

A Study of the Helminth Parasites of Certain Shore-Inhabiting Birds from Lake Texoma, Oklahoma¹

MARTHA ANN RIGGINS, University of Oklahoma, Norman

This study of the helminth parasites of certain shore-inhabiting birds on Lake Texoma, was begun in the summer of 1951, and birds were collected near the Biological Station almost daily from June 12, to July 29, 1952. Helminths were taken from the following hosts: *Charadrius vociferus* (Killdeer), *Actitis macularia* (Spotted Sandpiper), *Ereunetes pusillus* (Semipalmated Sandpiper), *Ereunetes mauri* (Western Sandpiper), *Erolia minutilla* (Least Sandpiper), *Micropalama himantopus* (Stilt Sandpiper), *Catoprophorus semipalmatus* (Willet), *Limosa fedoa* (Marbled Godwit), and *Agelatus phoeniceus* (Redwing).

These birds belong to the order Charadriiformes, except for the redwing, which belongs to the order Passeriformes. The eight charadriiform species have a wide year-round range from far northern North America to South America. Their food is quite varied, consisting mostly of aquatic and land insects. The redwing was included in this study because it is found in the same types of habitats in the Lake Texoma area.

Seventy-nine birds were examined; 54 of these were infected, and 28 species of parasites were taken. The abundance and variety of the helminths found, even though the number of birds examined was small, made this taxonomic study an interesting one.

MATERIALS AND METHODS

Birds were shot and taken to the laboratory for examination. They were refrigerated until examination, which in most cases was within three or four hours after death.

All helminths were removed from the host and placed in tap water until examination of the host was completed. This allowed the worms to relax, after which the flukes and cestodes were fixed with hot F.A.A. solution, and the nematodes and acanthocephala with warm 70 per cent alcohol with 2 per cent glycerine added.

Flukes and cestodes were stained with Mayer's paracarmine. Nematodes were studied alive, then fixed and studied further, after clearing with lactic acid. Some nematodes were stained with Ehrlich's acid hematoxylin, while acanthocephala were double stained with Ehrlich's acid hematoxylin and Mayer's paracarmine.

RESULTS

Nine species of hosts were examined in this collection. Seventy-nine birds were autopsied, of which 54 were infected, and from which 230 specimens of parasites were taken. These included the following ten species of trematodes: *Cyclocoelum mutabile*, *C. tringae*, *C. triangularis*, *C. wilsoni*, *C. obscurum*, *Catantropis verrucosa*, *Leucochloridium sorae*, *Psilostomum brevicolle*, *Maritrema gratosum*, and *Colluricincla* sp. The 11 species of cestodes found were: *Anomotaenia bacilligera*, *Choanotaenia cayennensis*, *C. macracantha*, *Anonchotaenia oriolina*, *Paricterotaenia sleswicensis*, *Progy-notaenia americana*, *Hymenolepsis amphitricha*, *Diorchis kodonodes*, *Dilepsis* sp., and two *Choanotaenia* sp. Three species of acanthocephala were present: *Mediorhynchus robustus*, *M. papillosus*, and *Polymorphus maritii*. Three species of nematodes were identified: *Echinuria horrida*, *Cosmocephalus obvelatus*, and *Streptocara* sp. Some specimens could not be identified because they were immature or incomplete. The distribution of these parasites in the hosts is shown in Table I.

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TABLE I
Host-Parasitic List for the Species of Birds Studied

<i>Actitis macularia</i> (Spotted Sandpiper)	<i>Schistorophus lacinatus</i> (nematode)
<i>Cloacitrema michiganensis</i> (trematode)	†† <i>Cyclococum triangularis</i> (trematode)
<i>Leucochloridium acitiss</i> (trematode)	†† <i>Collyricium?</i> sp. (trematode)
†† <i>Parciterotaenia slesowicensis</i> (cestode)	†† <i>Choanotaenia macracantha</i> (cestode)
†† <i>Choanotaenia cavennensis</i> (cestode)	†† <i>Anomotaenia boedligeri</i> (cestode)
†† <i>Cyclococum triangularis</i> (trematode)	†† <i>Mediorhynchus robustus</i> (acanthocephala)
†† <i>Spiruroidean</i> nematode	†† <i>Spiruroidean</i> nematode
<i>Agelaius phoeniceus</i> (Red-winged Blackbird)	<i>Ereunetes mauri</i> (Western Sandpiper)
<i>Oxyphryx mansonii</i> (nematode)	†† <i>Cyclococum tringae</i> (trematode)
<i>Diplotritaenoides agelatus</i> (nematode)	†† <i>Cyclococum obscurum</i> (trematode)
<i>Plagiorchiis nobilis</i> (trematode)	†† <i>Cyclococum wilsoni</i> (trematode)
<i>Gigatobilharzia gyraxii</i> (trematode)	†† <i>Ereunetes pusillus</i> (Semipalmated Sandpiper)
<i>Capillaria tridens</i> (trematode)	†† <i>Cyclococum triangularis</i> (trematode)
†† <i>Anonchoataenia oriolina</i> (cestode)	
†† <i>Mediorhynchus papillosus</i> (acanthocephala)	
<i>Catoptrophorus semipalmatus</i> (Willet)	<i>Erolia minutilla</i> (Least Sandpiper)
<i>Levinseniella cruzii</i> (trematode)	†† <i>Catartops verrucosa</i> (trematode)
<i>Schistorophus lacinatus</i> (nematode)	†† <i>Leucochloridium sorae</i> (trematode)
<i>Levinseniella charadriiformis</i> (trematode)	†† <i>Dilepis</i> sp. (cestode)
<i>Ophrycotyle insignis</i> (cestode)	†† <i>Spiruroidean</i> nematode
†† <i>Maritrema gratiosum</i> (trematode)	
†† <i>Cyclococum mutabile</i> (trematode)	<i>Limosa fedoa</i> (Marbled Godwit)
†† <i>Choanotaenia</i> sp. (cestode)	†† <i>Apateon elassocotylus</i> (trematode)
†† <i>Echinuria horrida</i> (nematode)	†† <i>Levinseniella cruzii</i> (trematode)
†† <i>Cosmocephalus obovatus</i> (nematode)	†† <i>Levinseniella charadriiformis</i> (trematode)
†† <i>Streptocara</i> sp. (nematode)	†† <i>Petitostomum brevicolle</i> (trematode)
	†† <i>Choanotaenia</i> sp.
<i>Charadrius vociferus</i> (Killdeer)	<i>Micropalama himantopus</i> (Stilt Sandpiper)
†† <i>Proterogynotaenia americana</i> (cestode)	†† <i>Hymenolepis amphitricha</i> (cestode)
<i>Uvvetitina macroisophaga</i> (trematode)	†† <i>Polymorphus maritii</i> (acanthocephala)
<i>Gyrocotia milligani</i> (cestode)	†† <i>Diorchis kodonodes</i> (cestode)

† New host record
†† New Oklahoma record for parasite

* All parasites shown with one or more asterisks were taken in this work
** New North American record for parasite

The willet was the most heavily parasitized bird studied. Of the killdeer, one had 17 individual parasites, one 13, and one six. The others had fewer than six worms per bird. Of the sandpipers, one host had 26, one 14, and one seven. All others had very few. The largest number of worms taken from a redwing was six. The number of autopsies and birds infected for each kind of bird studied is shown in Table II.

TABLE II
List of Hosts, Autopsied and the Number Infected

HOST	NUMBER OF HOSTS AUTOPSIED	NUMBER OF HOSTS INFECTED
Killdeer	39	25
Sandpiper	19	14
Redwing	19	13
Willet	1	1
Marbled Godwit	1	1

Seventeen of these birds had more than one species of parasite in a single bird. The Willet harbored six different species, including cestodes, nematodes, and trematodes. These worms were found almost entirely in the intestine, which is rather short in these birds, and they were not excluded from any part of the intestine.

DISCUSSION

The migratory habits and great range of these birds, and their extremely varied foods, seem to result in an infestation by many families, genera, and species of parasites. There seems to be little host specificity among these parasites as they are found in numerous species of birds and in various geographic locations. This has been found to be true by others in working with shore birds, as shown by Tseng (1) in his work on avian cestodes in China.

SUMMARY

1. A study was made of the helminth parasites from eight species of shore-birds and the redwing found on Lake Texoma, Oklahoma.
2. Eighty-one birds were examined and 28 species of helminths were found in 54 infected hosts.
3. This is the first recorded work on the helminths of the host *Breunetes pusillus* (Semipalmated Sandpiper).
4. Twenty-four new host parasite records are established by this study, including 11 new parasite records for North America and 25 new parasite records for Oklahoma.

LITERATURE CITED

1. TSENG, SHEN. 1932. Etude sur les cestodes de Chine. Am. parasitol. humaine et comparée 10(2):105-128.