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AVIAN HAEMATOZOA FROM THE OFFSHORE ISLANDS OF NORTHERN MEXICO

As far as the authors are aware this is the first reported study on the prevalence of blood parasites in birds from the offshore islands of Northern Mexico. The Islands from which samples were taken were: Todos Santos, Cedros, Cabo San Lucas, San Jose Del Cabo, Cerralvo, Isabela, Partida, Espiritu Santo, Tres Marietas, Socorro, San Benito and San Martin.

This study is based on blood smears taken from 191 banded adult and juvenile birds of 39 species (31 genera, 21 families) collected by one of us (BS) during the months of February through July of 1967. Blood smears were made in the field at the time of collection by piercing the brachial vein on the underside of the wing with a needle. Barring natural destruction most of these birds are still in the field. The smears were air dried, fixed in absolute methyl alcohol and stained with Giemsa's stain. Examination was made with low power (200 X), medium power (430 X) and with oil immersion lens (970 X). Smears revealing no parasites after a ten-minute examination were considered negative.

Results and Discussion

Examination of these blood smears revealed only 17 (8.9%) infected with *Haemoproteus*, *Leucocytozoon*, *Trypanosoma*, *Plasmodium*, *Hepatozoon* and microfilariae. Table 1 summarizes our findings.

The following are considered to be new host records: *Haemoproteus* sp. in *Amphispiza bilineata* (Black-throated Sparrow), *Spizella atrogularis* (Black-chinned Sparrow) and *Vireo belli* (Bell's Vireo); *Leucocytozoon* sp. and *Plasmodium* sp. in *Anthus spinoletta* (Water Pipit); *Leucocytozoon* sp. in *Myiarchus tyrannulus* (Wied's Crested Flycatcher); *Trypanosoma* sp. in *Mimodes graysoni* (Socorro Thrasher), *Parula pitiayumi* (Tropical Parula Warbler) and *Auriparus flaviceps* (Verdin); *Hepatozoon* sp. in *Fregata magnificens* (Magnificent Frigatebird) and *Loomelania melania* (Black Petrel); microfilariae sp. in *Poli-*

optila melanura (Black-tailed Gnatcatcher) and *Myiarchus tyrannulus* (Wied's Crested Flycatcher).

When compared with two other surveys taken in the United States (Clark and Swinehart, 1966, Bull. Wildl. Dis. Assoc. 2: 53-54; Clark, Lee and Lieb, 1967, Bull. Wildl. Dis. Assoc. 4: 15-17) the percentage of birds with blood infections was 8.9 for smears from the birds of the offshore islands of Northern Mexico, whereas it was 34.9 for the birds in the Sacramento (Calif.) region and 29.4 for the birds from Central Washington. One major difference existed between the surveys taken in the United States and the one in the offshore islands of Mexico. The former was taken throughout the year whereas the latter survey was taken during the spring and summer months only.

Among the birds which were infected the percentage in the different genera of parasites were as follows:

	Offshore Island	Sacramento Region	Central Wn.
<i>Haemoproteus</i>	23.5	56.0	20.6
<i>Leucocytozoon</i>	29.4	41.8	34.6
<i>Trypanosoma</i>	23.5	5.2	43.4
<i>Plasmodium</i>	5.9	2.2	5.9
<i>Hepatozoon</i>	1.8	0.8	15.4
<i>Microfilaria</i>	1.8	0.8	39.0

The trypanosomal and microfilarial incidence in the Central Washington survey was considerably higher than in the other two surveys. This was undoubtedly due to direct examination of fresh bone marrow and blood from many of the birds sampled.

Only one family of birds (Fringillidae) is represented in sufficient numbers to allow any kind of a comparison to be made between the three surveys in regards to parasite incidence: Offshore Islands of Mexico, 31.6% (6/19); Sacramento Region, 31.5% (93/292); Central Washington, 52.1% (23/45).

In the present study all birds with infections of *Haemoproteus*, *Leucocytozoon*, *Trypanosoma*, *Plasmodium* and microfilaria belonged to the order Passeriformes; *Hepatozoon* was found in the orders Procellariiformes and Pelecaniformes.

TABLE 1. Incidence of Haematozoa in birds from the offshore islands of Northern Mexico

Host	No. Exam- ined	No. Infect- ed	Haem.	L.	T.	P.	Hep.	M.
VIREONIDAE								
<i>Vireo belli</i> (Bell's Vireo)	1	1	1	—	—	—	—	—
SYLVIIDAE								
<i>Polioptila melanura</i> (Black-tailed Gnatcatcher)	4	2	—	—	—	—	—	2
MOTACILLIDAE								
<i>Anthus spinoletta</i> (Water Pipit)	1	1	—	1	—	1	—	—
MIMIDAE								
<i>Mimodes graysoni</i> (Socorro Thrasher)	1	1	—	—	1	—	—	—
TYRANNIDAE								
<i>Myiarchus tyrannulus</i> (Wied's Crested Flycatcher)	3	1	—	1	—	—	—	—
FREGATIDAE								
<i>Fregata magnificens</i> (Magnificent Frigatebird)	15	1	—	—	—	—	1	—
FRINGILLIDAE								
<i>Amphispiza bilineata</i> (Black-throated Sparrow)	1	1	1	—	—	—	—	—
<i>Spizella atrogularis</i> (Black-chinned Sparrow)	3	2	2	—	—	—	—	—
<i>Passerculus sandwichensis</i> (Savannah Sparrow)	8	3	—	3	—	—	—	—
PARULIDAE								
<i>Parula pitiayumi</i> (Tropical Parula Warbler)	1	1	—	—	1	—	—	—
HYDROBATIDAE								
<i>Loomelania melania</i> (Black Petrel)	5	1	—	—	—	—	1	—
PARIDAE								
<i>Auriparus flaviceps</i> (Verdin)	2	2	—	—	2	—	—	—

Legend: Haem. = *Haemoproteus*, L. = *Leucocytozoon*, T. = *Trypanosoma*,
P. = *Plasmodium*, Hep. = *Hepatozoon*, M. = *microfilariae*

The following birds were negative for blood parasites: *Larus californicus* (1), *Larus heermanni* (1), *Larus philadelphia* (1), *Larus occidentalis* (14), *Sterna fuscata* (50), *Anous stolidus* (2), *Puffinus griseus* (1), *Puffinus puffinus* (2), *Polioptila caerulea* (2), *Dendrocopos scalaris* (2), *Centurus uropygialis* (1), *Toxostoma longirostre* (1), *Myiarchus tuberculifer* (1), *Myiarchus cinerascens* (1), *Calypte costae* (1), *Richmondia cardinalis* (1), *Poocetes gramineus* (1), *Carpodacus mexicanus* (4), *Pipilo erythrophthalmus* (1), *Sula leucogaster* (1), *Sula neboxii* (19), *Salpinctes obsoletus*

(2), *Eremophila alpestris* (1), *Lobipes lobatus* (1), *Phalacrocorax auritus* (4), *Pelecanus occidentalis* (29), *Phaethon aethrurus* (1).

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