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Viable Land Snail Eggs in a Bird Pellet

On 2 January, 2011 at my house in St. Augustine, Trinidad, I found a regurgitated bird pellet that was full of small snail shells (Fig. 1). The pellet was dissected and found to contain ten snail shells (average length 7 mm), three black seeds (average width 4 mm) and various insect body parts. The pellet was held together by a yellowish fibrous matter which I took to be fruit pulp.

The snail shells were mostly intact and were identified as nine specimens of *Allopeas micra* (d'Orbigny, 1835) and one specimen of *Huttonella bicolor* (Hutton, 1834). The transparent nature of the *A. micra* shells showed that much of the snails soft body parts were still intact on the inside, however the foot and lower parts of the soft body had been destroyed. Two of the *Allopeas* examined had small white eggs visible in the body whorl of the shell. Two eggs from each shell were removed and placed on a damp kitchen towel in a small glass dish then covered with a plastic lid. Over the course of the next nine days the kitchen towel was kept damp and the eggs were observed. On 12 January one of the eggs hatched, the hatchling crawled to the edge of the glass dish and had dried out before it was found. The three remaining eggs were left for several more days but did not hatch; they were dissected and found to be non-viable.

The animal that left the pellet was not observed so it cannot be said for certain from where the pellet came. However, as far as I am aware, no local mammal, reptile, amphibian or invertebrate has the necessary diet of fruit, insects and molluscs to have left the pellet and therefore I conclude that it must have been a bird. Also the location of the pellet, on my back porch under the roof gutter, suggests it was dropped there from above as a ground based animal would have been unlikely to come onto the porch due to the gate and wall surrounding it.

Based on dietary preferences, the size of the pellet and the species of bird that have been commonly observed in my garden, I surmise that it was likely to have been a Bare-eyed Thrush (*Turdus nudigenis* Lafresnaye 1848). Thrushes are well-known for their consumption of snails; in a review of the literature on avian predators of terrestrial molluscs the majority of records were about members of the genus *Turdus* (Allen 2004). Although they tend to feed on larger species (>10 mm length) from which they extract the soft parts by breaking the shell, many small species (<10 mm length) of snails are also eaten.

On a further note, the presence of a single shell of *H. bicolor* is quite interesting. This snail, as well as being an alien species to Trinidad, is a micro-predator of other snails, so it is quite possible that it was eaten by the bird

whilst in the act of eating one of the *Allopeas*.

The survival of eggs following predation of adult snails by a bird raises the possibility of a new dispersal mechanism for land snails. There are many examples of molluscs being transported on the feet, legs and feathers of various birds and there are some examples of molluscs surviving passage through the digestive systems of various animals but, to my knowledge, there are no records of the eggs of a land snail hatching after the adult has been partly digested.



Fig. 1. Bird pellet with small snail shells.

Studies show that water-birds can transport a range of freshwater invertebrates and their eggs inside their gut (Frisch *et al.* 2007). It has also been observed that specimens of a marine gastropod have been found alive in the regurgitated pellets of a Willet (Sousa 1993). Another study observed that small land snails are often found virtually complete in the faeces of passerine birds, however, as no snails were found alive, it was suggested that this could be a dispersal technique only when conditions were optimal (Kawakami *et al.* 2008).

As the *Allopeas* that I found were in a regurgitated pellet rather than faeces, it is possible to assume that the snails spent a shorter period of time in the birds gut

than they would have if excreted. This shorter time along with the fact that the eggs were protected by the shell and soft body of the adult snails, which were dead upon finding, would have contributed to the viability of one of the eggs.

Further investigation is required to confirm if this mechanism is really an option for dispersal. The fact that the eggs were manually removed from the dead adult shells and then placed in a favourable environment for hatching means that care has to be taken in claiming that the juvenile snails could hatch and survive without interference. Controlled feeding of captive birds with adult snails and then examination of the pellets produced could provide the answers.

Specimens are stored at The University of the West Indies Zoology Museum under the numbers UWITT.2011.13.1 and .2.

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