






FIRST RECORD OF *PHYLLOCOPTRUTA MUSAE*
(ACARI: PROSTIGMATA: ERIOPHYIDAE)
IN THE NEOTROPICS, IN HISPANIOLA

**Primer registro de *Phyllocoptruta musae*
(Acari: Prostigmata: Eriophyidae) en el Neotrópico, en la Hispaniola**

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ABSTRACT

The banana rust mite, *Phyllocoptruta musae* Keifer, is reported for the first time from the Neotropics, in the Dominican Republic. The current known distribution of this pest is provided. Comparisons are made to other Neotropical species of *Phyllocoptruta* genus, and descriptions with photos are provided of the injury to plants.

Keywords: Mite, eriophyid, Musaceae, Caribbean, Dominican Republic.

RESUMEN

El ácaro que provoca el bronceado del plátano, *Phyllocoptruta musae* Keifer, es reportado por primera vez en el Neotrópico, en República Dominicana. La actual distribución de esta plaga es aportada. Se realizan comparaciones con otras especies del género *Phyllocoptruta* presentes en el Neotrópico y descripciones con fotos de los daños provocados en las plantas.

Palabras clave: Ácaro, eriófito, Musaceae, Caribe, República Dominicana.

The species *Phyllocoptruta musae* Keifer, 1955 (Acari: Prostigmata: Eriophyidae) was described from Queensland, Australia and it has as hosts species of the Musaceae family, with the host type *Musa x paradisiaca* L. (Keifer, 1955). These plants are cultivated in the Western Hemisphere from the Canary Islands in Spain to South America, (except Chile and Uruguay) including the Caribbean region, California, Louisiana, Florida, the Bahamas, half of Algeria, most of West Africa and south to Ghana (Organización de las Naciones Unidas para la Alimentación y la agricultura [FAO], 2019). In the Eastern Hemisphere distributions of *P. musae* have been only reported from three countries: Australia, specifically in the state of Queensland (Keifer, 1955), China, in the autonomous region of Guangxi Zhuang (Li *et al.*, 2007) and on Hainan Island (Tan *et al.*, 2014), and in Thailand (Chandrapatya *et al.*, 2016). In the Dominican Republic, country located on the Caribbean Island Hispaniola, it was found in the Línea Noroeste region, in banana plantations (Gran Enano and Williams hybrids) located in the Valverde and Monte Cristi provinces. The alert about this species of eriophyid in the Dominican banana plantations was given through a video that circulated on social networks since October 08, 2020, made by Eng. Dionicio Campos at the Mr. Antonio Bonilla's farm, located in El Charco, Guayacanes, Laguna Salada, Valverde province (19°36'45.6"N 71°05'02.2"W).

For the identification of the eriophyid that was affecting the banana plantations in the Línea Noroeste region, two samplings were carried out (Table I). The first sampling was conducted on October 15, 2020 in the localities from Valverde province: El Charco, Guayacanes, Laguna Salada (farmer Antonio Bonilla, 19°36'45.6"N 71°05'02.2"W); Jaibón, Laguna Salada (farmers Julio Cabrera and Ramón Perdomo). And from Monte Cristi province in Cerro Gordo, La Caída, Piloto Abajo (farmer Ramón Tejada, 19°36'02.9"N 71°13'41.2"W). This first sampling was carried out in collaboration with Eng. Campos, farmers Antonio Taveras and Víctor Eric Rodríguez, a student from the Technological University of Cibao Oriental, UTECO Mariely Jerez; as well as Roberto Polanco and Jonathan Gabriel Castillo, technicians from the company Bananos Ecológicos de la Línea Noroeste, BANELINO. In collaboration with Eng. Pablo Suárez, from the Dominican Institute of Agricultural and Forestry Research - IDIAF, on October 29, 2020 a second sampling was carried out in the following locations: El Charco, Guayacanes, Laguna Salada in Valverde province (farmers Salutina Campos, 19°35'48.5"N 71°04'39.3"W and Rubén D. Ferreira, 19°36'01.8"N 71°04'51.1"W) and in Los Cerros, Hatillo Palma, in Monte Cristi province (farmer Salvador Estévez 19°40'22.6"N 71°11'31.4" W and 19°40'14.9"N 71°11'42.0"W).

For identification, specimens of the eriophyid were taken directly from the banana leaves and placed in ethyl alcohol 70 %. Subsequently, microscopy slides were mounted using Hoyer's medium, which were kept for three weeks in an oven at 50 °C, until clarified in the UTECO Plant Protection laboratory, located in Cotui, Sánchez Ramírez province. For additional confirmation of the species, original descriptions were reviewed (Keifer, 1955) and samples in 70 % alcohol were sent to Professor J. Amrine from West Virginia University, Morgantown, WV, United States, and photographs to Professor Carlos Flechtmann from the University of São Paulo, USP-Campus Piracicaba, SP, Brazil.

In the plants, high populations on the flag leaf and brown and chlorotic streaks were observed on the bundle of young leaves when there were high populations on the underside. (Fig.1). Also, brown spots were observed on young leaves, as well as rachis and pseudostem (Fig. 2). In fruits, *P. musae* can also cause spotting (Keifer, 1955).

Specimens of this mite are kept in microscopy slides and 70 % alcohol in the laboratory of the UTECO and at West Virginia University, Morgantown, WV, United States.

Table I. Places sampled in the Línea Noroeste region from the Dominican Republic

Provincia	Localities	Coordinates	Farmers
Valverde	El Charco, Guayacanes, Laguna Salada	19°36'45.6"N 71°05'02.2"W	Antonio Bonilla
		19°35'48.5"N 71°04'39.3"W	Salutina Campos
		19°36'01.8"N 71°04'51.1"W	Rubén D. Ferreira
	Jaibón, Laguna Salada	–	Julio Cabrera
		–	Ramón Perdomo
Monte Cristi	Cerro Gordo, La Caída, Piloto Abajo	19°36'02.9"N 71°13'41.2"W	Ramón Tejada
		19°40'22.6"N 71°11'31.4" W	Salvador Estévez
	Los Cerros, Hatillo Palma	19°40'14.9"N 71°11'42.0"W	Salvador Estévez

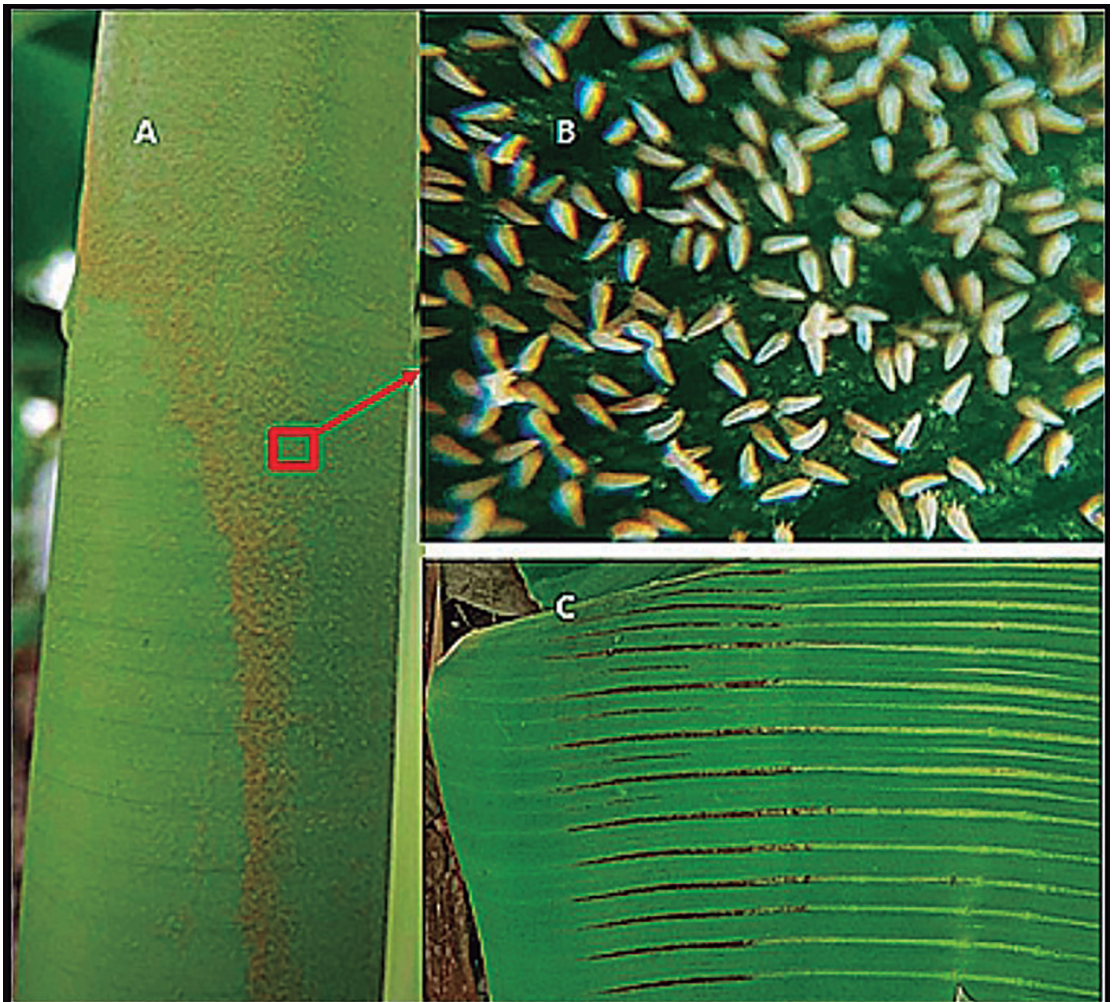


Figure 1. Populations of *Phyllocoptruta musae* on the flag leaf of young plant (A–B) and symptoms in the bundle of young leaves (C). Photos: D. Campos and Cristina Gómez. El Charco, Guayacanes, Valverde. October 15, 2020.

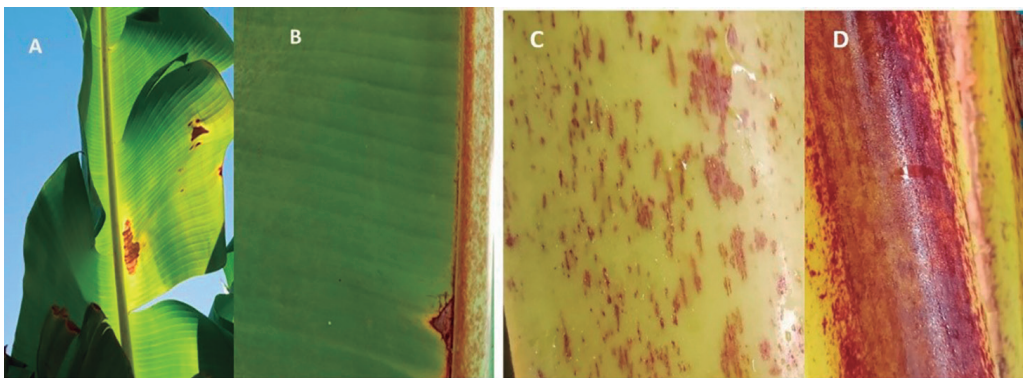


Figure 2. Brown spots on young leaves (A–B), rachis (C) and pseudostem (D). Photos: Cristina Gómez and Pablo Suarez. Los Cerros, Hatillo Palma, in Monte Cristi. October 29, 2020.

The banana rust mite *P. musae* has the seta *bv* absent on femur I, which is present in femur II. The seta of the tibia is basal and small, approximately 3 μm (Keifer, 1955). It is distinguished from *P. oleivora* (Ashmead, 1879), which has citrus plants as hosts and so far the only species of the genus reported in Hispaniola (Perez-Gelabert, 2020). Keifer (1955) reported that *P. musae* can be distinguished from *P. oleivora*, mainly by the elongate tibiae. The tibiae and tarsi are about the same length, being about 6 μm long in *P. oleivora*; however in *P. musae* the tibiae is around 13 μm long. Besides that, *P. oleivora* has five rays in the empodium and a smooth coxal area; while *P. musae* has four rays in the empodium and the coxal area ornamented with many short lines (Li *et al.*, 2007; Xue *et al.*, 2010) (Fig. 3).

According Flechtmann *et al.* (2000), *P. musae* is close to *P. antillana* Flechtmann 2000 in having the female genital coverflap with a well differentiated area basally; in *P. musae* this area is outlined with short longitudinal dashes; while in the *P. antillana* this area has 3 transverse complete lines. This last species of eriophyid is hosts of *Sapium caribaeum* (Euphorbiaceae) and reported from Guadeloupe, the French Antilles in Caribbean region (Flechtmann *et al.*, 2000).

It was possible to verify that the specimens collected in the Linea Noroeste region, in all sampling localities from the Valverde and Monte Cristi provinces (Table I), correspond to the *P. musae* species. This mite is probably more widespread. Careful searches should be made wherever bananas are grown. This is the first report of the banana rust mite in the Neotropics and even in the Americas. Severe symptoms and high populations of this eriophyid mite observed in Dominican Republic alert to the need of adoption of prevention and control measures to minimize its impact in the whole region, specially in banana production countries.

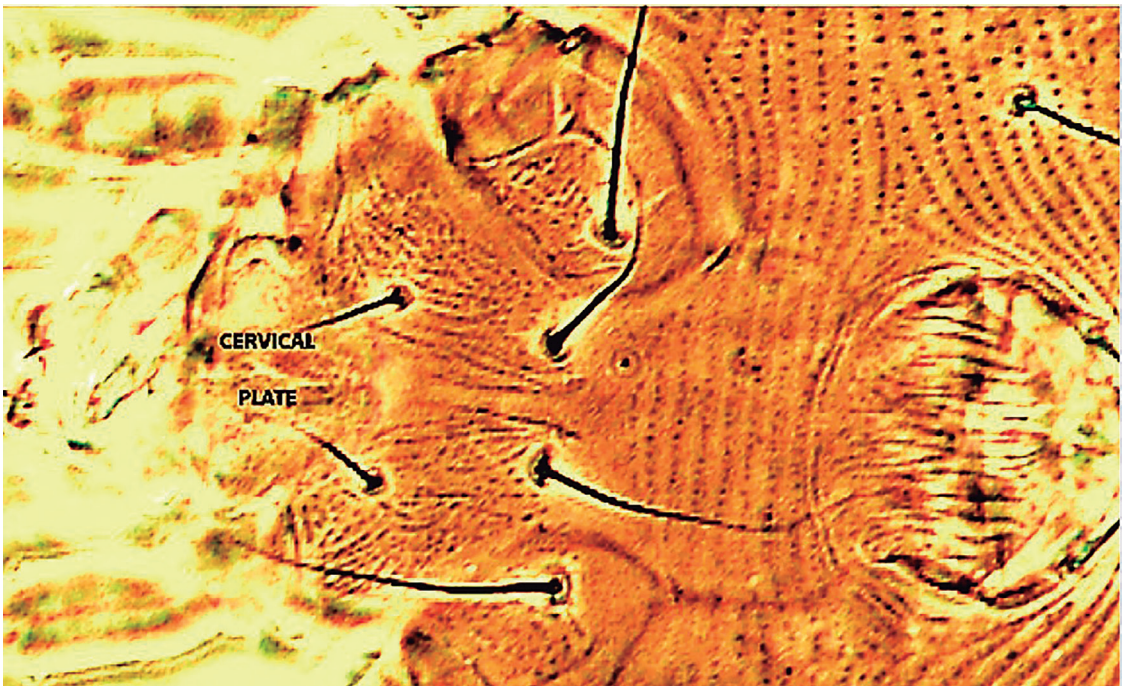


Figure 3. Coxal area of *Phyllocoptruta musae* Keifer, showing short lines. Photo by J. W. Amrine Jr.

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LITERATURE CITED

- Chandrapatya, A., P. Konvipasruang, & J. W. Amrine Jr. 2016. Present status of eriophyoid mites in Thailand. Proceedings of the International Congress of Acarology, 2014, Tokyo, *Journal of the Acarological Society of Japan*, 25 (S1): 83–107.
- Flechtmann, C. H. W., S. Kreiter, J. Etienne, & G. J. de Moraes. 2000. Plant mites (Acari) of the French Antilles. 4. Eriophyidae (Prostigmata). *Acarologia*, 40: 321–342.
- Keifer, H. H. 1955. Eriophyid studies XXIII. *Bulletin of the California Department of Agriculture*, 44: 126–130.
- Li, D.-W., G.-Q. Wang, & S.-G. WEI. 2007. A new genus and three new species of Phyllocoptinae (Acari: Eriophyidae) from South China. *Zootaxa*, 1587: 53–59.
- Organización de las Naciones Unidas para la Alimentación y la agricultura (FAO). 2019. Datos sobre alimentación y agricultura: FAOSTAT. <http://www.fao.org/faostat/es/#data/QC> (access: april 7, 2021).
- Perez-Gelabert, D. E. 2020. Checklist, Bibliography and Quantitative Data of the Arthropods of Hispaniola. *Zootaxa*, 4749 (1): 001–668.
- Tan, M.-C., L.-F. Huang, Y.-G. Fu, & G.-Q. Wang. 2014 One new genus and two new species of Phyllocoptini (Acari: Eriophyidae) from Hainan Island, South China. *International Journal of Acarology*, 40 (7): 513–518.
- Xue, X.-F., Z.-W. Song, & X.-Y. Hong. 2010. Review of *Phyllocoptruta*, with descriptions of two new species (Acari: Eriophyoidea). *Annals of the Entomological Society of America*, 103 (5): 697–705.

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