

## A new species of *Lizerius* Blanchard (Hemiptera: Drepanosiphidae) from Brazil

Suzan B. Z. Cunha &amp; Carlos R. Sousa-Silva\*

Departamento de Ecologia e Biologia Evolutiva – DEBE, Universidade Federal de São Carlos, UFSCar, Rod. Washington Luiz, Km 235, Monjolinho,  
Caixa Postal 676, 13565-905 São Carlos, SP, Brazil. (suzanbio@yahoo.com.br)

\*In memoriam

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**ABSTRACT.** In this study a new aphid species of the genus *Lizerius* Blanchard, 1923 (Hemiptera: Drepanosiphidae) is described. Samplings were carried out in the municipalities of Porto Ferreira and Pedregulho, state of São Paulo, Brazil, over plants of *Persea americana* Mill, 1768 and *Terminalia brasiliensis* Spreng, 1825. Morphological characteristics of apterous and alate are described and represented by drawings.

**KEYWORDS.** Brazilian Aphid, Lizeriini, *Persea americana*, *Terminalia brasiliensis*.

**RESUMO.** Nova espécie de *Lizerius* Blanchard (Hemiptera: Drepanosiphidae) do Brasil. Neste trabalho uma nova espécie de afídeo do gênero *Lizerius* Blanchard, 1923 (Hemiptera: Drepanosiphidae) é descrita. As coletas foram realizadas nos municípios de Porto Ferreira e Pedregulho, estado de São Paulo, Brasil, sobre *Persea americana* Mill, 1768 e *Terminalia brasiliensis* Spreng, 1825. As características morfológicas de ápteros e alados são descritas e ilustradas.

**PALAVRAS-CHAVE.** Afídeo brasileiro, Lizeriini, *Persea americana*, *Terminalia brasiliensis*.

The genus *Lizerius* Blanchard, 1923 belongs to the tribe Lizeriini placed by QUEDNAU (1974) in the Aphididae. QUEDNAU (1974) also points out that Lizeriini is a “primitive” tribe of South American aphids and recognize the subgenera *Lizerius* and *Paralizerius*, distinguishing them by: (i) number of distal setae present in the head region; (ii) absence of pleural setae in the abdominal tergites; and (iii) type and localization of the processes occurring in the body of the apterous forms. HEIE (1982) and ILHARCO (1992) consider Lizeriini belonging to the family Drepanosiphidae and do not recognize the above mentioned subgenera. In the present study, we followed the classification of ILHARCO (1992).

Until now, 11 species of *Lizerius* are known in the Neotropics, all of them, except *L. pustulatus* Quednau, 2010, already recorded in Brazil (QUEDNAU, 2010; CUNHA & SOUSA-SILVA, 2016). The current known geographical distributions for species of this genus are: *L. ocoteae* Blanchard, 1923 recorded in Brazil, Argentina and Uruguay; *L. acunai* (Holmam, 1974) in Brazil and Cuba; *L. tuberculatus* (Blanchard, 1939) in Brazil, Argentina, Venezuela and Mexico; *L. brasiliensis* Quednau, 1974, Brazil and Uruguai; *L. cermelii* Quednau 1974, Brazil, Argentina and Venezuela; *L. pichurim* Quednau 2010, Brazil and Venezuela (COSTA *et al.*, 1972; EASTOP *et al.*, 1993; QUEDNAU, 2010); and the following species *L. costai*

Quednau, 1974, *L. halberti* Quednau, 2010, *L. intermedius* Quednau, 1974, and *L. mammiferus* Quednau, 2010 with occurrence limited to Brazil (QUEDNAU, 2010).

Very little is known about the biology of the referred species and, in general, only the alate forms of most species of this tribe are known (BLACKMAN & EASTOP, 2016). In this work a new species of *Lizerius* collected in Southeast Brazil is described and illustrated.

### MATERIAL AND METHODS

Samplings were carried out in Porto Ferreira State Park, Porto Ferreira municipality and in Furnas do Bom Jesus State Park, Pedregulho municipality, state of São Paulo, southeastern Brazil, in the period between April 2014 and March 2016. In each locality aphid samples were taken by actively searching all types of plants (trees, bushes and herbaceous) along previously existing trails. Each locality was sampled monthly, with a total sampling effort of 96 hours at each place. Aphids were collected, transferred to plastic recipients and preserved in ethanol 90%. Plant branches, flowers or seeds, whenever present, were also preserved and herborized for posterior species identification by specialists. Aphids were mounted on glass slides following the procedure

recommended by ILHARCO & GOMES (1981). The specimens were identified using specialized literature (QUEDNAU, 1974, 2010; ILHARCO, 1992; BLACKMAN & EASTOP, 2016).

## RESULTS

### *Lizerius jorgei* sp. nov.

(Figs 1-10)

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Type material. Holotype: BRAZIL, **São Paulo**: Porto Ferreira (Porto Ferreira State Park), ♀ apterous viviparous, 21.I.2016, collected in *T. brasiliensis*, J. L. Cunha Col. (COLEAFIS-DEBE). The holotype is a specimen indicated by number 11 in a microscope slide numbered 1057 deposited in the Aphid Collection of *Departamento de Ecologia e Biologia Evolutiva, Universidade Federal de São Carlos* (COLEAFIS-DEBE/UFSCar). Paratypes: BRAZIL, **São Paulo**: Pedregulho (Furnas of Bom Jesus State Park), 8♀ apterous viviparous + 2♀ alate viviparous and ♂ alate, 21.I.2016, collected in *P. americana*, J. L. Cunha Col. (COLEAFIS – DEBE); 6♀ apterous viviparous + 3♀ alate viviparous, 21.I.2016, collected in *T. brasiliensis*, J. L. Cunha Col. (IBSP); 6♀

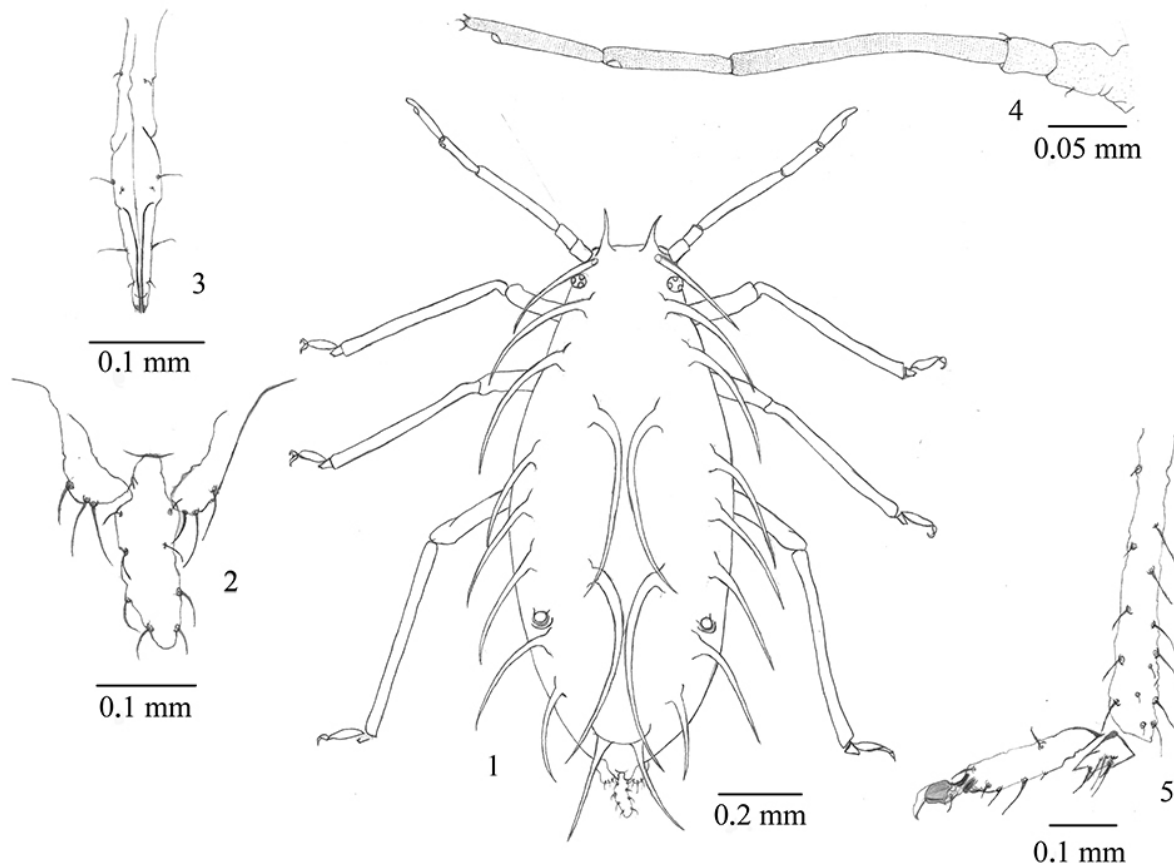
apterous viviparous + 3♀ alate viviparous, 21.I.2016, collected in *T. brasiliensis*, J. L. Cunha Col. (DZUP).

**Etymology:** This new species is named in honor of the aphid collector Jorge Luís da Cunha.

**Diagnosis.** *Lizerius jorgei* sp. nov. is very similar to *L. brasiliensis* and *L. costai*. The apterous form of *L. jorgei* is distinguished from *L. brasiliensis* by bearing finger-like processes in the spinal body region and being devoid of spinal setae in each abdominal tergite; the alate form is distinguished by the absence of mammiform processes in the head and pronotum, the absence of spinal setae in each abdominal tergite and the presence of processes only in VI, VII and VIII tergites. Alate females of *L. jorgei* are distinguished from alate females of *L. costai* by possessing mammiform processes in abdominal tergites VI, VII and VIII, bearing much lower number of secondary rhinaria present in each antennal segment.

## DESCRIPTION

**Apterous viviparous female.** Alive aphid with vivid yellow color, small greenish stripes at thorax and at three first segments of abdomen and black triommatidium. Specimens cleared and mounted in slides present body completely membranous with the last rostral segment bearing small sclerotization.



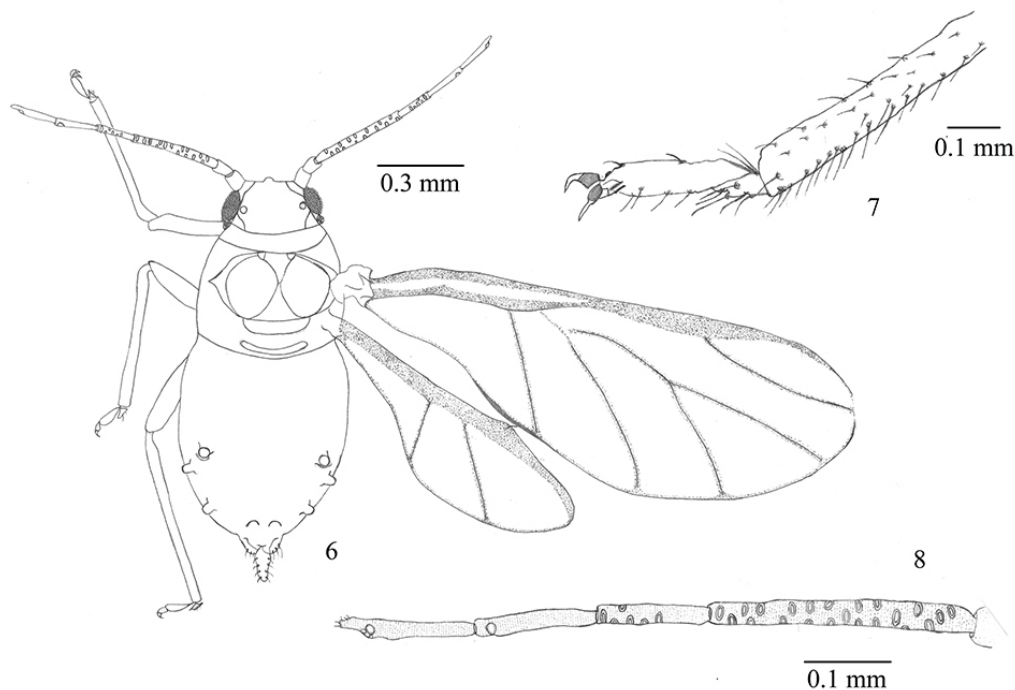
Figs 1-5. *Lizerius jorgei* sp. nov., apterous viviparous female: 1, body (100x magnification); 2, cauda (400x magnification); 3, rostrum (400x magnification); 4, antenna (400x magnification); 5, hind tarsus (400x magnification).

Morphological characters. Characteristics based on the analysis of 24 apterous viviparous female (Figs 1-5). Body entirely pale, measuring 1.25-2.05 mm in length (Fig. 1). Eyes reduced to triommatidium. Antennae 5-segmented, with total length range of 0.400-0.875 mm; 0.3-0.6 times as long as body. III antennal segment 0.17-0.44 mm, IV 0.07-0.17 mm, base of V antennal segment 0.07-0.16 mm; processus terminalis 0.03-0.04 mm and 0.18-0.57 times as long as base of V (Fig. 4). Rostrum 4-segmented extending until mesocoxae, with one pair of primary setae and one pair of secondary setae; apical segment obtuse (0.09-0.11 mm), 0.81-1.4 times as long as II segment of hind tarsus (Fig. 3). Fore femora normal, not enlarged, hind tibiae with many hairs, most localized, being the hairs longest near the tarsi with 0.012-0.027 mm length; first tarsal segments with 3-5 ventral setae reaching 0.020-0.037 mm; second segment hind tarsus reaching 0.07-0.11 mm long (Fig. 5). Siphunculi ring-like in 5th abdominal tergite. Knob of cauda finger-like (0.17-0.24 mm), bearing a constriction at basal one-third and with eight caudal hairs (Fig. 2). Anal plate bilobed with 3-4 long setae in the apical margin of each lobe, which are longer than others present in the middle region of the lobes. Four gonapophyses with 2-3 gonochaetae. Body with 12 pairs of long finger-like processes distributed as following. Two pairs in the head; one anterior and short (0.10-0.22 mm) and the other posterior and long (0.27-0.42 mm). In the thoracic region there are one lateral pair in the pronotum (0.32-0.56 mm), one lateral pair in the mesonotum (0.31-0.71 mm) and one spinal pair in the mesonotum (0.41-0.73 mm). In the abdomen the following pairs of processes are observed: 1st tergite, lateral pair (0.24-0.46 mm), 2nd tergite, lateral pair (0.32-0.51 mm), 3rd tergite, lateral pair

(0.32-0.52 mm), 4th tergite, spinal pair (0.38-0.70 mm), 5th tergite, absent, 6th tergite, lateral pair (0.27-0.50 mm), 7th tergite, lateral pair (0.24-0.35 mm) and 8th tergite, spinal pair (0.30-0.44 mm) (Fig. 1).

**Alate viviparous female.** Alive aphids with vivid yellow color and dark brown thorax; compound eyes black and red triommatidium. Specimens cleared and mounted in slides present body completely membranous with the last rostral segment bearing small sclerotization.

Morphological characters. Characteristics based on the analysis of 20 alate viviparous female (Figs 6-8). Body entirely pale, measuring 1.15-1.62 mm in length (Fig. 6). Head with setae varying length between 0.0075-0.010 mm. Epicranial suture absent. Antennae 6-segmented, with total length range of 0.750-0.925 mm, 0.49-0.82 times as long as body; III antennal segment 0.29-0.39 mm, IV 0.12-0.15 mm, V 0.12-0.17 mm, base of VI antennal segment 0.10-0.15 mm; processus terminalis 0.02-0.04 mm and 0.15-0.30 times as long as base of VI. Secondary rhinaria oval to elliptic; 18-29 secondary rhinaria in III antennal segment, evenly distributed over all the segment and 0-6 at IV antennal segment (Fig. 8). Rostrum 4-segmented, extending until procoxae; apical segment obtuse (0.08-0.10 mm), 0.72-1.00 times as long as II segment of hind tarsus. Fore wings with dark pigmented costal veins and pterostigma, cubital vein strongly delimited, tip of the veins weakly developed. Hind wings with two oblique veins (Fig. 6). Fore femora normal, not enlarged and hind tibiae with many hairs, the longest of them reaching 0.0015-0.0027 mm length and located at the apical half of tibia, near the tarsi. First segment of hind tarsi with 2 dorsal setae and 4-6 long ventral setae. Second segment of hind tarsi reaching 0.09-0.11 mm (Fig. 7).



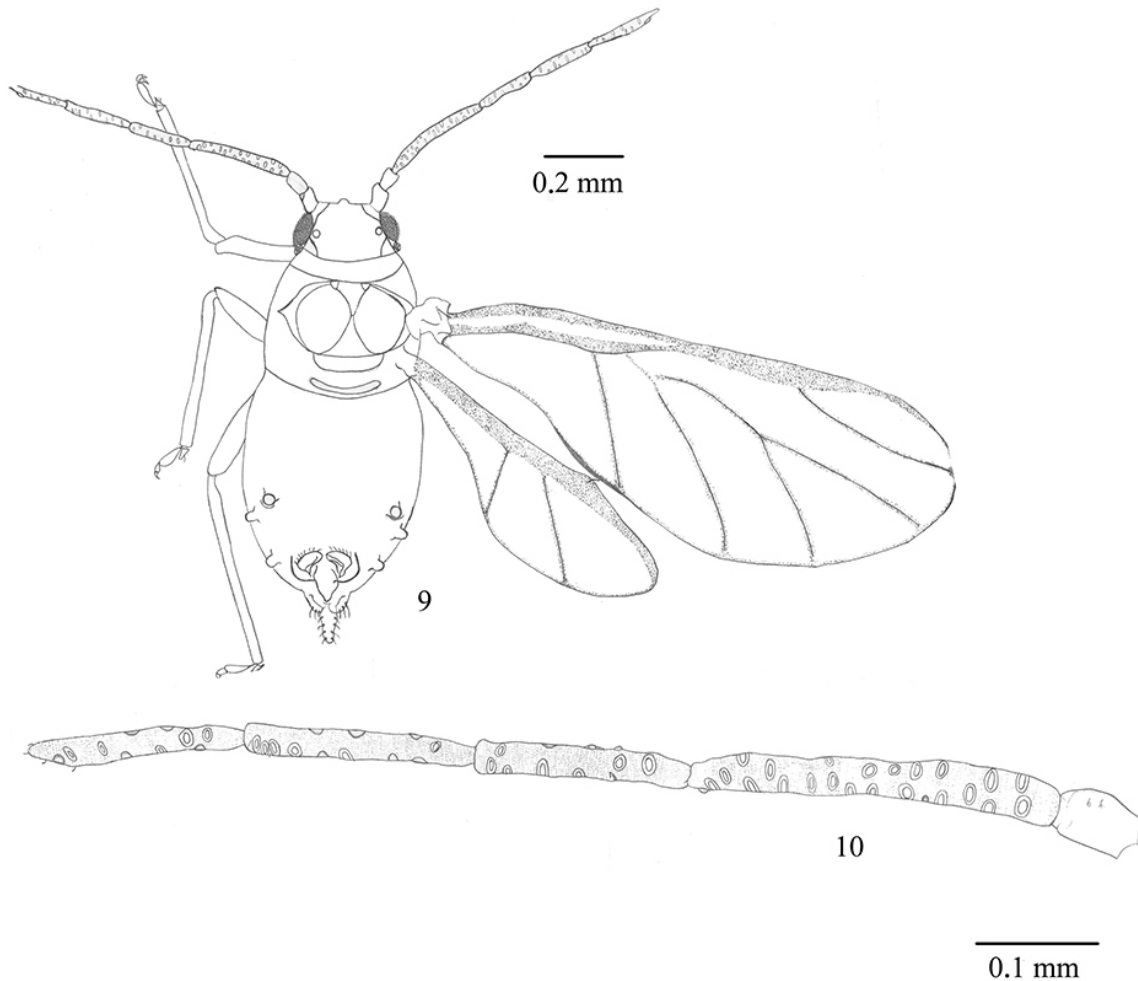
Figs 6-8. *Lizerius jorgei* sp. nov., alate viviparous female: 6, body and wings (100x magnification); 7, hind tarsus (400x magnification); 8, antennae (400x magnification).

Caudal knob finger-like, 0.13–0.21 mm and with 8–9 caudal hairs. One pair of small lateral mammiform processes in the 6th tergite (0.01–0.027 mm), one pair in the 7th tergite (0.015–0.028 mm) and one pair of small spinal mammiform processes in the 8th tergite (0.015–0.03 mm) are observed in the abdomen of alate specimens (Fig. 6). Other features similar to apterous forms.

**Alate male specimen.** Alive aphids with vivid yellow color, dark brown thorax; compound eyes black and red triommatidium. Specimens cleared and mounted in slides present body completely membranous with the thoracic

region darker than in females, very dark legs and last rostral segment with small sclerotization.

**Morphological characters.** Characteristics based on the analysis of one alate male form (Figs 9, 10). Body pale with dark thoracic region and very dark legs. It differs from alate females by having high number of secondary rhinaria and several rhinaria in V and VI antennal segments, which are similar in size and shape of rhinaria present at segment III; and by possessing V antennal segment slightly larger than females (Fig. 10). Body slightly smaller than females (Fig. 9). Other features similar to alate viviparous females.



Figs 9, 10. *Lizerius jorgei* sp. nov., alate male: 9, body and wings (100x magnification); 10, antennae (400x magnification).

## DISCUSSION

During samplings, the presence of apterous and alate females of *Aphis spiraecola* Patch, 1914 (Hemiptera: Aphididae) was observed co-occurring with *L. jorgei* sp. nov. and the predator *Harmonia axyridis* (Pallas, 1773) (Coleoptera, Coccinellidae). It is possible that *T. brasiliensis*, a native plant of Brazil, is the preferential host of *L. jorgei* since all the specimens collected in this plant were more

vigorous than those collected in *P. americana*. Nevertheless, more sampling and observations are required to gather sufficient evidence to this hypothesis.

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## REFERENCES

- BLACKMAN, R. L. & EASTOP, V. F. 2016. **Aphids on the world's plants: An online identification and information guide.** Available at <<http://www.aphidsonworldsplants.info>>. Accessed on 13 July 2016.
- COSTA, C. L.; EASTOP, V. F. & COSTA, A. S. 1972. A list of the aphids species (Homoptera: Aphidoidea), collected in São Paulo, Brazil. **Revista Peruana de Entomologia** 15(1):131-134.
- CUNHA, S. B. Z. & SOUSA-SILVA, C. R. 2016. **Catálogo taxonômico da fauna do Brasil: Aphidoidea.** Available at <<http://fauna.jbrj.gov.br/fauna/listaBrasil/PrincipalUC/PrincipalUC.do?lingua=pt>>. Accessed on 26 June 2016.
- EASTOP, V. F.; COSTA, C. L. & BLACKMAN, R. L. 1993. Brazilian Aphidoidea III. Sub-family Drepanosiphinae. **Pesquisa Agropecuária Brasileira** 28(12):1349-1355.
- HEIE, O. E. 1982. **The Aphidoidea (Hemiptera) of Fennoscandia and Denmark II.** Fauna entomológica Scandinavica. V.11. Klapenborg, Scandinavian Science Press LTD. 176p.
- ILHARCO, F. A. 1992. **Equilíbrio biológico de afídeos.** Lisboa, Fundação Calouste Gulbenkian. 300p.
- ILHARCO, F. A. & GOMES, A. 1981. Montagem de afídeos para observação microscópica. Introdução de uma nova operação. **Agronomia Lusitana** 28:41-45.
- QUEDNAU, F. W. 1974. Notes on the Lizerini Blanchard with descriptions of new *Lizerius* and *Paoliella* species from South America and Africa (Homoptera: Aphididae). **Canadian Entomologist** 106:45-72.
- QUEDNAU, F. W. 2010. **Atlas of the Drepanosiphine aphids of the world. Part III:** Mindarinae Tullgren, 1909; Neophyllaphidinae Takahashi, 1921; Lizeriinae e.e. Blanchard, 1923; Pterastheniinae Remaudière & Quednau, 1988; Macropodaphidinae Zachvatkin & Aizenberg, 1960; Taiwanaphidinae Quednau & Remaudière, 1994; Spicaphidinae Essig, 1953; Phyllaphidinae Herrich-schaeffer in Koch, 1857; Israelaphidinae Ilharco 1961; Saltusaphidinae Baker, 1920 (Hemiptera: Sternorrhyncha, Aphididae). **Memoirs of the American Entomological Institute** 83:1-365.