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A new monotypic genus of Epipsocidae (Psocodea: 'Psocoptera': Psocomorpha) from Cusco, Peru

Un nuevo género monotípico de Epipsocidae (Psocodea: 'Psocoptera': Psocomorpha) de Cusco, Perú

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ABSTRACT

A new monotypic genus of Epipsocidae, from Machu Picchu and Aguascalientes, Cusco, Peru, is here described and illustrated. It is related to *Gojaoides* García Aldrete, from which it clearly differs in having the external parameres distinctly developed, and in having the endophallic sclerites asymmetric. The types are deposited in the National Insect Collection (CNIN), Instituto de Biología, Universidad Nacional Autónoma de México, in Mexico City.
Key words: Neotropics, taxonomy, Epipsocetae, South America.

RESUMEN

Un nuevo género monotípico de Epipsocidae, de Machu Picchu y Aguascalientes, en Cusco, Perú, es aquí descrito e ilustrado. Está relacionado con *Gojaoides* García Aldrete, del cual difiere claramente por tener los parámeros externos bien desarrollados, y por tener los escleritos endofálicos asimétricos. Los tipos están depositados en la Colección Nacional de Insectos (CNIN), alojada en el Instituto de Biología, Universidad Nacional Autónoma de México, CdMx.
Palabras clave: Neotrópico, taxonomía, Epipsocetae, Sud América.

The family Epipsocidae presently includes 30 genera (García Aldrete *et al.,* 2015, Johnson & Smith, Psocodea Species File Online [retrieved 20 March, 2017], Lienhard & Smithers, 2002), predominantly neotropical, with genera also present in the Holarctic, Palaearctic and Oriental regions. Nine genera are represented only by females; in four genera (*Bertkauia* Kolbe, *Cubitiglabra* Li, *Heteroepipsocus* Li, and *Spordoepipsocus* Li), the phallosome is a simple, anteriorly open or closed frame, with well developed external parameres, without endophallic sclerites. In 11 genera (*Anastomopsocus* García Aldrete *et al., Dicropsocus* Smithers & Thornton, *Edmockfordia* García Aldrete, *Epipsocopsis* Badonnel, *Epipsocus* Hagen, *Gonzobandia* García Aldrete, *Incapsocus* García Aldrete, *Mesepipsocus* Badonnel, *Neurostigma* Enderlein, *Periepipsocus* García Aldrete *et al.,* and *Terryerwinia* García Aldrete), the phallosome is a simple, broadly V-shaped structure, with vestigial or well developed external parameres, and with or without an endophallic radula. In six genera (*Goja* Navás, *Gojaoides* García Aldrete, *Ianthorntonia* García Aldrete, *Papillopsocus* García Aldrete, *Phallofractus* García Aldrete, and *Rogojiella* García Aldrete), the phallosome is a closed or nearly closed frame, with or without external parameres, and with a complex set of endophallic sclerites.

Mockford (1998), diagnosed the family and defined the genera known at the time. Casasola González (2006), presented a cladogram with the phylogenetic relations of the genera of Epipsocetae, in which the genera of Epipsocidae were assigned in two clades.

In 2005 I collected in Machu Picchu and in the neighboring town of Aguascalientes. two males that are not assignable to any of the known genera of Epipsocidae. Those specimens are here described as a new genus, and its separation from related genera is established.

MATERIAL AND METHODS

Two male specimens were available for study, they were dissected in 80% ethanol, and their parts (head, right wings and legs, and genitalia) were mounted on slides in Canada balsam, following standard procedures. Parts on the slides were measured with a filar micrometer, the abbreviations of parts measured are the following: FW and HW: lengths of right fore- and hind- wings, F, T, t1 and t2: lengths of femur, tibia and tarsomeres 1 and 2 of right hind leg, ctt1: number of ctenidobothria on t1, Mx4: length of fourth segment of right maxillary palp, f1…fn: lengths of flagellomeres 1…n of right antenna, IO, D and d: minimum distance between compound eyes, antero-posterior and transverse diameter, respectively, of right compound eye on dorsal view of head, PO: d/D.

The slides of the specimens dissected, and the rest of their bodies, preserved in 80% ethanol, are deposited in the National Insect Collection (CNIN), Instituto de Biología, Universidad Nacional Autónoma de México, Mexico City, Mexico.

RESULTS

Family Epipsocidae

Cuscopsocus new genus

http://zoobank.org/E9226A79-5C30-46DE-875D-F99C5456E358

Diagnosis. Belonging in the family Epipsocidae. Outer cusp of lacinial tip with 8-9 denticles. Five distal inner labral sensilla, one central placoid, flanked by a pair trichoid-placoid. No row of cones on fore- or hind-femora. Preapical denticle present on pretarsal claws. Wing venation caeciliusid (*e. g.* Forewing R two-branched, forewing M three-branched). Hindwing Rs-M fused or joined by a crossvein. Hypandrium simple, with 3-4 macrosetae on each postero-lateral corner. Phallosome

with anterior border membranous, side struts slender, aedeagal arch apically truncate and slightly concave. External parameres well developed, bearing on distal half a field of strongly sclerotized short spines. Endophallic sclerites: a stout anterior large sclerite, anteriorly cleft in the middle, with eight sclerotized, longitudinal bands; an elongate, right acuminate sclerite, and a broad, left mesal sclerite, strongly sclerotized distally, bearing on distal half a field of short sclerotized spines; a central, stout, distally bifid sclerite, with left arm smooth, acuminate, and right arm stout, distally rounded, covered with a field of strong spines. Close to the assemblage of genera having a closed or nearly closed phallosome, with a complex set of endophallic sclerites. Differing from *Goja* Navás in having caeciliusid venation and in having the external parameres well developed, not membranous; differing from *Gojaoides* García Aldrete, in having well developed external parameres and in having the endophallic sclerites asymmetric; differing from *Ianthorntonia* García Aldrete, in having caeciliusid venation and in having the external parameres much stouter; differing from *Papillopsocus* García Aldrete, in having external parameres and in lacking a field of papillae in the endophallus; differing from *Phallofractus* García Aldrete, in having well developed external parameres and in having the aedeagal arch complete, not interrupted apically; differing from *Rogojiella* García Aldrete, in lacking sclerotized bands in the phallosome, next to the external parameres, in having the aedeagal arch not projected apically, and in having some endophallic sclerites with fields of spines.

Type species. *Cuscopsocus spinosus* new species.

Cuscopsocus spinosus new species.
Male
(Figs 1-6)
http://zoobank.org/0C554553-281C-4426-90E5-D85EB2C4D157

Color (in 80% ethanol). Body pale brown, with dark brown areas as indicated below. Head pattern (Fig. 1). An irregular ochre band on each gena below the compound eyes. Lower genae dark brown. Tergal lobes and pleura of meso- and metathorax dark reddish brown. Coxae dark brown, trochanters pale brown. Femora brown, with distal halves less pigmented. Tibiae brown, with a dark brown band anteapically. Tarsi dark brown. Antennae and maxillary palps brown. Forewings with a reddish brown hue, clear fenestrae distally between veins and wing margin, from R1 to Cu2. Hindwing almost hyaline, with a light brown orange hue. Abdomen light brown, with irregular subcuticular dark brown spots.

Morphology. As in diagnosis, plus the following: hypandrium slightly convex posteriorly, with posterior border distinctly sclerotized; field of setae as illustrated (Fig. 3). Phallosome and endophallic sclerites (Fig. 6), as described in the diagnosis. Paraprocts (Fig. 5), sclerotized distally and next the sensory fields, forming an arch near them; sensory fields elliptic, with 24-25 trichobothria on basal rosettes. Epiproct (Fig. 5) wide, convex anteriorly, broadly trapeziform, with a group of three macrosetae mesally, other setae as illustrated.

Measurements (in μm). Those of the paratype between parentheses. Holotype. FW: 3437 (3804), HW: 2565 (2778), T: 953 (969), F: 1625 (1616), t1: 816 (759), t2: 214 (228), ctt1: 35 (35), Mx4: 168 (169), f1: 923 (804), f2: 782 (805), IO: 283 (288), D: 226 (225), d: 176 (178), IO/d: 1.6 (1.6), PO: 0.78 (0. 61).

Specimens studied. Holotype male. PERU. Cusco. Machu Picchu Archaeological Zone, 2360 m., 13º09.948'S: 72º32.77'W. 9.VIII.2005. Beating shrubs with mosses and lichens, A. N. García Aldrete. Paratype male. PERU. Cusco. Aguascalientes (Machu Picchu pueblo), 2050 m. 8.VIII. 2005. Beating shrubs in ravine upstream from the termal baths. Same collector.

Etymology. The generic name is an artificial compound word, formed with Cusco, the Peruvian department to which belongs the type locality, + psocus, common in 'Psocoptera', as in *Epipsocus*, *Cladiopsocus*, *Polypsocus*, etcetera. The specific name refers to the fields of spines in the external parameres and in some of the endophallic sclerites.

DISCUSSION

The relationships of the genera of Epipsocetae were studied by Casasola González (2006), he produced a cladogram in which the genera of Epipsocidae known at the time were divided in two large clades: Clade **A**, including *Epipsocus*, *Incapsocus*, *Mesepipsocus*, *Neurostigma*, *Papillopsocus* and *Terryerwinia*, and Clade **B**, including *Bertkauia, Dichoepipsocus, Dicropsocus, Dimidistriata, Epipsocopsis, Goja* (including *Gojaoides*), *Heteroepipsocus, Hinduipsocus, Ianthorntonia, Liratepipsocus, Metepipsocus, Odontopsocus, Phallofractus* (as sp. 4 THAI), *Rogojiella, Spordoepipsocus,* and *Valvepipsocus*.

Phallofractus (as sp. 4 THAI), *Goja* (including *Gojaoides)*, *Ianthorntonia* and *Rogojiella*, constituted a subclade of related genera in Clade **B**.

On head pattern, wing venation and phallosome structure, *Cuscopsocus* is related to *Gojaoides* García Aldrete (2012), additional evidence is provided by the holotype of *Cuscopsocus*, in which the hindwing Rs-M are joined by a crossvein (in the paratype of *Cuscopsocus* the hindwing Rs-M are joined by a short distance). The species here described can not be assigned to *Gojaoides* because it has distinct, well developed external parameres, and because the endophallic sclerites are asymmetric.

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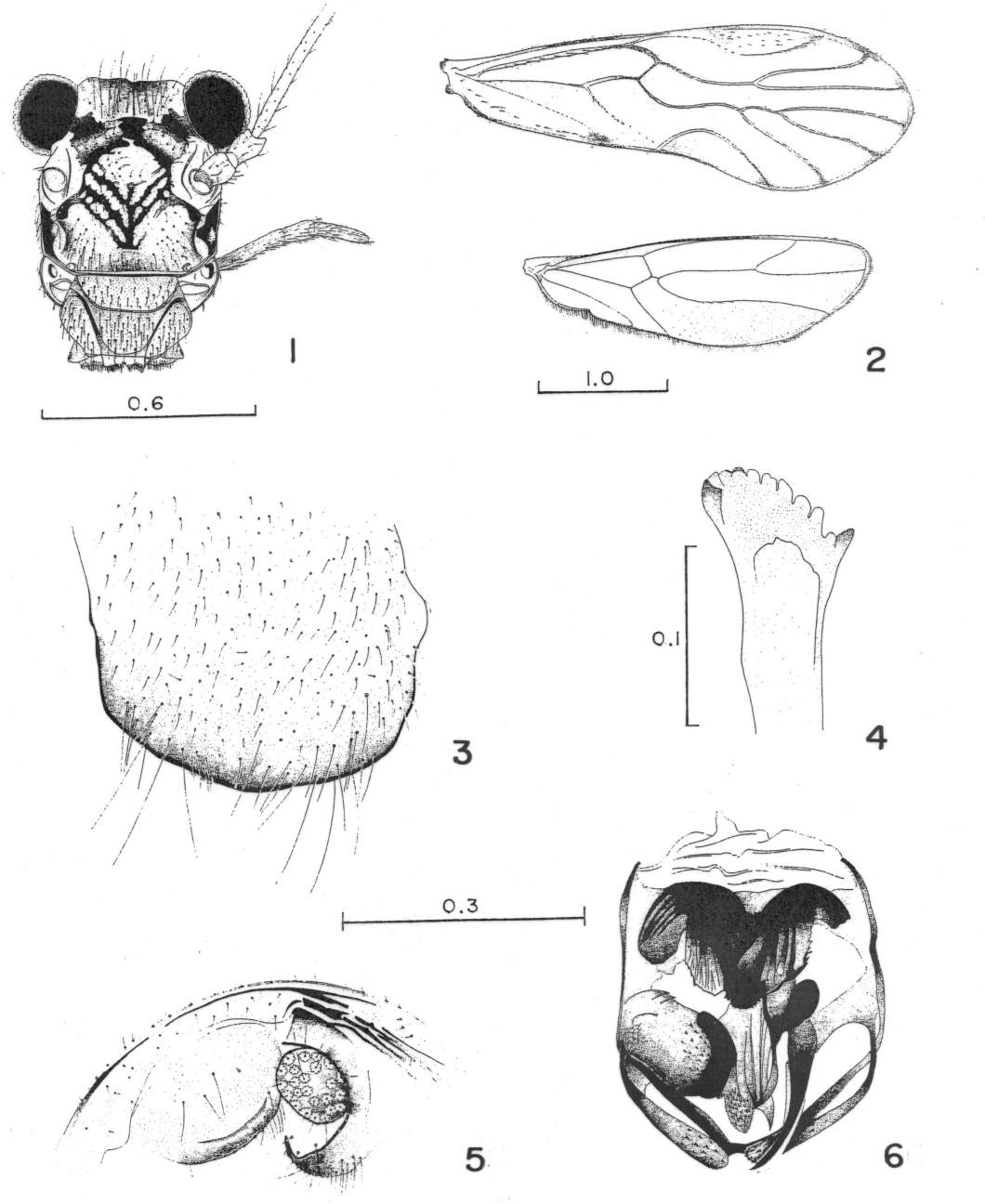

Figures 1-6. *Cuscopsocus spinosus* new genus, new species. Male. 1. Front view of head. 2. Fore- and hind- wings. 3. Hypandrium. 4. Lacinial tip. 5. Right paraproct, epiproct and clunium. 6. Phallosome. Scales in mm. Figures 3, 5 and 6 to common scale.

Triatoma recurva (Stål, 1868) Reduviidae. Collector: J. Rorabaugh. Date: 22 April 2008. Locality: Mexico, Sonora, Sahuaripa, Río Sahuaripa just upstream of the Río Yaqui confluence, 11.6 km (by air) NNW of Sahuaripa. Photographer James C. Rorabaugh.