



First Record of *Empoasca kraemeri* (Hemiptera: Cicadellidae) Attacking Sweet Potato in Brazil

Authors: Rocha de Souza, Michael Willian, Silva, Natalia Oliveira, Mendes de Sá, Veríssimo Gibran, Demolin Leite, Germano Leão, Zanuncio, José Cola, et al.

Source: Florida Entomologist, 102(3) : 627-629

Published By: Florida Entomological Society

URL: <https://doi.org/10.1653/024.102.0340>

BioOne Complete (complete.BioOne.org) is a full-text database of 200 subscribed and open-access titles in the biological, ecological, and environmental sciences published by nonprofit societies, associations, museums, institutions, and presses.

Your use of this PDF, the BioOne Complete website, and all posted and associated content indicates your acceptance of BioOne's Terms of Use, available at www.bioone.org/terms-of-use.

Usage of BioOne Complete content is strictly limited to personal, educational, and non - commercial use. Commercial inquiries or rights and permissions requests should be directed to the individual publisher as copyright holder.

BioOne sees sustainable scholarly publishing as an inherently collaborative enterprise connecting authors, nonprofit publishers, academic institutions, research libraries, and research funders in the common goal of maximizing access to critical research.

First record of *Empoasca kraemeri* (Hemiptera: Cicadellidae) attacking sweet potato in Brazil

Michael Willian Rocha de Souza¹, Natalia Oliveira Silva¹, Veríssimo Gibran Mendes de Sá², Germano Leão Demolin Leite³, José Cola Zanuncio⁴, and Marcus Alvarenga Soares^{1,*}

The sweet potato (*Ipomoea batatas* (L.) Lam., Convolvulaceae) is cultivated throughout the national territory of Brazil, presenting great phenotypic and genotypic diversity (Santos et al. 2018). The plant has a wide spectrum of potential uses, making it a species of economic interest, mainly for developing countries with food shortages. Therefore, sweet potato is grown in more than 100 countries, making it 1 of the world's 7 most important sources of food (FAO 2016). Cultivation can be designated for animal and human consumption, cosmetic, fabric, paper, preparation of adhesives, and alcohol fuel industries, as well as raw materials for food (Cardoso et al. 2005; Castro et al. 2018; dos Santos et al. 2018).

Among the most damaging sweet potato pests in Brazil are *Bedellia somnulentella* Zeller (Lepidoptera: Bedelliidae), *Diabrotica speciosa* Germar (Coleoptera: Chrysomelidae), *Euscepes postfasciatus* Fairmaire (Coleoptera: Curculionidae), *Megastes pusialis* Snellen (Lepidoptera: Crambidae), and the mites *Tetranychus ludeni* Zacher and *Tetranychus urticae* Koch (Acari: Tetranychidae) (Soares et al. 2012; dos Santos et al. 2018), all with the capacity to cause production losses.

The objective of this study was to report, for the first time, the attack and impact of the *Empoasca kraemeri* Ross & Moore (Hemiptera: Cicadellidae) on sweet potato germplasm in Brazil.

Adult and immature *E. kraemeri* (Fig. 1A–D) were observed in the Vegetable Crops sector at the Universidade Federal dos Vales do Jequitinhonha e Mucuri (UFVJM) in Diamantina, Minas Gerais State, Brazil (18.166600°S, 43.500000°W; 1,387 masl). The insects were detected between Sep and Dec 2017 in a bank of sweet potato germplasm, grown in soil beds within a greenhouse. The mean air temperature and relative air humidity of these months were 20.6 °C and 66.7% (INMET 2018), respectively. Physical injuries were caused by *E. kraemeri* penetrating the stylet into the phloem of the plant, creating chlorotic spots on the leaves and necrosis (Fig. 1C, D).

Adults of *E. kraemeri* were collected and killed in 70% alcohol, and taken to the Agricultural Entomology Laboratory of the University to confirm the identification. The identified samples were deposited in the entomological collection of the Museum of Entomology of the University.

Empoasca kraemeri is widely distributed in tropical and subtropical regions of the world (Singh & Allen 1979). This pest occurs in the

abaxial and adaxial leaf surfaces. In the third instar, the nymph can easily be seen and identified by its rapid lateral movement. Adults of *E. kraemeri* are green, and measure about 4 mm in length. The mean longevity of these adults is 60 d (Gallo et al. 2002). The egg incubation period is about 10 d, and the immature period lasts between 8 and 10 d (Gallo et al. 2002). Higher infestations may lead to changes in plant growth, which demonstrate downward facing leaf edges with reduced size (Boiça Júnior et al. 2000).

The species was observed attacking other crops with economic importance, ultimately causing damage, such as *Jatropha curcas* L. (Euphorbiaceae) (Laviola et al. 2010), *Manihot esculenta* Crantz (Euphorbiaceae) (Pamplona et al. 2009), *Phaseolus vulgaris* L. (Fabaceae), and *Ricinus communis* L. (Euphorbiaceae) (Santos et al. 2009), all records for Brazil. There is also a report of *E. kraemeri* attacking sweet potatoes in Peru (Langlitz 1964).

The geographic record of the presence of phytophagous species and the identification of their hosts are important for the design of local strategies for integrated pest management (IPM) (Pires et al. 2011). This is the first report of *E. kraemeri* damaging *I. batatas*, in the municipality of Diamantina (average temperature of 19 °C), and shows that this pest now warrants integration into Brazilian sweet potato pest monitoring programs.

The authors thank the Brazilian agencies “Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq)” and “Fundação de Amparo à Pesquisa do Estado de Minas Gerais (FAPEMIG)” for scholarships and financial support. This study was financed in part by the “Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES)” of Brazil, Finance Code 001.

Summary

Empoasca kraemeri Ross & Moore (Hemiptera: Cicadellidae) is a phytophagous species widely found in tropical and subtropical regions of the world. This species is associated with several agricultural crops, where they are established due to food supply and favorable developmental conditions. The objective was to record the occurrence and damage caused by *E. kraemeri* in sweet potato germoplasm in Diamantina, Minas Gerais State, Brazil. Physical injuries were caused by *E.*

¹Programa de Pós-Graduação em Produção Vegetal, Universidade Federal dos Vales do Jequitinhonha e Mucuri, Diamantina, 39100-000, Minas Gerais, Brazil; E-mail: michaelst2011@hotmail.com (M. W. R. S.), nataliasilva.13@hotmail.com (N. O. S.), marcussoares@yahoo.com.br (M. A. S.)

²DowDuPont, 9330 Zionsville Road, Indianapolis, Indiana 46268, USA; E-mail: VGSa@dow.com (V. G. M. S.)

³Instituto de Ciências Agrárias, Universidade Federal de Minas Gerais, Montes Claros, 39404-547, Minas Gerais, Brazil; E-mail: gldleite@gmail.com (G. L. D. L.)

⁴Departamento de Entomologia/BIOAGRO, Universidade Federal de Viçosa, Viçosa, 36570-900, Minas Gerais, Brazil; E-mail: zanuncio@ufv.br (J. C. Z.)

*Corresponding author; E-mail: marcussoares@yahoo.com.br

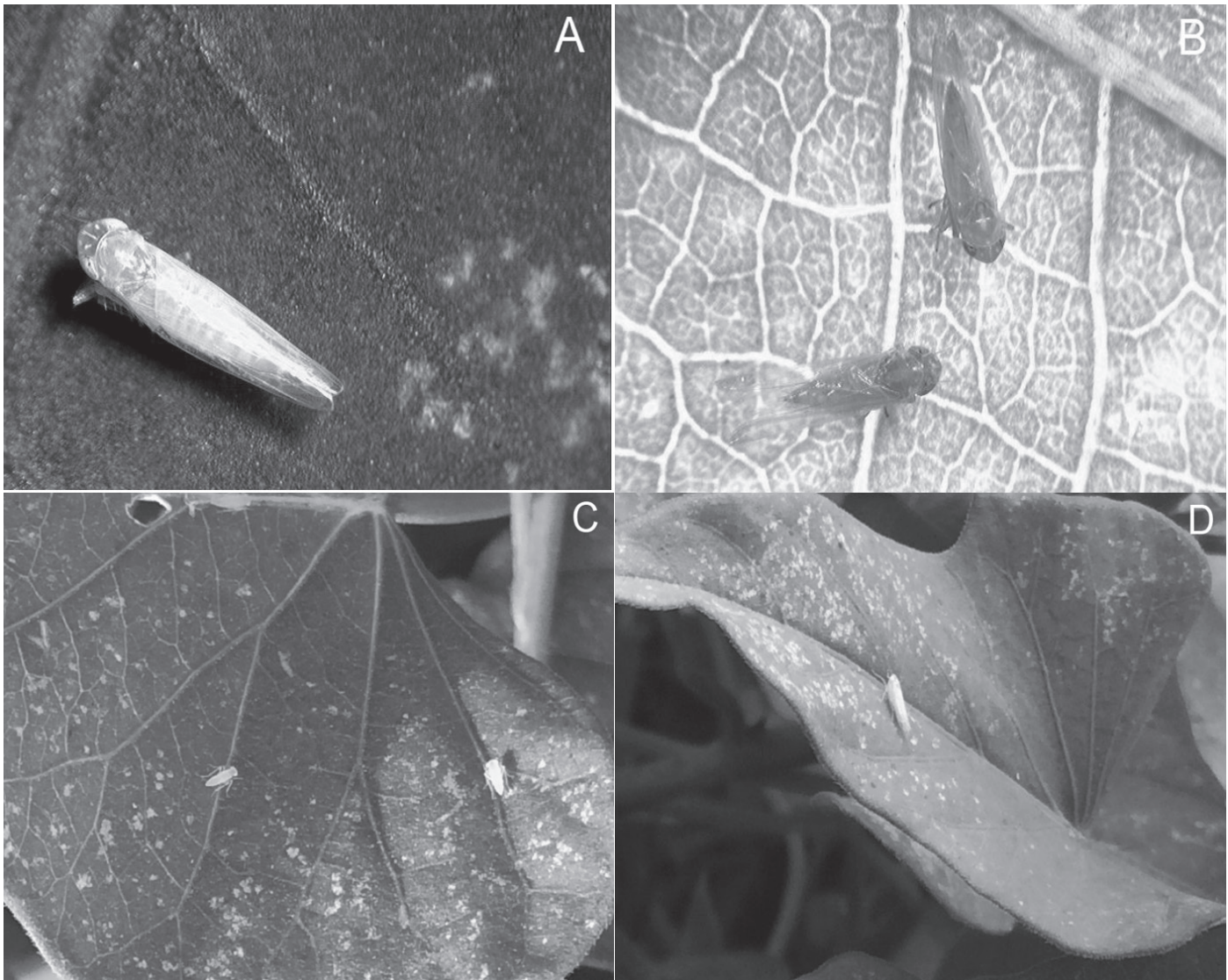


Fig. 1. Adults of *Empoasca kraemerii* (Hemiptera: Cicadellidae) on sweet potato leaves (A, B), immature (C) and resulting injuries; chlorotic spots (C, D) Diamantina, Minas Gerais State, Brazil, in 2017.

kraemerii penetrating the stylet into the phloem of the plant, creating chlorotic spots on the leaves with posterior necrosis. This insect has the potential to cause severe damage. Thus, it is important to include *E. kraemerii* in integrated pest management programs for the sweet potato.

Keywords: integrated pest management; leafhopper; *Ipomoea batatas*

Sumário

Empoasca kraemerii Ross & Moore (Hemiptera: Cicadellidae) é uma espécie fitófaga amplamente encontrada em regiões tropicais e subtropicais do mundo. Esta espécie está associada a várias culturas agrícolas, onde se estabelecem devido ao fornecimento de alimentos e condições favoráveis de desenvolvimento. O objetivo foi registrar a ocorrência e danos de *E. kraemerii*, atacando um banco de germoplasma de batata doce no município de Diamantina, estado de Minas Gerais, Brasil. Injúrias foram causadas por *E. kraemerii* ao penetrar os estiletes no floema da planta, provocando manchas cloróticas nas folhas

com posterior necrose. Este inseto tem o potencial de causar danos severos. Assim, é importante incluir *E. kraemerii* no manejo integrado de pragas da batata doce.

Palavras Chave: cigarrinha; *Ipomoea batatas*; manejo integrado de pragas

References Cited

- Boiça Júnior AL, Muçouçah MJ, dos Santos TM, Baumgartner JG. 2000. Effect of bean cultivars, chemical fertilization and insecticides on *Empoasca kraemerii* Ross & Moore 1957. *Acta Scientiarum Agronomy* 22: 955–961.
- Cardoso AD, Viana AES, Ramos PAS, Matsumoto SN, Amaral CLF, Sediyaama T, Morais OM. 2005. Evaluation of sweet potato clones in Vitória da Conquista. *Horticultura Brasileira* 23: 911–914.
- Castro BMC, Soares MA, Andrade Júnior VC, Santos Júnior VC, Fontes PCR, Wilcken CF, Serrão JE, Zanuncio JC. 2018. Preference of red mite *Tetranychus ludeni* Zacher (Acari: Tetranychidae) to sweet potato genotypes. *Brazilian Journal of Biology*. doi.org/10.1590/1519-6984.176665
- dos Santos MM, Soares MA, da Silva IM, Fontes PCR, Zanuncio JC. 2018. First record of the sweet potato pest *Bedellia somnulentella* (Lepidoptera: Bedelliidae) in Brazil. *Florida Entomologist* 101: 315–316.

- FAO (Food and Agriculture Organization of the United Nations). 2016. FAOSTAT. (online) <http://faostat.fao.org/site/567/DesktopDefault.aspx?PageID=567#ancor> (last accessed 26 Jan 2019).
- Gallo D, Nakano O, Silveira Neto S, Carvalho RPL, Baptista GC, Berti Filho E, Parra JRP, Zucchi RA, Alves SB, Vendramim JD, Marchini LC, Lopes JRS, Omoto C. 2002. Entomologia Agrícola. Fundação de Estudos Agrários Luiz de Queiroz - FEALQ, Piracicaba, São Paulo, Brazil.
- INMET (Instituto Nacional de Meteorologia). 2018. INMET. (online) <http://www.inmet.gov.br/portal/> (last accessed 26 Jan 2019).
- Langlitz HO. 1964. The economic species of *Empoasca* in the coastal and sierra regions of Perú. Revista Peruana de Entomología 7: 54–70.
- Laviola BG, Rocha RB, Kobayash AK, Rosado TB, Bhering LL. 2010. Genetic improvement of *Jatropha* for biodiesel production. Ceiba 51: 1–10.
- Pamplona AMSR, Guimarães R dos R, Dias MC. 2009. Ocorrência e controle de cigarrinha-verde *Empoasca kraemeri* (Ross e Moore, 1957) em plantio de mandioca, no município de Manacapuru, AM. Embrapa Amazônia Ocidental-Comunicado Técnico (INFOTECA-E), Manaus, Amazonas, Brazil.
- Pires EM, Bonaldo SM, Ferreira JAM, Soares MA, Candan S. 2011. New record of *Leptoglossus zonatus* (Dallas) (Heteroptera: Coreidae) attacking starfruit (*Averrhoa carambola* L.) in Sinop, Mato Grosso, Brazil. EntomoBrasilis 4: 33–35.
- Santos EAD, Andrade Júnior VCD, Viana DJS, Santos AAD, Silva AJMD, Fialho CMT. 2018. Sensitivity of sweet potato genotypes to clomazone and weed interference. Revista Caatinga 31: 352–359.
- Santos ZS, Nascimento ML, Menezes AMS, São José AR, Menezes Júnior AO, Carvalho JM, Lins Júnior JC, Souza IVB. 2009. Flutuação populacional e cigarrinha-verde na cultura da mamona em Irecê e Barra do Choça, Bahia. Revista Brasileira de Agroecologia 4: 693–697.
- Singh SR, Allen DJ. 1979. Parasitos y enfermedades del caupi. Manual Series 2. International Institute of Tropical Agriculture (IITA), Ibadan, Oyo, Nigeria.
- Soares MA, Castro BMC, Andrade-Júnior VC, Assis-Júnior SL, Pires EM. 2012. Attack of two new spider mites on sweet potato (*Ipomoea batatas*) in Diamantina, Minas Gerais State, Brazil. Brazilian Journal of Biology 72: 971–971.