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Source: Florida Entomologist, 98(1) : 175-177

Published By: Florida Entomological Society

URL: https://doi.org/10.1653/024.098.0130

Aethalion reticulatum (Hemiptera: Aethalionidae) feeding on *Erythrina speciosa* (Fabales: Fabaceae): First record of its host plant and damage characteristics

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Abstract

Erythrina speciosa Andrews (Fabales: Fabaceae) has multiple uses due to its medicinal properties, potential for recovering degraded areas, and excellent landscape effect, but insects that use this plant are poorly known. This paper reports, for the first time, the occurrence of *Aethalion reticulatum* (L., 1758) (Hemiptera: Aethalionidae) on *E. speciosa* seedlings in nurseries at Sacra Família do Tinguá, Municipality of Engenheiro Paulo de Frontin, Rio de Janeiro State, Brazil. Egg clutches of *A. reticulatum* were observed at the apex and on the median region of these seedlings, covered by a grayish brown substance, visually distinguished from the greenish color of the *E. speciosa* stem. Damage to this plant was characterized by hypertrophy and cracks at the apex of *E. speciosa* seedlings. Control measures for *A. reticulatum*, based on studies on other hosts, are presented.

Key Words: leafhopper; occurrence; ornamental plant; seedlings

Resumo

Erythrina speciosa Andrews (Fabales: Fabaceae) tem usos múltiplos, devido às suas propriedades medicinais, potencial para recuperação de áreas degradadas e excelente efeito paisagístico, mas insetos que se alimentam desta planta são pouco conhecidos. Este artigo relata, pela primeira vez, a ocorrência de *Aethalion reticulatum* (L., 1758) (Hemiptera: Aethalionidae) em mudas de *E. speciosa* em viveiros localizados em Sagrada Família do Tinguá, município de Engenheiro Paulo de Frontin, Rio de Janeiro, Brasil. Posturas de *A. reticulatum* foram observadas no ápice e na região mediana dessas mudas, cobertas por uma substância cinza, marrom, visualmente distinta da cor esverdeada do caule de *E. speciosa*. Danos a essa planta foram caracterizados por hipertrofia e rachaduras no ápice das mudas de *E. speciosa*. Medidas de controle de *A. reticulatum*, baseadas em estudos desse inseto em outras plantas hospedeiras, são apresentados.

Palavras Chave: cigarrinha; mudas; ocorrência; plantas ornamentais

The genus *Erythrina* (Fabales: Fabaceae) has more than 100 species in the tropical and subtropical regions of the world (Oliver-Bever 1981). Species of this genus are used by native populations to treat diseases and infections such as malaria, inflammation, bronchitis, insomnia, cough, and asthma (de Lima et al. 2006). *Erythrina velutina* Willd. is used to control epilepsy in northeastern Brazil (Dantas et al. 2004). The large quantity of alkaloids and flavonoids in these plants explains the medical use of *Erythrina* spp. (Cui et al. 2008; Ozawa et al. 2009).

Most species of the genus *Erythrina* are trees and shrubs, with few herbaceous ones, and therefore some of them are used in mixed plantations to restore degraded areas of permanent preservation (Lorenzi 1992; Zahawi 2008), besides having excellent landscape effect and producing shade during the summer. *Erythrina speciosa* Andrews (Fig. 1) occurs in Espírito Santo and Minas Gerais to Santa Catarina States in Brazil (Lorenzi 1992). This plant has typical inflorescence in a candelabra shape with red flowers (Fig. 2) that are attractive to many species of hummingbirds. *Erythrina speciosa* is a fast growing pioneer plant and adapted to damp places, such as swamps along rivers and coasts (Lorenzi 1992).

The morphology and phenology of *E. speciosa* are peculiar with the trunk full of thorns common to the genus, soft and durable wood, large leaves (usually in the form of rhombuses) that fall in the winter, and the tree having no foliage during the flowering period, which occurs in early spring (Lorenzi 1992).

Our objective was to record for the first time *Aethalion reticulatum* (Hemiptera: Aethalionidae) feeding on *E. speciosa* and describe its damage characteristics.

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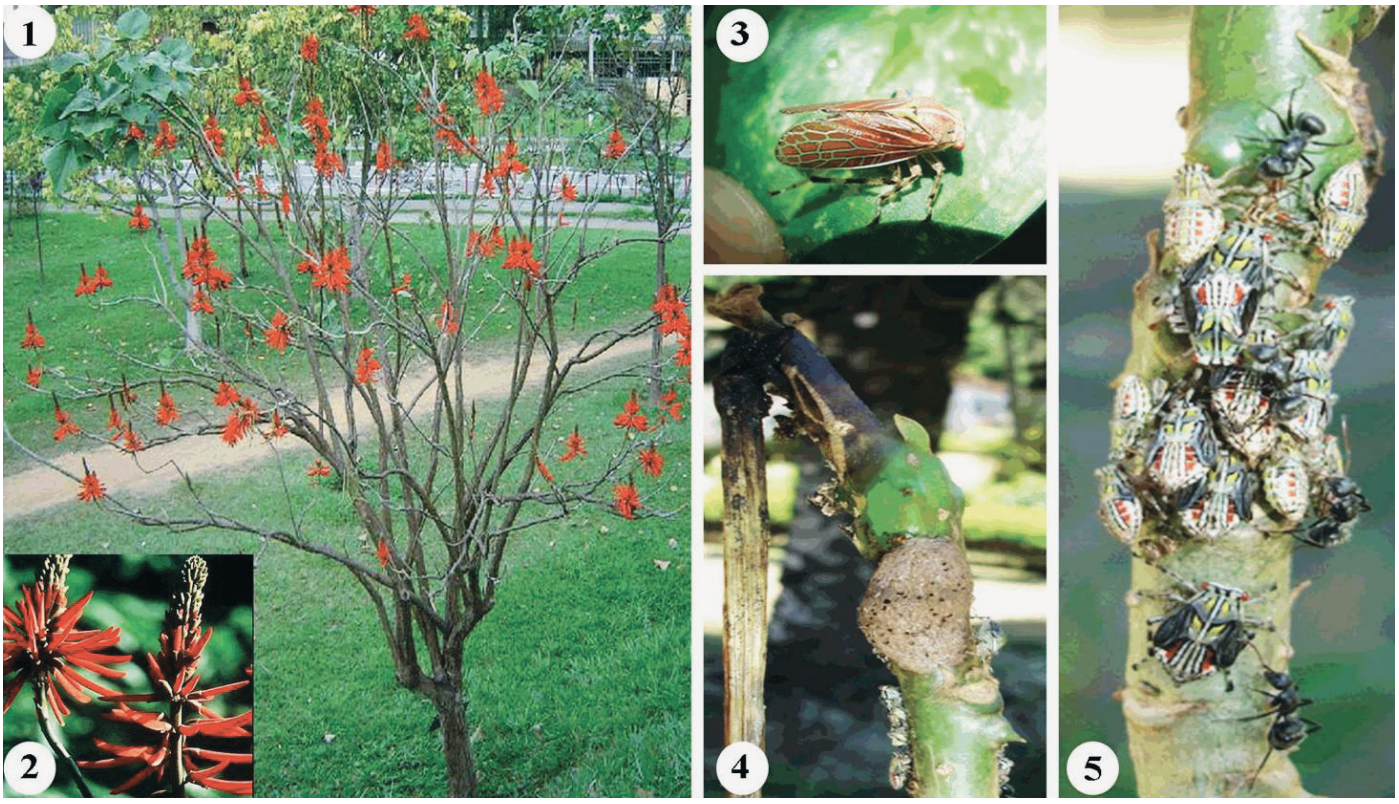

Figs. 1–5. *Erythrina speciosa* and *Aethalion reticulatum*. 1: Flowered adult *E. speciosa* plant (source: www.arvores.brasil.com.br). 2: Detail of the inflorescence of *E. speciosa* with a candelabra shape (source: www.arbolesornamentales.com/Erythrinaspeciosa.htm). 3: Adult *A. reticulatum*. 4: Damage caused by a colony of *A. reticulatum* on a seedling of *E. speciosa* detailing the egg clutch. 5: Nymph colony of *A. reticulatum* associated with *Camponotus* sp. ants.

Materials and Methods

A leafhopper was found on *E. speciosa* seedlings in nurseries of Sacra Família do Tinguá, Municipality of Engenheiro Paulo de Frontin, Rio de Janeiro State, Brazil, showing the need of describing its damage characteristics. Seedlings of this plant that were 4 mo old and 20 cm high were inspected daily during Jan and Feb 2009. Specimens of this leafhopper were collected, kept in 70% alcohol, and sent to Dr. Gabriel Simões de Andrade (Unioeste-PR) for identification.

The Municipality of Engenheiro Paulo de Frontin in Rio de Janeiro State, Brazil, is located at 22°32'59" S, 43°40'42" W at 395 m altitude with a typical tropical climate. The Atlantic rainforest vegetation is abundant in this region with almost half of the territory of the Sacra Família do Tinguá with this kind of vegetation. The occurrence and damage characterization of *A. reticulatum* were observed on seedlings from a nursery of the Non-Governmental Organization "Floresta Brasil," which leads a regional project of reforestation to recover degraded areas.

Photos of adults and damage by leafhoppers were obtained in macro mode with a digital camera (model DSC-W70, Sony Cyber-Shot, 7.2 megapixels), and adults of this leafhopper were held in the Regional Museum of Entomology of the Department of Animal Biology, Federal University of Viçosa in Viçosa, Minas Gerais State, Brazil.

Results

The leafhopper was identified as *Aethalion reticulatum* (L., 1758) (Hemiptera: Aethalionidae). The adult had its rostrum emerging from the bottom face of its head, short setaceous antennae, and membranous wings, which, in general, characterizes the individuals of the suborder Auchenorrhyncha. The Hemipteran order is currently divided into 4 suborders; among them, the Auchenorrhyncha suborder, which Araújo et al. (2010) considered to be paraphyletic, while Cryan & Urban (2011) presented molecular evidence that suggested the suborder to be monophyletic. *Aethalion reticulatum* adults were approximately 10 mm long with rusty-brown color and protruding ribs of the wings and greenish tones (Fig. 3). The posterior tibia did not have thorns, which characterizes the family Aethalionidae.

Aethalion reticulatum infested most of the observed *E. speciosa* seedlings and laid their eggs at the apex and at median parts of seedlings surrounded by a gray-brown substance, visually different from the green color of the stem of this plant (Fig. 4). Nymphs and adults (winged) of *A. reticulatum* remained clustered near the apex or at the median parts of *E. speciosa* plants and were associated with ants of the genus *Camponotus* (Hymenoptera: Formicidae) (Fig. 5). The main damage symptoms caused by *A. reticulatum* were hypertrophy and cracks at the apex of *E. speciosa* seedlings (Fig. 3). No natural enemy was found associated with *A. reticulatum* eggs, nymphs, or adults in the field.

Discussion

We here described for the first time the leafhopper *A. reticulatum* infesting and damaging *E. speciosa* seedlings in nurseries at Sacra Família do Tinguá, Municipality of Engenheiro Paulo de Frontin, Rio de Janeiro State, Brazil. This species has been reported causing direct and indirect damage on a broad range of tropical fruit plants such as cashew, cherry, citrus, fig, grape, jackfruit, mango, plum, and tamarind (Hickel et al. 2001; Soria & Dal Conte 2005), on medicinal plants such as figatil (*Vernonia condensata* Baker; Asterales: Asteraceae) (Menezes et al. 2013) and clove basil (*Ocimum gratissimum* L.; Lamiales: Lamiaceae) (Rando

& Lima 2010), and on exotic plants of agriculture and forest importance (Santana et al. 2005). This pest sucks the sap from the stalk of the fruits leading to atrophy and losses before harvest, as reported for mango, *Mangifera indica* L. (Sapindales: Anarcadiaceae), in Mexico (Waite 2002). The egg clutches of *A. reticulatum* are often confused with the bark of fruit plants where the gray-brown substance covering the eggs serves to camouflage them and protect against natural enemies (Rando & Lima 2010). The females of this insect lay up to 100 eggs on the branches or stems of the fruits of host plants (Rando & Lima 2010).

The herein observed association between *A. reticulatum* and *Camponotus* ants was previously reported for this leafhopper on *Bauhinia forficata* Link (Fabales: Fabaceae) (Fowler 1992) with mutual benefit between the two species. The leafhopper gets protection from the ants, while the ants receive rich carbohydrates, such as glucose, fructose, and sucrose, and free amino acids, lipids, starch, minerals, and vitamin B in a mixture named honeydew (Way 1963; Brown 1976; Völkl et al. 1999; Goussain et al. 2005). Adults of *A. reticulatum* can also be associated with stingless bees of the genus *Trigona* (Hymenoptera: Apidae) without necessarily resulting in dependence (Vieira et al. 2007; Baronio et al. 2012).

The most characteristic damage symptoms caused by *A. reticulatum* were hypertrophy and cracks at the apex of *E. speciosa* seedlings. This insect lives in colonies whose many individuals inject a large quantity of phytotoxic saliva into the plant and thereby contribute to premature aging of the stem. In general, the damage caused by *A. reticulatum* in *E. speciosa* was similar to that caused on fruit plants by this insect (Nascimento & Carvalho 1998).

The rapid lateral movement of *A. reticulatum* nymphs and adults hinders their mechanical control on *E. speciosa* seedlings as suggested on grapevines, where this species is considered a secondary pest (Soria & Dal Conte 2005). Although we did not detect any natural enemies associated with *A. reticulatum*, several have been reported. Among them, the egg parasitoids *Lymaenon aethalionis* (Oglobin) (Hymenoptera: Myrmaridae), *Abbelloides marquesi* Brèthes, *Latromerella* sp., and *Uscanopis* sp. (Hymenoptera: Trichogrammatidae) and the nymph parasitoid *Mycrotherys claripennis* Compère (Hymenoptera: Encyrtidae) are the main natural enemies of *A. reticulatum* (Silva et al. 1968). The efficacy of these natural enemies in the field needs to be better studied, including the ectoparasite *Aulacothrips dictyotus* Hood (Heterothripidae), which was found under the wings of adults of this leafhopper (Izzo et al. 2002). Aqueous extracts of *Piper aduncum* L. (Piperales: Piperaceae) leaves showed insecticidal activity on *Aethalion* sp. adults and therefore may represent an alternative to control this insect (Silva et al. 2007).

Aethalion reticulatum infested most of the *E. speciosa* seedlings and reduced their growth. This confirms the high adaptability of this aethalionid leafhopper on a broad range of host plants in Brazil. The biological performance of *A. reticulatum* on other species of the genus *Erythrina* with economical importance, and effective measures to control this pest should be investigated. To our knowledge, this is the first record of *A. reticulatum* feeding on *E. speciosa* seedlings, with a characterization of the damage it causes.

Acknowledgments

We thank Gabriel Simões de Andrade (Unioeste-PR) for identifying *Aethalion reticulatum*, and we acknowledge "Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq)" and "Fundação de Amparo à Pesquisa do Estado de Minas Gerais (FAPEMIG)" for financial support.

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