Pseudotriton ruber (Red salamander): Larval defensive posture

SEAN M. HARTZELL

Department of Biological and Allied Health Sciences, Bloomsburg University of Pennsylvania, Bloomsburg, Pennsylvania 17815 USA.
Email: smh14844@huskies.bloomu.edu

Salamanders employ numerous strategies to deter predation, including toxic or noxious skin secretions, aposematic, pseudoaposmatic, or cryptic colouration, vocalizations, antagonistic defences such as biting and tail lashing, flight (escape) behaviours, caudal autotomy, and a variety of immobile defensive postures (reviewed in Brodie, 1983). Most immobile defensive postures in salamanders either display aposematic signals or increase crypsis, thus reducing the risk of injury or mortality to the salamander (Brodie, 1977). Defensive posturing has been well documented for adult forms of many salamander species (e.g. Brodie, 1977; 1983); however, defensive postures of larval salamanders are rarely reported (but see Brodie et al., 1974). This note reports observations of defensive posturing in a larval Pseudotriton ruber, a medium-sized semi-aquatic salamander native throughout much of the eastern United States (Petranka, 1998).

On 08 May 2015 at 17:00h (United States Eastern Standard Time), the author observed a larval *P. ruber* (total length: 10 cm) in a small unnamed spring near Bloomsburg, Columbia County, Pennsylvania USA (41°1'24.3"N, 76°27'1.0"W; WSG84 grid; 150 m elevation). Upon initial detection, the larval *P. ruber* swiftly crawled ~25 cm along the gravel substrate and subsequently bent its head in a downward position against the substrate (Fig. 1). After assuming the posture, the salamander remained immobile for approximately 60 seconds. Following a brief capture for identification, the salamander was released and again swiftly crawled ~15 cm, bent its head downward against the substrate and remained immobile for approximately 30 seconds before retreating underneath leafy debris.

When threatened, adult *P. ruber* frequently assume a defensive posture with the body curled, rear limbs extended, and tail raised (Petranka, 1998). Additionally, salamanders of the genus *Pseudotriton* are known to elevate, coil or flip their bodies, assume immobile postures, or undulate tails in response to a predator (Brodie, 1977; 1983). However, to my knowledge no descriptions of defensive posturing have been reported for larval *P. ruber*. Salamanders often exhibit "flash" behaviours consisting of sudden, rapid movements prior to immobility, likely to misdirect potential predators (Brodie, 1977). The rapid locomotion observed prior to immobility of the larval *P. ruber* may be analogous with such behaviour.

Figure 1. Line drawing of a larval *Pseudotriton ruber* in defensive posture.

Salamander antipredator postures generally position the body in such a way as to increase the chances of survival if attack occurs (Brodie, 1977). The bending of the head in a downward position against the substrate observed in the larval *P. ruber* prior to immobility may protect the individual's head from damage if attack occurs. Further research should examine the frequency and effectiveness of antipredator postures in both larval *P. ruber* and other larval salamanders.

ACKNOWLEDGEMENTS

I thank an anonymous reviewer for helpful comments that greatly improved this manuscript, and the A.L. for support during the preparation of this note. Observations reported herein were conducted while collecting data as a citizen volunteer for the Pennsylvania Amphibian and Reptile Survey (PARS) database. The salamander was released unharmed at the site of capture after identification and the author complied with all Pennsylvania regulations.

REFERENCES

Brodie, E.D. Jr. (1977). Salamander Antipredator Postures. *Copeia* 1977: 529-536.

Brodie, E.D. Jr. (1983). Antipredator Adaptations of Salamanders: Evolution and Convergence Among Terrestrial Species. In *Adaptations to Terrestrial Environments*, pp. 109-133. Margaris, N.S. Arianoutsou-Faraggitaki, M. & Reiter, R.J. (Eds.). New York: Springer Publ. Co.

Brodie, E.D. Jr., Johnson, J.A., & Dodd, C.K. Jr. (1974). Immobility as a Defensive Behaviour in Salamanders. *Herpetologica* 30: 79-85.

Petranka, J.W. (1998). *Salamanders of the United States and Canada*. Washington DC.: Smithsonian Books.

Accepted: 28 June 2015