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### MÉMOIRES ORIGINAUX

## Description of a new Flagellate (Protozoa : Mastigophora) *Chilomastix qadrii* n. sp. from frog in India

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### Summary

A new flagellate, *Chilomastix qadrii* n. sp., is described from the rectum of the frog *Rana tigrina* (Daud) in Hyderabad, India. Body pear-shaped with a caudal spike;  $7.71-13.37 \mu \times 5.66-10.28 \mu$ ; Nucleus a little behind the anterior tip of body, with one or two central or eccentric endosomes; blepharoplasts three, between the nucleus and anterior end; Cytostome large, sac-like, about  $1/3$  to  $1/2$  body length and with one cytostomal fibril.

### Résumé

L'auteur décrit un nouveau flagellé, *Chilomastix quadrii* n. sp. à partir du rectum de la grenouille *Rana tigrina* (Daud) à Hyderabad, aux Indes. Le corps est en forme de poire avec une petite pointe caudale;  $7.71-13.37 \mu \times 5.66-10.28 \mu$ ; le noyau est un peu en arrière de l'extrémité antérieure avec un ou deux endosomes centraux ou excentriques; trois blépharoplastes sont entre le noyau et l'extrémité antérieure; le cytostome est de grande taille en forme de poche et atteint le tiers ou la moitié de la longueur du corps avec un seul filament.

Numerous interesting flagellates were found during the course of a survey of the intestinal flagellates of amphibians of the Hyderabad region. The common frog, *Rana tigrina* (Daud), was particularly rich in its flagellate fauna, harbouring parasites of five different genera, namely *Rhizomastix*, *Chilomastix*, *Trichomitus*, *Monocercomonas* and *Hexamitus*. One of these, a new species of the genus *Chilomastix*, is described in this communication.

The organism was found in the rectal contents of the frog and could be easily distinguished from the others by its sluggish motion along a spiral path.

The parasite has a somewhat ovoidal body, with a pointed spike-like posterior end (figs. 4, 5). The spike is very clear and conspicuous in the living organisms and reaches a maximum length of 3.09  $\mu$ . In many of the stained preparations, however, the posterior end appears rounded, possibly due to the effects of smearing and fixation. The anterior end of the organism is broad and convex (figs. 3, 6, 7, 9). The cytoplasm is vacuolated (figs. 7, 9) and also contains bacteria and other granules. The pellicle is thin, but stains clearly (figs. 1, 3).

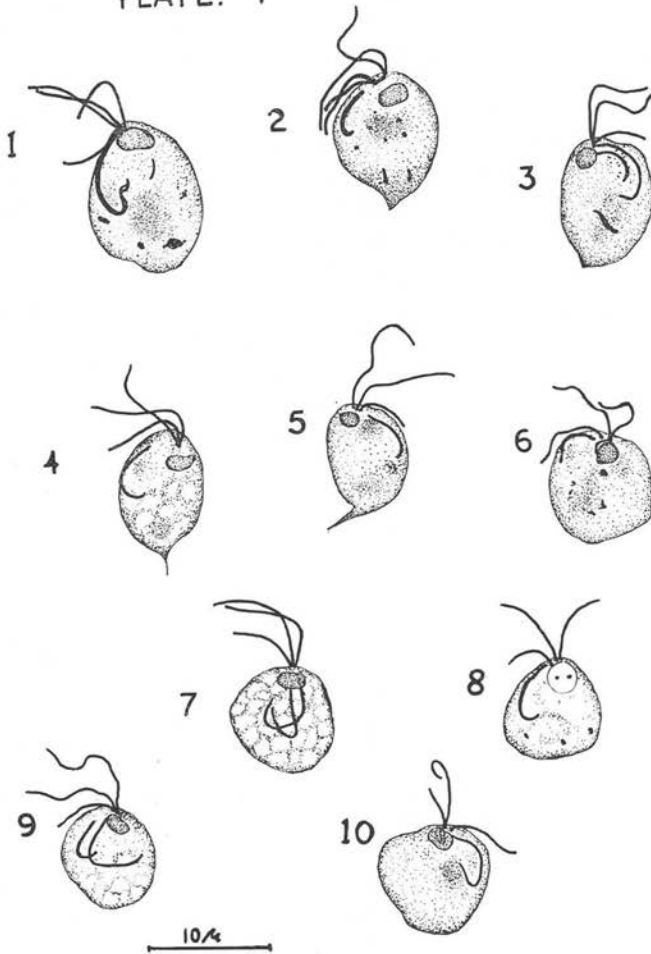
The nucleus is situated about 1  $\mu$  from the anterior tip of the body (figs. 2, 3, 5). It is rounded (figs. 3, 5, 6, 8) or transversely elongated (figs. 1, 4, 7) and has a distinct nuclear membrane inside which is a mass of chromatin granules and a small eccentric endosome (fig. 10). In extremely well differentiated specimens, there are two endosomes lying side by side, about 0.50 to 0.75  $\mu$  apart (fig. 8).

The blepharoplastic complex consists of three granules situated between the nucleus and the anterior end (figs. 5, 6, 8). These granules are close to one another and often stain together showing one (figs. 1, 4) or two (figs. 2, 9) blepharoplastic masses. The first of these gives rise to two anterior flagella, the second to the third anterior flagellum and the third to the recurrent flagellum extending into the cytostome. The first two anterior flagella are unequal and measure 3.60 - 8.74  $\mu$  and 5.66 - 10.28  $\mu$ , with averages of 5.95  $\mu$  and 7.74  $\mu$  respectively. The third anterior flagellum is the longest, ranging from 6.68  $\mu$  to 11.31  $\mu$ , with an average of 8.92  $\mu$ . The recurrent or the cytostomal flagellum is the shortest, being 3.09 - 6.17  $\mu$ , with an average of 4.37  $\mu$ .

The cytostome is large and conspicuous, situated on the ventral side and extending upto one-third or half the body length (figs. 1, 4, 8, 10). It is 2.57 to 6.17  $\mu$  long (average 4.34  $\mu$ ). It is slightly narrow anteriorly and broad posteriorly, giving it a sac-like appearance. The outer border of the cytostome has a thick and deeply staining filament running all along its length and recurving at the posterior end of the cytostome (figs. 1, 7, 10). This is the right cytostomal fibril which arises from the third blepharoplast, along with the cytostomal flagellum. The left fibril was not seen.

The average dimensions of the parasite, taken from fifty specimens selected at random from different smears, showed that the length of the body ranges from 7.71 to 13.37  $\mu$ , with an average of 10.58  $\mu$ , while the width of the body was 5.66-10.28  $\mu$ , with an average of 8.63  $\mu$ .

PLATE. I



*Chilomastix qadrii* n. sp.

FIG. 1-6. — From smears fixed in methyl alcohol after exposure to osmic vapours and stained with Giemsa's stain

FIG. 7-10. — From smears fixed in Schaudinn's fluid and stained with Heidenhain's Iron Haematoxylin. All figures drawn about 2.000 X

### Discussion.

Parasites of the genus *Chilomastix* Alexeieff, 1912 are reported from numerous vertebrates, but mammals harbour the maximum number of species. Many species show considerable variations and the validity of the specific identity of many of these forms is doubtful. Nie (1948) made an extensive study of this genus in man, mouse, rabbit, guinea pig, chicken, salamander and marine fish and suggested that features which had taxonomic value in distinguishing different species are such as i) the position of the nucleus; ii) the quantity and distribution of the endosomal substance in the nucleus and iii) the form and size of the organism as well as the cytostome, in combination with other characters.

Keeping this in view, a comparison of the present organism with those described so far, shows it to be different from them. *Chilomastix caulleryi* Alexeieff, 1909 from axolotls and tadpoles has a twisted body drawn out posteriorly and a vesicular nucleus at the extreme anterior end of the body. The organism described herein has a pear-shaped body and a nucleus a little (about 1  $\mu$ ) away from the anterior end. The pattern of the distribution of the endosomal substance within the nucleus is also different in the two. Further, while *C. caulleryi* ranges from 15 to 30  $\mu$  in length, the present species is distinctly smaller, showing a range of 7.71 - 13.37  $\mu$  in length.

Bishop (1935) described *Chilomastix* sp. from *Bufo vulgaris*. This organism has a carrot-shaped body tapering gradually, a vesicular nucleus with one or two endosomes at the periphery and four blepharoplasts. As contrasted with this, the new parasite described has a pear-shaped body, one or two central or eccentric endosomes and only three blepharoplasts. It is also markedly smaller in size, being 7.71-13.37  $\mu \times$  5.66 - 10.28  $\mu$  as against 18.00 - 45.00  $\mu \times$  8.00 - 12.00  $\mu$  in Bishop's species.

*C. gigante* Nie, 1948 from salamanders and the present species differ from one another in the shape and size of the body as well as the structure of the endosome. *C. gigante* has a much elongated body, with a snout-like anterior end and a large cap-like endosome at the anterior border of the nucleus while the flagellate under discussion is pear-shaped, with a rounded anterior end and one or two central or eccentric endosomes. Also the former is relatively larger in size than the present organism.

*C. bursa* Moskowitz, 1951 and *C. wenyoni* Janaki Devi, 1961 from reptiles are larger in size than the present form and also have larger cytostomes. Besides, the former has one and the latter four blepharoplasts, while that under discussion has only three.

Compared with the various species from mammals, the new organism comes nearest in size and structure to *C. wenrichi* Nie, 1948. However, that species has a nucleus placed close to the anterior end and with little endosomal substance while the new species has the nucleus a little behind the anterior end and with distinct endosome. Also, *C. wenrichi* is only 4.30  $\mu$  broad, as against this parasite which is 8.63  $\mu$  broad.

In view of these differences, the organism is considered new to science and named *Chilomastix qadrii* n. sp., after Dr. S. S. Qadri, Professor of Zoology, O. U. Post-graduate centre, Warangal, Andhra Pradesh (India).

SPECIES : *Chilomastix qadrii* n. sp.

HOST : *Rana tigrina* (Daud).

HABITAT : Large Intestine and Rectum.

LOCALITY : Hyderabad, India.

The type slides are deposited in the Department of Zoology, Marathwada University, Aurangabad, M. S., India.

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