Avoidance of noxious tadpole prey by fish and invertebrate predators: adaptivity of a chemical defence may depend on predator feeding habits

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With 2 tables

Abstract: We conducted laboratory experiments where different types of predators were allowed to prey on noxious versus non-noxious tadpoles. The introduced fish *Perccottus glenii* showed prey selectivity: while actively consuming all seized tadpoles of *Rana arvalis* and *Rana temporaria*, it consumed significantly fewer *Bufo bufo* tadpoles. When a *Bufo* tadpole was seized, it was frequently rejected after intraoral testing without much damage done to the tadpole. Nymphs of the dragonfly *Aeschna cyanea*, chewing captured prey, also consumed significantly more tadpoles of *Rana* spp. than *Bufo*. Seized *Bufo* tadpoles were as a rule released seriously damaged. Then *Aeschna* readily caught the next *Bufo* tadpole. On the contrary, larvae of the diving beetle *Dytiscus marginalis*, who suck out their prey, did not reject *Bufo* tadpoles. Hence, the relative unpalatability of the *Bufo* tadpoles may provide them with a satisfactory defence against *Perccottus*, an incomplete defence against *Aeschna*, and no protection against *Dytiscus*. It is possible that the relative unpalatability of *Bufo* tadpoles increases their population mortality in ponds with high *Aeschna* density.

Key words: *Rana temporaria*, *Bufo bufo*, chemical defence, predator behaviour, prey selection.

Introduction

Aquatic predators may significantly influence population demography and abundance of anuran amphibians. Fish are major predators for tadpoles (BEEBEE 1981, GLANDT 1984, SEXTON & PHILLIPS 1986, HAYES & JENNINGS 1987, BRADFORD et al. 1993, BRANA et al. 1996) as well as larvae of Odonata and