Furthermore, the finding of *Abbreviata* sp. in *Varanus beccarii* appears to be a new host record (Baker, 1987).

The author thanks Thomas P. Alvarado, D.V.M., Dallas, Texas for submitting this specimen.

**Literature Cited**


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**Research Note**

**Helminth Parasites of the Osprey, Pandion haliaetus, in North America**

JOHN M. KINSELLA,1,3 REBECCA A. COLE,2 DONALD J. FORRESTER,1 AND C. L. RODERICK2

1 Department of Pathobiology, College of Veterinary Medicine, University of Florida, Gainesville, Florida 32611-0880 and
2 National Wildlife Health Center, 6006 Schroeder Road, Madison, Wisconsin 53711-6223
(e-mail: rebecca__cole@nbs.gov and constance__roderick@nbs.gov)

**ABSTRACT:** A total of 28 species of helminths (17 trematodes, 3 cestodes, 7 nematodes, and 1 acanthocephalan) was recovered from 17 ospreys (*Pandion haliaetus*) from the United States. Intensities of infection were low and no lesions were attributed to the parasites. Seven species appear to be specialists in ospreys, 2 species generalists in raptors, and the remainder generalists in other orders of fish-eating birds. *Pandiontrema rjikovi, Diasiella diasi, and Contraacaeum pandion* are reported for the first time from North America.

**KEY WORDS:** helminths, osprey, parasites, *Pandion haliaetus, Pandiontrema rjikovi, Diasiella diasi, Contraacaeum pandion*.

The osprey, *Pandion haliaetus* (Linnaeus), is a cosmopolitan, monotypic member of the family Falconidae comprising its own subfamily, Pandioninae. Ospreys breed primarily in the Northern Hemisphere (North America and Eurasia) and winter in the Southern Hemisphere (South America, Africa, and India), with the exception of 2 nonmigratory subspecies in the Caribbean and Indonesia (Poole, 1989). Although this predominantly fish-eating raptor was considered threatened in North America in the 1960's because of pesticide contamination of the food chain, it has made a strong recovery and is now common in many parts of its former range (Ewins, 1994).
Perhaps because of its protected status, the osprey has not been surveyed for helminth parasites in either North or South America. Isolated records from North America include a few trematodes (Scaphanocephalus expansus by Hoffman (1953), Neogogatea pandionis and Nematostri-gea serpens by Chandler and Rausch (1948), and Renicola lari by Kennedy and Frelier (1984)); 2 cestodes (Paradilepis rugovaginosus by Freeman (1954) and Paradilepis simoni by Rausch (1949)); and 1 nematode (Sexanoscara skrjabini by Schmidt and Huber (1985)). In this report, we combine records of osprey helminths collected at the Department of Pathobiology, University of Florida (UF), Gainesville, and the National Wildlife Health Center (NWHC), Madison, Wisconsin.

Five injured or dead ospreys submitted to the Department of Pathobiology (UF) between October 1974 and September 1978 were examined at necropsy according to the methods of Kinsella and Forrester (1972). Ospreys submitted to the NWHC were examined for cause of death and helminths were collected when found, but parasite examinations were incomplete and not quantitative. Helminths were collected from 12 birds between November 1991 and April 1994. Voucher specimens of helminths were deposited in the Harold W. Manter Collection of the University of Nebraska, Lincoln.

A total of 28 species of helminths (17 trematodes, 3 cestodes, 7 nematodes, and 1 acanthocephalan) was recovered from the 17 ospreys. Prevalences and intensities of helminths from the 5 completely necropsied birds are listed in Table 1. Although the sample size was small, intensities were low and no significant lesions were associated with any of the infections. In Table 2, we list helminths and collection localities for the other 12 birds. Again, helminth infections were not implicated as the cause of significant lesions or death in these hosts. Pandion-trema ryjikovi, Diasiella diasi, and Contracaecum pandionis are reported from North America for the first time.

Seven species can be considered specialists in ospreys (helminths only reported from 1 host species). Three of these (N. pandionis, P. rugovaginosus, and P. simoni) have been reported only from North America. The other 4 (P. ryji-kovi, S. expansus, C. pandionis, and S. skrjabini) have been reported now from both North America and Eurasia (Sobolev and Sudarikow, 1939; Dubois, 1960; Oshmarin and Parukhin, 1960). This number of specialists is large in comparison to other avian hosts and may reflect the osprey’s

### Table 1. Prevalences and intensities of helminths of 5 ospreys in Florida.

<table>
<thead>
<tr>
<th>Trematoda</th>
<th>HWML No.</th>
<th>Location in host</th>
<th>Prevalence No. inf. %</th>
<th>Intensity Mean</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scaphanocephalus expansus</td>
<td>36935</td>
<td>SI</td>
<td>2</td>
<td>40</td>
<td>361</td>
</tr>
<tr>
<td>Mesorchis denticulatus</td>
<td>36936</td>
<td>SI</td>
<td>3</td>
<td>60</td>
<td>81</td>
</tr>
<tr>
<td>Ribeiria ondatrae</td>
<td>36938</td>
<td>P</td>
<td>2</td>
<td>40</td>
<td>33</td>
</tr>
<tr>
<td>Renicola lari</td>
<td>36934</td>
<td>K</td>
<td>3</td>
<td>60</td>
<td>96</td>
</tr>
<tr>
<td>Neogogatea pandionis</td>
<td>—</td>
<td>SI</td>
<td>2</td>
<td>40</td>
<td>89</td>
</tr>
<tr>
<td>Microcotyphus facetum</td>
<td>36937</td>
<td>C</td>
<td>1</td>
<td>20</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cestoda</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Paradilepis rugovaginosus</td>
<td>36941</td>
<td>SI</td>
<td>1</td>
<td>20</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Nematoda</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Capillaria falconis</td>
<td>—</td>
<td>SI</td>
<td>1</td>
<td>20</td>
<td>1</td>
</tr>
<tr>
<td>Sexanoscara skrjabini</td>
<td>—</td>
<td>E</td>
<td>1</td>
<td>20</td>
<td>3</td>
</tr>
<tr>
<td>Tetramites sp.</td>
<td>—</td>
<td>P</td>
<td>2</td>
<td>40</td>
<td>7</td>
</tr>
<tr>
<td>Contracaecum pandionis</td>
<td>—</td>
<td>P</td>
<td>1</td>
<td>20</td>
<td>1</td>
</tr>
<tr>
<td>Contracaecum multipapillatum</td>
<td>36939</td>
<td>P</td>
<td>2</td>
<td>40</td>
<td>9</td>
</tr>
<tr>
<td>Cardiofilaria pavlovskyi Shtrom</td>
<td>36940</td>
<td>BC</td>
<td>1</td>
<td>20</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Acanthocephala</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Andracantha mergi</td>
<td>36941</td>
<td>SI</td>
<td>1</td>
<td>20</td>
<td>4</td>
</tr>
</tbody>
</table>

* Location in host: BC = body cavity, C = cloaca, E = esophagus, K = kidney, P = proventriculus, SI = small intestine.
Table 2. Helminths from ospreys examined at the National Wildlife Health Center, Madison, Wisconsin.

<table>
<thead>
<tr>
<th>Helmint species</th>
<th>HWML No.</th>
<th>Location in host*</th>
<th>Collection localities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trematoda</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scaphanocephalus expansus (Creplin, 1842)</td>
<td>—</td>
<td>SI</td>
<td>Florida</td>
</tr>
<tr>
<td>Mesorchis denticulatus (Rudolphi, 1802)</td>
<td>—</td>
<td>SI</td>
<td>Florida</td>
</tr>
<tr>
<td>Ribeiroia ondatrae (Price, 1931)</td>
<td>—</td>
<td>P</td>
<td>Virginia, Massachusetts</td>
</tr>
<tr>
<td>Neogopatea pandionis Chandler and Rausch, 1948</td>
<td>38381</td>
<td>SI</td>
<td>Virginia</td>
</tr>
<tr>
<td>Diasiella diasi (Travassos, 1922)</td>
<td>38581</td>
<td>SI</td>
<td>Virginia</td>
</tr>
<tr>
<td>Pandiontrema ryjikovi (Oshmarin and Parukhin, 1960)</td>
<td>38105</td>
<td>SI</td>
<td>Washington</td>
</tr>
<tr>
<td>Nematostrigea serpens (Nitzsch, 1819)</td>
<td>38104</td>
<td>SI</td>
<td>Virginia</td>
</tr>
<tr>
<td>Mesophorodiplostomum pricei (Krull, 1934)</td>
<td>38386</td>
<td>SI</td>
<td>Florida, Massachusetts, Montana, Virginia</td>
</tr>
<tr>
<td>Neodiplostomum sp.</td>
<td>—</td>
<td>SI</td>
<td>Maryland</td>
</tr>
<tr>
<td>Phagicola longa Ransom, 1920</td>
<td>38387</td>
<td>SI</td>
<td>Florida, South Carolina</td>
</tr>
<tr>
<td>Phagicola sp.</td>
<td>—</td>
<td>SI</td>
<td>Florida</td>
</tr>
<tr>
<td>Ascocotyle sp.</td>
<td>—</td>
<td>SI</td>
<td>South Carolina</td>
</tr>
<tr>
<td>Echinococbus dietzevi Issaitschkoff, 1927</td>
<td>38382</td>
<td>SI</td>
<td>Florida</td>
</tr>
<tr>
<td>Cryptocotyle lingua (Creplin, 1825)</td>
<td>38380</td>
<td>SI</td>
<td>Massachusetts</td>
</tr>
<tr>
<td>Pygidopsis pinderamensis Travassos, 1929</td>
<td>38385</td>
<td>SI</td>
<td>Florida</td>
</tr>
<tr>
<td>Cestoda</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paradipnlepis rugovaginosus Freeman, 1954</td>
<td>38106</td>
<td>SI</td>
<td>Maryland</td>
</tr>
<tr>
<td>Paradipnlepis simoni Rausch, 1949</td>
<td>38384</td>
<td>SI</td>
<td>Montana</td>
</tr>
<tr>
<td>Cyclistera ibises (Schmidt and Bush, 1972)</td>
<td>38383</td>
<td>SI</td>
<td>Florida</td>
</tr>
<tr>
<td>Nematoda</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capillaria falconis (Goeze, 1782)</td>
<td>—</td>
<td>SI</td>
<td>Florida</td>
</tr>
<tr>
<td>Sexanoscara skrjabini Sobolev and Sudarikow, 1939</td>
<td>38394</td>
<td>E</td>
<td>Maryland</td>
</tr>
<tr>
<td>Tetramerex sp.</td>
<td>—</td>
<td>P</td>
<td>Virginia</td>
</tr>
<tr>
<td>Contracaecum multipapillatum (Drasche, 1882)</td>
<td>—</td>
<td>P</td>
<td>Florida, South Carolina</td>
</tr>
<tr>
<td>Contracaecum spiculigerum (Rudolphi, 1809)</td>
<td>—</td>
<td>P</td>
<td>Massachusetts, Montana, Virginia</td>
</tr>
<tr>
<td>Contracaecum larvae</td>
<td>—</td>
<td>P</td>
<td>Florida, Washington</td>
</tr>
<tr>
<td>Acanthocephala</td>
<td></td>
<td>SI</td>
<td>Massachusetts</td>
</tr>
</tbody>
</table>

* Location in host: E = esophagus, P = proventriculus, SI = small intestine.

reproductive and ecological isolation from other raptors since the Pleistocene (Poole, 1989).

All of the remaining helminths that could be identified to species can be considered generalists, found in more than 1 host species. In an earlier study on 6 species of hawks and falcons in Florida (Kinsella et al., 1995), the majority of helminths were judged to be generalists in raptors, not found in other orders of birds. In contrast, only 2 generalists in the osprey, Capillaria falconis and N. serpens, are restricted to raptors. The rest appear to exhibit ecological rather than host specificity and are found in members of other orders of fish-eating birds, including Anseriformes and Pelicaniformes (e.g., Ribeiroia ondatrae, Phagicola longa, Cryptocotyle lingua, Contracaecum multipapillatum, Contracaecum spiculigerum) (McDonald, 1969).

Perhaps the most unusual record found here was 3 specimens of D. diasi in the small intestine of an osprey from Virginia. This trematode was described from the pancreas of anhingas, Anhinga anhinga, in Brazil by Travassos (1922) and has recently been found in cysts on the pancreas of a great blue heron in Florida (Kinsella and M. G. Spalding, unpubl. data) and in the intestine of a bald eagle, Haliaeetus leucocephalus, from Virginia (Cole, unpubl. data). The pancreas appears to be the normal site of infection for this trematode, and its presence in the intestine of the osprey and eagle may be due to postmortem migration.

Although life-cycle data are not available for any of the 7 osprey specialists, it is highly probable that most are acquired through the ingestion of fish intermediate hosts, both freshwater and
The osprey’s diet consists almost exclusively (>99%) of fish (Poole, 1989; Ewins, 1994), and more data on helmint distribution will provide clues to the identity of intermediate hosts.

A few of the trematode generalists found (Phagicola longa, Cryptocotyle lingua, and Ascocotyle sp.) have life cycles primarily associated with estuarine and marine ecosystems and were found only in birds from coastal states such as Florida and South Carolina. These species could potentially act as biological tags reflecting the migratory behavior of the host; however, the host collection data provided in the present study was not precise enough to warrant any such conclusions.

We would like to thank Mauritzen Sterner for assistance in identifying acanthocephalans and Garry Foster for technical assistance. In addition, Carol Meteyer, Louis Locke, Louis Sileo, and J. Christian Franson of the NWHC are thanked for assistance in obtaining specimens. This research was supported by contracts from the Florida Game and Freshwater Fish Commission and is a contribution of Federal Aid to Wildlife Restoration, Florida Pittman-Robertson Project W-41. This is Florida Agricultural Experiment Stations Journal Series No. R-04740.

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