
A global review of frugivory and seed dispersal on islands

Manuel Nogales*^{†1}, Kim Mcconkey², Tomás Carlo³, Debra Wotton^{4,5}, Peter Bellingham⁶, Anna Traveset⁷, Aarón González-Castro⁸, Ruben Heleno⁹, Kenta Watanabe¹⁰, Haruko Ando¹¹, and Don Drake¹²

¹Spanish National Research Council (IPNA-CSIC) – Astrofísico Fco. Sanchez 3, 38206 La Laguna, Tenerife, Canary Islands, Spain, Spain

²School of Natural Sciences and Engineering / National Institute of Advanced Studies – Bangalore, India

³Department of Biology – Penn State University, United States

⁴Moa's Ark Research – Wellington, New Zealand

⁵Biological Sciences – University of Canterbury, Christchurch, New Zealand

⁶Lancare Research – Lincoln, New Zealand

⁷Spanish National Research Council (IMEDEA-CSIC) – Institut Mediterrani d'Estudis Avançats (IMEDEA-CSIC), Balearic Islands, SPAIN, Spain

⁸Spanish National Research Council (IPNA-CSIC) – Francisco Sanchez 3, 38206 La Laguna, Tenerife, Canary Islands, Spain, Spain

⁹Centre for Functional Ecology, Department of Life Sciences, University of Coimbra – Portugal

¹⁰Okinawa College / National Institute of Technology – Okinawa, Japan

¹¹Center for Environmental Biology and Ecosystem Studies, National Institute for Environmental Studies, JAPAN – Center for Environmental Biology and Ecosystem Studies, National Institute for Environmental Studies, Japan

¹²Department of Botany – University of Hawaii, United States

Abstract

Published information on frugivory and seed dispersal on islands is widespread, patchy, and heterogeneous among the topics and islands concerned. A systematic literature search on islands was performed using Internet scientific search engines. To the best of our knowledge, this is the first review carried out at a global scale, covering frugivory and seed dispersal on islands. About 450 contributions were retrieved, with most of the knowledge focused on New Zealand (large area), the Canaries and Puerto Rico, which were the better-studied islands. They were very few studies in Pacific archipelagos near Asia and Australia, and in the Indian Ocean. Most studies were carried out during the present century, especially during the last decade. Island ecosystems are comparatively simple, so they are ideal for developing and testing interesting and original ecological and evolutionary hypotheses. Perhaps, more in-depth studies concerning seed dispersal effectiveness, non-standard mechanisms of dispersal, or complete ecological networks are more feasible on an island setting, and particularly

*Speaker

[†]Corresponding author: mnogales@ipna.csic.es

oceanic islands, than in a more complex continental environment. In addition, comparisons among archipelagos offer opportunities for development of general theories. Indeed, the typical low biodiversity, high endemism, and ecological simplicity of oceanic islands is a most valuable advantage. From a conservation perspective, data from the IUCN, shows that most reported extinctions in the past 500 years have occurred on islands, both for vertebrates and plants. The same pattern is found when considering only those extinctions caused by introduced alien species, one of the greatest threats to the biota of isolated territories. Therefore, it is vital to know both how native systems work and at the same time to evaluate how alien species affect native interaction networks, altering the natural order of interactions. This information is essential to halt biodiversity loss and to guide restoration efforts on islands.

Keywords: conservation and restoration, mutualistic interactions, networks, plant dissemination, seed dispersal effectiveness