

SHORT COMMUNICATION

First Mexican record of *Neoariseumus maesi* with the description of the female (Diptera: Psychodidae)

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Abstract. *Neoariseumus maesi* Collantes & Martínez-Ortega, 1999 was described based on male specimens collected in Nicaragua. Here we record this species in Mexico for the first time. This corresponds to the first record of the genus in this country. *Neoariseumus maesi* is the only species of the genus registered in the study area and for that reason the sexes can be easily associated. We present morphological description of the previously unknown female.

Key words. Diptera, Psychodinae, Maruinini, *Neoariseumus*, moth fly, new record, female description, Mexico

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Introduction

Only two species of *Neoariseumus* Botosaneanu & Vaillant, 1970 are known in America. *Neoariseumus niger* Banks, 1894 is widely distributed in the USA (Indiana, Maryland, Michigan, Minnesota, New York, and Virginia) and in Canada (Ontario) (QUATE 1955), with a clear distribution in the Nearctic Region. *Neoariseumus maesi* Collantes & Martínez-Ortega, 1999 was described from Nicaragua, and since then, only known from that country of the Neotropical Region. Both sexes of the former species have been described, but only the males are known for the latter. There are 18 described species of the genus from the Afrotropical Region (TONNOIR 1939; SACHELL 1955; JUNG 1956; DUCKHOUSE 1978, 1987; KVIFTE 2012; JEŽEK & OBOŇA 2016; KVIFTE & WAGNER 2017), one species from the Oriental Region (JEŽEK 2004) and four species from the Palaearctic Region (TOKUNAGA 1961, VAILLANT 1963, WAGNER 1978, WAGNER & SALAMANNA 1984). The genus *Neoariseumus* belongs to the tribe Maruinini Enderlein, 1937. Adults of *Neoariseumus* are recognized by separate eyes, antenna with 13 flagellomeres with the apical two or three reduced, wing with radial sector pectinate and complete, and radial fork basal of medial fork. In males, the head presents small allurement organs, the aedeagal complex is asymmetric and composed of a large main

distal portion (distiphallus), surstyli with the basal region broadened, with some creases, some distal brush-shaped retinacula, and with numerous strong setae scattered before retinacula (COLLANTES & MARTÍNEZ-ORTEGA 1999, WAGNER & IBÁÑEZ-BERNAL 2009, JEŽEK & OBOŇA 2016).

In this work we record *Neoariseumus maesi* in Mexico for the first time, this being also the first record of the genus in this country, and present description of the female characteristics.

Material and methods

Study area. Specimens were collected in the locality of Rancho El Salado (18°20'13"N, 98°57'29"W), in the municipality of Jolalpan in southwestern portion of the State of Puebla, Mexico. This locality belongs to the physiographic province of Neovolcanic Axis and Sierra Madre del Sur, a component of Cuenca del Balsas of the biogeographic Mexican Transition Zone (INEGI 2009, MORRONE 2005). Climate is warm subhumid with summer rainfalls, with annual median temperature of 25.4 °C and annual precipitation mean of 827.1 mm (TREJO-VÁZQUEZ 1999). Vegetation is predominantly tropical dry forest with secondary shrub elements. In this place, there is clear seasonality, with some arboreal species losing foliage in the dry season for about six months (RZEDOWSKI 1978).



Sampling procedures. Moth flies were captured with Miniature CDC-UV light traps (Model 912, John W. Hock Company, Gainesville, FL.), these traps were placed on tree or shrub branches about 40 cm above the ground from 7:00 pm to 7:00 am. Specimens were killed with ethyl acetate and stored dry in Petri boxes.

Specimens preparation. Specimens were cleared, dissected and permanently mounted on slides following the procedure outlined by IBÁÑEZ-BERNAL (2005), with Euparal as permanent mounting medium (Bioquip Products, Inc., Rancho Dominguez, CA, USA). Specimens were examined using a Nikon Eclipse 50i phase contrast microscope. Measurements were obtained using an ocular micrometer and are given in millimeters. Drawings were made with the aid of a Nikon Y-IDT drawing tube, art work completed by mixed media drawing technique using Chinese ink and charcoal, and then digitally edited in Corel PHOTO-PAINT X3 graphic software (Version 13). Specimens are deposited in IEXA: Colección de Insectos del Instituto de Ecología, A. C., Xalapa, Veracruz, México.

Terminology. We follow MERZ & HAENNI (2000) for general morphological terminology, except for the male genitalia structures for which we use the terminology suggested by SINCLAIR (2000) and CURLER & MOULTON (2012). We also follow KOTRBA (2000) for female postabdomen and terminology used for description of *Trichocera (Staryia)* spp. by KRZEMIŃSKA & GORZKA (2016), as female genitalia are very similar to those of Psychodinae. **Measurements.** Head width was taken in the widest part, whereas the length was measured from the vertex to the lower margin of clypeus. Wing length is measured from the base of costa after the basal node to the wing tip. Ratio of the palpal segments is given considering the length of palpal segment I as a unit (1.0).

Taxonomy

Neoarisemus maesi Collantes & Martínez-Ortega, 1999

Neoarisemus maesi Collantes & Martínez-Ortega, 1999: 279. Type locality: Nicaragua, Masaya, Las Flores.

Material examined. MEXICO: PUEBLA: Jolalpan, Rancho El Salado, 18°20'28.2"N, 98°57'18.0"W, altitude: 933–944 m, CDC-UV light traps, J. Durán-Luz, col., 01–v–2015, 2 ♀♀; 02–v–2015, 1 ♂, 2 ♀♀; 03–v–2015, 2 ♂♂; 13–ii–2017, 2 ♀♀; 14–ii–2017, 1 ♀; 30–iv–2017, 6 ♂♂, 1 ♀; 01–v–2017, 1 ♂; 02–v–2017, 2 ♂♂; 29–viii–2017, 1 ♀.

Differential diagnosis of male. Head with small allure-ment organs. Two rows of fine filiform ascoids, forming complete circlet at apex of basal bulb. Flagellomeres 1–11 flask-shaped. Surstyli with dorsal pleats (see COLLANTES & MARTÍNEZ-ORTEGA 1999, for complete description).

Differential diagnosis of female. Head without allure-ment organs, without interocular suture, eye-bridge with 3 rows of facets, interocular space 7–8 facet diameters, flagellomeres 1–11 fusiform, with pair of V-shaped ascoids, genitalia with large oval oviduct endings, supported by two long laminar rods to genital chamber having two groups of sensilla internally in posterior portion, subge-

nital plate with anterior margin sclerotized, hypogynial valves poorly developed with shallow concavity between them, and long cerci.

Description of female. Head slightly wider than long, with 4 supra-ocular setae alveoli; ocular bridge with three rows of facets; eyes separated by 7–8 facet diameters; without interocular suture; without sensorial organs on head. Length of vertex at top margin of eyes represents approximately one third of total head length. Frontal patch of alveoli extending up between eyes, continuing as upper patch. Ratio of palpal segments 1.0 : 1.34 : 1.81 : 2.23. Palpal apex reaching base of flagellomere 8 (Fig. 1). Labium with inverted “Y” sclerite, and internally with 14–16 small spiniform setae near middle; labella bulbous with about 5 setae and five short spiniform setae on internal margin (Fig. 2). Antenna 1.9× longer than palpus; scape slightly longer than pedicel; flagellomeres reducing in size towards apex, 1–11 nodiform, each with pair of “V”-shaped ascoids, apical flagellomere without ascoids and with small apiculus (Figs 3, 4).

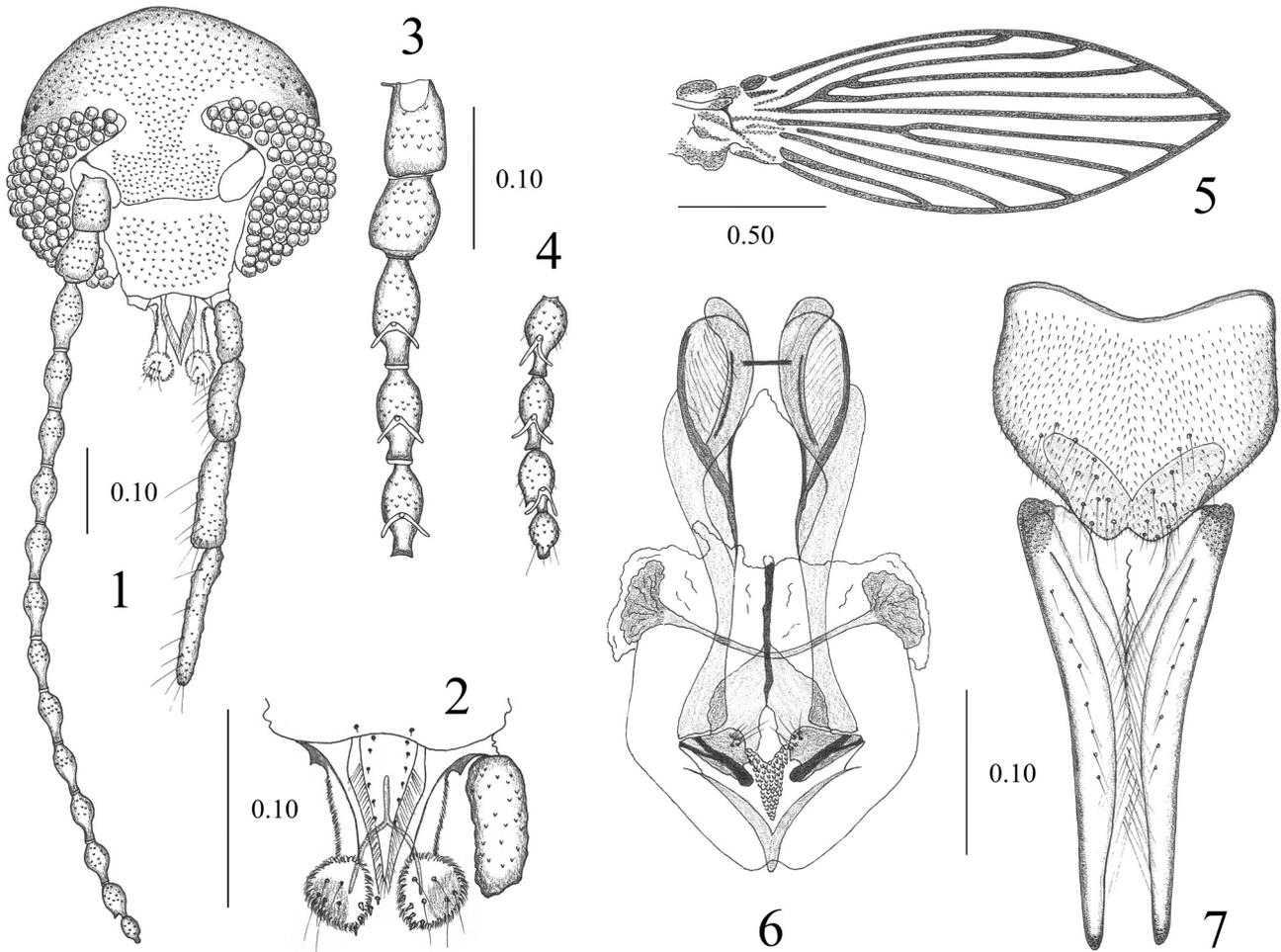
Wing 2.9× longer than wide, with membrane faintly infuscate; apex acute; R_1 very close to C; Sc ending beyond level of base of R_1 ; radial sector pectinate; R_{2+3} very short; R_5 ending at wing apex; CuA_2 broadened at base (Fig. 5).

Ventral receptacle with two oval structures linked by sclerotized short rod, each supported by long bar that reaches level of subgenital plate disc, ending in sclerotized compound plate at genital chamber, that produces two lobes with sclerotized rib, each with group of 5 setae; between these pilose lobes there is sclerotized inverted V plate to which central sclerotized rod produce anteriorly about halfway through pair of longitudinal rods; rugose central lobe, between pilose lobes, extended posteriorly, ending just at level of hypogynial valve bases (Fig. 6). Subgenital plate slightly wider than long, completely covered with short setae on external surface and with long setae on distal half, its basal margin strongly sclerotized internally, slightly concave in middle and expanded laterally, distal margin with converging oval hypogynial valves, that are separated just at end by triangular small concavity. Cerci 1.8× length of subgenital plate (Fig. 7).

Measurements. (n = 9). Head width: 0.401 (0.36–0.43); head length: 0.334 (0.31–0.35); labrum length: 0.092 (0.09–0.10); proboscis length: 0.110 (0.10–0.12); palpus length: 0.472 (0.46–0.50); antenna length: 0.898 (0.88–0.91) [n = 2]; wing length: 1.639 (1.55–1.70); wing width: 0.573 (0.53–0.61); width of subgenital plate: 0.173 (0.16–0.19); total length of subgenital plate: 0.157 (0.15–0.17); cerci length: 0.289 (0.28–0.30).

Distribution. Nicaragua (COLLANTES & MARTÍNEZ-ORTEGA 1999) and Mexico (new record).

Comments. In this study, we associated this female with the male of *N. maesi* based on the general morphological characteristics of both sexes and on the spatial co-distribution, as *N. maesi* was the only species of the genus *Neoarisemus* registered in the zone. The general structure of female postabdomen is like in *N. niger* but its genital plate does not show posterior shoulders as in *N. niger*, and the oval ventral receptacle structures are different too.



Figs 1–7. Female of *Neoariseus maesi* Collantes & Martínez-Ortega, 1999. 1 – head in frontal view with antenna and palp. 2 – mouth parts and first palpal segment. 3 – scape, pedicel and first flagellomeres. 4 – last flagellomeres. 5 – wing. 6 – genital chamber. 7 – subgenital plate and cerci. Scale in millimeters, figures 3+4 and 6+7 at the same scale.

Also, *N. maesi* differs in not having the first flagellomere reduced like *N. niger*. The type series was collected in an area with dry tropical forest and patches of crops (mango, corn and bean) in Nicaragua; this vegetation corresponds to that in our study area.

In general, it is possible to mention that the known females of *Neoariseus* are characterized by the large oval oviduct endings, supported by two long laminar rods to the genital chamber having two groups of sensilla internally in the posterior portion. Also, they can be recognized by the shape of the subgenital plate that has the anterior margin sclerotized and thin but expanded laterally, the hypogynial valves poorly developed with a shallow concavity between them, and by long cerci.

Dimorphism between males and females of *Neoariseus maesi* involve the allurement organs, interocular space separation, and the shape of flagellomeres and ascoids; males present dorso-lateral allurement organs, eyes separated by about 3 facet diameters, flagellomeres 1–11 nodiform, with a complete circling of two rows of fine digitate ascoids, whereas females do not present allurement organs and have eyes separated by 7–8 facet diameters, flagellomeres 1–11 fusiform with a pair of V-shaped ascoids.

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