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## A New Host for *Pleistophora ovariae* (Microsporida)

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### **A New Host for *Pleistophora ovariae* (Microsporida)**

*Pleistophora ovariae*, a microsporidan parasite that infects ovaries of the golden shiner (*Notemigonus crysoleucas*), is a widespread problem for minnow culturists. It occurred in shiners held at 45 of 49 commercial fish farms inspected by Summerfelt and Warner (1970, J Wildl Dis **6**: 457–465). This microsporidan causes considerable damage to golden shiner

TABLE I. *Characteristics of Pleistophora species occurring in fish gonads.*

Species	Spore morphology		Host	Site
	Shape	Size in $\mu\text{m}$		
<i>P. mirandellae</i> (1901)	ovoidal	12 $\times$ 6 and 7.5 $\times$ 4	<i>Alburnus mirandella</i>	France
<i>P. elegans</i> (1910)	highly elongate	10 $\times$ 4	<i>Abramis brama</i> $\times$ <i>Leuciscus rutilus</i>	Germany
<i>P. sciaenae</i> (1919)	pyriform	3-5 $\times$ 2-3	<i>Sciana australis</i>	Australia
<i>P. oolytica</i> (1948)	pyriform	8.4 $\times$ 4.2, 5.5-6.5 $\times$ 3.5, and 3.0 $\times$ 1.5	<i>Esox lucius</i> <i>Leuciscus cephalus</i>	Prague
<i>P. ovariae</i> (1964)	pyriform	8.42 $\times$ 4.24 (fresh), 6.60 $\times$ 3.31 (fixed), 8.20-6.80 $\times$ 4.00-4.80	<i>Notemigonus crysoleucas</i>	United States
<i>P. ovariae</i> (this paper)	pyriform	7.43 $\times$ 4.35	<i>Pimephales promelas</i>	United States

Information for this table was taken from the following sources: Kudo, 1924, Ill Biol Monogr 9: 268 pp.; Summerfelt, 1964, Trans Am Fish Soc 93: 6-10; Summerfelt and Warner, 1970, Am Fish Soc Spec Publ No 5: 142-160; Weiser, 1948, Parasitology 39: 164-166.

ovaries, reducing fecundity, but most fish farmers obtain an adequate supply of eggs from young fish (1 or 2 years old) in which ovarian damage is not yet extensive.

In a sample of fathead minnows (*Pimephales promelas*) from Arkansas examined for routine disease diagnosis in March 1976, one minnow was found with a microsporidan infection of the ovary. Although fathead minnows are often raised at the same farms as golden shiners, *P. ovariae* has not previously been reported from them. Both ovaries of the infected fathead minnow were preserved in 10% formalin for parasite identification. A random sample of 50 spores was measured at a magnification of 675 $\times$  with an ocular micrometer calibrated against a stage micrometer. Histological sections of the remaining ovary material were prepared for observation of the infection pattern.

The spores from the fathead minnow were pyriform, like those of most species of *Pleistophora* occurring in fish gonads. The average length of 50 preserved spores was 7.43  $\pm$  0.89  $\mu\text{m}$  and the average width, 4.34  $\pm$  0.40  $\mu\text{m}$ . These values fall close to those given in the original description of *P. ovariae* in Illinois: 8.42  $\pm$  0.17  $\mu\text{m}$  by 4.24  $\pm$  0.15  $\mu\text{m}$  for fresh spores and 6.44  $\pm$  0.11  $\mu\text{m}$  by 3.43  $\pm$  0.05  $\mu\text{m}$  for Schaudinn-fixed spores, and 6.60  $\pm$  0.08 by 3.31  $\pm$  0.05  $\mu\text{m}$  for Carnoy-fixed spores (Summerfelt, 1964, Trans Am Fish Soc 93: 6-10). They also appear within the range of *P. ovariae*

spore measurements taken in an extensive geographic survey by Summerfelt and Warner (1970, Am Fish Soc Spec Publ No 5: 142-160): 6.80 to 8.20 by 4.00 to 4.80  $\mu\text{m}$ . The spores are, however, somewhat different from those of the other *Pleistophora* species occurring in ovaries of fish (Table I), as well as another microsporidan, *Glugea hertwigi*, which also infects fish ovaries; it has a pyriform spore, but it measures 4.6 to 5.4 by 2.3  $\mu\text{m}$  (Kudo, 1924, Ill Biol Monogr 9: 268 pp.). *G. hertwigi* and *P. ovariae* are the only two microsporidans infecting fish ovaries which have been described in the United States.

Histological examination of serial sections of the fathead minnow ovary failed to reveal a typical sporont, but spore masses were very similar to those of *P. ovariae* in golden shiners. Spores either completely filled individual ova or appeared in a dense spore mass or stroma, causing atresia of the ovary. Thus, spore morphology and ovary pathology identify the microsporidan parasite from the fathead minnow ovary as *P. ovariae*, previously observed only in the golden shiner.

Histological examination of a sample of 15 female fathead minnows from another source (Ozark Fisheries, Missouri) did not reveal *P. ovariae*. The incidence of *P. ovariae* in fathead minnows thus appears to be low and should not be of concern to producers of this species. Since the life span of fathead minnows is only 2 or 3 years, producers generally utilize

1- and 2-year-old brood stock. Producers of golden shiners are similarly limited to these age groups for a different reason—that of controlling the incidence of *P. ovariae* in their stock. Although *P. ovariae* evidently has the potential to infect fathead minnows as well as golden shiners, it may never be a serious problem in this species because of the short life cycle of the fathead minnow.

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