

Common Freshwater Fish Parasites Pictorial Guide: Dinoflagellates, Coccidia, Microsporidians, & Myxozoans¹

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Introduction

This publication is one in a [series of pictorial guides](#) that is designed to assist in the identification of common freshwater fish parasites.

The information provided in this guide is not intended to be a complete, detailed description of each parasite or parasite group and its characteristics but rather is intended to assist in the visual identification of some of the most common species or groups of parasites seen in freshwater fish. For further information on each parasite, refer to publications in the "Recommended Reading" and "Reference" sections below.

Guide Information

- **Target Tissue:** provides the location on/in the fish where the parasite is most commonly found.
- **Characteristic:** provides a brief description about the appearance of the parasite.
- **Size:** provides the size or size range of the parasite. (1 μm = 0.001 mm = 0.0001 cm) (μm = micron or micrometer; mm = millimeter; cm = centimeter)
- **Movement:** provides the type of movement, if any, of the parasite.
- **Note:** provides a brief comment of interest about the parasite.

Dinoflagellates, Coccidia, Microsporidians, and Myxozoans

Dinoflagellate: *Piscinoodinium*



Figure 1. *Piscinoodinium* on gills (left)

Target Tissues: Skin, fin, gills

Appearance: Oval shape with amber color, "granular" interior; may see clear area near middle and one end of oval

Size: Trophont approx. 12 μm x 96 μm

Movement: Not free-moving

Note: Most pathogenic to young fish; complex life cycle with stages on and off fish

Coccidia

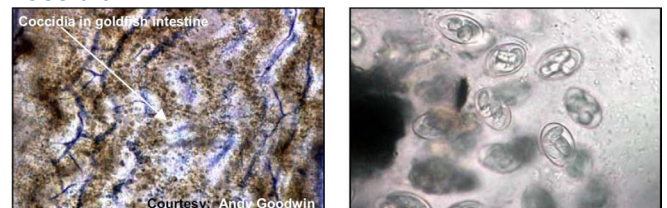


Figure 4. Myxozoans: with one polar capsule (left); with two polar capsules (right).

Target Tissues: Intestinal tract (most common); may be present in other organs

Appearance: Egg-shaped, clear oocyst; typically contains four sporocysts

Size: Approx. 25 μm in diameter

Movement: Not free-moving

Note: May or may not cause significant disease

Microsporidians

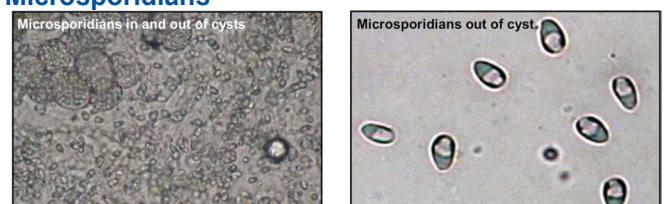


Figure 2. Coccidia: Coccidia in goldfish intestine (left)

Credit: Courtesy of Andy Goodwin (left)

Target Tissues: Any; common in muscle for some fish

Appearance: Often see grainy-looking cysts first (parasites inside cyst); individual parasite shaped like egg or Dutch "wooden shoe"

Size: Spores approx. 3–10 µm; largest stage up to 50 µm

Movement: Not free-moving

Note: Burst cyst to "free" individual spores for identification; direct fish to fish transmission in species studied

Myxozoans

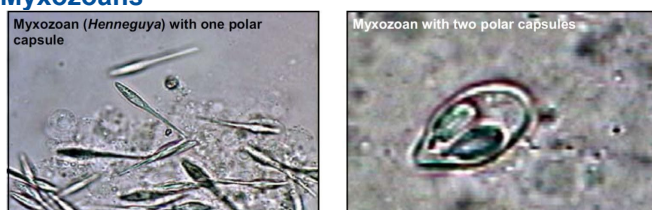


Figure 3. Microsporidians: in and out of cysts (left); out of cyst (right)

Target Tissues: Any

Appearance: Spores of different species vary greatly in shape and size; often see cysts first (parasites inside cyst); all spores have one to six polar capsules

Size: Spores approx. 8–20 µm

Movement: Not free-moving

Note: Burst cyst to "free" individual spores for identification; in species studied, indirect life cycle involving oligochaete worm

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Recommended Reading

- SRAC Publication No. 410 Calculating Treatments for Ponds and Tanks. Southern Regional Aquaculture Center. <https://fisheries.tamu.edu/files/2013/09/SRAC-Publication-No.-0410-Calculating-Treatments-for-Ponds-and-Tanks.pdf>

- SRAC Publication No. 475 Proliferative Gill Disease (Hamburger Gill Disease). Southern Regional Aquaculture Center. https://fisheries.tamu.edu/files/2019/01/SRAC_0475.pdf
- SRAC Publication No. 4701 Protozoan Parasites. Southern Regional Aquaculture Center. <https://fisheries.tamu.edu/files/2013/09/SRAC-Publication-No.-4701-Protozoan-Parasites.pdf>
- UF/IFAS Circular 91 Nematode (Roundworm) Infections in Fish. <https://edis.ifas.ufl.edu/FA091>
- UF/IFAS Circular 120 Fish Health Management Considerations in Recirculating Aquaculture Systems - Part 1: Introduction and General Principles. <https://edis.ifas.ufl.edu/FA099>
- UF/IFAS Circular 121 Fish Health Management Considerations in Recirculating Aquaculture Systems - Part 2: Pathogens. <https://edis.ifas.ufl.edu/FA100>
- UF/IFAS Circular 122 Fish Health Management Considerations in Recirculating Aquaculture Systems - Part 3: General Recommendations and Problem Solving Approaches. <https://edis.ifas.ufl.edu/FA101>
- UF/IFAS Circular 716 Introduction to Freshwater Fish Parasites. <https://edis.ifas.ufl.edu/FA041>
- UF/IFAS Circular 919 Stress--It's Role in Fish Disease. <https://edis.ifas.ufl.edu/FA005>
- UF/IFAS Circular 920 *Ichthyophthirius multifiliis* (White Spot) Infections in Fish. <https://edis.ifas.ufl.edu/FA006>
- UF/IFAS Circular 921 Introduction to Fish Health Management. <https://edis.ifas.ufl.edu/FA004>
- UF/IFAS Fact Sheet FA-13 Use of Copper in Freshwater Aquaculture and Farm Ponds. <https://edis.ifas.ufl.edu/FA008>
- UF/IFAS Fact Sheet FA-23 The Use of Potassium Permanganate in Fish Ponds. <https://edis.ifas.ufl.edu/FA032>
- UF/IFAS Fact Sheet FA-28 Monogenean Parasites of Fish. <https://edis.ifas.ufl.edu/FA033>
- UF/IFAS Fact Sheet FA-37 Use of Potassium Permanganate to Control External Infections of Ornamental Fish. <https://edis.ifas.ufl.edu/FA027>
- UF/IFAS Fact Sheet FA-55 Submission of Fish for Diagnostic Evaluation. <https://edis.ifas.ufl.edu/FA055>
- UF/IFAS Fact Sheet FA-90 Pentastomid Infections in Fish. <https://edis.ifas.ufl.edu/FA090>

- UF/IFAS Fact Sheet FA-107 Common Freshwater Fish Parasites Pictorial Guide: Sessile Ciliates. <https://edis.ifas.ufl.edu/FA107>
- UF/IFAS Fact Sheet FA-108 Common Freshwater Fish Parasites Pictorial Guide: Motile Ciliates. <https://edis.ifas.ufl.edu/FA108>
- UF/IFAS Fact Sheet FA-109 Common Freshwater Fish Parasites Pictorial Guide: Flagellates. <https://edis.ifas.ufl.edu/FA109>
- UF/IFAS Fact Sheet FA-111 Common Freshwater Fish Parasites Pictorial Guide: Monogeneans. <https://edis.ifas.ufl.edu/FA111>
- UF/IFAS Fact Sheet FA-112 Common Freshwater Fish Parasites Pictorial Guide: Digenean Trematodes. <https://edis.ifas.ufl.edu/FA112>
- UF/IFAS Fact Sheet FA-113 Common Freshwater Fish Parasites Pictorial Guide: Nematodes. <https://edis.ifas.ufl.edu/FA113>
- UF/IFAS Fact Sheet FA-114 Common Freshwater Fish Parasites Pictorial Guide: Acanthocephalans, Cestodes, Leeches, and Pentastomes. <https://edis.ifas.ufl.edu/FA114>
- UF/IFAS Fact Sheet FA-115 Common Freshwater Fish Parasites Pictorial Guide: Crustaceans. <https://edis.ifas.ufl.edu/FA115>
- UF/IFAS Fact Sheet VM-67 Management of Hexamita in Ornamental Cichlids. <https://edis.ifas.ufl.edu/VM053>
- UF/IFAS Fact Sheet VM-77 Use of Formalin to Control Fish Parasites. <https://edis.ifas.ufl.edu/VM061>
- UF/IFAS Fact Sheet VM-78 Bath Treatment for Sick Fish. <https://edis.ifas.ufl.edu/VM037>
- UF/IFAS Fact Sheet VM-85 "Red Sore Disease" in Game Fish. <https://edis.ifas.ufl.edu/VM059>
- UF/IFAS Fact Sheet VM-86 Use of Salt in Aquaculture. <https://edis.ifas.ufl.edu/VM007>
- UF/IFAS Fact Sheet VM-87 Sanitation Practices for Aquaculture Facilities. <https://edis.ifas.ufl.edu/AE081>
- UF/IFAS Fact Sheet VM-104 *Cryptobia iubilans* in Cichlids. <https://edis.ifas.ufl.edu/VM077>

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