Investigating causes of population decline in captive *Partula clara* and *Partula tohiveana* Polynesian snails

Ana Gouveia, Roamin Pizzi, Paul Pearce-Kelly, Donald MacFarlane, Dave Clarke, Shaheed MacGregor, Belinda Clark and Wayne Boardman.

Zoological Society of London

Abstract

*Partula* species Polynesian tree snails are small molluscs belonging to the class Gastropoda, order Stylommatophora, family Partulidae. They are a unique genus endemic to the Pacific region and more specifically to the Society Islands. There are over one hundred species of Partula snails described with 79 species on the International Union for the Conservation of Nature (IUCN) Red List. Fifty species are currently classified as extinct, 14 as extinct in the wild and 15 as critically endangered. Wild populations have declined since the introduction of a predatory snail, *Euglandina rosea*, introduced to control the also introduced Giant African land snail (*Achatina fulica*) which had become an agricultural pest.

The London Zoo co-ordinates a worldwide captive breeding programme for *Partula* snails and occasional high mortality rates have occurred in a variety of species. While the extinction of *Partula turgida* in captivity has been postulated to have been due to a Microsoridian infection investigations in to the majority of other captive *Partula* species population declines have failed to identify causative diseases.

A study of the population dynamics of a habitat generalist and a habitat specialist *Partula* species and the daily minimum and maximum temperature and humidity over a three year period was performed. At the same time histopathology of dead snails was performed to help eliminate the possibility of infectious diseases playing a role in the population declines. No infectious aetiologies were evident but there was clear association between some of the declines and changes in environmental parameters. Interestingly, the different species demonstrated different sensitivity to different environmental factors. The finding and implications for captive *Partula* snail husbandry will be discussed.