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Pacific Island Entomologists are Worried About a New Type of Coconut Rhinoceros Beetle Discovered on Guam

The coconut rhinoceros beetle (CRB), *Oryctes rhinoceros,* that has been attacking coconut trees on Guam since it was first discovered on the island in 2007 has proven to be voracious and tenacious. The coconut rhinoceros beetle, is a major pest of coconut palm, oil palm and other palm species. Palms are damaged when adult beetles bore into the crowns of palms to feed on sap. Tree mortality occurs when beetles destroy the growing tip (meristem). Immature beetles (grubs) do no damage. They feed on dead, decaying vegetation in breeding sites. Preferred breeding sites are dead, standing coconut stems, and piles of decaying vegetation such those left behind by typhoons or after replanting of oil palm plantations. If a CRB population is not suppressed, it is possible for a positive feed-back cycle to initiate whereby adult beetles kill massive numbers of palms, thereby generating more food for even more grubs which turn into adults which kill even more palms. An outbreak following this scenario occurred in the Palau Islands during the late 1940s resulting in about 50% coconut palms being killed by CRB throughout the archipelago and 100% mortality on some of the smaller islands.

Following a failed eradication attempt on Guam, Oryctes nudivirus was released as a biological control agent. This virus infects only rhinoceros beetles and it has been the best way of controlling rhino beetle damage on Pacific islands. Typically, damage is reduced by up to 90% and the virus suppresses the beetle population for up to 30 years after introduction. Unfortunately, the virus failed for the first time on Guam. Dr. Sean Marshall and Dr. Trevor Jackson of AgResearch New Zealand, world experts on Oryctes nudivirus, were baffled when collaborative research with University of Guam entomologist Dr. Aubrey Moore showed that the Guam beetles are resistant to all available strains of the biocontrol virus. In addition to this finding, Dr. Marshall discovered that the Guam beetles are genetically different from other rhino beetle populations on Pacific islands. On August 13, Marshall presented a talk entitled ***A new invasive biotype of the coconut rhinoceros beetle (Oryctes rhinoceros) has escaped from biological control by Oryctes rhinoceros nudivirus*** at the International

Congress on Invertebrate Pathology and Microbial Control in Vancouver.

Coincident with loss of the biocontrol virus as a tool for controlling coconut rhinoceros beetle populations is an increase in the number of new rhino beetle infestations in the Pacific. In the 1980s and 1990s there were no new rhino beetle infestations on Pacific islands. After Guam was invaded in 2007, the beetle was found in the Port Moresby area of Papua New Guinea in 2007, in Oahu, Hawaii in 2013, and in Guadalcanal, Solomon Islands in 2015. Marshall has shown that all of these invasions involve the Guam biotype.

Concern about further spread of the Guam rhino beetle biotype and the damage it causes, Jackson has published a a note in the International Association for the Plant Protection Sciences Newsletter entitled ***Need for emergency response for a new variant of rhinoceros beetle (Guam biotype).*** "Analysis at AgResearch has shown that the new invasive populations are free of the biocontrol virus. Disturbingly, tests for control of the beetle with *Oryctes* nudivirus have proven negative suggesting that the Guam biotype is resistant to the biocontrol. Our analysis suggests that healthy beetles of the Guam biotype are more vigorous and hence more successful as invaders being able to survive transport and establish in new environments. Once established they are extemely damaging and difficult to eradicate or contain," said Jackson. He suggests the following steps should be taken to avert large scale ecological and economic damage to palms by rhino beetle invasions on Pacific islands:

1. Raise awareness through biosecurity networks of the potential threat of CRB-Guam and provide information for early detection and eradication of limited outbreaks
2. Form an International Working Group to develop a strategy for control and containment and coordinate activities.
3. Identify funding sources and secure funding for key participating institutes.
4. Carry out a thorough delimiting survey to identify current distribution of CRB-G and identify center of origin.
5. Find and test *Oryctes* nudivirus variants to find CRB pathogenic strains.
6. Implement control and containment strategy to limit impact and spread of the beetle.

Worst Case Scenario

Uncontrolled infestations of CRB may kill most palms within a few years. A worse case scenario can be triggered by a massive outbreak of adult CRB emerging from abundant

breeding sites made by large amounts of decaying vegetation left in the wake of a typhoon (such as Typhoon Dolphin which visited Guam in May, 2015). Very high feeding activity will kill mature coconut palms, leaving standing dead coconut trunks that are ideal breeding sites for subsequent generations of beetles. During a CRB outbreak, there will be an increased risk of further spread to uninfested islands throughout the Pacific.

Palms are important on Pacific Islands for various reasons: as a cash crop for nuts, oil and lumber, as an ornamental tree appreciated by residents and tourists. On some of the smaller, more traditional islands the coconut palm is referred to as the tree of life. On these islands, this tree is an essential natural resource providing income, housing, food, oil, soap, clothing, mats, baskets, and other containers. The smaller, poorer Pacific islands will suffer the most if the spread of CRB-Guam cannot be controlled.

Prognosis for Guam

UOG entomologist Aubrey Moore fears that conditions on Guam are ripe for initiating a massive CRB population explosion, which could wipe out 50% or more of Guam's coconut trees. During August, Moore hosted Dr. Matt Siderhurst, Kat Lehman, and Diego Barahona from Eastern Mennonite University, VA, and Domenick Skabeikis from the USDA-ARS Pacific Basin Agricultural Research Center on the Big Island of Hawaii to test the feasibility of radio tracking rhino beetles to cryptic breeding sites. The idea worked. One of the first tagged beetles to be tracked lead the team to a small breeding site in a rotting breadfruit limb, twenty feet above the ground, the result of damage by Typhoon Dolphin. This breeding site was already occupied by three other adult beetles. According to Moore "Numerous small breeding sites such as this are starting up all over Guam as vegetation damaged during recent typhoons starts to rot. In addition, many mature coconut palms, which were riddled with CRB bore holes had their crowns blown off. These standing dead coconut palms, if not destroyed, will be turned into condos for several generations of rhino beetles. Unfortunately, many, if not most, of these typhoon generated breeding sites are inaccessible because they are in the jungle and/or on military bases. We desperately need to find an effective strain of Oryctes nudivirus or another biological control agent to suppress the rhino beetle population."

References

Marshall, Sean, Maclean Vaqalo, Aubrey Moore, Roland Quitugua, and Trevor Jackson (2015). **A new invasive biotype of the coconut rhinoceros beetle (*Oryctes rhinoceros*) has escaped from biological control by Oryctes rhinoceros nudivirus.** Presented at the International Congress on Invertebrate Pathology and Microbial Control and the 48th Annual Meeting of the Society for Invertebrate Pathology, Vancouver, BC, August 2015. Available on-line at http://www.sipmeeting.org/van1/SIP2015-Full%20Program.pdf

Jackson, Trevor (2015). **Need for emergency response for a new variant of rhinoceros beetle (Guam biotype).** International Association for the Plant Protection Sciences Newsletter (XI). November, 2015.. available on-line at https://www.plantprotection.org/portals/0/documents/newsletters/2015/iapps%2011-2015.pdf