



REVISTA BRASILEIRA DE
Entomologia
A Journal on Insect Diversity and Evolution

www.rbentomologia.com



Systematics, Morphology and Biogeography

Psyllobora picta (Germain) species complex (Coleoptera: Coccinellidae), with descriptions of two new species from Chile

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ARTICLE INFO

Article history:

Received 21 November 2016

Accepted 4 August 2017

Available online xxx

Associate Editor: Adriana Marvaldi

Keywords:

Coccinellini

Genital apparatus

New species

South America

Taxonomy

ABSTRACT

The *Psyllobora picta* species complex (Coleoptera: Coccinellidae: Coccinellini) was revised, with the description of two new species, *Psyllobora lueri* **sp. nov.** and *Psyllobora pauline* **sp. nov.**, both from Chile. *Psyllobora bicongregata* was recorded for the first time from Brazil, and there is no confirmed record of this species for Chile. Also, *P. picta* was not recognized from Paraguay and Uruguay. Male and female genitalia characters are illustrated for all the species.

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Introduction

Members of the genus *Psyllobora* Chevrolat are distinguished among the coccinellid beetles by their light colors, white, yellow or brown and with dark spots, ranging from light brown to black. The characteristic multidentate mandibles are associated with the micophagous habit, shared with a small number of genera previously grouped in the tribe Halyziini. The genus has a worldwide distribution, although most of the species are Neotropical.

Most of the South American species were described in the nineteenth and the first half of the twentieth centuries, with an additional 17 species described since then, totaling 55 species (Blackwelder, 1945; Mader, 1957; Almeida and Marinoni, 1983; Almeida, 1985, 1991a, 1991b, 1991c, 1992).

Except for the species described or revised in recent studies, which covered less than half of the known taxa, the genital apparatus of males has not been studied. Traditionally, elytral spots have been used for species identification, although this character is not always stable or accurate.

Psyllobora picta (Germain) has been cited from several countries of South America and linked to other species of the genus distributed in the same areas. The history of species related to *P. picta* began with its description by Germain in 1854. Soon thereafter,

Boheman (1859) described *Psyllobora bicongregata* Boheman from Argentina. Mulsant (1866), based on Chilean specimens, described *Psyllobora feralis*, which Philippi (1887) incorporated into his catalog of beetles in Chile as *Halycia femoralis* (sic). Crotch (1874) recognized *P. bicongregata* from Argentina and *P. feralis* from Chile and did not mention *P. picta*. Weise (1904) recognized the presence of *P. feralis* and *P. bicongregata* for Argentina and described *Psyllobora pavidata* Weise from that country. Brèthes (1923) synonymized the Chilean species under the name *P. picta* (= *P. feralis* = *P. femoralis*). Korschefsky (1932) synonymized *P. bicongregata* with *P. picta* as well, a decision followed by Costa Lima (1937) and Blackwelder (1945).

Finally, Mader (1957) revising specimens from both countries recognized them as the two different species *P. picta* (= *P. feralis*, = *P. femoralis*) and *P. bicongregata* (= *P. pavidata*), establishing *P. picta* in Chile, while considering *P. bicongregata* as also found in Argentina and Uruguay, but with doubtful records from Chile. However, Gordon (1987), who reviewed the Crotch collection, again considered *P. bicongregata* as synonymous with *P. picta*, based on Korschefsky (1932), and probably did not consider the work of Mader (1957). González (2008, 2010, 2013, 2014) and Serra et al. (2013) considered these two species as present in Chile, Argentina, Paraguay and Uruguay, based on the literature.

These species share similar characteristics in the pattern of spots and in the genital parts, and are referred to herein as a species complex of *P. picta*. González (2006) conducted analyses and dissections of specimens from several collections of this

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<http://dx.doi.org/10.1016/j.rbe.2017.08.002>

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group. This information, together with observations in the current study of the genital parts, geographical distribution and morphological aspects, have made it possible to recognize the described species, as well as to establish their geographical distribution and to describe new species of this complex with some confidence.

Material and methods

The terminology for adult structures, especially for the genitalia, corresponds to that used by Šlipiński (2007). The genital parts of all species included in this study were preserved in glycerin in microvials along with the respective specimen. The method of immersing the entire abdomen in a solution of 10% KOH, heated by thermal convection in a test tube immersed in boiling water was used. The abdomen was then washed in distilled water and the genital structure was separated under a stereomicroscope with the help of pins. All specimens and parts were photographed.

The length of the penis guide is measured from the apex to the insertion of the terminal strut, and the maximum length of the penis is measured from the apex to the farthest point of the penis tube.

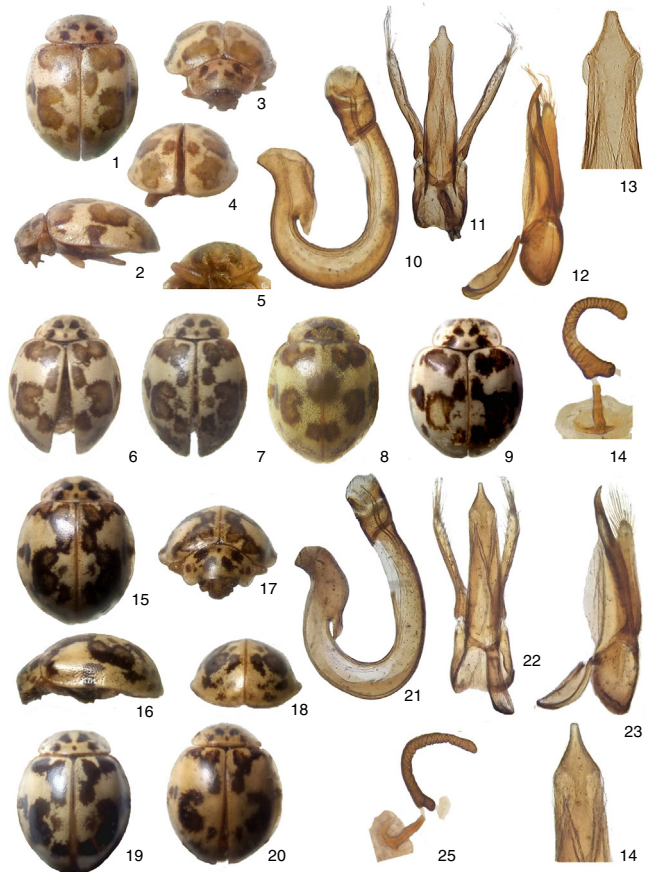
The material studied belongs to the following collections: CFDH: Federico d'Hervé private collection, Rio Negro, Argentina; CPAA: Alfonso Aguilera, private collection, Temuco, Chile; CPAL: Alfredo Lüer, private collection, Santiago, Chile; CPCF: Claudia Funes, private collection, Catamarca, Argentina; CPFR: Francisco Ramírez, private collection, Santiago, Chile; CPGG: Guillermo González, private collection, Santiago, Chile; CPMD: Manuel Diéguez, private collection, Santiago, Chile; CPRH: Richard Honour, private collection, Santiago, Chile; CPSL: Silvio Lanati, private collection, Mendoza, Argentina; CPUD: Ulf Drechsel, private collection, Asunción, Paraguay; DZUP: Coleção Entomológica Pe. J. S. Moure, Departamento de Zoologia, Universidade Federal do Paraná, Curitiba, Brazil (Lúcia M. Almeida); JEBC: Juan Enrique Barriga, private collection, Curicó, Chile; MAPA: Museu Anchieta de Ciências Naturais, Porto Alegre, RS, Brazil (Fernando R. Meyer); MHNP: Museo Nacional de Historia Natural de Paraguay, Asunción (John Kochalka); MHNS: Museo Nacional de Historia Natural de Santiago, Chile (Mario Elgueta); MNRJ: Museu Nacional do Rio de Janeiro, Brazil (Miguel A. Monné); UMCE: Colección Entomológica. Departamento de Biología. Universidad Metropolitana de Ciencias de la Educación (Danilo Cepeda); UNAB: Museo Entomológico Facultad de Agronomía, Universidad Nacional de Colombia, Sede Bogotá, Bogotá, Cundinamarca, Colombia (Francisco Serna).

The labels of the type materials are arranged in sequence from top to bottom, where the data for each label are within double quotes (""), a slash (/) separates the rows, and information between brackets ([]) provides the source and deposit collection.

Results

Species complex associated with Psyllobora picta (Germain)

Species associated with *P. picta* are characterized by their size (1.6–3.1 mm), pronotal plate with four spots in a semicircle around a fifth small spot near the middle of the base, sometimes one or two spots on each side, all independent or fused together. The elytral pattern consists of approximately ten spots (3:1:2:1:2:1), always recognizable but sometimes partially fused, separate or absent, or small supernumerary spots are present (Figs. 1, 19, 26, 40).



Figs. 1–25. 1–14: *Psyllobora pauline* sp. nov.: 1–5: male holotype habitus (dorsal, lateral, frontal, posterior and ventral detail); 6–9: variations (dorsal view); 10: male siphus; 11–13: male tegmen (dorsal, lateral and basal lobe detail); 14: female genitalia (spermatheca and infundibulum). 15–25: *Psyllobora lueri* n. sp.: 15–18: male holotype habitus (dorsal, lateral, frontal and posterior); 19–20: variations (dorsal view); 21: male penis; 22–24: male tegmen (dorsal, lateral and basal lobe detail). 25: female genitalia (spermatheca and infundibulum).

The clover-shaped apical spot has three subquadrate points (Figs. 4, 29).

The most distinctive character of the group is the very thick tube of the male penis, its width 1/6 of the maximum length, with the penis capsule with a convex outer corner and the apex about as thick as the tube, with a characteristic sub-rhomboidal shape, through which appears the sinuous ejaculatory duct, and an oblique sclerotic thorn on the apex. The structure of this penis is nearly the same in the different species of the complex (Figs. 10, 21, 35, 48). The tegmen in dorsal view has the sides of the penis guide straight or sinuate, slightly convergent, sometimes with a triangular mamilliform tip, characteristic in each species (Figs. 11, 22, 36, 49). In lateral view, there are membranous ventral penis guide projections, folded and crossing inward, more or less wide (Figs. 12, 23, 37, 50). Two subapical semicircular membranous and globose projections, shaped as faceted eyes, are present but are difficult to examine because they are usually crushed and deformed (Fig. 38). The spermatheca of the female is “C” shaped (Figs. 14, 25, 39, 52).

The color pattern of these species is very similar, which explains why they were synonymized. The characteristics of the penis, which has a width of 1/6 of the maximum length (not more than 1/8 in all other *Psyllobora* species) and the truncated apex of the same thickness as the tube are unique within the genus, and distinguish this complex from all other known species of *Psyllobora*.

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