A NEW MARINE TRICLAD FROM JAPAN

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ONE PLATE AND THREE FIGURES

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The marine triclads occurring in Japan have been represented by four species, *Procerodes lactea*, *Stummeria trigonocephala*, *Ectoplana limuli* (Ijima and Kaburaki, 1916) and *Miroplana trifasciata* (Kato, 1931). In the present paper I propose to describe a new triclad obtained in the autumn of 1936 by dredging from a depth of about 20 meters off Susaki, Idu.

Micaplana misae gen. et sp. nov.

While crawling the body is of an elongate lancet-shape. The ventral side is flat and the dorsal strongly convex. The tentacles are totally lacking. The larger specimen measures 5 mm in length and 1 mm across the broadest part of the body when fully extended.

The body is translucent milky white with a black cross band near the anterior extremity and some black speckles in front of the eyes. This coloration is due to the pigment granules embedded in the dorsal parenchyma. The intestine is red, yellow, brown or black according to the different contents.

At the hind margin of the first tenth of the body are situated a pair of the crescentic eyes which are closely approximated and deeply embedded in the parenchyma.

The epidermis is composed of ciliated cuboidal cells measuring 12 μ in height on the dorsal side and 6 μ in the ventral along the median line. It contains a large number of eosinophilous rhabdites and a small quantity of cyanophilous secretion, the latter being more densely distributed on the dorsal side, especially near the anterior end of the body, than the ventral. These two kinds of secretion are conveyed through the musculature and the basement membrane from

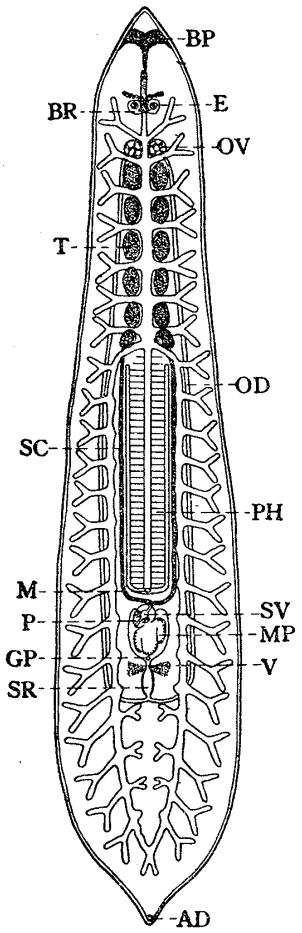

Fig. 1. Schematic representation of *Micaplana misae* gen. et sp. nov. ×45 AD adhesive disk; BP black pigment; BR brain; E eye; GP genital pore; M mouth; MP muscular process; OD oviduct; OV ovary; P penis; PH pharynx; SC seminal canal; SR seminal receptacle; SV seminal vesicle; T testis; V vagina; VG vitelline gland.

the glands embedded in the parenchyma.

The musculature of the dorsal side is made up of the feebly developed longitudinal muscle layer and that of the ventral of a single layer of circular muscle fiber immediately over the basement membrane and of the inner developed longitudinal muscle layer. The dorsoventral muscle fibers are also well developed.

The nervous system of this species agrees in the main with that of other triclads. The brain is located beneath the eyes.

The mouth lies a little in front of the anterior end of the last third of the body leading into the elongate pharyngeal chamber. The pharynx is cylindrical, occupying one-fourth the body-length. The anterior main trunk of the intestine is provided with 7 pairs of lateral branches and with no preocellar pair, while the posterior trunks each give off 15–17 lateral branches and are united at the hind end.

An extremely small adhesive disk is situated at the posterior end of the body.

The genital pore lies nearly halfway between the last third and the last fourth of the body and leads directly into the large genital atrium.

Six pairs of moderately large round testes, ventral in position, are arranged on both sides of the anterior main trunk of the intestine, extending from the second lateral branch to the insertion of the pharynx. The seminal canals, one on either side, run backward along just outside of the ventral nerve cords and near the level of the mouth turn dorsomedially to unite into a single duct which soon merges into the penis bulb to expand into a moderately wide seminal vesicle lined with a folded epithelium. Emerging from the distal end of the vesicle the ejaculatory duct runs dorsad and taking a tortuous course, opens posteroventrally to the genital atrium at the

tip of the penis. The ejaculatory duct is lined with tall columnar cells containing no nucleus and is coated with a thin muscular wall. The penis bulb consists of a very dense network of muscle fibers and embedding in the parenchyma are a large number of eosinophilous and cyanophilous, unicellular glands, the efferent ducts of them opening chiefly into the lumen of the seminal vesicle. The eosinophilous secretion granules are coarse and mostly discharged into the distal portion of the vesicle.

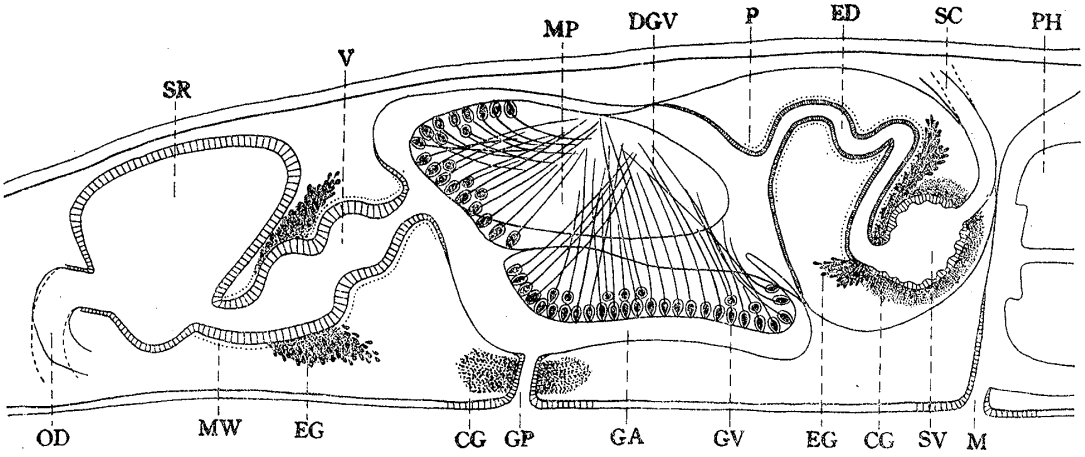

Fig. 2. Longitudinal section through genital organs of *Micaplana misae*, schematized. ×150 CG cyanophilous gland; DGV duct of glandular vesicle; ED ejaculatory duct; EG eosinophilous gland; MW muscular wall; GV glandular vesicle; GA genital atrium; other letters as in fig. I.

The penis is roundly conical in shape in the contracted individual (Pl. 3, fig. 2, 4, P), contrary to the extended animal (Textfig. 2, P). It is devoid of spines or stylets, but provided on either right or left side, with a large muscular process of glandular nature. This process is cylindrical in shape with two lateral folds and is also partly connected with the dorsal wall of the genital atrium. It consists of, as in the penis bulb, the parenchyma and the dense network of muscle fibers and over the entire surface, especially over the lateral folds, are distributed a large number of small glandular vesicles. Each vesicle is ovoid in shape, coated with a muscle fibers and opens by a minute pore at its neck to the genital atrium. The inner side is lined with a flat epithelium, usually full of cyanophilous secretion granules which are conveyed by a long duct from the gland scattering in the parenchyma of the process itself as well as the dorsal wall of the body. Owing to the presence of this muscular process occupying the

most part of the atrium, the penis is found to lie on one lateral side in the atrium.

A pair of ovaries lie ventrally between the first and the second lateral branch of the anterior main intestinal trunk. The uteri run backward along the ventral side just outside of the seminal canal and receive numerous ducts of vitteline glands which are distributed in the parenchyma, occupying chiefly the lateral and dorsal regions of the body, but also the medial region behind the copulatory organs. The uteri turn medially near behind the seminal receptacle and unite into a short common oviduct which directly opens into the seminal receptacle at its posterior aspect. The seminal receptacle is a moderately wide vesicle lined with cuboidal cells and has no muscular wall. It contains usually a mass of sperm, yolk granules or other secretion. From the anteroventral part a duct is sent off anteriorly and passes into a wide vagina which posterodorsally opens into the hind end of the genital atrium. The vagina is also lined with cuboidal cells and coated with a muscular wall. Into the posterior half of the vagina open numerous ducts of eosinophilous glands. The genital atrium opens ventrally to the exterior by a narrow pore into which are discharged a large quantity of cyanophilous secretion.

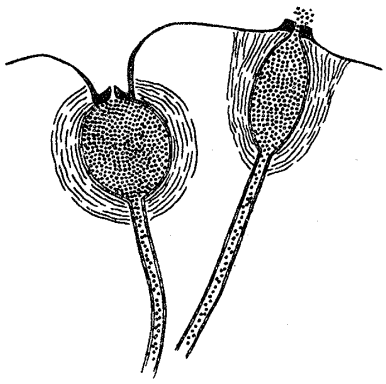

Fig. 3. Glandular vesicles on muscular process of penis of *Micaplana misae*. ×880.

According to Bresslau (1928–33) the Maricola is divided into three families, Bdellouridae, Uteriporidae and Procerodidae, and the last family is classified into five subfamilies, Procerodinae, Ectoplaninae, Cercyrinae, Miroplaninae and Microparynginae. In spite of the possession of the adhesive disk at the posterior end of the body as is usual in Bdellouridae, this free living triclad without a doubt belongs to Procerodidae in the possession of a seminal receptacle behind the penis and of a single genital aperture. The shape of body and the structure of the intestinal system resemble well those of Cercyrinae or Ectoplaninae. However, the possession of the oviduct opening directly into the seminal receptacle and of an asymmetrical muscular process attached to the penis are the most characteristic features of the present species and in these respects a new subfamily Micaplaninae may be established for this planarian.

Micaplaninae is diagnosed as follows:

"Free living Procerodidae with elongate, lancet-like body with fairly pointed anterior and posterior ends. Without tentacles. Without preocellar intestinal branch. Pharynx long, cylindrical. Penis small and conical, provided on one lateral side with a large muscular process of glandular nature. Just outside of the penis bulb the seminal canals unite into a single duct which enlarges into the seminal vesicle in the bulb. The oviduct opens directly into the moderately developed seminal receptacle at its posterior aspect. Type genus: *Micaplana*. Genotype: *Micaplana misae*."

LITERATURE

Böhmig, L. 1906 Tricladenstudien. I. Tricladida Maricola. Zeitschr. wiss. Zool., vol. 81.

Bresslau, E. 1928–33 Turbellaria (Kükenthal u. Krumbach: Handbuch der Zoologie).

Ijima, I. and T. Kaburaki. 1916 Preliminary descriptions of some Japanese triclads. Annot. Zool. Japon., vol. 9.

Kato, K. 1931 A new triclad turbellarian. Proc. Imp. Acad. Tokyo, vol. 7.

Kaburaki, T. 1922 On some Japanese Tricladida Maricola, with a note on the classification of the group. Jour. Coll. Sci. Tokyo Imp. Univ. vol. 44.

Wilhelmi, J. 1909 Tricladen. Fauna u. Flora des Golfes von Neapel. 32.

—— 1911 Citate zur Systematik der marinen Tricladen. Ein Nachtrag zur Seetricladen-Monographie. Arch. Naturg., Bd. I.

PLATE 3

1. *Micaplana misae* gen. et sp. nov. ×25
2. Transverse section at the level of penis. ×130
3. Transverse section at the level of genital pore. ×130
4. Longitudinal section through genital organs of slightly contracted specimen. Pharynx is partly protruded to the exterior. ×130
5. Longitudinal section through genital organs of extended specimen. ×130

ABBREVIATIONS

CG cyanophilous gland; ED ejaculatory duct; GA genital atrium; GP genital pore; GV glandular vesicle; IN intestine; MP muscular process; OD oviduct; P penis; PH pharynx; SC seminal canal; SR seminal receptacle; SV seminal vesicle; V vagina; VG vitelline gland.

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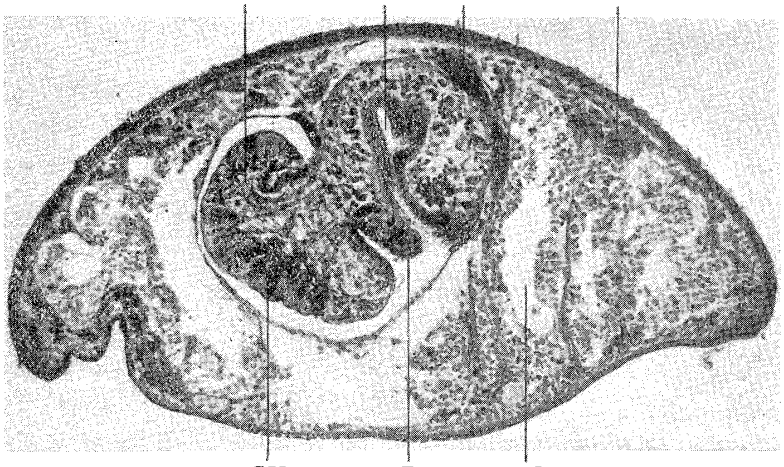

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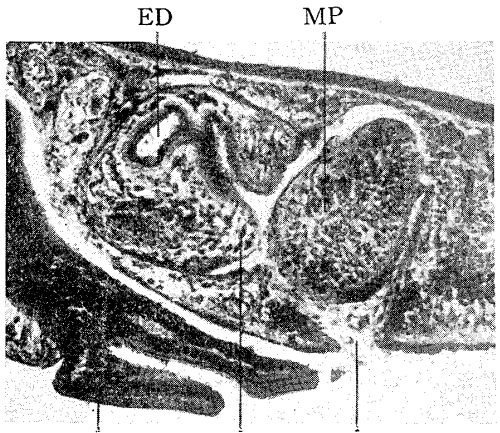

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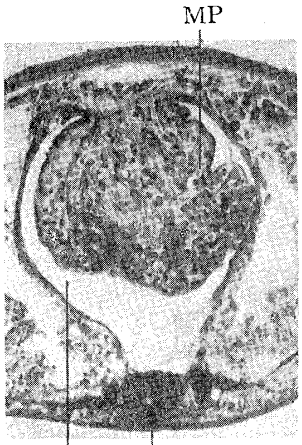

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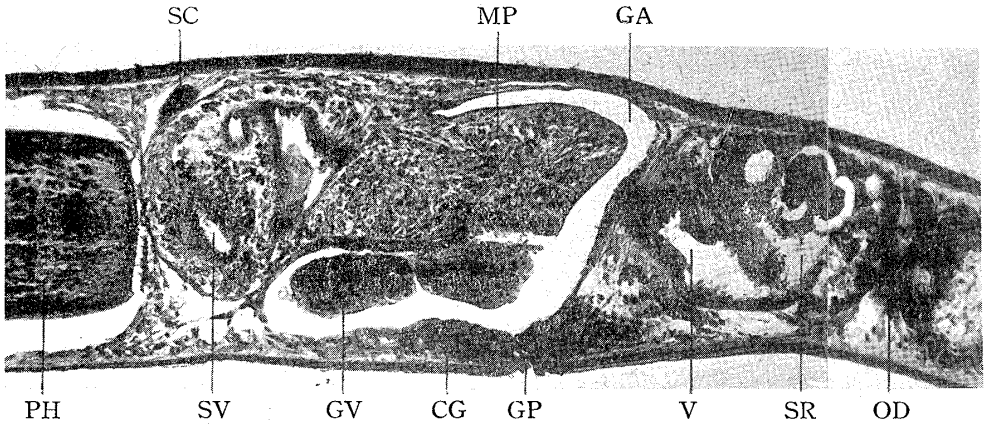

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