Bull. zool. Surv. India, 1 (2) : 103-106, 1978

STUDIES ON SOME AVIAN HAEMATOZOA FROM JAMMU AND KASHMIR, INDIA

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ABSTRACT

Sixty seven birds belonging to 39 species and subspecies were examined for haematozoa, 18 birds (26·8%) of 17 species harboured one or more blood parasites. The genera *Trypanosoma*, *Leucocytozoon*, *Haemoproteus* and *Plasmodium* were recorded in addition to microfilarial parasites. All the parasites are reported herein for the first time from this region. A number of parasites have also been noted for the first time from India and from new hosts.

INTRODUCTION

Although some reports of the blood parasites of wild birds have been published since 1897, the results have unfortunately not followed any uniform pattern. In some cases, no attempt has been made to identify the various parasites as to species ; in others, only protozoan parasites have been included, and even of these, the genera embraced have varied. Still another fact limiting the value of all surveys, is the relatively small sampling which can be obtained of many of the bird species examined, thus resulting in negative findings, or giving insufficient data for significant comparisons. The present survey deals with the blood parasites of 67 birds from Jammu and Kashmir.

MATERIAL AND METHODS

A total of 67 birds belonging to 39 species have been examined for the blood parasites from Jammu and Kashmir. The birds were shot in the year 1974 and 1976, and the smears were taken from the bleeding wounds. The blood smears were stained with Leishman's or Giemsa's stain. The smears were checked under low power of a microscope (400 ×) and subsequently under immersion-oil (1000×).

RESULTS AND DISCUSSION

Of the 67 birds of 39 species examined, 18 birds (26.8%) belonging to 17 species and subspecies showed parasitaemia in their blood. The results are presented in Table 1. Infections with species of *Haemoproteus* in 10 birds (14.9%), *Leucocytozoon* in 6 birds (8.9%) and microfilariae in 7 birds (10.4%) were recorded. The genera *Plasmodium* and *Trypanosoma* were noted, each in a single individual only. The occurrence of *Haemoproteus* is comparatively substantial. Infections with *Leucocytozoon* and microfilariae were revealed in relatively higher proportions than *Plasmodium* and *Trypanosoma*. Double and multiple infections were recorded in 6 birds belonging to 6 species. The barred owlet, *Glaucidium cuculoides* harboured quadruple infections *viz.*, two haemosporidians, *Haemoproteus cellii* and *Leucocytozoon danilewskyi* ; a haemoflagellate,

Trypanosoma avium and microfilaria. However, all the parasites are reported herein for the first time from this region of India.

Six species of *Haemoproteus viz., H. borgesi, H. cellii, H. dicruri, H. oryzivorae, H. postoris* and *H. thereicerycis* in addition to two undetermined species were detected. *Haemoproteus cellii* in *Glaucidium cuculoides* and *Strix aluco biddulphi*, is reported here for the first time from India and from new hosts. Four species of *Leucocytozoon* viz. *L. danewskyi, L. dubreuili, L. fringillinarum* and *L. ilmajoris*, and two unnamed species are reported for the first time from India. A perusal of literature indicates that they constitute new host-parasite records. *Plasmodium relictum* was encountered in *Muscicapa t. thalassina* which appeared to constitute new host-parastie record (*vide* Garnham, 1966). *Trypanosoma avium* is reported from India for the first time from *Glaucidium cuculoides*. All the microfilarial parasites have been communicated earlier in a separate paper (Nandi and Mandal, in press).

The present survey reveals a higher incidence of haematozoa (26.8%) in general from Jammu and Kashmir in comparison to that of Godavari River Basin, Nasik and Ahmednagar districts, Maharashtra (13.3% ; Nandi, 1976) and Orissa (12.7% ; Nandi and Mandal, 1977). The surveys from Godavari River Basin and Orissa showed only infections with *Haemoproteus* and *Plasmodium*, while the birds from Jammu and Kashmir had relatively rich nn dvaried types of haematozoa fauna comprising *Leucocytozoon, Trypanosoma* and microfilariae in addition to *Haemoproteus* and *Plasmodium*. The higher rate of parasitism is presumably a result of higher vector activity and density. The occurrences of *Trypanosoma* and *Plasmodium* recorded from a single bird inoach case, are probably much lower than the true figure as the examination of blood smear is a poor method for the diagnosis of these parasites. It is expected that the further study with improved method of diagnosis (Diamond and Herman, 1954 ; Bennett, 1962 ; Herman *et al.*, 1966) will reveal the true prevalence of parasites.

Acknowledgements

The authors are thankful to the Director, and to Dr. T. D. Soota, Superintending Zoologist, Zoological Survey of India, for facilities provided. Thanks are due to Dr. Ellis C. Greiner, Officer-in-Charge, International Reference Centre for Avian Haematozoa, Memorial University of Newfoundland, Canada, for his kind co-operation in confirming some of the parasite species. Thanks are also due to Dr. Amalesh Choudhury, University of Calcutta, for his kind interest in the study.

References

BENNETT, G. F. 1962. The hematocrit centrifuge for laboratory diagnosis of hematozoa. *Can. J. Zool*, **40** : 124-125.

DIAMOND, L. S. and HERMAN, C. M. 1954. Incidence of trypanosomes in the Canada goose as revealed by bone marrow culture. *J. Parasit.*, **40** : 195-202.

GARNHAM, P. C. C. 1966. *Malaria parasites and other Haemosporidia*. Blackwell Scientific Publication, Oxford. pp. xviii+1114.

HERMAN, C. M., KNISLEY, J. O. and SNYDER, E. L. 1966. Subinoculation as a technique in the diagnosis of avian *Plasmodium*. *Avian Dis.*, **10** : 541-547.

NANDI, N. C. 1976. Avian haematozoa from upper strectches of Godavari River Basin, Nasik and Ahmednagar districts, Maharashtra. *Indian J. Anim. Hlth.*, **15** : 137-138.

NANDI, N. C. and MANDAL, A. K. 1977. Studies on some avian haematozoa from Orissa, India. *Indian J. Anim. Sci.*, **47** : 558-561.

NANDI, N. C. and MANDAL, A. K. (In press). Studies on some avian microfilariae from Jammu and Kashmir. *Indian J. Helminth.*

TABLE 1. Prevalence of blood parasites in birds from Jammu and Kashmir

Bird species	Number of birds exam.	inf.	Parasite	Locality
ACCIPITRIDAE				
Buteo v. vulpinus (Gloger)	1	1	*Haemoroteus* sp.	Jhayyar, Kotli
CAPITONIDAE				
Megalaima zeylanica (Gmelin)	1	1	*Haemoproteus thereicerycis*	Jhayyar, Kotli
CORVIDAE				
Garrulus lanceolatus Vigors	1	1	*Haemoproteus* sp.	Patnitop, Uddampur
DICRURIDAE				
Dicrurus adsimilis (Bechstein)	3	1	*Haemoproteus dicruri*	Patnitop, Uddampur
FRINGILLIDAE				
Carpodacus erythrinus (Pallas)	1	1	*Leucocytozoon fringillinarum* and microfilariae.	Daksum Anantnag
Carpodacus erythrinus roseatus (Blyth)	1	1	*Leucocytozoon fringillinarum* and microfilariae	Daksum Anantnag
Mycerobas affinis (Blyth)	1	1	*Leucocytozoon* sp. and microfilariae	Daksum Anantnag
MUSCICAPIDAE				
Garrulax lineatus (Vigors)	2	1	Microfilariae	Ramban, Doda
Muscicapa t. thalassina Swainson	1	1	*Plasmodium relictum*	Patnitop, Uddampur
Myiophoneus caeruleus (Scopoli)	2	2	*Haemoproteus oryzivorae*	Jhayyar Kotli and Ramban, Doda
PICIDAE				
Jynx torquilla himalayana Vaurie	1	1	*Haemoproteus borgesi* and microfilariae	Daksum Anantnag
Picus s. squamatus Vigors	4	1	*Leucocytozoon* sp.	Patnitop, Uddampu
PYCNONOTIDAE				
Pycnonotus leucogenys humii Oates	2	1	*Leucocytozoon dubreuili* and *L. majoris*	Ramban, Doda
STRIGIDAE				
Glaucidium cuculoides (Vigors)	1	1	*Haemoproteus cellii, Leucocytozoon danilewskyi, Trypanosoma avium* and microfilariae	Ramban, Doda
Strix aluco biddulphi Scully	1	1	*Haemoproteus cellii*	Shar Khrew, Anantnag
STURNIDAE				
Acridotheres t. tristis Linnaeus	3	1	*Haemoproteus pastoris*	Ramban, Doda
UPUPIDAE				
Upupa epops Linnaeus	3	1	Microfilariae	Ramban, Doda
Uninfected species*	37			
Total	67	18 (26.8%)		

* Uninfected species : ACCIPITRIDAE—*Milvus migrans* (Boddaert) (1) ; *Neophron perenopterus ginginianus* (Latham) (2) ; ALCEDINIDAE—*Alcedo athis bengalensis* Gmelin (2) ; CAMPEPHAGIDAE—*Pericrocotus flammeus* (Forster) (1) ; CAPITONIDAE—*Megalaima virens marshallorum* Swinhoe (1) ; CHARADRIIDAE—*Tringa hypoleucos* Linnaeus (1) ; *Tringa nebularia* (Gunnerus) (1) ; CINCLIDAE—*Cinclus pallasii* Temminck (1) ; COLUMBIDAE—*Streptopelia chinensis* (Scopoli) (2) ; CORVIDAE—*Corvus macrorhynchos intermedius* Adamso (4) ; *Corvus splendens* Vieillot (2) ; *Cissa flavirostris cucullata* (Blyth) (1) ; EMBERIZIDAE—*Emberiza cia par* Hartet (1) ; MOTACILLIDAE—*Anthus trivialis haringtoni* Witherby (1) ; MUSCICAPIDAE—*Turdus unicolor* Tickell (3) ; *Monticola cinclorhynchus* (Vigors) (1) ; *Saxicola ferrea* Gray (1) ; *Pomatorhinus e. erythrogenys* Vigors (1) ; *Phylloscopus subaffinis* (Ogilive-Grant) (1) ; PICIDAE—*Picoides himalayensis albescens* (Baker) (2) ; PSITTACIDAE—*Psittacula krameri borealis* (Neumann) (3) ; PYCNONOTIDAE—*Pycnonotus cafer* (Linnaeus) (3) ; STURNIDAE—*Sturnus pagodarum* (Gmelin) (2).