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# Kleinere Mitteilungen.

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## On some fresh-water Rhizopods and Flagellates from Kashmir.

By

**B. L. Bhatia**, M.Sc., F.Z.S., F.R.M.S.

(Principal Government College, Hoshiarpur, India.)

(With 2 figures in the text.)

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Fresh water Protozoan forms are cosmopolitan in their distribution, and the forms met with in India are not very different from those known from European countries. Still our knowledge of the occurrence of various Protozoan forms in different parts of India is very inadequate, and a survey of the fauna is necessary.

I have previously published a number of papers on the fresh-water ciliates of Lahore. In 1924, I had the opportunity of studying the fresh-water Protozoa of Kashmir during my summer vacation. Although I was chiefly interested in the ciliates, I also examined, identified and made permanent preparations of a certain number of rhizopods and flagellates.

Srinagar is a particularly favourable spot for studying the fresh-water forms. There are the Dal Lake and its numerous estuaries, and numerous other big and small pools and puddles. I had taken with me complete equipment and a number of works of reference. I would however like to express my thanks to my friend Prof. BAHADUR SINGH, for affording laboratory accomodation and various other facilities.

Genus *Amoeba* EHRLBG.

This cosmopolitan genus is represented by *A. nitida* PEN. (= *A. proteus* LEIDY), *A. limax* DUJ., and *A. radiosa* DUJ. These common species must have been seen by observers in different parts of India, but none of them is previously recorded from any part of India.

Genus *Arcella* EHRLBG.

Various species were found abundantly in ponds, of which *A. dentata*, EHRLBG., *A. hemisphaerica* PY., and *A. vulgaris* EHRLBG., were identified. Of these *A. hemisphaerica* is being recorded for the first time from India.

*Arcella dentata* EHRLBG.

(= *A. Stellaris* PY.).

Shell provided with 8 or more teeth, as is characteristic of this species.

*Arcella hemisphaerica* PY.

Shell without teeth, broader than high, hemispherical in side view. Diameter of the shell varied from 40 to 50  $\mu$ , the height of the shell being about 33  $\mu$ , and the diameter of the mouth opening about 11  $\mu$ .

*Arcella vulgaris* EHRLBG.

Shell about 60  $\mu$  in diameter, width of the mouth opening about 33  $\mu$ , aperture with inturned margins.

Genus *Hyalosphenia* ST.*Hyalosphenia punctata* PEN.

Elongated bottle-shaped test, with anterior end broadly truncated, surface of the shell finely punctured. Length about 45  $\mu$ , width about 15  $\mu$ .

Genus *Phacus* DUJARDIN.

R. DREZEPOLSKI (1925) has described a number of new species and varieties of this genus from POLAND, and given a complete list of the 23 species described till then. The writer came across only three species of *Phacus* at Srinagar, of which two have been recorded from other parts of India before.

*Phacus pleuronectes* (O. F. MÜLL.).

This species is quite abundant. The body is widest in the posterior region and the tail is curved. The cuticle bears distinct longitudinal striations.

Length of the body  $44\ \mu$ , maximum width  $40\ \mu$ . The tail is about one-fourth the length of the body.

*Phacus triqueter* (EHRBG.).

*Ph. triqueter* (EHRBG.) is generally considered by recent authors as only a distinct variety of *Ph. pleuronectes*, but in my estimation it has as much claim to be regarded a distinct species as many other species of this genus. In my specimens, the body is ovate, and unlike *Ph. pleuronectes* broadest in the anterior half of the body. There is the characteristic keel-like elevation running longitudinally along the dorsal surface, and causing the organism to appear to consist of two leaves superimposed over one another at the keel. The keel is situated nearer the right border. The tail is straight, acuminate pointed, and in direct continuation of the thicker portion bounded by the keel and the left margin of the body. The cuticular surface is smooth, not "finely but distinctly striate longitudinally", as stated by KENT and as shown in his figure copied from STEIN.

Length of the body  $46\ \mu$ , maximum width  $35\ \mu$ . The tail is a little more than one-fourth of the length of the body.

Found in common with *Ph. pleuronectes* in stagnant water.

*Phacus longicaudas* (EHRBG.).

This species is also found abundantly in ponds overgrown with aquatic vegetation.

Genus *Euglena* EHRBG.

Of the 26 species enumerated by DREZEPOLSKI, 4 species were found in Kashmir of which 3 are already recorded from other parts of India.

*Euglena viridis* EHRBG.

Found abundantly in pond water.

*Euglena acus* EHRBG.

Fairly common in pond water.

*Euglena spirogyra* EHRLBG.

Fairly common in pond water at Srinagar.

The organism is of a bright green colour, with its body elongated and sub-cylindrical, seven times as long as broad and spirally twisted. The anterior end is broadly truncate, and the tail-like prolongation at the posterior end is colourless and tapering straight to a point. It is not curved as shown in KENT Pl. 20 fig. 27 or by STEIN (KENT, fig. 28). The cuticular surface is ornamented with numerous warty projections arranged in closely approximated spiral lines. Twenty two such lines can be counted on the exposed surface at the broadest part of the animal.

The gullet is narrow and slit-like. The rounded vacuole is situated immediately behind the stigma. The nucleus is subspherical and situated in the anterior half of the body.

The entire length of the animal is  $140\ \mu$ , of which the tail is  $11\ \mu$ , and the maximum width is 18 to  $20\ \mu$ .

*Euglena oxyuris* SCHMARDT.

Found abundantly in pond-water at Srinagar. The organism is of a green colour, with its body elongated and ligulate, eight or nine times as long as broad. The posterior part of the body is usually folded over or spirally twisted. The tail is slender, tapering and straight. The cuticular surface is obliquely striate, but is not provided with warts, which are characteristic of *E. spirogyra*.

The gullet is funnel-shaped. The vacuole is large, situated just behind the gullet, with the red stigma situated close to it. The nucleus is large, oval, and situated a little behind the middle of the body. There are two large paramylum bodies, or numerous, small and rod-shaped bodies scattered in the plasma. The chromatophores are abundant and distributed throughout the body.

The usual size of the body is  $148\ \mu$  in length, of which the tail is  $18.5\ \mu$ , maximum width of the body being 14 to  $18\ \mu$ .

Genus *Amblyophis* EHRLBG.

EHRENBERG established this genus to include *Euglena* like forms which were rounded posteriorly and did not possess a tail-like prolongation. Perty and other writers considered that the type of the genus merely represented a tail-less variety of *Euglena viridis*. STEIN maintained the generic and specific distinctness of the form. Later writers appear to have abandoned this generic title and

included the tail-less forms also under *Euglena*. In DREZEPOLSKI'S recent work, only one out of 26 species of *Euglena*, viz., *Euglena ehrenbergii* KLEBS is figured without a tail.

I came across a tail-less form, which I would refer to this genus.

*Amblyophis srinagari* sp. nov.

(Text-Fig. 1.)

The organism is of a bright green colour. The body is elongated and subcylindrical, with its length three times as much as its maximum width. The maximum width is in the anterior half of the body, and the posterior half is twisted round. The posterior

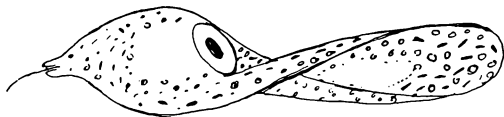


Fig. 1.

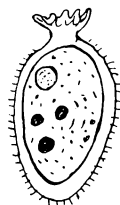


Fig. 2.

end of the body is rounded and without a tail. The nucleus is oval and situated in the anterior half of the body. Chromatophores are green and disc-shaped. Paramylum bodies are numerous, small and rod-shaped.

Flagellum single, cytostome situated at the summit of a projection. A small red stigma and the vacuolar system as in *Euglena*.

Length of the body  $114\ \mu$ , and the maximum width  $37\ \mu$ .

Genus *Trachelomonas* EHRLG.

*Trachelomonas hispida* (PERTY) STEIN.

The species is common and abundant, and the specimens are of the typical form.

Length of the shell  $74\ \mu$ , width  $37\ \mu$ .

*Trachelomonas kashmiri* sp. nov.

(Text-Fig. 2.)

The forms encountered resembled *T. eurostoma* St. in the following respects: — Lorica is ovate and bluntly pointed posteriorly, and about one and a half times as long as broad. The anterior aperture is comparatively wide, and slightly projecting, with its edges crenulate. The surface is however not smooth, but uniformly

and evenly hispid. The anterior projecting portion is not cylindrical (as represented in STEIN'S figure) but like a very short funnel being wider anteriorly and narrower posteriorly, the margin of the funnel being deeply crenulate.

The body is widest about the middle and the dimensions are  $103\ \mu$  by  $66\ \mu$ .

Genus *Peranema* EHRLG.

*Peranema trichophorum* (EHRLG.).

Typical specimens are fairly commonly found.

Genus *Urceolus* MERESCHKOWSKY.

*Urceolus cyclostomus* (STEIN).

Genus *Chilomonas*.

*Chilomonas peramaecium* EHRLG.

Body length  $18,7\ \mu$ , width  $8,5\ \mu$ . Length of flagella  $8,5\ \mu$ .

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