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Authors: BENNETT, GORDON F., and JOSE IGNACIO, BORRERO H.

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BLOOD PARASITES OF SOME BIRDS FROM COLOMBIA

GORDON F. BENNETT[1] and JOSE IGNACIO BORRERO H.[2]

Abstract: Blood films from 421 birds of 142 species, representing 29 avian families, from the environs of Cali, Colombia, were examined for blood parsites. Only 30 (7.1%) birds of 26 species harbored hematozoa. Species of *Haemoproteus* (3.1%) and microfilaria (2.3%) were the most commonly encountered blood parasites; species of *Leucocytozoon, Plasmodium, Akiba* and *Lankesterella* were found in a few birds. Mixed infections with more than one genus of blood parasite were rare; most infections encountered were of low intensity.

INTRODUCTION

Although the ornithological fauna of South and Central America is the richest and most diverse of any continent, the blood parasites of this avifauna have had only limited study, and then usually for rather specific regions. Recently, Gabaldon and his colleagues[7,8] conducted large-scale surveys of the avian hematozoa of Venezuela and Beltran and his co-workers conducted surveys on the blood parasites of Mexican birds.[2,3] Lainson *et al.*[15] reported on the blood parasites of some birds from Brasil while Jorg[14] reported on the blood parasites of some birds from Argentina. Hewitt,[12] Huff and Wetmore[13] and Galindo and Sousa[9] have all contributed to our knowledge of the avian hematozoa of Central American birds. Few, if any, surveys of avian hematozoa of birds from the western slopes of the Andes have been recorded, including Colombia. Studies conducted by the second author on the distribution of birds on the mountain slopes of the Andes in an area between Cali and Buenaventura Colombia, provided the opportunity to sample some of them for the hematozoan burden. This report summarizes the prevalence of hematozoa in 421 birds of 142 species.

MATERIALS AND METHODS

Birds were captured in a variety of ways from a number of locations ranging from sea level on the Pacific coast to an altitude of 2140 m on the western slopes of the Cordillera Occidental. Blood smears were air-dried and fixed in 100% methanol or ethanol in Colombia and subsequently stained in Giemsa's (pH 7.2) and examined for blood parasites at the International Reference Centre for Avian Hematozoa. The sample was collected at monthly intervals throughout the period 1971-1972, with larger samples collected in May and October, 1971 and January, 1972. The birds were not aged at time of collection. Most of the birds sampled represent indigenous species.

RESULTS AND DISCUSSION

A total of 421 birds of 142 species, representing 29 avian families, were examined for blood parasites (Table 1). Only 30 (7.1%) birds of 26 species were found to harbor hematozoa. The most commonly occurring blood parsite genus was *Haemoproteus* (3.1%), followed by microfiliaria[2] (2.3%); other parasite genera represented in small numbers were *Leucocytozoon, Plasmodium, Akiba* and *Lankesterella.* No infections with *Trypanosoma* were found. Most of the infec-

[1] Department of Biology and International Reference Centre for Avian Hematozoa, Memorial University of Newfoundland, St. John's, Newfoundland, Canada.

[2] Departmento de Biologia, Universidad del Valles, Cali, Colombia.

TABLE 1. Blood parasites of birds from Colombia.

Bird Family and Species	Birds examined Total	Infected	L.	H.	Pl.	M.	A./La.
COLUMBIDAE							
Columbigallina talpacoti	22	2		1	1		
CUCULIDAE							
Crotophaga ani	1	1		1			
GALBULIDAE							
Galbula ruficauda	1	1		1			
PARULIDAE							
Basileuterus rivularis	2	1					A
ICTERIDAE							
Psarocolius angustifrons	1	1			1		
PIPRIDAE							
Chloropipo holochlora	2	2		2			
PSITTACIDAE							
Pionopsitta haematotis	1	1				1	
Pionopsitta pulchra	1	1				1	
THRAUPIDAE							
Chlorothraupis olivacea	2	1		1			
Tachyphonus delatrii	10	2		1			La.
Tangara nigro-cincta	3	1		1			
Tangara ruficervix	1	1	1				
Tangara xanthogastra	5	1				1	
Thraupis palmarum	3	1				1	
Thraupis virens	3	1		1		1	
TROCHILIDAE							
Coeligena wilsoni	1	1				1	
Eutoxeres aquila	7	2		1		1	
TROGLODYTIDAE							
Thryothorus nigricapillus	2	1					A
TURDIDAE							
Catharus ustulatus	6	1	1			1	
Myadestes ralloides	3	1				1	
Turdus serranus	1	1	1				
TYRANNIDAE							
Contopus virens	2	1		1			
Mionectes olivaceous	5	1		1			
Myiozetetes cayanensis	9	1		1			
Schiffornis turdinus	3	1			1		
Tyrannus melancholicus	3	1				1	
NEGATIVE BIRDS (see below)	391						
TOTAL:	421	30	3	13	3	10	3
PERCENT INFECTED:		7.1	0.7	3.1	0.7	2.3	0.7

NOTE: L. = *Leucocytozoon*; H. = *Haemoproteus*; Pl. = *Plasmodium*; M. = *Microfilaria*; A. = *Akiba*; La. = *Lankesterella*.

TABLE 1 (Continued)

NEGATIVE BIRDS (number examined in parentheses): ACCIPITRIDAE: *Buteo magnirostris* (1); *B. platypterus* (1). ARDEIDAE: *Bubulcus ibis* (55); *Butorides striatus* (8). BUCCONIDAE: *Galbula ruficauda* (2); *Hapaloptila castanea* (1); *Monasa morphoeus* (1); *Notharcus tectus* (1). CAPITONIDAE: *Ebucco bourcierii* (1). CAPRIMULGIDAE: *Nyctodromus albicollis* (1). COLUMBIDAE: *Columba goodsoni* (2). COTINGIDAE: *Lipaugus unirufus* (1); *Pachyramphus cinnamomeus* (3); *Rytipterna holerythra* (1); *Tityra semifasciata* (1). CUCULIDAE: *Coccyzus pumilus* (2). DENDROCOLAPTIDAE: *Dendrocincla fuliginosa* (2); *Dendrocolaptes picumnus* (2); *Glyphorhynchus spirurus* (6); *Lepidocolaptes affinis* (1); *Xiphorhynchus erythropygius* (2). FORMICARIIDAE: *Hylophylax naevioides* (1); *Microrhopias quixensis* (1); *Myrmotherula surinamensis* (1); *Thamnophilus multistriatus* (1); *T. punctatus* (1). FRINGILLIDAE: *Arremon aurantiirostris* (3); *Atlapetes brunneinuncha* (2); *Oryzoborus angolensis* (4); *O. crassirostris* (1); *Passerina cyanea* (1); *P. cyanoides* (1); *Pitylus grossus* (4); *Saltator albicollis* (3); *S. atripennis* (2); *S. maximus* (1); *Spinus psaltria* (12); *Sporophila americana* (3); *S. intermedia* (2); *S. luctuosa* (2); *S. minuta* (19); *S. nigricollis* (2); *S. obscura* (2); *Tiaris olivacea* (1); *Volatinia jacarina* (15); *Zonotrichia capensis* (1). FURNARIIDAE: *Automolus ochrolaemus* (2); *Syndactyla subalaris* (2); *Synallaxis brachyura* (1); *Thripadectes ignobilis* (1). HIRUNDINIDAE: *Stelgidopteryx ruficollis* (4). ICTERIDAE: *Agelaius icterocephalus* (1); *Cacicus uropygialis* (1). PARULIDAE: *Basileuterus coronatus* (2); *B. nigrocristatus* (1); *Coereba flaveola* (4); *Dendroica petechia* (1); *Geothlypis semiflava* (1); *Oporornis philadelphia* (2). PHASIANIDAE: *Odontophorus hyperythrus* (1). PICIDAE: *Chrysoptilus punctigula* (1); *Picumnus granadensis* (2); *Veniliornis fumigatus* (1). PIPRIDAE: *Manacus manacus* (9); *M. vitellinus* (1); *Pipra coronata* (4). PSITTACIDAE: *Aratinga wagleri* (3); *Forpus conspicillatus* (4); *Pionus menstruus* (1). RAMPHASTIDAE: *Aulacorhynchus haematopygius* (1); *Ramphastos swainsoni* (1). STEATORNITHIDAE: *Steatornis caripensis* (2). SYLVIIDAE: *Microbates cinereiventris* (1). THRAUPIDAE: *Chlorospingus flavigularis* (1); *Chlorothraupis stolzmanni* (1); *Habia cristata* (1); *Mitrospingus cassinii* (2); *Pipraeidea melanonota* (1); *Ramphocelus dimidiatus* (1); *R. flamigerus* (8); *Tachyphonus rufus* (1). TROCHILIDAE: *Aglaiocercus kingi* (1); *Amazilia franciae* (1); *Coeligena coeligena* (1); *C. wilsoni* (1); *Metallura tyrianthina* (1); *Phaethornis guy* (2); *P. longuemareus* (1); *P. syrmatophorus* (1); *P. yaruqui* (5); *Thalurania furcata* (2); *Threnetes ruckeri* (2). TROGLODYTIDAE: *Cyphorinus thoracinus* (1); *Microcerculus marginatus* (1); *Troglodytes aedon* (5). TURDIDAE: *Microbates cinereiventris* (1); *Turdus ignobilis* (8). TYRANNIDAE: *Camptostoma obsoletum* (1); *Colonia colonus* (1); *Contopus* sp. (1); *Elaenia flavogaster* (6); *Empidonax virescens* (2); *Leptopogon rufipectus* (1); *L. superciliaris* (2); *Myiobius atricaudus* (1); *M. miniatus* (1); *M. villosus* (2); *Myiarchus tyrannulus* (1); *Myiotriccus ornatus* (1); *Phaemoyias murina* (7); *Pitangus sulphuratus* (2); *Phynchocychpus brevirostris* (1); *Pyrocephalus rubinus* (1); *Todirostrum cinereum* (1); *Tyranniscus viridiflavus* (1). VIREONIDAE: *Vireo olivaceous* (1).

tions were exrtmely light, frequently represented by only one or two parasites per smear. Such a low intensity precluded positive specific identification of most of the hematozoans. Among the haemoproteids, infections of *Haemoproteus maccallumi* and *H. archilocus* in a columbid and a trochilid respectively, were noted. Several haemoproteids were noted which did not correspond to any known species but taxonomic evaluation of these species is beyond the scope of this report. Two thrushes harbored *Leucocytozoon dubreuili* and a thraupid harbored *Leucocytozoon fringillinarum;* one tyrannid was infected with *Plasmodium relictum*. The monotypic genus *Akiba* has so far been limited to galliforms in South-East Asia. Two undoubted infections of *Akiba* in a parulid and a wren (Table 1)

TABLE 2. Altitudinal distribution of birds infected with blood parasites.

Altitude metres	Total birds examined	Total birds infected	
		Number	percent
0	43	0	
100	80	11	13.8
1000	52	0	
1035	75	2	2.7
1120	59	7	11.9
1220	57	1	1.8
1845	13	5	38.5
2140	14	1	7.1

were diagnosed—parasites differing from *Akiba cauleryi* in a number of ways. However, lack of material adequate for taxonomic treatment precludes their further consideration at this time.

The birds sampled were collected at various altitudes from sea level to 2140 m up the mountain slopes. The distribution of infected birds (Table 2) was highly variable and no trend could be determined.

The most striking aspect of this survey is the paucity of hematozoan infections in the avian population. This generally low prevalence is in accord with the results of other workers in South and Central America,[2,3,8,9,12,13,15] but in sharp contrast with the prevalence of blood parasites in North America[10] and in Africa[4,5] and Asia.[6,11] One would anticipate that the prevalence of blood parasites in the unique but rich and diversified avifauna of tropical Central and South America would be at least equal to that noted in similar tropical areas of Africa and Asia. The exceptionally low prevalence recorded is difficult to explain with complete satisfaction. The fact that some blood parasites do occur indicates that there are no physiological barriers in the bird population. One is forced to conclude, therefore, that the low prevalence is the result of a dearth of suitabable vector species. This is particularly surprising for *Plasmodium*, a genus generally believed to be plentiful in the wet tropical regions—a belief predicated on the fact that the culicine fauna of such regions is both rich and diverse. It is of interest to note that all three birds harboring *Leucocytozoon* were collected at elevations of 1845-2140 m. This situation might be anticipated if it is considered that the simuliid vectors of this haemosporozoan require rapid running water—a condition more likely to be encountered in mountains. On the other hand, two of the three birds (taken in October-November) were *Catharus ustulatus*, a migratory North American species known to overwinter as far south as Peru and Bolivia.[1] Their infections could have been contracted on their North American breeding grounds. This survey, taken with similar reports from South America indicate that a thorough survey of the species composition and density of the ornithophilic biting fly fauna of the regions is urgently needed.

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LITERATURE CITED

1. American Ornithologist' Union. 1957. *The A. O. U. Checklist of North American Birds*. 5th Edition. The American Ornithologist' Union. The Lord Baltimore Press, Baltimore, Maryland. 691 pp.
2. BELTRAN, E. 1939. Investigacion protozoologica de la sangre de 276 aves des mercado en la ciudad de Mexico. Rev. Inst. Salubr. Enferm. Trop. (Mexico) 1: 67-72.
3. ———— and A. PARDINAS. 1953. Los protozarios sanguineos de las aves mexicanas. Mem. Cong. Cien. Mex. 7: 117-138.
4. BENNETT, G. F., N. O. OKIA and M. F. CAMERON. 1974. Avian hematozoa of some Ugandan birds. J. Wildl. Dis. 10: 458-465.
5. ———— and C. M. HERMAN. Blood parasites of some birds from Kenya, Tanzania and Zaire. J. Wildl. Dis. 12: in press.
6. DISSANAIKE, A. S., P. NELSON, M. A. FERNANDO and W. J. NILES. 1965. Studies on the haemosporidia of Ceylon birds with special reference to plasmodia. Ceylon Vet. J. 13: 65-75.
7. GABALDON, A., G. ULLOA and A. G. de MONTCOURT. 1974. Encuesta sobre Malaria Aviaria en Venezuela; resultados del Primer Ano. Bol. Dir. Malar. San. Amb. 19: 80-103.
8. ————————. 1975. Encuesta sobre Malaria Aviaria en Venezuela; resultados del Segundo Ano. Bol. Dir. Malar. San. Amb. 20: 73-92.
9. GALINDO, P. and O. SOUSA. 1966. Blood parasites of birds from Almirante, Panama with ecological notes on the hosts. Rev. Biol. (Univ. Costa Rica) 14: 27-46.
10. GREINER, E. C., G. F. BENNETT, E. M. WHITE and R. F. COOMBS. 1975. Distribution of the avian hematozoa of North America. Can. J. Zool. 53: 1762-1787.
11. HEGNER, R. W. and H. J. CHU. 1930. A survey of protozoa parasitic in plants and animals of the Philippine Islands. Philipp. J. Sci. 43: 451-482.
12. HEWITT, R. 1940. Studies on blood protozoa obtained from Mexican wild birds. J. Parasit. 26: 287-295.
13. HUFF, C. G. and A. WETMORE. 1967. Blood parasites of birds collected in four successive years in Panama. Bull. Wildl. Dis. Ass. 3: 178-181.
14. JORG, M. E. 1931. Neuvos protozoos parasitos de la Republica Argentina. Arch. Soc. Biol. Montevideo 5 (Suppl.): 1142-1165.
15. LAINSON, R., J. J. SHAW and P. S. HUMPHREY. 1970. Preliminary survey of blood-parasites of birds of the area de pesquisas ecologicas do Guamá, Belém, Pará, Brasil. Proc. II nd. Int. Cong. Parasitol. in J. Parasit. 56 (Suppl.): 197-198.

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