Infection of Neonatal *Biomphalaria glabrata* with the Miracidia of *Echinostoma caproni*

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**ABSTRACT:** We used a *Biomphalaria glabrata* snail model for our studies and investigated the suitability of *B. glabrata* neonates, reared on a *Nostoc* sp. diet, for infection with *Echinostoma caproni* miracidia. We found that neonatal snails could become infected with *E. caproni* miracidia with 31 ± 11% standard error (SE) of our exposed snails containing rediae infections at 4 wk post-exposure (PE). However, the survival of exposed neonates was significantly (*P < 0.05; Student’s *t*-test) less than that of the unexposed controls at 1, 2, 3, and 4 wk PE.

Vasta et al. (2011) developed a simple method of rearing neonatal *Biomphalaria glabrata* snails on a diet of the cyanobacterium, *Nostoc* sp. This method has proved useful to us in studies on the infection of *B. glabrata* neonates with *Echinostoma caproni*. Previous work (Chernin and Antolics, 1975; Cooper et al., 1992) has shown that neonatal *B. glabrata* can become infected with *Schistosoma mansoni*. However, similar infection studies have not been performed with neonatal *B. glabrata* reared on a *Nostoc* sp. diet. The purpose of the present study was to determine if neonatal *B. glabrata* could become infected with *E. caproni* miracidia.

Neonatals were hatched from egg masses laid by uninfected adult *B. glabrata* snails and then placed in a 200 × 15 mm petri dish with 200 ml of artificial spring water (ASW). Neonates were allowed to hatch for 1 wk and remained unfed before exposure to *E. caproni* miracidia. After exposure, neonates were immediately fed a *Nostoc* sp. diet. Cultures were fed ad libitum, cleaned approximately 3 times a week, and maintained at 25 ± 1 C.

*Echinostoma caproni* eggs were teased from the uteri of worms collected from Balb/c mice 2–4 wk post-exposure (PE) to metacercariae. Eggs were placed in approximately 50 ml of ASW in a petri dish (100 × 15 mm) and incubated at 28 C in the dark for 11–13 days to allow the eggs to develop, as described by Idris and Fried (1996). After incubation, eggs were exposed to incandescent light and heat (up to 28 C) to induce hatching of the miracidia. Within 6 hr of hatching, neonates were individually exposed to 3–5 miracidia in 1 ml of ASW in a multiwell chamber for 4 hr. One hundred neonates were exposed in 4 separate trials with 25 exposed neonates per trial. Matched controls consisted of unexposed neonates.

Exposed and unexposed neonates were maintained for 4 wk prior to necropsy. The number of surviving snails in each culture was determined once a week. Survival of exposed neonates was 47, 36, 26, and 24% at 1, 2, 3, and 4 wk PE, respectively. Survival of control snails was 89, 78, 73, and 66% at 1, 2, 3, and 4 wk PE, respectively. The survival of the controls was significantly greater at each week PE (*P < 0.05, Student’s *t*-test).

At 4 wk PE, all of the surviving exposed snails were necropsied and each digestive gland–gonad complex (DGG) was dissected and examined under the low power (×100) of a compound microscope by compressing the DGG between a glass slide and cover slip. Infection was confirmed by the presence of rediae in the DGG. Necropsy of all the surviving neonatals at 4 wk PE showed that 31 ± 11% SE were infected. Our results indicate that neonates can become infected with *E. caproni* miracidia. Our results also indicate considerably less survival of neonates exposed to *E. caproni* miracidia than of the corresponding unexposed neonates.

Kuris (1980) reported that exposing juvenile *B. glabrata* en masse to miracidia of *E. caproni* (referred to as *Echinostoma liei* in that paper) also resulted in reduced survival of the snails. Our study extends the observations of Kuris (1980) to include decreased survival of neonates infected with *E. caproni*.

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**LITERATURE CITED**


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