocera heda sp. nov.
Apidioplana okadai sp. nov.
Pseudostylochus notoensis sp. nov.
Pseudostylochus sadoensis sp. nov.

COTYLEA

Thysanozoon japonicum sp. nov.
Pseudoceros nipponicus sp. nov.
Pseudoceras izuensis sp. nov.
Cycloporus japonicus sp. nov.
Stylostomum maculatum sp. nov.
Prosthiostomum sadoensis sp. nov.
Prosthiostomum wagurensis sp. nov.
Prosthiostomum notoensis sp. nov.
Prosthiostomum nozakensis sp. nov.
Prosthiostomum komaii sp. nov.
Prosthiostomum susakiensis sp. nov.

The writer should like here to express his hearty thanks to Professor I. AMEMIYA, Director of the Mitsui Institute of Marine Biology for his kind help during the course of this study. The writer also expresses his deep gratitude to the following gentlemen: Professors D. MIYADI, H. OHSHIMA, Y. OKADA, K. TAKEWAKI and Messrs. REIZO ISHIYAMA, KANZAEMON KIKUCHI for placing valuable specimens at his disposal; Professors T. KABURAKI, T. KOMAI, H. OHSHIMA for the loan of literatures.

SYSTEMATICS

Order *Polycladida* LANG, 1884

Suborder *Acotylea* LANG, 1884

Section CRASPEDOMMATA BOCK, 1913

Family **Discocelidae** LAIDLAW, 1903

Genus ***Discocelis*** EHRENBERG, 1836

1. ***Discocelis japonica*** YERI et KABURAKI, 1918

Discocelis japonica, YERI et KABURAKI 1918, p. 3–5, pl. 2, fig. 3; text-fig. 1; KATO 1937a, p. 212–213, text-figs. 1, 2; KATO 1938a, p. 561; KATO 1938b, p. 578.

Localities: Sirahama, Awa; Misaki; Susaki near Simoda, Izu; Enoura, Suruga; Sugasima, Sima; Seto, Kii; Tomioka, Amakusa.

2. ***Discocelis pusilla*** KATO, 1938

Discocelis pusilla, KATO 1938a, p. 560–561, pl. 36, figs. 1, 2; text-figs. 1–3.

Locality: Tomioka, Amakusa. Commonly found on *Zostera*.

3. ***Discocelis fulva*** sp. nov. (Text-figs. 1, 2)

Description: Body elongated oval shape, usually 20–25 mm in length and the breadth is a little shorter than a half length of body. Color uniformly light yellowish-brown, darker along the median line, without any color pattern. Marginal eyes distributed to the level of the first quarter of body. With distinct tentacular and cerebral eyes which lie about the first seventh of body from the anterior end. Tentacles totally lacking. Pharyngeal sheath long, occupying half a length of body and provided with about a dozen side-pockets. Mouth at the extreme posterior end of pharyngeal sheath. The common genital pore lies directly behind the mouth. The male and female genital apparatus are similar to those in *Discocelis japonica*, except for the scarcity of villus-like muscular

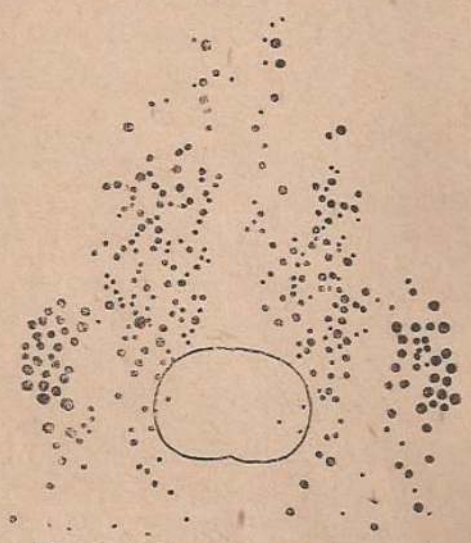


Fig. 1. *Discocelis fulva* sp. nov.; eye-spots. ×35.

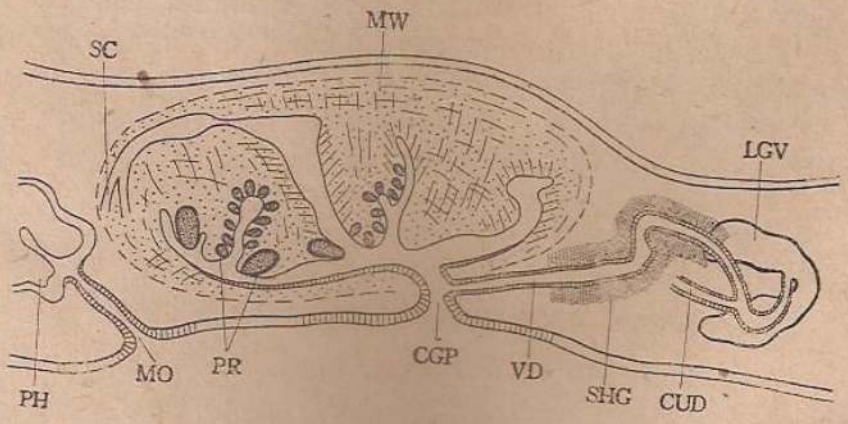


Fig. 2. *Discocelis fulva* sp. nov.; longitudinal section through genital organs. ×35.

projections in the antrum masculinum.

Remarks: This species is clearly distinguished from *Discocelis japonica* and other members of the genus in its body color.

Localities: Misaki; Susaki. Common under stones between tidemarks in summer.

Family **Latocestidae** LAIDLAW, 1903

Genus ***Trigonoporus*** LANG, 1884

The present writer considers the genus *Bergendalia* being a synonym of *Trigonoporus*; he will discuss in detail the affinies between them in his "Monograph of Polycladida", which will be published in the near future.

4. ***Trigonoporus diversus*** (YERI et KABURAKI, 1918)

Bergendalia diversa, YERI et KABURAKI 1918, p. 8–11, pl. 2, fig. 15; text-figs. 6–8.

Locality: Sirahama, Awa.

5. ***Trigonoporus mirabilis*** (KATO, 1938)

Bergendalia mirabilis, KATO 1938b, p. 578–580, pl. 30, figs. 1, 2; text-figs. 1–3.

Locality: Seto, Kii. A single specimen.

Family **Plehniidae** BOCK, 1913

Genus ***Plehnia*** BOCK, 1913

6. ***Plehnia japonica*** BOCK, 1923

Plehnia japonica, BOCK 1923a, p. 1–15, pl. 1, figs. 1–4; text-figs. 1–3.

Locality: Kobe Bay. Two specimens collected from 12–15 m in depth.

7. ***Plehnia pacifica*** KATO, 1939

Plehnia pacifica, KATO, 1939a, p. 66–68, pl. 3, figs. 1–4; text-figs. 1–3.

Locality: Off west coast of Takosima near Onagawa, Rikuzen. A single specimen collected from a depth 28 m.

Family **Stylochidae** STIMPSON, 1857 (emend. BOCK, 1913)

Genus ***Stylochus*** EHRENBERG, 1831

8. ***Stylochus orientalis*** BOCK, 1913

Stylochus orientalis, BOCK, 1913, p. 128–132, pl. 3, fig. 11; pl. 5, fig. 3; pl. 9, figs. 1, 3; text-figs. 16, 17.

Stylochus orientalis var. *splendida*, BOCK 1913, p. 132–136, figs. 18, 19.

Distribution: Formosa Strait, 26°N., 121°30′E. from 75 m deep; Koh Kam, Gulf of Siam, from 9 m deep; between Koh Kam and Koh Chuen, from 27 m deep; Cape Jaubert, Western Australia.

9. ***Stylochus rutilus*** YERI et KABURAKI, 1918

Stylochus rutilus, YERI et KABURAKI 1918, p. 5–6, pl. 2, fig. 1; text-fig. 2.

Locality: Mera, Awa. A single specimen.

10. ***Stylochus ijimai*** YERI et KABURAKI, 1918

Stylochus ijimai, YERI et KABURAKI 1918, p. 6–8, pl. 2, fig. 8; text-figs. 3–5; KATO 1934b, p. 124; KATO 1938b, p. 578.

Remarks: This species attacks cultivated oysters to cause often heavy damage to them.

Localities: Misaki; Enoura, Suruga; Susaki near Simoda; Seto, Kii.

11. ***Stylochus aomori*** KATO, 1937

Stylochus aomori, KATO 1937c, p. 39–41, text-figs. 1–3; KATO 1939, p. 142.

Locality: Asadokoro near Asamusi, Mutsu. Found creeping on the muddy beach.

12. ***Stylochus speciosus*** KATO, 1937

Stylochus speciosus, KATO 1937f, p. 347–349, pl. 20, figs. 1, 2; text-figs. 1–3.

Localities: Moroiso Bay, Misaki, found on oyster shells cultivated; Sugasima, Sima, under stones between tidemarks.

13. ***Stylochus uniporus*** sp. nov. (Text-figs. 3, 4)

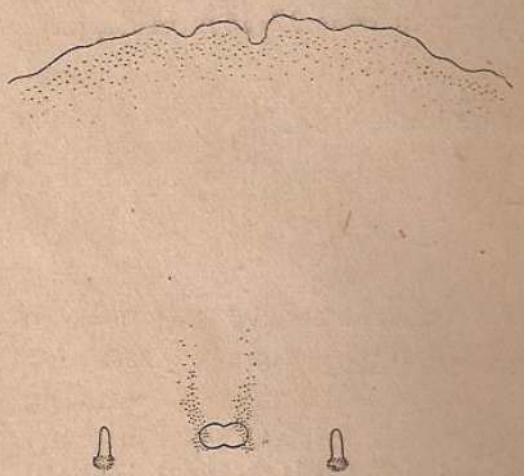


Fig. 3. *Stylochus uniporus* sp. nov.; arrangement of eye-spots. ×11.

Description: Body oval, measuring 50 mm in length and 35 mm in breadth in the larger specimen. Dorsal surface dark green with uniformly dispersed dark dots. Slender, conical tentacles lie at the first sixth of body from the anterior body end; they are contractile in the deep sheath. Cerebral eyes are separated into two elongated groups; marginal eyes are much crowded, extending to the anterior limit of the last fourth of body. Mouth nearly in the center of body. Male and female copulatory apparatus open outside by a

common genital pore near the posterior body end. The copulatory apparatus agrees well that of the type of the genus. Penis is very small; prostate vesicle large; seminal vesicle also large and anchor-shape.

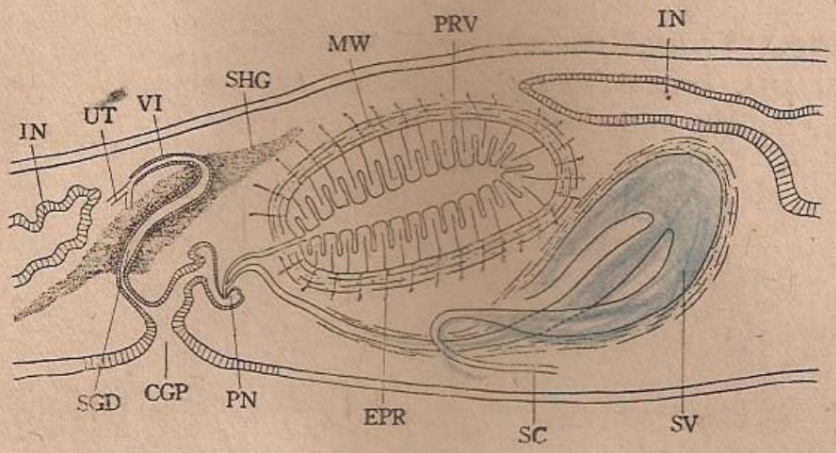


Fig. 4. *Stylochus uniporus* sp. nov.; longitudinal section through genital organs. ×22.

Remarks: This flatworm thrived in the spring of 1938 at Najima near Fukuoka and attacked the living bivalve, *Paphia* (*Tapes*) *philippinarum* (ADAMS et REEVE) to make them death; thus a large number of this clam suffer a great damage. This fact was first observed by Mr. K. YASUMOTO of the Kyûshû Imperial University and through the kindness of Professor H. OHSHIMA, a large number of this worm were sent to the present writer in the living state for study.

Locality: Najima near Fukuoka, Kyûshû.

14. ***Stylochus hamanensis*** sp. nov. (Text-figs. 5, 6)

Description: Body oval, 10 mm long by 7 mm broad. In the preserved state dorsal surface covered with small brown maculae, more densely distributed along the median line. Conical tentacles situated at the limit of the first quarter of body. Tentacular eyes very numerous and those lying at the base of the tentacle are larger than those in the tip; cerebral eyes are comparatively small in number; with a few frontal eyes; marginal eyes arranged in many rows along the anterior body margin to near the level of brain. Mouth nearly in the center of body situated at the first fourth of pharyngeal chamber, which has many lateral pouches and occupies a half length of body. Pharynx much plicated. Male and female genital pores closely applied each other, lying at the last ninth of body and in the middle between the posterior end of pharyngeal sheath and the posterior end of body. The animals examined did not attain full maturity, but the copulatory apparatus were almost developed as illustrated in the text-figure. Penis rudimentary; prostate vesicle rather large; seminal vesicle anchor-

shape; antrum masculinum deep.

Remarks: In the autumn of 1938, this worm abundantly flourished at Kôtô along the Lake of Hamana, and attacked the cultivated oysters by hanging method to give much damage. Through the courtesy of Mr. Reizo Ishiyama, several specimens of this planarian were sent to the writer for study.

Locality: Lake Hamana, Tôtômi.

Fig. 5. *Stylochus hamanensis* sp. nov.; arrangement of eye-spots. ×11.

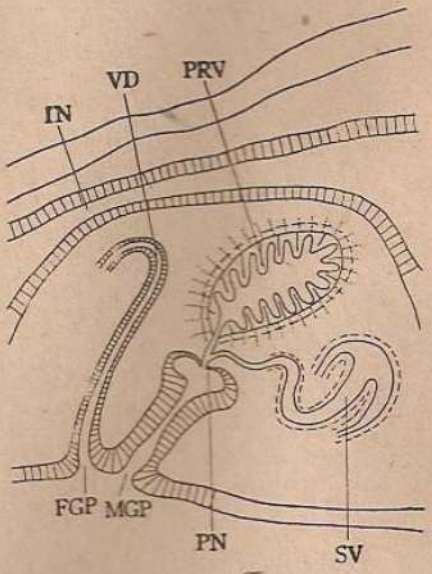


Fig. 6. *Stylochus hamanensis* sp. nov.; longitudinal section through genital organs. ×50.

15. ***Stylochus miyadii*** sp. nov. (Pl. XXVI, fig. 1; Text-figs. 7, 8)

Description: Body oval, measuring 4 mm by 2.5 mm, of a firm consistency. In the preserved state, dorsal surface is scattered uniformly with brown maculae and along the median line darker in color. Slender tentacles situated at the level of the first third of body; they are able to contract in each extremely deep sheath; this is a marked feature of the present species. With tentacular and cerebral eyes, the latter being smaller in number and distinctly divided into two lateral groups. There are many large ocelli along the inner side of the marginal rows of small ocelli; the latter densely arrange along the anterior half of body. Mouth nearly in the center of body. Pharyngeal sheath rather small. A common genital pore lies near the posterior end of body. Penis flatly conical; prostate vesicle moderately large; seminal vesicle anchor-shape. Female copulatory apparatus did

Fig. 7. *Stylochus miyadii* sp. nov. ×17.

not attain complete maturity, hence shell secretion was not formed.

Locality: Off Sioo, Awazisima in Osaka Bay. Two specimens collected by Dr. D. MIYADI from a depth of about 45 m on August, 1939.

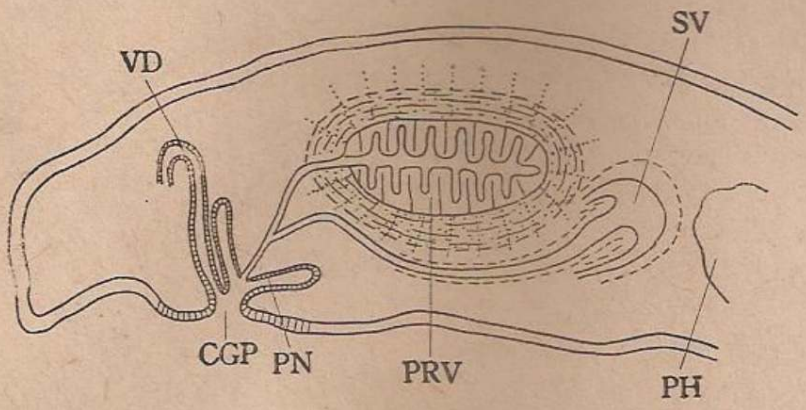


Fig. 8. *Stylochus miyadii* sp. nov.; longitudinal section through genital organs. ×60.

16. ***Stylochus izuensis*** sp. nov. (Text-figs. 9, 10)

Description: Body elongated oval, very flexible but of a firm consistency; 45–50 mm long by 20 mm broad in fully extended state. Color milky white with uniformly scattered minute orange pigment; this pigment gathers to form round spots except near the body margin, where it arranges as short striations perpendicular to the margin; black minute spots distributed evenly on orange colored dorsal surface. Tentacles are also of orange color, lying at a distance of 6 mm from the anterior body margin and 3.5 mm apart from each other. Tentacular eyes are chiefly at the anterior wall of tentacle. Ventral side white. Marginal eyes along the anterior margin of body to the level a little behind the tentacles; cerebral eyes make two distinct elongated groups. Genital pores closely approximated, located 5 mm apart from the posterior end of body. Main intestine provided with a dozen pairs of main intestinal branches and occupies 20 mm in length. Penis moderately large, flatly conical. Prostate vesicle elongated. Seminal vesicle of a typical anchor-shape. Female copulatory apparatus was in a rudimentary state of development, and the shell gland secretion was not observed.

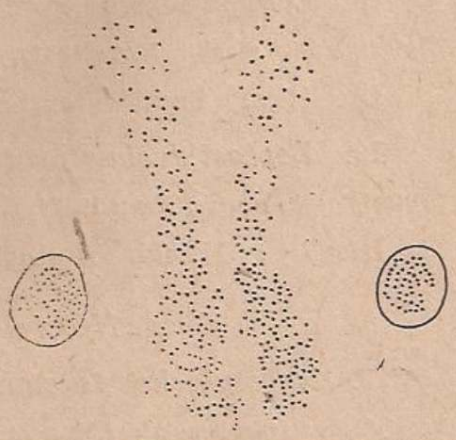


Fig. 9. *Stylochus izuensis* sp. nov., eye-spots. ×11.

Locality: Off Susaki near Simoda, Izu.

A single specimen was collected by the dredge from a depth of 18 m on February 20, 1937.

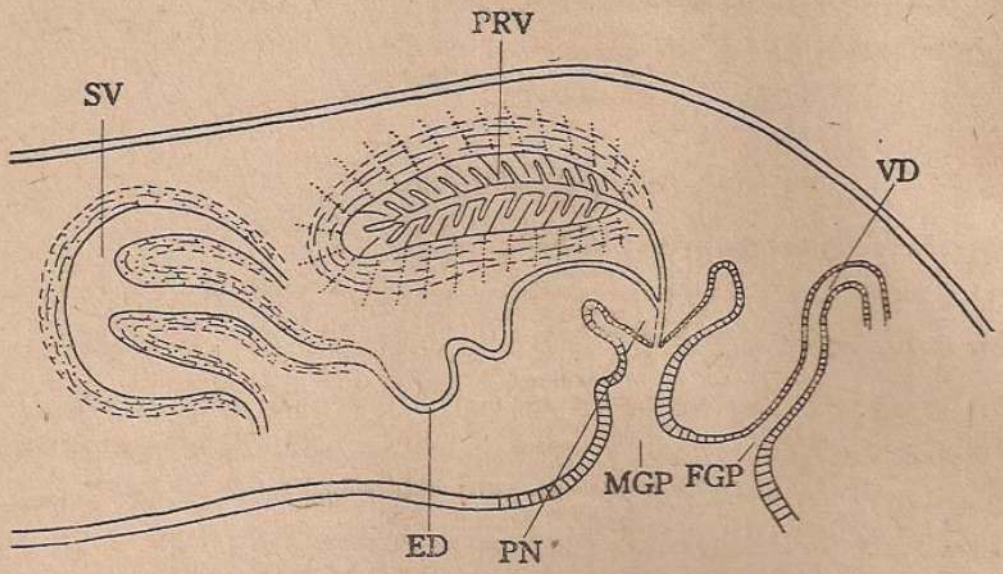


Fig. 10. *Stylochus izuensis* sp. nov.; longitudinal section through genital organs. ×35.

Genus ***Idioplana*** Woodworth, 1898

17. ***Idioplana pacifica*** Kato, 1943

Idioplana pacifica, Kato 1943c, p. 80, 81, pl. 4, figs. 1, 2; text-figs. 1, 2.

Locality: Madarai, Palao. A single specimen.

Genus ***Leptostylochus*** Bock, 1925

18. ***Leptostylochus gracilis*** Kato, 1934

Leptostylochus gracilis, Kato 1934a, p. 374–377, text-figs. 1, 2.

Localities: Susaki near Simoda, Izu; Misaki.

19. ***Leptostylochus ovatus*** Kato, 1937

Leptostylochus ovatus, Kato 1937f, p. 349–351, text-figs. 4, 5.

Locality: Misaki. A single specimen under stone between tidemarks.

Genus ***Neostylochus*** Yeri et Kaburaki, 1920

20. ***Neostylochus fulvopunctatus*** Yeri et Kaburaki, 1920

Neostylochus fulvopunctatus, Yeri et Kaburaki 1920, p. 591–596, text-figs. 1–3.

Locality: Misaki. A single specimen.

Genus *Discostylochus* BOCK, 1926

21. *Discostylochus yatsui* KATO, 1937

Discostylochus yatsui, KATO 1937f, p. 351–353, pl. 20, figs. 6, 7; text-figs. 6–8.

Locality: Misaki. A single specimen.

Genus *Cryptophallus* BOCK, 1913

22. *Cryptophallus eximius* KATO, 1937

Cryptophallus eximius, KATO 1937f, p. 353–355, pl. 20, figs. 3–5; text-figs. 9–11.

Locality: Misaki. A single specimen.

23. *Cryptophallus japonicus* sp. nov.

Cryptophallus sondaicus BOCK, KATO 1938b, p. 580–582, pl. 38, figs. 3, 4; text-figs. 4–6.

Description: Body elongated oval, 40 mm long by 20 mm broad. It measured 9 mm from tentacular eyes to anterior body end; 12 mm from mouth to posterior end. Female genital pore 4 mm apart from posterior end; male gonopore 3.5 mm apart from female pore and 5 mm from mouth. Color of dorsal surface light silvery black, darker along the median line. Tentacular groups of eyes each consists of only 4–5 ocelli; marginal eyes are far larger than those in *Cryptophallus eximius;* besides the marginal, tentacular and cerebral eyes, there is a large number of eyes scattered over the anterior end of body, extending back as far as a little behind the brain. Male copulatory apparatus lie beneath the posterior end of pharyngeal sheath. Shell gland duct is extremely narrow.

Remarks: *Cryptophallus sondaicus* was described by BOCK (1925) from Amboina. The present writer (1938) recorded the occurrence of that species from Japan; however, recently he came to hold the consideration that the Japanese specimen is not identical with that from Amboina, but represents a new species.

Locality: Edura near Seto, Kii. A single specimen.

Genus *Kaburakia* BOCK, 1925

24. *Kaburakia gloriosa* KATO, 1938

Kaburakia gloriosa, KATO 1938a, p. 562–563, pl. 36, figs. 7, 8; text-figs. 4–6.

Locality: Oniike near Tomioka, Amakusa. A single specimen.

Genus *Mirostylochus* KATO, 1937

25. *Mirostylochus akkeshiensis* KATO, 1937

Mirostylochus akkeshiensis, KATO 1937e, p. 124–127, pl. 8, figs. 1–3; text-figs. 1–4.

Remarks: This species was first described basing on only one preserved specimen; but afterwards, in the summer of 1939, the present writer collected by himself numerous specimens in Akkeshi. The worm often associated with *Hydroides* between tidemarks, and also collected from the bottom of Lake Akkeshi, attached to dead oyster shell.

Locality: Akkeshi, Hokkaidô.

Family **Cryptocelidae** LAIDLAW, 1903

Genus ***Cryptocelis*** LANG, 1884

26. ***Cryptocelis ijimai*** BOCK, 1923

Cryptocelis ijimai, BOCK 1923a, p. 15–36, pl. 1, figs. 5–14; text-figs. 4–7.

Localities: Misaki; Susaki near Simoda.

27. ***Cryptocelis amakusaensis*** KATO, 1936

Cryptocelis amakusaensis, KATO 1936a, p. 17–20, pl. 1, figs. 1–6; text-figs. 1–3; KATO 1938, p. 564.

Remarks: This worm attacks the living periwinkles, *Umbonium moniliferum* LAMARCK.

Locality: Tomioka, Amakusa. On muddy beach.

28. ***Cryptocelis littoralis*** KATO, 1937

Cryptocelis littoralis, KATO 1937f, p. 355–357, pl. 20, figs. 8, 9; text-figs. 12–14.

Locality: Misaki. Two specimens.

29. ***Cryptocelis orientalis*** KATO, 1939

Cryptocelis orientalis, KATO 1939b, p. 142–144, pl. 8, figs. 1, 2; text-figs. 1, 2.

Locality: Moura-sima near Asamusi, Mutsu. A single specimen.

Genus ***Ilyplanoides*** mihi

Cryptocelidae with elongated body. Marginal eyes around the whole body margin. With cerebral and tentacular groups of eyes. Without tentacles. Male and female genital pores separated and rather near the posterior end of body. Without false or true seminal vesicle. With prostatic duct, but without any definite prostate vesicle. With special antral glands. Without Lang's glandular vesicle.

30. ***Ilyplanoides mitsuii*** gen. et sp. nov.
(Pl. XXVI, fig. 7; Text-figs. 11–13)

Description: Body elongated with bluntly pointed anterior and posterior ends. 25 mm in length and 7 mm in breadth; body thin but of a firm consistency. Color uniformly milky white. Without tentacles. Brain lies at the first fifth of body. Tentacular eyes are represented by a few, coarsely grouped ocelli; cerebral eyes distributed closely on either side of brain, forming a linear cluster; at the foremost part of each cerebral group there are two ocelli which are plainly distinguished from the rest by the larger size; marginal eyes around the whole body and much crowded in the anterior end, while very sparse in the caudal region.

The dorsal and the ventral epidermis are equal in height and contain a small quantity of rhabdites and a large amount of eosinophilous secretion granules. The dermal musculature composed of a single layer of circular muscle fibers immediately beneath the basement membrane, next the longitudinal layer followed by the two diagonal layers and the innermost poorly developed circular muscle layer. The ventral side composed of an outer single circular layer, next the longitudinal layer and the inner two diagonal layers, between them there is a weak circular muscle layer; the innermost layer is longitudinal. On the whole the dorsal and the ventral musculature are almost equal in thickness.

The mouth lies a little behind the middle of body and passes into the pharyngeal sheath at the last third of its length. Pharynx plicated, occupying about one-third the body length.

Genital pores are closely applied, lying near the last eighth of body. Seminal canals run forwards from the anterior part of body and near the male genital pore, turn mediad and unite each other to pass into the ejaculatory duct whose inner epithelium being flat. The ejaculatory duct, taking an upwards course, continues to a little wide duct, the latter soon turns ventrad and widens very much. The inner epthelium of this part consists of cuboidal cells, each of which has an expanded nucleus at each basal part. Into this duct pours the secretion of prostatic character. Hence, this wide duct may correspond to the prostate vesicle found in other polyclads. The prostate duct as well as the ejaculatory duct are surrounded with moderately developed musculature. The true seminal vesicle is

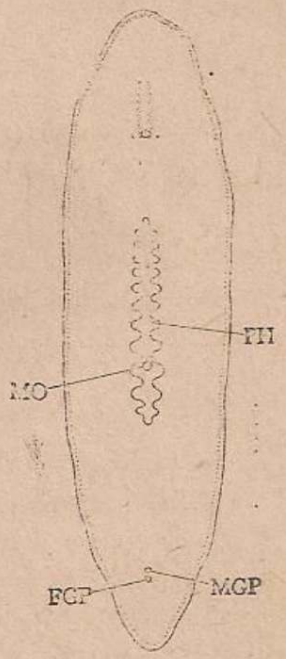


Fig. 11.
Illyplanoides mitsuii gen. et sp. nov.
×3.

totally lacking in this species. The prostate duct opens ventrally into a wide cavity, that is the antrum masculinum. The antrum is lined with columnar cells and their cilia are not so conspicuous than those of the prostate duct; but the nucleus is also much expanded. In the antrum, there is an enormous mass of cyanophilous glands and the secretion is discharged into the antrum masculinum; this secretion is fibrous in nature. Directly behind the male genital pore lies the female pore which through the short vagina externa, passes

Fig. 12. *Ilyplanoides mitsuii* gen. et sp. nov., eye-spots. ×45.

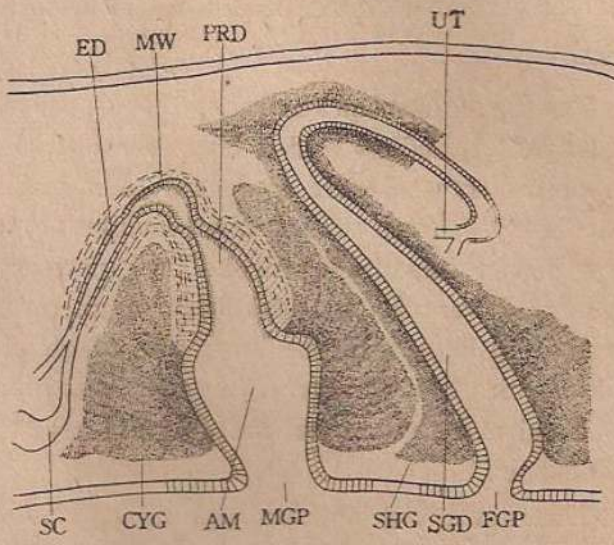


Fig. 13. *Ilyplanoides mitsuii* gen. et sp. nov.; longitudinal section through genital organs. ×70.

into the wide and long shell-gland duct, which takes an antero-dorsal course. On the dorsal side it turns postero-downwards and passes into the short vagina interna. This soon receives the two uteri. There is no Lang's glandular vesicle.

Remarks: This species seems to have a close affinity to *Ilyplana aberrans* Bock in the following points: 1) The arrangement of eyes. 2) The structure of female copulatory apparatus. 3) The lacking of true seminal vesicle. 4) The presence of cyanophilous antral glands. However, this worm has no penial process and has an interpolated prostate duct, while Bock's species has a large penis and free prostate vesicle. Therefore, the present species can not be included not only in the genus *Ilyplana* but in the family *Stylochidae*. Judging from the structure of the copulatory apparatus, it seems to be adequate to place this animal under the family Cryptocelidae, in which it has a special affinity to the genus *Cryptocelis*. The writer proposes to erect a new genus *Ilyplanoides*

for the species in question and he takes pleasure in naming it in honor of Mr. TAKANAGA MITSUI, the founder of the Mitsui Institute of Marine Biology.

Family **Phaenocelidae** STUMMER-TRAUNFELS, 1933

Genus ***Amemiyaia*** mihi

Body slender, of delicate consistency. Without nuchal tentacles. With tentacular and cerebral groups of eyes; marginal eyes along the whole body margin. Pharyngeal sheath is short, rather anteriorly situated. Intestinal branches very sparse. Genital pores widely separated from the posterior body end, and widely apart from each other. With true seminal vesicle and interpolated prostate vesicle. Penis is muscular, armed with hard chitin-like membrane around the whole length. With penis sheath. With distinct vagina bulbosa and Lang's glandular vesicle.

31. ***Amemiyaia pacifica*** gen. et sp. nov.

(Pl. XXVI, figs. 4–6; Text-figs. 14–16)

Description: Two specimens of this planarian were first collected on September 20, 1933 at Susaki, and at the second time a single specimen was obtained on June 23, 1937 at Siroiwazaki, Tomioka; these three individuals were all immature. On May 9, 1937 two more mature specimens were collected at Susaki and the writer had at last the opportunity to study this interesting polyclad.

Body is very slender, measuring about 23–25 mm in length, and less than 4 mm in breadth, thin and delicate in consistency. Color uniformly milky white without any pattern. Marginal eyes arranged in a single row along the whole body margin, more densely distributed in the anterior end of body. There are no tentacles. At the first fifth of body from the anterior end there is a brain, and on either side of it there are tentacular groups of eyes, which are represented by three or four ocelli. Cerebral eyes chiefly distributed in front of the level of the brain, forming two elongate clusters of relatively small number of ocelli. The tentacular eyes are somewhat larger than the cerebral ones.

The epidermis is as high on the dorsal as on the ventral side, containing much rhabdites. The dermal musculature consists on the dorsal side, of an outer single layer of circular muscle fiber, a middle longitudinal and an inner circular muscle layer; on the ventral side, besides those found on the dorsal side, there is an innermost layer of thick longitudinal muscle fibers.

The pharynx is very small and much plicated, being enclosed, as usual, within the pharyngeal sheath which occupies about one-fourteenth of the body length and lies nearly at the first third of body. Mouth situated near the

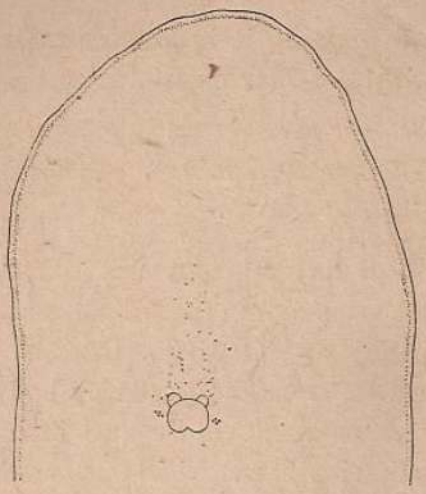


Fig. 14. *Amemiyaia pacifica* gen. et sp. nov.; anterior end of body showing arrangement of eye-spots. ×11.

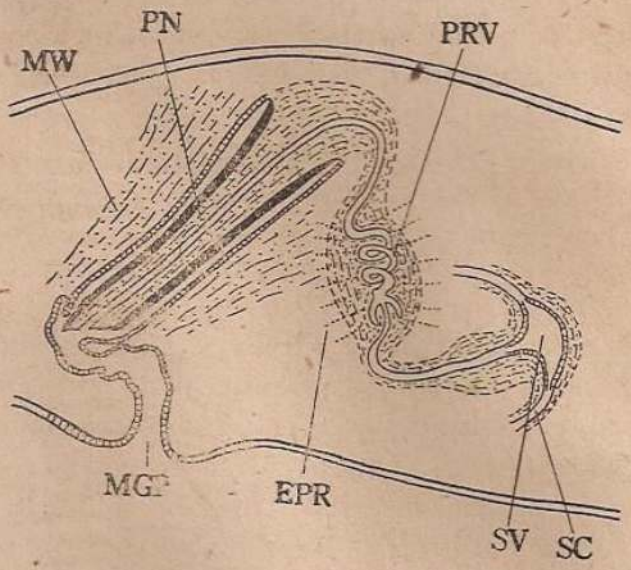


Fig. 15. *Amemiyaia pacifica* gen. et sp. nov.; longitudinal section through male genital organs. ×80.

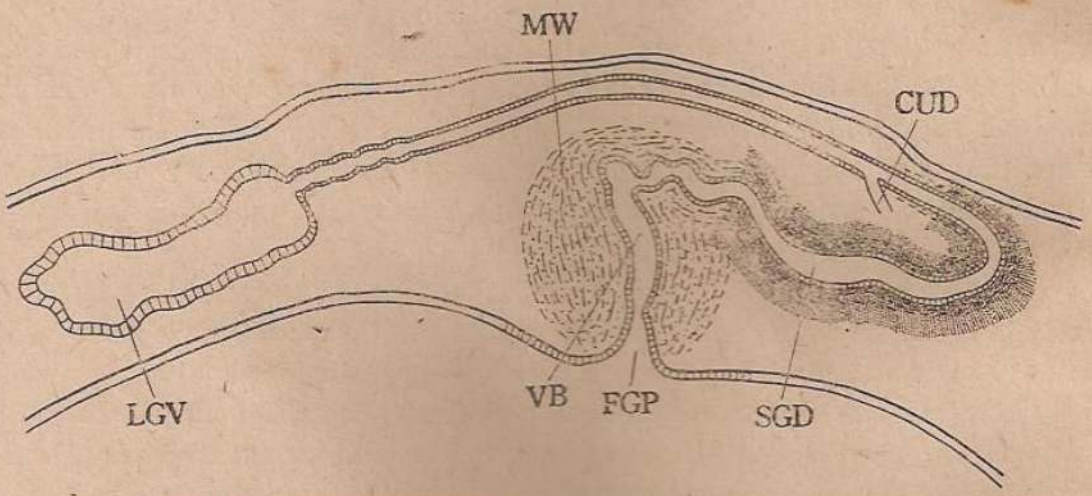


Fig. 16. *Amemiyaia pacifica* gen. et sp. nov.; longitudinal section through female genital organs. ×80.

posterior part of pharyngeal sheath. Main intestine runs along the whole body length and provided with relatively small number of intestinal branches, which make no anastomosing system.

The female genital pore lies a little in front of the last third of body and the male pore nearly in the center of body. The characteristic feature of the male copulatory apparatus is the presence of extremely large penis and the interpolated prostate gland. Penis is cylindrical, thick (0.14 mm in diameter at its base) and long (0.45 mm in length); its length occupies the four-fifth the thickness of body at the level of the penis; it is strongly muscular, surrounded with

a thick, hard, chitin-like membrane of eosinophilous nature. This copulatory organ is disposed slantly in the deep penis pocket and directed posteriorly. Antrum masculinum is rather deep. The seminal vesicle, lying a little behind the penis, is a rather small organ with a muscular wall, and receives the seminal canal on both lateral sides. The prostate vesicle is interpolated between the seminal vesicle and the upper base of penis. The prostate is composed of coiled duct with thin musculature and lined with ciliated cuboidal cells, and is also surrounded with a thick musculature to form an ovoid shape. The ejaculatory duct from the seminal vesicle protrudes a little into the central end of this tubular prostate. The duct makes three or four coils in the muscular bulb. The extracapsular glands of the prostate are well-developed and discharge the secretion into the inner duct. Around the penis sheath the musculature is also well developed.

The female apparatus widely apart from the male pore. The vagina externa is surrounded with a thick musculature to form a vagina bulbosa. The shell gland duct runs anteriad for a long distance and abruptly curves posteriad at the dorsal side and receives a common uterine duct. Lang's glandular vesicle is a large saccular organ and situated slightly behind the level of the female pore and provided with a long efferent duct.

Localities: Susaki near Simoda; Tomioka, Amakusa.

Remarks: This genus was so named in acknowledgement of the help that has been given the writer all during the course of this study by Professor IKUSAKU AMEMIYA, Director of the Mitsui Institute of Marine Biology.

Section SCHEMATOMMATA BOCK, 1913

Family **Leptoplanidae** LANG, 1884 (emend. BOCK, 1913)

Genus ***Stylochoplana*** STIMPSON, 1857 (emend. LANG, 1884)

32. ***Stylochoplana pusilla*** BOCK, 1924

Stylochoplana pusilla, BOCK 1924, p. 1–24, pl. 1, figs. 1–6; text-figs. 1–6; KATO 1934b, p. 124–125; KATO 1939b, p. 144.

Remarks: This species is commonly found in the mantle cavity of *Monodonta labio* LINNÉ, and rarely of *Tegula exanthostigma* (A. ADAMS), *Thais tumulosa clavigera* (KÜSTER). In Asamusi, the animal very often found also in the common limpet, *Cellana toreuma* REEVE. The worm leaves the host at the time of deposition, when it may be collected on the rocks between tidemarks.

Localities: Misaki; Susaki near Simoda; Asamusi; Sugasima, Sima.

33. ***Stylochoplana parasitica*** KATO, 1935

Stylochoplana parasitica, KATO 1935a, p. 123–129, pl. 9, figs. 1–6; text-figs. 1–2.

Locality: Susaki near Simoda, Izu.

34. ***Stylochoplana amica*** KATO, 1937

Stylochoplana amica, KATO 1937a, p. 213–214, pl. 14, figs. 1–3; pl. 15, fig. 9; text-figs. 3, 4.

Remarks: A single specimen found in an aquarium, in which were kept a number of limpets, *Patelloida schrenchii* LISCHKE.

Locality: Susaki near Simoda.

35. ***Stylochoplana clara*** KATO, 1937

Stylochoplana clara, KATO 1937f, p. 357–359, pl. 21, fig. 5; text-figs. 15, 16.

Remarks: Commonly found living on eel grasses, *Zostera* and *Phyllospadix*.

Localities: Misaki; Susaki near Simoda.

36. ***Stylochoplana suoensis*** KATO, 1943

Stylochoplana suoensis, KATO 1943b, p. 70–72, pl. 3, fig. 4; text-figs. 3, 4.

Locality: Suô, Formosa. A single specimen.

37. ***Stylochoplana utinomii*** KATO, 1943

Stylochoplana utinomii, KATO 1943b, p. 72, 73, pl. 3, fig. 2; text-figs. 5, 6.

Locality: Suô, Formosa.

38. ***Stylochoplana taiwanica*** KATO, 1943

Stylochoplana taiwanica, KATO 1943b, p. 70, pl. 3, fig. 3; text-figs. 1, 2.

Locality: Suô, Formosa. A single specimen.

39. ***Stylochoplana aberrans*** sp. nov.

(Pl. XXVII, figs. 5–7; Text-figs. 17–19)

Description: Body oval with rounded anterior and posterior ends; 15 mm long by 10 mm broad, very thin and of a delicate consistency. Tentacles very small, situated at the level of the first fifth of body. Tentacular cluster of eyes consists of 20–30 ocelli; cerebral eyes lie on either side of brain, chiefly in front of it, and divided into two clusters, anterior and posterior ones; frontal eyes are sparsely distributed at the anterior end of body. The arrangement of eyes mentioned above is a unique feature of this species. Dermal musculature is very weakly developed. Pharyngeal sheath centrally situated, occupying nearly one-third of the body length and has many lateral folds. Mouth lies nearly in the center of body. Female genital pore lies at the middle between the hind end of pharyngeal sheath and the posterior extremity of body. Male pore in

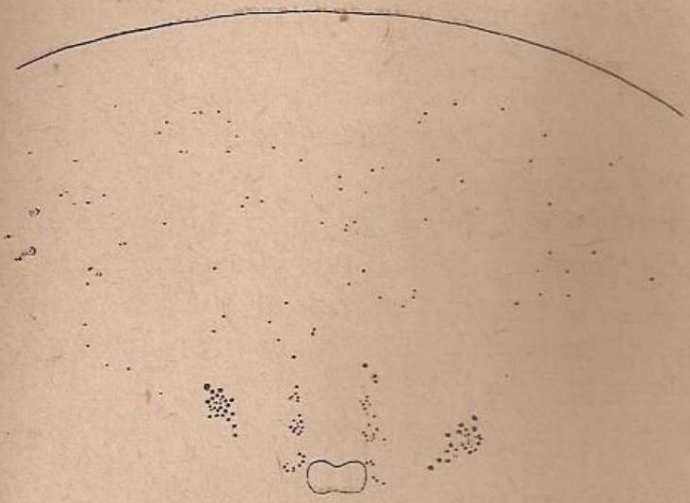


Fig. 17. *Stylochoplana aberrans* sp. nov.; arrangement of eye-spots. ×18.

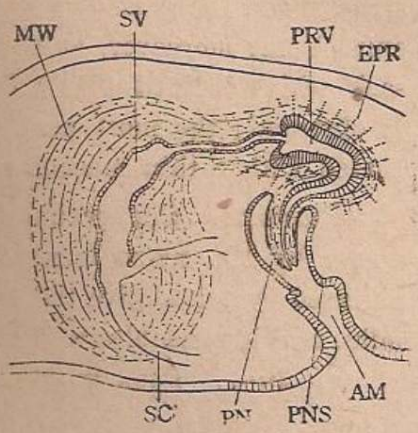


Fig. 18. *Stylochoplana aberrans* sp. nov.; longitudinal section through male genital organs. ×70.

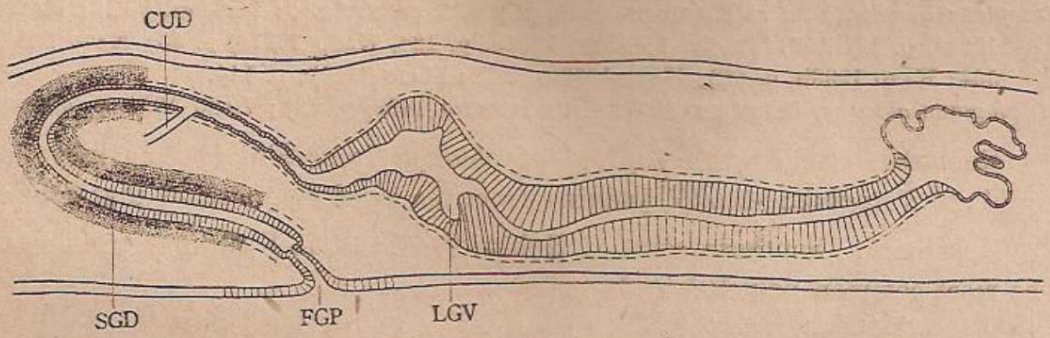


Fig. 19. *Stylochoplana aberrans* sp. nov.; longitudinal section through female genital organs. ×70.

the middle between the hind end of pharyngeal sheath and the female pore. Seminal vesicle dorso-ventrally elongated and provided with a thick muscular coating; it receives at its ventral aspect a pair of seminal canals, and from its dorsal end a narrow duct runs backwards for a short distance to lead into the fairly large prostate vesicle, which is lined with a thick epithelium and provided also with a muscular wall. Extracapsular prostate glands are very well developed. The prostate vesicle tapers gradually towards ventral side and merges into the penis to open at its tip. Penis rather large, muscular, conical in shape and with no stylet; it is surrounded with the penis sheath, which opens outside through a small antrum masculinum. Female pore widely separated from male pore; antrum femininum narrow, but distinct. Shell-gland duct long and curves posteriorly; after receiving the common uterine duct it passes to the moniliform duct of Lang's vesicle. Lang's vesicle has a very characteristic

structure in the present worm. It is extremely long and large, lined with thick epithelium; moreover, at the posterior end it is provided with a much folded sack, which is lined with a flat epithelium and in which a large mass of sperm is observed; the most part of the prostate, except for the posterior sack, is coated with a thin muscular wall.

Remarks: Six specimens of this interesting polyclad were forwarded to the writer by Mr. Reizo Ishiyama. According to him, this planarian attacks the cultured oyster to give them much damage, together with *Stylochus hamanensis* mihi, and it resembles well to the latter species in its external appearance.

Locality: Lake Hamana, Tôtômi.

Genus ***Notoplana*** Laidlaw, 1903

40. ***Notoplana humilis*** (Stimpson, 1857)

Leptoplana humilis, Stimpson 1857, p. 9; Diesing 1862, p. 533; Lang 1884, p. 496.
Notoplana humilis, Yeri et Kaburaki 1918, p. 11–13, pl. 2, fig. 6; text-figs. 9, 10; Kaburaki 1923a, p. 191–192, text-fig. 1; Kato 1934b, p. 124, Kato 1937d, p. 35; Kato 1938a, p. 564; Kato 1938b, p. 582; Kato 1939a, p. 72; Kato 1939b, p. 144.
?*Leptoplana oblonga*, Stimpson 1857, p. 9; Diesing 1862, p. 533; Lang 1884, p. 496.

Remarks: Stimpson's *Leptoplana oblonga* from Simoda, Izu may be referable to *Notoplana humilis*, judging from the brief diagnosis of that species.

Localities: Southern coast of Hokkaidô; Honshû; Kyûshû; Bonin Islands. The most common polyclad in Japan.

41. ***Notoplana delicata*** Yeri et Kaburaki, 1918

Notoplana delicata, Yeri et Kaburaki 1918, p. 13–15, pl. 2, fig. 14; text-figs. 11–13; Kato 1934b, p. 124; Kato 1938a, p. 564; Kato 1938b, p. 582.

Remarks: According to the original writers' description, this species has no penis sheath, but the present author's examination has revealed that in most cases it has a small penis sheath; such a difference is probably due to the state of preservation.

Localities: Sirahama, Awa; Misaki; Susaki near Simoda; Seto; Sugasima, Sima; Tomioka, Amakusa.

42. ***Notoplana japonica*** Kato, 1937

Notoplana japonica, Kato 1937a, p. 215–216, pl. 14, figs. 6, 7; text-figs. 5, 6.

Remarks: Usually found on the under surface of stones embedded rather deeply in the sand at the low tidemark.

Localities: Susaki near Simoda; Misaki.

43. *Notoplana koreana* KATO, 1937

Notoplana koreana, KATO 1937b, p. 234–235, pl. 16, figs. 3, 4; text-figs. 2, 3; KATO 1939a, p. 72, text-fig. 10.

Localities: Gunzan, Korea; Isihama, Mamakohama near Onagawa, Rikuzen.

44. *Notoplana septentrionalis* KATO, 1937

Notoplana septentrionalis, KATO 1937e, p. 127–129, pl. 8, figs. 4–6; text-figs. 5, 6.

Locality: Muroran, Hokkaidô.

45. *Notoplana serica* KATO, 1938

Notoplana serica, KATO 1938a, p. 564–565, pl. 37, figs. 1–3; text-figs. 7, 8.

Locality: Tomioka, Amakusa. A single specimen.

46. *Notoplana libera* KATO, 1939

Notoplana libera, KATO 1939a, p. 68–70, pl. 4, figs. 3, 4; text-figs. 4–6.

Locality: Takenoura near Onagawa. Two specimens.

47. *Notoplana sophia* KATO, 1939

Notoplana sophia, KATO 1939a, p. 70–72, pl. 3, fig. 5; pl. 4, fig. 5; text-figs. 7–9.

Remarks: This species was first described on two specimens from Onagawa, and afterwards two more examples were collected by the writer in Akkeshi, Hokkaidô.

Localities: Konorihama, Onagawa, found on the wooden floats of a gill-net; Akkeshi, under stones between tidemarks.

48. *Notoplana palaoensis* KATO, 1943

1943c *Notoplana palaoensis*, KATO 1349c, p. 81–83, pl. 4, figs. 4, 5; text-figs. 4, 5.

Locality: Tokobei, Palao. A single specimen.

Genus *Discoplana* BOCK, 1913

49. *Discoplana gigas* (SCHMARDA, 1859)

Leptoplana gigas, SCHMARDA 1859, p. 17, pl. 3, fig. 36; Lang 1884, p. 508.
Centrostomum gigas, DIESING 1862, p. 544.
Discoplana gigas, STUMMER-TRAUNFELS 1933, p. 3492–2394, text-figs. 9, 10.
Leptoplana subviridis, PLEHN 1896c, p. 330–331, pl. 23, figs. 11, 12; LAIDLAW 1903d, p. 15; LAIDLAW 1903f, p. 580; MEIXHER 1907a, p. 168; MEIXNER 1907b, p. 457–460, pl. 26, fig. 5; pl. 28, fig. 6; pl. 29, figs. 5–7.
Discoplana subviridis, BOCK 1913, p. 220–221, pl. 3, figs. 17, 18.

Leptoplana pardalis, LAIDLAW 1902, p. 287–289, pl. 14, fig. 9; pl. 15, fig. 14; text-fig. 63; LAIDLAW 1903a, p. 7.
Susakia badiomaculata, KATO 1934b, p. 125–127, pl. 1, fig. 4; text-figs. 1, 2.

Remarks: In 1934, the present writer described *Susakia badiomaculata* gen. et sp. nov. from Japan, but further study on that specimen has shown that the worm from Japan is quite identical with *Discoplana gigas,* which has a wide distribution in the Pacific and Indian Oceans.

Distribution: Molucca; Goidu, Goifurfehendu Atoll, Minikoi, Laccadive Islands; Somaliland, East Africa; Kupang, Timor; Ceylon; Funafuti, Ellis Islands; Susaki near Simoda, Izu, Japan.

50. ***Discoplana takewakii*** KATO, 1935

Discoplana takewakii, KATO 1935b, p. 149–157, pl. 10, figs. 1–5; text-figs. 1, 2; KATO 1938b, p. 582.

Remarks: This species harbors in the genital bursa of *Ophioplocus japonicus* H. L. CLARK and deposits eggs in it.

Localities: Susaki near Simoda; Misaki; Seto, Kii.

51. ***Discoplana longipenis*** KATO, 1943

Discoplana longipenis, KATO 1943c, p. 83, 84, pl. 4, fig. 3; text-figs. 5–7.

Locality: Ngatmel, Palao. A single specimen.

Genus ***Zygantroplana*** LAIDLAW, 1906

52. ***Zygantroplana clepeasta*** sp. nov.

(Pl. XXVII, fig. 1; Text-figs. 20, 21)

Description: Body elongated, 8 mm in length and 2.3 mm in breadth. Color in life is milky white with a faint touch of brown. Without tentacles. A little behind the level of the first sixth of body lies the brain. Numerous eyes irregularly scattered at the anterior end of body, and the tentacular and cerebral groups are not totally discernible. There are no marginal eyes. Hence the arrangement of eyes in this animal is somewhat similar to that of *Cestoplana.* The epidermis is higher on the dorsal side than on the ventral. Dorsal dermal musculature consists of an outer single row of circular muscle fiber, a middle thick longitudinal layer and an inner transverse layer. Ventral musculature consists of an outer single transverse layer, a middle longitudinal, an inner transverse layer and an innermost longitudinal layer. Pharynx very short and plicated and directly behind the brain, occupying one-seventh of body length. Mouth lies in the anterior part of pharyngeal chamber. Main intestine extends near the posterior end of body and provided with many lateral branches. There

are observed a large number of blackish brown pigment granules on the dorsal side of the intestinal epithelium.

Common genital pore lies at the posterior end of body in the ventral side. Antrum masculinum is very narrow and deep, disposed horizontally. Penis is small, slender and provided with a long stylet. Seminal canals, full of spermatozoa, runs on the ventral side of each lateral side of body and in the posterior part of body unite into a single duct and directly expands into a small seminal vesicle of muscular coating. The duct from the posterior end of seminal vesicle

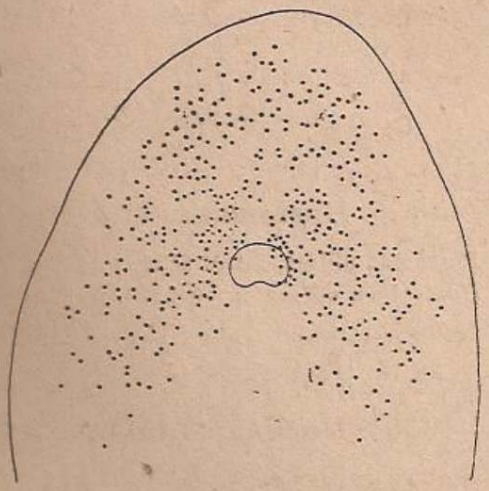


Fig. 20. *Zygantroplana clepeasta* sp. nov.; anterior end of body showing arrangement of eye-spots. ×22.

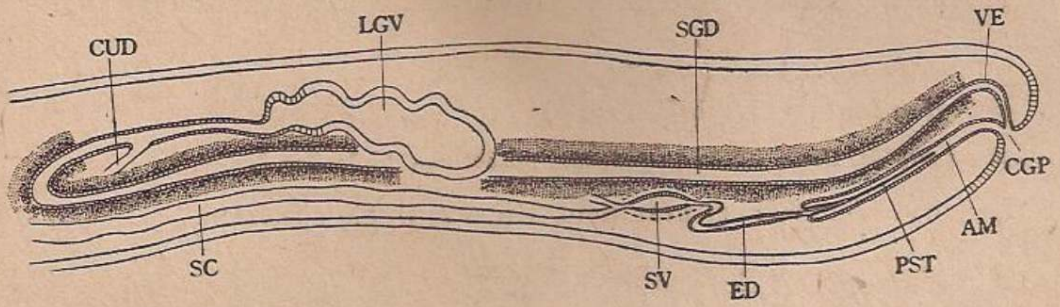


Fig. 21. *Zygantroplana clepeasta* sp. nov.; longitudinal section through genital organs. ×55.

runs posteriad taking a sinuous course at the base of the penis and opens at its tip. Thus the animal has no separate prostate vesicle, but the duct from the seminal vesicle is lined with glandular ciliated cells and it plays a function of prostatic character. The vagina opens at the dorsal side of the male antrum into the common genital pore and runs anteriorly as far as a little behind the level of the last fourth of body, and there, abruptly turn posteriad. After receiving the common uterine duct the vagina passes into the duct of Lang's glandular vesicle. This vesicle is very large, expanded much horizontally and slightly folded; it contains a mass of spermatozoa. Shell-glands open throughout the most part of vagina.

Remarks: Two specimens of this interesting species were found on *Clepeaster japonicus* DÖDERLEIN by Dr. K. TAKEWAKI in the summer of 1938. One specimen was wholly injured at the time of collection and a single specimen was placed under the writer's study.

Locality: Misaki.

Family **Hoploplanidae** Stummer-Traunfels, 1933

Genus ***Hoploplana*** Laidlaw, 1902

53. ***Hoploplana villosa*** (Lang, 1884)

Planocera villosa, Lang 1884, p. 441–442, pl. 1, fig. 2; pl. 10, fig. 10; pl. 30, fig. 16.
Hoploplana villosa, Bock 1913, p. 225; Kato 1937a, p. 216–218, pl. 10, fig. 10; text-figs. 7, 8.

Distribution: Naples, Nisida Island near Naples; Susaki near Simoda, Izu, Japan. In Naples the worm found to be associated with *Ciona intestinalis* Linné; in Japan, it is usually found on a bryozoa, *Microporella ciliata* (Pallas).

54. ***Hoploplana ornata*** Yeri et Kaburaki, 1918

Hoploplana ornata, Yeri et Kaburaki 1918, p. 15–17, pl. 2, fig. 7; text-figs. 14–16; Bock 1924, p. 22; Kato 1938a, p. 565.

Localities: Misaki; Simonoseki; Tomioka, Amakusa; Wagura, Sarusima, Noto.

55. ***Hoploplana cupida*** Kato, 1938

Hoploplana cupida, Kato 1938b, p. 582–584, pl. 30, figs. 5, 6; text-figs. 7, 8.

Locality: Tunasirazu near Seto, Kii. A single specimen.

56. ***Hoploplana deanna*** Kato, 1939

Hoploplana deanna, Kato 1939b, p. 144–146, pl. 8, figs. 3, 4; text-figs. 3, 4.

Locality: Aburakawa near Asamusi. A single specimen from a depth of 10 m.

57. ***Hoploplana schizoporellae*** sp. nov.

(Pl. XXVII, fig. 4; Text-figs. 22, 23)

Description: Body almost circular or slightly elliptical, of a fairly firm consistency, measuring 1.5–2 mm long. Color dark orange-red like the color of the host; this coloration is chiefly due to intestinal contents; body margin colorless. Tentacles white in color, thick and long, contractile into its deep sheath, lying at the level of the anterior third of body. A certain number of eyes arranged around the tentacular sheath and some occur on either side of the brain which situated a little behind the level of tentacles. Epidermis slightly thicker on the dorsal side than on the ventral, and contains a large number of spindle shaped rhabdites and fine secretion granules. Dorsal epidermis protrudes outwards to make a large number of slight knobs, the epithelium of each knob

lacking rhabdites as in *Hoploplana villosa* and *papillosa*. The dermal musculature very poorly developed probably owing to its parasitic life. Mouth lies slightly anterior to the middle of body, leading into plicated pharynx with many lateral lobes. Pharynx very large in proportion to the size of body, occupying more than one-third of body length. The general plan of copulatory apparatus is similar to that of other species of this genus. Antrum masculinum wide and deep, and its epithelium much folded; prostate vesicle, penial stylet, antrum masculinum, all are surrounded with a thick muscular coating.

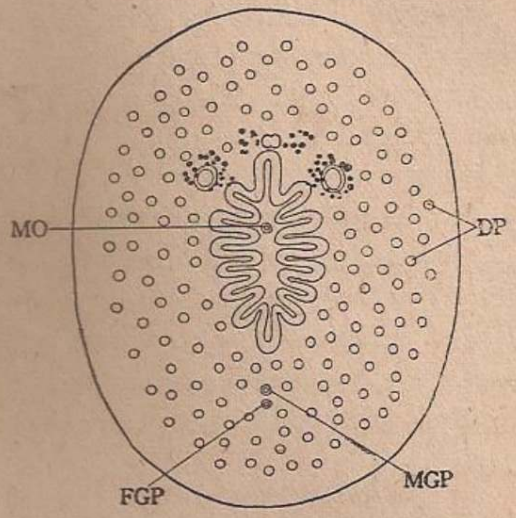


Fig. 22. *Hoploplana schizoporellae* sp. nov. ×33.

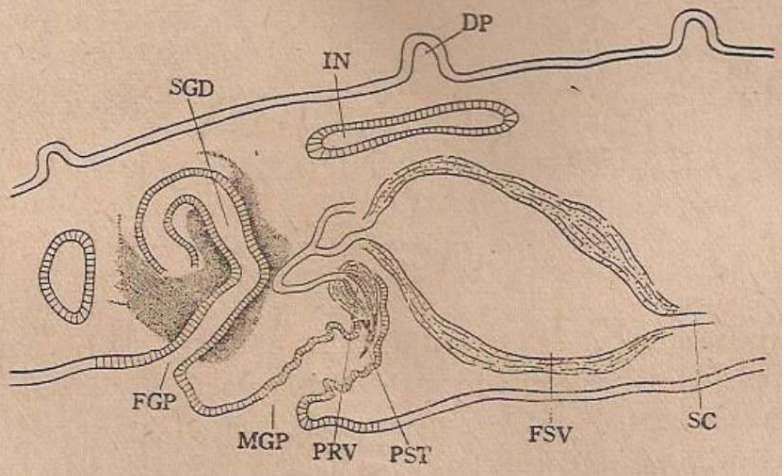


Fig. 23. *Hoploplana schizoporellae* sp. nov.; longitudinal section through genital organs. ×150.

Remarks: HALLEZ (1893, p. 156) described *Leptoplana schizoporellae* from Portel, English Channel, but as he gives no anatomical description of the worm, its systematic position is quite uncertain.

Locality: Sarusima, Note. Found on *Schizoporella oenochros* ORTMANN, very common.

58. ***Hoploplana rubra*** sp. nov. (Text-figs. 24, 25)

Description: Body oval, 7 mm long. Ground color milky white with a faint touch of red, over which are scattered numerous white dots, and body

margin yellow; intestinal branches red. Long conical tentacles situated at the level of the first fourth of body and yellow in color. The arrangement of eyes is illustrated in the text-figure. On the whole dorsal surface there are numerous small tubercles. Both the dorsal and the ventral epidermis consist of cubical cells with rounded free surface and contain much cyanophilous secretion except the epithelial cells on the tubercles; there is no typical rhabdites. The inside of tubercle is filled with parenchyma which is separated by the basal membrane from the body parenchyma; in some tubercles there is observed cyanophilous section which is conveyed from the glands embedded deeply in the dorsal parenchyma and seems to pour out near the tip of the tubercles. Mouth lies at the first third of body; pharynx large.

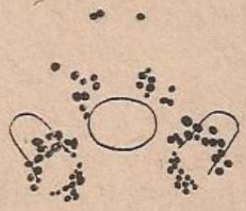


Fig. 24. *Hoploplana rubra* sp. nov.; eye-spots. ×35.

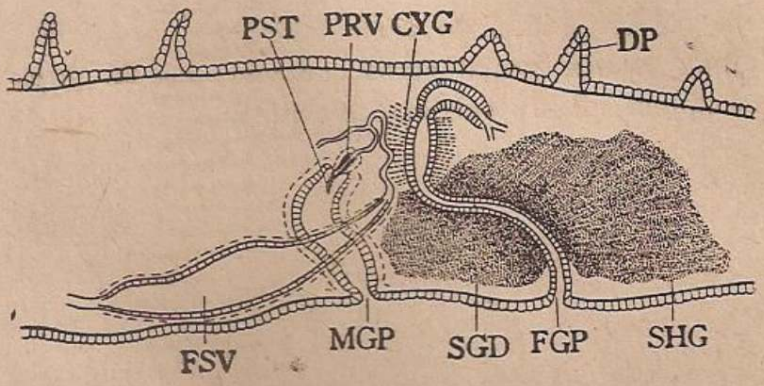


Fig. 25. *Hoploplana rubra* sp. nov.; longitudinal section through genital organs. ×45.

Genital pores situated near the last third of body. False seminal vesicle large and elongated very much; prostate vesicle small, pyriform; penis represented by a small curved stylet; antrum masculinum deep. Shell-gland duct short, supplied with much deeply eosinophilous secretion granules and dorsally continues to a wide pouch, into which is discharged a large quantity of cyanophilous secretion. This pouch dorsally passes into the common uterine duct which receives from posteriad two uteri. The existence of cyanophilous secretion pouch or duct is the unique feature in all *Hoploplana* species.

Locality: Sugasima, Sima. Two specimens collected by the writer on June, 1935 from under-surface of stone in low tidemark.

Family **Planoceridae** Lang, 1884 (emend. Bock, 1913)

Genus ***Planocera*** Blainville, 1828

59. ***Planocera pellucida*** (Mertens, 1832)

Planaria pellucida, Mertens 1832, p. 8–13, pl. 2.

Stylochus pellucidus, EHRENBERG 1836, p. 67; DIESING 1850, p. 216; CLAPARÈDE 1861, p. 75.
Gnesioceros pellucidus, DIESING 1862, p. 571.
Planocera pellucida, OERSTED 1844, p. 48; Challenger Expedition, Narrative 1, p. 136; LANG 1884, p. 437; GRAFF 1892, p. 197–201, pl. 7, figs. 1–6; WOODWORTH 1894, p. 49–50; PLEHN 1896a, p. 170–171; PLEHN 1896b, p. 11–12, pl.: fig. 8; BÖHMIG 1896, p. 840; LAIDLAW 1903c, p. 102; LAIDLAW 1904a, p. 1; BOCK 1913, p. 240–244, text-fig. 49; BOCK 1923, p. 357–358; BOCK 1931, p. 277–278; KATO 1938c, p. 231–233, text-figs. 1–3.
Planocera gaimardi, BLAINVILLE 1828, Tom. 57, p. 578–579, pl. 40, fig. 18; LANG 1884, p. 436.
Planaria velellae, LESSON 1830, p. 453–454; LANG 1884, p. 607.
Planaria oceanica, DARWIN 1844, p. 246–247, pl. 5, fig. 1; LANG 1884, p. 608.
Stylochoplana tenera, STIMPSON 1857, p. 67; LANG 1884, p. 461; BOCK 1913, p. 223.

Distribution: Off Susaki near Simoda, Izu (a single specimen). Holopelagic species. Very common in Pacific, Atlantic and Indian Oceans, between 42°N. and 54°42′S.

60. ***Planocera reticulata*** (STIMPSON, 1855)
(Pl. XXVIII, figs. 6, 7; Text-fig. 26)

Stylochus reticulatus, STIMPSON 1855, p. 381; DIESING 1862, p. 569.
Stylochoplana reticulata, STIMPSON 1857, p. 11.
Planocera reticulata, LANG 1884, p. 445; YERI et KABURAKI 1918, p. 19–22, pl. 1, fig. 4; text-figs. 20–22; KATO 1934b, p. 127; KATO 1937b, p. 235; KATO 1938a, p. 565; KATO 1938b, p. 584; KATO 1939b, p. 146.

Localities: Loochoo; Misaki; Susaki near Simoda; Seto; Asamusi; Tomioka, Amakusa; Ha-niu, Sado Island; Saisyu Island, Korea; Bonin Islands. The most common polyclad in Japanese waters.

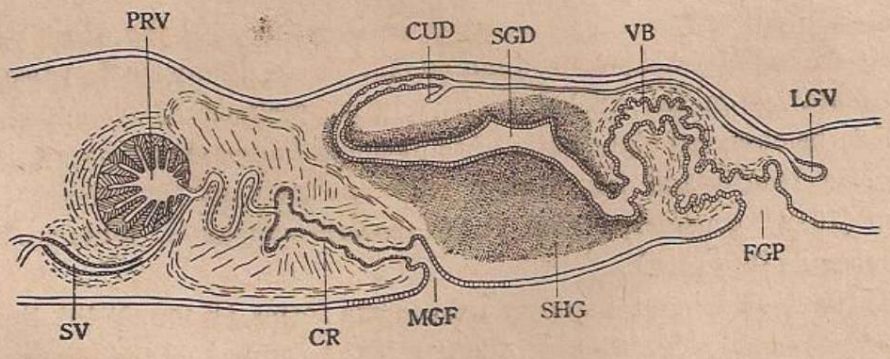


Fig. 26. *Planocera reticulata*; longitudinal section through genital organs. ×11.

61. ***Planocera purpurea*** YERI et KABURAKI, 1918 (Text-fig. 27)

Planocera purpurea, YERI et KABURAKI 1918, p. 22–23, pl. 1, fig. 7; text-fig. 23; KATO 1937a, p. 220.

Description: Body oval, 20–25 mm long by 13–18 mm broad. Dorsal sur-

face dark purplish, darker in the median parts. Tentacles conical, of the same color as body, situated on a clear spot at the hind end of the first quarter of body. In structural respects this species closely resembles *Planocera reticulata*, but it is distinguished from the other by the larger size of seminal vesicle and relatively close approximity of two genital pores; in externally the two species are easily distinguished from each other by the different coloration.

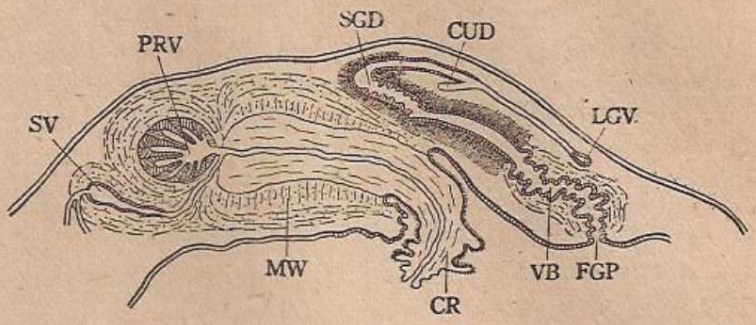


Fig. 27. *Planocera purpurea*; longitudinal section through genital organs. ×22.

Localities: Misaki; Sirahama, Awa; Susaki near Simoda.

62. ***Planocera profunda*** Kato, 1937

Planocera profunda, Kato 1937f, p. 359–360, pl. 21, figs. 6, 7; text-figs. 17, 18.

Locality: Misaki, from 32–36 m deep.

63. ***Planocera multitentaculata*** sp. nov.
(Pl. XXVIII, figs. 1–5; Text-fig. 28)

Description: In external aspects this species closely resembles *Planocera reticulata*. In Misaki and in several other localities on the Pacific coast of Japan, the animal is usually more than 50 mm long, and always has two or more pairs of tentacles on the nuchal region; in a specimen of 90 mm long there happened to be observed eight pairs of tentacles. *Planocera reticulata* is usually 10–50 mm in length and has always only one pair of tentacles. Yeri and Kaburaki (1918) considered that in *Planocera reticulata*, tentacles increase their number as its growth.

After the developmental study on these two forms (Kato, 1940) the present writer found remarkable differences between the cources of their development; namely, *P. multitentaculata* develops as the typical Müller's larva, while the other species develops as "Intracapsular Müller's larva". Moreover, the arrangement of egg-shell in egg-plate is also different each other, and the diameter of egg measures 310–330μ in *multitentaculata*, and 170–185μ in *reticulata*. After the close comparative study on genital organs, the writer found several features mentioned below distinguishing these two species: 1) In *reticulata* the small antrum continues directly to cirrus cavity, the inner surface of which is lined

with bristles. In *multitentaculata* the antrum continues to rather long duct, where bristles are absent. 2) Around the female genital pore, there are many epidermal folds in *multitentaculata*, while in *reticulata* they are wanting. 3) Shell gland duct takes a strongly dorsal position and accordingly the distribution of shell-glands are also dorsally in *multitentaculata*, but in the other species, the duct and glands occupy rather ventral position. 4) In fully grown large specimens of *multitentaculata*, the vagina bulbosa extremely developed as shown in photograph (pl. XXVIII, fig. 3), and lined with spines which are longer in distal part of vagina bulbosa and very low in proximal part; this is a somewhat similar fact as observed in *Planocera gilchristi* and *P. uncinata*. In these respects the two species in question are clearly separated from each other.

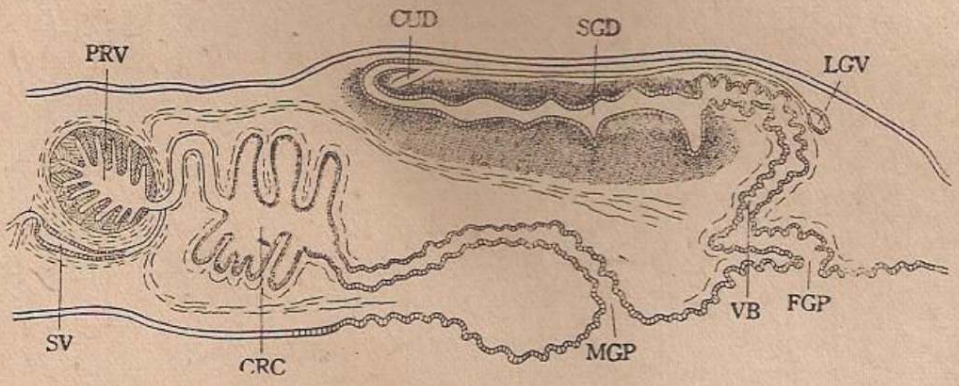


Fig. 28. *Planocera multitentaculata* sp. nov.; longitudinal section through genital organs. ×11.

In a few specimens of *Planocera* collected by Mr. K. KIKUCHI at Ha-niu, Sado Island, the writer found a single specimen of *multitentaculata* which is only 20 mm long and has three pairs of tentacles.

Localities: Asamusi; Misaki; Susaki near Simoda; Sugasima, Sima; Seto; Tomioka, Amakusa; Sado Island. Usually found together with *Planocera reticulata*.

64. ***Planocera heda*** sp. nov. (Text-figs. 29, 30)

Description: Shape of body is a usual *Planocera* type, about 30 mm in length; body margin slightly frilled. Ground color of body milky white, over which scattered a large number of light red spots. Cirrus much folded and lined with small spines; prostate vesicle spherical and rather large; seminal vesicle small; ejaculatory duct much tortuous; very large vagina bulbosa, tapering towards its anterior part, makes a downward, sinuous course to be continuous with shell-gland duct. The inner epithelium of vagina bulbosa has an appearance of chitin-like membrane. The shell-gland duct very narrow, supplied much shell

secretion throughout its course. Lang's vesicle spherical and small, lying near the level of female genital pore; the duct of Lang's vesicle very long.

Locality: Heda, Izu. A single specimen dredged in the Bay of Heda by the Sanken Maru of the Mitsui Institute of Marine Biology in the autumn of 1937.

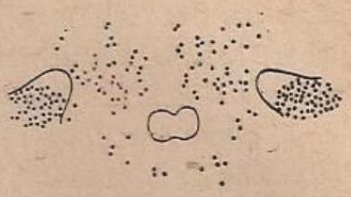


Fig. 29.
Planocera heda sp. nov.; eye-spots. ×11.

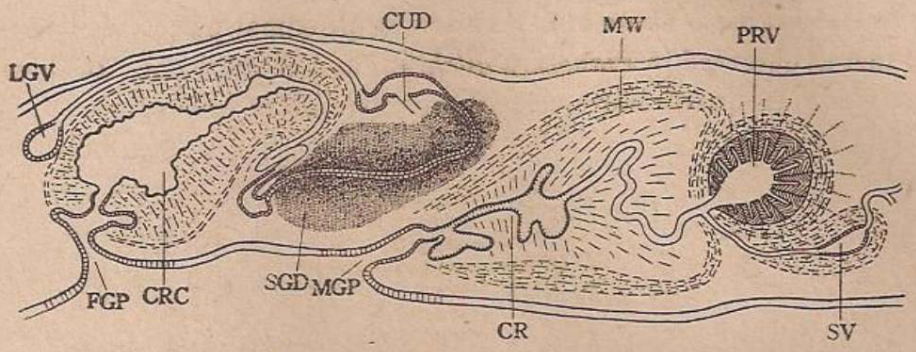


Fig. 30. *Planocera heda* sp. nov.; longitudinal section through genital organs. ×17.

Genus ***Paraplanocera*** Laidlaw, 1903

65. ***Paraplanocera oligoglena*** (Schmarda, 1859)

Stylochus oligoglenus, Schmarda 1859, p. 34, pl. 7, fig. 77; 1 text-fig.; Diesing 1862, p. 567.
Planocera oligoglena, Lang 1884, p. 444.
Paraplanocera oligoglena, Stummer-Traunfels 1933, p. 3552–3556, text-figs. 122–125; Kato 1943b, p. 73, 74.
Stylochus amphibolus, Schmarda 1859, p. 34, pl. 7, figs. 7, 8; 1 text-fig.; Diesing 1862, p. 566.
Planocera amphibola, Lang 1884, p. 444.
Planocera discus, Willey 1897, p. 155–157, text-fig. 7.
Paraplanocera discus, Bock 1913, p. 246.
Planocera langi, Laidlaw 1902, p. 286–287, pl. 14, fig. 1; pl. 15, fig. 13; text-fig. 62.
Paraplanocera langi, Laidlaw 1903a, p. 4; Bock 1913, p. 246.
Paraplanocera rotumanensis, Laidlaw 1903a, p. 4–7; Bock 1913, p. 246.
Paraplanocera laidlawi, Jacubowa 1906l, p. 3–9, pl. 1, figs. 1–9; pl. 5, figs. 1, 2.
Paraplanocera misakiensis, Yeri et Kaburaki 1918, p. 22–25, pl. 2, fig. 5; text-figs. 24–26; Kato 1936b, p. 21–29, text-figs. 1–5.
Paraplanocera marginata, Meyer 1922, p. 139–145, pl. 1, figs. 1–8; text-figs. 1–3.

Distribution: Minikoi, Maldive Islands; Rotuma, Fiji Islands; Trincomalee, Ceylon; Blanche Bay, New Britain; Isle of Pine, New Caledonia; Koseir, Red Sea; Misaki; Susaki near Simoda; Suô, Formosa.

66. ***Paraplanocera rubrofasciata*** Kato, 1937

Paraplanocera rubrifasciata, Kato 1937f, p. 360–362, pl. 21, figs. 1–4; text-figs. 19, 20

Remarks: As to the coloration, this species somewhat resembles *Paraplanocera aurora*, but the internal anatomy of the latter species has been very poorly known, so that, the writer prefers to regard this form as a separate species for the present.

Locality: Misaki. A single specimen from a depth of 27 m.

Genus ***Neoplanocera*** YERI et KABURAKI, 1918

67. ***Neoplanocera elongata*** YERI et KABURAKI, 1918

Neoplanocera elongata, YERI et KABURAKI 1918, p. 17–19, pl. 2, fig. 4; text-figs. 17–19; KATO 1937a, p. 220–223, pl. 14, fig. 8; text-fig. 11–15.

Localities: Sirahama, Sunosaki, Awa; Susaki near Simoda.

Family **Apidioplanidae** BOCK, 1926

Genus ***Apidioplana*** BOCK, 1926

68. ***Apidioplana okadai*** sp. nov. (Pl. XXIX, figs. 5, 6; Text-figs. 31, 32)

Description: Body in life broadly elongated with round anterior and posterior ends and of a fairly firm consistency. 4–5 mm long by 1.3–1.5 mm broad. Color orange red, due to the minute pigment granules under dorsal epidermis. Brain lies at the anterior end of the first seventh of body. Near the level of brain situated a pair of rudimentary tentacles, the existence of which being only detected in sections by the total lacking of rhabdites in the epidermis. At the base of tentacular knobs lie two tentacular ocelli; on either side of brain are four cerebral ocelli, two of them are the ventral eyes; tentacular ocellus is larger in size than cerebral one. Mouth stiuated near the anterior end of body, immediately behind brain and leads into pharyngeal sheath at its anterior part. Pharynx short, cylindrical. Main intestine runs along the median line as far as the level of copulaytory apparatus and provided with numerous lateral branches which form a network; there is an anterior median branch of intestine. Seminal canals unite into a single duct which immediately opens into a large elongated seminal vesicle; the latter passes into a cylindrical prostate vesicle by a narrow slit-like pore; both the seminal and the prostate vesicle coated by a thick muscular wall. The anterior end of prostate vesicle tapers gradually to form the ejaculatory duct which merges into cylindrical penis; penis without stylet and disposed horizontally in antrum masculinum;

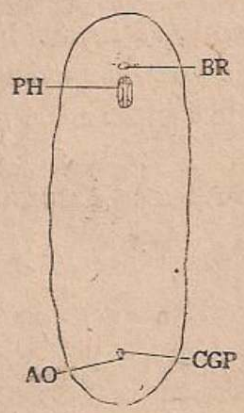


Fig. 31. *Apidioplana okadai* sp. nov. ×9.

antrum opens ventrally together with vagina by a common genital pore at the level of the last seventh of body.

Wide shell-gland duct proceeds anteriad over the male copulatory organs and near the middle of seminal vesicle, it abruptly turns backwards and at the level of the base of penis passes into vagina interna which receives from postero-ventrad two uteri, which extend to the level of pharynx. Without Lang's vesicle.

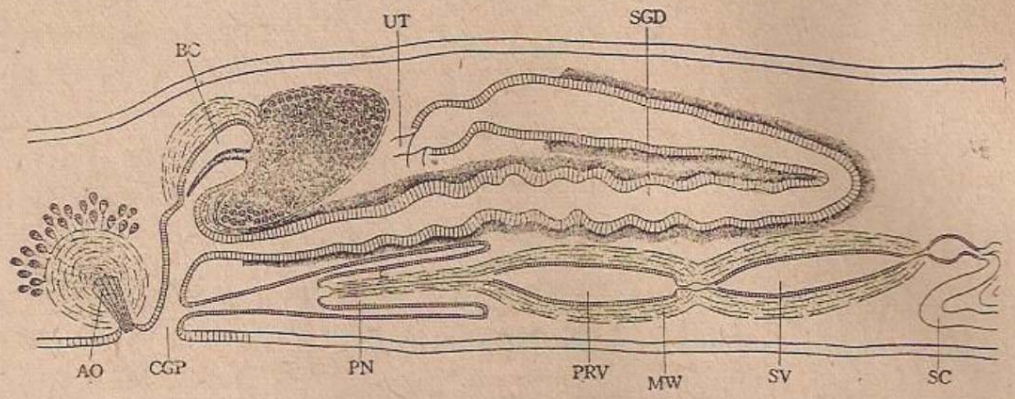


Fig. 32. *Apidioplana okadai* sp. nov.; longitudinal section through genital organs. ×90.

The upper part of vagina externa forms a muscular bulsa copulatrix; closely attached to the anterior side of bulsa copulatrix is situated a large special gland vesicle; this vesicle is provided, as its defferent duct, with a sharply pointed, curved stylet which projects into bulsa copulatrix. The gland vesicle is filled with an abundance of secretory cells; the most of them have each a nucleus in one side and is filled with faintly eosinophilous secretion granules; the cells in process of forming secretion granules have vacuolated cytoplasma and highly expanded nucleus in its center. The present species has only a single apioid organ which is situated directly behind the genital pore; that organ provided with, as in *Apidioplana mira,* a protrusile hard mouth piece, a muscular wall and extracapsular glands; in this species the muscular wall is extremely thicker than in *A. mira.*

Locality: Simoda, Izu. Found on *Melitodes flabellifera* Kückenthal by Professor Yaichiro Okada on August, 1937.

Family **Diplosolenidae** Bock, 1913

Genus ***Callioplana*** Stimpson, 1857

69. ***Callioplana marginata*** Stimpson, 1857 (Text-fig. 33)

Callioplana marginata, Stimpson 1857, p. 11; Yeri et Kaburaki 1918, p. 32–34, pl. 1, fig. 1; text-figs. 35–37; Stummer-Traunfels 1933, p. 3558–3561, text-figs. 129–132; Kato 1934b, p. 217; Kato 1938b, p. 584.

Stylochus marginatus, DIESING 1862, p. 569; MEIXNER 1907, p. 103.
Planocera? marginata, LANG 1884, p. 445.
Stylochus oxyceraeus, SCHMARDA 1859, p. 35, pl. 8, fig. 80; 1 text-fig.; DIESING 1862, p. 567.
Planocera oxyceraeus, LANG 1884, p. 445.
Diplosolenia johnstoni, HASWELL 1907, p. 469–471, pl. 36, figs. 1, 2; BOCK 1913, p. 248.

Description: Body oval, leaf-like, with frilled margin and a dorsal median ridge. 50 mm long by 30 mm broad in large specimen. Color of dorsal surface velvety black, bordered all around with a narrow band of tawny brown just inside the colorless margin. Tentacles conical, orange colored in the distal end

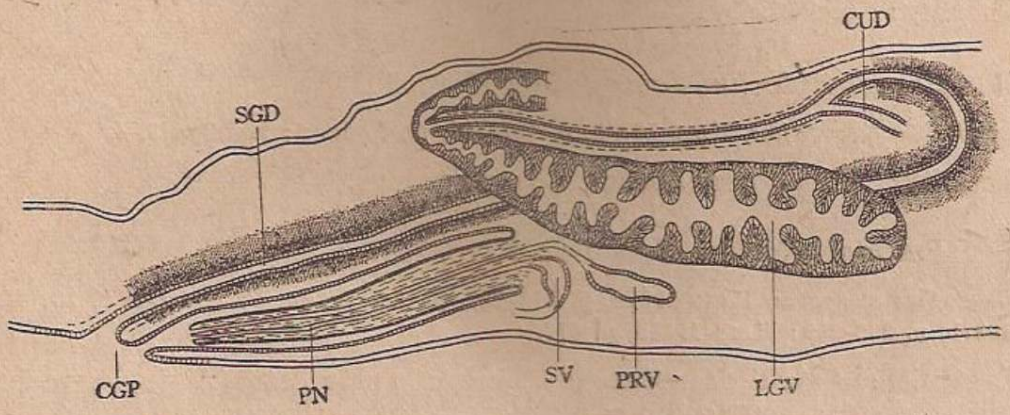


Fig. 33. *Callioplana marginata*; longitudinal section through genital organs. ×18.

and colorless in the basal part, lying about the hind border of the first fifth of body. Mouth nearly in the center of body. Main intestine provided with about seven pairs of lateral branches, the final branchlets of which but rarely anastomose. Genital pores lie at the anterior end of the last fifth of body. Lang's vesicle is paired, each consisting of elongated large saccular body, lined internally with a villus-like epithelium; the latter tissue consists of very elongate cells filled with fine granular secretion; a large mass of spermatozoa is often observed in Lang's vesicle.

Localities: Amami-Ousima; Misaki, Sunosaki; Susaki near Simoda; Seto; Trincomalee, Ceylon; South-east Australia.

Genus ***Pseudostylochus*** YERI et KABURAKI, 1918

70. ***Pseudostylochus obscurus*** (STIMPSON, 1857)

Stylochus obscurus, STIMPSON 1857, p. 11; DIESING 1862, p. 566; LANG 1884, p. 464.
Pseudostylochus obscurus, YERI et KABURAKI 1918, p. 30–31, pl. 1, fig. 10; text-figs. 33–34; KATO 1934b, p. 128; KATO 1938a, p. 565; KATO 1938b, p. 584; KATO 1938a, p. 74.

Localities: Onagawa; Misaki; Susaki near Simoda; Tôsima near Seto; Oniike near Tomioka; Mera, Awa.

71. *Pseudostylochus takeshitai* YERI et KABURAKI, 1918

Pseudostylochus takeshitai, YERI et KABURAKI 1918, p. 26–28, pl. 2, fig. 11; text-figs. 27–29; KATO 1939a, p. 74–75, pl. 3, fig. 6; text-figs. 13–14; KATO 1939b, p. 148.

Localities: Matuwa near Misaki; Konorihama, Onagawa, Rikuzen; Gomisima near Asamusi.

72. *Pseudostylochus fulvus* YERI et KABURAKI, 1918

Pseudostylochus fulvus, YERI et KABURAKI 1918, p. 28–29, pl. 2, fig. 10; text-fig. 30–32.

Locality: Misaki.

73. *Pseudostylochus fuscoviridis* KATO, 1934

Pseudostylochus fuscoviridis, KATO 1934b, p. 127–128, pl. 1, fig. 2; text-figs. 3, 4.

Locality: Susaki near Simoda. Very common.

74. *Pseudostylochus elongatus* KATO, 1937

Pseudostylochus elongatus, KATO 1937a, p. 218–220, pl. 14, figs. 4, 5; text-figs. 9, 10; KATO 1937b, p. 238–239; KATO 1938b, p. 577.[1)]

Localities: Susaki near Simoda; Kitahama near Seto (A single specimen was collected on May 4, 1928); Huzan, Korea; Sugasima, Sima.

75. *Pseudostylochus okudai* KATO, 1937

Pseudostylochus okudai, KATO 1937b, p. 236–237, pl. 16, fig. 6; text-figs. 4, 5; KATO 1937e, p. 130, pl. 8, fig. 8.

Localities: Zinsen, Korea; Usu Bay near Muroran, Hokkaidô.

76. *Pseudostylochus longipenis* KATO, 1937

Pseudostylochus longipenis, KATO 1937b, p. 237–238, pl. 16, figs. 1, 2; text-figs. 6, 7.

Locality: Gunzan, Korea. A single specimen.

77. *Pseudostylochus stimpsoni* KATO, 1937

Pseudostylochus stimpsoni, KATO 1937d, p. 35–37, text-figs. 1, 2; KATO 1937e, p. 130.
Pseudostylochus obscurus, KABURAKI 1923a, p. 193–196, text-figs. 2, 3.

Remarks: This species was very commonly found by the writer at Muroran in the summer of 1939. KABURAKI recorded *Pseudostylochus obscurus* from Oshoro, Hokkaidô; however, judging from the description and figures of the Oshoro specimen, the present writer considers it must be referable to the present species.

---

1) The description of this species was carelessly omitted in that paper.

Localities: Muroran, Oshoro, Hokkaidô.

78. ***Pseudostylochus aino*** KATO, 1937

Pseudostylochus aino, KATO 1937e, p. 129–130, pl. 8, fig. 7; text-figs. 7, 8; KATO 1939a, p. 75–76; KATO 1939b, p. 147–148.

Localities: Muroran, Hokkaidô; Onagawa, Rikuzen; Asamusi.

79. ***Pseudostylochus edurus*** KATO, 1938

Pseudostylochus edurus, KATO 1938b, p. 584–585, pl. 38, fig. 8; text-figs. 9, 10; KATO 1939a, p. 76.

Localities: Edura near Seto; Onagawa.

80. ***Pseudostylochus maculatus*** KATO, 1938

Pseudostylochus maculatus, KATO 1938b, p. 585–586, pl. 39, fig. 7; text-figs. 11–12.

Locality: Yuzaki near Seto. A single specimen.

81. ***Pseudostylochus meridialis*** KATO, 1938

Pseudostylochus meridialis, KATO 1938a, p. 566–567, pl. 36, figs. 3, 4; text-figs. 9, 10.

Locality: Tomioka, Amakusa.

82. ***Pseudostylochus nationalis*** KATO, 1939

Pseudostylochus nationalis, KATO 1939a, p. 73–74, pl. 4, fig. 6; text-figs. 11–12.

Locality: Onagawa, Rikuzen. A single specimen.

83. ***Pseudostylochus intermedius*** KATO, 1939

Pseudostylochus intermedius, KATO 1939b, p. 146–147, pl. 8, figs. 5, 6; text-fig. 5.

Locality: Asamusi.

84. ***Pseudostylochus notoensis*** sp. nov.
(Text-figs. 34, 35)

Description: Shape of body resembles *Pseudostylochus elongatus,* elongated with broad anterior end and with bluntly pointed posterior extremity; 10 mm in length and 4 mm in width in large specimen. Dorsal surface light brown scattered with brown maculae all over the dorsal surface. Tentacles very small, situated at the first fifth of body. Genital pores a little in front of the level of the last third of body from posterior body end; penis flatly conical; prostate vesicle ovoidal with a thick muscular coating; seminal

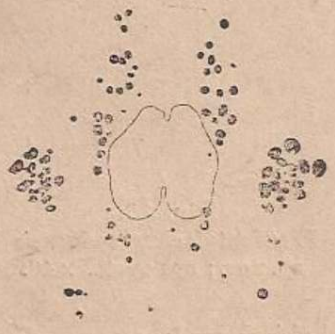


Fig. 34.
Pseudostylochus notoensis sp. nov.; eye-spots. ×27.

vesicle small, compact shape and situated directly behind the posterior end of pharyngeal chamber; female pore directly behind male pore and with glandular folds of epidermis around it; Lang's vesicle small and ovoidal.

Locality: Wagura, Noto. Four specimens collected by the writer under stones between tidemarks on August, 1937.

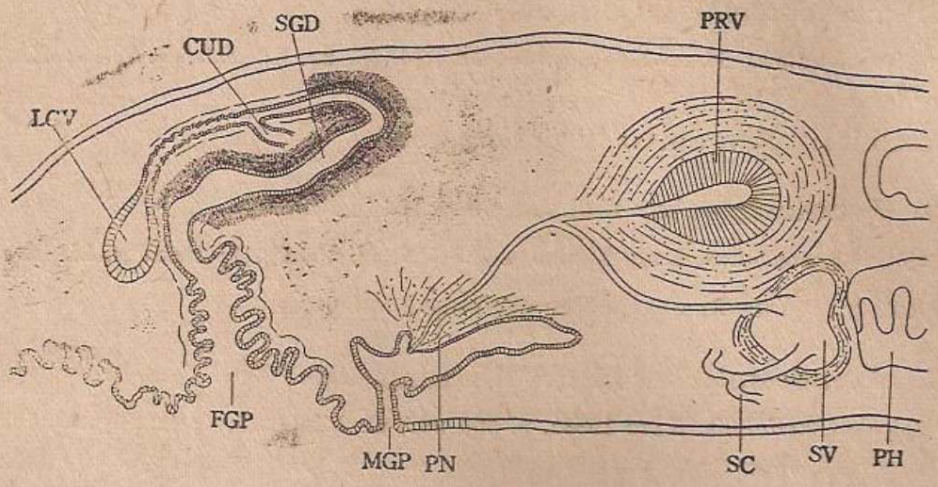


Fig. 35. *Pseudostylochus notoensis* sp. nov.; longitudinal section through genital organs. ×55.

85. ***Pseudostylochus sadoensis*** sp. nov.

(Pl. XXVII, fig. 2; Text-figs. 36, 37)

Description: Body in preserved state oval, 6–7 mm long by 4 mm broad. Color markings totally faded away. Small tentacles lie in front of the level of the first fourth of body. Pharynx almost centrally disposed and occupies a quarter of body length. Genital pores lie nearly at the level of the last third of body and moderately separated from each other; penis small, flatly conical; prostate vesicle large and chambered, with thick muscular wall; seminal vesicle tubular, closely attached to the ventral wall of muscular coating of prostate vesicle; Lang's vesicle large, saccular and slightly constricted; female pore a little behind male pore; with well-developed glandular folds of epidermis.

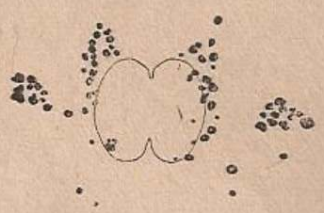


Fig. 36. *Pseudostylochus sadoensis* sp. nov.; eye-spots. ×40.

Locality: Ha-niu, Sado. Numerous specimens collected by Mr. K. Kikuchi in the tidal zone in the autumn of 1937.

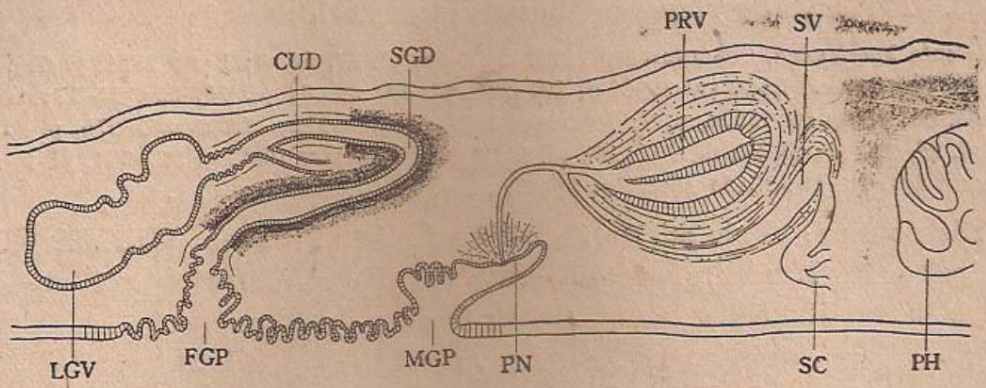


Fig. 37. *Pseudostylochus sadoensis* sp. nov.; longitudinal section through genital organs. ×50.

Section EMPROSTHOMMATA BOCK, 1913

Family **Cestoplanidae** LANG, 1884

Genus ***Cestoplana*** LANG, 1884

86. ***Cestoplana rubrocincta*** (GRUBE, 1840)

Orthostomum rubrocinctum, GRUBE 1840, p. 56; GRUBE 1855, p. 158, pl. 6, fig. 6; DIESING 1850, p. 238.

Typhlolepta rubrocincta, STIMPSON 1857, p. 3.

Cestoplana rubrocincta, LANG 1884, p. 516–520, pl. 2, fig. 5; pl. 15, fig. 1; pl. 30, figs. 11, 12; text-fig. 43; etc.; BOCK 1913, p. 250; KATO 1937a, p. 225–227, pl. 15, figs. 7, 8; text-figs. 18, 19; KATO 1938b, p. 586–587, text-fig. 13.

Tricelis fasciatus, QUATREFAGES 1845, p. 131.

Cestoplana filiformis, LAIDLAW 1903, p. 110–111; BOCK 1913, p. 250.

Cestoplana australis, HASWELL 1907, p. 479–480, pl. 37, fig. 5; BOCK 1913, p. 250.

Distribution: Naples; Sicily; Port Jackson, Australia; off Weligama reef, Ceylon; Susaki near Simoda; Seto, Kii.

87. ***Cestoplana lactea*** KATO, 1937

Cestoplana lactea, KATO 1937a, p. 223–225, pl. 15, figs. 1–6; text-figs. 16, 17.

Locality: Susaki near Simoda. A single specimen.

88. ***Cestoplana marina*** KATO, 1938

Cestoplana marina, KATO 1938a, p. 567–568, pl. 37, figs. 6–8; text-figs. 11–12.

Locality: Tomioka, Amakusa. A single specimen.

Suborder *Cotylea* LANG, 1884

Family **Pericelidae** LAIDLAW, 1902

Genus ***Pericelis*** LAIDLAW, 1902

89. ***Pericelis byerleyana*** (COLLINGWOOD, 1876)

Typhlolepta byerleyana, COLLINGWOOD 1876, p. 92–93, pl. 17, fig. 8; LANG 1884, p. 616.
Pericelis byerleyana, LAIDLAW 1902, p. 291–294, pl. 14, fig. 6; pl. 15, figs. 15–17; text-figs. 65, 66; LAIDLAW 1903a, p. 9; MEIXNER 1907a, p. 170–171; MAIXNER 1907b, p. 473–480, pl. 25, fig. 10; pl. 26, figs. 11, 16; pl. 29, fig. 3; PALOMBI 1938, p. 351–354, pl. 9, fig. 3; text-figs. 12, 13; KATO 1943c, p. 84–86, pl. 4, fig. 6; text-figs. 8, 9.

Distribution: Pulo Barundum, off west coast of Borneo; Fiji, Ellis, Gilbert Archipelogoes; Minikoi, Laccadive Islands; Musha Island, Gulf of Aden; Batavia, Java; Mauritius Island, Indian Ocean; Palao.

Family **Boniniidae** BOCK, 1923

Genus ***Boninia*** BOCK, 1923

90. ***Boninia mirabilis*** BOCK, 1923

Boninia mirabilis, BOCK 1923b, p. 1–29, pl. 1, figs. 1–9; text-figs. 1–9.

Distribution: Hama-jima, Chichi-jima, Bonin Islands; Samboanga, Philippines.

Family **Pseudoceridae** LANG, 1884

Genus ***Thysanozoon*** GRUBE, 1840

91. ***Thysanozoon brocchii*** (RISSO, 1818) (Text-figs. 38, 39)

Tergipes brocchi, RISSO 1818, p. 373.
Planaria brocchi, RISSO 1826, p. 264.
Thysanozoon brocchi, GRUBE, 1840, p. 55; GRUBE 1855, p. 140–144, pl. 6, figs. 4, 5.
Eolidioceros brocchii, QUATREFAGES 1845, p. 140–142, pl. 3, figs. 15, 16; pl. 5, fig. 1.
Thysanozoon brocchii, LANG 1884, p. 525–535, pl. 6, figs. 3, 4; STUMMER-TRAUNFELS 1895, p. 713; YERI et KABURAKI 1918, p. 34–35, pl. 1, fig. 11; PLEHN 1899, p. 448–449; KATO 1934b, p. 133; PEARSE 1938, p. 85; PALOMBI 1939, p. 135.
?*Thysanozoon brocchi,* HYMAN 1940, p. 485.
Planaria tuberculata, DELLE CHIAJE 1829, Vol. 3, p. 119–120, pl. 35, figs. 29–31; DELLE CHIAJE 1841, Vol. 3, p. 132; Vol. 5, p. 112, pl. 112, figs. 29–31.
Thysanozoon tuberculatum, GRUBE 1840, p. 55.
Planaria verrucosa, DELLE CHIAJE 1829, Vol. 4, p. 197, pl. 108, figs. 1, 4, 5.
Thysanozoon diesingii, GRUBE 1840, p. 54–56, pl.: fig. 9; SCHMARDA 1859, p. 29; STUMMER-TRAUNFELS 1895, p. 700, 723.
Planaria dicquemaris, DELLE CHIAJE (nec RISSO), 1841, Vol. 3, p. 132; Vol. 5, p. 112; pl. 36, figs. 1, 4, 5; pl. 109, fig. 20.
Thysanozoon dicquemaris, OERSTED 1844, p. 47.
Stylochus? papillosus, DIESING 1836, p. 316.
Thysanozoon papillosum, GRUBE 1840, p. 56.
Eolidiceros panormus, QUATREFAGES 1845, p. 142–143, pl. 3, figs. 2–4, 17; pl. 6, figs. 6, 13.
Thysanozoon panormus, DIESING 1850, p. 213–214.
Planeolis panormus, STIMPSON 1857, p. 2; DIESING 1862, p. 554–555.
Thysanozoon fockei, DIESING 1850, p. 213; DIESING 1850, p. 213; DIESING 1862, p. 556.

Remarks: The Japanese specimen usually 50–60 mm in length. Ground color of body brown; papillae also brown, partly whitish-yellow along the median line and everywhere; body margin bluish. The specific name *brocchii* was dedicated to GIOVANNI BATTISTA BROCCHI, an Italian naturalist (1772–1826), therefore, the writer prefers to adopt the name *brocchii* instead of *brocchi*.

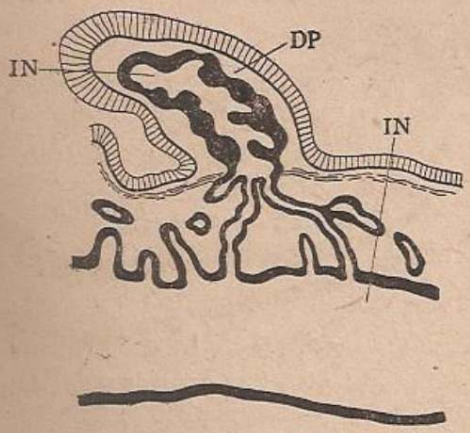


Fig. 38. *Thysanozoon brocchii*; section through dorsal papilla, showing intestinal branch in papilla. ×55.

Distribution: Mediterranean Sea, very common; East London, South Africa; Crooked Island Sound west of Farmdale, St. Joe Bay, Fla.; Laysan Island near Hawaii; Misaki; Susaki near Simoda; Sugasima, Sima; Seto, Japan.

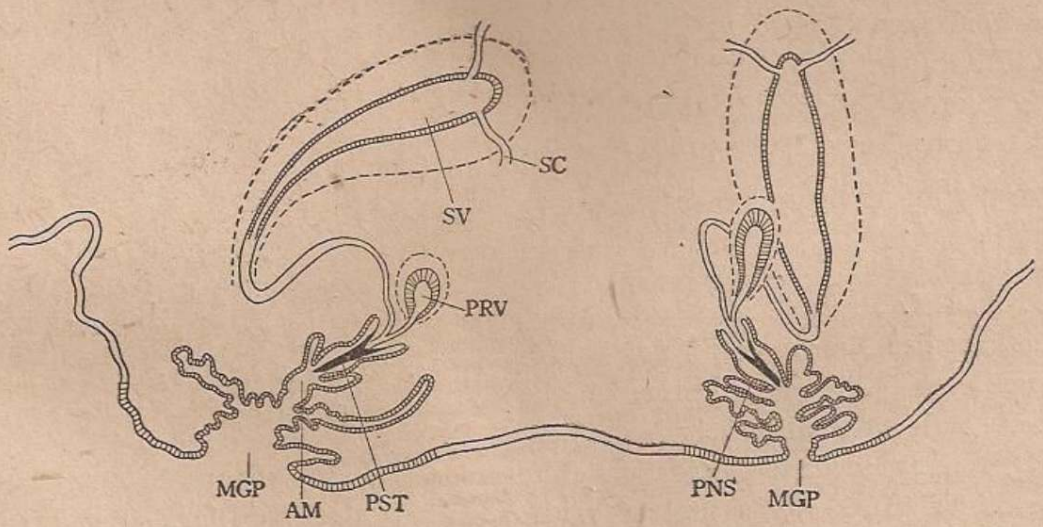


Fig. 39. *Thysanozoon brocchii*; cross section through male genital organs. ×70.

92. ***Thysanozoon vulgaris*** PALOMBI, 1939 (Text-figs. 40, 41)

Thysanozoon brocchii (GRUBE), YERI et KABURAKI 1918, p. 34–35, pl. 1, fig. 11; KATO 1934b, p. 133.

Thysanozoon vulgaris, PALOMBI 1939, p. 135.

Description: Body broadly oval, leaf-like, with somewhat frilled margin. Large specimen measures 35 mm by 21 mm. Dorsal papillae best developed in the middle part, diminishing in size and more sparsely distributed towards the body margin. Color of dorsal surface purplish-gray or yellowish-purple, with a whitish or yellowish median stripe. Papillae generally of a dark grayish color

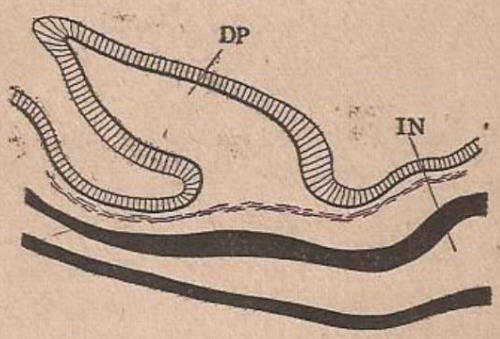


Fig. 40. *Thysanozoon vulgaris*; dorsal papilla. ×55.

with a tint of purple, except white basal part and frequently ornamented with a few number of white dots near the tip. In some specimen, the papillae are in part of a whitish color in the median longitudinal or in the middle transverse zone of body. Marginal tentacles folded. Sucker central. Mouth nearly at the hind end of the first fifth of body. Pharynx much plicated. Intestinal branches anastomose and never enter into the dorsal papillae. A pair of male copulatory apparatus are on either side of the median line, closely behind the pharyngeal chamber. Slightly behind them occurs the single female gonopore.

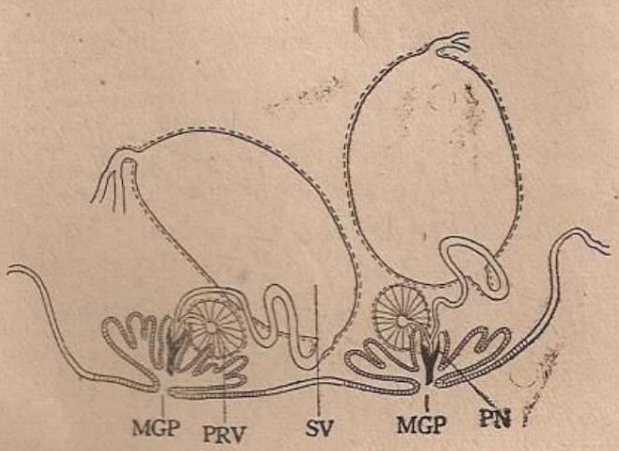


Fig. 41. *Thysanozoon vulgaris;* cross section through genital organs. ×35.

Remarks: This Japanese form of *Thysanozoon* was first recorded from Misaki by YERI and KABURAKI, and identified as *Thysanozoon brocchii* (GRUBE). Afterwards, BOCK (1923c, p. 361) had a suspicion on the occurrence of *T. brocchii* in Japan and says, "Dass die Japanische Art dem *T. Brocchi* nahesteht, geht aus der Beschreibung der japanischen Autoren hervor. Aber ob sie tatsächlich mit der Mittelmeerart identisch ist, das zu entscheiden erfordert einen sehr eingehenden Vergleich." In 1934, the present writer recorded this Misaki form from Izu and in the description he says, "In two specimens the body margin was found to be light blue." (p. 133). In the following years the writer collected numerous specimens of Misaki form from Izu and also color varietal form last mentioned from Izu as well as Sugasima, Sima and Seto, Kii. After careful comparison of these two forms the writer attained such a conclusion that, the color varietal form just mentioned is identical with the European species, *Thysanozoon brocchii* (RISSO) and the Misaki form, firstly recorded by YERI and KABURAKI, is a quite different species from the European one. The Misaki form has constantly small body size, and characteristic coloration, and moreover, their intestinal branches never enter into the dorsal papillae; YERI and KABURAKI say, "Lateral intestinal branches anastomose and are continued into dorsal papillae without opening to

the exterior." (1918, p. 35); However, the writer's investigation on a large number of Misaki form has revealed that their observation is erroneous. In *Thysanozoon brocchii* occurring in the Japanese waters, the coloration of body is almost constant and in well accordance with that of the European form; it usually measures 50–60 mm in length and its intestinal branches enter clearly into the dorsal papillae. In 1939, PALOMBI made reference to Japanese *Thysanozoon* and says, "Recentemente KATO (1938) ha riferito che gli esemplari rinvenuti nei mari del Giappone, attribuiti da YERI e KABURAKI a *Thysanozoon brocchii* GRUBE del Mediterraneo, sono non solo da questi distinti, ma rappresentano una nuova specie da lui chiamata *vulgaris*." (p. 135) Therefore, for the Misaki form of Japanese *Thysanozoon*, the present author proposes to give the name *Thysanozoon vulgaris* after PALOMBI.

Localities: Misaki; Susaki near Simoda, Izu.

93. ***Thysanozoon japonicum*** sp. nov. (Text-figs. 42, 43)

Description: Body oval, with slightly wavy margin, 10 mm long in large specimen. Dorsal surface of body appears totally blackish, owing to the presence of black pigment granules distributed densely on the dorsal surface as well as on the papillae; cerebral region colorless. Papillae conical, rather thick. Intestinal branches enter into the dorsal papillae as in *Thysanozoon brocchii*. In the specimens examined, copulatory apparatus were not yet formed, but well-developed papillae show that the 10 mm specimen may probably be a full grown individual. Sucker nearly in the center of body.

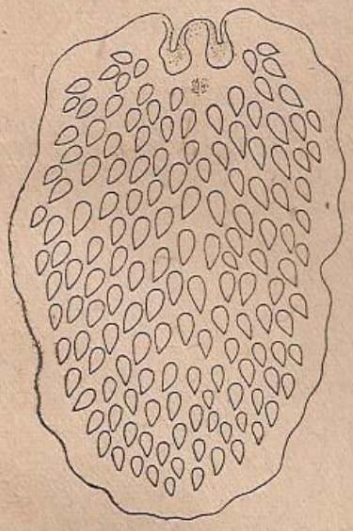


Fig. 42.
Thysanozoon japonicum, sp. nov. ×7.

Remarks: This species somewhat resembles *Thysanozoon nigrum* from Bermuda in its coloration, however as is uncertain whether that species has so wide distribution, the writer considers this as a separate species from the other. This planarian is plainly distinguishable from other Japanese species, *Thysanozoon brocchii* and *T. vulgaris* in its small size and coloration.

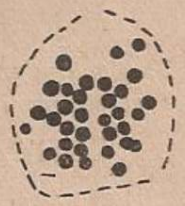


Fig. 43.
Thysanozoon japonicum sp. nov.; eye-spots. ×70.

Localities: Abusima, Nanao, Noto. Several specimens collected by the writer on under-surface of stones in low tidemark.

Genus ***Pseudoceros*** Lang, 1884

94. ***Pseudoceros interruptus*** (Stimpson, 1855)

Eurelepta interrupta, Stimpson 1855, p. 380; Stimpson 1857, p. 8; Diesing 1862, p. 550; Lang 1884, p. 591–592.

Locality: Loochoo.

95. ***Pseudoceros guttato-marginatus*** (Stimpson, 1855)

Eurelepta guttato-marginata, Stimpson 1855, p. 380; Stimpson 1857, p. 8; Diesing 1862, p. 549; Lang 1884, p. 592.

Locality: Loochoo.

96. ***Pseudoceros fulminatus*** (Stimpson, 1855)

Eurelepta fulminata, Stimpson 1855, p. 380; Stimpson 1857, p. 7; Diesing 1862, p. 548–549; Lang 1884, p. 592.

Locality: Loochoo.

97. ***Pseudoceros albicornis*** (Stimpson, 1857)

Proceros albicornis, Stimpson 1857, p. 7; Diesing 1862, p. 551.
Prostheceraeus? albicornis, Lang 1884, p. 564.

Locality: Hokkaidô.

98. ***Pseudoceros coccineus*** (Stimpson, 1857)

Eurelepta coccinea, Stimpson 1857, p. 7–8; Diesing 1862, p. 549×550; Lang 1884, p. 592.

Locality: Loochoo.

99. ***Pseudoceros nigrus*** (Stimpson, 1857)

Eurelepta nigra, Stimpson 1857, p. 8; Diesing 1862, p. 549.
Prostheceraeus? nigra, Lang 1884, p. 565.

Locality: Amami-Ousima.

100. ***Pseudoceros japonicus*** (Stimpson, 1857)

Eurelepta japonica, Stimpson 1857, p. 8; Diesing 1862, p. 549.
Prostheceraeus? japonica, Lang 1884, p. 565.

Locality: Hokkaidô.

101. ***Pseudoceros flavomarginatus*** Laidlaw, 1902

Pseudoceros flavomarginatus, Laidlaw 1902, p. 298; Laidlaw 1903a, p. 11.
Pseudoceros luteomarginatus, Yeri et Kaburaki 1918, p. 37–39, pl. 1, fig. 5; text-fig. 40; Kato 1937a, p. 229; Kato 1937b, p. 239.

Description: LAIDLAW's specimen measures 25 mm long by 15 mm broad. Dorsal surface velvety black with an orange margin about 1.5 mm wide. The Japanese specimens 35 mm long by 15 mm broad; dorsal surface velvety black, and usually bordered all round by a russet brown marginal and a clear yellow submarginal band; marginal tentacles appear as folded flaps of the frontal margin. With a pair of male copulatory apparatus.

Remarks: YERI and KABURAKI distinguished the Misaki specimen, to which was given the name *Pseudoceros luteomarginatus* by the different arrangement of colored marginal and submarginal bands. However, examining numerous specimens of Japanese forms, the writer has recognized the fact that in some specimens the margin is only bordered by a yellowish-brown band and in some rare cases it is bordered by a colorless band on which are sparsely distributed a small number of orange specks; therefore he prefers to look upon *P. luteomarginatus* as a synonym of *P. flavomarginatus*.

Distribution: Minikoi, Laccadive Islands; Misaki; Susaki near Simoda; Saisyû, Korea.

102. ***Pseudoceros bedfordi*** LAIDLAW, 1903

Pseudoceros bedfordi, LAIDLAW 1903b, p. 314, pl. 23, fig. 9; BOCK 1913, p. 254–255, pl. 3, figs. 2–4; text-fig. 51; KATO 1943c, p. 87, text-fig. 11.

Localities: Singapore; west to Billiton, Mindanao, Philippines; Korôru, Palao.

103. ***Pseudoceros reticulatus*** YERI et KABURAKI, 1918

Pseudoceros reticulatus, YERI et KABURAKI 1918, p. 35–36, pl. 1, fig. 3; text-figs. 38, 39; KATO 1934b, p. 133.

Localities: Misaki; Sirahama, Awa; Susaki near Simoda.

104. ***Pseudoceros nigromarginatus*** YERI et KABURAKI, 1918

Pseudoceros nigromarginatus, YERI et KABURAKI 1918, p. 39–40, pl. 1, fig. 2; text-figs. 41, 42.

Locality: Matuwa near Misaki.

105. ***Pseudoceros atropurpureus*** KATO, 1934

Pseudoceros atropurpureus, KATO 1934b, p. 129–130, pl. 1, fig. 3; text-figs. 5, 6; KATO 1938a, p. 568; KATO 1938b, p. 587.

Localities: Susaki near Simoda; Oniike near Tomioka, Amakusa; Seto.

106. ***Pseudoceros micropapillosus*** KATO, 1934

Pseudoceros micropapillosus, KATO 1934b, p. 130, pl. 1, fig. 1; text-figs. 7–9.

Locality: Susaki near Simoda.

107. ***Pseudoceros gratus*** KATO, 1937

Pseudoceros gratus, KATO 1937a, p. 227–229, text-figs. 20–22; KATO 1943c, p. 86, 87, text-fig. 10.

Localities: Susaki; Mikomoto-sima, Izu; Misaki; Iwayama Bay, Korôru, Palao.

108. ***Pseudoceros yessoensis*** KATO, 1937

Pseudoceros yessoensis, KATO 1937d, p. 37–38, text-figs. 3, 4.

Locality: Muroran, Hokkaidô. One specimen.

109. ***Pseudoceros sagamianus*** KATO, 1937

Pseudoceros sagamianus, KATO 1937f, p. 362–363, pl. 22, figs. 9–11; text-figs. 21, 22; KATO 1939a, p. 76–77, text-figs. 15, 16.

Localities: Misaki; Onagawa, Rikuzen.

110. ***Pseudoceros tomiokaensis*** KATO, 1938

Pseudoceros tomiokaensis, KATO 1938a, p. 568–569, pl. 27, fig. 9; text-figs. 13–15.

Locality: Tomioka, Amakusa. Found on *Gelidium*.

111. ***Pseudoceros memoralis*** KATO, 1938

Pseudoceros memoralis, KATO 1938a, p. 569–570, text-figs. 16–18.

Locality: Tusi-jima near Tomioka, Amakusa.

112. ***Pseudoceros pius*** KATO, 1938

Pseudoceros pius, KATO 1938a, p. 570–571, text-figs. 19–21.

Locality: Siroiwazaki near Tomioka, Amakusa. A single specimen.

113. ***Pseudoceros exoptatus*** KATO, 1938

Pseudoceros exoptatus, KATO 1938b, p. 587–588, pl. 39, figs. 1, 2; text-figs. 14, 15.

Locality: Seto, Kii.

114. ***Pseudoceros asamusiensis*** KATO, 1939

Pseudoceros asamusiensis, KATO 1939b, p. 148–149, pl. 9, figs. 4–6; text-figs. 6, 7.

Locality: Asamusi. Dredged among the seaweeds between Yuno-sima and Benten-sima. A single specimen.

115. ***Pseudoceros nipponicus*** sp. nov. (Text-fig. 44)

Pseudoceros lacteus (COLLINGWOOD)?, KABURAKI 1918, p. 37, pl. 1, fig. 6.

Description: Body oval, with frilled margin, 20 mm in length by 10 mm

in breadth. Dorsal surface rosy color with a number of scattered blackish spots of a moderate size and a lightly colored median stripe extending posteriorly from behind the cerebral eyes; with a blackish marginal and a russet brown submarginal band all around. The extreme margin is narrowly colorless. Sucker nearly in the center of body. Mouth situated at a distance of 3.5 mm from the anterior body end. With a single male copulatory apparatus. The structure of genital organs is similar to that in other species of the genus.

Fig. 44. *Pseudoceros nipponicus* sp. nov.; marginal tentacles and eye-spots. ×35.

Remarks: YERI and KABURAKI referred this form with a query to COLLINGWOOD's *Sphyngiceps lacteus*. The present writer collected this planarian at Seto and after comparing this with the description and colored sketch of COLLINGWOOD, he has come to hold such an opinion that it is better to separate the Japanese species from COLLINGWOOD's, basing on their different color markings.

Localities: Misaki; Seto.

116. ***Pseudoceros izuensis*** sp. nov. (Text-figs. 45, 46)

Description: This beautiful species was first collected at Susaki on March 6, 1934 and another specimen on May 3, 1934 at Mikomoto-sima. These two specimens measure each 20 mm in length and 13 mm in breadth, and the genital organs did not developed. On Feb. 1939, a fully mature individual was collected at Susaki; it measures 60 mm long by 28 mm broad in the living state.

Body is of a leaf-like shape, with fairly frilled margin and of firm consistency. Ground color of dorsal surface is greenish-white, scattered all over with numerous black spots and more minute white dots. Along the median line darker in color. Extreme outer margin of dorsal surface is quite black and next to this there exists a stripe of sepia color which is interrupted

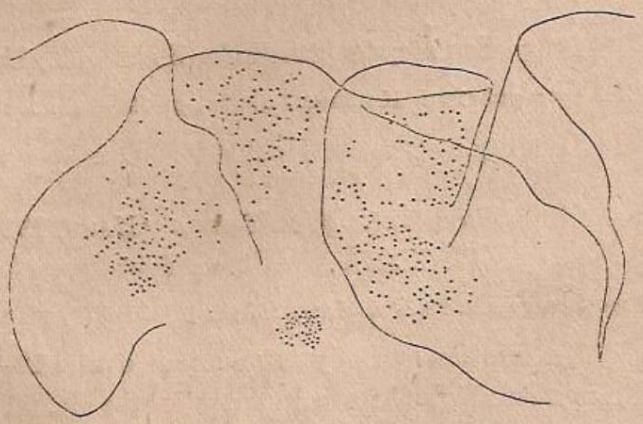


Fig. 45. *Pseudoceros izuensis* sp. nov.; marginal tentacles and eye-spots. ×18.

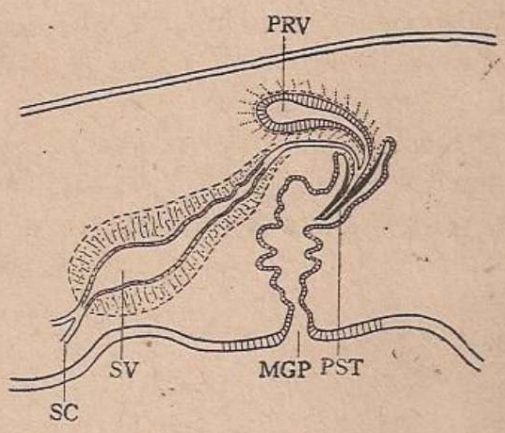


Fig. 46. *Pseudoceros izuensis* sp. nov.; longitudinal section through genital organs. ×18.

numerously in narrow streaks with the ground color. Ventral surface milky white. A large number of eyes scattered as usual in the tentacular flaps which are slightly purplish in color. At the base of tentacular flaps there is a cluster of cerebral eyes which form a single cluster. Mouth opening lies immediately behind the brain. Intestinal branches make a network. Sucker is near the center of body. With a pair of male copulatory apparatus. Prostate vesicle very elongated. Seminal vesicle rather tubular with a thick muscular wall. Penis is represented by a large penial stylet. Antrum masculinum is deep and its wall is much folded.

Localities: Susaki near Simoda; Mikomoto-sima, Izu.

Genus ***Yungia*** LANG, 1884

117. ***?Yungia sasakii*** KABURAKI, 1923

Yungia sasakii, KABURAKI 1923a, p. 196–199, text-figs. 4–6.

Remarks: It is uncertain whether or not this species is a representative of the genus *Yungia*.

Locality: Oshoro, Hokkaidô. Two specimens.

Family **Eureleptidae** LANG, 1884

Genus ***Eurelepta*** EHRENBERG, 1831

118. ***Eurelepta punctata*** KABURAKI, 1923

Eurelepta punctata, KABURAKI 1923a, p. 199–201, text-figs. 7, 8.

Locality: Oshoro, Hokkaidô. One specimen.

119. ***Eurelepta susakiensis*** (KATO, 1934)
(Pl. XXIX, figs. 2–4; Text-figs. 47, 48)

Pseudoceros susakiensis, KATO 1934b, p. 131–133, pl. 1, fig. 6; text-figs. 10, 11.

Description: Body elongated oval, 12–15 mm long by 6–7 mm broad. Translucent light brown in color on the dorsal surface, over which are scattered minute reddish-yellow pigment granules save on the tentacles, the brain region and along the body margin; along the median line are present a number of

brown specks; small white spots sparsely distributed along the dorsal margin and on the tentacles. A single specimen collected from Sarusima has scattered reddish-brown spots on the dorsal surface. Marginal tentacles are represented by the conical processes furrowed on the ventral aspect. Numerous eyes are found in the tentacles as well as on the anterior body margin. Cerebral eyes lie in two closely approximated clusters over the brain region. Sucker is a small cup-like disc situated at about midway between the middle and the posterior end body. Mouth occurs behind the cerebral eyes and passes into a long cylindrical pharynx at its anterior end. The pharynx continues posteriorly to the wide main intestine which extends along the median line to near the end of body. Main intestine gives off a few branches on either side which are repeatedly subdivided but do not anastomose. The epidermis is in almost equal thickness both on the dorsal and on the ventral side. The dermal musculature is poorly developed.

The seminal canal runs forwards from the posterior part of body and near the male genital organs it enormously distends with a mass of spermatozoa. The canal narrows to run mediad and meet the seminal vesicle of elongated crescent shape with a thick muscular coating. Emerging from the vesicle a

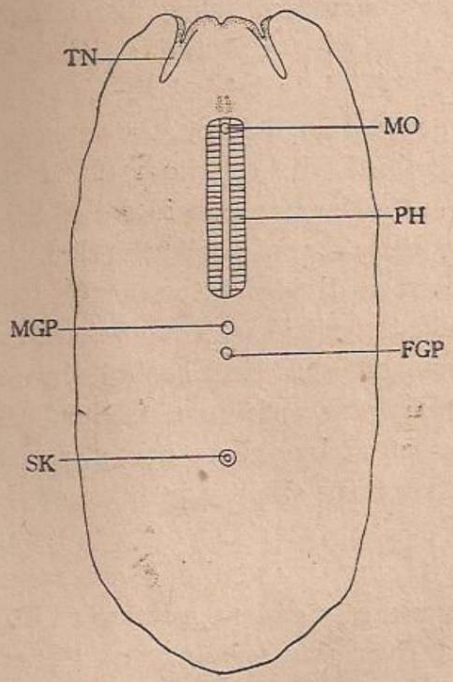


Fig. 47. *Eurelepta susakiensis.* ×5.

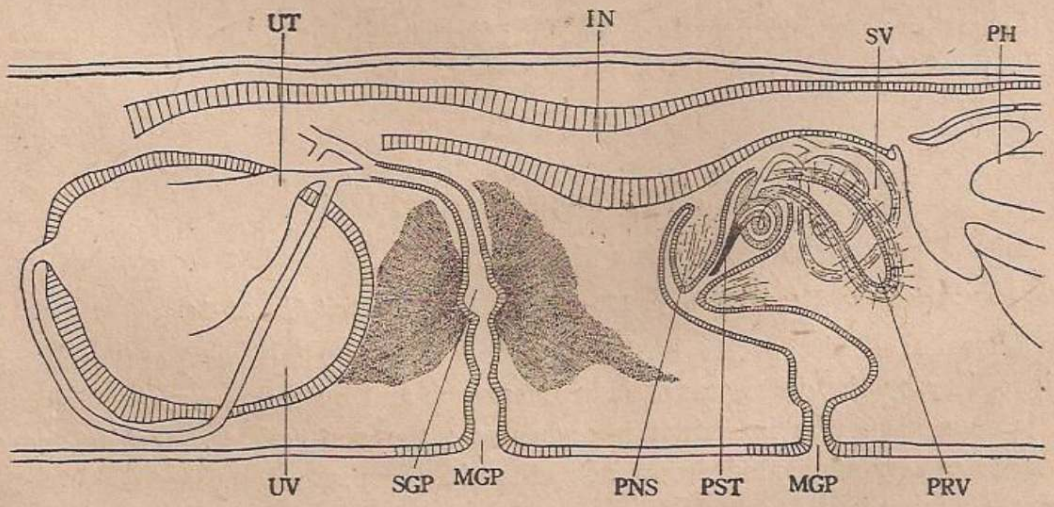


Fig. 48. *Eurelepta susakiensis;* longitudinal section through genital organs. ×70.

narrow ejaculatory duct takes a somewhat tortuous course and immediately after receiving the duct from the prostate vesicle, merges into the penis to open into the penis pouch. The prostate is an elongated pyriform vesicle and coated with a thick muscular wall which is pierced by efferent ducts from the extracapsular glands. The penis is a slender muscular process and provided with a hard, pointed stylet at the tip. The penis often coils in the narrow sheath which is surrounded by a developed musculature and passes ventrally into a wide, elongate antrum masculinum which narrows at the ventral side to open outside immediately behind the posterior end of the cylindrical pharynx.

Slightly behind the male gonopore, lies the female pore which anteriorly passes into the slightly expanded antrum femininum, the inner side of which is lined with columnar gland cells with minute faintly eosinophilous granules. The antrum passes into the short gland duct, into which are discharged much spindle-shaped shell secretion. This duct continues to the vagina interna which is soon divided into two uteri distended with ova, and runs posteriorly. As a characteristic feature of the *Eurelepta*, a pair of the uterine vesicle are present one on each side behind the female genital pore. This is a large spherical glandular vesicle and is lined with the ciliated glandular epithelium containing much eosinophilous granules. By a narrow duct this vesicle is connected with the uterus slightly in front of the junction to the vagina interna.

Remarks: This species was recorded by the author as *Pseudoceros*, but afterwards, examining a large number of specimens, it has revealed that the worm represents a member of *Eurelepta*. This species seems to be closely related to *Eurelepta cornuta*, but differs from the latter and other known species in the genus in the color markings, the arrangement of eyes and the structure of the male copulatory apparatus.

Localities: Susaki near Simoda, Izu; Sarusima, Noto. From tidemarks to the depth of 20 m.

Genus *Cycloporus* Lang, 1884

120. *Cycloporus variegatus* Kato, 1934

Cycloporus variegatus, Kato 1934b, p. 133–135, pl. 1, fig. 5; text-figs. 12–14.

Remarks: This species is distinguished from *Cycloporus papillosus* and *C. japonicus* by the difference of color markings and by the presence of narrow canals connecting the intestinal branches and the end-vesicles. Genital pores are more widely separated from each other in the present species than in the case of *C. japonicus*.

Locality: Susaki near Simoda. A single specimen.

121. *Cycloporus japonicus* sp. nov.

Cycloporus papillosus (M. SARS 1878), YERI et KABURAKI 1918, p. 40–41, pl. 1, fig. 9; KATO 1937a, p. 229–230, text-figs. 23, 24; KATO 1938b, p. 588; KATO 1939b, p. 149–150, text-fig. 8.

Description: Small specimen usually measures 9 mm long by 6 mm broad and in large specimen 20 mm in length. The color of body fairly variable, but in general ochraceous, flecked with a large number of russet spots; along body margin there is a series of dark spots which indicate the position of end-vesicle. Cerebral eyes consists of two lateral clusters. Without any trace of dorsal papillae.

Remarks: The Japanese *Cycloporus* was first recorded from Misaki by YERI and KABURAKI, and referred by them to *Cycloporus papillosus*, the common European species. The present writer also treated it as the previous authors' identification; but, in recent years, after examining a large number of specimens, he came to convince that the Japanese species may be a separate one from the European worm by the total different arrangement of cerebral eyes.

Localities: Misaki; Susaki near Simoda; Seto, Kii; Asamusi, Mutsu; commonly found on compound ascidians.

Genus *Stylostomum* LANG, 1884

122. *Stylostomum hozawai* KATO, 1939

Stylostomum hozawai, KATO 1939b, p. 150–152, pl. 9, figs. 1–3; text-figs. 9, 10.

Locality: Gomi-sima near Asamusi. Found on a certain orange-colored compound ascidian between tidemarks.

123. *Stylostomum maculatum* sp. nov.

(Pl. XXVII, fig. 3; Text-figs. 49, 50)

Description: Body oval, about 4 mm in length. Ground color milky white, over which are scattered sparsely large brown spots; central part of body thick and faintly yellow in color. Without marginal tentacles. Marginal eyes are represented by only three ocelli on either side of the median line; cerebral cluster of eyes consists of two ocelli on each side, with a pair of ventral eyes. The internal structure of body is quite in accord with that of the type of the genus. Without uterine vesicle. Prostate vesicle lies rather ventrally beneath the seminal vesicle as in *Stylostomum hozawai*, Pharynx is short and thick. With anterior median branch of intestine.

Fig. 49.
Stylostomum maculatum sp. nov.; eye-spots. ×22.

Locality: Susaki near Simoda. A single

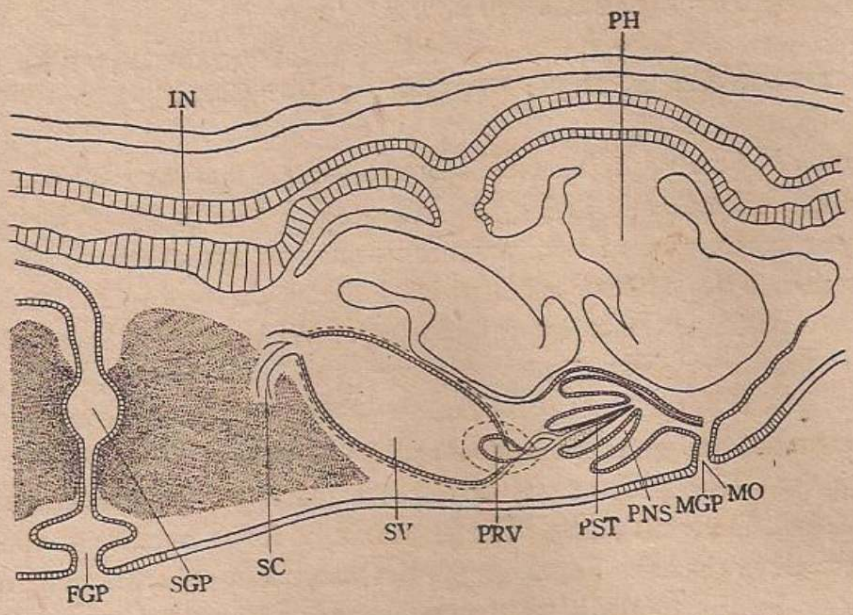


Fig. 50. *Stylostomum maculatum* sp. nov.; longitudinal section through genital organs. ×110.

specimen found on a certain white compound ascidian on July 29, 1938.

Family **Stylochoididae** Bock, 1913

Genus ***Leptoteredra*** Hallez, 1913

124. ***Leptoteredra tentaculata*** Kato, 1943

Leptoteredra tentaculata, Kato 1943a, p. 47–53, pl. figs. 1–4; text-figs. 1–4.

Locality: Susaki near Simoda. One specimen.

Family **Chromoplanidae** Bock, 1922

Genus ***Chromoplana*** Bock, 1922

125. ***Chromoplana bella*** Bock, 1922

Chromoplana bella, Bock 1922, p. 1–20, pl. 1, figs. 1–3; pl. 2, fig. 1; text-figs. 1–3; Kato 1938b, p. 588–589, text-fig. 16.

Localities: Misaki; Seto.

Genus ***Amyella*** Bock, 1922

126. ***Amyella lineata*** Bock, 1922

Amyella lineata, Bock 1922, p. 20–30, pl. 1, figs. 2, 4, 5; pl. 2, figs. 2–6; text-figs. 4–6.

Locality: Misaki.

Family **Prosthiostomidae** LANG, 1884

Genus ***Prosthiostomum*** QUATREFAGES, 1845

127. ***Prosthiostomum grande*** STIMPSON, 1857

Prosthiostomum grande, STIMPSON 1857, p. 28; LANG 1884, p. 603; YERI et KABURAKI 1918, p. 42–43, pl. 2, fig. 2; text-figs. 43, 44; KATO 1934b, p. 135; KATO 1938a, p. 572; KATO 1938b, p. 589.

Leptoplana grandis, DIESING 1862, p. 539.

Localities: Amami-Ousima; Misaki; Matuwa near Misaki; Mera, Awa; Susaki near Simoda; Tomioka, Amakusa; Seto; Wagura, Noto; Saru-sima, Noto.

128. ***Prosthiostomum marmoratum*** YERI et KABURAKI, 1918

Prosthiostomum marmoratum, YERI et KABURAKI 1918, p. 43–44, pl. 1, fig. 8; text-figs. 45, 46; KATO 1937a, p. 230; KATO 1938b, p. 589.

Localities: Sirahama, Awa; Susaki near Simoda; Seto.

129. ***Prosthiostomum awaense*** YERI et KABURAKI, 1918

Prosthiostomum awaense, YERI et KABURAKI 1918, p. 44, pl. 2, fig. 12; text-fig. 47.

Locality: Sirahama, Awa. A single specimen.

130. ***Prosthiostomum rubropunctatum*** YERI et KABURAKI, 1918

Prosthiostomum rubropunctatum, YERI et KABURAKI 1918, p. 45, pl. 2, fig. 9; text-fig. 48.

Locality: Misaki.

131. ***Prosthiostomum trilineatum*** YERI et KABURAKI, 1920

Prosthiostomum trilineatum, YERI et KABURAKI 1920, p. 596–598, text-figs. 4, 5; KATO 1943c, p. 87–89, text-figs. 12–14.

Localities: Hatake-jima, Kii; Korôru, Palao.

132. ***Prosthiostomum asiaticum*** KATO, 1937

Prosthiostomum asiaticum, KATO 1937b, p. 239–240, pl. 16, fig. 5; text-figs. 8, 9.

Locality: Zinsen, Korea.

133. ***Prosthiostomum auratum*** KATO, 1937

Prosthiostomum auratum, KATO 1937f, p. 363–364, pl. 22, fig. 8; text-figs. 23, 24; KATO 1938a, p. 572; KATO 1938b, p. 589; KATO 1939b, p. 152.

Localities: Misaki; Susaki near Simoda; Seto; Tomioka, Amakusa; Yunosima near Asamusi; Nanao, Noto.

134. ***Prosthiostomum ostreae*** KATO, 1937

Prosthiostomum ostreae, KATO 1937f, p. 365–366, pl. 22, figs. 4, 5; text-figs. 25–27.

Locality: Misaki. Found on cultivated oyster-shells.

135. ***Prosthiostomum purum*** KATO, 1937

Prosthiostomum purum, KATO 1937f, p. 366–367, pl. 22, figs. 6, 7; text-figs. 28–30.

Localities: Off Hutamatiya near Misaki; off Susaki near Simoda. From about 30 m deep.

136. ***Prosthiostomum yerii*** KATO, 1937

Prosthiostomum yerii, KATO 1937f, p. 367–369, pl. 22, figs. 1–3; texf-figs. 31–33.

Localities: Off Hutamatiya near Misaki; off Susaki. From 30 m deep.

137. ***Prosthiostomum sonorum*** KATO, 1938

Prosthiostomum sonorum, KATO 1938a, p. 572–573, pl. 36, figs. 5, 6; text-figs. 22, 23.

Locality: Off Tomoe-zaki near Tomioka, Amakusa. Along with some corals from 18 m deep.

138. ***Prosthiostomum vulgaris*** KATO, 1938

Prosthiostomum vulgaris, KATO 1938b, p. 589–590, pl. 39, figs. 3, 4; text-figs. 17, 18; KATO 1938a, p. 572.

Prosthiostomum siphunculus (DELLE CHIAJE), YERI et KABURAKI 1918, p. 41, pl. 2, fig. 13; KATO 1937a, p. 230.

Localities: Misaki, Matuwa; Sirahama, Awa; Susaki; Seto; Tomioka, Amakusa; Nozaki, Noto; Suga-sima, Sima.

139. ***Prosthiostomum laetum*** KATO, 1938

Prosthiostomum laetum, KATO 1938b, p. 590–591, pl. 39, figs. 5, 6; text-figs. 19, 20.

Locality: Off Tonda near Seto, Kii. A single specimen collected by the dredge-net from a depth of about 18 m.

140. ***Prosthiostomum bellum*** KATO, 1939

Prosthiostomum bellum, KATO 1939a, p. 77–78, pl. 4, figs. 1, 2; text-figs. 17, 18.

Locality: Mamakohama near Onagawa, Rikuzen. A single specimen.

141. ***Prosthiostomum formosum*** KATO, 1943

Prosthiostomum formosum, KATO 1943b, p. 74, 75, text-figs. 7, 8.

Locality: Suô, Formosa. A single specimen.

142. ***Prosthiostomum sadoensis*** sp. nov. (Text-figs. 51, 52)

Description: Body in the preserved state is elongated, about 10 mm in length, anterior end more pointed than the posterior. Color light brown owing to the presence of minute brown pigment granules in the dorsal epidermis. Marginal eyes rather numerous in number and more crowded in the anterior end; cerebral eyes divided into two elongated groups and provided with a distinct pair of ventral eyes. Sucker a little behind the middle of body. Genital pores are widely separated from the posterior end of cylindrical pharynx, this being one of the most remarkable feature of the present species. The structure of copulatory apparatus is similar to that of the type of the genus. Antrum masculinum very deep and horizontally disposed.

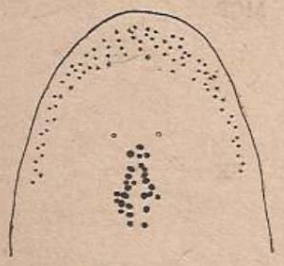


Fig. 51. *Prosthiostomum sadoensis* sp. nov.; arrangement of eye-spots. ×22.

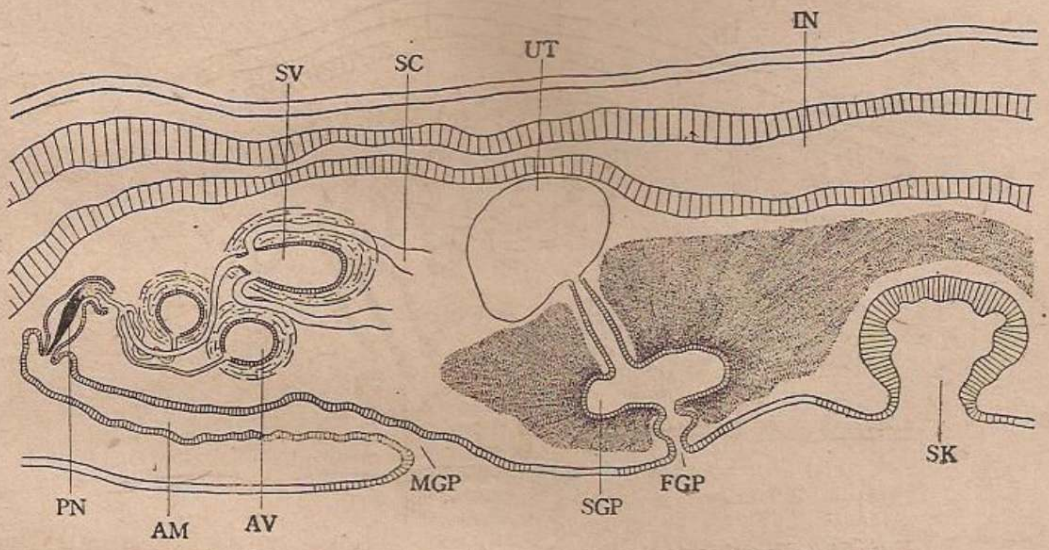
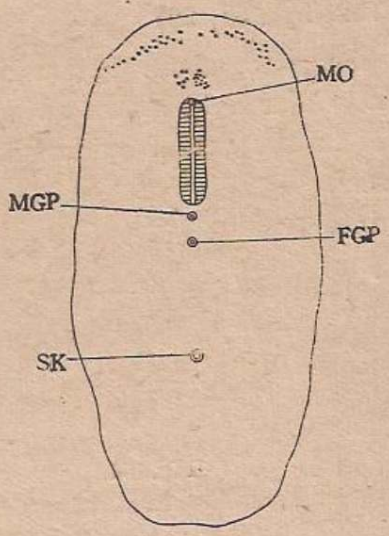


Fig. 52. *Prosthiostomum sadoensis* sp. nov.; longitudinal section through genital organs. ×70.

Locality: Ha-niu, Sado. A single specimen collected by Mr. KANZAEMON KIKUCHI in the summer of 1938, who kindly sent it to the writer for identification.

143. ***Prosthiostomum wagurensis*** sp. nov.
(Pl. XXIX, fig. 1; Text-figs. 53, 54)

Description: Body oval, with round anterior and posterior ends, 3–4 mm in length. Ground color milky white, over which are scattered numerous, rather large, blackish-brown pigment spots, and along the median line they crowd more densely. Body margin is pigment free. The arrangement of eyes is demon-



strated in text-figure. Genital pores situated between the anterior limit of the first third and the middle of body. The sucker lies posteriorly, near the second third of body. The general plan of copulatory apparatus is similar to that of the type of this genus.

Locality: Wagura, Noto.

Fig. 53.
Prosthiostomum wagurensis sp. nov. ×22.

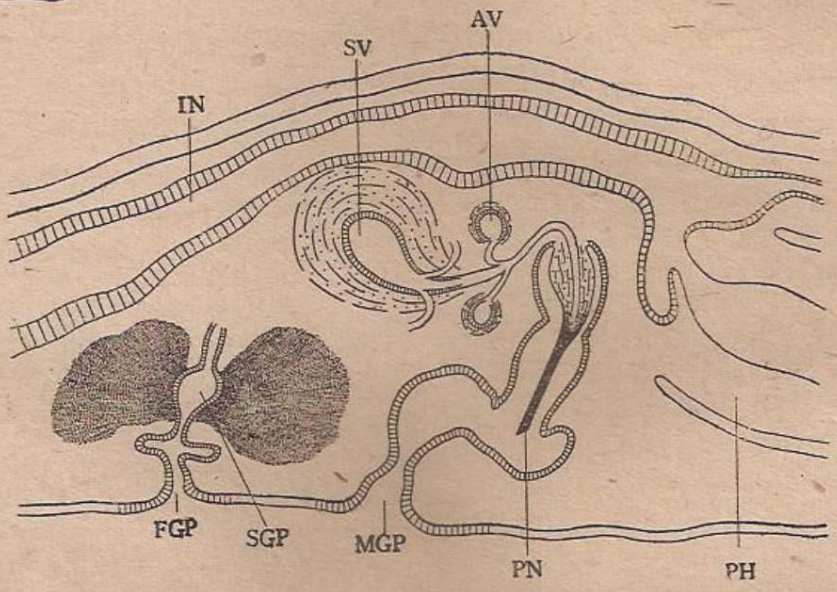


Fig. 54. *Prosthiostomum wagurensis* sp. nov.; longitudinal section through genital organs. ×150.

144. ***Prosthiostomum notoensis*** sp. nov. (Text-figs. 55, 56)

Description: Body elongated with round anterior margin and bluntly pointed posterior extremity; about 10 mm in length. Ground color of body milky white, with a large number of minute brownish black pigment flecks, and darker along the median line. The arrangement of eyes is shown in text-figure. Pharynx very long, with anterior median branch of intestine. Sucker nearly in the center of body. The copulatory apparatus is like the type of the genus.

Localities: Wagura, Nanao, Noto.

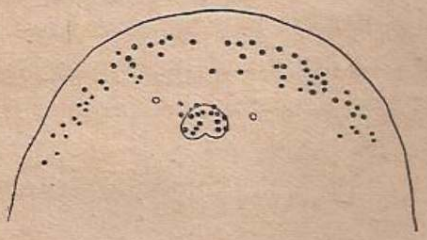


Fig. 55. *Prosthiostomum notoensis* sp. nov.; arrangement of eye-spots. ×22.

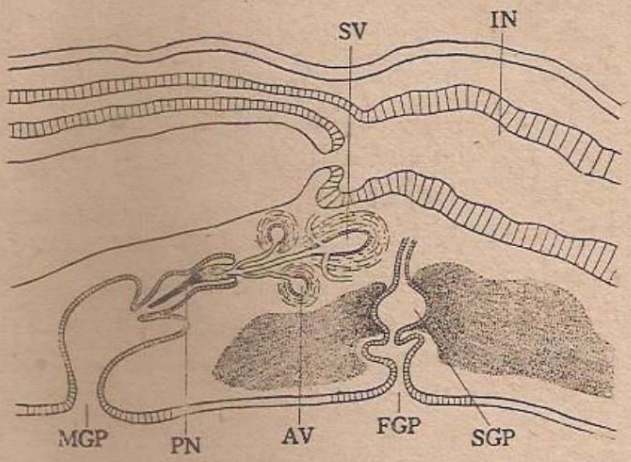


Fig. 56. *Prosthiostomum notoensis* sp. nov.; longitudinal section through genital organs. ×70.

145. ***Prosthiostomum nozakensis*** sp. nov. (Text-figs. 57, 57)

Description: Body elongated with rounded anterior end and bluntly pointed posterior extremity. It measures 15 mm in length. Ground color light brown and with numerous dark brown spots over the whole dorsal surface. The appearance of body very looks like *Pseudostylochus elongatus* KATO. Marginal eyes make two or three rows along the anterior body margin and lacks at the median part. Sucker nearly central. Genital pores a little behind the posterior end of pharynx. The structure of copulatory apparatus is as usual.

Locality: Nozaki, Noto.

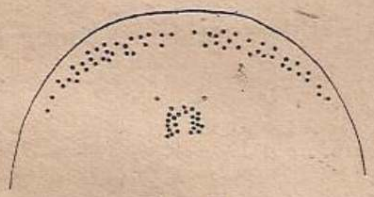


Fig. 57. *Prosthiostomum nozakensis* sp. nov.; arrangement of eye-spots. ×15.

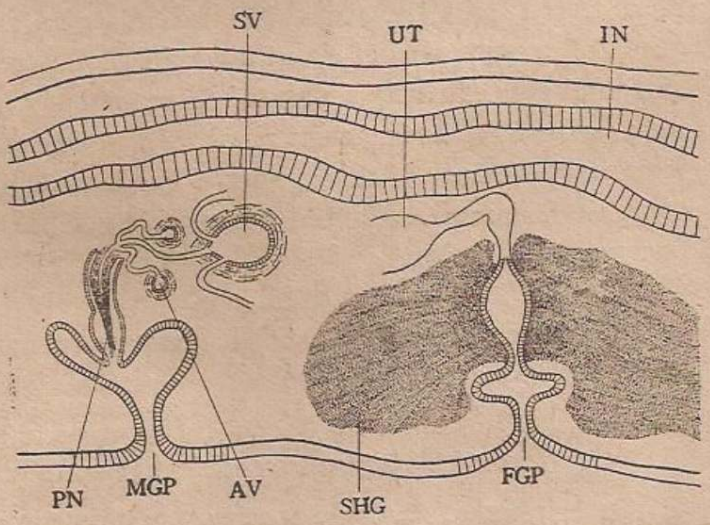


Fig. 58. *Prosthiostomum nozakensis* sp. nov.; longitudinal section through genital organs. ×60.

146. ***Prosthiostomum komaii*** sp. nov.
(Pl. XXVI, figs. 2, 3; Text-figs. 59, 60)

Description: This beautiful species was represented by a single specimen

which was collected by the writer on May 20, 1939, on undersurface of stone at Susaki. It measures 17 mm in length in fully extended state. The ground color of body is milky white; a slender orange yellow striation runs from the cerebral region to the end of body; in front of the brain there is a transverse band of the same color; at the level of the brain there is a rather broad transverse black band directly behind the orange one. On either side of the median orange line there are a pair of black longitudinal lines which are connected by five transverse black lines in regular intervals. Near the posterior end of body there is one more transverse line extending in full breadth of body. Cerebral group of eyes consists of about 20 ocelli which are divided into two lateral parts. Marginal eyes extemely separated from the body margin and repersented by only four ocelli. The arrangement and the smaller number of marginal eyes are the remarkable feature of this species. The copulatory apparatus is of a usual type of *Prosthiostomum*. Genital pores widely separated from the posterior end of pharyngeal chamber.

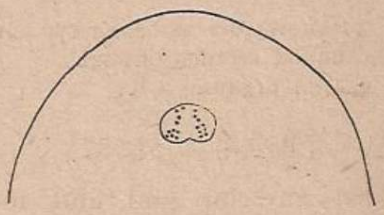


Fig. 59.
Prosthiostomum komaii sp. nov.; arrangement of eye-spots. ×17.

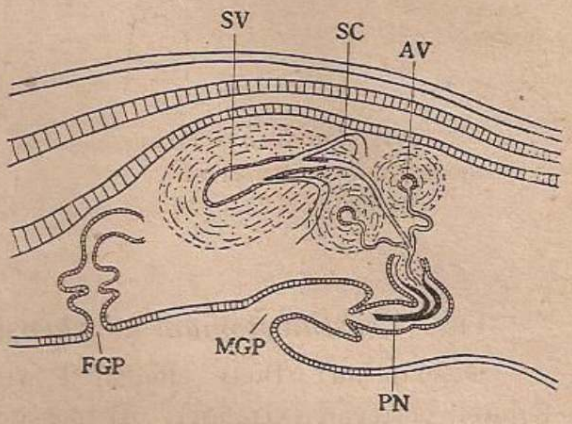


Fig. 60. *Prosthiostomum komaii* sp. nov.; longitudinal section through genital organs. ×55.

Locality: Susaki near Simoda.

Remarks: The writer takes pleasure in naming this species in honor of Professor T. Komai.

147. ***Prosthiostomum susakiensis*** sp. nov. (Text-figs. 61, 62)

Description: A single specimen of this species was collected by the writer on April 5, 1938 at Susaki under stone on low tidemark. It measures 30 mm in length. Ground color milky white and the light yellowish-green intestinal branches are seen from the dorsal side. Along the median line of the whole body length there is light brown longitudinal band which is not distinctly defined from the ground color. Body periphery is colorless. Marginal eyes very numerous, especially densely distributed at the anterior body end, and extend

backwards as far as behind the brain. Cerebral group consists of about 30 ocelli with a pair of ventral eyes. In this species the pharynx is very long comparing with other species of this genus, and hence genital pores are widely separated from the month. The copulatory apparatus is a usual type of this genus as represented in the text-figure.

Locality: Susaki near Simoda.

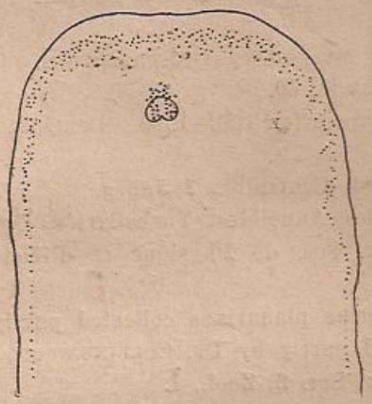


Fig. 61.
Prosthiostomum susakiensis sp. nov.; arrangement of eye-spots. ×33.

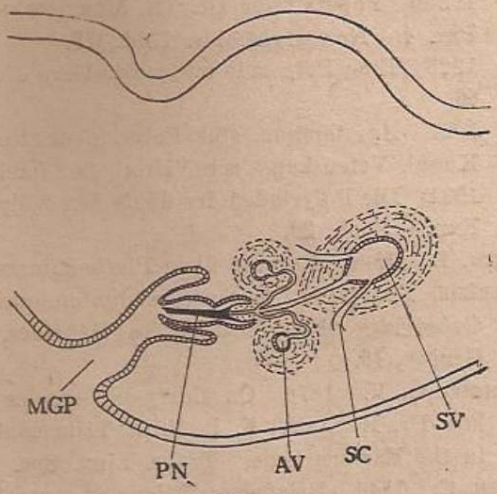


Fig. 62.
Prosthiostomum susakiensis sp. nov.; longitudinal section through genital organs. ×55.

Genus ***Enchiridium*** BOCK, 1913

148. ***Enchiridium japonicum*** KATO, 1943

Enchiridium japonicum, KATO 1943b, p. 75, 76, pl. 3, fig. 1; text-figs. 9, 10.

Locality: Suô, Formosa.

Genus ***Amakusaplana*** KATO, 1938

149. ***Amakusaplana ohshimai*** KATO, 1938

Amakusaplana ohshimai, KATO 1938a, p. 573–575, pl. 37, figs. 4, 5; text-figs. 24–26.

Locality: Magarizaki near Tomioka, Amakusa. Found on Madreporarians.

Literature

BLAINVILLE, de. 1826 et 1828 Dictionnaire des Sciences naturelles. Art. Planarie., **41**, 1826; Art. Vers. **56**, 1828 Planches. 2e partie: Régne organisé. Zool. Vers et Zoophytes 1816–30. Planche 40. Paris.

BOCK, S. 1913 Studien über Polycladen. Zoologiske Bidrag från Uppsala, **2**.

—— 1922 Two new cotylean genera of polyclads from Japan and remarks on some other cotyleans. K. Svenska Vetenskapsakademien, Arkiv för Zool., **14**.

—— 1923a Two new acotylean polyclads from Japan. Ibid., **15**.

—— 1923b *Boninia*, a new polyclad genus from the Pacific. Nova Acta Reg. Soc. Sci. Uppsala. Ser. 4, **6**.

—— 1924 Eine neue *Stylochoplana* aus Japan. Arkiv för Zool., **16**.

—— 1925a Papers from Dr. TH. MORTENSEN's Pacific Expedition 1914–16. 25. Planarians, Parts 1–3. Videns, Medd. Nat. For., Kjöbenhavn, **79**.

—— 1925b Papers from Dr. TH. MORTENSEN's Pacific Expedition 1914–16. 27. Planarians, Par. 4. New stylochids. Ibid., **79**.

—— 1926 Eine Polyclade mit muskulösen Drüsenorganen rings um dem Körper. Zool. Anz., **66**.

—— 1927 *Apidioplana*, eine Polycladengattung mit muskulösen Drüsenorganen. Göteborgs Kungl. Vetenskaps- och Vitterhets-Samhälles Handl., **30**.

—— 1931 Die Polycladen der deutschen Südpolar Expedition 1901–1903. Deutsche Südpolar Exped. Zool., **20**.

BÖHMIG, L. 1896 Referat über Plathelminthes. Zool. Centralbl., 3 Jahrg.

CLAPARÈDE, ED. 1861 Recherches anatomiques sur les Annélides, Turbellariés, Opalines et Grégarines observés dans les Hébrides. Mém. Soc. de Physique et d'Histoire nat. Genève, **16**.

COLLINGWOOD, V. 1876 On thirty-one species of marine planarians collected partly by the late Dr. KELAART, F. L. S. at Trincomalee, and partly by Dr. COLLINGWOOD, F. L. S. in the Eastern Seas. Trans. Linn. Soc. London, Ser. 2, Zool., **1**.

DARWIN, C. 1844 Brief descriptions of several terrestrial Planariae, and of some remarkable marine species, with an account of their habits. Ann. and Mag. Nat. Hist., **14**.

DELLE CHIAJE, S. 1822–1829 Memorie sulla storia e notomia degli animali senza vertebre del regno di Napoli. 1822 **1**, 1823; **2**, 1825; **3**, 1828; **4**, 1829 Napoli.

—— 1841 Descrizione e notomia degli animali invertebrati della Sicilia citeriore osservati vivi negli anni 1822–1830. 1841 Napoli.

DIESING, C. M. 1850 Systema Helminthum. **1**. Vindobonae 1850.

—— 1862 Revision der Turbellarien-Abtheilung: Dendrocoelen. Sitzungs-berichte der Mathem.-naturw. Classe der kais. Akad. der Wissenschaften zu Wien, **44**.

EHRENBERG, C. G. 1831 In HEMPRICH et EHRENBERG: Symbolae physicae. Animalia evertebrata exclusis insectis percensuit Dr. C. G. EHRENBERG. Series prima cum tabularum decade prima. Continet animalia africana et asiatica 162. Berolini 1831 Fol. Phytozoa Turbellaria africana et asiatica in phytozoorum tabula IV et V delineata.

GRAFF, L. 1892a Über pelagische Polycladen. Verh. Deutschen Zool. Ges., 2. Vers.

—— 1892b Pelagische Polycladen. Zeitschr. wiss. Zool., **55**.

GRUBE, ED. 1840 Actinien, Echinodermen und Würmer des adriatischen und Mittelmeere. Königsberg.

—— 1855 Bemerkungen über einige Helminthen und Meerwürmer. Archiv Naturgeschichte. Jahrg. 21, **1**.

HALLEZ, P. 1890 et 1893 Catalogue des Turbellariés (Rhabdocoelides, Triclades et Polyclades) du Nord de la France et de la Côte Boulonnaise récoltés jusqu'à ce jour. Extrait de la Revue Biol. du Nord de la France, **2**. Lille 1890; Edition augmentée et entièrement remanié, 1893.

—— 1913 Vers. Polyclades et triclades maricoles. Deuxième expédition antarctique française (1908–1910) ommandée par le Dr. JEAN CHARCOT. Paris.

HASWELL, W. A. 1907 Observations on Australian polyclads. Trans. Linn. Soc. London, Ser. 2, **9**.

HYMAN, L. H. 1940a Revision of the work of PEARSE and WALKER on littoral polyclads of New England and adjacent parts of Canada. Bull. Mount Desert Island Biol. Lab., 1940.
—— 1940b The polyclads of the Atlantic coast of the United States and Canada. Proc. U. S. Nat. Mus., **89**, 3101.
JACUBOWA, L. 1906 Polycladen von Neu-Britannien und Neu-Caledonien. Jena. Zeitschr. f. Naturwiss., **41**.
—— 1909 Les polyclades de la Baie de Sébastopol (In Russian). St. Pétersburg Mém. Acad. Sci., Ser. 8, **24**.
KABURAKI, T. 1923a Notes on Japanese polyclad turbellarians. Annot. Zool. Japan., **10**.
KATO, K. 1934a *Leptoplana gracilis*, a new polyclad turbellarian. Proc. Imp. Acad. Tokyo, **10**.
—— 1934b Polyclad turbellarians in the neighbourhood of the Mitsui Institute of Marine Biology. Japan. Journ. Zool., **6**.
—— 1935a *Stylochoplana parasitica* sp. nov., a polyclad parasitic in the pallial groove of the chiton. Annot. Zool. Japan., **15**.
—— 1935b *Discoplana takewakii* sp. nov., a polyclad parasitic in the genital bursa of the ophiuran. Ibid., **15**.
—— 1936a A new polyclad turbellarian, *Cryptocelis amakusaensis*, from southern Japan. Japan. Journ. Zool., **7**.
—— 1936b Notes on *Paraplanocera*. Ibid., **7**.
—— 1937a Polyclads collected in Idu, Japan. Ibid., **7**.
—— 1937b Polyclads from Korea. Ibid., **7**.
—— 1937c *Stylochus aomori*, a new polyclad from northern Japan. Annot. Zool. Japan., **16**.
—— 1937d Three polyclads from northern Japan. Ibid., **16**.
—— 1937e The fauna of Akkeshi Bay, 5. Polycladia. Ibid., **16**.
—— 1937f Thirteen new polyclads from Misaki. Japan. Journ. Zool., **7**.
—— 1938a Polyclads from Amakusa, southern Japan. Ibid., **7**.
—— 1938b Polyclads from Seto, middle Japan. Ibid., **7**.
—— 1938c On a pelagic polyclad, *Planocera pellucida* (MERTENS) from Japan. Zool. Mag., **50**.
—— 1939a Polyclads in Onagwa and vicinity. Sci. Rep. Tôhoku Imp. Univ., Ser. 4, **14**.
—— 1939b Report of the biological survey of Mutsu Bay. 34. The polyclada of Mutsu Bay. Ibid., **14**.
—— 1940 On the development of some Japanese polyclads. Japan. Journ. Zool., **8**.
—— 1943a A new polyclad with anus. Bull. Biogeogr. Soc. Japan, **13**, 7.
—— 1943b Polyclads from Formosa. Ibid., **13**, 11.
—— 1943c Polyclads from Palao. Ibid., **13**, 12.
LAIDLAW, F. F. 1902 The marine turbellaria, with an account of the anatomy of some of the species. Fauna and Geography of the Maldive and Laccadive Archipelagoes, 1902, **1**, Part 3.
—— 1903a Notes on some marine turbellaria from Torres Straits and the Pacific, with a description of new species. Mem. and Proc. Manchester Lit. and Phil. Soc., **47**.
—— 1903b On a collection of turbellaria polycladida from the Straits of Malacca (Skeat. Exped. 1899–1900). Proc. Zool. Soc. London, **1**.
—— 1903c On the marine fauna of Zanzibar and British East-Africa, from collections made by CYRIL CROSSLAND in the years 1901 and 1902 Turbellaria Polycladida. Part 1. The Acotylea. Ibid., **2**.
—— 1903d Suggestions for a revision of the classification of the polyclad turbellaria. Mem. and Proc. Manchester Lit. and Phil. Soc., **48**, Part 1.

Lang, A. 1884 Die Polycladen. Fauna und Flora des Golfes von Neapel. 11.

Lesson. 1830 Voyage autour du monde exécuté par order du Roy sur la Corvette "la Coquille" pendant les années 1822–1825. Zoologie, **2**, Part 1. Paris.

Meixner, A. 1907a Polyclades recueillis par M. Ch. Gravier dans le Golfe de Tadjourah en 1904. Bull. Mus. d'hist. nat., 1907, 2.

—— 1907b Polycladen von der Somaliküste, nebst einer Revision der Stylochinen. Zeitschr. wiss. Zool., **88**.

Mertens, H. 1832 Untersuchungen über den innern Bau verschiedenen in der See lebender Planarien. Mém. Acad. Imp. Sci. St. Pétersburg, Sér. 5, **2**.

Meyer, F. 1922 Polycladen von Koseir (Rotes Meer). Archiv f. Naturwiss., **31**.

Moore, A. R. 1933 On the rôle of the brain and cephalic nerves in the swimming and righting movements of the polyclad worm, *Planocera reticulata*. Sci. Rep. Tôhoku Imp. Univ., Ser. 4, **8**.

Örsted, A. S. 1844 Entwurf einer systematischen Eintheilung und speciellen Beschreibung der Plattwürmer auf microscopische Untersuchungen gegründet. Copenhagen 1844.

Palombi, A. 1938 Turbellari del Sud Africa. Ibid., **25**.

—— 1939 Turbellari del Sud Africa. Policladi di East London. Ibid., **28**.

Pearse, A. S. 1938 The polyclads of the east coast of North America. Proc. U. S. Nat. Mus., **86**, 3044.

Plehn, M. 1896a Neue Polycladen, gesammelt von Herrn Capitän Chierchia bei der Erdumschiffung der Corvette Vettor Pisani, von Herrn Prof. Dr. Kükenthal im nördlichen Eismeer und von Herrn Prof. Dr. Semon in Java. Jena. Zeitschr. Naturwiss., **30**.

—— 1896b Die Polycladen der Planktonexpedition. Ergebnisse der Planktonexpedition der Humbolt-Stiftung, **2**.

Quatrefages, A. 1845 Étude sur les types inférieurs de l'embranchement des annelés. Mémoire sur quelques planariées marines appartenant aux genres *Tricelis* (Ehr.), *Polycelis* (Ehr.), *Prosthiostomum* (Nob.) *Proceros* (Nob.), *Eolidiceros* (Nob.) et *Stylochus* (Ehr.). Ann. Sci. Nat., Sér. 3, Zool., **4**.

Risso, A. 1818 Mémoire sur quelques gastéropodes nouveaux, nudibranches et tectibranches, observés dans la mer de Nice. Journ. de Physique, de Chimie, d'Histoire naturelle et des Arts. Par M. H. M. Ducrotay de Blainville. **87**.

Schmarda, L. K. 1859 Neue wirbellose Thiere beobachtet und gesammelt auf einer Reise um die Erde 1853 bis 1857. **1**.: Turbellarien, Rotatorien und Anneliden. Hälf. 1. Leipzig.

Stimpson, W. 1855 Description of some new marine invertebrata. Proc. Acad. Nat. Sci. Philadelphia, **7**.

—— 1857 Prodromus descriptionis animalium evertebratorum quae in Expeditione ad Oceanum Pacificum septentrionalem, Johanne Rodgers Duce a Republica Federata Missa, observuit et descripsit. Pars I. Turbellaria Dendrocoela. Ibid., **9**.

Stummer-Trunfels, R. 1895 Tropische Polycladen. 1. Das genus *Thysanozoon* Grube. Zeitschr. wiss. Zool., **60**.

Tseng-Jui Tu. 1939 Geschichtliche Überblick über Studien der Turbellarien in Ostasien und Stand unserer Kenntnisse von diesen. Zool. Jahr. Syst., **73**.

Watanabe, Y. et C. M. Child. 1933 The longitudinal gradient in *Stylochus ijimai*: with a critical discussion. Physiol. Zool., **6**.

Willey, A. 1897 Letters from New Guinea on *Nautilus* and some other organismus. Q. J. M. S., **30**.

Woodworth, W. Mc. M. 1894 Report on the Turbellaria (Albatross-Report 9). Bull. Mus. Comp. Zool. Harvard Univ., **25**, 4.

—— 1898 Some planarians from the Great Barrier Reef of Australia. Ibid., **32**.

Yeri, M. et T. Kaburaki. Description of some Japanese polyclad turbellaria. Journ. Coll.

Sci. Tokyo Imp. Univ., **39**.
—— 1920 Notes on two new species of Japanese polyclads. Annot. Zool. Japon., **9**.

Explanation of Plates

Plate XXVI

Fig. 1. *Stylochus miyadii* sp. nov., longitudinal section through the tentacle. ×29.
Fig. 2. *Prosthiostomum komaii* sp. nov., longitudinal section through genital organs. ×40.
Fig. 3. Same, anterior end of body. ×15.
Fig. 4. *Amemiyaia pacifica* gen. et sp. nov., anterior end of body. ×2.
Fig. 5. Same, longitudinal section through female genital organs. ×40.
Fig. 6. Same, longitudinal section through male genital organs. ×40.
Fig. 7. *Ilyplanoides mitsuii* gen. et sp. nov., longitudinal section through genital organs. ×40.

Plate XXVII

Fig. 1. *Zygantroplana clepeasta* sp. nov. ×12.
Fig. 2. *Pseudostylochus sadoensis* sp. nov. ×6.5.
Fig. 3. *Stylostomum maculatum* sp. nov. ×15.
Fig. 4. *Hoploplana schizoporellae* sp. nov. ×26.
Fig. 5. *Stylochoplana aberrans* sp. nov., eye-spots. ×26.
Figs. 6, 7. Same, longitudinal section through genital organs. ×58.

Plate XXVIII

Fig. 1. *Planocera multitentaculata* sp. nov. ×1.
Fig. 2. Same, longitudinal section through genital organs (small specimen). ×25.
Fig. 3. Same, longitudinal section through genital organs (large specimen). ×6.
Figs. 4, 5. Same, longitudinal section through genital organs to show spines lining vagina bulbosa. ×25.
Fig. 6. *Planocera reticulata* (STIMPSON) longitudinal section through genital organs (small specimen). ×25.
Fig. 7. Same, longitudinal section through genital organs (large specimen). ×25.

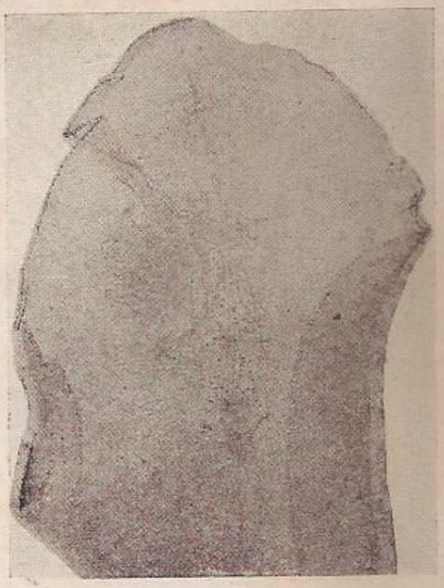
Plate XXIX

Fig. 1. *Prosthiostomum wagurensis* sp. nov. ×12.
Fig. 2. *Eurelepta susakiensis* (KATO), anterior end of body. ×15.
Fig. 3. Same, longitudinal section through genital organs. ×40.
Fig. 4. Same, longitudinal section through uterine vesicle. ×40.
Fig. 5. *Apidioplana okadai* sp. nov. ×15.
Fig. 6. Same, longitudinal section through genital organs. ×80.

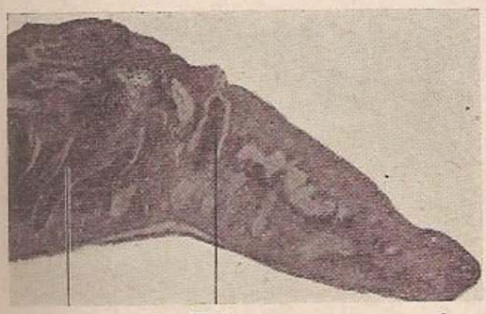
ABBREVIATIONS

AF: antrum femininum, AM: antrum masculinum, AO: apioid organ, AV: accessory vesicle, BC: bursa copulatrix, BR: brain, CGP: common genital pore, CR: cirrus, CRC: cirrus

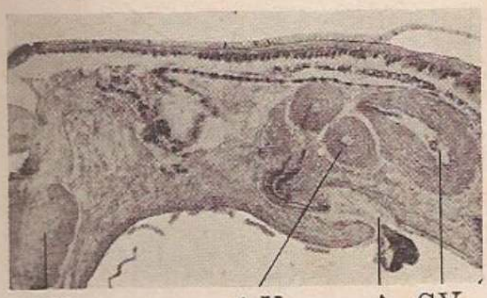
cavity, CUD: common uterine duct, CYG: cyanophilous gland, CYS: cyanophilous secretion, DP: dorsal papilla, ED: ejaculatory duct, EPR: extracapsular prostate gland, FGP: female genital pore, FSV: false seminal vesicle, IN: intestine, LGV: Lang's glandular vesicle, MGP: male genital pore, MO: mouth, MW: muscular wall, PH: pharynx, PN: penis, PNS: penis sheath, PR: prostate gland, PRD: prostate duct, PST: penial stylet, PRV: prostate gland vesicle, SC: seminal canal, SGD: shell gland duct, SGP: shell gland pouch, SHG: shell gland, SK: sucker, SP: spine, SV: seminal vesicle, TN: tentacle, UT: uterus, UV: uterine vesicle, VB: vagina bulbosa, VD: vaginal duct, VE: vagina externa, VI: vagina interna, ♂: male genital pore, ♀: female genital pore.



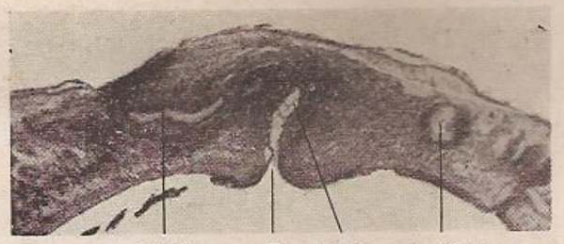
4



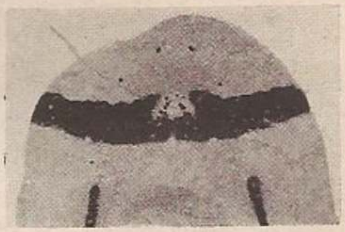
PH TN 1



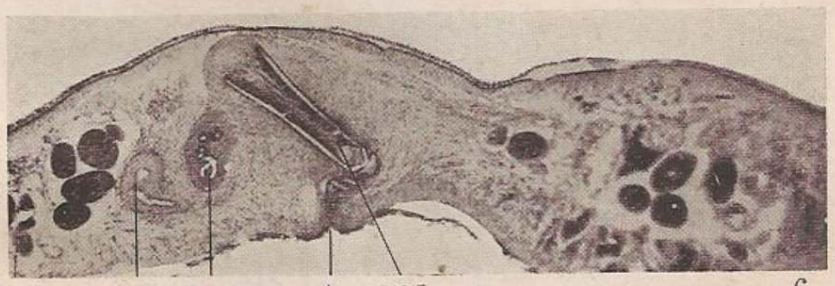
2 PH AV ♂ SV



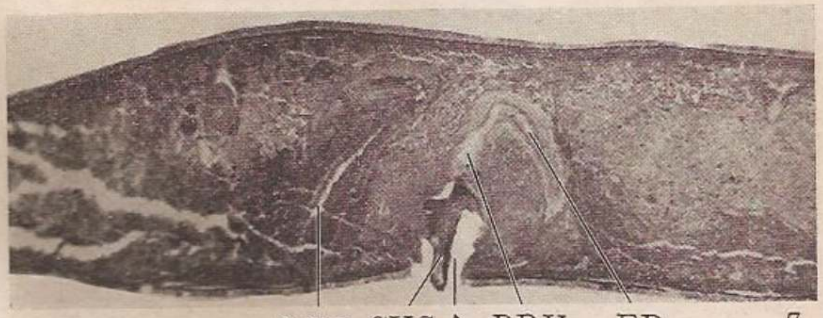
5 SGD ♀ VB LGV



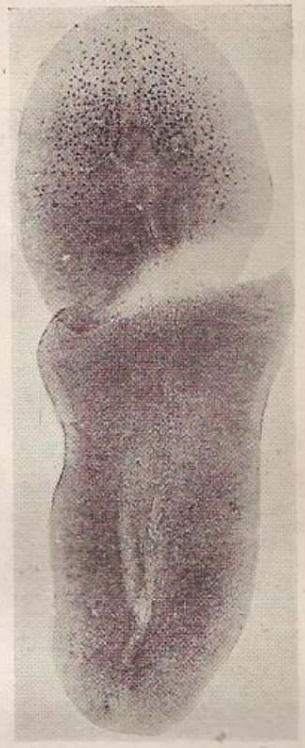
3



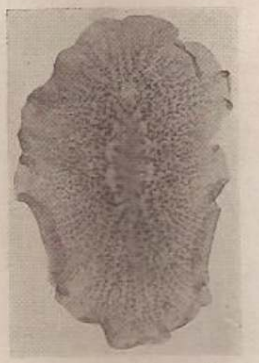
6 SV PRV ♂ PN 6



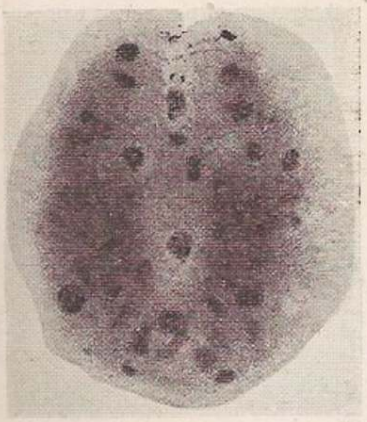
SGD CYS ♂ PRV ED 7



1

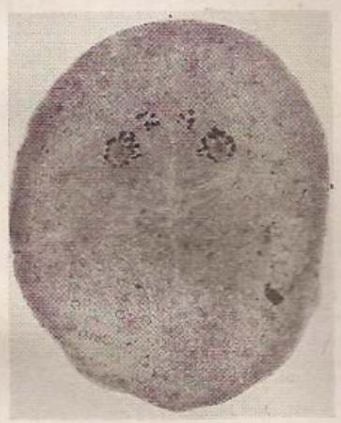


2

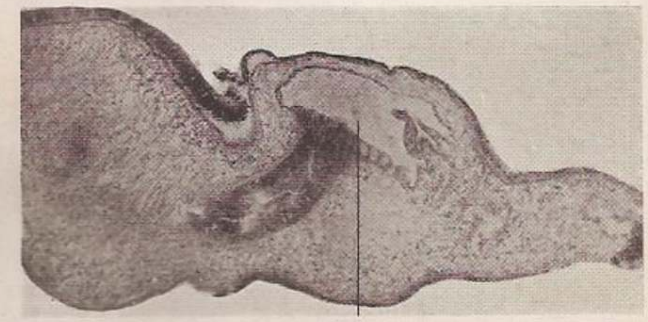


3

5

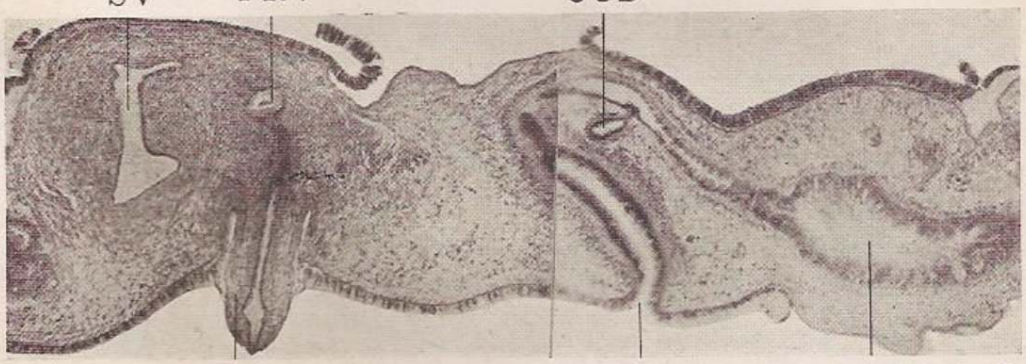


4

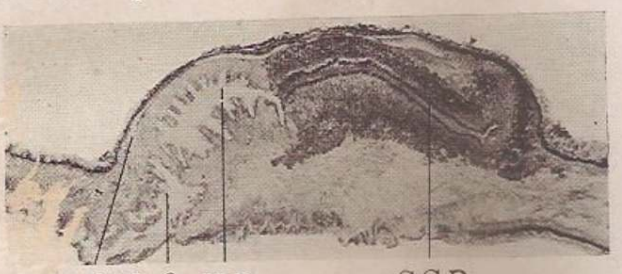


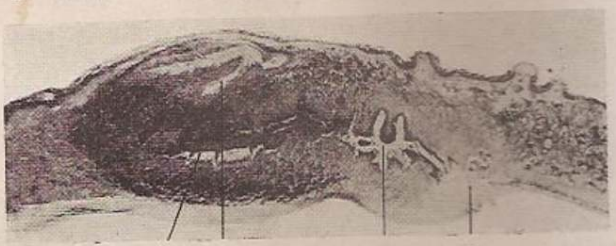
LGV 6

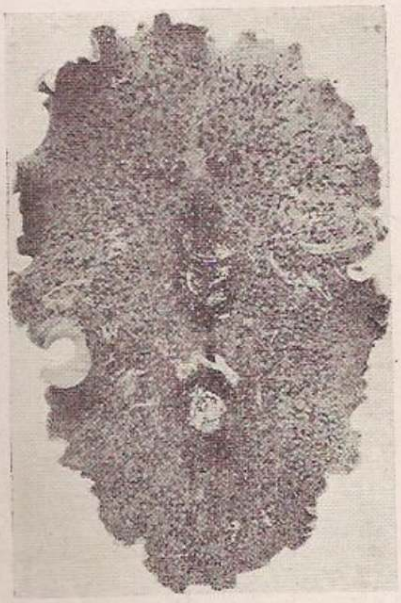
SV PRV CUD

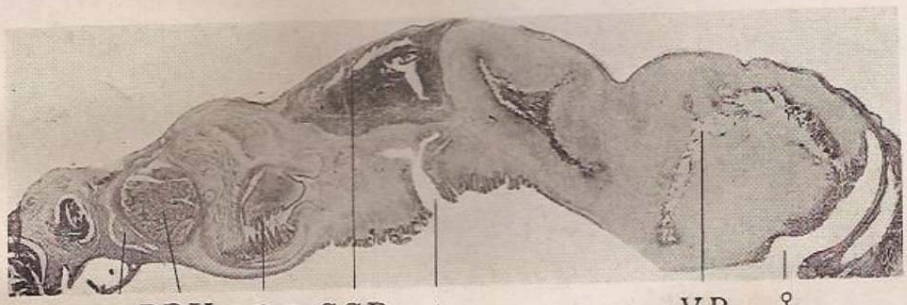


PN ♀ LGV 7

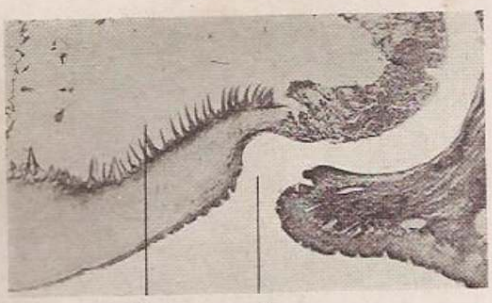

2 LGV ♀ VB SGD

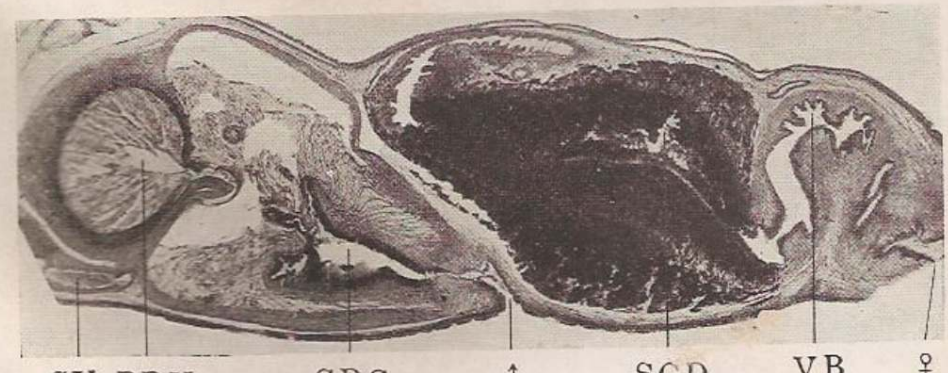

6 SGD CUD VB ♂

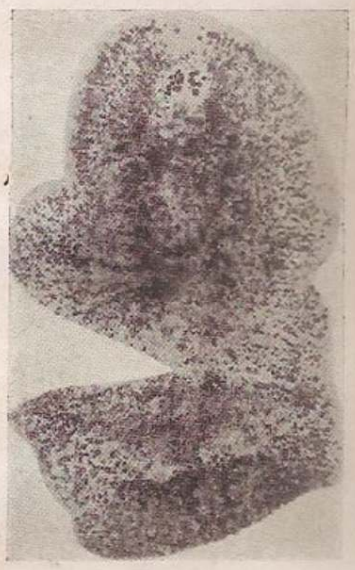

1


SV PRV CRC SGD ♂ VB ♀ 3

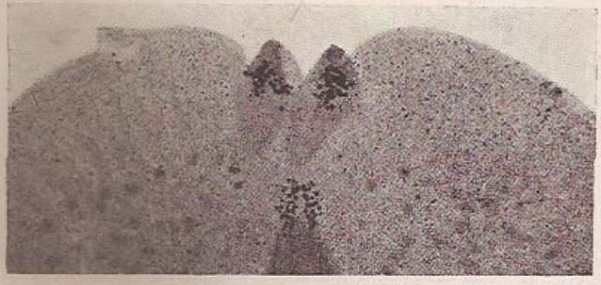

4 ♂ SP


SP ♀ 5


SV PRV CRC ♂ SGD VB ♀ 7

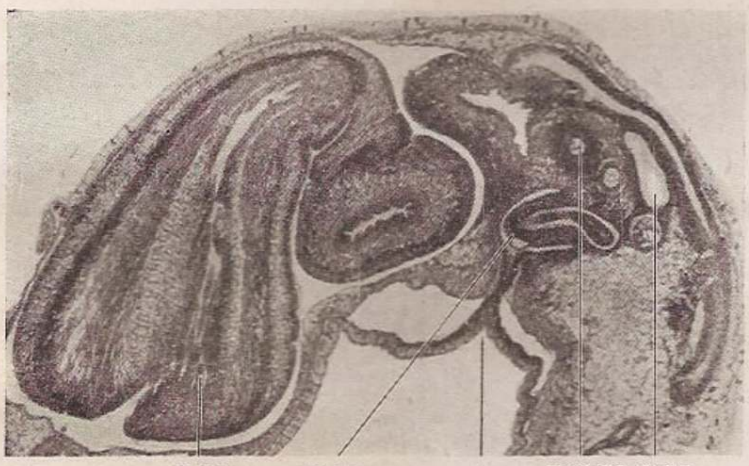


1

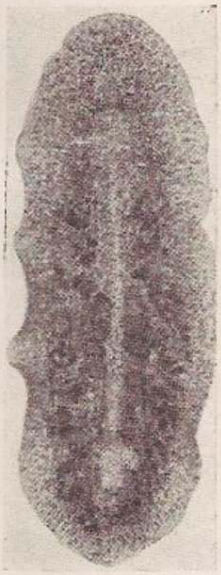


2

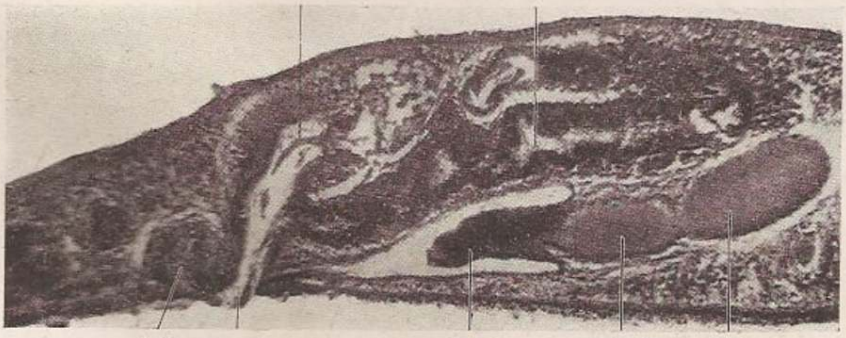
UV 3



4 PH PN PRV SV



5



BC SGD

6 AO CGP PN PRV SV