Abstract

[Project Information]

Project Title :	Database Establishment and Development of Data Acquisition Technique for Conservation of Plant–Insect Interaction Network in Ogasawara Islands
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[Abstract]

We constructed a low-cost, low-power, automated video recording system using Raspberry Pi to facilitate pollinator identification in the field, and used the technique to elucidate the pollinators of endemic plants in the Ogasawara Islands. We found that nocturnal moths, whose importance as pollinators has received little attention, play an important role as pollinators in the Ogasawara Islands ecosystem. We also conducted a comprehensive survey of lepidopteran diversity in the Ogasawara Islands, and confirmed the presence of 218 species of microlepidoptera, including about 70 undescribed species. One endemic species of the family Bucculatricidae, which mines the leaves of *Hibiscus glaber*, and two endemic species of the family Crambidae, which emerged from bryophytes, were described as new species. Some endemic species underwent host shifts at the family level after colonizing the Ogasawara Islands, while others may have diversified within the archipelago by changing their larval feeding habits. Finally, we used genomic analysis to assess the extinction risk of lepidopteran insects on the Ogasawara Islands. Specifically, we established a technique for rearing leaf-mining lepidopteran species in the laboratory and conducted inbreeding experiments to determine the threshold of heterozygosity at which a population begins to collapse. We also estimated the effective population size of the moth, which we found to be important as pollinators of endemic plants. Overall, the study has provided fundamental

information for the conservation of plant–insect interaction networks in the Ogasawara Islands. We also found many new examples of unique plant–insect evolution, which will contribute to enhancing the value of the Ogasawara Islands as a World Natural Heritage Site.

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