

Age dependent tolerance to parasitism: Trematode infections in tadpoles of common hourglass tree frog (*Polypedates cruciger*)

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When exposed to parasites, hosts increase their fitness by either increasing resistance to parasites (parasite burden) or by increasing tolerance (reducing the harm caused by a given parasites load). Among amphibians, the older tadpoles are known to have higher tolerance to trematode infections than younger tadpoles. Here we examined the age dependent tolerance of the tadpoles of common hourglass tree frog (*Polypedates cruciger*), exposed to pleurolophocercous cercariae under laboratory conditions. Pleurolophocercous cercariae released from freshwater snail, *Melanoides* sp. were exposed to tadpoles at 10, 20 and 30 days post-hatch (Gosner stages 27, 28/29, 30/31, respectively) in a dose-dependent manner (control= 0, low=16, medium =32, high =48). Sixty tadpoles were used for each stage with a total of 180 tadpoles. A control tank was setup without introducing cercariae. Survival, growth [snout-to-vent length (SVL) and body mass], time required for fore limb emergence of half of the number of tadpoles (TE₅₀) and development of malformations were recorded in tadpoles and metamorphs. Overall, infection at 10 and 20 days post-hatch stage resulted in significantly low survival (40.0% and 53.4%; Chi square test, $p < 0.05$) but not when the exposure age increased to 30 days post-hatch (96.7%). Cercariae exposed tadpoles developed malformations and the types of malformations developed were mainly axial such as kyphosis and scoliosis. Overall percentage of malformations was higher in younger tadpoles than older ones (10 days = 71.4%; 20 days= 56.2% and 30 days= 28.5%). Older tadpoles had a higher tolerance to parasitism than the younger tadpoles. The growth of exposed tadpoles was also affected. The SVL, body weight and TE₅₀ values showed that the tadpoles exposed at early stages were smaller in size and took longer time to metamorphose. The magnitude of the effects decreased with the age of the tadpole and this may have fitness consequences in natural context. Since the cercariae are relatively large, they may have impeded the smaller tadpoles at early stages of development. The harm caused by the parasite at a given parasitic dose was less in older tadpoles showing an age dependent tolerance to parasitism by the tadpoles of *P. cruciger*.

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