family Strigeidae (Holostomidae) IX.


Parasites of the Common Crow (Corvus brachyrhynchos Brehm, 1822) in Insular Newfoundland

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ABSTRACT: Ninety-nine crows (Corvus brachyrhynchos Brehm, 1822) obtained from 12 localities in insular Newfoundland were examined for parasites using standard parasitological techniques. Whenever possible blood smears were made. Eighteen species of parasites (3 trematode, 3 cestode, 5 nematode, 1 acanthocephalan, 3 mallophagan, and 3 haematozoan) were recovered. One is a new host and distribution record while six are new host records for North America. Ninety-five percent of the crows examined were infected with helminth parasites, the number of species per infected bird ranging from 1–7 (mean 4) with the number of individuals per infected bird ranging from 1–190 (mean 63). Preferred age and sex of host and site of infection/infestation for each parasite species are noted. Three species of helminth (Cyathostoma lari, Conspicuum macrochis, Prosthorhynchus formosum) were observed to cause damage to the host but none was lethal.

The common crow (Corvus brachyrhynchos Brehm, 1822) is widely distributed throughout North America, breeding in both Canada and the United States (AOU Check-list, 1957). While many aspects of the biology of the crow have been investigated, few detailed studies have been made of its parasites. A study was, therefore, initiated to determine the nature and burden of parasites of the common crow in Newfoundland, and to compare the results obtained with the work of previous authors. Andrews and Threlfall (1973) gathered together many of the previous records dealing with this host in their checklist of the helminth parasites of members of the genus Corvus (Aves).

Materials and Methods

Common crows were collected (shot, 12-gauge shotgun, shot size 2-7½) during the period May 1971–December 1973, from 12 localities in Newfoundland [11 areas on the Avalon Peninsula and one on the west coast (Bonne Bay)]. Weights and standard measurements (wing, tail, tarsus, and culmen) of the birds were recorded, as part of a wider survey, and then the specimens were examined for parasites. Autopsies were normally performed, using conventional techniques, within 4 hr of death. If any delay was anticipated the birds were deep-frozen (–10 C) for later examination.

The various regions of the digestive tract (esophagus, proventriculus, gizzard, duodenum, small intestine (subdivided into three equal sections), rectum, ceca, and cloaca) were
examined individually to determine the linear distribution of any parasites found.

Trematodes and cestodes were relaxed in 1% ethyl carbamate prior to preservation while nematodes were killed and fixed in glacial acetic acid. Ectoparasites were fixed and preserved in 70% ethyl alcohol. Trematodes were stored in 70% ethyl alcohol while cestodes and Acanthocephala were placed in Demke's solution. Nematodes were preserved in glycerine alcohol. Trematodes and cestodes were stained [Semichon's Acetic-Carmine, Gomori's Trichrome, Celestine Blue (cestodes only), Mayer's HCL Carmine], dehydrated, cleared, and mounted in Canada balsam. Acanthocephala, nematodes, and ectoparasites were mounted and cleared in Rubin's fluid, while blood smears were air-dried, fixed in 100% ethanol, and stained with Giemsa.

All measurements are given in microns.

**Results and Discussion**

Ninety-nine common crows (37 adult males, 18 adult females, 4 adults of unknown sex, and 40 immatures) were examined during the survey. A total of 18 species of parasites were recovered (3 trematode, 3 cestode, 5 nematode, 1 acaenothocephalan, 3 mallophagan, and 3 haematozoan). Ninety-four crows (95%) were infected with helminth parasites (Table 1), the number of species per infected bird ranging from 1–7 (mean 4) with the number of individual parasites per infected bird ranging from 1–190 (mean 63).

**Trematoda**

Three species of digenetic trematodes belonging to three genera (Table 1) were recovered from 79 (80%) of the crows examined (range 1–125; mean 14 per infected bird).

*C. macrorchis*, recovered from 79 (80%) of the crows examined, was described by Denton and Byrd (1951) from *C. brachyrhynchos* taken in Texas. Jones (1968) recorded this parasite from the same host in Ohio. Immature crows were the most frequently infected age class, while adult males and immatures had the highest intensity of infection. The gall bladder yielded 58% of the parasites recovered, the bile ducts 35%; the remaining 7% being located in various other body regions, probably as a result of post-mortem migration. Measurements and morphological characters of specimens obtained during the present study agreed with those of Denton and Byrd (1951), with the exception of two specimens in which the cirrus sac was extremely large (961 by 175; 692 by 429, respectively). The size difference may have been due to differences in the techniques of preservation and subsequent treatment (Ulmer, 1952). On removal of *C. macrorchis* from the gall bladder wall, small mushroom-shaped projections at the site of attachment were noted. Bassett (1958), in a study of *C.icteridorum*, reported similar mushroom-shaped projections with a subsequent loss of the supporting tissue and lining of the gall bladder wall.
Two male crows were infected with *Brachylecithum stuntkardi*, the majority of the helminths (91%) being found in the gall bladder. It is interesting to note that the two host specimens were collected on the west coast of Newfoundland, approximately 270 miles from the main sampling areas. This would suggest that either the parasite is at the extremity of its range or that its intermediate hosts are present only in the western part of the island. The possibility also exists that there may be differences in the diets of different host populations. Measurements of the specimens agreed with those of Denton and Byrd (1951) with the exception of the eggs (preserved) which were 38-49 (44) by 26-33 (28), while Denton and Byrd (1951) reported egg measurements (preserved) of 30-41 by 21-27. They noted, however, that the eggs were 38-45 by 28-33 before preservation, which corresponds with the size range of preserved eggs in the present study.

*Prosthogonimus macrorchis* was recovered from the bursa of Fabricius of 17 (17%) of the immature crows examined. This parasite, normally found in domestic fowl, has been recovered previously from experimentally infected *C. brachyrhynchos* by Macy (1934a, b). This author notes that *P. macrorchis* shows a tendency for considerable variation and that the host may influence the size of the organism.

**Cestoda**

Three species of cestodes (Table 1) belonging to three genera were recovered from 60 (61%) of the crows examined (range 1–111; mean 14 per infected bird).

*Dilepis undula* was noted in 56 (57%) of the crows examined, the greatest intensity of infection being seen in adult male and immature birds. The preferred site of infection was the mid-section of the small intestine. *Hymenolepis farciminosa* was recovered from 13 (13%) of the birds. Immature birds were the most frequently infected age class while the midsection of the small intestine harbored the greatest number of parasites.

Two adult male and two immature crows were infected with *Schistocephalus solidus*. The midsection of the small intestine harbored the greatest number of parasites. The adult of this cestode normally occurs in the intestine of fish-eating birds (Hopkins and Smyth, 1951), and despite a wide range of definitive hosts, the adult worm is rarely found. This is probably due to the rapid (36 hr) maturation of the plerocercoid larva in the definitive host, and the short time (3–4 days) that the adult remains there (Hopkins and Smyth, 1951). The crows, in this instance, were probably accidental hosts as they do not normally consume large amounts of fish. The time of collection coincided with an annual mass die-off of threespine sticklebacks (*Gasterosteus aculeatus* L.) which are the second intermediate host of this helminth (Threlfall, 1968a). The crows, being scavengers, probably fed on dead fish as they washed ashore.

**Nematoda**

Three species of adult nematodes belonging to two genera and two larval forms belonging to two other genera were recovered from 73 (74%) of the crows examined (range 1–153; mean 37 per infected bird).

Two commonly found adult parasitic forms were *Capillaria contorta* located in the esophagus, and *Capillaria resecta* found in the duodenum and small intestine. Immature birds harbored the greatest numbers of these parasites.

*Cyathostoma lar* was noted in the nasal cavities of 37 (37%) of the crows examined, immature birds being the most heavily infected age class. Threlfall (1968b) noted this helminth in herring gulls (*Larus argentatus* Pont.) taken in Newfoundland. It is possible that infection of the crow occurs at the sanitary fill where the birds were collected and where considerable species interaction occurs. Since the life cycle of *C. lar* is direct, transfer from one host to another might be expected in this situation. *C. lar* was observed to cause damage to host tissue, as was recorded by Threlfall (1966) and Colam (1971).

Two immature crows were infected with larval ascaridids, one specimen being recovered from the midsection of the small intestine of one crow and another from the posterior section of the small intestine of a second crow. No representatives of the family Ascarididae have been recorded previously from crows in North America.
Table 2. Details of infestation of common crows (Corvus brachyrhynchos Brehm, 1822) with ectoparasites.

<table>
<thead>
<tr>
<th>Ectoparasite</th>
<th>No. (%) infested birds</th>
<th>Total No. parasites recovered</th>
<th>Range of No. recovered</th>
<th>Average No. per infected bird</th>
</tr>
</thead>
<tbody>
<tr>
<td>Philopterus ocellatus (Scopoli, 1763)</td>
<td>70 (70%)</td>
<td>1,300</td>
<td>1–357</td>
<td>19</td>
</tr>
<tr>
<td>Myrsidea interrupta (Osborn, 1896)</td>
<td>67 (68%)</td>
<td>1,218</td>
<td>1–202</td>
<td>18</td>
</tr>
<tr>
<td>Brueelia rotundata (Osborn, 1896)</td>
<td>44 (44%)</td>
<td>1,692</td>
<td>1–262</td>
<td>38</td>
</tr>
</tbody>
</table>

One bird was infected with microfilariae. Anderson (1959), in an extensive survey of microfilariae, included records of these parasites from crows in Canada and the United States.

**Acanthocephala**

The mid and posterior sections of the small intestine of 60 (60%) of the crows examined harbored Prosthorhynchus formosum. This acanthocephalan can cause a considerable amount of damage at the site of attachment, since its hooks and proboscis usually penetrate the mucosa of the small intestine. Schmidt (1963) reported the histopathological changes associated with the attachment of this parasite in a robin.

**Ectoparasites**

Three species of mallophaga representing three genera were recovered from 82 (83%) of the birds examined (range 1–357; mean 51 per infested bird) (Table 2).

*Philopterus ocellatus* was recovered in greatest numbers from the head and neck of 70 (70%) of the crows examined, adult female and immature birds having the highest intensity of infestation. Immature *P. ocellatus* were found in greater numbers than either adult males or females.

Greatest numbers of *Myrsidea interrupta* were recovered from the ventral regions of 67 (68%) of the birds. Adult male and immature birds showed the highest intensity of infestation. Adult male *M. interrupta* were the most prevalent age class.

*Brueelia rotundata* infested 44 (44%) of the birds, greatest numbers being recovered from the ventral region. Immature birds had the highest intensity of infestation while immature forms of this ectoparasite were most numerous.

**Haematozoa**

A light infection with haematozoa was noted in 13 (13%) of the crows. The parasites recovered belong to three genera, namely *Leucocytozoon* (six birds infected); *Haemoproteus* (six birds infected); and *Plasmodium* (two birds infected).

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**Literature Cited**


Unicoelium prochilodorum gen. et sp. n. (Trematoda: Haploporidae) from a Freshwater Fish (Prochilodus reticulatus) in Colombia

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ABSTRACT: Unicoelium prochilodorum gen. et sp. n. is described from the intestinal tract of a Colombian freshwater characid fish, Prochilodus reticulatus Steindachner. The new form is included in the subfamily Unisaccinae Martin, 1973, because of the union of the intestinal branches. The new genus differs from others in the subfamily by the more posterior position of the ovary, testis, vitelline glands, and acetabulum, and by the more anterior extension of the uterus and the receptaculum seminis uterinum.

The family Haploporidae is a small group of digenetic trematodes found principally in the intestines of the mullet and other closely related marine fishes. Some members of the family have been reported from freshwater fishes, however. Martin (1973a) presented a comprehensive review of the genera and species in this family along with their distribution. Haploporid trematodes have been reported from South America by Sziat (1954), Freitas (1947), and Thatcher and Dossman (1974).

During examinations of freshwater fishes of the upper Cauca River, near Cali, Colombia, an undescribed genus of Haploporidae was collected from a characid fish (Prochilodus reticulatus Steindachner). The host fish is of commercial importance and is known locally as the “bocachico” (smallmouth). The new genus of trematode described herein is widespread in the upper Cauca River and its tributaries. Infection rates of from 10–60% with infection densities of from 1–53 worms per fish have been encountered.

**Materials and Methods**

The trematodes were washed from the host viscera in tap water, killed on slides with gentle