

A note on a new species of trypanosoma discovered in the blood of an Indian bullock at Singapore / by P. Scott Falshaw ; and notes by A. Lingard.

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Publication/Creation

Calcutta : Thacker, Spink, 1907.

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A NOTE ON A NEW SPECIES OF TRYPANOSOMA
DISCOVERED IN THE BLOOD OF AN INDIAN
BULLOCK AT SINGAPORE

(2)

BY

P. SCOTT FALSHAW

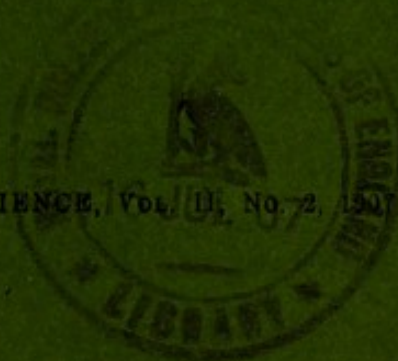
Chief Government Veterinary Surgeon, Singapore

AND NOTES BY

PROF. A. LINGARD, M.B.

Imperial Bacteriologist to the Government of India

FROM THE JOURNAL OF TROPICAL VETERINARY SCIENCE, VOL. II, NO. 2, 1907



CALCUTTA
THACKER, SPINK & CO

1907



A NOTE ON A NEW SPECIES OF TRYPANOSOMA DISCOVERED IN THE BLOOD OF AN INDIAN BULLOCK AT SINGAPORE.

P. SCOTT FALSHAW,

Chief Government Veterinary Surgeon, Singapore ;

AND NOTES BY

PROFESSOR A. LINGARD, M.B.,

Imperial Bacteriologist to the Government of India.

DURING the month of January 1907, Mr. Scott Falshaw forwarded a blood film from an animal which died somewhat suddenly in Singapore to me in Bareilly, with the request "that an opinion might be given with regard to the contained Trypanosoma, as no description of any mammalian trypanosoma approaching the size of this one could be found, except those described at page 251 in Laveran and Mesnil's work, which latter do not correspond in form with the one submitted for examination."

The history of the case as furnished, was as follows : "On the 21st December 1906 I ordered an Indian bullock (a long-horned, humped animal from Madras Presidency) to be discharged from the Municipal Infirmary for Animals. This bullock had been stopped by the P. C. A. Department, while working, on account of being overloaded and emaciated. The animal while in the Infirmary refused the food (cooked rice, etc.), and the owner told me it was only used to sour uncooked rice dust in water, and asked to be allowed to take it home. The animal was then very weak and unable to walk ; no definite symptoms of any kind were noted. Just previous to its departure on the evening of the 21st I found it had a considerable rise in temperature, so took

a film on the only slide available then, namely, a piece of window glass, which I carefully cleaned. I next day found the trypanosome in the specimen, had the bullock brought back, and made films, found nothing in a dozen; same result on the 23rd, and also on the morning of the 24th. At midday the animal's temperature dropped to 97.5°F. , and it died at 2 P.M.

Post-mortem made at 4 P.M.

Blood 0.5 c. c. from interior of heart, injected into the peritoneal cavity of a small dog.

No enlargement of spleen, ecchymosis on peritoneum and pericardium. Microscopic examination of spleen smears, cerebro-spinal fluid, heart's blood, peritoneal exudate, etc., failed to reveal any other parasites. Dog's blood was examined daily up to the 15th January 1907, with a negative result.

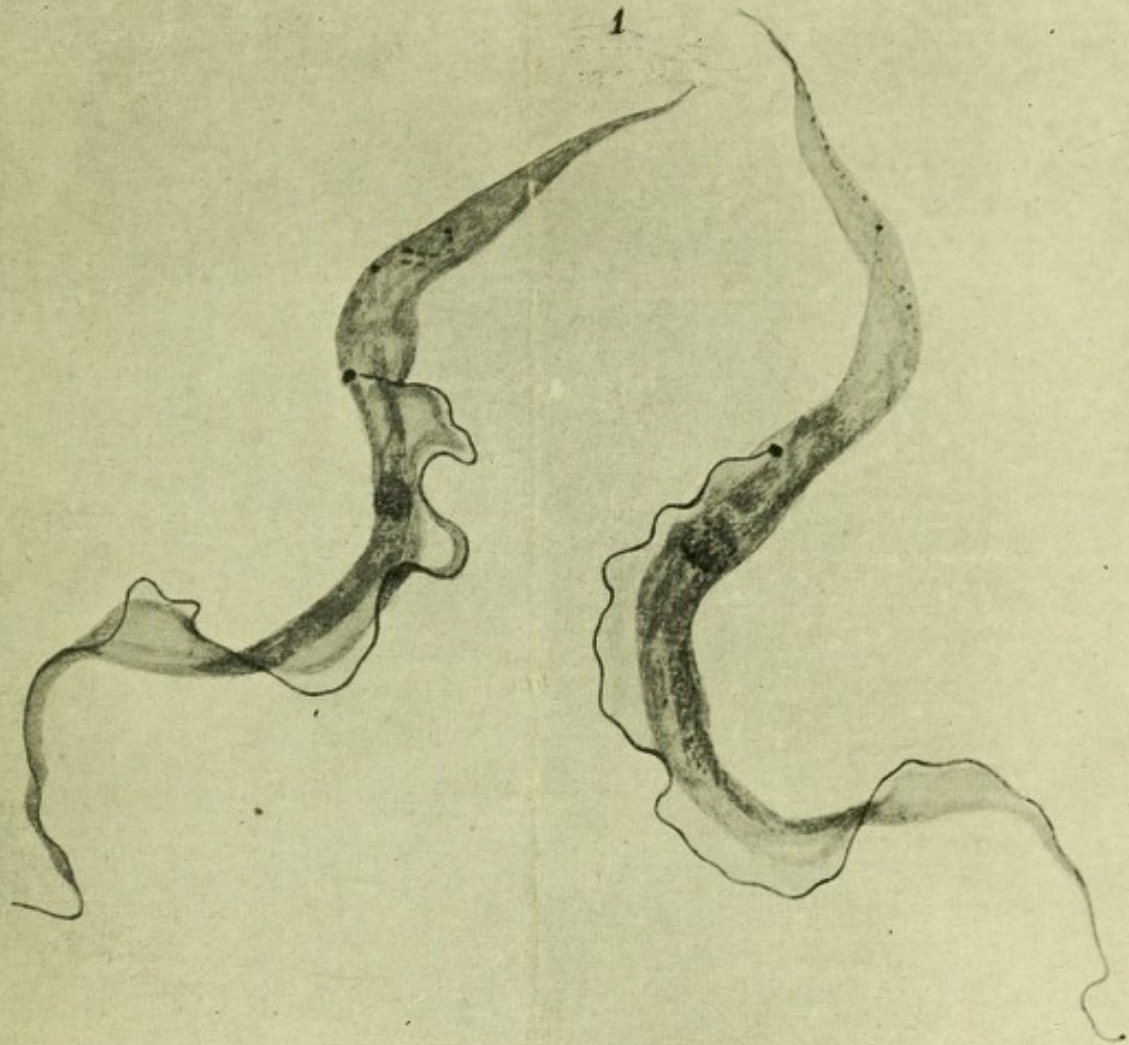
Note on the Microscopical Examination of the Specimen of Blood forwarded.

The blood film stained by the Leishmann-Romanowsky method revealed the presence of the following parasitic forms on microscopical examination.

- (i) Two large specimens of trypanosomata (Fig. 1).
- (ii) Several erythrocytes with classical examples of *Piroplasma bigeminum*. (Fig. 2 j).
- (iii) Micro and macrogametes, the immature forms of a plasmodium found in bovines (h and i).
- (iv) A hæmamoeba.
- (v) A number of free, oval-shaped bodies (Fig. 2 a) and a few intracorpuseular bodies.

(i) *Trypanosoma N. sp.*—Only two flagellates were discovered in the specimen of blood examined. The chief characteristics of which were as follows: the length of the parasites 72.98 and 84.47μ , respectively; the great distance existing between the blepharoplast and the tip of the posterior extremity, equal to 30.20 per cent. of the total length of the mean of the measurements, 78.72μ ; the small size of the nuclei, especially of the blepharoplast; the diaphanous structure of the body protoplasm, particularly of the undulating membrane; the short free flagellum (8.20μ) which

PLATE V.



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in one instance was observed to terminate in a fine knob; and the situation of the reserve material, together with the few chromatin granules observable at the posterior extremity of the body of the trypanosoma.

The measurements of the two specimens of trypanosomata encountered are given in the following table:

Serial No.	Length from posterior extremity of Tryp. to the centre of the blepharoplast.	Length from centre of bleph. to posterior edge of N. nucleus.	Postero-anterior length of N. N.	Length from anterior edge of N. N. to termination of body protoplasm anteriorly.	Length of free flagellum.	Total length of Trypanosoma.	Maximum width of body.
	μ	μ	μ	μ	μ	μ	μ
1	26.25	4.92	2.46	42.64	8.20	84.47	3.28
2	21.32	4.92	2.46	36.08	8.20	72.98	3.28
Mean measurements.	23.78	4.92	2.46	39.36	8.20	78.72	3.28
Percentage of mean.	30.20	6.25	3.13	50.00	10.42	100.00	4.16

From the above it will be seen that four out of the six measurements, respectively, coincide with each other and that the main differences exist in the variations in length of the posterior extremity, and that portion of the body of the parasite which lies between the anterior edge of the nutritive nucleus and the termination of the body protoplasm anteriorly.

Diagnosis.—The only species of trypanosomata that the above described parasite might possibly be confounded with, are the *T. Himalayanum* and the variety of the *T. Muktesari* possessing a short flagellum. On reference to the table in the January number of this year's Journal (Vol. II, No. 1) facing page 46, the percentage of the mean measurements of various species of trypanosomata found in bovines is given. It will then be observed that the length of the posterior extremity of the Singapore trypanosoma exceeds that of any other species by 9 per cent. or more, thus differentiating it as a new species.

Other parasitic forms met with included endo-corpuseular bodies (Fig. 2 a), which in the stained specimen exhibited a somewhat round or oval mass occupying two-thirds or three-fourths of the invaded red corpuscles. These contained a

darkly stained nucleus surrounded by a light halo, and in addition chromatin granules dotted in small numbers through the protoplasm, while in another erythrocyte (c) may be observed two bodies, one circular and the other somewhat pyriform in contour. The former contains two faintly stained nuclei, each respectively being surrounded by a light unstained area.

Certain protozoic forms as illustrated, Fig. 2 (b. g.), occupying erythrocytes, are oval or flask-shaped. They stain in the majority of instances in varying shades of dark red. A nucleus is plainly visible at the more pointed end, while three similar darkly stained bodies can be made out in the broader portion of the same organism. Many similar forms, single and double, were met with, Fig. 2 (d. e. f.), lying free in the blood plasma. These stained in a variety of colours, blue with the nuclei red; pale pink, each of these cells contained a large and small nucleus which took a dark purplish-red; while the majority of forms met with exhibited a purplish-red shade. In length they varied between 1.64 and 2.78μ , while the minimum breadth was found to be 1.3μ .

The single organisms illustrated Fig. 2 (e) and those at (f) each present two nuclei respectively, the smaller of the two the blepharoplast, the larger the nutritive nucleus. These would, therefore, appear to be the immature forms of flagellates, but whether they are closely associated with the large forms of trypanosomata above-mentioned it is impossible to form a definite opinion.
