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

Michael Willian Rocha de Souza¹, Natalia Oliveira Silva¹, Veríssimo Gibran Mendes de Sá¹, Germano Leão Demolin Leite², José Cola Zanuncio⁴, and Marcus Alvarenga Soares¹,*

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 *Bedella sommulentella* Zeller (Lepidoptera: Bedelliidae), *Diabrotica speciosa* Germar (Coleoptera: Chrysomelidae), *Eucepsyes postfasciatus* Fairmaire (Coleoptera: Curculionidae), *Megastes pusialis* Snellen (Lepidoptera: Crambidae), and the mites *Tetranychus ludeni* Zacher and *Tetranychus urticae* Koch (Acarina: 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* 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.

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**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 germplasm in Diamantina, Minas Gerais State, Brazil. Physical injuries were caused by *E.
kraemeri 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. kraemeri in integrated pest management programs for the sweet potato.

Keywords: integrated pest management; leafhopper; Ipomoea batatas

**Sumário**

Empoasca kraemeri 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. kraemeri, atacando um banco de germoplasma de batata doce no município de Diamantina, estado de Minas Gerais, Brasil. Injúrias foram causadas por E. kraemeri ao penetrar os estíletes 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. kraemeri 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 kraemeri Ross & Moore 1957. Acta Scientiarum Agronomy 22: 955–961.

Cardoso AD, Viana AES, Ramos PAS, Matsumoto SN, Amaral CLF, Sediyama 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 Bedelia somnulentella (Lepidoptera: Bedeliidae) in Brazil. Florida Entomologist 101: 315–316.

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