

BOOK OF ABSTRACTS
POSTERS

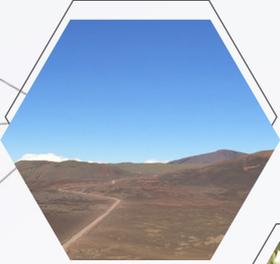


Island BIOLOGY

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Evolution of pesticide resistance in invasive versus indigenous agricultural pests in an insular tropical environment

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Insular environments are among the most vulnerable ecosystems in the world, partly due to their small size and isolation. In La Réunion, an island in the southwest Indian Ocean, three whitefly species of the *Bemisia tabaci* (Gennadius) complex of cryptic species coexist: the indigenous species IO, and two exotic invasive species MEAM1 and Med, introduced in the late 1990s and in the early 2010s, respectively. *B. tabaci* is a major pest distributed worldwide, and a vector of plant viruses, responsible of serious damages on crops. The generalization of the use of pesticides has led to the emergence and rapid evolution of resistance in whitefly populations. In other countries, MEAM1 and Med have already demonstrated high resistance levels to all of the important classes of pesticides. Our objectives were to understand indigenous versus invasive whitefly species distribution in La Réunion, according to the different ecosystems; and how it could be linked to selection pressure of pesticide treatments. To assess species distribution, whiteflies were sampled at 59 collection sites, located all over the island in agroecosystems and natural areas. Molecular (kdr mutation, conferring Pyrethroid resistance) and laboratory bioassays (on three main classes of pesticides: Neonicotinoids, Pyridine azomethine derivatives and Pyrethroids) approaches were conducted on part of the sampled populations to assess pesticide resistance. The indigenous species IO was mainly sampled in natural areas and was found to be sensitive to the three classes of pesticides tested; in addition, no kdr mutation conferring Pyrethroid resistance was detected. The two exotic invasive species MEAM1 and Med were dominant in agrosystems. Most of the MEAM1 populations were found to be resistant to the three classes of pesticides tested, and kdr mutation was detected in both invasive species. Our results are in line with resistance cases reported worldwide in the literature, and suggest that whitefly species distribution in La Réunion could be driven by selection pressure of pesticide treatments.

Keywords: *Bemisia tabaci*, insular environment, biological invasion, species distribution, pesticide resistance

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