

The traceback enigma: A case study featuring a tropical species of carpenter ant

It has long been known that shipping containers are an important entry pathway for insects of significant biosecurity risk to New Zealand. The Ministry for Primary Industries (MPI) undertakes a comprehensive range of programmes to counter this, including risk analyses and profiling of shipping containers as they arrive in New Zealand. Recently an incursion of structure-infesting ants found in a shipping container illustrated the complexity of this risk-analysis and profiling process.

In mid-June 2019, MPI was notified byASUREQuality of a large live ant (Figures 1, 2) found in an empty shipping container at a Taranaki exporting business. Provisional identification based on photographs was *Camponotus* sp. (carpenter ant, not present in New Zealand). The photos were forwarded to MPI Plant Health Incursion Investigators, who arranged for the specimen to be sent to Plant Health & Environment Laboratory (PHEL) entomologists, who confirmed the identification. As the species of *Camponotus* are difficult to differentiate, molecular analysis was initiated at this stage. Meanwhile, an urgent measures response was launched by the investigator. The shipping container was quickly isolated and the area around it treated with insecticide, prior to methyl bromide fumigation of the container and further insecticide treatment of the location where it had sat. One live and several dead ants were found inside the container, but the live specimen was in a poor state of health. It appeared that an infestation of carpenter ants was located somewhere below the timber flooring of the shipping container. Other response work included determining the port of origin of the container, investigating its previous travel history and identifying the cargo.

This traceback work revealed a remarkable sequence of events. The shipping container had originally been loaded with bulk raw plastic beads in Houston, Texas, in early April, transported by rail to Long Beach, California, and shipped in late April

to the Port of Tauranga, arriving in May 2019. From there the container was trans-shipped to Hamilton and then Palmerston North, before arriving at the importer's premises in New Plymouth in late May 2019, whereupon the contents were devanned. The empty container was then moved and stored at a transport yard in New Plymouth until mid-June, when it was sent to the exporter. The exporter spotted the first live suspect ant during a routine inspection just before the container was to be loaded. This traceback work also identified two further sites in Taranaki that required follow-up work to ensure the carpenter ants had not become established elsewhere, undetected.

Following these operational activities, PHEL entomologists provided results of the molecular diagnostic work that identified the ant as *Camponotus conspicuus*, a tropical species of carpenter

ant originating in Central America and the Caribbean region.

The obvious issue quickly identified was that the port of origin of the shipment (Houston) was not a location where this ant species was known to be present. This raised the question of where the infestation of the shipping container had occurred. It seemed unlikely that the ants were hitchhikers on the actual cargo of plastic beads, as this cargo did not come from an area where this species has been recorded. The most likely scenario was that the shipping container itself had become contaminated before it was loaded and shipped from Houston. With the assistance of the shipping line that owned the container, further traceback determined that the container had indeed been located in Honduras from February to March 2019, before being loaded with cargo, shipped to Houston, emptied and then reloaded with the plastic bead consignment for New Zealand in April 2019. *C. conspicuus* is native to Honduras.

This sequence of events shows the remarkable tenacity of ants, in that this infestation of a large tropical ant species had survived some 4 months in the floor of a shipping container that had been repeatedly loaded, unloaded and moved on trucks, trains and ships before finally ending up in Taranaki. It also illustrates the difficulties in risk-profiling of both cargo and shipping containers, and the speed at which a shipping container can be moved from location to location around the globe. Such rapid movement makes it difficult to trace dispersal pathways such as these for biosecurity risks like ants and other insects.

Fortunately in this instance the ants were detected, thanks to the diligence of the exporter in Taranaki and an ASUREQuality staff member present at the time, and this allowed follow-up measures to be undertaken. It is also fortunate that this ant species is tropical, meaning that it is unlikely to become established in New Zealand's temperate environment.



Figure 1: Carpenter ant, *Camponotus* sp. Photo supplied by ASUREQuality



Figure 2: *Camponotus conspicuus*. Photo: ww.AntWeb.org. The text says that this is the species identified by PHEL so no need to repeat.

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