

Pest Alert

Florida Department of Agriculture and Consumer Services
Division of Plant Industry

***Delottococcus confusus* (De Lotto) (Hemiptera: Pseudococcidae)**, a mealybug pest of cut-flower protea (Proteaceae: *Protea* spp.)

Ian C. Stocks, Ian.Stocks@FreshFromFlorida.com, Biological Scientist IV, Florida Department of Agriculture and Consumer Services, Division of Plant Industry

INTRODUCTION: On several occasions in 2013 and 2014, FDACS-DPI inspectors with the Detector Dog-Inspector Team program at shipping distribution centers in Broward and Miami-Dade counties intercepted cut flower shipments from Hawaii that were contaminated with the mealybug *Delottococcus confusus* (De Lotto) (Coccoidea: Pseudococcidae). This species is native to southern Africa and is primarily associated with plants in the genera *Protea* and *Leucadendron* (Proteaceae).

Delottococcus confusus was first documented in Maui, Hawaii, in 2009 (Bernarr Kumashiro, Hawaii Department of Agriculture, personal communication), and to date all shipments intercepted in Florida were found to have originated from nurseries on Maui, Hawaii. Miller and Giliomee (2011) clarified that the previously unidentified species of *Delottococcus* that had been an intermittent pest of *Protea* spp. and *Leucadendron* spp. in California nurseries since 2003 was in fact *D. confusus*. The California Department of Food and Agriculture does not consider this species to be established and infestations are eradicated when discovered (Watson 2007; Miller and Giliomee 2011).

Protea spp. (Figs. 1–2) and *Leucadendron* spp. flowers are large and colorful, and popular in cut-flower arrangements. Species in these genera are adapted to a cooler and drier Mediterranean-type climate rather than the hotter and more humid climate of Florida, and are therefore not widely cultivated in Florida. However, *D. confusus* has been recorded from plants in other genera, many of which occur in Florida. Thus, this species presents a wider risk of becoming established in Florida.



Fig. 1. King protea, *Protea cynaroides* L. Photography credit: Stan Shebs. Licensed under Creative Commons Attribution-Share Alike 3.0.



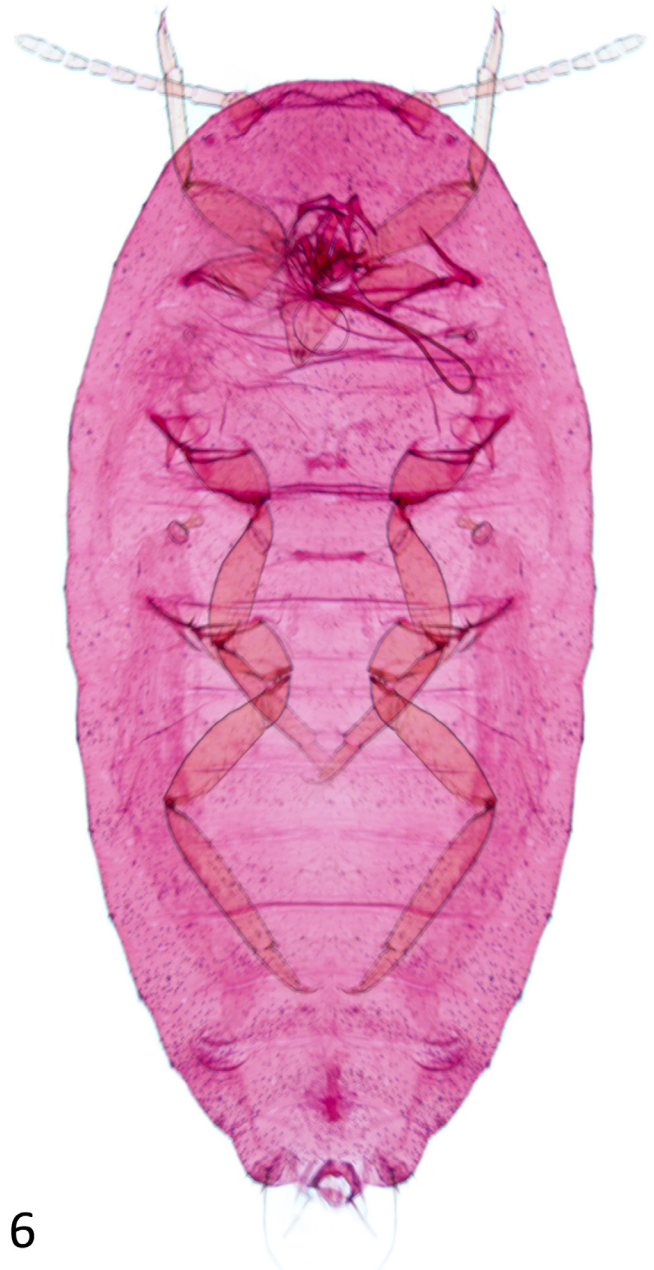
Fig. 2. Boxed king protea intercepted at a package sorting facility. Photography credit: I. Lopez, FDACS-DPI.



Florida Department of Agriculture and Consumer Services
Adam H. Putnam, Commissioner

DESCRIPTION: Figure 3 illustrates an actively moving female prior to settling for the production of an ovisac. Figures 4 and 5 illustrate females that have settled and produced ovisacs. Figure 4 also illustrates the small yellow crawler stages that are beginning to disperse. Figure 5 shows a female that had become separated from the ovisac, which probably occurred during shipment.

Adult female *Delottococcus confusus* resemble in size, color and distribution of wax other species of *Delottococcus* and many species in other genera. Identification requires slide-mounted specimens (Fig. 6). Mealybugs on protea or related hosts that are consistent with the appearance of the specimens in the figures should be submitted for identification.



Figs. 3 and 4. Female *Delottococcus confusus* with ovisacs on king protea; 4) free-moving female. Photography credit: Images reproduced by permission of California Department of Food & Agriculture.

Fig. 5. Adult female *Delottococcus confusus* with ovisac on king protea intercepted at a package sorting facility. Photography credit: I. Lopez, FDACS-DPI.

Fig. 6. Slide-mounted adult female *Delottococcus confusus*. Photography credit: I. Stocks, FDACS-DPI.

BIOLOGY: Few details are known other than an apparent preference for the mealybug to settle on the leaves rather than flowers or stems. However, specimens noticed on plants that are in transit may have migrated from their preferred location and be can found on other plant parts (Fig. 3).

HOSTS: Although species of Proteaceae are the primary hosts, species in the following families have also been recorded: Sapotaceae (*Mimusops* sp.), Apocynaceae (*Carissa macrocarpa* (Eckl.) A. DC.), Lamiaceae (*Plectranthus* sp.), Myrtaceae (*Psidium guajava* L.), Rubiaceae (*Canthium* sp.) and Solanaceae (*Lycium* sp.).

ECONOMIC IMPORTANCE: Watson (2006) reported that heavy infestations cause severe stress to the plant, such as leaf necrosis and branch die-back, and may have led to the death of at least one *Leucadendron* sp. plant in the only reported infestation outside of a nursery.

DISTRIBUTION: *Delottococcus confusus* is native to regions of southern Africa (Ben-Dov *et al.* 2014). As an adventive species, this species is documented in California and Hawaii, but is either restricted to nurseries or subject to eradication programs.

NATURAL ENEMIES: No natural enemy is documented in the literature.

LITERATURE CITED:

Ben-Dov, Y., D.R. Miller and G.A.P. Gibson. 2014. ScaleNet. *Delottococcus confusus*. <http://www.sel.barc.usda.gov/catalogs/pseudoco/Delottococcusconfusus.htm>. [accessed 2014, September 2].

Miller, D.R. and J.H. Giliomee 2011. Systematic revision of the mealybug genus *Delottococcus* Cox & Ben-Dov (Hemiptera: Pseudococcidae). African Entomology 19(3):614–640.

Watson, G. 2007. Hemiptera: Sternorrhyncha. New federal records. *Delottococcus* sp. In: California Plant Pest & Disease Report. http://www.cdfa.ca.gov/plant/ppd/PDF/CPDR_2006_23-1.pdf. [accessed 2014, September 2].