

## Notas Científicas

# New species of *Rhinoleucophenga*, a potential predator of pineapple mealybugs

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**Abstract** – The objective of this work was to describe a new species of *Rhinoleucophenga* (Diptera: Drosophilidae). *Rhinoleucophenga capixabensis* sp. nov. is described based on specimens collected from pineapple (*Ananas comosus* var. *comosus*) infested with *Dysmicoccus brevipes* (Hemiptera: Pseudococcidae) in the state of Espírito Santo, Brazil. Distinguishing characters of *R. capixabensis* sp. nov. include hyaline wings, a strong seta on the second antennal segment, body length of about 2–3 mm, uniformly dark brown scutellum, one pair of strong prescutellar setae, ventral epandrial lobes with about 17–18 teeth, and female cerci with approximately 20 long setae.

**Index terms:** Diptera, Drosophilidae, biological control, integrated pest management, natural enemy, predator.

## Nova espécie de *Rhinoleucophenga*, potencial predadora da cochonilha-do-abacaxizeiro

**Resumo** – O objetivo deste trabalho foi descrever uma nova espécie de *Rhinoleucophenga* (Diptera: Drosophilidae). *Rhinoleucophenga capixabensis* sp. nov. foi descrita com base em espécimes coletados em associação com *Dysmicoccus brevipes* (Hemiptera: Pseudococcidae) em *Ananas comosus* var. *comosus*, no Estado do Espírito Santo, Brasil. As principais características de *R. capixabensis* sp. nov. incluem asas hialinas, uma seta forte no segundo segmento da antena, comprimento do corpo de aproximadamente 2–3 mm, escutelo uniformemente castanho-escuro, um par robusto de setas prescutelares, lobos epadriais ventrais com aproximadamente 17–18 dentes e cercos da fêmea com aproximadamente 20 setas longas.

**Termos para indexação:** Diptera, Drosophilidae, controle biológico, manejo integrado de pragas, inimigo natural, predador.

Predatory Drosophilidae (Insecta: Diptera) are relatively little-known but occur in several genera, including *Rhinoleucophenga* Hendel, 1917. The limited information available concerning *Rhinoleucophenga* species indicate that they are larval predators of Sternorrhyncha, such as scale insects (Vilela, 1990; Grimaldi, 1993). Most scale insect species known to occur in Espírito Santo, Brazil, are polyphagous and widely distributed (Culik et al., 2007, 2008). Thus, they are potential pests of many agricultural crops in many areas. Most *Rhinoleucophenga* species are apparently known only from the original descriptions (Bächli, 2008).

At least six species of *Rhinoleucophenga*, including *R. angustifrons* Malogolowkin, 1946, *R. lopesi* Malogolowkin, 1946, *R. personata* Malogolowkin,

1946, *R. matogrossensis* Malogolowkin, 1946 and *R. nigrescens* Malogolowkin, 1946, described from the states of Mato Grosso do Sul and Rio de Janeiro, and *R. obesa* Loew, 1872 or a species similar to *R. obesa*, occur in Brazil (Malogolowkin, 1946; Vilela, 1990). Adult *Rhinoleucophenga* have more than about 35 supracervical setae, 50 or more interfrontal setulae, and acrostichal setulae in 12 rows (Okada, 1989; Grimaldi, 1993).

Because knowledge of pest and beneficial insects is essential for integrated pest management (IPM), and as part of ongoing efforts to document insect biodiversity of Espírito Santo, Brazil (Culik et al., 2007, 2008), this research was conducted to determine what species of insects are associated with pineapple (*Ananas comosus* var. *comosus*) in this state.

The objective of this work was to describe a new species of *Rhinoleucophenga* that was collected from pineapple infested with mealybugs in Espírito Santo, Brazil.

The *Rhinoleucophenga* species described in this study was reared from an immature (unripe) pineapple fruit heavily infested with *Dysmicoccus brevipes* Cockerell, 1893 mealybugs (Hemiptera: Pseudococcidae) that was collected from a pineapple field at the Instituto Capixaba de Pesquisa, Assistência Técnica e Extensão Rural (Incaper) Pacotuba experimental farm (20.750°S, 41.290°W, 146 m altitude) in the municipality of Cachoeiro do Itapemirim, ES, Brazil, on 16 January 2008, during surveys of scale insects and their natural enemies. After collection, the pineapple sample was placed in a plastic bag and transported to research facilities in Vitória, ES, where it was maintained at room temperature (about 22°C) in a plastic container covered with linen to allow development and emergence of natural enemies present. The sample was examined every few days, for about four weeks, to collect and preserve samples of the natural enemies that developed as well as associated mealybugs. Several drosophilid pupae were also collected from the sample and allowed to develop separately to enable preservation of puparia with associated adults that emerged.

The adult drosophilids collected from the mealybug infested pineapple sample (20 adults) were preserved in alcohol and mounted on slides for study and identification. Measurements were made on individuals placed in temporary mounts on depression slides in lactic acid, using a Motic SMZ-143 stereomicroscope and a Moticam 480 camera, and photographs were made of dissected genital structures mounted in synthetic resin mounting medium on microscope slides using a Leica compound microscope and a Motic 2000 camera. Type specimens and the other specimens collected will be deposited in the insect collections of the following institutions: Incaper, Vitória, ES; Museu Nacional (MNRJ), Rio de Janeiro, RJ; and Universidade Federal do Espírito Santo (Ufes), Vitória, ES, Brazil. Terminology follows that of Harrison (1951) and Grimaldi (1990).

***Rhinoleucophenga capixabensis* sp. nov.** (Figure 1) Diagnosis – *Rhinoleucophenga capixabensis* sp. nov. is distinguished from all other known *Rhinoleucophenga* species by having the following combination of characters: hyaline wings, a strong seta on the second

antennal segment, body length of about 2–3 mm, uniformly dark brown scutellum, one pair of strong prescutellar setae, left ventral epandrial lobe with a row of about 18 teeth on the medial margin, right ventral epandrial lobe with about 17 teeth on the medial margin, and each female cercus with approximately 20 long setae (setae with length about equal to or greater than the width of the cercus).

Description – Small, dark brown flies. Body length: 2.21–3.04 mm (n = 6). Head: antenna with a strong seta on the second segment about as long as or longer than the width of the segment; arista dark with lighter, yellowish base (aristomere 1), with 5–6 dorsal and 3–4 ventral branches in addition to the distal fork; front and face brownish yellow, orbital plates and ocellar triangle may be darker and area above antennae darker extending ventrally between each eye and antenna and between antennae to about the middle of the carina; about 60 interfrontal setulae including seven setulae in a row below each proclinate orbital seta and seven setulae in a row along the frontal suture above each antenna; one pair of prominent oral vibrissae; palp with about 18 setae; eyes red, eye (interfacetal) setulae sparse, thin, straight, and short; area below the eye dark anteriorly, yellowish posteriorly. Thorax: mesonotum dark brown (slightly paler longitudinal areas may be apparent along the midline or on each side); halteres whitish to pale yellow; acrostichal hairs in about 12 rows (lateral rows less regular); one pair of prescutellar setae, and anterior and posterior dorsocentral setae present; prescutellar about 2/3 length of posterior dorsocentral seta; anterior dorsocentral seta about 1/2 length of posterior dorsocentral seta; ratio of transverse to longitudinal distance between the dorsocentral setae 4:1; scutellum dark brown with basal scutellars convergent, apical scutellars cruciate (usually); scutellum width to length ratio 1.6:1; legs yellow-brown, tibiae and tarsi with dense rows of short, black setae; dorsopreapical bristles present on midtibia; wings hyaline; wing length 2.43–3.06 mm (n = 6); costal-index 2.9, 4<sup>th</sup> vein index 2.2. Abdomen: abdomen mostly dark brown; abdominal tergite II relatively light colored with a dark brown anterolateral area or spot on each side (tergite sometimes appearing uniformly brown); the anterior and posterior margins of abdominal tergite III may also be paler. Male terminalia (one individual examined): left ventral epandrial lobe with a row of about 18 teeth on the medial margin,

right ventral epandrial lobe with about 17 teeth on the medial margin (Figure 1 A). Female terminalia (two individuals examined): each female cercus with approximately 20 long setae (setae with length about equal to or greater than the width of the cercus), with the length of the longest seta on the cercus about two times the length of the cercus (Figure 1 B).

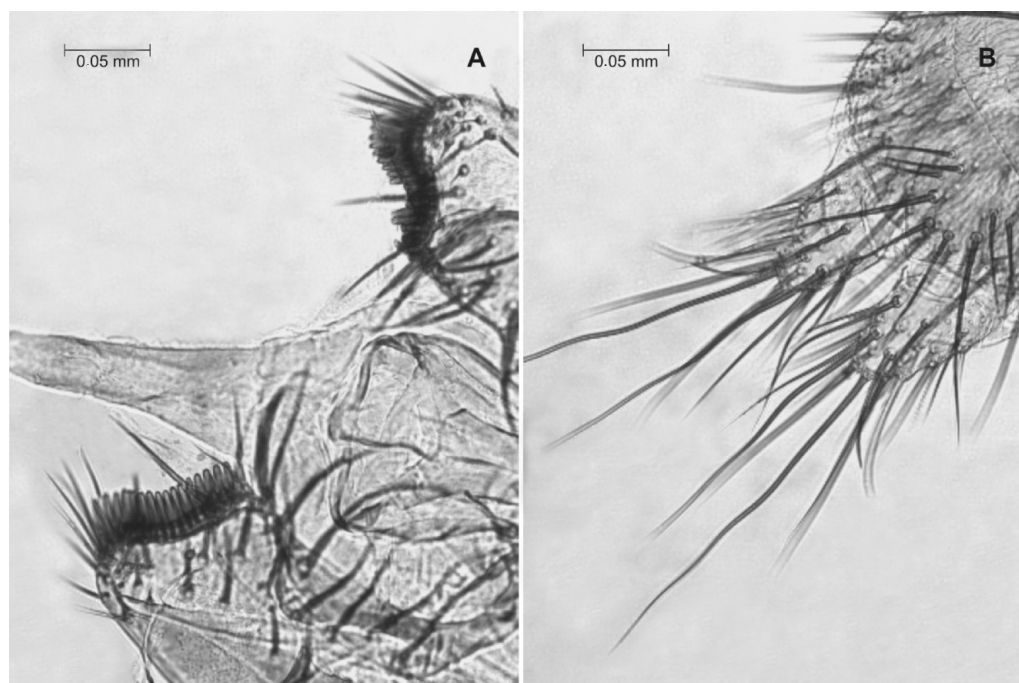
Type material – Holotype: one adult (male), Cachoeiro de Itapemirim, ES, Brazil, 16.I.2008, M.P. Culik, ex. *Ananas comosus* (L.) Merr. var. *comosus* infested with *Dysmicoccus brevipes* Cockerell (Pseudococcidae: Hemiptera), (Ufes). Paratypes: four adults (two male, two female), same data as holotype, (Ufes), four adults (two male, two female), same data as holotype, (MNRJ).

Etymology – The specific name refers to “capixaba”, the common name for those native to or things of the state of Espírito Santo, Brazil, where the species was found.

Geographic distribution – Known only from locality of the holotype (20.750°S, 41.290°W, 146 m altitude), municipality of Cachoeiro do Itapemirim, ES, Brazil.

Comments – *Rhinoleucophenga capixabensis* sp. nov. differs from *R. gigantea* Thomson, 1869, *R. obesa* Loew, 1872, and *R. pallida* Hendel, 1917 in having hyaline wings. Of the other congeners with no distinct

abdominal pattern, *R. capixabensis* sp. nov. differs from *R. bezzii* Duda, 1927, in having a strong seta on antennal segment two, and from *R. matogrossensis* Malogolowkin, 1946 and *R. nigrescens* Malogolowkin, 1946, in size (body length of approximately 2–3 mm in comparison to 5–6 mm for *R. matogrossensis* and *R. nigrescens*). Of the seven *Rhinoleucophenga* species considered to have distinct abdominal patterns (Malogolowkin, 1946), *R. capixabensis* sp. nov. differs from *R. punctulata* Duda, 1929 and *R. subradiata* Duda, 1929 by the small size of the latter species (body length about 1.5 mm) as well as by the presence of spots on the mesonotum of *R. punctulata* and short branches of the arisae of *R. subradiata*. *Rhinoleucophenga capixabensis* sp. nov. also differs from *R. angustifrons* Malogolowkin, 1946 and *R. stigma* var. *flaviceps* Duda, 1929 in having a dark area below the eye, and from *R. stigma* Hendel, 1917 in lacking a dark spot in the ocellar triangle. *Rhinoleucophenga capixabensis* sp. nov. differs from *R. brevipilumata* Duda, 1927 in having a uniformly dark brown scutellum in contrast to the yellow scutellum with dark brown lateral margins present in the latter species (*R. punctulata* also has a yellow scutellum with dark brown lateral margins, and *R. subradiata*, *R. angustifrons*, *R. stigma* var. *flaviceps*, and *R. stigma* have a yellow scutellum and a dark posterior margin on abdominal segments).



**Figure 1.** *Rhinoleucophenga capixabensis* sp. nov. (A) Male, ventral epandrial lobes, base of aedeagus, and associated structures, posterior view. (B) Female, cerci, dorsal view.

*Rhinoleucophenga capixabensis* sp. nov. appears to be most similar to the species *R. personata* Malogolowkin, 1946 and *R. lopesi* Malogolowkin, 1946, based on the presence of a uniformly dark brown scutellum and relatively light colored abdominal tergite II with a dark anterolateral spot on each side. However, *R. capixabensis* sp. nov. differs from *R. personata* most notably in having 17–18 teeth on the ventral epandrial lobes in contrast to 12–13 teeth present on the epandrial lobes of *R. personata*, as well as reddish eye color, body length of 2.21–3.04 mm, wing length of 2.43–3.06 mm, and 4<sup>th</sup> vein index 2.2 in comparison to *R. personata*, which has brownish eye color, body length of 4.4 mm, wing length of 5 mm, and 4<sup>th</sup> vein index 2.7. *Rhinoleucophenga capixabensis* sp. nov. differs from *R. lopesi* in having about 20 long setae on the female cercus in contrast to about 13 setae present on the female cercus of *R. lopesi*, as illustrated by Malogolowkin (1946), and other characteristics including body length (2.21–3.04 vs. 3.5 mm), eye color (red vs. brown), number of rows of setulae between the orbital plates (about 4 or 6 vs. 8), number of setae on the palp (about 18 vs. 2), wing length (2.43–3.06 vs. 3.5 mm), costal index (2.9 vs. 3.9), transverse:longitudinal distance between the dorsocentral setae (4:1 vs. 3:1), acrostichal setulae in about 12 rows with lateral rows irregular (vs. 12 regular rows), and scutellum width:length (1.6:1 vs. 2:1).

Results of this study confirm that potentially beneficial insects that have remained largely unknown, overlooked, and ignored, such as *Rhinoleucophenga* species, are present in areas such as Espírito Santo, and indicate the importance of using integrated pest management methods, and avoiding improper and harmful management practices such as misuse of pesticides, to prevent destruction of beneficial insects and natural enemies that may commonly help control scale insects and other pests in such areas. As predators of scale insects, *Rhinoleucophenga* species are of potential use as natural enemies of pests in economically important crops, and results of this study will facilitate additional research on *R. capixabensis* sp. nov. to determine its potential effectiveness as a biological control agent. Results of this study also demonstrate the practical value of

research on biodiversity to increase knowledge of organisms of potential importance for sustainable development (such as biological control agents) and confirm the need for greater research on and preservation of such biodiversity.

### Acknowledgements

To Fundação de Apoio à Ciência e Tecnologia do Espírito Santo, Financiadora de Estudos e Projetos, and Conselho Nacional de Desenvolvimento Científico e Tecnológico, Brazil, for providing financial support for this work; to Y. Ben-Dov, ARO Volcani Center, for confirming the identification of the mealybug species associated with *Rhinoleucophenga capixabensis* sp. nov. in this study.

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Received on December 5, 2008 and accepted on March 31, 2009