

## OBSERVATION ON AN ENDOPARASITE (APICOMPLEXA : SPOROZOEA) FROM THE EARTHWORM OF WEST BENGAL, INDIA

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A new aseptate gregarine *Monocystis lalbagensis* sp. n. has been described from the seminal vesicles of an earthworm *Metaphire (Pheretima) posthuma* from the soil of Lalbag, Murshidabad, West Bengal, India. The parasite is cone shaped. It measures 62.4 - 108.1  $\mu\text{m}$  in length and 33.2 - 53.2  $\mu\text{m}$  in width. The small gametocyst measures 58.2 - 75.0  $\mu\text{m}$  in length and 32.1 - 50.0  $\mu\text{m}$  in width. The oocyst is biconical in shape with more or less rounded extremities. It measures 6.4 - 6.6  $\mu\text{m}$  in length and 3.1 - 3.2  $\mu\text{m}$  in width.

### INTRODUCTION

The genus *Monocystis* was established by Stein (1848). Later on many scientists worked on the genus *Monocystis*. Ghosh (1923), and Bhatia & Chatterjee (1925) described three new species of genus *Monocystis* from *Metaphire (Pheretima) posthuma*. Levine (1988) listed three species of the genus *Monocystis* from the earthworm. During the course of study of the aseptate gregarine of earthworm, the authors found a new species of the genus *Monocystis* which has been described here.

### MATERIALS AND METHODS

The seminal vesicles of earthworm were dissected out and placed on glass slides with a drop of 0.5% NaCl solution. Thin film of seminal fluid were then drawn and covered with a cover slip for examination of protozoan parasite in living condition under a phase contrast microscope. For permanent preparation of slide the content of seminal vesicles were air dried and were fixed in Schaudinn's fluid for 20 minutes and Bouin's fluid for 2 to 3 hours. The slides were then kept in 70% alcohol for removal of Mercuric chloride. The smears were then passed through descending grades of alcohol for 5 minutes and brought to the distilled water, kept over night in 3% iron alum solution and stained with Heidenhain's haematoxylin for 20 minutes. The slides were then washed thoroughly and dehydrate in ascending grades of alcohol. It was then cleared in xylene and mounted in Canada balsam.

### OBSERVATIONS

#### *Monocystis lalbagensis* sp. n. (Figs. 1 - 3)

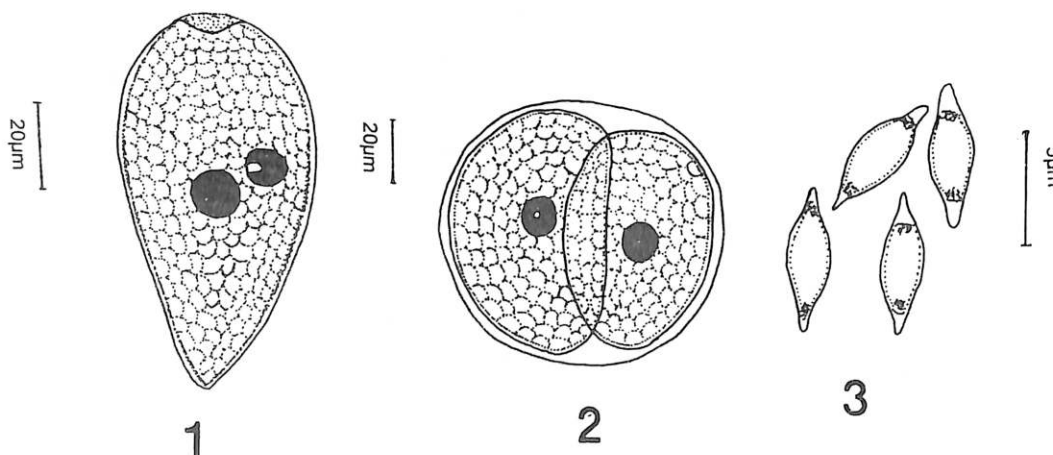
**Trophozoite** : The trophozoite is cone shaped. It measures 62.4 - 108.1  $\mu\text{m}$  in length and 33.2 - 53.2  $\mu\text{m}$  in width with an average of 87.0  $\mu\text{m}$  and 45.3  $\mu\text{m}$  respectively. The nucleus measures 8.3 - 12.5  $\mu\text{m}$  (9.3  $\mu\text{m}$ ) in diameter. The pellicle is distinct but very delicate. The epicyteal striations cannot be seen in either fresh or stained preparations. The endoplasm is excavated by vacuoles. The nucleus is spherical in outline and is situated at the anterior half of the body. The nucleus of the trophozoite measures 8.3 - 12.5  $\mu\text{m}$  in diameter with an average of 9.3  $\mu\text{m}$  (Fig. 1).

**Gametocyst** : The gametocysts are ovoidal in outline and always enclosing two gametocytes of unequal size. The large gametocyst measures in 71.0 - 83.2  $\mu\text{m}$  in length and 45.0 - 76.1  $\mu\text{m}$  in

width with an average of 46.3  $\mu\text{m}$  and 70.2  $\mu\text{m}$  respectively. The small gametocyst measures 58.2 - 75.0  $\mu\text{m}$  (66.0  $\mu\text{m}$ ) in length and 32.1 - 50.0  $\mu\text{m}$  (40.0  $\mu\text{m}$ ) in width (Fig. 2).

*Oocyst* : The oocyst is biconical in shape but their extremities are more or less rounded. It measures 6.4 - 6.6  $\mu\text{m}$  (6.5  $\mu\text{m}$ ) in length and 3.1 - 3.3  $\mu\text{m}$  (3.2  $\mu\text{m}$ ) in width (Fig. 3).

- *Host* : *Metaphire (Pheretima) posthuma*.
- *Incidence* : 8 out of 25 (32%).
- *Period of infection* : October, 1999 to February, 2000.
- *Pathogenicity* : Not apparent.
- *Material* : Syntypes on slide No. MN/12, kept in the Departmental collection will soon be deposited in ZSI, Calcutta.



Figs. 1 -3. *Monocystis lalbagensis* sp. n. 1. Mature trophozoite; 2. Gametocyst; 3. Oocysts.

### DISCUSSION

Of the four species of *Monocystis* have so far been described from *Pheretima posthuma*. Of these three species namely, *M. bengalensis* Ghosh, 1923, *M. lloydi* Ghosh, 1923 emend. Loubatieres, 1955 and *M. pheretimae* Bhatia & Chatterjee, 1925, are known from India. While compared with the previously described species, the parasite from *Metaphire (Pheretima) posthuma* described here displays clear differences in shape and size of the trophozoites, gametocysts and oocysts. The data in Table I together with the morphometric parameters of different species of *Monocystis* clearly shows the differentiating characteristics. The present species differs from *M. bengalensis*, *M. lloydi* and *M. pheretimae* in shape. The present species is considerably larger than *M. bengalensis* but smaller than *M. lloydi* and *M. pheretimae* in length. It is smaller than *M. pheretimae* but larger than *M. bengalensis* in width. The gametocyst of the present species also differs from gametocysts of the previously described three species. The oocyst in the present species is biconical and measuring 6.4 - 6.6  $\times$  3.1 - 3.3  $\mu\text{m}$ . Therefore, *Monocystis* under study is considered as a new species and is designated as *Monocystis lalbagensis* sp. n. after the name of the locality of the host.

**Table I :** A comparative account of *M. lalbagensis* with other species of *Monocystis*.

| Parasite                    | Host                      | Trophozoite   | Gametocyst  | Oocyst   | Reference                            |
|-----------------------------|---------------------------|---|---|--|--------------------------------------|
| <i>M. bengalensis</i>       | <i>P. posthuma</i>        | Elongated, club shaped<br>40-80 x 12-30 $\mu$ m                         | Hemispherical<br>70 to 80 $\mu$ m in diameter   | NS   | Ghosh, 1923                          |
| <i>M. lloydi</i>            | -do-                      | Fusiform<br>100 $\mu$ m   | Spherical or oval 84 $\mu$ m in diameter  | NS   | Ghosh, 1923 emend. Loubatieres, 1955 |
| <i>M. pheretimae</i>        | -do-                      | Spherical, ovoidal, ellipsoidal or dumb-bell shaped<br>200 x 50 $\mu$ m | Spherical<br>80 $\mu$ m in diameter   | NS   | Bhatia & Chatterjee, 1925            |
| <i>M. lalbagensis</i> sp.n. | <i>Metaphire posthuma</i> | Cone shaped<br>62.4-108.1 (87.0) x 32.2-53.2(45.3) $\mu$ m              | Ovoidal<br>71.0-83.2(46.3) x 45.0-76.1(70.2) $\mu$ m, 58.2-75.0 (66.0) x 32.1-50.0 (40.0) $\mu$ m | Biconical<br>6.4-6.6 (6.5) x 3.1-3.3 (3.2) $\mu$ m | Present authors                      |

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