

Gut Microbiome as Driver of Insect Invasiveness

Dr Marie-caroline Lefort^{1,2}, Miss Kerry-Lee Pigg¹, Miss Amy Wardrop¹, Dr Stephane Boyer¹

¹Unitec Institute of Technology, ²Bio-Protection Research Centre

The agricultural sector in isolated islands, such as New Zealand, is particularly at risk of suffering from the introduction and establishment of new pest species. Among these, some soil invertebrates, particularly insects, represent a significant threat because they can be difficult to detect and intercept, can quickly reach sizeable populations resulting in severe economic damage and can be very difficult to control or eradicate. Dispersal ability, environmental tolerance and phenotypic plasticity are critical determinants of the invasion success of these insects. Recent studies indicate that these attributes can be modified by gut bacteria and yet the role of the gut microbiome in invasion success remains unexplored. As part of our new international research project MADII (Microbiome As Driver of Insect Invasiveness), we used Next Generation Sequencing (NGS) technologies, to interrogate the role of gut microbial communities in driving invasiveness in phytophagous insects by (1) assessing the differences in the gut microbiome composition of closely related invasive and non-invasive species in the New Zealand beetles *Costelytra zealandica* (White) and *C. brunneum* (Broun), and by (2) testing the acquisition of gut microbial communities in the black field cricket *Teleogryllus Commodus* (Walker). In this presentation we will give a snapshot of this large-scale study and discuss the role of the gut microbiome in insect invasiveness as well as its implications for pest control and biosecurity.