Onderstepoort Journal of Veterinary Research,
Volume 25, Number 3, March, 1952.
The Government Printer, Pretoria.

Babesia thomasi Sp. Nov., an Intra-erythrocytic Parasite of the Cape Dassie [*Procavia capensis* (Pallas)].

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INTRODUCTION.

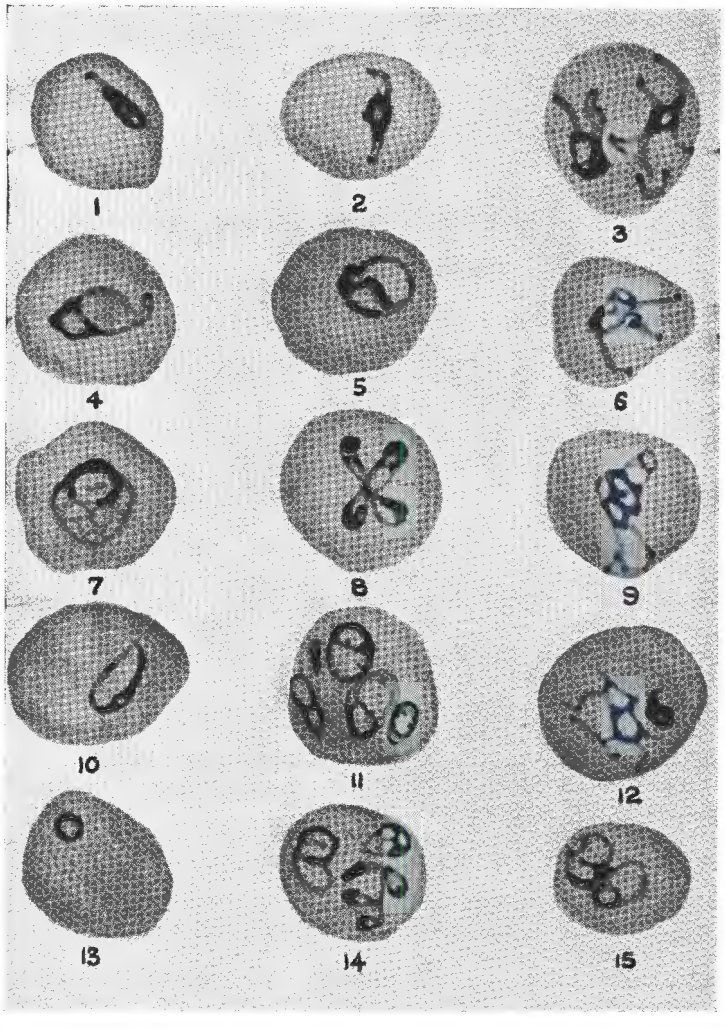
THE CAPE DASSIE is widely distributed in South Africa and in a recent article Thomas (1946) states that "although harmless in itself, it has become a pest in the Cape Midlands very much in the same way as the imported rabbit in Australia". Nothing is known about the role that this animal may play as a reservoir of infection for diseases transmissible to man and domestic animals.

In January, 1946 a number of dassies were obtained from Murraysburg, Cape Province. On arrival they were drafted to the Institute's small animal breeding establishment for observation. A report on similar observations has been published by Murray (1942). Animals surplus to breeding requirements were available for experimental work. In the course of an experiment in which it was attempted to establish whether the dassie is susceptible to *Theileria parva* (Theiler, 1904), one animal was splenectomised 16 days and another 21 days after the infestation with infective brown-tick nymphae (*Rhipicephalus appendiculatus* Neumann). These ticks had been fed only on bovines and sheep for ten generations previous to this experiment. The examination of daily blood smears and smears from the removed spleen proved that *Th.parva* did not develop, but that one dassie harboured a latent infection of a hitherto undescribed blood parasite which appeared six days after the operation.

LABORATORY EXAMINATION.

(*a*) The description of the parasite is based on examination of Giemsa-stained blood and organ smears. The intra-erythrocytic, unpigmented parasite shows a marked pleomorphism in size and shape. It may be round, ovoid or quite irregularly amoeboid with a solid or granular chromatin body as indicated in the appended illustration. The limited number of extra-cellular parasites are either round or ovoid. The smallest stages (Fig. 13) are minute rings 1·5 μ in diameter with a distinct red staining chromatin body situated along the margin. Larger forms which have retained the ring shape as well as the ovoid forms (Fig. 10) have elongate nuclei taking up half the circumference. In still larger forms up to 4·6 μ in size (Fig. 7) the cytoplasm forms a delicate, blue, net-like structure and the nucleus is usually divided into several chromatin masses which are joined by thinner strands (Fig. 9). The amoeboid forms very often show one or more prominent pseudopodium-like processes which may extend to the periphery of the host cell. The terminal ends of the pseudopodia are usually thickened and more darkly staining than the rest of the cytoplasm.

In a heavy infection, after splenectomy, where several parasites occupy a single erythrocyte the various forms, up to 15 in number, may be superimposed upon one another and give the impression of an irregular meshwork in which the chromatin bodies are noticeable.



In splenectomised animals the parasites usually do not become very large and are more inclined to be merely round or slightly ovoid, while in the unoperated rock-rabbit they are generally larger and show a greater variation in size and shape. Then the parasites mostly occur singly in cells.

Multiplication is effected by division into four in which case the daughter individuals are arranged in a cross-like pattern (Fig. 8), but binary fission (Fig. 15) is also evident.

(*b*) *Clinical Symptoms.*—This parasite is only slightly pathogenic for the normal dassie. One such animal reared at this Institute, was given subcutaneously 0·25 c.c. of blood from a splenectomised animal showing a heavy infection. After four days several parasites appeared in the blood-films. They slowly increased in number for about five days and then slowly decreased. After four weeks they could be demonstrated only with difficulty. Listlessness and inappetence were observed for a period of about eight days after the appearance of the parasites.

Splenectomised animals show a completely different clinical picture; four days after an injection of 0·25 c.c. infective blood a healthy, splenectomised dassie showed a heavy infection of parasites in its blood. These increased rapidly in number up to the tenth day when the animal died. Numerous dividing forms could be seen in the erythrocytes. A severe haemoglobinuria, inappetence, listlessness, anaemia and wasting were observed and at autopsy jaundice was evident.

(*c*) *Pathogenicity.*—It was impossible to infect cattle by the intravenous administration of infective spleen material, and guinea-pigs by the intraperitoneal infection of infective blood. The mode of transmission in nature is unknown. From the above description it is obvious that dassies develop a premunity after recovery and that the spleen plays a prominent role in maintaining this.

Classification.

Although this parasite closely resembles *Babesia decumani* Macfie, 1915 of *Rattus norvegicus* (Berkenhout) in Nigeria, it does not seem to be a typical *Babesia* on account of its pseudopodia, the net-like appearance of its cytoplasm and broken-up nucleus. However, if one considers the views of Wenyon, 1926 and Doflein and Reichenow, 1929 it is not justified at this stage to create a new genus.

A consideration of the characteristics of this parasite has led the author to conclude that it is a valid new species for which the name *Babesia thomasi* is proposed in honour of Dr. A. D. Thomas who has been intimately associated with the activities of the Zoological Survey at this Institute.

Summary.

(1) A new species of protozoan parasite in the Cape dassie is described for which the name *Babesia thomasi* is proposed.

(2) This parasite is only slightly pathogenic for normal animals but fatal for splenectomised Cape dassies.

(3) A premunity develops in recovered animals.

(4) Attempts at transmission to cattle and guinea-pigs failed.

(5) The natural transmission is unknown.

(6) The Cape dassie is not susceptible to *Theileria parva* infection.

Acknowledgment.

I wish to thank Miss G. E. Laurence for the careful and accurate preparation of the illustrations in the plate.

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