

NOTE

New Records of Host Plants for *Lorryia formosa* Oudemans (Acari: Prostigmata: Tydeidae) in Mexico

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Lorryia formosa Oudemans (Acari: Prostigmata: Tydeidae) is one of 209 species in the richest genus of Tydeinae (Silva et al. 2016, Da-Costa et al. 2019). Its main hosts are species of *Citrus* (Silva et al. 2016), but it has also been reported on Amaranthaceae, Commelinaceae, Compositae, Convolvulaceae, Brassicaceae, Cyperaceae, Bignoniaceae, Bombacaceae, Euphorbiaceae, Fumariaceae, Poaceae, Fabaceae, Malvaceae, Oxalidaceae, Phytolaccaceae, Polygonaceae, Rubiaceae, Scrophulariaceae, Solanaceae, and Verbenaceae (Aguilar et al. 2001, Hoffman and López-Campos 2002, Hernandez et al. 2006, Lorençona et al. 2016, Monjarás-Barrera et al. 2019). Published accounts of its feeding behavior are based on anecdotal and inconsistently interpreted observations (Badii et al. 2001, Lorençona et al. 2016, Gautam et al. 2018) with some authors reporting feeding on the leaves and fruits of *Citrus sinensis* Osbeck (Rutaceae) (Aguilar et al. 2001), *Coffea arabica* L. (Rubiaceae) (Romero et al. 2011), *Hevea brasiliensis* Muell. Arg. (Euphorbiaceae) (Mondin et al. 2016, Nuvoloni et al. 2020); Walter and Proctor (2013) mentioning that it feeds on fungi and pollen; and Smirnoff (1957) reporting it feeds on honeydew given off by *Saissetia oleae* (Olivier) (Hemiptera: Coccidae) on citrus trees. Little is known about the feeding habits of *L. formosa* in Mexico (Hoffman and López-Campos 2002, Monjarás-Barrera et al. 2019), but it has been reported from *Gardenia* spp., *Citrus* spp., and *Capsicum annuum* L. var.

glabriusculum (Dunal) Heiser & Pickersgill (Hoffman and López-Campos 2002, Monjarás-Barrera et al. 2019).

Recently, we collected leaves from seven different plants at sites in southwest and northeast Mexico in an effort to record data about *L. formosa* feeding behavior. We made firsthand observations with a 30X magnifying glass then the samples were placed in a cooler with cooling gel at 5 ± 2 °C and taken to the Population Ecology Laboratory of the Institute of Applied Ecology. During the collection of leaves, the presence the others mites was not evaluated. All mites were counted on the leaves with the help of a stereoscopic microscope. Ten specimens per host plant were mounted in Hoyer's medium (Monjarás-Barrera et al. 2019) for identification with a phase contrast Zeiss Primo Star microscope. Specimens of *L. formosa* were identified using the taxonomic keys of Silva et al. (2016) based on observations made of the following female characters: nude dorsal idiosomal setae, reticulate areas (A) are divided into Ac_2 , $A(c_1)$, Ac_2 , Ae_1 , $A(d_1)$, and Ae_1 (see Silva et al. 2016). As a result of these efforts, we report seven new host and range records for *L. formosa* in Mexico with specific localities and numbers of specimens observed (Table 1). We did not, however, observe any damage caused by the mites, which agrees with the studies by Gautam et al. (2018) on *Citrus jambhiri* Lush (Rutaceae) and Hernandez et al (2006) on *H. brasiliensis* leaves respectively. More studies are needed to learn the details of their feeding habits

Table 1. New host plants for *Lorryia formosa* in Mexico.

Family	Scientific name	Common name	Location	Coordinates	MASL*	Number of leaves	Total of Individuals
Lamiaceae	<i>Aegiphila</i> sp. Jacq.	Molinillo	Valle Morelos, Villa Corzo, Chiapas	16° 07' 56" N and 92° 59' 37" W	560	51	22
Annonaceae	<i>Annona macroprophyllata</i> Donn.Sm.	Anona	Valle Morelos, Villa Corzo, Chiapas	16° 08' 00" N and 92° 59' 41" W	563	45	19
Rutaceae	<i>Casimiroa pubescens</i> Ramirez	Chapotillo	Miquihuana, Tamaulipas	23° 27' 38" N and 99° 44' 15" W	1,967	67	15
Meliaceae	<i>Cedrela odorata</i> L.	Red cedar	Comitán de Domínguez, Chiapas	16° 15' 36" N and 92° 07' 36" W	1,571	55	16
Asteraceae	<i>Pseudelephantopus spicatus</i> (B. Juss. ex Aubl.) C.F. Baker	Pig-ear	Valle Morelos, Villa Corzo, Chiapas	16° 07' 55" N and 92° 59' 37" W	559	25	16
Myrtaceae	<i>Psidium guajava</i> L.	Guava	Valle Morelos, Villa Corzo, Chiapas Ciudad Victoria, Tamaulipas	16° 08' 07" N and 92° 59' 34" W 23° 45' 20" N and 99° 09' 50" W	568 323	70 50	17 22
Bignoniaceae	<i>Tabebuia rosea</i> (Bertol.) DC.	Maculishuate	Valle Morelos, Villa Corzo, Chiapas	16° 07' 55" N and 92° 59' 36" W	561	40	21

MASL: meters above sea level

and host plant associations to better understand the role *L. formosa* plays in ecological processes such as pollination, fungivory and predation.

LITERATURE CITED

- Aguilar, H., C. C. Childers, and W. C. Welbourn. 2001. Relative abundance and seasonal occurrence of mites in the family Tydeidae on citrus in Florida, pp. 376–380. *In* Halliday, R. B., D. E. Walter, H. C. Proctor, R. A. Norton, and M. J. Colloff, eds. *Acarology: proceedings of the 10th International Congress*, Melbourne. Melbourne: CSIRO Publishing. 657 pp.
- Badii, M. H., A. E. Flores, G. Ponce, J. Landeros, and H. Quiroz. 2001. Does the *Lorryia formosa* Cooreman (Acari: Prostigmata: Tydeidae) population visit or reside on citrus foliage?, pp. 413–418. *In* Halliday, R. B., D. E. Walter, H. C. Proctor, R. A. Norton, and M. J. Colloff, eds. *Acarology: proceedings of the 10th International Congress*. Melbourne. Melbourne: CSIRO Publishing. 657 pp.
- Da-Costa, T., L. F. Rodighero, G. L. Silva, N. J. Ferla, and E. Blochtein. 2019. Two new species of Tydeidae (Acari: Prostigmata) associated with stingless bees. *Zootaxa* 4652: 101–112.
- Gautam, S. G., Y. Ouyang, P. Gu, and E. E. Grafton-Cardwell. 2018. Food suitability and population dynamics of *Lorryia formosa* (Acari: Tydeidae). *Environmental Entomology* 47: 511–518.
- Hoffman, A. and G. López-Campos. 2002. Acari, pp 223–276. *In* Llorente-Bousquets J. and J. J. Morrone, eds. *Biodiversidad, taxonomía y biogeografía de Artrópodos de México, Hacia una síntesis de su conocimiento*. Vol. 3. UNAM, D. F. Mexico. 690 pp.
- Hernandes, F. A., R. J. F. Feres, and F. Nomura. 2006. Biological cycle of *Lorryia formosa* (Acari, Tydeidae) on rubber tree leaves: a case of thelytoky. *Experimental Applied Acarology* 38: 237–242.
- Lorençona, J. R., S. C. Andrade, and D. J. Andrade. 2016. Mites occurrence on *Pachira aquatica* Aubl. including aspects of external mouthpart morphology of *Brachytydeus formosa* (Acari: Tydeidae). *Brazilian Journal of Biology* 76: 136–143.
- Mondin, A. S., F. M. Nuvoloni, and R. J. F. Feres. 2016. Four new species of *Lorryia* (Acari: Tydeidae) associated with *Hevea brasiliensis* Muell. Arg. (Euphorbiaceae) in Brazil. *Zootaxa* 4158: 473–490.
- Monjarás-Barrera, J. I., J. C. Chacón-Hernandez, G. L. da Silva, L. Johann, O. S. da Silva, J. Landeros-Flores, V. Vanoye-Eligio, F. Reyes-Zepeda, and N. Juárez. 2019. Mites associated to chile piquín (*Capsicum annum* L. var. *glabriusculum*) in two protect natural areas in northeastern México. *Systematic and Applied Acarology* 24: 2537–2551.
- Nuvoloni, F. M., A. S. Mondin, and R. J. F. Feres. 2020. Review of *Lorryia* Oudemans, 1925 (Acari: Tydeidae: Tydeinae) associated with *Hevea* spp. in Brazil, *International Journal of Acarology* 46: 235–240. DOI: 10.1080/01647954.2020.1760931.
- Romero, G. Q., R. D. Daud, A. T. Salomão, L. F. Martins, R. J. F. Feres, and W. W. Benson. 2011. Mites and leaf domatia: no evidence of mutualism in *Coffea arabica* plants. *Biota Neotropica* 11: 27–34.
- Silva, G. L., M. H. Metzethin, O. da Silva, and N. Juárez. 2016. Catalogue of the mite family Tydeidae (Acari: Prostigmata) with the world key to the species. *Zootaxa* 4135: 1–68.
- Smirnoff, W. A. 1957. An undescribed species of *Lorryia* (Acarina: Tydeidae) causing injury to citrus trees in Morocco. *Journal of Economic Entomology* 50: 36–362.
- Walter, D. E., and H. C. Proctor. 2013. Mites: ecology, evolution and behaviour: life at a microscale. Springer, Heidelberg. 508 pp.
- J. I. Monjarás-Barrera, G. L. Silva, Rapucel T. Q. Heinz-Castro, F. Reyes-Zepeda, A. Mora-Olivo and J. C. Chacón-Hernández. (*JIM-B*) Facultad de Enología y Gastronomía, Universidad Autónoma de Baja de California, Carretera Transpeninsular Ensenada-Tijuana 3917, Fracc. Playitas, C.P. 22860, Ensenada, Baja California, México; (*FR-Z, AM-O and JCC-H*) Universidad Autónoma de Tamaulipas, Instituto de Ecología Aplicada, División del Golfo 356, Colonia Libertad, C.P. 87019. Ciudad Victoria, Tamaulipas, México (e-mail (*JCC-H*): jchacon@docentes.uat.edu.mx); (*GLS*) Laboratório de Acarologia, Universidade do Vale do Taquari - Univates, Lajeado, 95914-014, Rio Grande do Sul, Brasil; (*RTQH-C*) Facultad de Agronomía y Veterinaria, Universidad Autónoma de San Luis Potosí, Soledad de Graciano Sánchez, San Luis Potosí, Mexico