Egg Development—The mature redia of the digenean, _Proterometra macrostoma_ (Faust), contains a single, “embryonic” progenetic (i.e., developed sexual organs) cercaria and several smaller cercariae that are less differentiated (Horsfall 1934; Rosen et al. 2005a) (Figure 1a). Just prior to _P. macrostoma_ emergence from its snail intermediate host, the distome body of the largest cercaria in the redia completely withdraws into its cercarial tail (Figure 1b). The withdraw process likely serves as a mechanism for streamlining the cercaria so that it can engage in its distinctive swimming behavior in the water column that serves to attract the fish definitive host (Prior and Uglem 1979). In this regard, Horsfall (1934) noted that the drag produced by the distome attached to the anterior end of the cercarial tail (and not withdrawn) prevented effective swimming in this species. In addition, the withdraw of the distome body protects it from osmotic stress encountered by the worm following its release from the snail into a hypotonic, freshwater environment (Braham et al. 1996; Braham and Uglem 2000). While it is clear that distome withdraw sustains maximal infectivity during the cercaria’s 14–20 hr swimming phase (Braham et al. 1996), it is not known whether or not the distome body is infective to the fish definitive host prior to this retraction.

It also is well known that the progenetic cercaria of _P. macrostoma_ may or may not contain eggs in early stages of development (Dickerman 1945; Rosen et al. 2005b) (Figure 1c). However, in those cercariae lacking eggs, it is not clear what time frame is required for the initiation of egg production once the cercaria is ingested by an appropriate centrarchid fish definitive host. The following study was initiated to address these two questions.

Bluegill, _Lepomis macrochirus_ Rafinesque, were obtained from the Pleiffer Fish Hatchery near Frankfort, Kentucky, held at 22.7 ± 4.6°C, and maintained on fish pellets obtained from the hatchery. Three fish were placed in smaller, 1-gal tanks for exposure to cercariae. Snails, _Elimia semicarinata_ (Say), previously screened for patent (i.e., shedding cercariae) _P. macrostoma_ infections as described by Rosen et al. (2000), were placed into enamel pans, crushed, and 3–5 of the largest embryonic (i.e., body not withdrawn into the tail) cercariae were pipetted into the tanks with individual fish. As embryonic cercariae are poor swimmers, a 10-ml pipette was used when necessary to keep worms suspended in the water column to attract fish until the former were ingested. At 2 and 5 days PI (postinfection), bluegill were anesthetized in MS-222 (tricaine methane sulfonate), sacrificed, and necropsied. The number of worms recovered along with the number of eggs within these worms were recorded. For the second experiment, freshly emerged cercariae were examined with a compound microscope to determine the presence or absence of eggs. Seventeen young bluegill were then individually placed into one gallon tanks and exposed to 1–4 four cercariae with (8 fish) or without (9 fish) eggs. Once all introduced cercariae were ingested, the fish were returned to their respective 10-gal holding tanks. On day 1, PI, fish were anesthetized as previously described for recovery of worms and the number of eggs in these worms recorded.

Developing adult worms were recovered from all 3 fish exposed to embryonic cercariae with bodies not retracted into their tails. Day 5 PI worms (N = 6) recovered from 2 fish had an average of 51.5 ± 13.2 eggs indicating the progression of normal development in the fish definitive host. Sixteen worms were recovered from fish exposed to cercariae lacking eggs and 15 worms from fish exposed to cercariae with eggs on day 1 PI. Adult worms derived from the former had an average of 13.9 ± 1.3 eggs, while adult worms obtained from cercariae with eggs had an average of 21.7 ± 2.3. These averages were significantly different when assessed with a Student’s _t_-test ( _t_ = 2.868; _df_ = 29; _P_ = 0.008).

In summary, the distome body of the _P. macrostoma_ cercaria was infective to bluegill prior to the retraction of