Notes on the Turbellarian Fauna of Rochester (N. Y.) with Special Reference to the Anatomy of Macrostomum ontarioense n. sp.*

Frederick Ferdinand Ferguson

Monroe County, New York, is of especial interest to students of Turbellarian fauna because it is one of the few places in our country where comparisons may be made of the fauna at present with that existing in 1884 and 1911 when Silliman and Graff, respectively, described their findings. Of interest also is the Genesee River Falls in this area since it is the habitat of that most striking of American species of Rhabdocoelida, *Mesostoma ehrenbergii* var. *wardii* Ruebush, whose chromosomes (N=4, 2N=8, length up to 32μ) and large translucent body (7 mm.) make it valuable as an experimental form. The many excellent aquatic habitats abounding in and near Rochester present a profitable field from which to obtain information on these organisms. Our present knowledge upon the Turbellaria of this region shows that species of the following genera have been studied: *Catenula, Stenostomum, Dalyellia, Microdalyellia, Castrella, Mesostoma, Phaenocora, Microstomum, Prorhynchus, Jensenia, Olisthanella, Strongylostoma, Rhynchomesostoma, Typhloplana, Castrada, Gyratrix, Polycystis,* and *Macrostomum*. The following is a description of a new species of *Macrostomum* (Rhabdocoelida).

Macrostomum ontarioense n. sp.

Ecology.—Macrostomum ontarioensis was first taken from the rough open shore line waters of Grand View Beach, Lake Ontario in early September, 1941. It was associated with an unusually large number of Protozoa and Crustacea mixed with algae. Altitude, about 247 feet. Geology, glacial.

Description.—Body colorless except for brownish enteron, dorsoventrally compressed (Fig. 1), extremities rounded, broadest at midbody level. Length *ca.* 560μ, width 140μ. Epidermis of flat pentagonal cells (*ca.* 5μ thick) with an overall even coat of cilia. Sensory spines disposed anteriorly (*ca.* 8μ), posteriorly lacking. Sensory hair tufts overall, posteriorly in groups of 2 and 3 (*ca.* 28μ), laterally sparse. Rhabdoids consist of abundant, uniformly dispersed adhesive rods (*Rhabdites*) in groups of 7-8 on the dorsum, of strongly developed anterior streamers of adenal filaments (*Rhabditen-Strassen*) dorsal and ventral to the brain and of ovoidal rods (*Stäbchen*) ventro-radially dispersed at the female gonopore. Brain of semi-lunar contour (*ca.* 20μ thick in mid-line), commissure not discrete. Eyes paired (Fig. 2) and black (*ca.*

* A research award of the A.A.A.S. through the Virginia Academy of Science has materially aided in this work.

12μ long) exactly posterior to brain, closer to each other than to sides of body, pigment granules quite small and not of uniform size. Mouth limited by longitudinal ciliated lips, located antero-ventrally in mid-line (*ca.* 120μ long), abundantly supplied with adenal (*Rhammiten*) glands. *Pharynx simplex* well developed, possessed of latero-posteriorly directed streamers of granule and rhabdoidal gland cells. Enteron colorific, sac-like, longitudinally extending dorsal to female genital atrium, with ciliated endodermal epithelium. Excretory system of paired lateral protonephridia apparently separate, external openings not observed. Testes obovate, smooth walled, latero-ventrally disposed. Vesicula seminalis of all specimens studied considerably distended (*ca.* 35μ in diameter) with sperm cells, walls quite thin. Portal between sperm and granule sacs prominent. Vesicula granulorum relatively small with a central ciliated crypt, distally supplied with numerous rosettes of small granuliferous cells extending far into genital canal of penis stilette. Penis stilette a sharply terminated conical tube with two distinct right angle flexures in different planes somewhat simulating a coiling, base crenated (*ca.* 13μ in diameter), length *ca.* 32μ, external opening terminal with outlet on left side, shows all but last flexure in a dorsal plane, point of stilette is most ventral part of last flexure and is slightly recurved. Ciliated male gonopore very close to posterior end of body. Ovaries paired and lateral, highly granular and indented, rest of female sex apparatus regular. Eggs spherical, grayish-black in female genital atrium (*ca.* 100μ in diameter). Sperm cells undifferentiated threads (*ca.* 20μ long) except for a central chain of spheroidal granules (usually 3 to 4), *Nebengeisseln* lacking.

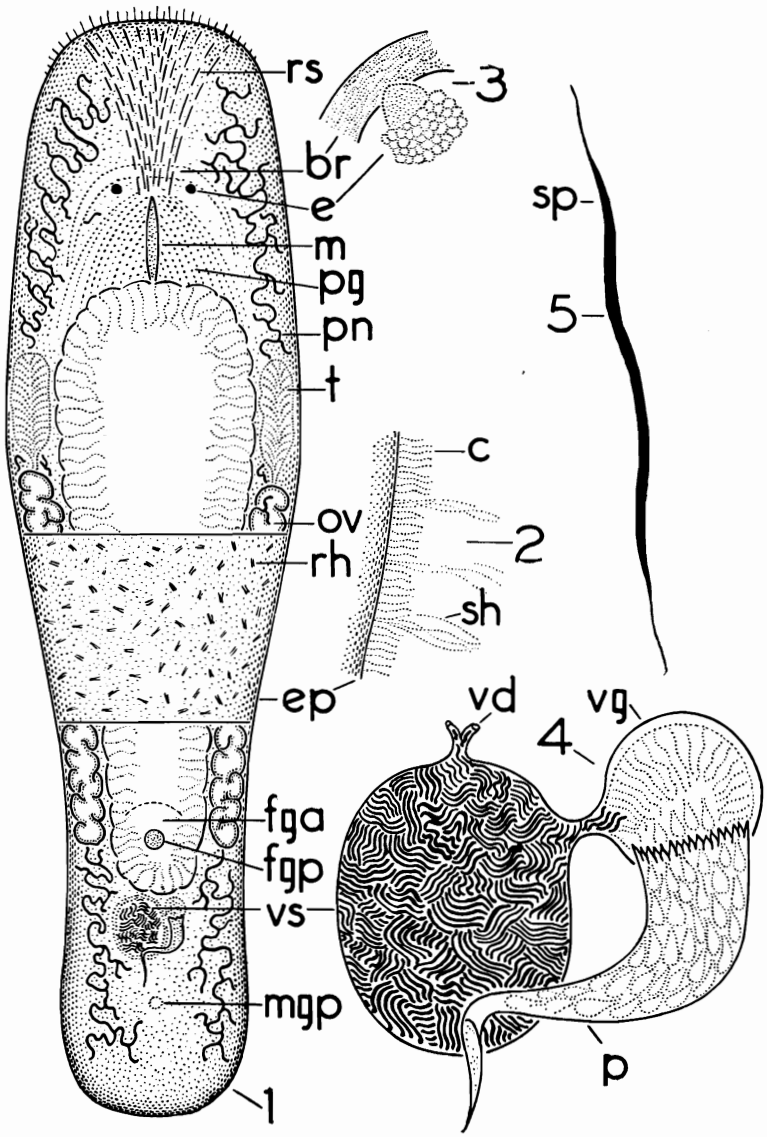
Taxonomic disposition.—Reference to the monograph on the genus *Macrostomum* (Ferguson, 1939-1940) shows that *M. ontarioense* is more closely related to *M. viride, M. collistylum* and *M. lineare* than to other species.

This species is compared to *M. viride* van Beneden because it has an S-shaped penis stilette (See van Beneden, 1870, p. 11). The stilette of the Rochester form has an S-shaped copulatory organ only in the sense that it is doubly flexed. In several other characters these two organisms differ markedly.

M. collistylum Ferguson and *M. lineare* Uljanin have stilettes which are quite distinctly coiled by flexures involving arcs of from 315° to a complete

LEGEND TO TEXT FIGURES

br—brain
c—cilia
ce—ciliated enteron
e—eye
ep—epidermis
fga—female genital atrium
fgp—female genital pore
m—mouth
mgp—male genital pore
ov—ovary
p—penis stilette
pg—pharyngeal glands
pn—protonephridium
rh—rhabdite
rs—*Rhabditen-Strassen*
s—sperm cell
sh—sensory hairs
sp—sensory spines
t—testis
vd—vas deferens
vg—vesicula granulorum
vs—vesicula seminalis



Figs. 1-5. *Macrostomum ontarioense*, n. sp. 1. Gross anatomy showing most of body in dorsal optical section. ×275.—2. Detail of epidermal cilia and sensory hair tufts. ×750.—3. Detail of eye. ×750.—4. Detail of male sex apparatus. ×1500.—5. Detail of mature sperm cell. ×3750.

circle (See Ferguson, 1939, p. 189, Fig. and Uljanin, 1870, p. 9, Fig. 1.). Viewed in dorsal optical section under oil immersion it may be seen that the penis stilette of the New York flatworm begins its curving very near the wide crenated base (Fig. 4), bends to the left as the tube narrows abruptly, dips ventrally at the next turn and finally slightly recurves in its sharpened terminus; thus most of the proximal tube may be viewed in a dorsal plane while the narrowed distal region is seen in a ventral plane of focus. In establishing this form as a new species, it is of interest to note that it belongs to a small group of species whose sperm cells possess rows of chromatin granules as discussed by Phillips (1936). Co-type material will be deposited in the U.S. National Museum.

Differential Diagnosis.—Macrostomum ontarioense. Body colorless, extremities rounded, length 0.5 mm. *Rhabdites, Stäbchen* and *Rhammiten* abundant. Epidermal cilia, sensory spines and hair tufts present. Brain of semi-lunar contour, without marked commissure. Vesicula semianalis thin walled extensive sac, vesicula granulorum small with central ciliated crypt and distal rosette of granuliferous cells. Penis stilette an extended, sharply pointed funnel with two right angle bends, producing a peculiarly twisted tube whose parts do not lie in same plane, length 32μ, external opening on left side of pointed terminus. Male gonopore very near posterior tip of body. Sperm cells elongate threads with a row of chromatic granules but without *Nebengeisseln,* length 20μ.

REFERENCES

FERGUSON, F. F. 1939—A monograph of the Genus *Macrostomum* O. Schmidt 1848. Part IV. Zool. Anz. **128**:188-190. Figs. 1-3. Part V. loc. cit. **128**:276-277. Fig. 5.

GRAFF, L. V. 1911—Acoela, Rhabdocoelida, und Alloeocoela des Ostens der Vereinigten Staaten von Amerika. Zeitschrift. f. wiss. Zool. **99**.

PHILIPS, H. M. 1936—A cytological study of *Macrostomum tuba* von Graff. Zool. Anz. **114**:322-330.

SILLIMAN, W. A. 1885—Beobachtungen über die Süsswasser-turbellarien Nordamerikas. Zeitschrift. f. wiss. Zool. **41**:48-78, pls. III-V.

ULJANIN, W. 1870—Turbellarien der Bucht von Sewastopol. Arbeiten der II. Versammlung russischer Naturforscher zu Moskau 1869. Tom. II. Abtheilung für Zoologie, Anatomie und Physiologie.

VAN BENEDEN, E. 1870—Étude zoologique et anatomique du genre *Macrostomum* et description de deux especes nouvelles. Bull. l'Acad. roy. Belgique, 2. sér., **30**:116-133, pl. 1.

COLLEGE OF WILLIAM AND MARY
AND
VIRGINIA POLYTECHNIC INSTITUTE,
NORFOLK DIVISIONS,
NORFOLK, VIRGINIA.