Description of *Urostyla polymicronucleata*, sp. nov.

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With 1 figure in the text.

A new species of Hypotrichous ciliate, which was discovered early in 1936, is particularly interesting because of the numerous prominent micronuclei which characterize it. The ease with which this species can be cultured, its size, and large number of micronuclei should make it of considerable importance for experimental work.

Urostyla polymicronucleata was found in an infusion of vegetable débris that had remained untouched in the laboratory in a battery jar for several months. The original collection of the material was made in the autumn of 1935 from a small pool close to the edge of the West River in Edgewood Park near the outskirts of New Haven, Connecticut.

The genus *Urostyla* was established by EHRENBERG (1832 a). He did not at this time, however, do more than mention it as a new genus with two species, and of the two species only one was named. This was *U. grandis*, which he thought might be synonomous with MÜLLER's (1786) *Trichoda patens*. The genus was placed in the *Oxytrichina*, accompanied only by the description, "styli; uncini nulli:". Mention was made of the genus again by EHRENBERG (1832 b) shortly thereafter, and although the species *grandis* was described in some detail, the limits of the genus were still neglected. The

first true definition of the genus was given by EHRENBERG (1838) when he wrote, "Character: Animal ex Oxytrichinorum familia, ciliatum, stylis munitum, uncinis carens.", but there was as yet no mention of the number of ventral rows of cilia as a diagnostic character. This characteristic, and a still more complete generic description first appeared when STEIN (1859) wrote, "Character: Körper sehr metabolisch, langgestreckt, elliptisch, oblong oder eiförmig, vorn und hinten abgerundet; 3 oder mehrere griffelförmige Stirnwimpern; 5—12 dünne griffelförmige Afterwimpern; 5 oder mehrere Längsreihen von borstenförmigen Bauchwimpern". STEIN also added *U. weissei* (*Oxytricha urostyla* of CLAPARÈDE and LACHMANN (1858)) and *U. viridis* to the previously described *U. grandis*. He believed that CLAPARÈDE and LACHMANN'S *Oxytricha multipes* and PERTY'S (1852) *Oxytricha fusca* were the same as *U. grandis*.

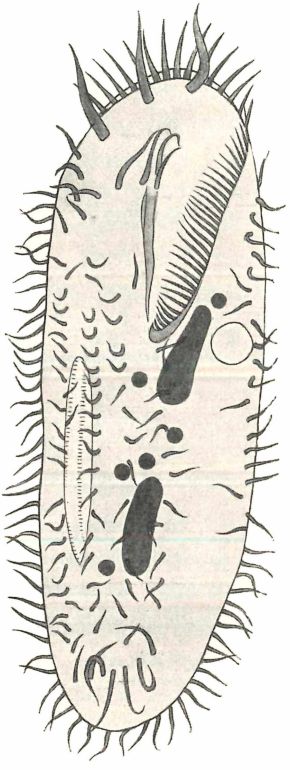

Fig. 1. Ventral view of *Urostyla polymicronucleata*, sp. nov. Semi diagrammatic. × 500. (Typically ingested diatom sp. included in drawing.)

After STEIN various species were added from time to time to the genus *Urostyla*, among them *U. intermedia* by BERGH (1889), which did not belong there since it had but two rows of ventral cilia. Accordingly KAHL (1935) removed this species to the genus *Holisticha*. The five or more rows of ventral cilia continued to be a characteristic of the genus *Urostyla* from the time of STEIN, and appeared in every important reference up to KAHL; he lowered the number to four rows, thus including a new species, *U. dispar*. The species about to be described also has four rows of ventral cilia, and therefore falls within the genus *Urostyla* as delimited by KAHL.

Urostyla polymicronucleata is typically elliptical in shape when viewed from the dorsal or ventral aspect. Normal specimens average 225 micra in length, and 65 micra in width at the middle of the body, although individuals of much smaller or greater dimensions are relatively common. Both the anterior and posterior ends of the

animal are bluntly rounded. The ventral surface is of course flat, the dorsal convex; the body is definitely flexible. Living specimens invariably appear to be a dark green or brown and are very nearly opaque. Large diatoms are commonly ingested and frequently stand out conspicuously in the bodies of these animals. The live *polymicronucleata* are most regularly seen crawling along the bottom; when swimming, they proceed in a typical spiral path. They have subsisted in a culture medium of oat infusion containing *Chilomonas* and *Colpidium*, but have developed most abundantly in pond water in which Oscillatoria and diatoms were predominant.

The morphology of *U. polymicronucleata* has been studied in both living and stained material, and has revealed the following facts. There are three large and conspicuous frontal cirri, and ten smaller frontals, which may be divided into two groups of six and four respectively. The group of six is on the right side of the animal, that of four is medianly situated. There are seven anal cirri in an oblique line, of which only two extend beyond the posterior end of the animal. The ventral cilia form four longitudinal rows which are often hard to distinguish distinctly. Of these rows, the two on the right side always form straight lines, while the other two are much less definite in their alignment. Marginal cilia are clearly in evidence save on the anterior half of the left side of the animal, where they become slightly ventral. There are characteristically thirteen stout cilia along the margin of the frontal field. The single contractile vacuole is situated on the left side just beside the posterior end of the peristomal field, which is definitely triangular and extends more than one third of the length of the body.

The presence of two extensive macronuclei and the relatively large number of conspicuous micronuclei is most striking in stained individuals. The macronuclei are elongate, averaging 25 by 8 micra; the micronuclei are typically perfectly round and exceptionally large, their diameter being about 4.4 micra. The micronuclei range from three to eleven in number; in most cases there are five to seven, and accordingly the name *polymicronucleata* appears appropriate for this new species.

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Bibliography.

Bergh, R. S. (1889): Recherches sur les noyaux de l'Urostyla grandis et de l'Urostyla intermedia n. sp. Arch. de Biol. Vol. 9 p. 497—513.

Claparède, E. and J. Lachmann (1858): Études sur les Infusoires et les Rhizopodes. Geneva. p. 141 and 143.

Ehrenberg, C. G. (1832 a): Beiträge zur Kenntniss der Organisation der Infusorien und ihrer geographischen Verbreitung. Abh. Akad. Wiss. Berlin. Aus dem Jahre 1830 p. 43.

— (1832 b): Über die Entwickelung und Lebensdauer der Infusionsthiere; etc. Ibid. Aus dem Jahre 1831 p. 119.

— (1838): Die Infusionsthierchen als vollkommene Organismen. Leipzig. p. 369.

Kahl, A. (1935): Urtiere oder Protozoa, I: Wimpertiere oder Ciliata (Infusoria). Die Tierwelt Deutschlands, etc. Jena. p. 540, 564 and 585.

Müller, O. F. (1786): Animalcula Infusoria fluviatilia et marina, etc. Hauniae (Copenhagen). p. 181.

Perty, M. (1852): Zur Kenntniß kleinster Lebensformen, etc. Bern. VIII, 228 p.

Stein, F. R. (1859): Der Organismus der Infusionsthiere, etc. Leipzig. I. Abt. p. 191—206.