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Are Purple Hermit Crabs (*Coenobita brevimanus*) Seed Dispersers or Predators?

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Are Purple Hermit Crabs (*Coenobita brevipimanus*) Seed Dispersers or Predators?*

Alyssa Cepeda; Haldre Rogers, PhD; Meg Kargul; and Anthony Castro

Abstract

Vertebrate frugivores play an important role in forests by dispersing seeds and helping improve germination through gut passage. Some frugivores may also be seed predators, where the seed is destroyed through gut passage. On the island of Saipan, the native frugivores are birds, bats, and crabs. This experiment focused on purple hermit crabs, *Coenobita brevipimanus*, which are known to consume fruits, but it is unknown whether purple hermit crabs disperse or predate the seeds they consume. A maximum of ten purple hermit crabs, ranging in size from medium to large individuals, were captured from the forest and kept in captivity. In captivity, they were fed native fruits including Premna (https://en.wikipedia.org/w/index.php?title=Premna_mariannarum&action=edit&redlink=1 *Premna mariannarum* or *Premna paulo-barbata*), Ficus (*Ficus prolixa*), Aglaia (*Lansium parasiticum*), and Guamia (*Guamia mariannae*) and non-native fruits including papaya (*Carica papaya*) collected in the wild. The cage was inspected to see if fruits were consumed but the seeds were not ingested, and the fecal matter was searched for damaged seeds (crushed or in pieces) or undamaged seeds (whole or intact). Analysis of predation or dispersal was done using logistic regression. It was hypothesized that purple hermit crabs are beneficial seed dispersers, passing most seeds unharmed for both native and non-native fruiting tree species. As beneficial frugivores, purple hermit crabs could play a significant role in dispersing seeds in the forests of Saipan.

KEYWORDS: frugivores; seed dispersers; karst forest; hermit crab

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Vertebrate frugivores play an important role in forests by dispersing seeds and helping improve germination through gut passage. Some frugivores may also be seed predators, where the seed is destroyed through gut passage. On the island of Saipan, the native frugivores are birds, bats, and crabs. This experiment focused on purple hermit crabs, *Coenobita brevipanus*, which are known to consume fruits, but it is unknown whether purple hermit crabs disperse or predate the seeds they consume. A maximum of ten purple hermit crabs, ranging in size from medium to large individuals, were captured from the forest and kept in captivity. In captivity, they were fed native fruits including *Premna* (*Premna mariannarum* or *Premna paulobarbata*), *Ficus* (*Ficus prolixa*), *Aglaia* (*Lansium parasiticum*), and *Guamia* (*Guamia mariannae*) and non-native fruits including papaya (*Carica papaya*) collected in the wild. The cage was inspected to see if fruits were consumed but the seeds were not ingested, and the fecal matter was searched for damaged seeds (crushed or in pieces) or undamaged seeds (whole or intact). Analysis of predation or dispersal was done using logistic regression. It was hypothesized that purple hermit crabs are beneficial seed dispersers, passing most seeds unharmed for both native and non-native fruiting tree species. As beneficial frugivores, purple hermit crabs could play a significant role in dispersing seeds in the forests of Saipan.

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