

Scientific Note

Report of the mite *Lasioseius prorsoperitrematus* Abo-Shnaf, Sánchez & Moraes, 2016 (Acari: Blattisociidae) in Brazil associated with the insect *Sphenophorus levis* Vaurie, 1978 (Coleoptera: Curculionidae)

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Abstract. The sugarcane weevil, *Sphenophorus levis* Vaurie, 1978 (Coleoptera: Curculionidae), is a pest of sugarcane in Brazil. *Lasioseius prorsoperitrematus* Abo-Shnaf, Sánchez & Moraes, 2016 (Acari: Blattisociidae), described from the Dominican Republic, is reported from Brazil in association with *S. levis* in Iracemópolis, São Paulo state. The actual role of each organism in this association needs to be verified. A key to species of *Lasioseius* Berlese, 1916 recorded from Brazil associated to Coleoptera is provided.

Keywords: Gamasina, phoresis, sugarcane.

The sugarcane weevil, *Sphenophorus levis* Vaurie, 1978 (Coleoptera: Curculionidae) is a key pest of sugarcane in Brazil, where annual losses attributed to this insect can reach 20-30 ton/ha (Degaspari et al. 1987; Dinardo-Miranda et al. 2006; Leite et al. 2012). It is usually found in four Brazilian states, namely Mato Grosso do Sul, Minas Gerais, Paraná and São Paulo (Moraes & Ávila 2013; Dinardo-Miranda 2014). Eggs of this species are laid at the base of sugarcane stalks, and larvae tunnel toward the rhizome (Cerdeira et al. 1999). It is presently controlled with the use of pesticides, not always successfully, mainly because of the secluded behaviour of the juveniles (Zarbin et al. 2003). Promising results have been obtained in its control with the use of entomopathogenic nematodes (Giometti et al. 2011; Leite et al. 2012), but other biological control agents have been searched for. Predatory mites of the order Mesostigmata are commonly found in the soil, where they feed on a range of organisms, including other mites, nematodes, small insects and other invertebrates (Moraes et al. 2015).

Given the limited ability to disperse, predatory mites usually use insects as carriers to move between patches of ephemeral habitats, a process named phoresis, known for mesostigmatid mites of the families Laelapidae and Macrochelidae, families of a mesostigmatid group called Uropodina, and others (e.g. Hoffmann & López-Campos 1995; Krantz 1998; Bajerlein & Witalinski 2014). In this process, the transported organism is benefited, but it causes no damage to the carrying species.

The present study reports the first record in Brazil of the association between a species of *Lasioseius* Berlese, 1916 on a beetle.

A mesostigmatid mite was recently found on the body of adults of *S. levis* collected from sugarcane fields in Iracemópolis (22°34'53"S, 47°31'11"W), São Paulo state, Brazil (Fig. 1). They were most often found between coxae I and II of the insects, but also occasionally near the base of antennae. The mites were removed from *S. levis* with a brush, mounted on microscope slides with Hoyer's medium and examined under phase (Leica, DMLB) and interference (Nikon, Eclipse 80i) contrast microscopes. Voucher specimens of the mite were deposited in the Acarology Collection of Departamento de Entomologia e Acarologia,

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Figure 1. *Lasioseius prorsoperitrematus* Abo-Shnaf, Sánchez & Moraes, 2016 on the ventral surface of *Sphenophorus levis* Vaurie, 1978.

The mite was identified as *Lasioseius prorsoperitrematus* Abo-Shnaf, Sánchez & Moraes, 2016 (Figs. 2-3) after a comparison with the holotype, deposited at ESALQ/USP. This species was originally described from specimens collected from coconut fruits (*Cocos nucifera* L., Arecaceae) in the Dominican Republic (in the Caribbean) (Abo-Shnaf et al. 2016). Nothing is known about the biology of this mite species. The sugarcane weevil was identified based on the description study (Vaurie 1978).

Preliminary observations in the laboratory showed mites to leave the carrier and move onto eggs recently laid by the latter, tapping the surface continuously, as if trying to feed, leaving the egg after 10-12 hours (Fig. 4). It is possible that the association be only phoretic, with mites riding the insect in search of their actual prey or other types of food, as fungi (Moraes et al. 2015). But it could also cause some type of damage to *S. levis*, or even attack nematodes, some of which could be pathogenic to the insect. Further studies are necessary, to demonstrate the type of relation between *L. prorsoperitrematus* and *S. levis*.

Although phoresis does not seem common for *Lasioseius* (Blattisociidae), other three species reported in Brazil have records

of association with beetles (Santos et al. 2020): *Lasioseius floridensis* Berlese, 1916 was reported associated on host *Ips avulsus* (Eichhoff, 1868) (Curculionidae) (McGraw & Farrier 1969); *Lasioseius subterraneus* Chant, 1963 on culture of bruchid (Bruchidae) (Walter & Lindquist 1997) and *Lasioseius corticeus* Lindquist, 1971 on *Dendroctonus frontalis* Zimmermann, 1868 (Lindquist 1971), *Ips avulsus* (Eichhoff, 1868), *Ips calligraphus* (Germar, 1824) and *Ips grandicollis* (Eichhoff, 1868) (Moser & Roton 1971).



Figure 2. *Lasioseius prorsoperitrematus* Abo-Shnaf, Sánchez & Moraes, 2016, adult female: dorsum (A) and venter (B) of idiosoma.

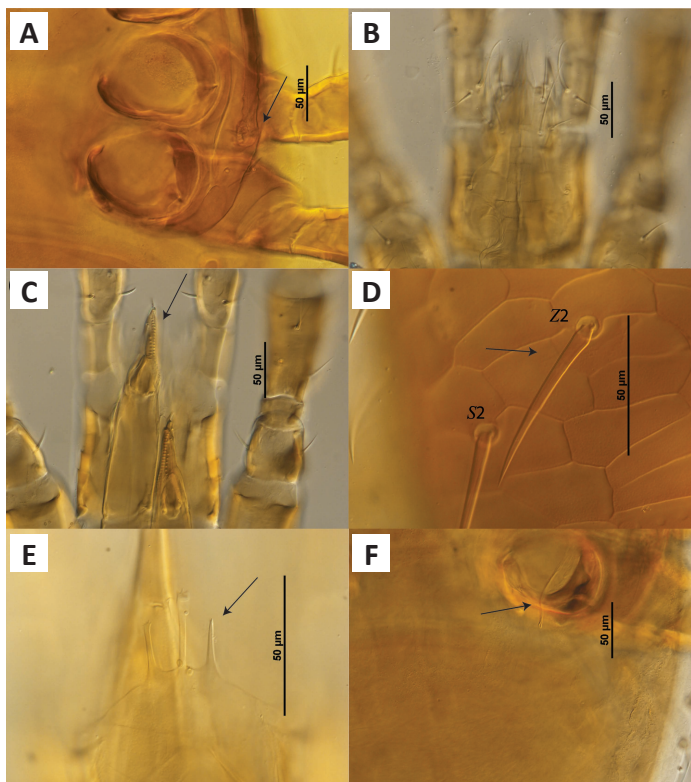


Figure 3. *Lasioseius prorsoperitrematus* Abo-Shnaf, Sánchez & Moraes, 2016: posterior portion of peritreme and stigma (A); hypostome (B); helicera (C); setae Z2 and base of S2 (D); tectum (E); spermatheca (F).

The rare occurrence of phoresis in this genus suggests that these mites are well adapted to the usual changes in the niche they occupy, given the polyphagous habits of species of this group (Moraes et al. 2015).

Differences between Brazilian *Lasioseius* associated with beetles can be seen in the dichotomous key provided in this note.



Figure 4. *Lasioseius prorsoperitrematus* Abo-Shnaf, Sánchez & Moraes, 2016 moving on a recently laid egg of *Sphenophorus levis* Vaurie, 1978.

Key to *Lasioseius* species recorded from Brazil in association with Coleoptera (based on females)

1. Movable cheliceral digit with five or more teeth; posterior margin of sternal shield convex; with a pair of robust endopodal shields beside coxae III-IV *Lasioseius (Endopodalius)* Christian & Karg, 2006
... *Lasioseius prorsoperitrematus* Abo-Shnaf, Sánchez & Moraes, 2016
- 1'. Movable cheliceral digit usually with at most four teeth; posterior margin of sternal shield straight or concave; without robust endopodal shield beside coxae III *Lasioseius (Lasioseius)* Berlese, 1916 2
2. Dorsal shield with seta r4 short, not more than half as long as s4...
..... *Lasioseius floridensis* Berlese, 1916
- 2'. Dorsal shield with seta r4 longer, over half as long as long as s4 3
3. Most dorsal setae simple *Lasioseius subterraneus* Chant, 1963
- 3'. Most dorsal setae tricarinate.. *Lasioseius corticeus* Lindquist, 1971

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Authors' Contributions

FCNE and LSN detected the mite in association with the sugarcane weevil. VB and JCS helped in the identification of the mite. FCNE, VB, JCS, LSN and GJM wrote the note.

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