

# Project Information for the Fish Parasites Project

## Project Details

**Principal Investigator:** Dr. Sherman Hendrix

**Project Description:** Metazoan parasites of GSMNP fishes

**Project Dates:** **Start Date:** 7/13/2010 **End Date:** 9/9/2010

**Protocol:** Fishes collected by seine, dip netting and electroshocking are then fixed in 10% formalin wither singly or by species for each collection. Each fish is measured and sexed where possible. The fish is examined both externally and internally with each major organ examined. Parasites are then processed for identification and included into the ATBI database.

The following lab procedures were employed.

After confirming the fish ID and locality data, I measured  each to the nearest mm for standard length. Second, the  fish was placed in a glass 100 mm Petri dish with tap water  so that I would not have to breathe formalin fumes and to  have any parasites found remain moist. All dissections  were done underwater with the aid of a dissecting  microscope in order to visualize very small parasites and  prey items, etc.

Parasite specimens removed from host fishes were initially  placed in Stendor dishes with distilled water to remove the  formalin then placed in a graded series of ethanols (30%,  50% and finally 70% for storage) by removing the previous  fluid in order to minimize the handling of the parasite  specimens. A few were placed in fresh 10% formalin but  this was rare and usually involved leeches.

Examining the body surface, including fins, was the first  order of business. This is where I was able to see if  blackspot metacercariae were present as well as leeches  and various cysts. Once that was done, I used a pair of  scissors to remove the fish's head to get to the gills, eyes  and brain. I used scissors to cut the cranium and removed  the brain. Next, I removed the gills and placed them into a  separate dish of tap water for examination. The eyes were  last and opened as well to examine them for trematode  larvae.

I next turned my attention to the pericardial cavity and  abdomen of the fish. Again, using fine scissors I cut along  the left and right sides to behind the vent in order to open  the abdominal cavity. Thus, I had two  parts: the dorsal side with the kidney and the ventral side  with heart and all abdominal organs, including mesenteries.  I then separated the swim bladder from the viscera,

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removed the heart, liver, and gall bladder and separated   
the stomach from the intestine placing all into separate   
dishes or, if small, into different quadrants of the Petri   
dish. I was able to sex most of the fishes by examining the   
gonads at this time. The stomach was slit open with the   
fine scissors as was the intestine. Any worms present   
would be apparent and removed into Stendor dishes for   
processing. The kidneys were removed and teased apart   
for examination for cysts and parasites. The liver was   
examined for any worms or cyst by teasing it apart while   
the gall bladder was opened to look for worms or myxozoan   
cysts.

### Project Notes:

#### Summary:

With the aid of park personnel, I was able to collect 175 fishes from 10 sites in 6 GSMNP watersheds in summer and fall of 2010. The fishes represented 4 orders, 6 families, and 21 species in 16 genera. Of these, 116 fishes were infected with at least one parasite species comprising either myxozoan cysts (Myxozoa) and/or helminth (worm) parasites. Helminths included members of three classes of Platyhelminthes, (Monogenoidea, Trematoda, and immature Cestoidea); leeches (Annelida); Nematoda; a possible Nematomorpha; and a single probable member of the phylum Acanthocephala. Moreover, glochidia of a unionid mussel (Mollusca) were observed on fins of a hog sucker. Myxozoan spores in cysts seem to represent species in the genus Myxobolus and are a new park records for this "phylum". No parasitic crustaceans (e.g. Copepoda) were collected. The most widespread parasite species found was the immature trematode, the blackspot metacercaria, *Neascus pyriformis*, of the avian parasite, *Uvulifer ambloplites*. Other common parasites found were the nematode *Rhabdochona* sp. in the intestine of several fish species plus *Dactylogyrus* and other Monogenoidea infested fish gills and skin. *Plagiorus* spp (Trematoda) were in gall bladder or intestine of their host.

## Data Summary

### Data Collection Year(s):

Number of Sites Sampled:	10
Number of Samplings:	32
Number of Orders Identified:	16
Number of Families Identified:	21
Number of Genera Identified:	33
Number of Species Identified:	30
Number of Specimens Identified to Species:	259
Number of Specimens not Identified to Species:	62
Total Number of Individuals Counted (actual or estimated):	1101
Percentage of Major Watersheds Sampled:	16 %