

SYNOPSIS

The problem which has been worked out in course of the present investigation is entitled "Studies on the malaria parasites of certain Himalayan animals". The work has been dealt with in three parts. The first part includes studies on the malaria parasites of the Himalayan flying squirrels; the second part includes studies on the malaria parasites of certain Himalayan birds while the third part concerns fluorescent microscopic studies on the tissue stages of Hepatocystis and Rayella of the Himalayan flying squirrels.

Part I

Three different flying squirrels have been studied for malaria parasites. These are (i). Petaurista elegans caniceps Gray, (ii). Petaurista magnificus Hodgson and (iii). Hylopetes alboniger Hodgson. Amongst these P. elegans caniceps is being studied here for the first time for malaria infection.

The occurrence of Hepatocystis has been detected in P. elegans caniceps and P. magnificus. In both

these flying squirrels merocysts have been detected in the lung and spleen. A detailed study of the development of merocysts has shown that merocysts develop within the macrophage cells.

It has been confirmed that in flying squirrels growth of merocysts is not confined to liver of the host. It is proposed in this work that Hepatocystis of flying squirrels showing merocysts in lungs and spleen as well as in the liver should be separated from those parasites merocysts of which occur specifically in the liver. A new subgenus Harendrella n. subgen. is being proposed whose type species is H. rayi (merocysts occurring in the liver, lungs and spleen).

Occurrence of Rayella is also recorded here from P. elegans caniceps and P. magnificus. From P. elegans caniceps the occurrence of Rayella is being recorded for the first time. This parasite appeared different from other described species of Rayella and a new specific name Rayella gigantea n. sp. is being proposed. Tissue schizonts of Rayella have been discovered in the lung of P. magnificus for the first time. It has also been found in the present study that the tissue schizonts of Rayella develop within the macrophage cells.

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The tissue schizonts of Rayella in the liver occur in clusters in association with a blood vessel. The cause of cluster formation has so long been in doubt. In the present investigation it could be seen that an infected macrophage cell took a position in a capillary in the liver of Hylonetes alboniger. Following this, other macrophage cells also came and aggregated around this infected cell, themselves became infected and a continuation of this process led to the formation of a cluster of cystic schizonts.

Part II

Malaria parasites have been detected in the following birds:-

- (i). Tragopan satyra, (ii). Ithagenes cruentus, (iii). Niltava sundara, (iv). Xantholaema haematocephala, (v). Leioptila capistrata and (vi). Aethopyga saturata.

In Tragopan satyra the blood forms and the tissue schizonts in the reticulo-endothelial cells of bone-marrow and in the liver have been detected, while in Ithagenes cruentus the blood forms and the tissue schizonts from the liver and kidney have been described. The malaria parasites of these birds have been identified as Plasmodium relictum as they have got many

features common to those found in the type species of Plasmodium relictum.

In Miltava sundara blood forms and the tissue schizonts in the kidney have been described. This malaria parasite, pending further observations, has been temporarily labelled as Plasmodium sp. Type I.

Blood forms and tissue stages in the liver of Xantholaema haematocephala have been described. Until further studies it is proposed to designate this parasite as Plasmodium sp. Type II

In Leipptila capistrata a mixed infection of Plasmodium and Haemonproteus has been encountered. As no specific name could be given to this Plasmodium in the absence of sufficient features available for study the parasite has been tentatively labelled as Plasmodium sp. Type III. Haemonproteus in L. capistrata has been found to be different from the other described species. A new name for this parasite, Haemonproteus himalayanus n. sp. is being proposed.

In Aethopyga saturata the occurrence of a Haemonproteus has been recorded. Blood forms of this parasite have been described. No tissue schizont could be detected. Pending further studies,

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this parasite is proposed to be known temporarily as Haemoproteus sp. Type I.

Part III

Fluorescent microscopic studies on the merocysts of Hepatocystis and the tissue schizonts of Rayella were undertaken. For this purpose acridine orange and thioflavine dyes were used. Acridine orange was used to detect the presence of RNA and DNA whereas thioflavine was used to detect amyloid materials within the parasitic bodies.