

***Phalacrocooccus howertoni* Hodges & Hodgson (Hemiptera: Coccoidea: Coccidae), a new soft scale record for the island of Guadeloupe**

***Phalacrocooccus howertoni* Hodges & Hodgson (Hemiptera: Coccoidea: Coccidae), nuevo registro de una escama blanda para la isla de Guadeloupe**

Jean Etienne¹, Danièle Matile-Ferrero², Takumasa Kondo³

¹ Entomologist. Institut National de la Recherche Agronomique, Centre Antilles-Guyane, Domaine Duclos, FR – 97170 Petit-Bourg, Guadeloupe. Jean.etienne2@wanadoo.fr

² Entomologist. Muséum National d'Histoire Naturelle, Département de Systématique & Evolution, UMR 7205, MNHN-CNRS: ISYEB, Institut de Systématique, Evolution, Biodiversité, CP 50, FR – 75231 Paris Cedex 05. dmatile@mnhn.fr

³ Entomologist. Corporación Colombiana de Investigación Agropecuaria (Corpoica), Centro de Investigación Palmira, Calle 23, Carrera 37, Palmira, Valle, Colombia. tkondo@corpoica.org.co

Fecha de recepción: 30/03/2014

Fecha de aceptación: 19/05/2014

ABSTRACT

The croton scale, *Phalacrocooccus howertoni* Hodges & Hodgson (Hemiptera: Coccoidea: Coccidae) is newly reported from the island of Guadeloupe, French West Indies, on several host-plants, including some new host records, i.e., on *Spondias cytherea* Sonnerat; (Euphorbiaceae), *Ocotea membranacea* (Sw.) R.A. Howard (Lauraceae), *Miconia furfuracea* (Vahl) Griseb (Melastomataceae), *Ficus citrifolia* Mill. (Moraceae) and *Piper dilatatum* Rich. (Piperaceae).

Key words: Coccid, scale insect, soft scale, *Phalacrocooccus howertoni*.

RESUMEN

La escama blanda del croton *Phalacrocooccus howertoni* Hodges & Hodgson (Hemiptera: Coccoidea: Coccidae) se reporta por primera vez en la isla de Guadeloupe, Antillas Francesas, sobre varias plantas, incluyendo nuevos hospedantes, i.e., *Spondias cytherea* Sonnerat; (Euphorbiaceae), *Ocotea membranacea* (Sw.) R.A. Howard (Lauraceae), *Miconia furfuracea* (Vahl) Griseb (Melastomataceae), *Ficus citrifolia* Mill. (Moraceae) y *Piper dilatatum* Rich. (Piperaceae).

Palabras claves: Cócido, insecto escama, escama blanda, *Phalacrocooccus howertoni*.

INTRODUCTION

The croton scale, *Phalacrocooccus howertoni* Hodges & Hodgson (Hemiptera: Coccoidea: Coccidae) is a highly polyphagous soft scale species, hitherto reported on 72 host plants in 34 botanical families (Amarasekare & Mannion, 2011; Ben-Dov *et al.*, 2014; Hodges & Hodgson, 2010; Williams, 2010). This species was described in 2010 based on specimens collected on ornamental croton in the State of Florida, USA (Hodges & Hodgson, 2010) and soon after it was recorded in Guatemala (Williams, 2010) and Barbados (Anonymous, 2011). The adult female of *P. howertoni* (Fig. 1A, 1B) is approximately 4 mm long and 2 mm wide, green to yellow-green in color, with dark striations on dorsum (Hodges & Hodgson, 2010). *Phalacrocooccus howertoni* is ovoviviparous; females go through three nymphal stages before reaching the adult stage; males go through four nymphal stages, including a pre-pupal (third instar) and a pupal stage (fourth instar) before becoming an alate male (Fig. 1B) (Amarasekare & Mannion, 2011). In Florida, *P. howertoni* has multiple overlapping generations per year, averaging about one generation a month; it overwinters as adult female; each which can lay about 400 eggs (Hodges & Hodgson, 2010). Hodges & Hodgson (2010) listed several natural enemies, namely *Cryptolaemus montrouzieri* Mulsant (Coleoptera: Coccinellidae), *Laetilia coccidivora* (Comstock) (Lepidoptera: Pyralidae) and the parasitoid *Metaphycus flavus* (Howard) (Hymenoptera: Encyrtidae). The present paper aims to report *P. howertoni* for the first time on Guadeloupe Island, French West Indies, and provide a list of new host plants for this species.

MATERIALS AND METHODS

The first author (J.E.) collected specimens of a soft scale insect on ornamental croton, *Codiaeum variegatum* (L.) Rumph. ex A. Juss. (Euphorbiaceae), which differs from all known species on Guadeloupe Island. The first author sent photographs of the undetermined coccid to the third author (T.K.) who based on its external morphology tentatively identified the species as *Phalacrocooccus howertoni* Hodges & Hodgson (Hemiptera: Coccidae). Specimens were slide-mounted following the method described by Williams & Granara de Willink (1992) and identified as *P. howertoni* based on its cuticular morphology by the first (J.E.) and second author (D.M.F.) using the original description by Hodges & Hodgson (2010) and by comparison with

slide mounted adult females of *P. howertoni* received from the Florida State Collection of Arthropods. The material studied is deposited in the Muséum National d'Histoire Naturelle, Paris, France (MNHN). Host plants were identified following Fournet (2002).

Material studied

Phalacrocooccus howertoni. **Guadeloupe:** Baie-Mahault, Calvaire, ex *Psidium guajava*, 5.II.2013, coll. J.E., in alcohol (MNHN), ex *Spondias cytherea*, 23.IV.2014, coll. J.E., in alcohol (MNHN); Baie-Mahault, Daubin, ex *Codiaeum variegatum*, coll. J.E., in alcohol (MNHN); Deshaies, Grande Anse, ex *C. variegatum*, 13.V.2013, coll. J.E., in alcohol (MNHN); Lamentin, Ravine Chaude, ex *C. variegatum*, 21.XI.2012, coll. J.E., MNHN 14829, 7 slides, 12 specimens, 17.I.2013, coll. J.E., in alcohol (MNHN), ex *Psidium guajava*, 18.I.2013, coll. J.E., in alcohol (MNHN), ex *Piper dilatatum*, 18.I.2013, coll. J.E., in alcohol (MNHN), id., 26.II.2014, coll. J.E., in alcohol (MNHN 14872), ex *Citrus citrifolia*, 19.I.2013, coll. J.E., 8 specimens, 4 slides (MNHN), ex *Acalypha wilkesiana*, 24.I.2013, coll. J.E., in alcohol (MNHN), ex *Mangifera indica*, 1.III.2013, coll. J.E., in alcohol (MNHN); Lamentin, route Duclos, ex *Miconia furfuracea*, coll. J.E., in alcohol (MNHN); Morne-à-L'Eau, Perrin, ex *C. variegatum*, coll. J.E., in alcohol (MNHN); Pointe-à-Pitre, Boissard, ex *Mangifera indica* (fruits), coll. J.E., in alcohol (MNHN); Sainte-Rose, ex *C. variegatum*, 13.V.2013, coll. J.E., in alcohol (MNHN); Petit-Bourg, Duclos, ex *Ocotea membranacea*, 22.II.2013, coll. J.E., in alcohol (MNHN); Petit-Bourg, Prise d'Eau, ex *C. variegatum*, 26.I.2013, coll. J.E., in alcohol (MNHN).

RESULTS AND DISCUSSION

The polyphagous croton scale, *P. howertoni* was first discovered in Guadeloupe on November 21, 2012, at the locality of Ravine Chaude, in the municipality of Lamentin, on the leaves of ornamental croton, *C. variegatum*. A year later, the same species was collected again on *C. variegatum* in several other sites of Guadeloupe. On January 26, 2013, it was found in the locality of Prise-d'Eau in the municipality of Petit-Bourg; on January 29, in the locality of Daubin in the municipality of Baie-Mahault; and on May 13, in the locality of St. Rose. Other infestations on the same host plant were also found on May 13 in the locality of Grande Anse, municipality of Deshaies; on May 15 in

the locality of Perrin, municipality of Morne-à-L'Eau, and on June 25 in the locality of Boissard, municipality of Pointe-à-Pitre. The record of *P. howertoni* increases the number of known soft scales on the island to 27 species. In Guadeloupe, 18 months after its discovery on the island, *P. howertoni* has been found on the following host plants [new host records for *P. howertoni* are marked with an asterisk (*): **Anacardiaceae:** *Mangifera indica* L., **Spondias cytherea* Sonnerat; **Euphorbiaceae:** *Acalypha wilkesiana* Müll.-Arg., *Codiaeum variegatum* (L.) Rumph. ex A. Juss.; **Lauraceae:** **Ocotea membranacea* (Sw.) R.A. Howard; **Melastomataceae:** **Miconia furfuracea* (Vahl) Griseb; **Moraceae:** **Ficus citrifolia* Mill.; **Myrtaceae:** *Psidium guajava* L.; **Piperaceae:** **Piper dilatatum* Rich.

The adult female of *P. howertoni* may be confused with *Philephedra tuberculosa* Nakahara & Gill (Fig. 1C) which also occurs on ornamental croton in Guadeloupe and have similar coloration. However, the two species can be easily differentiated in the field since the mature adult female of *P. tuberculosa* has a white ovisac which

is about twice as long as its body, with wax partially covering the dorsum (Nakahara & Gill, 1985), whereas the mature adult female of *P. howertoni* is mottled, green to yellowish in color, with dark specks and have no ovisac nor white wax partially covering the body.

In Guadeloupe Island, *P. howertoni* is found mainly on the young shoots of its host plants. Amongst cultivated plants, the most affected are *C. variegatum*, *P. guajava* and *S. cytherea*. Hedges of *C. variegatum* are particularly affected resulting in the dieback of many of them. This soft scale insect produces abundant honeydew, which induces the growth of fungi that cause symptoms of sooty molds, especially on ornamental croton and guava. The family Coccidae (Hemiptera: Coccoidea) on the island of Guadeloupe, was hitherto represented by 26 species (Matile-Ferrero & Etienne, 2006); with the addition of *P. howertoni*, the number of soft scale insect species on the island is increased to 27. It is expected that in the coming years this soft scale insect will invade most of the Caribbean islands and it is likely that some of these islands are already infested by this new insect pest.



Figure 1. A. Adult females and first- and second-instar nymphs of *Phalacrocooccus howertoni* Hodges & Hodgson on ornamental croton. B. Adult female (left) and adult male (center) of *P. howertoni*. C. Adult females and first-instar nymphs of *Philephedra tuberculosa* Nakahara & Gill. Photos: A & B by J. Lotz; C by T. Kondo.

CONCLUSIONS

The croton scale, *Phalacrocooccus howertoni* Hodges & Hodgson (Hemiptera: Coccoidea: Coccidae) occurs in the New World and is known from Barbados, Guadeloupe, Guatemala and the USA (Florida). Five plant species are recorded as new host plants for *P. howertoni*, increasing the number of known host plant species of *P. howertoni* to 77 species in 34 botanical families.

ACKNOWLEDGEMENTS

The authors thank Dr. Ana Lucia Peronti (Unesp-FCAV, Jaboticabal, SP, Brazil), Dr. M. Bora Kaydan (Çukurova University, Adana, Turkey), and anonymous reviewers for kindly reviewing the manuscript. Thanks to Dr. Greg Hodges (Florida DPI) for contacting Mr. Jeff Lotz (FDACS-DPI) who kindly provided Figures 1 A and B of *Phalacrocooccus howertoni*. Thanks also to Dr. Ian Stocks, Florida State Collection of Arthropods, Gainesville, USA, for providing a gift to the MNHN Paris, composed of several slide mounted adult females of *P. howertoni* and material in 70% alcohol.

REFERENCES

- Amarasekare KG, Mannion CM. 2011. Life history of an exotic soft scale insect *Phalacrocooccus howertoni* (Hemiptera: Coccidae) found in Florida. *Florida Entomologist* 94(3): 588-593.
- Anonymous. 2011. Another New Insect Pest Discovered in Barbados. BGIS Barbados, 23 August 2011, 1 p.
- Ben-Dov Y, Miller DR, Gibson GAP. 2014. ScaleNet: a database of the scale insects of the world. In: <http://www.sel.barc.usda.gov/scalenet/scalenet.htm>; accessed: May 2014.
- Fournet J. 2002. Flore illustrée des phanérogames de Guadeloupe et de Martinique. Nouvelle édition revue et augmentée. Cirad & Gondwana éditions, 2^{ème} édition. 2538 p.
- Hodges GS, Hodgson CJ. 2010. *Phalacrocooccus howertoni*, a new genus and species of soft scale (Hemiptera: Coccidae) from Florida. *Florida Entomologist* 93(1):8-23.
- Matile-Ferrero D, Etienne J. 2006. Cochenilles des Antilles Françaises et de quelques autres îles des Caraïbes (Hemiptera, Coccoidea). *Revue Française d'Entomologie (N.S.)* 28(4): 161-190.
- Nakahara S & Gill RJ. 1985. Revision of *Philephedra*, including a review of *Lichtensia* in North America and description of a new genus *Metapulvinaria* (Homoptera: Coccidae). *Entomography* 3:1-42.
- Williams DJ & Granara de Willink C. 1992. Mealybugs of central and South America. CAB International, Wallingford, UK, 635 p.
- Williams ML. 2010. Annotated list of the scale insects of Guatemala. *Entomologia Hellenica* 19(2):144-152.