CONTRIBUTION TO THE SYSTEMATICS OF *DICERATASPIS* ASHMEAD, 1896 (HYMENOPTERA: CYNIPOIDEA: FIGITIDAE)[1]

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ABSTRACT: This paper deals with the identity, geographical distribution and host associations of *Diceratataspis* species. The authors propose the new synonymy *Diceratataspis grenadensis* Ashmead, 1896 (= *D. flavipes* Kieffer, 1909) and redescribe and illustrate *D. grenadensis*.

KEY WORDS: Hymenoptera, Cynipoidea, Figitidae, *Diceratataspis grenadensis*, synonymy

Eucoilinae is a diverse and important subfamily of Cynipoidea Figitidae, and contains 85 genera and 973 species (Buffington, 2009). Six informal genus groups were proposed by Nordlander (1982) to bring structure to Eucoilinae classification: the *Gronotoma* group, *Trybliographa* group, *Rhoptromeris* group, *Chrestosema* group, *Ganaspis* group and *Kleidotoma* group. Dìaz and Gallardo (1997) placed three of the neotropical genera (*Rhabdeucoela* Kieffer*, Penteucoila* Weld and *Zaeucoila* Ashmead*)* included originally in the *Gronotoma* group into a new group, the *Zaeucoila* group. To this group they added *Agrostocynips* Diaz, *Tropideucoila* Ashmead, *Lopheucoila* Weld, *Dettmeria* Borgmeier and *Moneucoela* Kieffer (Díaz and Gallardo, 1997, 1998; Gallardo and Díaz, 1999). Buffington (2004, 2006) described two new genera (*Preseucoela* and *Moritiella*) and included them within the *Zaeucoila* group; subsequently, this author (2009) proposed the tribe Zaeucoilini for these genus groups including *Marthiella* Buffington and *Diceratataspis* Ashmead.

The genus *Diceratataspis* was proposed by Ashmead (1896) containing the simple species *D. grenadensis*. Kieffer (1909) described *Dissodontaspis*, monobasic on *D. flavipes*; Weld (1921) suggested that *Diceratataspis* was closely related to *Dissodontaspis*, and speculated that these genera are synonyms. Thus, Weld (1952) established the synonymy and the new combination for *Diceratataspis flavipes*.

The objectives of this paper are to gather and to update all the information referring to the identity, geographical distribution and host associations of *Diceratataspis* species.

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[1] Received on September 30, 2008. Accepted on February 8, 2009.

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Mailed on April 7, 2011

METHODS

We studied 53 specimens (17 females and 36 males) of the genus *Diceratataspis*. The names of the institutions where the studied specimens are housed are designated by their initials within parentheses.

The material studied belongs to the following institutions: California Academy of Sciences (CAS), USA; Natural History Museum (NHM), ENGLAND; Museu de Entomologia da Escola Superior de Agricultura "Luiz de Queiroz" (ESALQ), BRAZIL and Museo de La Plata (MLP), ARGENTINA.

Terminology used in descriptions follows Fontal-Cazalla, et al. (2002) and Buffington (2009). Measurements reported are relative, except for the total length (head to abdominal tip, without the antennae), antennae length, and forewings length, which are expressed in millimeters. The photographs were taken with a Zeiss - DSM940A, SEM housed at the Núcleo de Apoio à Pesquisa/ Microscopia Eletronica aplicada à Pesquisa Agrícola from Escola Superior de Agricultura "Luiz de Queiroz," Universidade de São Paulo (NAP/MEPA - ESALQ/USP) in Brazil.

Diceratataspis Ashmead

Diceratataspis Ashmead, 1896: 744; Weld, 1921: 450 (cited), 1952: 106, 197 (synonymy); Díaz, 1974: 20 (distribution); Wharton et al., 1998: 109 (distribution and hosts); Guimarães et al., 2000: 133 (cited), 2003: 7 (cited); Buffington, 2009: 173, 174, 185 (redescription and phylogeny)

Dissodontaspis Kieffer, 1909: 59; Weld, 1921: 451 (cited), 1952: 106, 197 (taxonomy)

Type species. *Diceratataspis grenadensis* Ashmead, 1896, by monotypy (*Diceratataspis*).

Dissodontaspis flavipes Kieffer, 1909, by monotypy (*Dissodontaspis*).

Redescription. A redescription of *Diceratataspis* was recently provided by Buffington (2009).

Distribution. USA, Mexico, Costa Rica, Grenada, Panama, Brazil, Argentina (Ashmead, 1896; Kieffer, 1909; Weld, 1952; Díaz, 1974; Fergusson, 1995; Wharton et al., 1998), Trinidad and Tobago. This distribution belongs to Neartic and Neotropical regions, biogeographic provinces Amazonica, Cerrado and Paraense (Amazonico Domain) *sensu* Cabrera and Willink (1980). Fontal and Nieves-Aldrey (2004) and Buffington (2009) also mentioned the presence of this genus in Ecuador and Venezuela.

We have seen undescribed species from Cuba, Republica Dominicana, Dominica, Trinidad & Tobago and Colombia housed at California Academy of Sciences, Smithsonian Institution and Texas A&M University.

Biology. *Diceratataspis* is a solitary koinobiont endoparasitoid of dipterous flies that is known to be associated with a wide diversity of fruits. Wharton et al.

(1998) obtained some specimens of *Diceratas pis* from Drosophilidae in peach and guava and mentioned the possible specificity of this genus with drosophilids in decaying fruits on the ground. However, Hernandez-Ortiz (1993) mentioned the association of *Diceratas pis* with one species of *Rhagoletis* (Diptera: Tephritidae). This genus was also associated with *Anastrepha* spp. (Diptera: Tephritidae) in Wharton et al. (1998) and Guimarães et al. (2000), but the association with tephritid hosts needs to be clarified.

***Diceratas pis grenadensis* Ashmead, 1896**

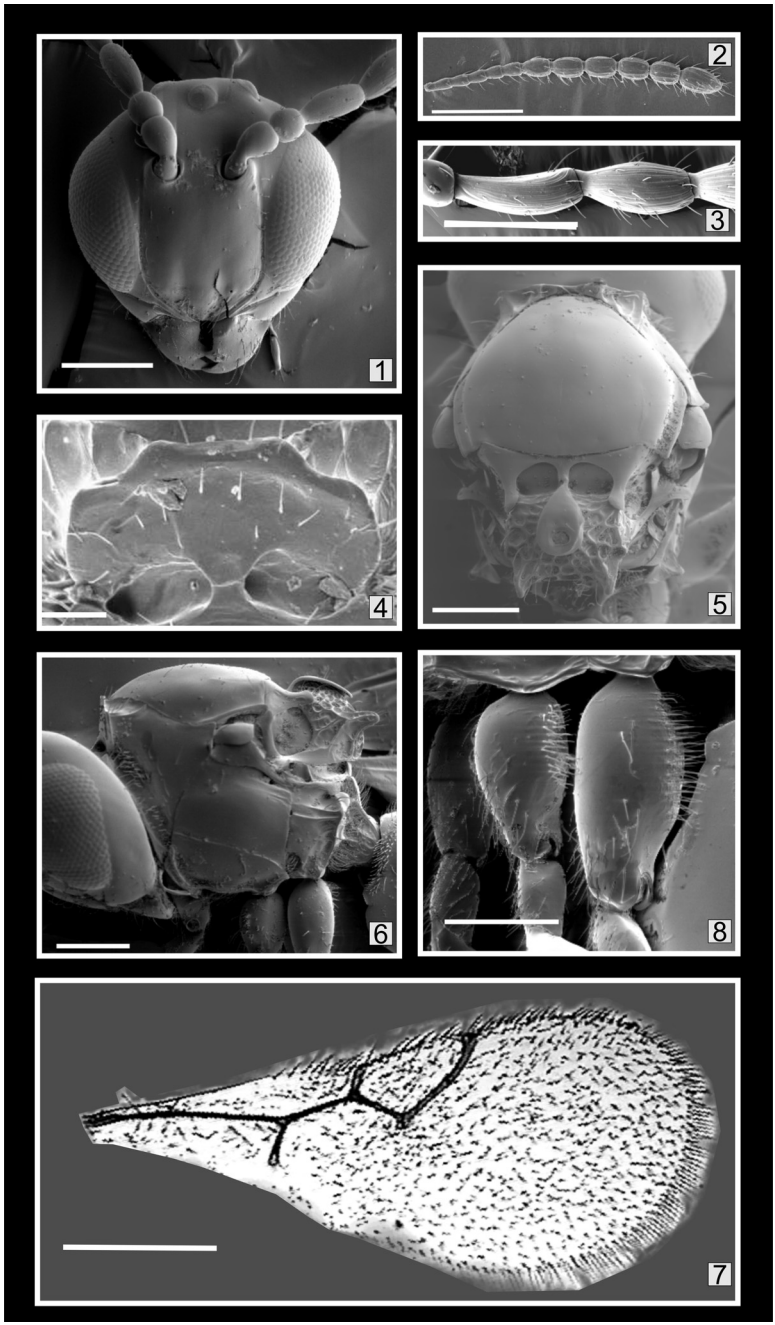
(Figs. 1-9)

Diceratas pis grenadensis Ashmead, 1896: 744; Weld, 1921: 450, 1952: 106, 197; Díaz, 1974: 20; Wharton et al., 1998: 110; Guimarães et al., 2003: 7 (taxonomy and distribution), 2004: 55 (host); Buffington, 2009: 174 (cited)

Dissodontaspis flavipes Kieffer, 1909: 59

Diceratas pis flavipes; Weld, 1952: 198; Guimarães et al., 2000: 128-130, 133 (cited); Buffington, 2009: 174 (cited); **New Synonymy**

Redescription. *Female* (Figs. 1, 2, 4-8). Body length (in lateral view) 1.32-1.37 mm (n= 17). Head and mesosoma reddish brown, dark brown or black, metasoma reddish brown; antennae yellowish-brown or reddish-brown, scape and pedicel lighter than flagellum, segments of the club darker; veins and legs yellow or yellowish-brown. Head (Fig. 1) in anterior view higher than broad, area between the ocelli glabrous and smooth. Orbital furrows originating from lateral aspect of torulus, meeting malar sulcus at clypeal margin. Malar sulcus simple. Malar space without protuberances. Antennae (Fig. 2) pubescent; with conspicuous 6-segmented club, 8-13 with rhinaria; length 0.81 mm, relative length of articles 2: 1.5: 1: 1: 1: 1: 1: 1.5: 1.5: 1.5: 1.5: 1.5: 2.5. Genae rounded. Mesosoma (Fig. 6) stout, in lateral view longer than high. Width: length of mesoscutum, scutellum and scutellar plate (in dorsal view) 11: 6, 4.5: 5, and 2: 2.5 respectively. Dorsal margin of pronotal plate (Fig. 4) with three notches and fine isolated pubescense, surface smooth; pronotal fovea open. Pronotal triangle present, sides of pronotum smooth. Mesoscutum (Figs. 5, 6) smooth, convex in profile, in dorsal view wider than longer. Suprategular furrows deep and narrow. Scutellum wide (ratio 2: 4.5); scutellar foveae (Fig. 5) wider than long, suboval, smooth and deep, separated by a short septum; lateral bars smooth; dorsal surface of scutellum (Fig. 5) reticulate, margined laterally, emarginated posteriorly; laterodorsal projections reduced; posterior projections well developed. Scutellar plate small, flat, surface smooth, posterior border rounded; midpit placed posteriorly. Mesopleuron with subalar pit reduced in size, small. Metapleuron slightly sculptured, anteroventral cavity small, semicircular and pubescent. Forewings (Fig. 7) completely hyaline or dusky at base, pubescent, apical fringe long and continuous from anterior margin of wing to posteroventral corner; total length 1.22 mm; marginal cell more than twice as long as wide (ratio, 2.5: 6). Metacoxa



Figures 1-8 *Diceratasp is grenadensis*. 1, Head (frontal view) 140X; 2, female antenna 240X; 3, flagellomeres 1 and 2 of male 280X; 4, pronotal plate 366X; 5, mesosoma (dorsal view) 130X; 6, mesosoma and metasoma (lateral view) 120X; 7, forewing 0.50mm; 8, metacoxa 130X.

(Fig. 8) with a row of hairs along the superior half of the posterior margin. Keels of the propodeum with medium expansion scarcely developed. Metasoma (Fig. 6) sessile, base of syntergum with a hairy ring interrupted dorsally.

Male (Fig. 3). Similar to female. Body length (in lateral view) 1.36-1.56 mm. (n=36). Antennae (Fig. 3) filiform, pubescent; article 3 bent, 3-15 with rhinaria; length of 1-2 flagellomeres 3: 2.5.

Distribution (Fig. 9). USA, Mexico, Costa Rica, Grenada, Panama, Brazil and Argentina (Ashmead, 1896; Kieffer, 1909; Weld, 1952; Díaz, 1974; Wharton et al., 1998). New record from Trinidad & Tobago.

Hosts. Diptera Tephritidae: *Anastrepha* sp. (?) (in Wharton et al., 1998), *A. amita* (?) (in Guimarães et al., 2000), *Rhagoletis* (?) (in Hernández-Ortíz, 1993) and Diptera Drosophilidae (?) (in Wharton et al., 1998). These records of *Diceratasp*is spp. associated with *Anastrepha* species need to be clarified. Wharton et al., 1998 pointed out that probably the small size of *Diceratasp*is specimens make them more related to drosophilids than tephritids. This hypothesis was confirmed by Guimarães et al. (2004) based on the isolation of the flies' puparium, where all the emerged parasitoids were obtained from drosophilid puparia. Moreover, these authors studied the parasitism behavior of *D. grenadensis* on guavas infested by tephritids and drosophilids. Also, they verified the host preference of females of *D. grenandesis* in a four-way airflow olfactometer establishing the preference of this parasitoid to host larvae in guava substrate infested by drosophilids instead of tephritids.

Type material examined. GRENADA. (Mount Gay Est.). Holotype female of *Diceratasp*is *grenadensis*, without date, Smith col. (NHM). BRAZIL. *Pará*. Holotype female of *Dissodontaspis flavipes*, without date, Baker col. (CAS).

Other material examined. ARGENTINA. *Misiones*. Loreto, 1 female, 13 males, 6-X-1930, Ogloblin col. (MLP). TRINIDAD & TOBAGO. TRINIDAD. (N. range Mountains), 5 females, 8-VII-1991, White col., obtained of mangoes (*Mangifera indica*) (CAS). BRAZIL. *Goiás*. 1 female, 25-III-2000, Marchiori col. (MLP). *São Paulo*. Nazaré Paulista, 2 males, 11-VII-1996, 1 female, 19-VII-1996, 13 males, 19-VII-1997, obtained of star fruit (*Avehrroa carambola*); Monte Alegre do Sul, 1 female, 24-IV-2000, obtained of *Citrus* sp.; Campinas, 1 male, 30-XI-1994, obtained of mangoes, 1 female, 1 male, 7-II-1996, obtained of *Citharexylum myrianthum*, 3 males, 9-III-2000, obtained of *Eugenia schomburgkii*, Souza Filho col.; Piracicaba, 5 females, 3 males, 14-III-2000, obtained of *E. schomburgkii* (*Psidium guajava*), Guimarães col. (ESALQ).

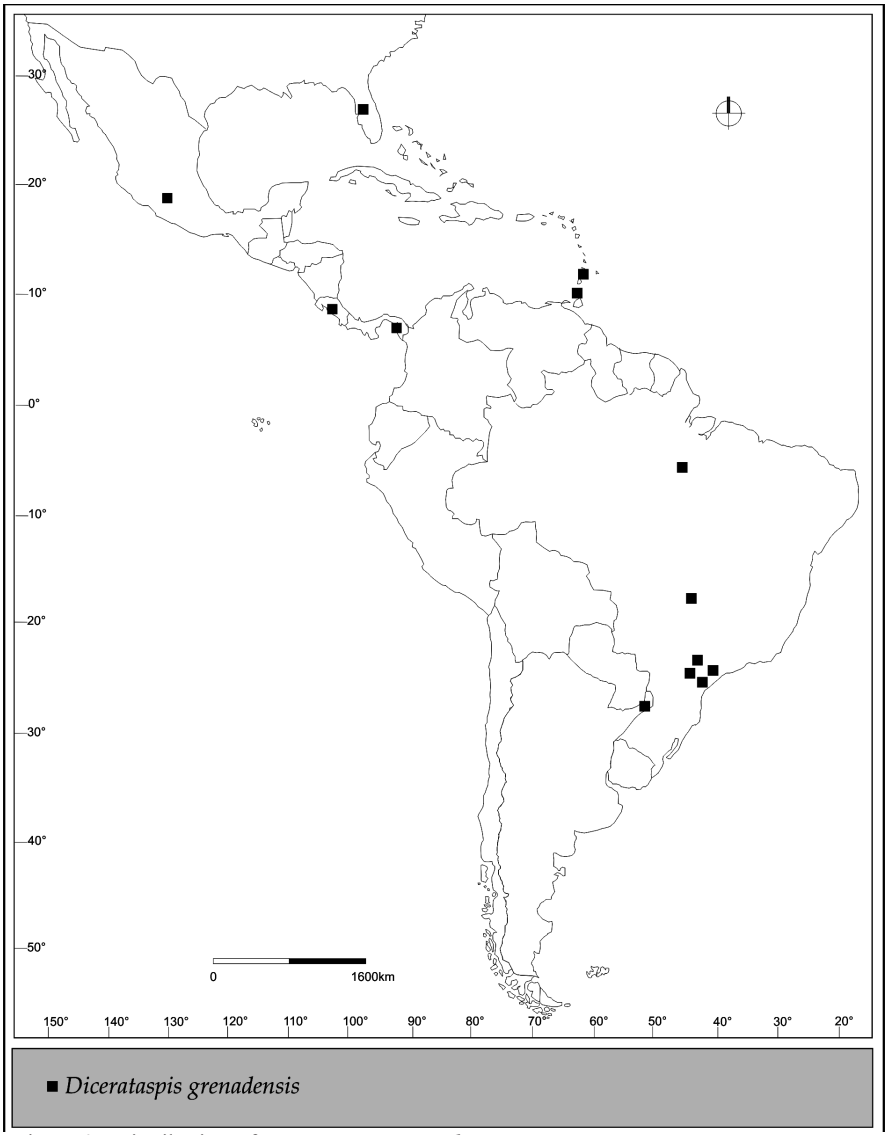


Figure 9: Distribution of *Diceratapsis grenadensis.*

CONCLUSIONS

Diceratapsis Ashmead, 1896 was represented by two neotropical species, *Diceratapsis grenadensis* Ashmead, 1896 and *D. flavipes* (Kieffer, 1909). The analysis of type and other specimens of these species shows that the differences in size and color of the body and the wings are individual variations of this species. Thus, we established their synonymy, *D. grenadensis* being the valid name.

ACKNOWLEDGMENTS

The authors thank Suzanne Lewis (NHM) and Robert Zuparko (CAS) for loaning the type material, Carlos Marchiori and Miguel Francisco de Souza Filho for loaning us material for study and Cecilia Gorretta for technical support. We also thank the Núcleo Apoio a Pesquisa/Microscopia Eletrônica aplicada à Pesquisa Agrícola (NAP/MEPA - ESALQ-USP) for the Scanning Eletronic Microscope. This study was supported by Fundação de Amparo a Pesquisa do Estado de São Paulo (FAPESP- Proc. Nº 99/01107-4); Escola Superior de Agricultura "Luiz de Queiroz", Universidade de São Paulo (ESALQ/USP) – Brazil; Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET) and Universidad Nacional de La Plata (UNLP) – Argentina, and Comisión de Investigaciones Cientificar de la Provincia Buenos Aires (CIC) - Argentina.

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