



Aprostocetus (Ootetrastichus) infulatus (Hymenoptera: Eulophidae): description of the male, new distribution and first host records

The large and cosmopolitan genus *Aprostocetus* Westwood (Hymenoptera: Eulophidae: Tetrastichinae) currently includes 697 valid species (Noyes 2003). In the Neotropical region there are 52 described species of *Aprostocetus*, three of which belong to the subgenus *Ootetrastichus* Perkins. Species of *A. (Ootetrastichus)* are external egg parasitoids (acting as egg predators) of Hemiptera (Cicadellidae and Delphacidae), Orthoptera (Gryllidae), Odonata, and Coleoptera (Dytiscidae) (Clausen 1940; Graham 1987; Noyes 2003).

The only named species of *A. (Ootetrastichus)* from Argentina is *A. (O.) infulatus* (De Santis). Until recently, this species has been known only from a single female collected in Buenos Aires Province by sweeping at a wild pasture. This holotype specimen is deposited in La Plata Museum, La Plata, Buenos Aires, Argentina (De Santis 1957); it is poorly mounted on a slide. In Tucumán Province of Argentina, the first author of this communication recently obtained many specimens of *A. (O.) infulatus* using sentinel eggs of several leafhopper and planthopper species.

The objective of this study is to describe and illustrate the previously unknown male of *A. (O.) infulatus* and also to provide additional data to the existing description of its female by De Santis (1957), based on the holotype and also the freshly collected specimens. In addition, information is given on the distribution and the previously unknown host associations of this species.

In the laboratory, 6–10 females of the twelve following species were placed in polyethylene-terephthalate cylindrical cages (20 cm high, 7 cm diameter) on corn leaves to obtain sentinel eggs: the leafhoppers *Dalbulus maidis* (DeLong & Wolcott), *Chlorotettix fraterculus* (Berg), *Exitianus obscurinervis* (Stål), *Tapajosa rubromarginata* (Signoret), *Scopognathia subolivacea* (Stål), *Dechacona missionum* (Berg), *Syncharina punctatissima* (Signoret), *Ciminius platensis* (Berg), *Hortensia similis* (Walker), *Plesiommata mollicella* (Fowler), *Agalliana ensigera* Oman, and the planthopper *Peregrinus maidis* (Ashmead). Potted corn plants containing less than 24 hour old eggs of each one of the species were exposed for between 72 and 96 hours in a subsistence corn crop enclosed by dense natural vegetation of the subtropical Yunga's rain-forest (at "El Manantial", 26°49'50.2"S, 65°16'59.4" W, elevation: 495 m), and in a similar crop located in an urban site near San Miguel de Tucumán (26°48'35.7" S, 65°16'25.3" W, elevation: 470 m). Both collecting sites are located in Tucumán Province of Argentina. Exposures of sentinel eggs were made biweekly from November to April (2004–05, 2005–06).

After eight days, the leaves with the exposed eggs were cut from the plants and transferred to Petri dishes containing wet tissue paper on the bottom and covered with a clear plastic food wrap to avoid desiccation and to keep parasitoids from escaping. Parasitized eggs were checked daily to ensure leaf quality until the emergence of all the adult wasps.

Specimens were preserved in 70% ethanol and later slide-mounted in Canada balsam. All measurements are given in millimeters (mm) as the range, followed by the mean (\pm SD) in parentheses. Terminology is that of Gibson (1997). Voucher specimens are deposited in the collections of Fundación e Instituto Miguel Lillo, San Miguel de Tucumán, Tucumán, Argentina (IMLA), La Plata Museum, La Plata, Buenos Aires, Argentina (MLPA), and Entomology Research Museum, University of California, Riverside, California, USA (UCRC).

Aprostocetus (Ootetrastichus) infulatus (De Santis 1957)

(Figs. 1–3)

Ootetrastichus infulatus De Santis 1957: 62–65.

Tetrastichus infulatus (De Santis): De Santis 1967: 10, 135.

Aprostocetus (Ootetrastichus) infulatus (De Santis): Noyes 2001; Noyes 2003.

Type locality. Punta Lara, Buenos Aires, Argentina.

Type material examined. Holotype female [MLPA] on slide: ARGENTINA, BUENOS AIRES, Punta Lara, ii.1955, L. De Santis, MLPA type No. ZA-91.

Material examined [IMLA, MLPA, UCRC]. ARGENTINA. TUCUMÁN: El Manantial, E. Luft Albarracin & E.G.Virla: 24.i–2.ii.2005 (ex. *Dalbulus maidis* (DeLong & Wolcott) eggs), 2 ♀; 22–25.ii.2005 (ex. *Chlorotettix fraterculus* (Berg) eggs), 2 ♂; 25.ii–2.iii.2005 (ex. *D. maidis* eggs), 3 ♂; 4–11.iii.2005 (ex. *C. fraterculus* eggs), 6 ♂; 9–17.iii.2005 (ex. *D. maidis* eggs), 1 ♂; 17–26.iii.2005 (ex. *D. maidis* eggs), 2 ♂; i.2006 (ex. *Syncharina punctatissima* (Signoret) eggs), 3 ♀ and 3 ♂; ii.2006 (ex. *Exitianus obscurinervis* (Stål) eggs), 2 ♀. San Miguel de Tucumán, E. Luft Albarracin: ii.2006 (ex. *C. fraterculus* eggs), 1 ♀; iii.2006 (ex. *Peregrinus maidis* (Ashmead) eggs), 1 ♂.

Redescription.

FEMALE (based on the holotype and 4 non-type individuals). Body color blackish green to intensive black with yellow and metallic tinge. Antennal scape longer than wide, not enlarged; flagellum with apparently 3 anelli, 3 funicular segments and a 2-segmented clava (De Santis 1957: Fig. 11B, p. 62).

Measurements (n=5): Body length: 1.09–1.20 (1.16±0.05); head (length/width): 0.20–0.24 (0.22±0.02)/ 0.19–0.26 (0.23±0.03); mesosoma length: 0.32–0.42 (0.37±0.04); metasoma length: 0.57–0.63 (0.60±0.02); ovipositor length: 0.43–0.54 (0.49±0.04). Antennal segments (Table 1). Forewing length: 0.95–1.06 (1.01±0.04); maximum width: 0.30–0.40 (0.34±0.04); longest marginal setae: 0.06–0.09 (0.07±0.01); length of submarginal, marginal and stigmal veins in the followings proportions: 16:33:6. Hind wing length: 0.76–0.87 (0.81±0.05), maximum width: 0.10–0.14 (0.12±0.02); longest marginal setae: 0.06–0.09 (0.08±0.01).

TABLE 1. *Aprostocetus (Ootetrastichus) infulatus*, dimensions of antennal segments (in mm).

Antennal segment	Male		Female	
	Length range (mean ± SD)	Width range (mean ± SD)	Length range (mean ± SD)	Width range (mean ± SD)
Scape	0.13–0.17 (0.15±0.02)	0.07–0.15 (0.10±0.03)	0.11–0.14 (0.13±0.01)	0.01–0.02 (0.015±0.006)
Pedicel	0.03–0.06 (0.04±0.012)	0.02	0.04–0.05 (0.046±0.005)	0.01–0.02 (0.018±0.004)
Anelli (combined)	0.01–0.02 (0.013±0.005)	0.01	0.01–0.02 (0.012±0.004)	0.01
F1	0.03–0.05 (0.037±0.008)	0.01	0.04–0.06 (0.052±0.008)	0.01–0.02 (0.014±0.005)
F2	0.03–0.06 (0.038±0.012)	0.01	0.03–0.05 (0.041±0.008)	0.01–0.02 (0.016±0.005)
F3	0.03–0.05 (0.037±0.008)	0.01	0.03–0.05 (0.04±0.006)	0.01–0.015 (0.011±0.003)
F4	0.03–0.05 (0.037±0.008)	0.01	-	-
Clava	0.10–0.14 (0.12±0.011)	0.01–0.02 (0.013±0.005)	0.10–0.12 (0.11±0.008)	0.02–0.04 (0.03±0.007)

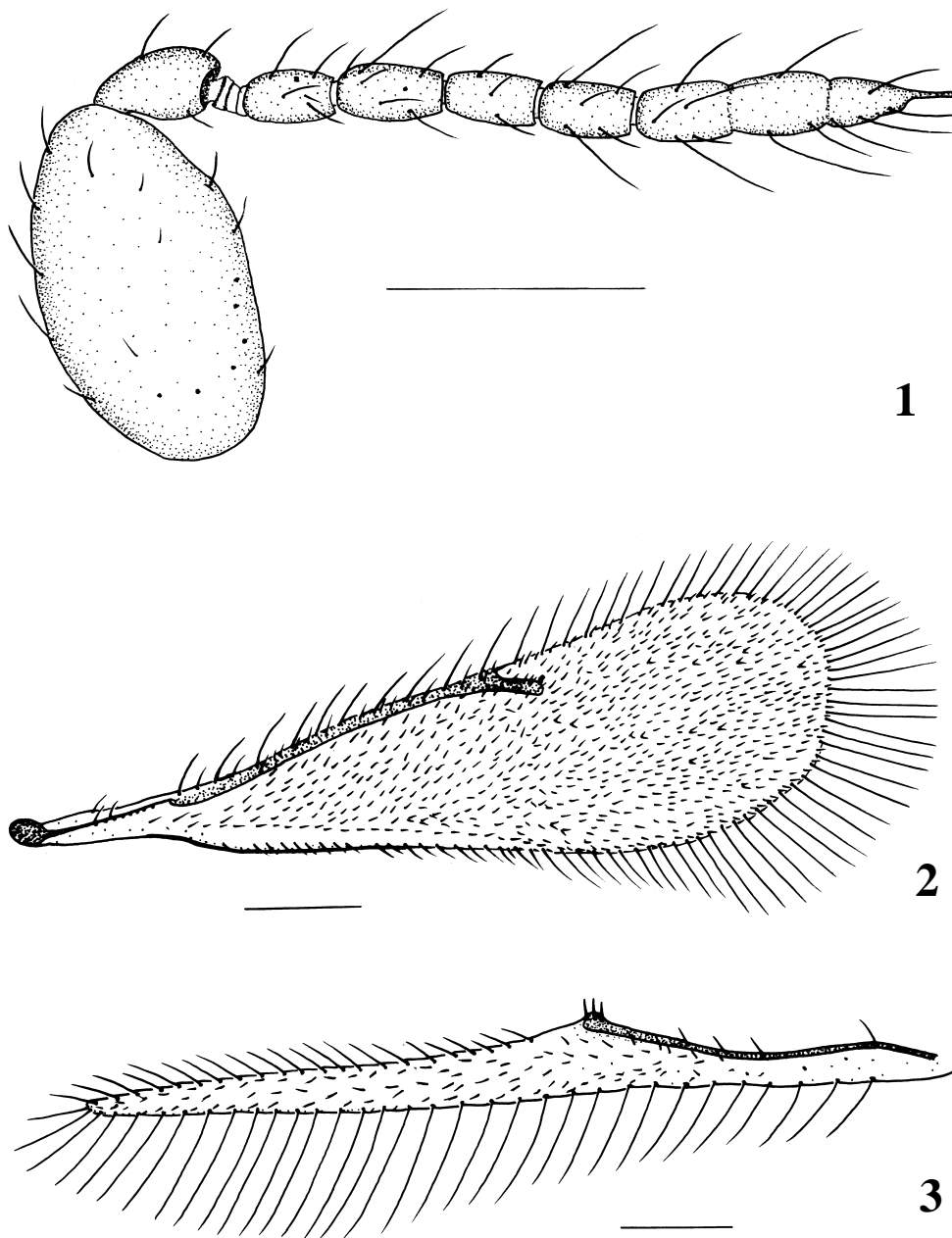
MALE (n = 12). Similar to female, except for antenna (Fig. 1), and the following. Body length 0.79–1.01 (0.93 ± 0.07). Body smooth, with metallic tinge. Eyes and ocelli reddish; vertex (behind ocelli in dorsal view), pronotum, scutellum, distal tarsal segments, metacoxa, and distal third of gaster black. Head (except vertex behind ocelli), antenna, mesoscutum, legs (except metacoxa and distal tarsal segments) and base of gaster brown to yellowish. Wings hyaline, venation brownish.

Head length/width 0.14–0.28 (0.19±0.05) / 0.17–0.32 (0.23±0.05); in dorsal view slightly wider than mesoscutum, in frontal view rounded, slightly wider than long; mandible tridentate; ocelli in an obtuse triangle; toruli at middle of face, their ventral edge a little above lower edge of eyes; distance between toruli 0.04; distance between eyes 0.13.

Antennal flagellomeres with long setae (Fig. 1); scape long and expanded, almost twice wider than long; funicle with apparently 3 subequal anelli and 4 subequal, elongated segments; clava 3-segmented, with an apical spicula; antennal segments in following proportions (Table 1, as scape, pedicel, anelli (combined), F1, F2, F3, F4, clava: 15: 4: 1: 3: 4: 3: 3: 12).

Mesosoma length 0.30–0.39 (0.33±0.06). Pronotum entire, short (length 0.02–0.04 (0.03±0.008)), almost 3 times wider than long; mesoscutum length: width ratio as 10:9, mid lobe convex, with two or three pairs of setae; scutellum as long as wide, a little shorter than mesoscutum and with two pairs of setae. Propodeum short, median length 0.04–0.06 (0.05±0.01), with a weak longitudinal median carina.

Wings. Forewing length 0.65–0.98 (0.80±0.11), maximum width 0.20–0.39 (0.3± 0.05); longest marginal setae 0.07–0.11 (0.08±0.01); length of submarginal, marginal and stigmal veins in the following proportions: 12:25:5, submarginal vein with two dorsal setae (Fig. 2). Hind wing (Fig. 3) narrow, length 0.60–0.86 (0.70±0.08), maximum width 0.09–0.14 (0.11±0.02), longest marginal setae 0.05–0.09 (0.08±0.01).



FIGURES 1–3. *Aprostocetus (Ootetrastichus) infulatus* (male). 1. Antenna. 2. Forewing. 3. Hind wing. Scale lines: 0.1 mm.

Legs. Metatibia longer than pro- and mesotibiae. Three first tarsal segments subequal: distal segments a little longer than preceding ones in the following proportion 4:5; apical spur of metatibia 0.02 mm.

Metasoma length 0.37–0.56 (0.47±0.09); oval, sharp-pointed apically, as long as head and mesosoma combined. Petiole short. Gaster entirely covered by short and dispersed setae. Apex of gaster with a pair of long setae ranged 0.08–0.13 (0.1±0.02).

Distribution. Argentina: Buenos Aires (De Santis 1957) and Tucumán (new record).

Hosts. We report new host records from the sentinel eggs of *Chlorottetix fraterculus* (Berg), *Dalbulus maidis* (DeLong & Wolcott), *Exitianus obscurinervis* (Stål), *Syncharina punctatissima* (Signoret) (Cicadellidae), and *Peregrinus maidis* (Ashmead) (Delphacidae). Most of the specimens were obtained during late summer.

This species is economically important, since its hosts include such vectors of corn diseases as the leafhopper *D. maidis* and the planthopper *P. maidis* (Paradell 1995; Remes Lenicov & Virla 1999).

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