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Gyratrix hermaphroditus: A State Record For Arkansas

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Gyratrix hermaphroditus (Platyhelminthes, Rhabdocoela) was collected from Magnolia Manor in Clark County near Arkadelphia on 3 January 2003, constituting a new geographic distribution record for the state of Arkansas. This pond has been routinely sampled for microturbellarians since September 2001, but this was the first individual of this species observed. Magnolia Manor pond is approximately 40 years old, is surrounded by a mixture of pine and hardwoods, and has a mature stand of Asiatic lotus (*Nelumbo nucifera*) covering about 80% of the pond. The pond is approximately 50 m in diameter and 1.245 to 2 m deep at the deepest point. The substrate is silty and covered with a layer of fallen leaves and other detritus. *Gyratrix* was collected using a zooplankton net dragged along the bottom. Multiple samples were collected to include the debris stirred by the action of the net. A sample of one liter was collected, taken to the laboratory, and allowed to settle for two hours. After settling, 5 ml of bottom silt and water were placed in a watch glass and observed with a dissection microscope. Individual worms were transferred to a microscope slide for further observation utilizing a compound microscope. As fixation methods tend to destroy the epidermis or distort the location and size of the internal organs, this microturbellarian was observed and photographed alive. Chromosome numbers were not determined. Voucher specimens are in preparation to be deposited in the Queensland Museum, Brisbane, Australia.

Gyratrix hermaphroditus is well studied in contrast to many microturbellarians. Kolasa (1991) states that there are

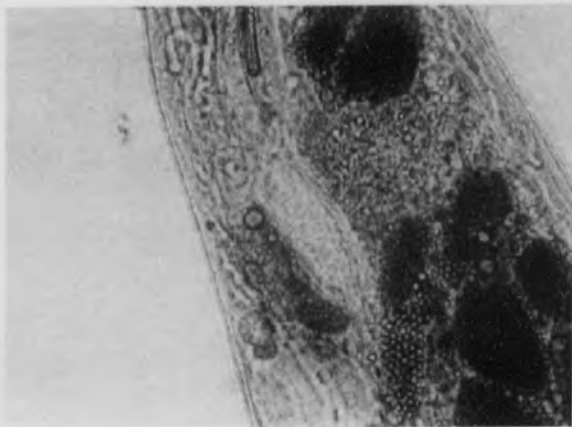


Fig. 1. Testis – *Gyratrix hermaphroditus* (1,000x).

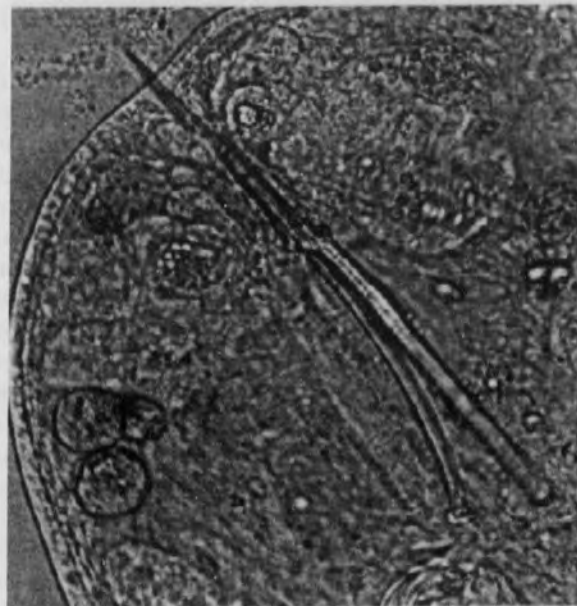


Fig. 2. Stylus and sheath – *Gyratrix hermaphroditus* (1,000X).

about 400 species of freshwater microturbellarians, but only 150 species have been recorded in the United States. Most freshwater microturbellarians are less than 1 mm in length, which causes them to be overlooked (Kolasa, 1991). Previous research indicates that freshwater *G. hermaphroditus* has one pair of dark brown eye spots set about the end of the first one third of the body, but some eyeless marine specimens have been described (Artois et al., 2000). A proboscis is situated anteriorly to the eyes. The mouth and pharynx rosulatus are located midventrally. The intestine, which is covered on the dorsal side by vitellaria, reaches both anteriorly and posteriorly from the mouth. The reproductive system is located in the posterior fifth of the body. The male reproductive system consists of a single testis (Fig. 1) on the side opposite the ovary, and a stylet with a sheath at the very posterior end of the animal (Fig. 2). The stylet can be used as a means of food capture (Kolasa, 1991). The female reproductive system consists of a single ovary and a large, dispersed vitteline (yolk gland) system. The nephridia are located laterally in the posterior end of the animal.

Gyratrix hermaphroditus has been found in marine (Curini-Gallatti and Puccinelli, 1994), freshwater (Mead and Kolasa, 1984), and brackish habitats (Therriault and Kolasa,

1999). It has been reported from North Australia (Curini-Gallatti and Puccinelli, 1990), Jamaica (Therriault and Kolasa, 1999), Hawaii (Karling et al., 1973), the North American Pacific coast (Karling et al., 1973), and from New York state (Kolasa et al., 1987). Some consider this species to consist of a "complex of sibling species" (Curini-Gallatti and Puccinelli, 1994). Specimens taken from various sites show considerable variation in dimensions of the male stylet, in chromosome number, in body color, and in presence or absence of eyes.

Curini-Gallatti and Puccinelli (1994) stated that *G. hermaphroditus* is represented in western Europe by individuals that are distinct both karyologically and ecologically. Their research indicates that individuals in marine environments have a base chromosome number of $2n = 6$, but freshwater individuals are $2n = 4$. The only contradicting results were obtained near Darwin, Northern Territory, Australia by Curini-Gallatti and Puccinelli in 1990. They found individuals in intertidal habitats with both chromosome configurations. As salinity fluctuates widely in this area at different times of the year, the coexistence of the two species could be possibly explained. According to Kolasa (1991), members of the superfamily Kalyptorhynchia are rarely found in freshwater, but *G. hermaphroditus* has been found in several different freshwater sites.

Very little, if any, research has been conducted on this order of Platyhelminthes in Arkansas. To date, four species of the genus *Stenostomum*, one species of *Microdalyellia*, and one species of *Phaenocora* have been identified from Magnolia Manor and are the subjects of further research. Four other species have been observed, but identification has not been determined. These findings, in addition to *G. hermaphroditus*, will be monitored over several years to assess the species' impact on this pond.

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