Bulletin of Insectology ***71*** *(2): 189-191, 2018*
ISSN 1721-8861

Leucothrips furcatus (Thysanoptera Thripidae): a new pest of *Sechium edule* (Cucurbitaceae) in Brazil

Élison Fabrício Bezerra LIMA[1], Miguel Francisco SOUZA-FILHO[2,3]
[1]*Universidade Federal do Piauí (UFPI), Floriano, PI, Brazil*
[2]*Instituto Biológico (IB), Campinas, SP, Brazil*
[3]*Fellow of the Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq), Brasília, DF, Brazil*

Abstract

In this contribution, we report damage caused by *Leucothrips furcatus* Hood to *Sechium edule* (Jacq.) Swartz (chayote) in the states of São Paulo and Minas Gerais, Brazil. Apart from cotton, this is the second report of damage caused to crop plants and also the first record of the species in the country. Individuals (larvae and adults) of *L. furcatus* feed on plant tissue and cause chlorosis on the leaves and scarification on the fruits, which become deformed and bleached from whitish to silvery. Details on the species' morphology are provided in order to aid its identification.

Key words: pest thrips, scarification, chlorosis, chayote.

Introduction

Chayote, *Sechium edule* (Jacq.) Swartz (Cucurbitaceae), is one of the ten most consumed vegetables in Brazil, which is the largest producer of this crop in the world. The recommended cultivation system in the country is conducive to increasing the populations of chayote pests and diseases, due to the presence of orchards of different ages in neighbouring areas and low rotation with other crops (Melo *et al*., 2014). These pests (mainly mites, thrips, aphids, caterpillars and beetles) occur on different parts and stages of development of the plant, especially on leaves, branches and fruits (Saade, 1996). However, studies on their identification are sparse.

Although with a variety of habits, the members of the Thysanoptera are best known for their economic importance for several crops, which involves direct damage to plant tissues and/or transmission of phytopathogens, especially tospoviruses (Lewis, 1997; Rotenberg *et al*., 2015). Usually, thrips cause chlorosis of leaves and flowers or malformation of fruits due to feeding or oviposition on the leaf tissue.

Only about 2% of the approximately 6,000 thrips species described (ThripsWiki, 2017) are recorded as pests. Most of these belong to the family Thripidae, especially the subfamilies Thripinae and Panchaetothripinae (Moritz *et al*., 2004). The other two subfamilies of Thripidae, Sericothripinae and Dendrothripinae, have fewer pest representatives. In Dendrothripinae, species such as *Pesudodendrothrips mori* (Niwa) and *Pesudodendrothrips darci* (Girault) are recorded as damaging *Morus* spp. and *Ficus* spp., respectively, while some species of *Leucothrips* are pests of ferns and vegetables (Mound, 1999).

Leucothrips furcatus Hood (Thysanoptera Thripidae), native to the Neotropics, was originally described from Guadeloupe on *Erythrina* sp. This leaf-feeding species is recorded in several Central and South American countries, although these records require further evaluation (Mound and Marullo, 1996). The species has also been recorded as a pest of cotton (Bournier, 2002).

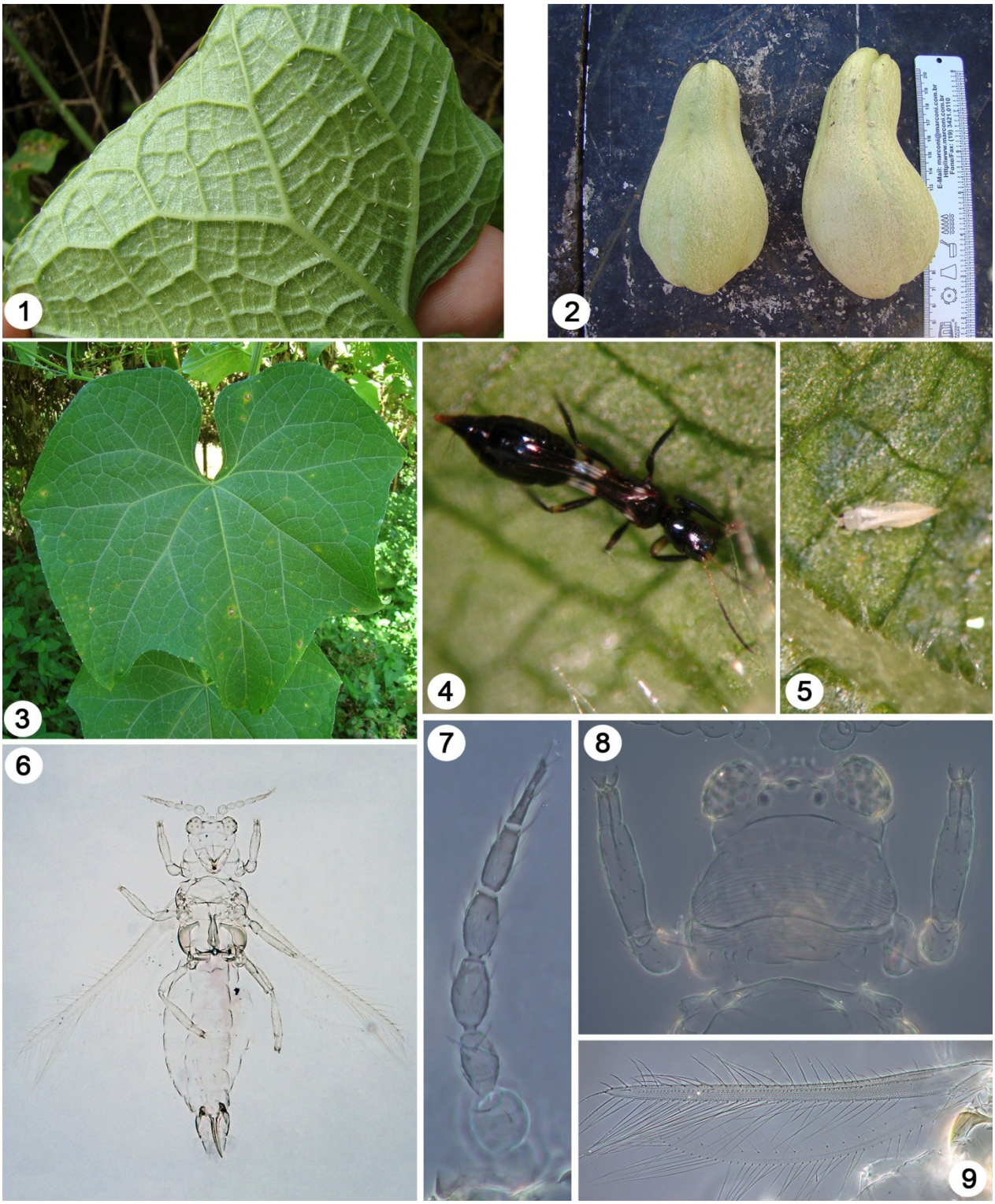
In this contribution, we report *L. furcatus* as a pest of another crop (chayote) in Brazil, and comment on the biology and taxonomy of the species.

Materials and methods

Thrips specimens (adults and larvae) were surveyed in chayote orchards in 2015 and 2016 in Amparo, State of São Paulo, and in April 2017 in Pedralva, State of Minas Gerais, Brazil. Voucher specimens were collected directly from leaves with the aid of fine-bristle brushes, stored in vials with 100% ethanol solution, slide-mounted following the method suggested by Mound and Marullo (1996), and deposited in the Coleção de História Natural da Universidade Federal do Piauí, Floriano, State of Piauí, Brazil (CHNUFPI) and in the Entomological Collection of the Escola Superior de Agricultura "Luiz de Queiroz", Universidade de São Paulo, Piracicaba, State of São Paulo, Brazil (ESALQ).

Results and discussion

L. furcatus has been observed in São Paulo fields since the year 2009, but its identification has been confirmed only with material from 2015 on. In hot and dry periods, weather conditions favorable for the development of large populations (figure 1), individuals of the species feed on plant tissue and cause chlorosis in the leaves and scarification on the fruits (figures 2, 3), which become deformed and whitish to silver-coloured. Due to their small size (less than 1 mm) and ability to hide on the lower side of leaves, controlling thrips by conventional chemical means is difficult. *Franklinothrips vespiformis* (Crawford) (Thysanoptera Aeolothripidae) (figure 4) is a predator of thrips that has been frequently found in association with *L. furcatus.* Further biological studies involving the two species to test the viability of



Figures 1-9. 1. Numerous individuals of *L. furcatus* on the underside of *S. edule* (chayote) leaves; **2.** Damage to exocarp; **3.** Injuries (chlorotic punctations) on chayote leaf; **4.** *F. vespiformis* adult female; **5.** *L. furcatus* adult female; **6.** *L. furcatus* adult female in microscope slide (Canada balsam); **7.** Antenna; **8.** Head and pronotum; **9.** Forewing. (In colour at www.bulletinofinsectology.org)

biocontrol should be carried out in order to determine the feasibility of the use of this predator in crop areas.

Because minutely detailed observations are required for a correct identification in *Leucothrips*, microscopic preparations of both cleared and uncleared fresh material were conducted. The traditional view (Hood, 1931) is that *L. furcatus* is very similar to *Leucothrips theobromae* (Priesner), from which it is distinguished basically by the absence of red pigmentation on the anterior margin of the head next to the antennae insertion. While *L. theobromae* is associated with leaves of cacao, *Theobroma cacao* L. (Malvaceae), (Mound and Marullo,

1996), *L. furcatus* is thought to be associated with more plant species, although this requires further investigation. An alternative view raised by Skarlinsky *et al*. (2017) is that the so-called *L. furcatus* may include a species complex with taxa that are either polyphagous or host-specific for *S. edule*. No differences between adults from Brazil and Costa Rica were found in the present study. Therefore, the name *L. furcatus* is applied here as well. Larvae collected during this survey are similar to those found for *S. edule* in Costa Rica by Skarlinsky *et al*. (2017).

Within the genus, two other species are also known to cause damage to cultivated plants. *Leucothrips piercei* (Morgan) breeds and oviposits on sweet pepper, *Capsicum annuum* L. (Solanaceae), and causes brown spiral injuries on the leaves (Zamar *et al*., 2014). *Leucothrips nigripennis* Reuter is a minor pest of ferns (Mound, 1999). As *L. furcatus* was already known to be a pest of cotton (Bournier, 2002), chayote is now the second crop with records of damage caused by this thrips.

Morphological traits

Body colour white (figures 5, 6). Antennae 7-segmented; antennal segment II globose; forked sense cones on antennal segments III-IV (figure 7). Head with no or very weak lines of sculpture; anterior margin near base of antennae without red pigment; ocellar triangle red in unwashed specimens; ocellar setae I absent (figure 8). Pronotum with striate sculpturing; median apodeme well developed; four pairs of well-developed setae on posterior margin (figure 8). Metanotum with longitudinal sculpturing; median setae ahead of anterior margin; endofurca well developed and lyre-shaped. Forewing first vein with several lacunae and incomplete row of setae, two setae distally (figure 9). Abdominal tergites with median pair of setae long and close together (distance between their bases about twice the size of their insertion); tergite VIII with complete posteromarginal comb.

Material examined

Brazil. São Paulo: Amparo (22°44'00.6"S 46°44'15.4"W), on fruits and leaves of *Sechium edule* L. (Chayote), 25.iv.2015, 22♀ 7 Larvae II; 21.xi.2016, 17♀. Minas Gerais: Pedralva (22°15'55"S 45°24'37"W), same host, 7.iv.2017, 19♀ 8 Larvae II (Souza Filho M.F., Lima E.F.B., cols.) (CHNUFPI and ESALQ).

Conclusion

L. furcatus is recorded as a pest of chayote, on which it causes leaf chlorosis and fruit scarification. This is the first record of this thrips species in Brazil.

Acknowledgements

The authors thank the Brazilian Council for Scientific and Technological Development (CNPq) for the Research Productivity Fellowships granted to Miguel F. Souza-Filho; the chayote producers of the municipality of Amparo, São Paulo and Pedralva, Minas Gerais, Brazil for kindly allowing us to collect insects on their properties and also providing us with useful information about the insects described in this article; and Laurence A. Mound (CSIRO, Australia) for comments on a previous version of the manuscript.

References

BOURNIER J., 2002.- *Les Thysanoptères du cotonnier (Déprédateurs du cotonnier en Afrique tropicale et dans le reste du monde, 12)*.- CIRAD-CA, Montpellier, France.

HOOD J. D., 1931.- Notes on New York Thysanoptera, with descriptions of new species III.- *Bulletin of the Brooklyn Entomological Society*, 26: 151-170.

LEWIS T., 1997.- Pest thrips in perspective, pp. 1-13. In: *Thrips as crop pests* (LEWIS T., Ed.).- CAB International, Wallingford, England.

MELO A. M. T., AZEVEDO FILHO J. A., TRANI P. E., 2014.- Chuchu, pp. 132-137. In: *Instruções agrícolas para as principais culturas econômicas* (AGUIAR A. T. E., GONÇALVES C., PATERNIANI M. E. A. G. Z., TUCCI M. L. S., CASTRO C. E. F., Eds), Boletim do Instituto Agronômico de Campinas, 200.- IAC, Campinas, Brazil.

MORITZ G., MOUND L. A., MORRIS D., GOLDARAZENA A., 2004.- *Thrips ID: pest thrips of the world: an interactive identification and information system*.- CSIRO Publishing, Collingwood, Australia.

MOUND L. A., 1999.- Saltatorial leaf-feeding Thysanoptera (Thripidae, Dendrothripinae) in Australia and New Caledonia, with newly recorded pests of ferns, figs and mulberries.- *Australian Journal of Entomology*, 38: 257-273.

MOUND L. A., MARULLO R., 1996.- The thrips of Central and South America: an introduction (Insecta: Thysanoptera).- *Memoirs on Entomology, International*, 6: 1-488.

ROTENBERG D., JACOBSON A. L., SCHNEWEIS D. J., WHITFIELD A. E., 2015.- Thrips transmission of tospoviruses.- *Current Opinions in Virology*, 15: 80-89.

SAADE R. L., 1996.- *Promoting the conservation and the use of underutilized and neglected crops 8: chayote* Sechium edule *(Jacq.) Sw.*- International Plant Genetic Resources Institute, Rome, Italy.

SKARLINSKY T. L., RUGMAN-JONES P., FUNDERBURK J., STOUTHAMER R., UJUETA C. S., 2017.- Adult identity crisis in *Leucothrips* (Thysanoptera: Thripidae) associated with the tropical ornamental plant *Codiaeum variegatum* (Euphorbiaceae).- *Florida Entomologist*, 100 (3): 509-514.

THRIPSWIKI, 2017.- *ThripsWiki - providing information on the world's thrips*.- [online] URL: http://thrips.info/wiki (accessed 29 August 2017).

ZAMAR M. I., BORBÓN C. M., AGUIRRE A., MIÑO V., CÁCERES S., 2014.- Primer registro del daño de *Leucothrips piercei* (Morgan) (Thysanoptera: Thripidae) em cultivos de pimiento (*Capsicum annuum* L.) (Solanaceae) en la Argentina.- *Revista de la Faculdad de Ciencias Agrarias Uncuyo*, 46 (1): 213-219.

Authors' addresses: Élison Fabrício Bezerra LIMA (corresponding author; efblima@ufpi.edu.br), Universidade Federal do Piauí, Campus Amílcar Ferreira Sobral, BR 343, Km 3.5, Meladão, Floriano, PI, 64808-605 Brazil; Miguel Francisco SOUZA-FILHO, Instituto Biológico, Centro Avançado de Pesquisa em Proteção de Plantas e Saúde Animal, Laboratório de Entomologia Econômica, Alameda dos Vidoeiros, 1097, Campinas, SP, 13101-680 Brazil.

Received January 5, 2018. Accepted May 11, 2018.