

PREDICTING THE RISK OF PLANT INVASION ON ISLANDS: THE CASE OF *MICONIA CALVESCENS* IN THE MARQUESAS, FRENCH POLYNESIA (SOUTH PACIFIC)

Mélanie Libeau, Robin Pouteau, Ravahere Taputuurai, Jean-Yves Meyer

Miconia calvensens (Melastomataceae), a small tree native to Central and South American rainforests, is a dominant plant invader in the Society Islands (French Polynesia), Hawaii, New Caledonia, and tropical Australia, thus listed as one of the world's 100 worst invasive species. This fast growing, early reproducing and prolific seed producer (small fleshy fruits dispersed by birds over long distances) with a long-lasting soil seed bank (several decades) was first detected 20 years ago in the Marquesas (French Polynesia), a remote archipelago with a unique and endangered native flora (48% of endemism and 145 threatened species). Despite some eradication efforts, several new outbreaks have been located in the last few years on the largest island of Nuku Hiva. In this alarming context, it is urgently needed to determine the potential distribution of the species in order to assess the risk of invasion and refine the areas for further surveys and control. Species distribution models (SDMs) are numerical tools that project species distribution from the combination of species occurrences with environmental variables. Fitting an SDM on the basis of Marquesas populations to predict the future of *Miconia* over the archipelago would violate the equilibrium assumption behind SDMs. Moreover, projecting the environmental envelope occupied by the species in its native range would ignore inherent characteristics of island ecosystems (e.g. low species richness, low functional redundancy, vacant niches, restricted and specialized habitats) that leave them much more vulnerable than continents to biological invasions. As a result, the environmental distribution of *Miconia* across the similarly-sized high-elevation islands of the Society and the Hawaiian archipelagos was projected over the Marquesas. The different SDMs agree that *Miconia* will spread over a large area of native lowland rainforest and montane cloud forest in Nuku Hiva unless appropriate control strategies are rapidly adopted.