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A new species of *Malacophagula* (Diptera: Sarcophagidae) obtained during a rapid biodiversity assessment in Sierra de la Ventana, Argentina

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Una nueva especie de *Malacophagula* (Diptera: Sarcophagidae) obtenida durante una evaluación rápida de la biodiversidad en Sierra de la Ventana, Argentina

RESUMEN. Se describe una nueva especie del género *Malacophagula* Bequaert (Diptera: Sarcophagidae), *M. ventana* **sp. nov.**, recolectada durante una Evaluación Rápida de Biodiversidad (EBR) en Sierra de la Ventana, un área de alto valor para la conservación en Argentina. En este trabajo se registra por primera vez, el género *Malacophagula* en Argentina. Se brindan ilustraciones del *habitus* y estructuras fálicas, para el diagnóstico y reconocimiento de la especie.

PALABRAS CLAVE. Buenos Aires. Moscas de la carne. Sarcophaginae. Taxonomía.

ABSTRACT. A new species of the genus *Malacophagula* Bequaert (Diptera: Sarcophagidae) is described, *M. ventana* **sp. nov.**, collected during a Rapid Biodiversity Assessment (RBA) in Sierra de la Ventana, an area of high value for conservation of Argentina. In this work the genus *Malacophagula* is recorded for the first time in Argentina. Illustrations of the *habitus* and phallic structures to diagnose and recognition of this species are provided.

KEYWORDS. Buenos Aires. Flesh flies. Sarcophaginae. Taxonomy.

INTRODUCTION

Biodiversity inventorying is an important task for systematics and conservation of global and regional biodiversity. In conservation practice there is the need to rapidly assess the extant biodiversity in endangered habitats and ecosystems for the purpose of conservation and management practices. Among the approaches for biodiversity assessment on multiple taxa inventory, the Rapid Biodiversity Assessment (RBA) focuses on certain taxa to provide an initial estimate of biological richness of a given site/region (Singh, 2002). Thus, RBA is oriented to collect voucher specimens and document the biodiversity in highly endangered or priority areas for conservation before it is permanently lost.

The mountain range of Sierra de la Ventana covers a large region of the southwestern areas of Buenos Aires province. Parts of these areas are protected by the Parque Provincial Ernesto Tornquist. This reserve occupies 6,707 ha of rocky peaks and grasslands that range between 450 and 1,175 meters above sea level, with several permanent watercourses. This park constitutes one of the few protected areas in the pampean grasslands, but has a special condition as an "orographic island" with high value for conservation. The herbaceous steppe dominated by species of the genera *Stipa* L., *Piptochaetium* J.Presl., *Festuca* L. and *Briza* L. are important due to the peculiarities of its environment, its richness and documented endemisms (Frangi & Bottino, 1995). During a RBA exploration focused on the diversity of Calyptratae inhabiting the natural remnants in Sierra de la Ventana we obtained a specimen of an undescribed species of *Malacophagula* Bequaert.

Lopes (1969a) considered the genus as part of Sarcophagini. Posteriorly, the tribal classification based on first-instar larval character states proposed by this author (Lopes, 1983) included *Malacophagula* along with species of *Lepidodexia* Brauer & Bergenstamm and *Titanogrypa* Townsend in the tribe Johnsoniini. According to the phylogenetic tree obtained by Buenaventura & Pape (2018) *Malacophagula* is part of the "Argoravinia clade" composed of four genera (*Argoravinia* Townsend,

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Malacophagula, *Malacophagomyia* Lopes and *Rafaelia* Townsend) and the monophyly of *Malacophagula* was supported by five autapomorphies: head rounded in profile, first flagellomere shortened, lunule widened, postgena swollen and lower calypter rounded.

The genus *Malacophagula* was originally erected to include *M. neotropica* Bequaert, 1925. Lopes (1969b) described the genus *Weyrauchimyia* with two species, *W. bicoloricauda* Lopes and *W. peruviana* Lopes. Later, Pape (1996), in his World catalog of Sarcophagidae, synonymized *Weyrauchimyia* with *Malacophagula*. Today, *Malacophagula* comprises a small group of sarcophagine flies known from five described species distributed in South America in northern areas of Brazil and in Andean areas of Ecuador, Peru and Chile: *M. andina* (Lopes & Tibana), *M. bicoloricauda* (Lopes), *M. neotropica*, *M. peruviana* (Lopes), and *M. schlingeri* (Lopes). According to the available information on the biology of the species of *Malacophagula* these appear to be associated to land snails as true parasites (Bequaert, 1925; Lopes, 1940, 1969b).

The objective of this paper is to describe the new species found in the RBA, and to expand the known distribution of the genus to the mountain range of Sierra de la Ventana in Argentina. representing an eastward extension of this genus in temperate South America. Photographs of the *habitus* of the adult male are provided to diagnose and separate the species from other *Malacophagula*.

MATERIAL AND METHODS

The samplings during the RBA were undertaken in well preserved areas of native grasslands in the Parque Provincial Ernesto Tornquist, during 2016 (Fig. 1a). The capture of the holotype of the new species occurred near a stream with a hand net (Fig 1b).

The holotype of the new species was photographed using a Zeiss Discovery Z12 stereomicroscope equipped with a Canon EOS 80D digital camera. High-resolution digital photos were produced by composite stacking of several images taken in different focal planes. For this purpose, we used stacking software Helicon Focus 8.1.0 and edited using the software Adobe Photoshop CS6 to clarify and remove artifacts from images backgrounds.

Terminology follows Cumming & Wood (2017) for external morphology. The general terminology of the phallic structures follows Mello-Patiu & Pape (2000), Giroux et al. (2010) and Buenaventura & Pape (2018). The term *paraphallus* is used as adopted by Whitmore et al. (2013) and "hillae" in the sense of Buenaventura & Pape (2018).

Body length measurements are given in millimeters while other measurements are provided as ratios. The type specimen is deposited in the collection of Museo Argentino de Ciencias Naturales "Bernardino Rivadavia", Buenos Aires, Argentina (MACN).

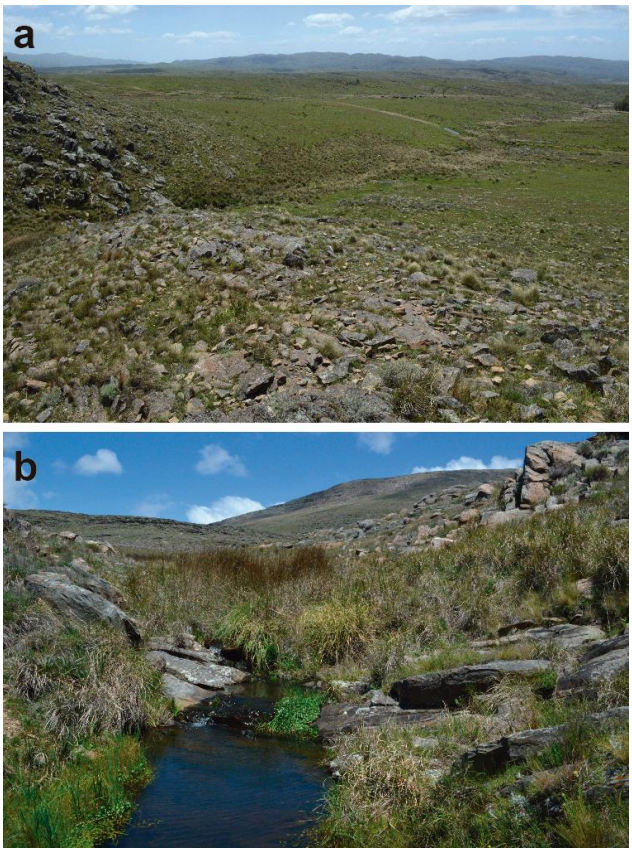

Fig. 1. Landscape from Tornquist Provincial Park in the Sierra de la Ventana. a. Grasslands of Sierra de la Ventana. b. Collection site of the holotype of *Malacophagula ventana* **sp. nov.**

RESULTS

***Malacophagula ventana* sp. nov.**

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HOLOTYPE [MACN_En 39927]: "Arg, BsAs, PPE Tornquist / Est. Meteorológica / -38.055280, -61.978819 / transecta, 520 m.a.s.l. / 26.X.2016, Mulieri & Olea [white label]" // "HOLOTYPE / Malacophagula / ventana [red label, black frame.]"

Description. Male (Fig. 2a). Length: 6.40 mm

Head (Fig. 2b). Parafacial, fronto-orbital plate and postocular orbits blackish with silver pruinosity; facial ridge with setae near the vibrissa; parafacial with row of strong setulae close to eye, similar in size to subvibrissal setae, with additional row of setulae closer to eye; frons about 0.18 head width at level of ocellar triangle; frontal vitta blackish; 12 well-developed frontal setae reaching level of apex of pedicel; rows of frontal setae parallel except anteriormost 2 divergent; reclinate orbital seta present, proclinate orbital setae absent; ocellar setae small not differentiated; outer vertical seta well differentiated from postocular setae; gena with silver pruinosity, genal groove

dark brown; gena with black setae; postgena silvery pruinose with black setae; antenna black; first flagellomere approximately 1.2x longer than pedicel; arista short plumose on basal half; palpus blackish.

Thorax. Black with silvery-gray pruinosity; chaetotaxy: acrostichals 1-2 + 2, dorsocentrals 2-3 + 3, intra-alars 1+3, supra-alars 1 + 3, postpronotals 3, notopleurals 4-3; postalar wall bare; postalar callus with 2 setae; scutellum with a pair of basal and subapical setae, apical setae present, and discal setae absent; katepisternum with 2 setae; meral setae 6-8; proepisternum bare. Wing. Hyaline, with brown veins; tegula black; basicosta whitish; vein R4+5 with setulae dorsally on 1/2 of distance to crossvein r-m; vein R1 setulose in full length; cell r4+5 open at wing margin; costal spine well developed; third costal sector bare ventrally. Legs. Black, pulvilli brown; mid femur with 3 median anterior setae, a row of anteroventral setae, 2-3 preapical posterior setae, a row of posteroventral setae, with a ctenidium; mid tibia with 3 median anterior seta, 2 posterior-dorsal seta and 1 posterior setae; hind trochanter without a ventromedian pad of short, spiniform setae.

Fig. 2. *Malacophagula ventana* sp. nov. male. a. Male *habitus*. b. Head, lateral view. c. Cercus, dorsal view. d. Genitalia, lateral view. References= cer: cercus, pr: pregonite, po: posgonite, sur: surstylus. Scale bars= a: 1mm, b: 0.5mm, c-d: 0.1mm.

Abdomen. Black with silvery pruinosity except T5 with pale golden pruinosity; T4 without a pair of median marginal and 3 pair of lateral marginal setae; T5 with a row of marginal setae; ST2-4 covered with villosity. ST5 V-shaped with long marginal setae on inner margin.

Terminalia. Syntergosternite 7+8 shining black with 2-3 rows of marginal erect setae; epandrium black; cerci straight in profile, with short spines in distal half and setae on cercal base; cercus with cercal base 1.4 times the cercal prong (Fig. 2c). Pregonite curved (Fig. 2d); postgonite with the apex pointed and curved (Fig. 2d); basiphallus and distiphallus distinctly separated by dorsal membranous strip; vesica heavily sclerotized broad and flat, with two small heavily sclerotized medial lobes (Fig. 3a); juxta proximally well demarcated from paraphallus by a desclerotized strip, distally composed by a pair of spatulate-shaped apophyses less sclerotized (Fig. 3a, b); median stylus elongated slightly curved upward (Fig. 3a-b); lateral stylus elongated with spines ventrally, with hillae directed latero-ventrally at base (Fig. 3b).

Female. Unknown.

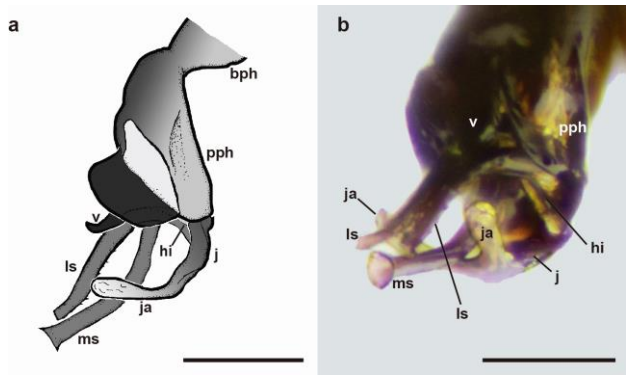

Fig. 3. Phallus of *Malacophagula ventana* sp. nov. a. Lateral view (Scale bar= 0.1 mm). b. Ventro-lateral view (Scale bar= 0.1 mm). References= bph: basiphallus, hi: hillae, j: juxta, ja: juxtal apophysis, ls: lateral stylus, ms: median stylus, pph: paraphallus, v: vesica. Scale bars= 0.1mm.

Etymology. The species epithet “ventana” should be treated as a noun in apposition. The name refers to the mountain range of Sierra de la Ventana.

Diagnosis. In its phallic appearance, *M. ventana* resembles *M. andina*, with which it shares the median stylus curved upward. The new species differs from *M. andina* by the juxtal morphology with apophyses more elongated and spatulate-shaped distally.

Distribution. ARGENTINA (Buenos Aires).

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