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North American Triclad Turbellaria. 14 A New, Probably Exotic, Dendrocoelid

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There was sent for identification by the United States National Museum a single specimen of a fresh-water planarian that had been collected in the Shaw Lily Ponds, Washington, D. C., by H. S. Barber and C. R. Shoemaker, April 10, 1926. A cursory examination of this specimen showed at once that it is something foreign to the planarian fauna of the Americas. Sections have revealed that it is closely related to the Eurasian genus *Bdellocephala* de Man, 1874. Doubtless the animal was carried into the lily ponds with exotic plants. It has appeared to me desirable to erect a new genus for this and some other dendrocoelids that had been put into *Bdellocephala* by their authors.

ORDER TRICLADIDA²
FAMILY DENDROCOELIDAE
Genus *Rectocephala*, new genus

DEFINITION: Dendrocoelidae with an adhesive organ in the center of the anterior margin; colored or white; eyes two or none; penis papilla lacking; ejaculatory duct enters large, expanded, weakly muscular

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² I decline to accept the classificatory scheme for the Turbellaria first proposed by Meixner (1938) and vigorously promulgated by Karling (1940) and Westblad (1948), according to which the Tricladida are reduced to a section of the Alloecoela Seriatea. While no one doubts that the triclads are descended from the seriate alloecoels, the differences between these groups in external appearance and internal structure are considerable. On the same grounds one could insist that mammals be made a section under reptiles. I also cannot accept some other features of the Meixner-Karling-Westblad scheme but will defer consideration of them to some other occasion.

but highly glandular chamber (presumably the penis bulb) continuous posteriorly with the reduced male antrum; common ovovitelline duct enters the roof of the male antrum, immediately anterior to the entrance of the bursal canal.

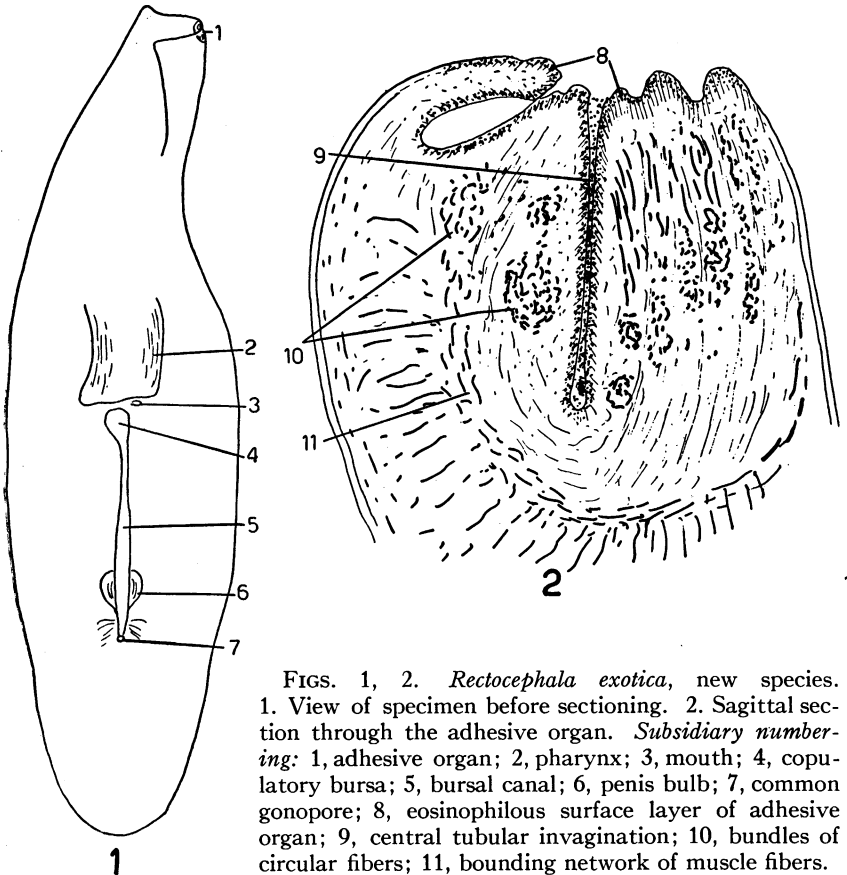
TYPE SPECIES: *Bdellocephala mediobuccalis* Sabussova, 1929.

Rectocephala exotica, new species

Figures 1-4

The specimen, represented whole in figure 1, is 14 mm. long, preserved. The anterior margin appears straight, with a central cushion representing an adhesive organ. No eyes could be seen in the cleared specimen, but sections showed that a pair of eyes is present. The animal appeared to be of a uniform black coloration.

The anterior part was cut off, and both parts were sectioned sagittally.



FIGS. 1, 2. *Rectocephala exotica*, new species. 1. View of specimen before sectioning. 2. Sagittal section through the adhesive organ. *Subsidiary numbering*: 1, adhesive organ; 2, pharynx; 3, mouth; 4, copulatory bursa; 5, bursal canal; 6, penis bulb; 7, common gonopore; 8, eosinophilous surface layer of adhesive organ; 9, central tubular invagination; 10, bundles of circular fibers; 11, bounding network of muscle fibers.

Good sections were obtained of the adhesive organ which is shown in sagittal view in figure 2. As usual in the Dendrocoelidae, the organ is only moderately developed. It has the histological structure typical of such organs. The surface epidermis disappears as it approaches the organ which consists externally of several shallow folds and a deeper median fold, all clothed with an indefinite layer without exact cell boundaries but filled with eosinophilous granules. Definite gland cells could not be discerned. The organ is very muscular. Muscle bundles, running mostly transversely, appear to either side of the central tubular invagination, and the organ is demarcated from the general parenchyma by a curved network of muscle fibers from which fibers extend to the muscle layers of the body wall.

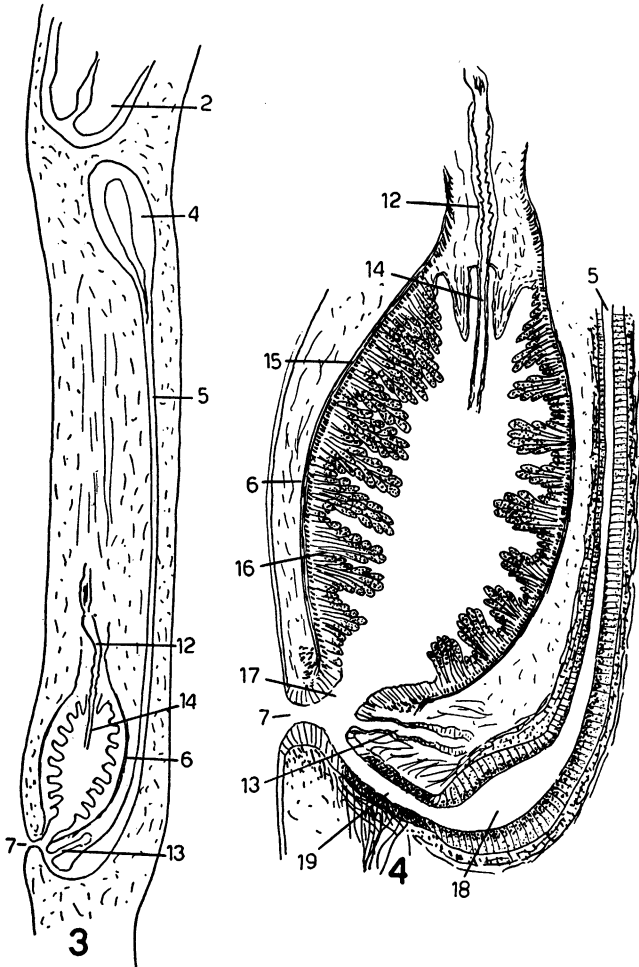
The remainder of the general histology appeared to offer nothing of particular interest. The inner muscular layer of the pharynx plainly shows the lattice intermingling of circular and longitudinal fibers diagnostic of the Dendrocoelidae.

The series of sections of the trunk revealed a fully developed copulatory apparatus, of which a general sagittal view is given in figure 3. The location of the apparatus with reference to the pharynx appears in figure 1. The copulatory bursa is situated as usual directly behind the pharynx, but the bursal canal is very elongated so that the copulatory apparatus lies farther behind the pharynx than is usually the case in fresh-water planarians. The ovaries were found in the sections but appear somewhat far posterior to the anterior end. Testes could not be identified. An abundance of yolk glands is present between the intestinal diverticula. A few sperm are present in the ejaculatory duct. Apparently the animal is protandrous and had passed the male condition.

An enlarged sagittal view of the copulatory apparatus is shown in figure 4. The ejaculatory duct with a somewhat muscular wall enters the anterior end of the main male chamber of the copulatory apparatus and projects for some distance into the lumen of the latter. There is no indication of a penis papilla. The nature of the main chamber of the male apparatus is puzzling, but it may best be interpreted as a penis bulb. It is a large oval body with a thin muscular investment of outer longitudinal and inner circular fibers. The lining epithelium consists of tall slender cells, taller ventrally than dorsally, and is thrown into many folds. The bulbous free ends of the epithelial cells are packed with granules of glandular secretion, apparently cyanophilous, at least not eosinophilous. The secretion is seemingly produced in the epithelial cells themselves, as there is no evidence of parenchymal gland cells opening into the penis bulb.

At its posterior end the penis bulb narrows into a very short male

antrum, lined by an ordinary, non-secretory epithelium and receiving the common ovovitelline duct into its dorsal wall. The male antrum, after being joined by the termination of the bursal canal, exits below by the common gonopore.



FIGS. 3, 4. *Rectocephala exotica*, new species. 3. General sagittal view of the copulatory apparatus. 4. Enlarged view of the terminal part of the copulatory apparatus. *Subsidiary numbering*: 2, pharynx; 4, copulatory bursa; 5, bursal canal; 6, penis bulb; 7, common gonopore; 12, ejaculatory duct; 13, common ovovitelline duct; 14, projection of ejaculatory duct into penis bulb; 15, muscle layer of penis bulb; 16, glandular lining of penis bulb; 17, male antrum; 18, widened part of bursal canal; 19, narrowed, glandular, muscular part of bursal canal.

The copulatory bursa is the usual oval sac located directly behind the pharynx. Its unusually long canal runs posteriorly above the male apparatus, then curves ventrally and opens into the common antrum directly behind the ovovitelline duct. The bursal canal is lined by a cuboidal epithelium, taller dorsally than ventrally, and has a good muscular investment of inner circular and outer longitudinal fibers, somewhat intermingled. At its curve the bursal canal widens considerably, and here the lining epithelium shows evidence of glandular function by the presence of distal granules. The bursal canal then narrows again, and this tubular portion is highly secretory as well as more muscular than the preceding parts of the canal.

Rectocephala exotica is differentiated from other species of the genus by the excessively long bursal canal and the projection of the ejaculatory duct into the anterior end of the penis bulb.

It remains to differentiate *Rectocephala* from *Bdellocephala*. The structure of the type species of *Bdellocephala*, *B. punctata* (Pallas), 1774, has been well elucidated by Ude (1908). From his figure of the copulatory apparatus, it can be seen that the sperm ducts enter a small, highly muscular penis bulb provided with external glands and opening from the ventral side into an extensive male antrum with much folded walls; a definite penis papilla is wanting. Consequently *Bdellocephala* is characterized by the highly muscular, definitely delimited penis bulb with external glands, entering ventrally the expanded male antrum. In *Rectocephala* the large, highly glandular but weakly muscular penis bulb without external glands is axially continuous with and poorly separated from the greatly reduced male antrum. I consider that the following species belong to *Bdellocephala*, in addition to *punctata*: *angarensis* (Gerstfeld), 1858; *annandalei* Ijima and Kaburaki, 1916; *brunnea* Ijima and Kaburaki, 1916; and *parva* Sabussova, 1936. I would transfer the following to *Rectocephala*: *baicalensis* (Sabussov), 1903; *kamtschatica* (Sabussova), 1929; *mediobuccalis* (Sabussova), 1929; and *schneideri* (Komarek), 1930. *Planaria grubiiiformis* Sabussova, 1929, also probably belongs in *Rectocephala*, but the figures furnished by the author are not sufficiently detailed.

The type specimen of *Rectocephala exotica* in the form of sections (10 slides) has been deposited in the United States National Museum (U.S.N.M. No. 24714).

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