SHORT COMMUNICATION

Bull. zool. Surv. India, 1 (3) : 311-314, 1978

SOME NEW RECORDS OF HYPERMASTIGIDS (PROTOZOA) FROM SAGAR ISLAND, WEST BENGAL

Chakravarty and Banerjee (1956) described three species of hypermastigid flagellates viz., *Holomastigotoides* Grassi and Foa, *Pseudotrichonympha* Grassi and Foa and *Spirotrichonympha* Grassi and Foa from the termites of Calcutta. Later Das (1976) described three more species and ten new records of the species belonging to the aforesaid genera from West Bengal. Subsequently Tiwari (1977) added one more species of *Spirotrichonympha bhadreshwarensis* Tiwari to the flagellates of termites of West Bengal. During the course of further studies on termite flagellates, the author came across four new host records and a new record from West Bengal, of species belonging to two genera viz., *Holomastigotoides* and *Pseudotrichonympha* from Sagar Island, 24-Parganas district, West Bengal.

The Sagar Island is an unexplored area so far as the termite symbionts are concerned. It is approximately 358.4 square kilometers in area. Wood-eating termites were collected from mango (*Mangifera indica*), banyan (*Ficus bengalensis*), pipal (*Ficus religiosa*) and drumstick (*Moringa* sp.). The heavy infestation of the termites were noticed on *Moringa* sp. (Tiwari, 1977a). The guts of the termites were dissected and the smears of the gut contents prepared. The live flagellates were studied in fresh smears of the gut contents diluted with 67% locke's solution, in which symbionts remained more active for a prolonged period. The micropreparations were fixed in Schaudinn's fluid and stained in iron-haematoxylin. All the measurements were taken with the aid of ocular micrometer.

Order HYPERMASTIGIDA
Family HOLOMASTIGOTIDAE

Holomastigotoides bengalensis Chakravarty and Banerjee, 1956

Pl. VII, Fig. A

Description : The body is more or less oval with the anterior part of the body gradually tapering and terminating in a blunt cone while the posterior end is round. The body length measures 67.50 - 72.72 μ (average 69.86 μ) and breadth 41.25 - 45 μ (average 43.12 μ). The spiral bands are dexiotropic. Twenty five spiral bands could be counted from the side of the body. A little portion of the posterior part of the body is devoid of flagellar bands. The axostyle is well developed extending up to the posterior extremity of the body. The nucleus lies anterior, oval in shape and 12.18 × 9.37 μ in size. The prenuclear zone conical, is densely granulated around the anterior end of the nucleus.

Hosts : *Heterotermes* sp., Calcutta (Type host) ; *Heterotermes indicola* (Wasm.), Indian Museum Campus, Calcutta ; *Coptotermes heimi* (Wasm.), Bamankhali, Sagar Island, 24-Parganas district, West Bengal.

Remarks : Chakravarty and Banerjee (1956) described *H. bengalensis* from undetermined species of *Heterotermes*. Das (1976) recorded this species from the host *Heterotermes indicola* (Wasm.) West Bengal. *Copto-*

termes heimi (Wasm.) is therefore a new host record for *H. bengalensis* from Sagar Island, 24-Parganas district. Specimens of *H. bengalensis* in the present study are identical with the types in all respect except that they are slightly smaller and the axostyle is extending up to the posterior extremity of the body wall.

Holomastigotoides hartmanni Koidzumi, 1921

Pl. VII, Fig. B

Description : This species is oval or elliptical in outline and slightly narrowed at the anterior end. It measures 93 - 75 - 175.5 μ (average 110.62 μ) in length and 63.75 - 86.25 μ (average 75 μ) in breadth. The shape of the body seems to be constant. The spiral bands are dexiotropic and are 26 in number. Two types of flagella cover the body. The first variety of flagella covers the major portion of the body except the posterior one fourth. The second variety of flagella at the posterior end are fairly large. The nucleus is oval, situated near the anterior end of the body, measuring 15.93×11.99 μ. The prenuclear zone is well developed. The endoplasm contains a large quantity of fragments of wood of different sizes. The food contents are clearly visible in posterior part of the body. As a result of heavy ingestion of food, mainly wood, the axostyle could not be detected.

Hosts : *Coptotermes formosanus* Shiraki, Formosa (Type host) ; *Coptotermes heimi* (Wasm.), Gangasagar, Sagar Island, 24-Parganas district, West Bengal.

Remarks : Koidzumi (1921) described this species from the host *Coptotermes formosanus* collected from Formosa. Specimens of *H. hartmanni*, collected now from the new host *Coptotermes heimi* from Sagar Island, West Bengal are identical with those described by Koidzumi, except that the prenuclear zone in the present record is very well developed.

Holomastigotoides ogivalis de Mello, 1935

Pl. VII, Fig. C

Description : The body resembles the form of an inverted cup with a blunt finger like elevation, measures 67.5 - 94 μ (average 80.75 μ) in length and 40.5 - 56.25 μ (average 48.37 μ) in breadth. The body is covered by two types of flagella. The shorter flagella occupy the whole of the body in dexiotropic rows while longer ones are situated densely on the posterior surface. The ovoid nucleus is anterior, measures 11.62×9 μ and carries a distinct prenuclear zone. The axostyle is indistinct.

Hosts : *Coptotermes* sp., Daman, India (Type host) ; *C. heimi* (Wasm.), Dharwar, India ; *C. heimi* (Wasm.) Haldia (Midnapur district) and Falta (24-Parganas district) ; *Heterotermes indicola* (Wasm.), Sapkhali, Sagar Island, 24-Parganas district, West Bengal.

Remarks : de Mello (1935) described this species from *Coptotermes* sp. Karandikar and Vittal (1954) and Das (1976) recorded it from *C. heimi*. The species recorded from the new host *H. indicola* from Sagar Island, 24-Parganas district, in the present study is identical with type except in this the finger like elevation is well developed.

Family : TRICHONYMPHIDAE

Pseudotrichonympha cardiformes Karaudikar and Vittal, 1954

Pl. VII, Fig. D

Description : The body is heart-shaped and measures 105.00 - 131.25 μ (average 118.12 μ) in length and 82.2 - 101.25 μ (average 91.87 μ) in breadth. The anterior part consists of a bell like campanula. The

middle portion of the campanula is called rostral tube which measures 15 μ. The tube bears a hemispherical apical cap. The campanular surface is covered by three types of flagella which are distinguishable from one another in regards to their length and location. The flagella of first type are relatively short and confined to the rostral tube region of the campanula. The flagella of second type are the longest and extremely mobile. They arise in a thick circular band just below the first type of flagella. The flagella of the third type which are situated posterior to the circular band of the second type are a little longer those of the first type and arranged in longitudinal rows in a leiotropic manner. They cover the campanula and the rest of the body except the short glabrous end of the posterior extremity. The nucleus is spherical and situated in the middle region of the body. It measures 15 μ in diameter. The endoplasm contains fragments of wood of different size.

Hosts : *Heterotermes malabarica* Snyder and *C. heimi* (Wasm.), Dharwar, Karnatak (Type host) ; *Heterotermes indicola* (Wasm.), Sapkhali, Sagar Island, 24-Parganas district, West Bengal.

Remarks : Karandikar and Vittal (1954) described this species from the host *Heterotermes malabaricus* and *Coptotermes heimi* from Dharwar, India. *Heterotermes indicola* is a new host for *P. cardiformes* from Sagar Island, 24-Parganas, West Bengal. The specimens recorded from *H. indicola* are exactly identical with the type in all characters except that it is smaller.

Pseudotrichonympha subapicalis Karandikar and Vittal, 1954

Pl. VII, Fig. E

Description : The body is generally rounded and swollen anteriorly, slightly narrow posteriorly to a blunt end, measures 172.5 - 195 μ (average 181.66 μ) in length and 82.5 - 90 μ (average 87.5 μ) in breadth. The campanula is situated in the middle in the anterior portion of the body. The campanular region can be seen in the form of two circular areas situated one within the other. The outer circle in the species represents the peripheral margin of the campanula. The middle circle represented the rim along which are arranged the second series of the flagella like the eyelashes. The inner circle has the tiny aperture in the centre. The disc represents flexed upper margin of the rostral tube, while the tiny aperture corresponds to its lumen. The body covered all over with the third series of flagella. The endoplasm is distinguishable in two zones. The zone adjoining the campanular region is finally granular while the rest is full of coarse granules is spherical and is usually found in anterior region, measures 18.12 μ in diameter.

Hosts : *Coptotermes heimi* (Wasm.) and *Heterotermes malabaricus* Snyder, Dharwar, India (Type host) ; *C. heimi* (Wasm.), Bamankhali, Sagar Island, 24-Parganas district, West Bengal.

Remarks : *Pseudotrichonympha subapicalis* collected from the termites of West Bengal. Comparatively smaller in dimension and the anterior end of the body is disc like.

Sincere thanks are due to the Director, Zoological Survey of India for facilities provided for the work. I am also grateful to Dr. A. K. Mandal, Zoological Survey of India, for going through the manuscript and Dr. P. K. Maity of the same department for identifying the hosts used for this study.

REFERENCES

CHAKRAVARTY, M. M. AND BANERJEE, A. K. 1956. Observation of the holomastigotid and trichorymphid flagellates from an Indian termite. *Proc. zool. Soc.*, Calcutta, **9** : 35 - 44.

DE MELLO, F. 1927. Trichonymphids de l'intestine du *Leucotermes indicola* Wasm. avec reference speciale a' la complexite' de leurs phenomines mitotiques. *Trans. 7th congr. East. Assoc. Trop, Med.*, **2** : 582 - 598.

DE MELLO, F. 1935. Sur des Trichonymphids nouveaux des dermites indiens. *C. R. XII congr. Int. Zool. Lisb.* : 1353 - 1380.

DAS, A. K. 1976. Studies on some hypermastigids (Protozoa) from the termites of West Bengal, India, *Acta Protozool.*, Warszawa, **15** (2) : 101 - 124.

KARANDIKAR, K. R. AND VITTAL M. 1954. Flagellates in termites from Dharwar, *J. Univ. Bombay*, **23B** : 1 - 24.

KOIDZUMI, M. 1921. Studies on the intestinal protozoa found in the termites of Japan, *Parasitology*, **13** : 235 - 309.

TIWARI, D. N. 1977. A new species of Spirotrichonympha Grassi and Foa (Protozoa : Mastigophora) from a xylophagous termite from India. *Curr. Sci.*, **46** (7) : 232 - 233.

TIWARI, D. N. 1977a. Destruction of the plant *Moringa* sp. by a wood-eating termite in West Bengal with a note on its symbionts *Newsl. zool. Surv. India*, **3** (3) : 123.

Zoological Survey of India, Calcutta

D. N. TIWARI