ALIENS IN PARADISE: A COMPARATIVE ASSESSMENT OF INTRODUCED AND NATIVE MANGROVE BENTHIC COMMUNITY COMPOSITION, FOOD-WEB STRUCTURE, AND LITTER-FALL PRODUCTION.

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ABSTRACT

Mangrove benthic community ecology and food-web structures in introduced and native mangroves were examined in detail in this dissertation. Introduced mangroves support a diverse macrofaunal community, primarily composed of polychaetes, oligochaetes and amphipods. The dominance of introduced and cryptogenic fauna in mangrove sediments indicates that mangroves may facilitate the persistence and spread of introduced species in Hawaii.

Examination of mangrove food webs indicated that the relative importance of mangrove detritus to detritivores differed in introduced and native mangrove communities. Based on $\delta^{13}C$ and $\delta^{15}N$ stable isotopic analysis, it was determined that few Hawaiian detritivores appear to rely on mangrove leaves for their diets. Based on $\delta^{15}N$, it appeared that particulate organic matter and/or benthic microalgae, rather than mangrove detritus, supported infauna from Hawaiian mangroves. In addition, significant differences in stable isotopic values of sandflat and mangrove sediment infauna suggest a landscape driven shift in stable carbon isotopic values to more depleted, possibly mangrove-influenced values with increased penetration into the interior of mangroves.

Mangrove food-webs were explored in more detail in native mangrove forests on Kosrae, Micronesia. Mangal contribution to the diets of the mangrove crab, *Scylla serrata*, ranged from 70-100% for Okat and Utwe watersheds. In contrast, crabs collected from the Lelu watershed had a lower percentage of mangal contribution (53-73%), and higher $\delta^{13}C$ and $\delta^{34}S$ indicating that these crabs may forage more on adjacent reef flats, resulting in enriched tissue isotopic values. Mangrove faunal associates, including

grapsid crabs and benthic infauna, served as important food sources for the crabs, as indicated by their corresponding $\delta^{13}C$ and $\delta^{15}N$ values. Discriminant analysis indicated that mangrove crabs restrict their movement to within their resident watershed.

Based on four months of litter sampling on Oahu, it was concluded that introduced mangroves in Hawaii export a greater proportion of litter relative to native forests in Puerto Rico. Export differences between sites may be a function of the physical environment (e.g., width of the forest) and rainfall patterns.

To conclude, the research presented in this dissertation enhances our understanding of the benthic community ecology and food-web structure in introduced and native mangrove communities.