Burying Beetles as Parasitoids of Northern Ringneck Snakes

David L. LeGros[1], Shane Pratt[2], and David V. Beresford[2]

[1]Department of Biology, Laurentian University, Sudbury, Ontario, Canada ON P3E 2C6 (dl_legros@laurentian.ca)
[2]Department of Biology, Trent University, Peterborough, Ontario, Canada K9J 7B8

Photographs by the senior author.

The Burying Beetle (*Nicrophorus pustulatus* [Coleoptera: Silphidae]) has been identified as a parasitoid of the eggs of Eastern Rat Snakes (*Scotophis alleghaniensis*, formerly assigned to *Elaphe obsoleta*) (Blouin-Demers and Weatherhead 2000, Keller and Heske 2001), the only known breeding medium for this beetle species in the wild (Blouin-Demers and Weatherhead 2000, Smith et al. 2007). However, *N. pustulatus* has been found in areas devoid of Eastern Rat Snakes, albeit in low numbers (LeGros and Beresford 2010, Brousseau et al. 2010), suggesting that *N. pustulatus* must breed on some other medium.

Although *N. pustulatus* can be reared on carrion in captivity, the species shows a preference for snake eggs (Smith et al. 2007). Because of this, recent authors (Smith et al. 2007, LeGros and Beresford 2010) have suggested that this parasitoid could have a negative impact on Eastern Rat Snake populations and other threatened oviparous snakes.

On 19 July 2010, while randomly searching under stones during a survey of the local herpetofauna, a nest of snake eggs was found near the Algonquin Park Visitor Centre in Algonquin Provincial Park, Sproule Township (W 4535156, N 07821511). The nest was located on soil beneath a flat slab of granite (75 x 50 cm by 20 cm thick) in a small clearing of moss-covered granite within a forested area comprised of Sugar Maple (*Acer saccharum*), Red Oak (*Quercus rubra*), and White Pine (*Pinus strobus*).

The eggs were identified as those of the Northern Ringneck Snake (*Diadophis punctatus edwardsii*). Clutches of *D. punctatus edwardsii* are usually comprised of 3 or 4 eggs (Logier 1970), but a maximum of 10 has been recorded. Also, communal nesting of several females is known in this species (Blanchard 1942, Gilhen 1970). We counted 19 eggs in the nest, all of which had been killed. *Nicrophorus pustulatus* larvae were feeding amidst the ruined eggs. A single adult male *N. pustulatus* was collected from the nest, and a second adult escaped into a cavity in the soil below.

This is the second species of snake eggs on which *N. pustulatus* larvae have been observed feeding in the wild. Our results explain why the range of *N. pustulatus* is not limited to the distribution of *Scotophis alleghaniensis*, but might include any oviparous snake. Given this evidence, research into *N. pustulatus* is potentially important for the conservation of endangered or rare snake species (Smith et al. 2007). Indeed, we see no reason to exclude investigation of the eggs of other taxa (e.g., turtles, which have been shown in the laboratory to be a suitable, albeit not a favored host of *N. pustulatus*; Smith et al. 2007) as potential hosts for this beetle parasitoid in a natural setting.

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Two Burying Beetle (*Nicrophorus pustulatus*) larvae amidst empty eggshells.

Intact Northern Ringneck Snake eggs in a nest in Algonquin Provincial Park, Ontario.

A dark-phase adult Banded Gila Monster (*Heloderma suspectum cinctum*) from Washington County, Utah.