



## A new species of armored scale (Hemiptera: Coccoidea: Diaspididae) found on avocado fruit from Mexico and a key to the species of armored scales found on avocado worldwide

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### Abstract

A new species of armored scale, *Abgrallaspis aguacatae* Evans, Watson, and Miller spec. nov. is described and illustrated from specimens collected on avocado fruit from Mexico. This species has caused considerable concern as a quarantine issue in the United States. A key to the armored scale species known to feed on avocado worldwide is provided.

**Key words:** Pest, *Persea americana*, quarantine, taxonomy, regulatory, invasive species

### Introduction

Avocado (*Persea americana* Mill., Lauraceae), known as *aguacate* or *palta* in Spanish, is a tree native to Mexico and Central America. Evidence suggests that it may have been cultivated in Mexico for as long as 10,000 years (Barry, 2001). It has been cultivated in South America since at least 900 A.D, because an avocado-shaped water jar was found in the pre-Incan city of Chan Chan in Peru (Barry, 2001). The fruit has become very popular around the world; according to the United Nations Food and Agriculture Organisation (FAOSTAT, 2008), nearly 3.45 million metric tons of avocados were produced worldwide in 2004. Mexico is the largest producer; it accounted for 33.2% (an estimated 1.14 million tons) of global production and 27.6% of the export market in 2004 (Evans & Nalampang, 2006).

Beginning in 1914, U.S. authorities prohibited the importation of fresh avocados from Mexico because of the presence of avocado seed weevils in Mexico. In 1994, the Mexican government requested that the United States Department of Agriculture (USDA)/Animal Plant Health Inspection Service (APHIS) allow importation into the U.S. of fresh 'Hass' avocado fruit from the State of Michoacán, Mexico. A pest risk assessment was prepared and restrictions were lifted in 1997, allowing avocados to be imported into 13 U.S. States from Michoacán (USDA/APHIS, 2004). A new policy took effect in January 2005 that allowed 'Hass' avocados from approved orchards in municipalities in Michoacán to be sold year-round in 47 U.S. states, with a two-year delay on importation into the commercial avocado-producing states of California, Florida and Hawaii (USDA/APHIS, 2007). The last U.S.-imposed trade restrictions were lifted on February 1, 2007, and the first avocados were shipped to these remaining states on that day (Associated Press, 2007). On the same day, agricultural inspectors in California intercepted armored scales from Mexico on 'Hass' variety of avocado fruits. Specimens were sent to Dr. Gillian Watson of the California Department of Agriculture, and later to the other two authors of this paper, who together concluded that the material contained an undescribed species with similarities to San Jose scale (*Diaspidiotus perniciosus* (Comstock)), *Hemiberlesia diffinis* (Newstead)