

Survey of literature for snails

Year 2006

Authors: Yusa, Y., Wada, T., Takahashi, S.

Title: Effects of dormant duration, body size, self-burial and water condition on the long-term survival of the apple snail, *Pomacea canaliculata* (Gastropoda: Ampullariidae).

Source: Applied Entomology and Zoology (2006), 41(4): 627-632.

Language: English.

Address: National Agricultural Research Center for Kyushu Okinawa Region (KONARC), Nishigoshi 861-1192, Japan.

Abstract: We investigated factors influencing the survival of the apple snail during dormancy in the laboratory at 20-26 °C. We placed snails of three size classes in small pots with soil and water, drained the water to induce self-burial, and subsequently checked the snails' survival at intervals. The duration of the dormant period, body size and the success of self-burial all affected the survival of the snails. The effects of water conditions (dry or moist) affected the survival of the snails through interactions with body size and duration. The longest duration of survival under dry conditions was 11 months, and a small proportion of medium-sized and large snails survived the entire experimental period of 29 months under moist conditions.

Authors: Hicklen, R. S., Chadwick, M. A., Dobberfuhr, D. R.

Title: Effects of detrital food sources on growth of a physid snail.

Source: Journal of Molluscan Studies (2006), 72(4): 435-438.

Language: English.

Address: Department of Biological Sciences, The University of Alabama, Box 870206, Tuscaloosa, AL 35487, USA.

Abstract: In this study, the growth rate of *Haitia pomilia* snails collected from Florida, USA, in June 2004 and fed detritus composed of *Hydrilla verticillata*, red maple (*Acer rubrum*), sweet gum (*Liquidambar styraciflua*) and water oak leaves (*Quercus nigra*) was determined. It was shown that snails fed *Hydrilla verticillata* had the highest growth rate, food consumption and lowest amount of organic matter. It is suggested that the other food sources are either unpalatable or nutritionally poor for the snails.

Authors: Aufderheide, J., Warbritton, R., Pounds, N., File-Emperador, S., Staples, C., Caspers, N., Forbes, V.

Title: Effects of husbandry parameters on the life-history traits of the apple snail, *Marisa cornuarietis*: effects of temperature, photoperiod, and population density.

Source: Invertebrate Biology (2006), 125(1): 9-20.

Language: English.

Address: ABC Laboratories Inc., Columbia, MO 65202, USA.

Abstract: The objective of the study is to identify suitable husbandry conditions for maintaining multi-generation populations of this species in the laboratory for use in ecotoxicological testing. In this article, we focus on the effects of photoperiod, temperature, and population density on adult fecundity and juvenile growth. Increasing photoperiod from 12 to 16 h of light per day had no effect on adult fecundity or egg hatching and relatively minor effects on juvenile growth and

development. Rearing snails at temperatures between 22 °C and 28 °C did not influence the rates of egg production or egg clutch size. However, the rates of growth and development (of eggs and juveniles) increased with increasing temperature in this range, and when temperatures were reduced to 22 deg C egg-hatching success was impaired. Juvenile growth and development were more sensitive to rearing density than adult fecundity traits. On the basis of the present results, we conclude that rearing individuals apple snails at a temperature of 25 deg C, a photoperiod of 12L:12D, and a density of <0.8 snails L-1 (with lower densities for juvenile snails) should provide favorable husbandry conditions for maintaining multi-generation populations of this species.

Authors: Turner, A. M., Turner, S. E., Lappi, H. M

Title: Learning, memory and predator avoidance by freshwater snails: effects of experience on predator recognition and defensive strategy.

Source: Animal Behaviour (2006), 72(6):1443-1450.

Language: English.

Address: Department of Biology, Clarion University, Clarion, PA 16214, USA.

Abstract: We assessed whether perception of predation risk and choice of defensive strategies by the snail *Physa acuta* is influenced by experience by performing three experiments in which we manipulated exposure to predators and then assayed behavioural responses to predator cues. We first assessed the scope for learned avoidance behaviour by comparing the antipredator response of wild snails (exposed to predators) and captive-reared snails (not exposed to predators). Wild-caught snails showed a stronger response than did captive-reared snails to predators feeding on insect prey, predators feeding on snails and crushed-snail cues. A second experiment in which snails were reared with and without exposure to crayfish predators showed that snails from both rearing treatments responded to fish and crayfish, but the choice of defensive strategy depended on experience. Snails reared without exposure to predators responded to fish cues by moving under cover, whereas snails reared with crayfish responded to fish by moving to the water's surface. The final experiment also manipulated exposure to predators and showed that although snails from a fish-free pond responded to both fish and crayfish, their responses did not depend on experience. Overall, the effects of experience were significant but small relative to the overall effects of predator cues on snail habitat use, showing that the antipredator responses of *P. acuta* are largely innate.

Authors: Fagbuaro, O., Oso, J. A., Edward, J. B., Ogunleye, R. F.

Title: Nutritional status of four species of giant land snails in Nigeria.

Source: Journal of Zhejiang University (Science B) (2006), 7(9): 686-689.

Language: English.

Address: Department of Zoology, Faculty of Science, University of Ado-Ekiti, PMB 5363 Ado Ekiti, Nigeria.

Abstract: Four species of African giant land snails (*Archachatina marginata* (ovum) Pfeiffer, *Archachatina marginata* (saturalis) Philippi, *Achatina achatina* and *Limicolaria* spp.) were assessed for their proximate and mineral compositions, aimed at establishing their nutritive values on wet weight basis. Analysis of muscle revealed that composition of crude protein varied from 18.66% in *Limicolaria* spp. and 20.56% in

Archachatina marginata; moisture content was 76.56% in *Archachatina marginata* and 78.68% in *Limicolaria* spp., and ash was in *Achatina achatina* and 1.44% in *Archachatina marginata*. Carbohydrate and fat content were generally low. Crude fibre was not detected in any of the species. The concentrations of zinc, iron, manganese, magnesium, calcium, phosphorus, sulfur, potassium and sodium in the flesh of the snails were determined. Values of iron, magnesium, calcium, phosphorus, potassium and sodium were consistently high while cobalt, copper and lead were not detected. Snails complement the required trace and minor elements needed for proper growth and development in human being, so it is recommended for regular consumption.

Authors: Ebenso, I. E.

Title: A note on the effect of water on incubating eggs of edible tropical land snail *Limicolaria aurora*.

Source: Livestock Research for Rural Development (2006), 18(10): paper 150.

Language: English.

Address: Heliciculture Research, Animal Production Unit, Department of Animal Science, University of Uyo, PMB 1017, Uyo, Nigeria.

Abstract: The egg-water flux from gravid *L. aurora* in plastic boxes as incubation chambers under controlled laboratory conditions for 30 days was investigated. Each of 6 incubation chambers with soil as substrate contained 5 eggs each buried in soil differing in water contents: 0 (control), 5, 10, 15, 20 and 25%. It was shown that all eggs in the control chambers were desiccated, while those buried in 15% water incubation chamber hatched. Higher hatchability is assured with increased water uptake after 15 days of incubation.