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ORIGINAL ARTICLE

Aleiodes Wesmael (Hymenoptera, Braconidae, Rogadinae) species described by Brèthes: taxonomic clarification

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ABSTRACT

Two species of *Doryctes* Haliday 1836 described by Brèthes have their taxonomic status revised, and are transferred to the genus *Aleiodes* Wesmael 1838. The new combination and new names are: *Aleiodes bonariensis* (Brèthes, 1910) comb. n., and *Aleiodes argentinensis* nom. nov. The identity of *Aleiodes bonariensis* as a species is still doubtful, due to the poor condition in which the holotype is found, in addition to its general resemblance with *Aleiodes gossypii* (Muesebeck, 1960). The validity of the name *Aleiodes brethesi* (Shenefelt, 1975) (= *Rhogas nigriceps* Brèthes, 1909) is discussed and confirmed.

RESUMEN

La situación taxonómica de dos especies de *Doryctes* Haliday 1836 descritas por Brèthes es revisada y ambas son transferidas al género *Aleiodes* Wesmael 1838. La nueva combinación y nuevo nombre son: *Aleiodes bonariensis* (Brèthes 1910) comb. n., y *Aleiodes argentinensis* nom. nov. La identidad de *Aleiodes bonariensis* como especie sigue siendo dudosa, debido al mal estado en que se encuentra el holotipo, además de su semejanza general con *Aleiodes gossypii* (Muesebeck, 1960). También discutimos y confirmamos la validez del nombre *Aleiodes brethesi* (Shenefelt 1975) (= *Rhogas nigriceps*, Brèthes 1909).

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Argentina; *Rogas*; *Doryctes*; Doryctinae; classification

Introduction

Jean Brèthes was the first curator of the entomological collection of the Museo Argentino de Ciencias Naturales, and published more than 200 entomological contributions (Dallas 1928), mainly on southern South American Diptera and Hymenoptera. Within the family Braconidae, he described several species of Braconinae and, to a lesser extent, species of other subfamilies (Quicke & Genise 1994). Brèthes (1909) described only one species of Rogadinae, *Rhogas nigriceps* Brèthes 1909 (= *Rogas brethesi* Shenefelt 1975), which has been transferred to the genus *Aleiodes* Wesmael 1838 (Shaw et al. 1998).

Aleiodes is the most common and diverse genus of Rogadinae (Hymenoptera, Braconidae), and currently has 91 described species in the Neotropical Region (Yu et al. 2012; Shimbori et al. 2015), but the knowledge of this genus in Argentina is still remarkably poor. To this date the Argentinean fauna of *Aleiodes* was represented by three species only: *Aleiodes brethesi* (Shenefelt 1975), a relatively common parasitoid of *Rachiplusia nu*

(Guenée, 1852) (Lepidoptera: Noctuidae) in southern South America (Arretz et al. 1994; Luna & Sánchez 1999), in addition to *Aleiodes melanopterus* (Erichson, 1848) (Shaw 1993) and *Aleiodes laphygmae* (Viereck, 1912) (Valverde et al. 2012), two of the most common and widespread Neotropical species within the genus. A careful examination of Brèthes's type material housed at the Entomology Division of the Museo Argentino de Ciencias Naturales (MACN) revealed that two additional species described in the genus *Doryctes* (Doryctinae) need to be transferred to the Rogadinae and classified in the genus *Aleiodes*. In this work we revise and reclassify the Rogadine species described by Brèthes.

Materials and methods

The species described by Brèthes were identified as members of Rogadinae using keys provided in van Achterberg (1993) or Sharkey (1997). Type material was examined and identified using keys to genera (Shaw 1997) and to species-groups of *Aleiodes* (Shaw et al. 1997), and compared with types of closest species

(i.e. *Aleiodes gossypii*, *Aleiodes laphygmae* and *Aleiodes molestus*). Terminology follows Sharkey and Wharton (1997) and Shaw et al. (1997). Images were captured with a 3MP Leica video camera and a Leica M205C stereomicroscope running Leica Application Suite (LAS) software (Wetzlar, Germany), and focus-stacked using the same software. Some minor adjustments in images and plate preparation were performed in Adobe Photoshop version CS6 (Adobe Systems Incorporated, San Jose, CA, USA). The type material examined is deposited at Museo Argentino de Ciencias Naturales, in Buenos Aires, Argentina (MACN). Additional material was examined from the University of Wyoming Insect Museum, in Laramie, USA (UWIM) and from Museo de La Plata, La Plata, Argentina (MLP).

Results

Taxonomic treatment

Aleiodes argentinensis new name

(Figures 1–5)

Doryctes testaceus Brèthes 1913, 24: 44.

[New name for preoccupied *testaceus* Spinola, 1808, not *testaceus* Telenga 1941]

Type-specimen examined

Holotype, female (?) (MACN), point mounted. Four labels, from top to bottom: “Bs. Aires”; “10547”; “*Doryctes testaceus* Brèthes”; “Holotype /*Doryctes testaceus* Brèthes”. Type-locality. Argentina: General Urquiza, Buenos Aires.

Diagnosis

Body size 3.7 mm; antenna with 32 segments. Head with small eyes, in dorsal view eye about as long as temple; ocell-ocular distance 2x width of lateral ocellus; malar space wide, as long as eye height and 2x longer than basal width of mandibles; occipital carina shortly interrupted mid-dorsally. Mesosoma sculpturing mostly granular; pronotum and mesopleuron irregularly rugose; propodeum mostly rugose except lateral areas, median carina strong and almost complete, apically vanishing in rugosity. Hind coxa striate dorsally. Forewing: angle between vein r and pterostigma about

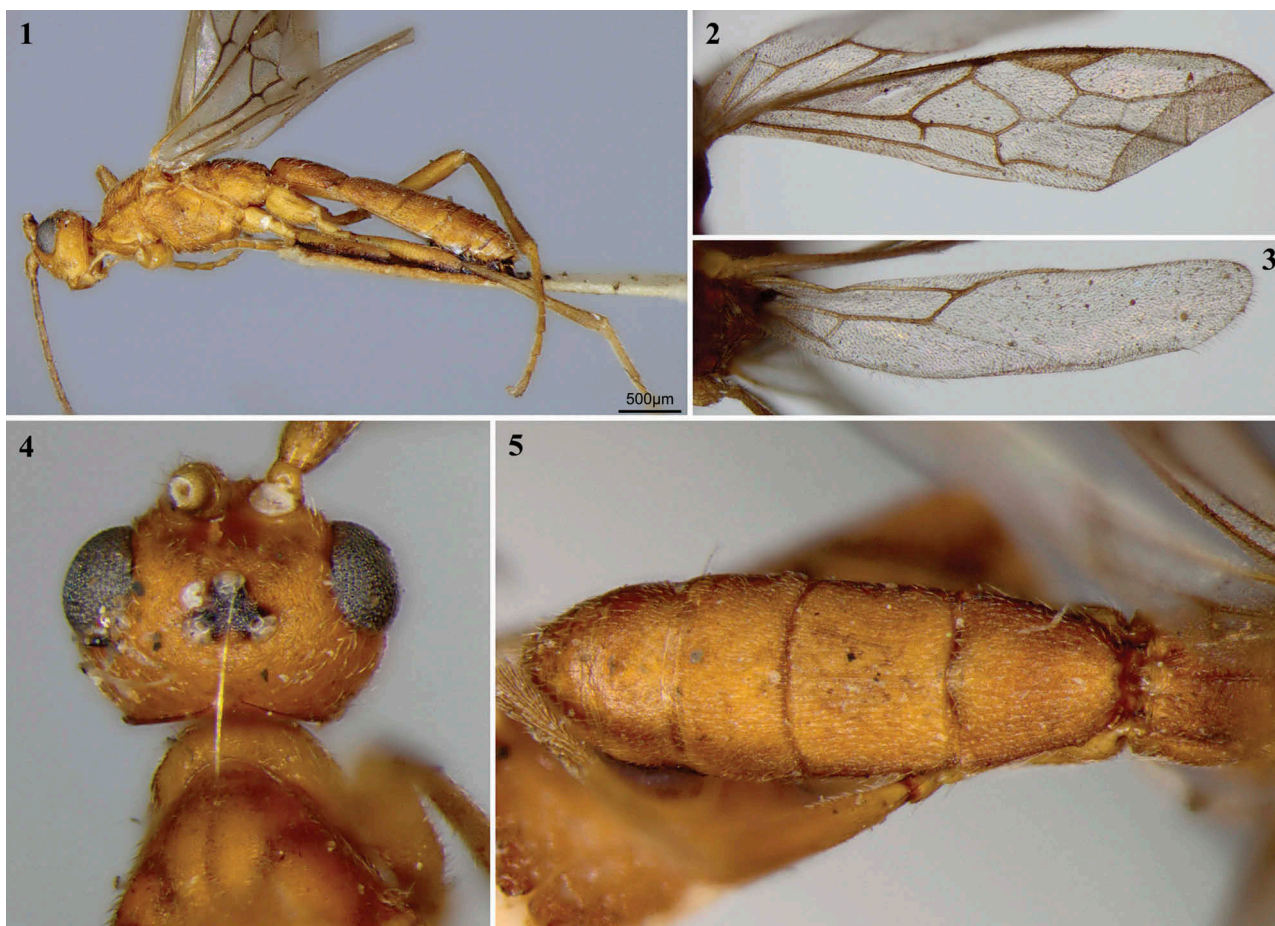


Figure 1–5. *Aleiodes argentinensis* nom. nov. (replacement name for *Doryctes testaceus* Brèthes 1913), holotype, female (?). 1, Habitus, lateral. 2, Fore wing. 3, Hind wing. 4, Head, dorsal. 5, Metasoma, dorsal.

120°; vein RS+Mb long, about as long as vein 2RS; vein 1CUa 0.7 times vein 1cu-a. Hind wing veins M+CU + 1M (mediella) 2.2 times vein r-m (basella). Metasomal tergum 1 about as long as wide; terga 1–3 rugose costate; median carina extending from terga 1–3, interrupted medially on tergum 1. Body color honey yellow; antenna dark brown except scapus mostly honey yellow but dorsally brown; propodeum brown; wings hyaline, veins and pterostigma brown.

Comments

This species belongs to the *gastritor* species-group and closely resembles *A. laphygmae* (Viereck 1912). *Aleiodes argentiniensis* nom. nov. has a smaller ocellus, the ocell-ocular distance is 2 times longer than width of lateral ocellus, as compared with ocell-ocular distance about as long as width of ocellus in *A. laphygmae*. The angle between vein r and pterostigma is distinctly smaller (about 120°) than in *A. laphygmae*, in which the vein r is almost in the same line of the margin of pterostigma. It differs also in the color of pterostigma, entirely brown in *A. argentiniensis* nom. nov., as compared with brown with basal and apical yellow spots in *A. laphygmae*.

Here we provide a new name based on the priority of usage by *Aleiodes testaceus* (Spinola 1808), and not *Heterogamus testaceus* Telenga 1941. Fortier & Shaw (1999) transferred the species described by Telenga to

the genus *Aleiodes*, but after a recent status revision, the species returned to the genus *Heterogamus* (Zaldívar-Riverón et al. 2008). The holotype is in good condition, lacking the left flagellum. Its terminalia is glued to the point card, making it difficult to determine the sex. It is apparently a male; however, the original description and also Shenefelt & Marsh (1976) state the type sex as a female.

Etymology

The species name refers to the type country.

Distribution

This species is known only from type locality in General Urquiza, Buenos Aires, Argentina.

Aleiodes bonariensis (Brèthes 1910) comb. n. (Figures 6–8)

Doryctes bonariensis Brèthes 1910, 20: 205

Type-specimen examined

Holotype, female (MACN), pin mounted (lacking head, left forewing and both hind wings, right front leg and left mid leg). Four labels, from top to bottom: “Bs. Aires”; “10178”; “*Doryctes bonariensis*”; “Holotype *Doryctes bonariensis* Brèthes”. Type-locality. Argentina: Buenos Aires.



Figure 6–8. *Aleiodes bonariensis* (Brèthes 1910) comb. n., holotype, female. 6, Habitus, lateral. 7, Fore wing. 8, Metasoma and propodeum, dorsal.

Diagnosis

Body length approximately 4.5 mm (head missing). Body honey yellow, wings hyaline with brown veins. Mesosoma is mostly covered with short setae and granulate, but propodeum is mostly weakly rugose and with complete mid-longitudinal carina. Forewing second submarginal cell is rectangular, the vein 3RSa is about 1.6 times longer than vein r; length of vein 1CUa is about 0.5 times length of vein 1Cub. Metasomal terga 1–3 are rugose-striate, with longitudinal carina extending until basal half of tergum 3. Apical half of tergum 3 is weakly striate, and remaining terga granular-coriaceous. The apex of hind tibia lacks a comb of flattened setae, and the tarsal claws are simple, not pectinate basally.

Comments

Aleiodes bonariensis (Brèthes 1910) comb. n. belongs to the *gastritor* species-group. The holotype of *A. bonariensis* comb. n. is in poor condition, lacking the head and both hind wings. It is very similar to *Aleiodes gossypii* Muesebeck 1960; however, the condition of the holotype makes impossible to distinguish the species described by Brèthes from *A. gossypii*. The only difference found is the smaller body size of *A. bonariensis* comb. n. Considering the lack of information, we decide to maintain the name of this species as valid even if not morphologically distinct from *A. gossypii*. With the eventual finding of a topotype, we expect to redescribe this species.

Distribution

This species is known only from type locality in Buenos Aires, Argentina.

Aleiodes brethesi (Shenefelt 1975)

(Figures 9–15)

Rhogas nigriceps Brèthes 1909, 19: 55

Rogas nigriceps De Santis 1967: 47.

Rogas brethesi Shenefelt 1975, 12: 1219. (New name, preoccupied by *nigriceps* Wesmael 1838)

Aleiodes brethesi Shaw et al. 1998 7(1): 63.

Type-specimen examined

Holotype, female (MACN), point mounted. Five labels, from top to bottom: “*Rhogas nigriceps*”; “Huergo”; “Holotype *Rhogas testaceus* Brèthes”; “Holotype *nigriceps* Brèthes”; “*Aleiodes brethesi* Shenefelt = *nigriceps* Brèthes det. S. R. Shaw 1988”. Type-locality. Argentina (Buenos Aires).

Diagnosis

Body length 5.0–6.8 mm; antenna with 44–48 segments. Body color orange; legs and head black; antenna and propleuron dark brown to black; ovipositor sheaths black; in males terga 4–7 black; wings hyaline to weakly infusate, veins dark brown. Body surface mostly smooth and polished, including head. Oral opening circular; clypeus short and protruding; malar space about as long as mandible base; ocelli small, diameter of lateral ocellus slightly shorter than ocell-ocular distance; occipital carina complete dorsally and meeting hypostomal carina ventrally. Mesoscutum smooth and polished, mostly devoid of setae; notauli deep and scrobiculate, meeting triangular rugose area posteriorly; mesopleuron smooth and polished, subalar groove rugose; sternaulus absent; propodeum rugose with complete mid-longitudinal carina; metasomal terga 1 and 2 rugose, tergum 3 striate, remaining terga smooth and polished; median carina complete on tergum 1, varying from complete to completely absent on tergum 2; terga 4–7 on male with dense patch of setae on each side divided by a bare median line. Fore wing with second submarginal cell relatively short, almost square; vein 1Cub 1.3–2 times longer than 1CUa. Hind wing vein RS straight basally, slightly bent downward on apical half; vein m-cu present and interstitial to weakly postfurcal to vein r-m; tarsal claws strongly pectinate.

Variation

Specimens from Chile have the membrane of the wings more infusate than specimens from Argentina, including the holotype. Additionally, in specimens from Chile the forewing vein 1Cub is less than 1.5 times longer than vein 1CUa, as compared with about 2 times longer, and the vertex is more coriaceous, while smooth and polished in Argentinean specimens.

Comments

Aleiodes brethesi (Shenefelt) is the only known species from Neotropical Region in the *apicalis* species group (there are at least three undescribed species, two from Brazil and one from Costa Rica). The group is characterized by the strongly pectinate tarsal claws and virtually straight vein RS of hind wing. Males have a distinct dense setal mat on terga 4–7, subdivided medially. Identification of the species is possible through the key to New World species of *apicalis* species-group (Shaw et al. 1998). *A. brethesi* differs from other species in the entirely orange mesosoma and the black legs, and by the mostly smooth and polished body surface with a virtually bare mesoscutum. It resembles *Aleiodes molestus* (Cresson, 1872), in color and also in the

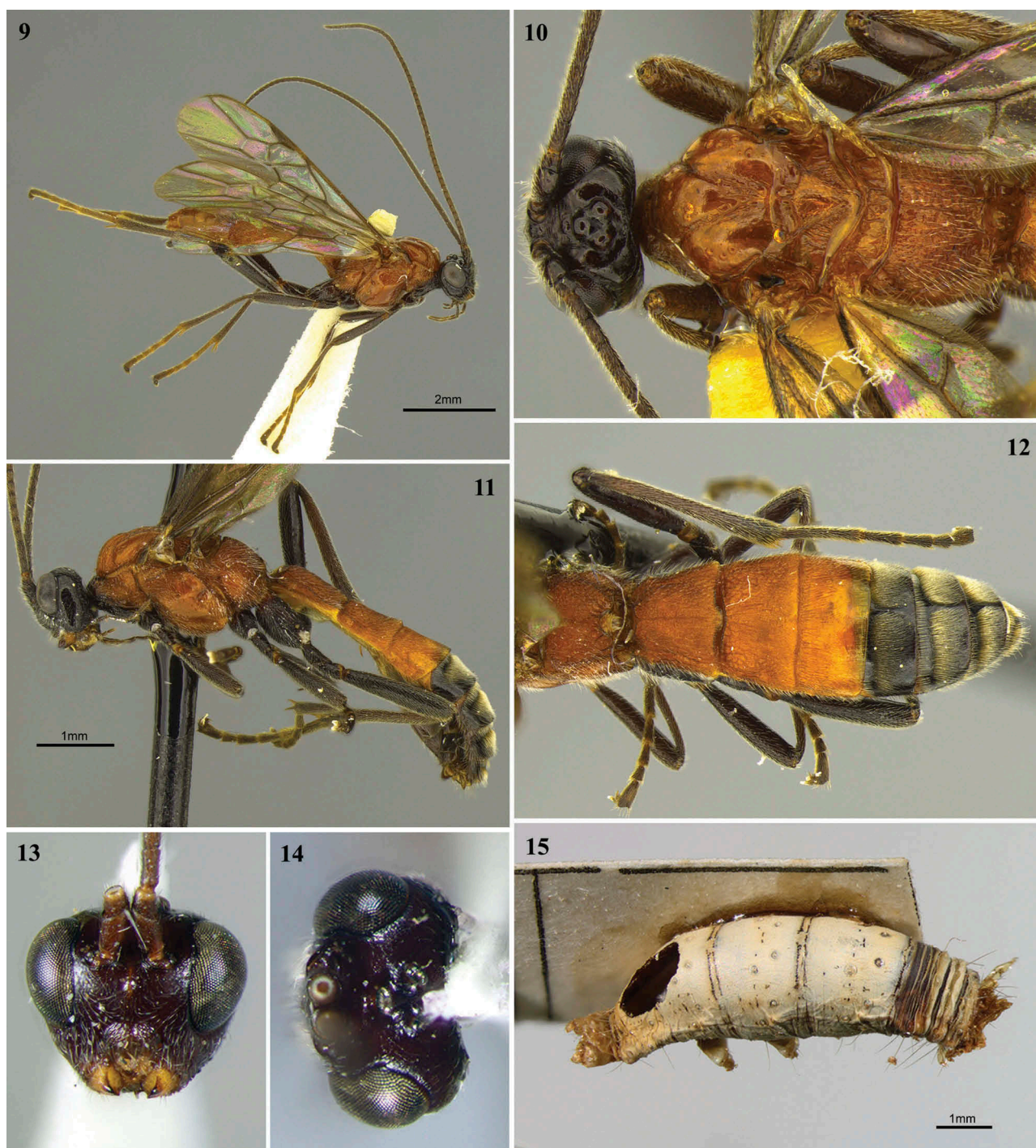


Figure 9–15. *Aleiodes brethesi* (Shenefelt 1975) (= *Rhogas nigriceps* Brèthes 1909). 9, Non-type female from Argentina, habitus lateral. 10, Non-type male from Argentina, head plus mesosoma, dorsal. 11, 12, Non-type male from Chile: 11, habitus, lateral; 12, propodeum and metasoma, dorsal. 13, 14, Holotype, female, head: 13, frontal; 14, dorsal. 15, Mummy of *Rachiplusia nu* (Noctuidae) produced by a non-type male.

mesoscutum widely devoid of setae. The two species can be distinguished by the color of hind coxa black in *brethesi*, as compared with orange in *molestus*, and the sculpturing of vertex, rugulose in *molestus*, as opposed to smooth in *brethesi*. The color of the mesosoma is also useful, as frequently partially (i.e. propodeum and

part of metapleuron and mesopleuron) dark brown to black in *molestus*, as compared with entirely orange in *brethesi*. The holotype is in fair condition, with head detached from body and lacking both antennae.

Shenefelt (1975) gave a new name for the species described by Brèthes (1909) by its prior usage by

Wesmael (1838). Since the name *nigriceps* was used as a subspecies within *circumscriptus* Nees 1834, and not a valid species, the question of priority could be debated. However, an ongoing revision of the European species of *Aleiodes* confirmed *nigriceps* as a valid distinct species (Mark Shaw, pers. comm.), favoring our decision to maintain the name given by Shenefelt (1975).

Other material examined

ARGENTINA: One female, Buenos Aires, 3 July 1919, No. 12286 (MACN); two females, Buenos Aires, Villa Devoto, with dates 17 December 1925 and 27 November 1926, Bridarolli col. (MACN); two females, Delta, arroyo Chaná, with dates 12 October 1918 and 20 October 1918 (MACN); one female, Entre Ríos, La Paz, January 1928, Vanasco col. (MACN); four females, Buenos Aires city, three females collected on 17 February 1919 and another one on 19 November 1915, J. M. Bosq col. (light) (MACN); one female, Santa Fe, Piquete, 13 January 1928, Bridarolli col. (MACN), three females, La Pampa, Santa Rosa, two collected on 12 December 2004 and one on January 2005, Martínez col. (MACN); one female, Buenos Aires province, Médanos, 10 March 2008, Carpintero col. (light) (MACN), one female, Buenos Aires province, Tandil, January 2007, Dellapé col. (light) (MACN); two males, Buenos Aires province, Martínez, one collected on 16 December 1926 and the other on 21 December 1916, Bridarolli col. (MACN); one male, Buenos Aires, 7 February 1916, Zotta col. (MACN); one male, Buenos Aires province, Reserva Natural Otamendi, 22 October 2006, Martínez col. (MACN); one male, Buenos Aires province, Balanca nr. La Plata, 19 November 1968, C.C. Porter col. (UWIM); one male, Buenos Aires province, La Plata (Fac. Agronomía), 18–30 November 1968, C. Porter (UWIM); two females and one male, Jujuy Province, Posta Lozano, 27 October–2 November 1968, C.C. Porter col.; one female, same data different date, 21–23 March 1969; one male, same data, Rio Lozano, 28 November–2 December 1987, C. Porter & E. Willink col. (UWIM); one male with a mummified host larva, Oliveros (probably referring to a locality in the province of Santa Fe), 10 January 1985, *Aleiodes* nr. *brethesi* det. Shimbori 2014 (MLP); one male with no data (MACN). CHILE: one female, El Canelo, Stgo. 11 November 1964, 700 m, C. C. Porter col. *Aleiodes brethesi* Shenefelt = *nigriceps* Brèthes, det. S. R. Shaw; one male, same data except date, 5 November 1964 (MACN); one female, same data except date, 2 November 1962; one male, same data except date, 10

November 1964; one male, same data except date, 14 November 1964; one female, Stgo., ft. rd. to Farallones, 1100–1400 m, 28 November 1962, P.J. Darlington col.; one male, La Cruz, 1966, Ex. *Rhachiplusia nu* (UWIM). URUGUAY: one female with only one label reading “Colonia”, attributed to the Uruguayan locality on the La Plata River coast (MACN).

Biology

This species has been recorded parasitizing larvae of *Rachiplusia nu* (Guenée, 1852) (Lepidoptera, Noctuidae) feeding on beans and soybeans (Arretz et al. 1994; Luna & Sánchez 1999).

Distribution

The distribution of this parasitoid is coincident with its host distribution, at Southern South America. Countries with records are: Argentina, Chile and Uruguay.

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Disclosure statement

No potential conflict of interest was reported by the authors.

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