

Following Radio Tagged Rhino Beetles to Discover Breeding Sites

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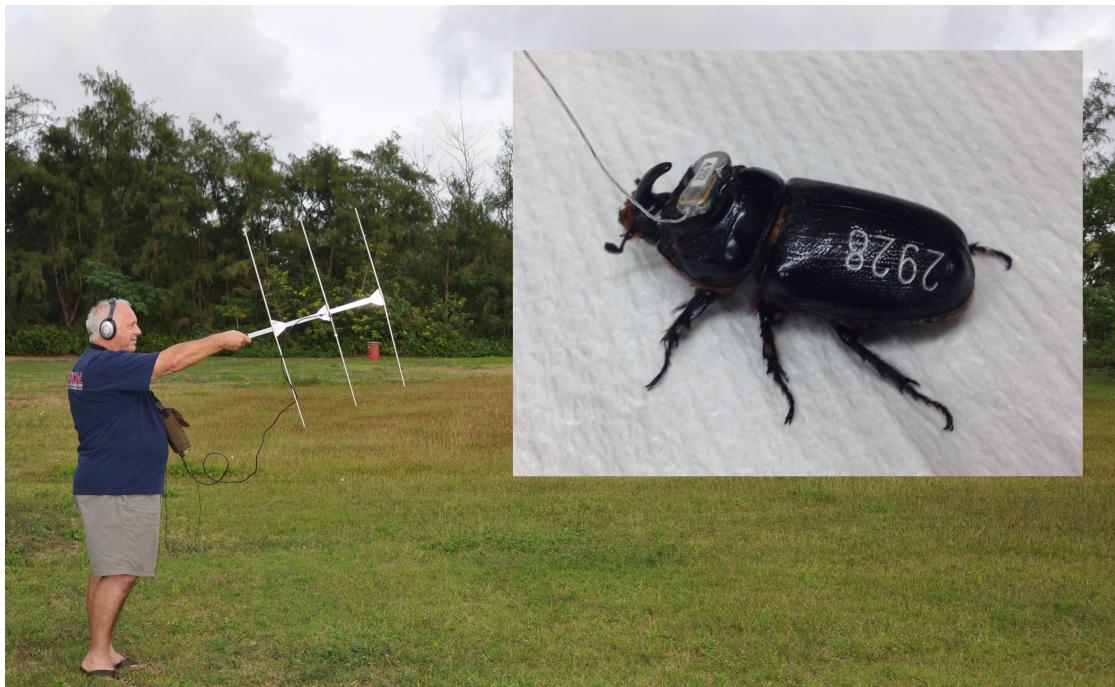


Figure 1: Radio-tagged rhinoceros beetle and tracking equipment.

The coconut rhinoceros beetle was first discovered on Guam in 2007. Adults kill palms when they bore into crowns to feed on sap. Rhino beetle larvae feed only on dead plant material at breeding sites and they do no damage. In order to eradicate rhino beetles, all breeding sites must be found and destroyed. Four dogs were trained to lead handlers to cryptic breeding sites on Guam. This detector dog program was effective but very expensive and it was shut down after a couple of years.

Aubrey Moore, a UOG entomologist, suggested following radio-tagged rhino beetles to breeding sites as a cost-effective alternative to using detector dogs. In August 2015 this

idea was tested in a small feasibility study on Guam by a research team which included Moore, Dr. Matthew Siderhurst and his students, Kat Lehmann and Diego Barahona from Eastern Mennonite University, VA, Domenick Skabeikis from the USDA Pacific Basin Research Center in Hilo, HI and UOG technician Ian Iriarte.

During the 10 day field trial, miniature radio transmitters were glued to the backs of rhino beetles (inset in Fig. 1). These beetles were released at the UOG Agricultural Experiment Station in Yigo and at the Asan Beach Park and their locations were tracked for a few days using special radio receivers equipped with directional antennas (Fig.1).

The majority of beetles were tracked to coconut trees which had already been damaged by rhino beetles. A few other beetles quickly flew beyond the detection range of the receivers and were never recovered. As hoped, several beetles lead the team to cryptic breeding sites. The transmitter from one of the first beetles to be released was found the next day in a hole in a rotting branch of a breadfruit about 20 feet above the ground. Three other adult beetles were found in the same hole indicating that the beetles had aggregated here to establish a new breeding site. According to Moore, "It is very likely that the breadfruit branch was broken during Typhoon Dolphin which visited Guam in May 2015. If this is the case, there must be thousands of new, miniature breeding sites in Guam's jungles resulting from typhoon damage. These breeding sites will be generating large numbers of adult rhino beetles within the next several months." Another unexpected result from the field trial is the fact that none of the 30 tagged beetles were caught in traps, even though all were released within pheromone trapping grids. This indicates that rhino beetle pheromone traps may be useful for detection and surveillance but are ineffective for population control.

Cryptic breeding sites can be found by following radio-tagged beetles and this method may be a critical to the success of eradication attempts on a recently invaded island.

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