



# First Record of *Diaspis coccois* (Lichtenstein) (Hemiptera: Diaspididae) for Mexico

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## Discussion

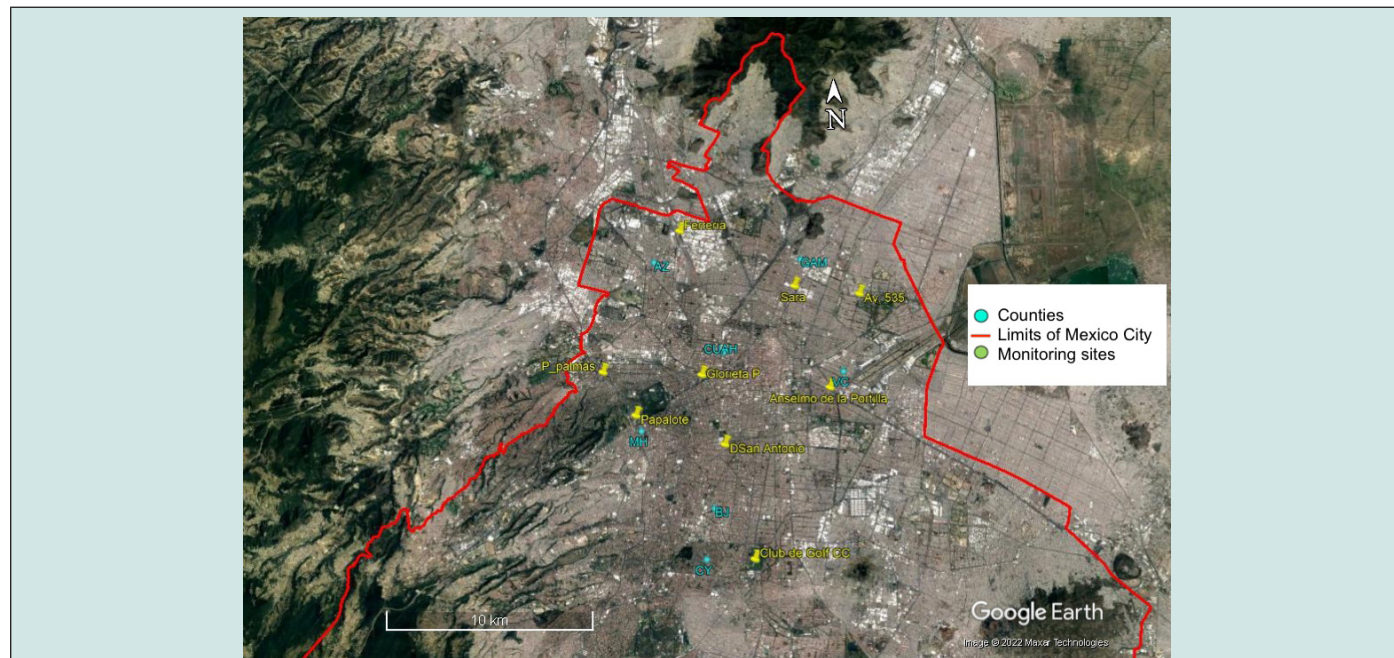
Undoubtedly, urban trees fulfil important functions for society in general, their benefits include landscape designs that are appropriate for the sight and psychology of human beings, recreation sites, shaded areas, reduction of air pollution levels, sources of oxygen, aquifer recharge areas, just to mention a few. In contrast, some associated problems include reforestation programs with wrong choices of tree species, inappropriate density, pollution effects, reduced spaces for their growth and in many cases, limited management programs in soil improvement, pruning programs, fertilization, irrigation, pests, and diseases management. Currently, there is a phytosanitary problem in Mexico City that is causing the death of Canarian palms (*Phoenix canariensis* Hort. Ex. Chabaud), registered since 2015. In the case of palm trees, based on the study "Agents associated with the decline and death of palm trees in the CMX" financed by SECTEI, there were detected the presence of wilting caused by Phytoplasma 16 srIV subgroup D [1], the fungi of the petiole and rachis *Nalanthamala vermoesenii*, *Phomopsis*, *Lasiodiplodia* and *Serenomyces*, the fungi of the foliage *Neopestalotiopsis*, *Alternaria* and *Phoma glomerata*, and of the root *Fusarium oxysporum* [2]. Although canary palms are common in Mexico City, their diversity of associated organisms, particularly the entomofauna, has never been studied. With this background, the present study aimed to determine the species of armored scale associated with Canarian palms from some locations in Mexico City.

Due to the lack of knowledge about the distribution of palm trees in Mexico City, Google Earth images were used to locate and analyse 40 green areas (parks, gardens, avenues, etc.), in the search for potential individuals for study for which virtual tours were carried out through the streets and avenues of the city, using the same platform and with the support of personnel from SEDEMA, SEMARNAT and private companies, more than 20 land tours were carried out, finally, 35 monitoring sites were established in form of transects with a length of 200 m to evaluate the health condition of palm trees in Mexico City. The counties included were: Azcapotzalco, Benito Juárez, Cuauhtémoc, Gustavo A. Madero, Iztapalapa, Iztacalco, Miguel Hidalgo, Xochimilco, Tlalpan and Venustiano Carranza [3] (Figure 1). As part of the activities of a parallel project to determine the phytosanitary health conditions of the palm trees, the transects were evaluated twice, in the dry and rainy season of 2022 in CDMX. The first was held from May 13 to July 22, and the second from August 22 to November 2, 2022.

From the palms reviewed in each transect, foliage samples were taken from the fronds (Figure 2), material that was placed in Ziploc bags for transportation to the Forest Entomology laboratory of the Colegio de Postgraduados, Campus Montecillo, Texcoco, Estado de Mexico. The plant material was reviewed under a stereoscopic microscope, to separate the armored scales that were preserved in 1.0 mL Eppendorf tubes with 70% ethyl alcohol. The specimens were

processed and mounted by the method of following [4] standard mounting technique for Diaspididae. Identification was made using Ferris's keys [5]. According to the results obtained during the samplings, it was found that the presence of the scale, *Diaspis coccois* Lichtenstein 1982 (Hemiptera: Diaspididae), is the most frequent

species and associated with the foliage of palm trees in Mexico City (Figures 3A & 3B; Figures 4A & 4B). The colour of the waxy covers of both sexes is transparent white, only that the pupae of the males are elongated, while the waxy covering of adult females is circular (Figure 3B).



**Figure 1:** Distribution of the scale *Diaspis coccois* in the 35 monitoring sites in Mexico City. 2022.

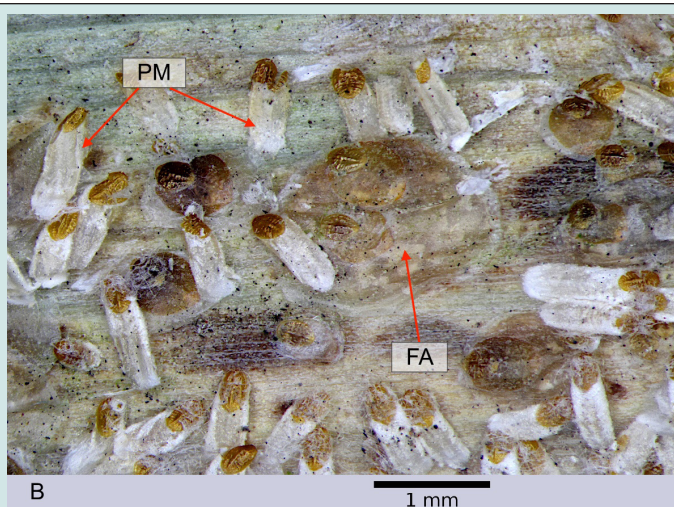


**Figure 2:** Sampling of plant material in palms of Mexico City.





**Figure 3: A.** *Diaspis coccois* (Hemiptera: Diaspididae) on foliage of *Phoenix canariensis* from Mexico City.



**Figure 3: B.** Male pupae (MP) and adult female (AF).

The armed scale of the coconut palm *D. coccois*, was described in coconut palm (*Cocos nucifera* L.) from Montpellier (France) [5]. It is native to the Neotropical region and is mainly associated with palm trees, particularly on coconut palms in tropical and subtropical countries [6]. In the American Continent, it has been detected in the USA (California and Florida), Panama, Jamaica, Trinidad & Tobago, and Chile [7-10]. In Mexico, a close species has been detected, yet without specific determination, *Diaspis* nr. *coccois* in leaves, branches, and fruits of avocado (*Persea americana*) Mexi-

can and Hass cultivar [11]. In Florida, USA, *D. coccois* was detected on the orchid *Laelia speciosa* (HBK) Schltr., and on Mexican vanilla *Epidendrum aramaticum* (Sw.) J. Parm., plants that were destroyed and that this scale is reported as not established in that state. In California, USA, it has been reported on *Chamaerops*, *Cocos*, *Howea* (= *Kentia*), *Latania*, *Livistona*, *Phenix* and *Roystonea* palms [12]. In addition to palms, it can attack other species of *Arecaceae*, *Anacardiaceae* and *Orchidiaceae* [13].

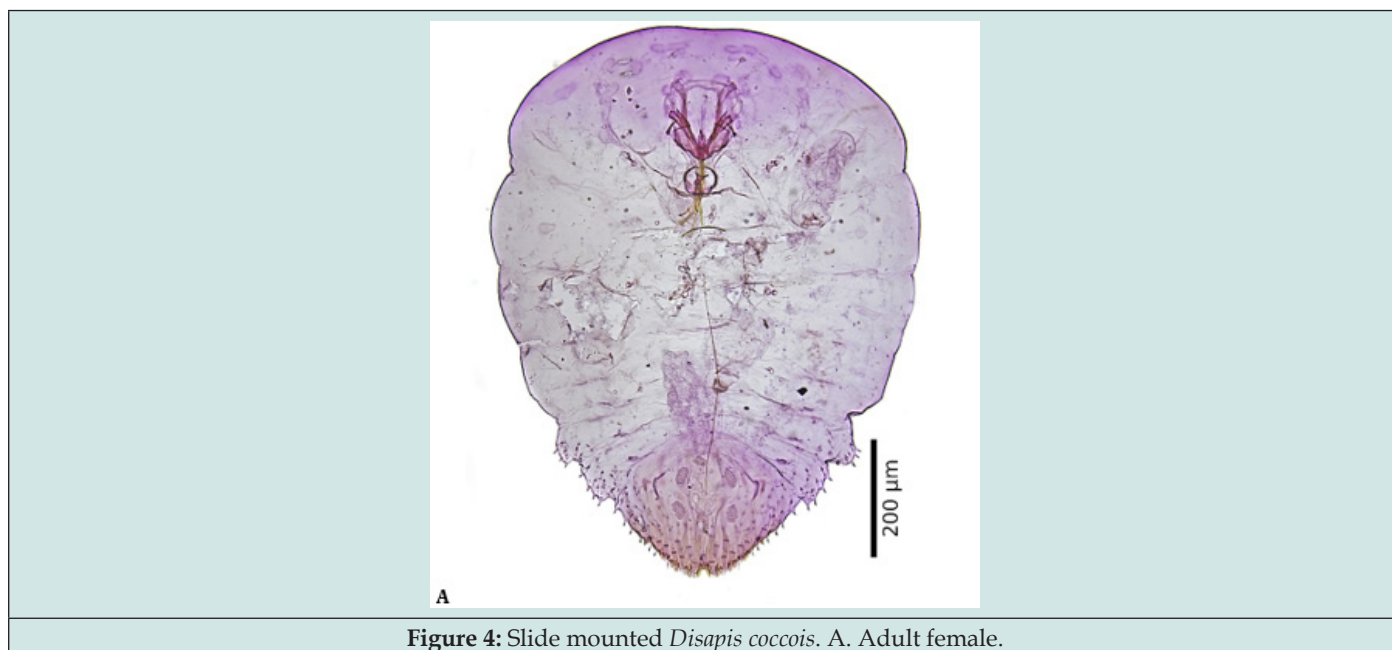


Figure 4: Slide mounted *Disapis coccois*. A. Adult female.

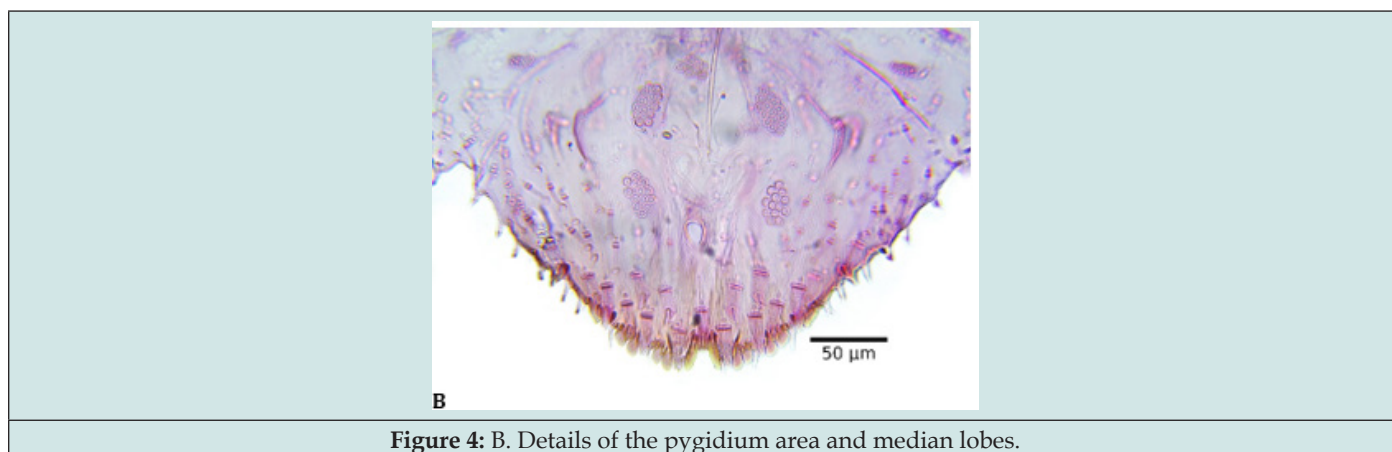


Figure 4: B. Details of the pygidium area and median lobes.

As expected, *D. coccois* populations vary according to the health of the palms. A range of infestation and damage was observed in the palms, from very discreet to severe. The damage that *D. coccois* can cause to the leaves of the Canary Island palm is chlorosis at the points of infestation, which in high population densities can dry out the leaves. Its presence was also observed in young palms, which were also reviewed during the samplings in the three municipalities. Finally, there are no previous reports of *D. coccois* in Mexico, on any host plant, making it the first report of this species of armored scale in Mexico and on the Canary Island palm *Phoenix canariensis* in Mexico City.

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