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ZOOLOGY

PARASITIMIC LOAD OF HAEMATOZOAN PARASITES IN ROCK PIGEONS (*COLUMBA LIVIA*)

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Abstract

The present investigations were undertaken to define the intensity and parasitimic load of haematozoan parasites, *Haemoproteus* and *Plasmodium* from the peripheral blood smears of *Columba livia*. Out of 266 pigeons sampled, 148 pigeons were positive for *Haemoproteus* at a prevalence of 55.63%. Only 18 pigeons (2.67%) had a mixed infection with *Haemoproteus* and *Plasmodium* and 130 pigeons (48.87%) had *Haemoproteus* infection alone and no pigeons were positive for *Plasmodium* alone. The mean load of *Haemoproteus* for infected pigeons was 1.68 Gametocytes/100 RBC's whereas for *Plasmodium* it was 1.38 Gametocytes /100 RBC's.

Keywords: *Haemoproteus*, *Plasmodium*, Pigeon

Introduction

Variation in parasite prevalence and in the strength and occurrence of interspecific associations among parasites should be important for predictory impact of parasites on host populations. Factors that can account for variation in parasite prevalence or intensity include: host genotype (Gregory *et al;* 1990), host size (Blower and Roughgarden 1988), age or sex of host (Schall, 1983), host condition (Forbes and Becker, 1990) and host reproductive effort (Festa-Bianchet 1989). Factors extrinsic to hosts, such as geographical region (Krikpatrick *et al.,*1991) and time of season or year (Weatherhead and Bennett, 1992) are also important because they can influence the distribution and abundance of infection stages or vectors. The view that commensalisms is the only outsome of host-parasite interaction has been challenged and during the last decade, curiosity in parasites and their hosts has risen (Price, 1980; Loye and Zuk, 1991; Toft *et al.*, 1991). The study of host parasite interaction has focused mainly on the fields of population regulation (Anderson, 1978, 1979), coevolution (Toft *et al.* 1991) and ecology (Loye and Zuk, 1991) as well as behavioral ecology (Loye and Zuk, 1991; Keymer and Read, 1991).

In avians, the effect of parasites on host ecology has been ignored. Recently, the view that well adapted parasites do not harm their hosts, has been challenged and there is growing evidence that parasites do have a present day effect on a great variety of host fitness components.

Materials and Methods

Columba livia (n = 266) weighing 400-500gms were collected from different sources of Bareilly regions and kept in cages. They were maintained in the laboratory under suitable environmental conditions. Blood was collected directly from brachial vein, a drop placed on a clean microscopic slide and blood smears were prepared and stained in Giemsa's solution. The slides were washed, dried and examined for blood parasites at 100x. Parasite species were identified using morphologic characteristics (Garnham, 1966). Parasitaemia were calculated from counts of 100 red blood cells at x1,000.

Results

Results from haemato-parasitological examination of thin blood smears revealed hematozoa of mainly two genera, *Haemoproteus* and *Plasmodium.* Out of 266 pigeons sampled, 148 pigeons were positive for *Haemoproteus* at a prevalence of 55.63%. Only 18 pigeons (2.67%) had a mixed infection with *Haemoproteus* and *Plasmodium* and 130 pigeons (48.87%) had *Haemoproteus* infection alone and no pigeons were positive for *Plasmodium* alone. it varied from 62.79% in females and 57.65% in males. In case of *Plasmodium,* only five females and 13 male were infected with this parasite. The mean load of *Haemoproteus* for infected pigeons was 1.68 Gametocytes/100 RBC's ranging from 1 to 6 Gametocytes/100 RBC's whereas for *Plasmodium* it was 1.38 Gametocytes /100 RBC's and varied from 1.0 to 2.0 Gametocytes/100 RBC's.

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Discussion

During the present course of study, blood parasites were quite abundant but their distribution and prevalence markedly varies from region to region and from one avian family to the other in the Indian Subcontinent (Nandi and Bennett, 1997). Life cycle studies on species of *Haemoproteus,* particularly those involving vector studies of the other genera of blood parasites should be approached with caution and undertaken in those regions where it is obvious that both abundant infections occur in the feral avian populations, a prevalence that will indicate the availability of suitable vector in the area.

The relative frequency of different parasites species found in this study accords with previous findings showing that the most common avian blood parasite is *Haemoproteus* (Desser and Bennett, 1993). Levine and Kantor (1959) found a range of 28 to 100% occurrence of *Haemoproteus* in domestic pigeons. Studies, to date, have determined that the most common blood parasite found in pigeons is *Haemoproteus* and infection rate may be as high as 75% ranging from 6 to 86% (Stabler, *et al.,* 1977; Qureshi and Sheikh, 1978; Aguirre, *et al.,* 1986; Mandour *et al.,* 1986; Kaminjola, *et al*., 1988 and Subbiah and Joseph, 1988). Nandi and Bennett (1997) also recorded 54.4% infectivity of *Haemoproteus* and 34.6% of *Plasmodium* in U.P., India.Surveys indicates that the incidence of infection differs in different kinds of birds and in different localities (Fallis *et al*., 1974). Locality is one of the important ecological factors which play a existing role in the occurrence of parasite species. Because many birds migrate, the occurrence of parasites in birds in a particular locality is not necessarily indicative of local transmission. Incidence and levels of parasitemia may indicate, among other things, the susceptibility of the bird, the availability of suitable vectors of the parasites, preference of vectors for certain birds, and the relative abundance of different kinds of birds and vectors.

Ahmed and Mohammad (1978) concluded that pigeons carrying chronic or latent infections are immune to super infection by injecting sporozoite with physiological saline solution. Bennett (1970) stated that phagocytosis plays a major role in checking the number of parasites. Brown (1976) indicated an active immunoglobulin synthesis in malaria infection in addition to macrophage activation and suggested that phagocytosis of merozoites is mediated by opsonins. Presumably gametocytomia with *Haemoproteus* is controlled by the physiology of the host species and to some extent, by the number of infected bites.

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