

N O T E

New Record of *Tetranychus merganser* (Acari: Tetranychidae) on *Eustoma grandiflorum* (Gentianales: Gentianaceae) in Northeastern Mexico¹

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Most species of spider mites belonging to the family Tetranychidae are polyphagous and are found on major food crops and ornamental plants of economic importance (Zhang 2003, CABI Publishing, Wallingford, Oxon, UK). The red spider mite, *Tetranychus merganser* Boudreaux, is found in China (Oriental), Mexico, Thailand, and the United States. This mite feeds on different plant species of economic importance, such as, *Capsicum annuum* L. (Solanaceae), *Carica papaya* L. (Caricaceae), *Cucurbita máxima* Duchesne (Cucurbitaceae), and *Opuntia ficus-indica* (L.) Mill (Cactaceae) (Migeon y Dorkeld 2023, <http://www.montpellier.inra.fr/CBGP/spmweb>, accessed 11 August 2023). Its feeding habits cause small white spots on the leaves and, when the *T. merganser* populations are high, the spots can merge, causing the leaves to turn completely white (López-Bautista et al. 2016, Int. J. Acarol. 42:303–309).

Herein, we report lisianthus, *Eustoma grandiflorum* (Raf.) Shinners (Gentianaceae), as a new host for *T. merganser* in northeastern Mexico. Our discovery was serendipitous in that our objective was to evaluate the response of *E. grandiflorum* plants to different fertilization levels and the use of *Trichoderma harzianum* Rifai as a biologically based fungicide under greenhouse conditions (Moreno-Ramírez 2023, Investigation Project: Comportamiento agronómico y evaluación de poscosecha de variedades de lisianthus (*Eustoma grandiflorum* (Raf.) Shinn). Ciudad Victoria, Tamaulipas, Mexico. <http://dx.doi.org/10.13140/RG.2.2.23324.05764>, accessed 11 August 2023).

In May 2023, three plants with signs and symptoms of the presence of mites were separated, and the remainder of the plants (50 plants) were treated with a

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chemical acaricide (Agri-Mek 1.8% EC, Syngenta, The Philippines) to control the mite population. With the aid of a 30× magnifying glass, 10 adult mites were collected from lisianthus leaves. We used the taxonomic keys of Baker and Tuttle (1994, Indira Publishing House, West Bloomfield, MI) to identify *T. merganser*. Identification used the empodium with proximoventral hairs (female) and aedeagus in goose-shaped head (male).

After the three lisianthus plants were separated, the number of immatures and adults of *T. merganser* per plant were counted. The growth rate was calculated: $r = [\ln(Nt/NO)](1/t)$, where Nt is the final number of immatures and adults of *T. merganser* at time t , NO is the number of individuals at time 0 (number of immatures + adults in the initial count), and t is the number of days elapsed since the beginning to the end of the bioassay (= 4 d). The r is useful when it is necessary to examine patterns of population growth in short periods (Carey 1993, Oxford University Press, NY, NY). If $r = 0$, there is no change in the size of the population, $r > 0$, the population increases, and if $r < 0$, the population decreases (Smith and Smith 2015, Pearson Education, Harlow, Essex, England).

Lisianthus, *E. grandiflorum* (synonyms *Eustoma andrewsii*, *E. russellianum*, *Lisianthus russellianum*), is an important cut and potted flower that has increased in demand over the last 3 decades. It is an ornamental flowering plant native to central and southern United States, mainly in the wet prairies of Nebraska, Colorado, and Texas, and in the northern part of Mexico. It is known as “prairie gentian,” “prairie rose” or “Texas bluebell.” Lisianthus ranks fifth in Japan, 10th globally, and 11th in the United States in cut flower value (Harbaugh 2007, Pp. 645–663 *In Flower Breeding and Genetics: Issues, challenges and opportunities for the 21st Century*. Springer. Dordrecht, The Netherlands; McGovern 2018, Pp. 583–632 *In Handbook of Florists’ Crops Diseases (Handbook of Plant Disease Management)*, Springer International, Cham, Switzerland; Roh et al. 2018, Pp. 322–327 *In Handbook of Flowering*, CRC Press, Boca Raton, FL). In Mexico, the cultivated area of lisianthus is approximately 4 ha, and it is produced in Arteaga, Coahuila; Zacatepec, Morelos; Villa Guerrero, State of Mexico; Tecamachalco, Puebla and Guadalajara, Jalisco (Castillo-González et al. 2017, RMEXCA. 8: 345–354.). Although lisianthus can provide substantial economic returns for the grower, it is a difficult crop to propagate and grow and requires rigorous management of fungal and fungus-like diseases, bacterial and phytoplasma diseases, viral diseases, and nematode diseases (McGovern 2018). Lisianthus has several insect and mites pests, including whiteflies (*Trialeurodes vaporariorum* Westwood [Homoptera: Aleyrodidae]), aphids (*Myzus persicae* Sulzer [Hemiptera: Aphididae] and *Aphis gossypii* [Hemiptera: Aphididae]), beet armyworm (*Spodoptera exigua* Hübner [Lepidoptera: Noctuidae]), and thrips (several species, including *Thrips australis* Bagnall, *T. palmi* Karny, *T. tabaci* Lindeman, *Frankliniella schultzei* Trybom, *F. occidentalis* Pergande [Thysanoptera: Thripidae] and *Haplothrips gowdeyi* Franklin [Thysanoptera: Phlaeothripidae]). Fungus gnats (*Bradysia* spp.) are major insect pests of lisianthus (Harbaugh 2007; Yamada et al. 2016, *Cientifica, Joboticabal*, 44: 326–332), as well as the two-spotted spider mite, *T. urticae* Koch (Hinamoto et al. 2001, *Appl. Entomol. Zool.* 36: 459–464; Osakabe et al. 2002, *Appl. Entomol. Zool.* 37: 399–407). This is the first report of the occurrence

of *T. merganser* on *E. grandiflorum* under greenhouse conditions in northeast Mexico.

The population growth rate on the three plants we examined was 0.10 ($N_t = 49$, $N_0 = 33$, $t = 4$, $r = 0.10 > 0$), indicating that at low densities of *T. merganser*, this mite colonized and established itself in a favorable environment for its population growth on lisianthus plants. Feeding damage of *T. merganser* produced chlorotic spots on *E. grandiflorum* leaves which can decrease the market value of plants. Further studies are encouraged, such as assessing the impact of *T. merganser* on economic yield of lisianthus plants.