Multiplication of Nyctotherus macropharyngeus.

By

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(With 2 figures in the text.)

Wenyon (1926) in the description of *N. cordiformis* states, "The ciliate multiplies in the usual manner by binary fission, and at certain times encystment occurs. The cyst, which was first described and figured by Stein (1867) is an ovoid structure 80 to 90 microns in length and contains a single ciliate". Quite recently Grassé (1928) writing on the genus *Nyctotherus* states that conjugation as observed in *N. cordiformis* is anisogamous, and is similar to the process in other Heterotricha.

From the observations made by the present writer, it appears that the above facts about *N. cordiformis* do not hold good for *N. macropharyngeus.*

(1) Observations on wet smears kept in moist chambers showed that *N. macropharyngeus* could survive up to a period of 2 to 7 days at room temperature. These specimens did not show division or encystation under the conditions. Sporulation of this ciliate, as obtained and described by Walker could not be reproduced experimentally by the technique suggested.

(2) The processes of multiplication; binary division and conjugation, seem to take place under restrictions of climatic conditions. Since it was not even once that these phases were met with during a period of six months from October to March (winter) in the Punjab (India), when over 200 frogs were searched, and out of which almost 80 % harboured *N. macropharyngeus.* However, it was not the case at Bombay, where the climate is equitable throughout the year. It is here that all the stages of binary fission, and conjugation as described below were met with in September 1930, and January and February 1931.

(3) Apart from the other details of these processes, the conjugants are isomorphic and the fusion is temporary.

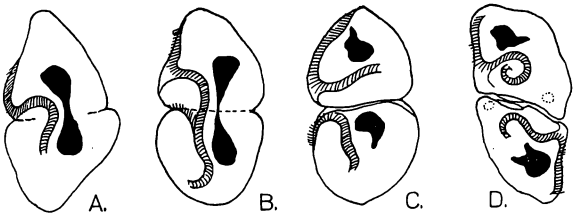

Fig. 1 A, B, C and D [1]). Showing the stages of binary fission.

Binary fission:

It is a transverse division, and as usual the macronucleus takes the lead. The micronucleus does not make itself distinct in this process, and remains masked by the deeply stained macronucleus. The pharynx extendslengthwise a from its curl, and gets cut off into two portions by the division wall. Unlike *Paramaecium* a new mouth is formed at the place where the pharynx is cut. (See A, B, C and D of Fig. 1). The two individuals then rotate so that the mouth comes to lie either on the same side or on the opposite side, but its relation with the nucleus is always maintained the latter being always in front of the pharynx when the ciliate swims.

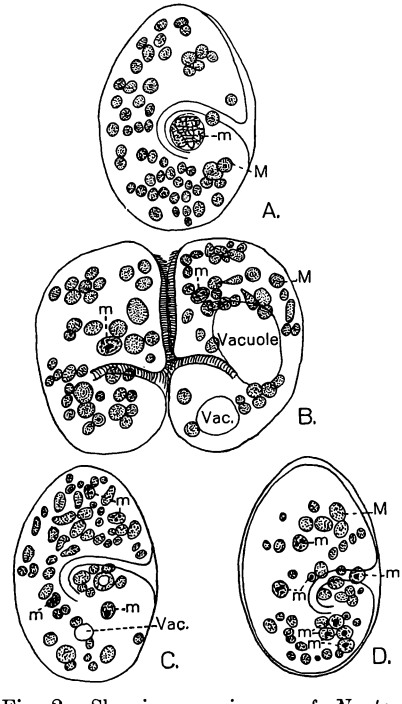

Fig. 2. Showing specimens of *Nyctotherus macropharyngeus* (A) just before conjugation; (B) conjugating gametes; (B and D) just after conjugation.

Conjugation:

The macronucleus breaks up into small lumps. The structure of these lumps is finely granular. The number and size of these lumps is very variable. The micronucleus is clearly seen at this stage as a distinct entity. Figure 2 A shows it lying in the coil of the pharynx. The chromatin material is arranged in the form of a spireme here. This spireme has the structure of a chain of beads.

[1]) Two figures: Camera lucida drawings, magnification 250 diameters.

The conjugants are isomorphic (see Fig. 2 B) and are fused with their mouths facing each other. The conjugation is transient, so that the two individuals separate after the nuclear exchange takes place. Here the micronucleus is distinguished from the lumps of macronucleus by its containing one or more nucleoli.

Apparently, the conjugants after separating divide and re-divide. In Fig. 2 C there are 4 micronuclei, and in Fig. 2 D there are 8 micronuclei. These micronuclei are still distinguishable from the macronuclei by one or more prominent nucleoli contained in them. The macronuclei are all uniformly granular, the granules being very small, and thickly packed.

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