

OCCURRENCE AND DISTRIBUTION OF THE TREMATODE,
COLLYRICLUM FABAE (BREMSER) IN BIRDS

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THE trematode, *Collyriclum faba*, has been reported from two orders, thirteen families, 24 genera, and 26 species of birds. This fluke occurs in cysts in the skin, primarily around the vent. The purpose of this paper is to record a new host occurrence, give a brief review of the literature, and present a complete parasite-host list with its geographical distribution. It is hoped that this report may stimulate research and observations leading to the solution of the life cycle of *C. faba*.

Collyriclum faba, a trematode of the subclass Digenea, order Pro-sostomata, suborder Distomata and family Troglotrematidae, has been known for more than a century. It was originally described as *Monostoma faba* by Schmalz (1831) on the basis of descriptions and drawings made by S. Thom. von Soemmerring and Guilielmi Soemmerring from specimens collected by Bremser from *Parus major* near Vienna, Austria; descriptions and drawings sent in by Bremser from *Phylloscopus sibilatrix* collected in June, 1823, near Vienna, Austria; and from descriptions by Prof. Fischer, Vienna, of specimens collected from *Motacilla cinerea*. In his letter to Schmalz in 1823, Bremser refers to the parasite as *Monostoma geminum*. It appears that Schmalz based his descriptions on the material submitted to him from these three sources; named it *M. faba*, and gave credit to Bremser, apparently because he was the first to observe the parasite.

Miescher (1838) described a trematode, *M. bijugum*, which Seibold (1839) recognized to be synonymous with *M. faba*. A good account of this may be found in the treatise of Dujardin (1845). Rolando (1841) created the genus *Globularia* as the genus *Monostoma* was becoming unwieldy. Cobbold (1860) placed *faba* in the genus *Wedlia*. Odhner (1907) excluded the species *faba* from *Wedlia*. Kossack (1911) agreed with Rolando in proposing a new genus for *faba* but pointed out that the name *Globularia* was already in use for a genus of mollusks. Therefore, Kossack proposed the genus *Collyriclum* with *faba* as the type and only species in this genus. Ward (1917) created a new species, *C. colei*, which was shown to be synonymous with *C. faba* by Chapin (1926). For detailed descriptions of the parasite, the papers of Jegen (1917), Ward (1917) and Tyzzer (1918) may be consulted.

On July 12, 1942, a juvenile female cowbird was trapped near Tomahawk, Wisconsin. This bird which was heavily parasitized with *C. faba* was one of a family of three cowbirds which was being raised

by a pair of song sparrows. Neither of the other cowbirds nor the foster parents were infected. All were trapped, inspected, banded, and released. The infected cowbird harbored approximately 54 cysts around the anus. Several of the cysts were small; each of these contained two immature flukes. A total of 28 mature flukes were recovered. The clumping of the cysts around the anus gave the appearance of a tumor-like growth. The cysts were from 3 to 6 mm. in diameter and protruded 6-10 mm. from the skin surface. Eggs were recovered from the cyst openings, cultured, and active miracidia were obtained. In the vicinity of the area in which this family was raised were three shallow ponds and a lake. Snails, *Planorbis* sp. and *Stagnicola emarginata* were collected from two of the ponds; none could be found in the third pond or in the lake. Examination of 246 snails did not reveal the presence of immature flukes (sporocysts, ceraria, or metacercaria).

On June 2, 1942, on the campus of the University of Wisconsin, a sick juvenile male robin was collected and taken to the laboratory for examination. The robin harbored 14 cysts near the anus containing 27 mature *C. faba*. *Collyriclum faba* from the cowbird is a new host record.

The life cycle of this parasite is not known. There is no confirmation for the suggestion of Jegen (1917) that the life cycle is direct. As most trematodes require an intermediate host, it is reasonable to assume that a snail host plays a rôle in its life cycle. Riley (1931) believes that the dragonfly nymph is the second intermediate host.

Cole (1911), Jegen (1917), Tyzzer (1918), Riley and Kernkamp (1924), and Riley (1931), who found large numbers of infected individuals, state that the parasite is confined almost exclusively to young birds. Our records also confirm this point. This may be due to a host-parasite relationship and, therefore, of no significance in the life-cycle. All dated records are for late spring and summer, from May to September. It is therefore probable that most birds become infected as young in the nest, from food carried by the parents.

The geographical distribution of *M. faba* is definitely limited to three regions: (1) *Central Europe*, including Switzerland, Austria, southern Germany, southeastern France, and northern Italy; (2) *Eastern United States*, including Maryland, New Jersey, and Massachusetts; (3) *North-central United States*, including Wisconsin, Michigan, and Minnesota. Every record falls into one of these three regions. One species, *Passer domesticus*, has been found infected in each of these three regions. There are no records west of the Great Plains in the United States.

Because of the rigidity of trematode life cycles of this group, it is safe to assume that the intermediate hosts, especially the second, of *C. faba* are invariable. This would then lead to the conclusion that infection in all 26 species of birds must occur by eating the same invertebrate intermediate hosts (possibly a dragonfly or Mayfly). In consideration of the variety of species in the host list it is obvious that any such item must be rare, sporadic, or accidental in many of the species of hosts. There may possibly be a relationship between the distribution of the intermediate host and the peculiar distribution of the records of the parasite.

In the host list, scientific names are according to Niethammer (1937) for European birds, and the fourth A.O.U. Check-List (1931) for American birds. Common names of European birds are in general those from Thorburn (1926-27); common names for American birds are from the fourth A.O.U. Check-List (1931). The taxonomic relationship of groups is that of Wetmore (1940).

PARASITE-HOST LIST OF *Collyricium faba*

ORDER GALLIFORMES

Family PHASIANIDAE

Gallus gallus (Linnaeus), Domestic Fowl.—Riley and Kernkamp (1924): Minneapolis, Minnesota, June, 1922.

Family MELEAGRIDIDAE

Meleagris gallopavo Vieillot, Domestic Turkey.—Riley and Kernkamp (1924): Vining, Minnesota, June 29, 1923. Marcotel (1926): Romans, Drome Province, France (southeast).

ORDER PASSERIFORMES

Family CORVIDAE

Corvus brachyrhynchos Brehm, Crow.—McIntosh (1935): Douglas Lake, Michigan, June 28, 1928; July 14, 1928; July 18-26, 1929. Morgan and Waller (1941): Iowa, June, 1940. Riley (from Beaudette, 1940): Minnesota.

Cyanocitta cristata (Linnaeus), Blue Jay.—Hassell, (1908): Maryland. Riley (from Beaudette, 1940): Minnesota.

Garrulus glandarius (Linnaeus), European Jay.—Railliet (1898): collected by Laguesse at Fixin, Côte d'Or Province, France (east), September, 1897.

Family PARIDAE

Parus major Linnaeus, Great Titmouse.—Bremser (in Schmalz, 1831): Vienna, Austria, early summer, 1823.

Family SITTIDAE

Sitta carolinensis Latham, White-breasted Nuthatch.—McIntosh, (1935): Douglas Lake, Michigan, July 2, 1928.

Family TURDIDAE

Turdus migratorius Linnaeus, Robin.—Riley and Kernkamp (1924) [*Planesticus migratorius*]: St. Paul, Minnesota, 1919. Morgan (this paper): Madison, Wisconsin, June 2, 1942.

Ruticilla phoenicura (Linnaeus), European Redstart.—Jegen (1917): Basel, Switzerland.

Oenanthe oenanthe (Linnaeus), Wheatear.—Willemoes-Suhm (1873) [*Saxicola oenanthe*]: Genoa, Italy. Kossack (1911) [*Saxicola oenanthe*]: specimen in Munich Museum collected by Willemoes-Suhm, Genoa, Italy, Sept. 25, 1889.

Family SYLVIIDAE

Sylvia borin (Boddaert), Garden Warbler.—Kossack (1911) [*Sylvia simplex*]: specimen in Munich Museum, Germany.

Sylvia hortensis (Gmelin), Orphean Warbler.—Kossack (1911): Gruenewalde, Bavaria, Germany.

Phylloscopus sibilatrix (Bechstein), Wood Warbler.—Bremser (*in Schmalz*, 1831) [*Sylvia sibilatrix*]: Vienna, Austria, June, 1823.

Phylloscopus trochilus (Linnaeus), Willow Warbler.—Creplin (1839) [*Sylvia sibilatrix*]: southern Germany, June 8, 1831.

Family MUSCICAPIDAE

Muscicapa striata (Pallas), Spotted Flycatcher.—Jegen (1917) [*Muscicapa grisola*]: Basel, Switzerland.

Family MOTACILLIDAE

Motacilla cinerea Tunstall, Gray Wagtail.—Fischer (*in Schmalz*, 1831) [*Motacilla boarula*]: Vienna, Austria. Diesing (1860) [*Motacilla boarula*]: Vienna, Austria.

Family STURNIDAE

Sturnus vulgaris Linnaeus, Starling.—Rolando (1841): Italy.

Family PLOCEIDAE

Passer domesticus (Linnaeus), House Sparrow.—Miescher (1838) [*Fringilla domestica*]: Basel, Switzerland. Kossack (1911) [*F. domestica*]: Basel, Switzerland, June, 1849. Cole (1911): Madison, Wisconsin, June 15–July 25, 1910. Jegen (1917) [*F. domestica*]: Basel, Switzerland. Riley (1931): Ithaca, New York, 1914. Tyzzer (1918): Boston, Massachusetts, summers of 1917 and 1918. Riley (*from* Beaudette, 1940): Minnesota.

Family ICTERIDAE

Quiscalus quiscula (Linnaeus), Purple Grackle.—Riley (*from* Beaudette, 1940) [*Quiscalus quiscula aeneus*]: Waconia, Minnesota.

Agelaius phoeniceus (Linnaeus), Red-winged Blackbird.—Riley (*from* Beaudette 1940): Minnesota.

Molothrus ater (Boddaert), Cowbird.—Farner and Morgan (this paper): Tomahawk, Wisconsin, July 12, 1942.

Family FRINGILLIDAE

Carduelis spinus (Linnaeus), European Siskin.—Miescher (1838) [*Fringilla spinus*]: Basel, Switzerland.

Serinus canarius (Linnaeus), Canary.—Miescher (1838) [*Fringilla canariensis*]: Basel, Switzerland.

Emberiza cirius Linnaeus, Cirl Bunting.—Parona, Italy, 1887.

Fringilla coelebs Linnaeus, Chaffinch.—Jegen (1917): Basel, Switzerland.

Cardopacus purpureus (Gmelin), Purple Finch.—Beaudette (1940): Demarest, Bergen County, New Jersey, May 2, 1939.

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BROOD HABITS AND GROWTH OF 'BLUE GROUSE'¹

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THE 'blue grouse' (*Dendragapus fuliginosus* and *Dendragapus obscurus*), the West's premier game birds, inhabit mountain forests from Alaska to New Mexico. They are associated with the coniferous forests and have been called aptly the "coniferous counterpart of the Ruffed Grouse."

The principal work of this study was concentrated in the general area accessible from Conconully, Okanogan County, Washington, on

¹A coöperative study between the State College of Washington and the Washington Game Department. The birds of this study are Richardson's Grouse, *Dendragapus obscurus richardsoni*. See page 503.