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New records of Dryinidae of Argentina and descriptions of two new species (Hymenoptera: Chrysidoidea)

Abstract - Two new species of Dryinidae (Hymenoptera: Chrysidoidea) from Argentina are described: *Gonatopus cuyanus*, from Mendoza, and *Esagonatopus minuslamellatus*, from Corrientes. The males of the following species, previously known only on the basis of female specimens, are described: *Gonatopus doellojuradoi* (Ogloblin), *G. silvestrii* Kieffer, *G. fritzi* (Olm), *G. hilaris* Olmi and *G. autumnalis* Olmi. *Trichogonatopus raptor* (Fenton) and *Gonatopus flavoides* (Olm) were cited for the first time in Argentina. New keys to the females of the Neotropical species of *Esagonatopus* and the males of the Neotropical species of *Gonatopus* are presented.

Riassunto - Nuovi reperti di Dryinidae della Repubblica Argentina e descrizione di due nuove specie (Hymenoptera: Chrysidoidea).

Vengono descritte le seguenti nuove specie: *Gonatopus cuyanus*, di Mendoza, ed *Esagonatopus minuslamellatus*, di Corrientes. Vengono inoltre descritti i maschi delle seguenti specie, di cui in precedenza erano conosciute soltanto le femmine: *Gonatopus doellojuradoi* (Ogloblin), *G. silvestrii* Kieffer, *G. fritzi* (Olm), *G. hilaris* Olmi e *G. autumnalis* Olmi. *Trichogonatopus raptor* (Fenton) e *Gonatopus flavoides* (Olm) sono citati per la prima volta di Argentina. Vengono presentate infine nuove chiavi dicotomiche delle femmine delle specie neotropicali di *Esagonatopus* Olmi e dei maschi delle specie neotropicali di *Gonatopus* Ljungh.

Key words: *Esagonatopus*, Gonatopodinae, *Gonatopus*, Neotropical Region.

INTRODUCTION

Dryinidae (Hymenoptera: Chrysidoidea) are parasitoids of Hemiptera Cicadomorpha and Fulgoromorpha (Guglielmino & Olmi, 1997, 2006, 2007; Virila & Olmi, 2008, in press).

The Neotropical Dryinidae have not been sufficiently studied. Too few biological and male systematic data have in fact been published because of the lack of research on this family. The sexual dimorphism is so strong that the association of sexes is very

difficult. Every contribution including new male descriptions is very helpful to have a more adequate systematics of the group.

The number of species known in Argentina (130) is considered insufficient compared with other better known Neotropical countries (for example, Costa Rica with 148 known species). The diversity attributed to Argentina is a consequence of insufficient research (Virla & Olmi, 2008, in press).

In 2006, the authors began an intense programme of research on dryinids of Argentina, under the scientific and technological co-operation between the Italian Republic and the Republic of Argentina.

The results of the work developed in 2006 are reported below.

MATERIAL AND METHODS

The descriptions follow the terminology used by Olmi (1984, 1994, 1999) and Virla & Olmi (2008, in press). The measurements reported are relative, except for the total length (head to abdominal tip, without the antennae), which is expressed in millimetres.

In the descriptions POL is the distance between the inner edges of the two lateral ocelli; OL is the distance between the inner edges of a lateral ocellus and the median ocellus; OOL is the distance from the outer edge of a lateral ocellus to the compound eye; OPL is the distance from the posterior edge of a lateral ocellus to the occipital carina; TL is the distance from the posterior edge of an eye to the occipital carina.

Rearing data are abbreviated as follows: C = collection date of parasitized host; B = emergence date of mature dryinid larva; E = emergence date of dryinid adult.

All specimens studied in this paper are deposited in the following collections: OL: Massimo Olmi's collection, c/o Dipartimento di Protezione delle Piante, Università della Tuscia, Viterbo, Italy; TU: Instituto Fundación Miguel Lillo, Universidad Nacional de Tucumán, San Miguel de Tucumán, Argentina.

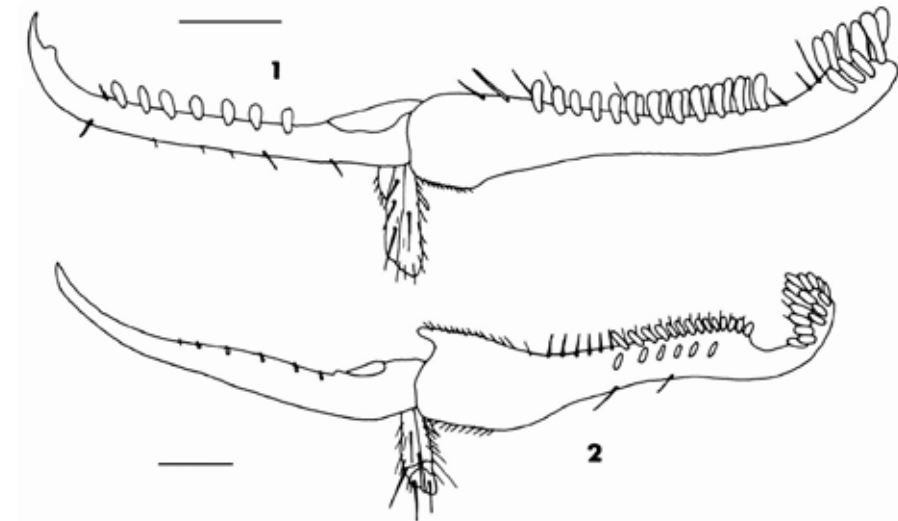
RESULTS

Gonatopus cuyanus n. sp.

MATERIAL EXAMINED: female holotype: Argentina, Mendoza Province, along Rd 40, 34°22.03'S 68°32.205'W, elevation 950 m, reared from an unidentified Flatid collected on 10.XI.2005, E. Virla coll. (TU); 1 male paratype: same locality label (TU).

DESCRIPTION OF THE FEMALE: apterous; length 2.5 mm.

Head brown, except mandibles, clypeus, anterior margin of face, genae and two short stripes along the orbits testaceous; antennae brown, except segments 7-10 and ventral side of segment 1 testaceous; mesosoma black, except sides of pronotum and posterior third of pronotal disc testaceous-brown; gaster black; legs brown, except articulations and part of trochanters testaceous.



Figs 1 - 2. Chelae of holotypes: 1, *Gonatopus cuyanus* n. sp. (scale bar = 0.08 mm); 2, *Esagonatopus minuslamellatus* n. sp. (scale bar = 0.10 mm).

Antennae clavate; antennal segments in the following proportions: 8:4:11.5:6.5:5:5:5:4.5:4:4:7.

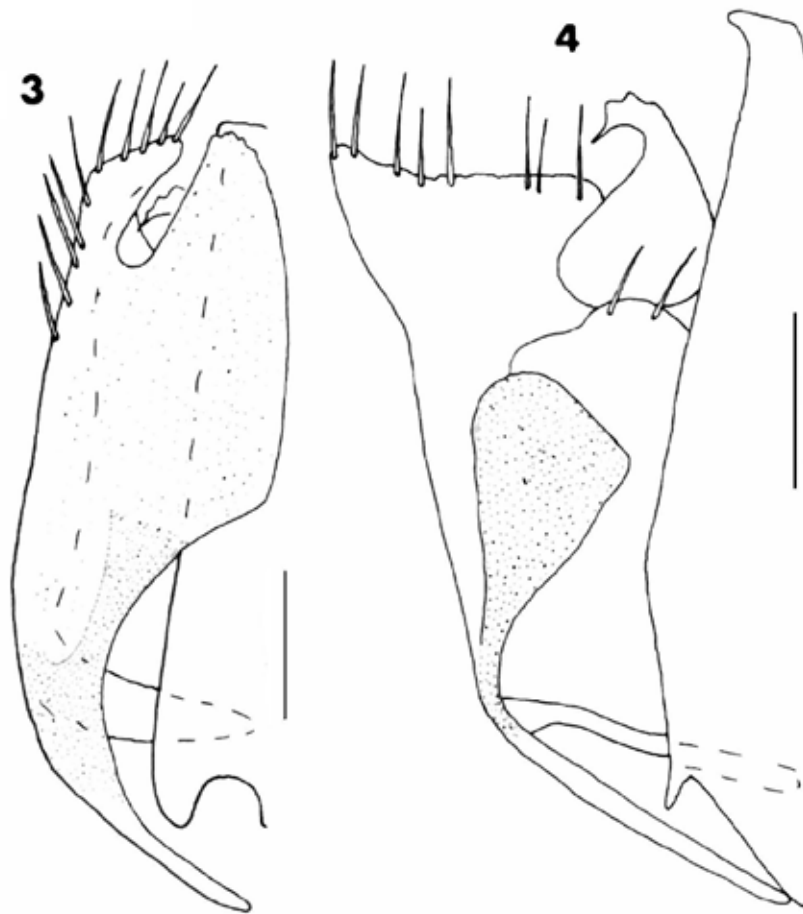
Head excavated, dull, granulated; frontal line complete; occipital carina absent; temples distinct; POL = 1; OL = 3; OOL = 7; greatest diameter of posterior ocelli = 1. Pronotum dull, granulated, crossed by a strong transverse impression. Scutum dull, granulated, without lateral points. Scutellum shiny, inclined. Metanotum hollow behind the scutellum, flat, granulated. Metathorax + propodeum dull, with anterior surface granulated and posterior surface granulated and transversely striate. Mesopleura and metapleura dull, granulated and transversely striate. Meso-metapleural suture distinct and complete. Fore tarsal segments in the following proportions: 12:2.5:4.5:13:20. Enlarged claw (Fig. 1) with a large subdistal tooth and a row of 7 lamellae. Segment 5 of front tarsus (Fig. 1) with two rows of 19 lamellae; distal apex with a group of at least 10 lamellae. Palpal formula 5/3. Tibial spurs 1, 0, 1.

DESCRIPTION OF THE MALE: fully winged; length 1.87 mm.

Head black, except mandibles testaceous; antennae brown; mesosoma black; gaster brown; legs brown, except tarsi testaceous.

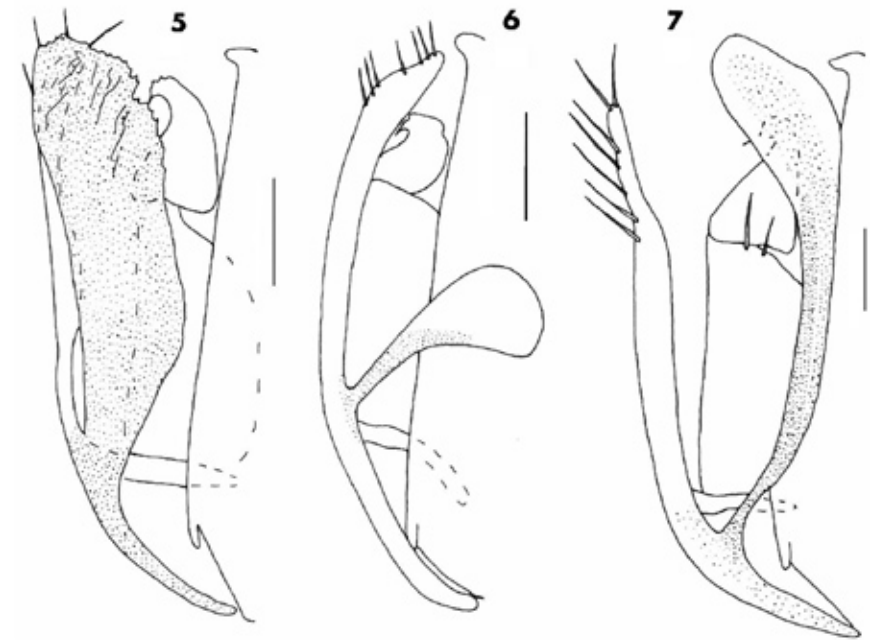
Antennae hairy, filiform; antennal segments in the following proportions: 4:4:6:5:6:6:5.5:5:5:8; antennal segment 3 three times as long as broad: 6:2.

Head dull, granulated and reticulate rugose; frontal line absent; occipital carina absent; temples distinct; POL = 5; OL = 2; OOL = 3; greatest diameter of posterior ocelli: 2; vertex with two oval smooth and shiny areas situated on the sides of the posterior ocelli and occupying the areas between the posterior ocelli and the eyes; these areas are



Figs 3 – 4. Genitalia (right half removed): 3, *Gonatopus hilaris* Olmi (scale bar = 0.05 mm); 4, *Gonatopus moyaraygozai* Olmi (scale bar = 0.04 mm).

not anteriorly surrounded by a high carina. Scutum dull, granulated; notauli complete, posteriorly separated; minimum distance between the notauli as long as greatest diameter of posterior ocelli. Scutellum and metanotum shiny, smooth, finely punctate, without sculpture among the punctures. Propodeum dull, completely reticulate rugose, without longitudinal or transverse keels. Forewing hyaline, without dark transverse bands; marginal cell open; stigmal vein regularly curved, with distal part longer than proximal part (approximately 12:9). Dorsal process of paramere (Fig. 5) about as long as penis and paramere, with distal region broadened and distal margin serrated. Palpal formula 5/3. Tibial spurs 1, 1, 2.



Figs 5 - 7. Genitalia (right half removed): 5, *Gonatopus cuyanus* n. sp. (scale bar = 0.05 mm); 6, *Gonatopus virlai* Olmi (scale bar = 0.07 mm); 7, *Gonatopus doellojuradoi* (Ogloblin)(scale bar = 0.03 mm).

ETIMOLOGY: from the latin adjective *cuyanus* = inhabiting Cuyo region.

REMARKS: the female of *G. cuyanus* is similar to that of *G. longichelatus* (Fenton, 1927). Following the above description, a new key to the females of the Neotropical *Gonatopus* of group *longichelatus* (formerly *Agonatopoides* Perkins; see Olmi, 1993) is presented:

- 1 Meso-metapleural suture obsolete..... *vignai* (Olmi)
- Meso-metapleural suture distinct and complete
- 2 Anterior surface of metathorax + propodeum with granulate sculpture
- Anterior surface of metathorax + propodeum granulate

The male of *G. cuyanus* is similar to that of *G. vidanoi* Olmi, 1994. However, in *G. vidanoi* the antennal segment 3 is more than three times as long as broad and the dorsal process of the paramere has very small papillae on distal region (Fig. 15) (in *G. cuyanus* the antennal segment 3 is about three times as long as broad and the dorsal processes of parameres have a deeply serrated distal region (Fig. 5)). For the inclusion of the male of this new species in the key to the males of the Neotropical *Gonatopus*, see below.

Esagonatopus minuslamellatus n. sp.

MATERIAL EXAMINED: female holotype: Argentina, Corrientes Province, along Rd 12, 7 Km W Misiones Province border, C. 26.XI.2006, B. 30.XI.2006, reared from an adult of *Agudus sexmaculatus* Linnavuori (Cicadellidae)(TU); 1 female paratype: same locality label and same host, C. 26.XI.2006, B. 30.XI.2006 (OL).

DESCRIPTION OF THE FEMALE: apterous; length 3.12-3.31 mm (holotype 3.31 mm).

Head black, with anterior part of the face, clypeus, genae and mandibles testaceous; antennae brown, with ventral side of segment 1 yellow; mesosoma black, with reddish nuances on disc and part of lateral regions of pronotum; in the paratype the disc and part of the lateral regions of pronotum are ferruginous; petiole and gaster black; legs brown.

Antennae clavate; antennal segments in the following proportions: 9:6:21:11:10:9:8:8:7:10.

Head excavated, dull, granulated; frontal line complete; occipital carina absent; POL = 2; OL = 2; OOL = 9; greatest diameter of posterior ocelli: 1. Pronotum crossed by a strong transverse impression, dull, completely granulated. Scutum dull, granulated, with 2 lateral pointed apophyses. Scutellum flat, shiny, granulated, partly without sculpture. Meso-metapleural suture obsolete. Metanotum granulated, not hollow behind the scutellum. Metathorax + propodeum dull, completely granulated, with sides rounded. Mesopleura, metapleura and posterior surface of propodeum granulated, dull, not transversely striate. Fore tarsal segments in the following proportions: 15:3:5:18:25. Enlarged claw (Fig. 2) without a preapical tooth and with a row of 5-6 peg-like bristles (5 in the holotype). Segment 5 of front tarsus (Fig. 2) with 2 rows of 20-23 lamellae; distal apex of segment 5 with a group of 15-18 lamellae. Palpal formula 6/2. Tibial spurs 1, 0, 1.

MALE: unknown.

ETIMOLOGY: from *minus* and *lamellatus* = with fewer lamellae (than in *E. olmii* Virla).

REMARKS: the female of *G. minuslamellatus* is similar to that of *G. olmii* Virla, 1997. Following the above description of *E. minuslamellatus*, the following new key to the females of the Neotropical *Esagonatopus* is presented:

- 1 Posterior surface of propodeum totally granulated, not transversely striate
- Posterior surface of propodeum strongly transversely striate
- 2 Segment 5 of fore tarsus with three rows of lamellae and with distal apex provided of a group of more than 20 lamellae (Fig. 4 in Virla, 1997) *olmii* Virla
- Segment 5 of fore tarsus with two rows of lamellae and with distal apex provided of a group of less than 20 lamellae (Fig. 2) *minuslamellatus* n. sp.
- 3 Mesosoma black with distal apex of propodeum testaceous
- Mesosoma mostly testaceous *neotropicus* Olmi

Gonatopus doellojuradoi (Ogloblin)

Gonatopus doellojuradoi (Ogloblin, 1938) was known only on the basis of female specimens from Argentina (Olmi, 1984; Virla, 1997; Virla & Olmi, 1998). In 2006, both sexes of this species were reared from unidentified Cicadellidae in the following locality: Argentina, Corrientes Province, Itati, C. 26.XI.2006, B. 27.XI.2006, reared from a nymph of an unidentified Cicadellid belonging to Deltocephalinae, 1 female (OL); same locality label, C. 26.XI.2006, B. 29.XI.2006, reared from a nymph of an unidentified Cicadellid, 1 female (TU); same locality label, C. 26.XI.2006, B. 30.XI.2006, reared from a nymph of an unidentified Cicadellid belonging to Deltocephalinae, 1 male (OL).

The following is the description of the male of *G. doellojuradoi*:

DESCRIPTION OF THE MALE: fully winged; length 1.87 mm.

Head black, with mandibles testaceous; antennae brown; mesosoma black; gaster brown-dark; legs testaceous-darkened.

Antennae hairy, filiform; antennal segments in the following proportions: 4.5:4.5:8:8:8:8:7.5:7.5:6.5:9; antennal segment 3 more than three times as long as broad (8:2).

Head shiny, slightly granulated, laterally without two shiny and smooth areas situated between the posterior ocelli and the eyes; frontal line absent; occipital carina absent; occiput concave; temples distinct; POL = 5; OL = 2; OOL = 3; greatest diameter of anterior ocellus: 3. Scutum dull, granulated. Notauli complete, posteriorly joint. Scutellum and metanotum shiny, finely hairy, very finely punctate, without sculpture among punctures. Propodeum dull, completely granulated. Forewing hyaline, without dark transverse bands; marginal cell open; distal part of stigmal vein longer than proximal part (16:8.5); dorsal process of the paramere (Fig. 7) long and with distal apex broadened, longer than paramere. Palpal formula 4/2. Tibial spurs 1, 1, 2.

REMARKS: the male of *G. doellojuradoi* is similar to that of *G. variistriatus* (Fenton, 1927) and *G. desantisi* Olmi & Virla, 1993. However, in *G. doellojuradoi* the paramere is shorter than dorsal process (Fig. 7) and the propodeum is completely granulated (paramere longer than dorsal process and propodeum partly or almost completely smooth and without sculpture in the other two species).

For the inclusion of the male of *G. doellojuradoi* in the key to the males of the Neotropical *Gonatopus*, see below.

Virla (1997) examined a series of females from some localities of Argentina and expressed the opinion that the supposed synonymy of *G. doellojuradoi* and *G. argentinus* Olmi, 1986 (officially established afterwards by Olmi et al., 2000), was not sufficiently proved. For this reason he introduced the concept of *G. doellojuradoi* complex, including many specimens with characters of both *G. doellojuradoi* and *G. argentinus*. He suggested to wait for the discovery of males for supporting the validity of both species or their synonymy. To contribute to the solution of this problem, it is important to point out that the male above described was reared with females corresponding to the description of *G. doellojuradoi*. Unluckily, one of the authors (Olmi) reared in a different locality (Argentina, Buenos Aires Province, 12 Km E Pinamar) some females corresponding to the description of *G. argentinus*, but he could not find any males.

Gonatopus silvestrii Kieffer

Gonatopus silvestrii Kieffer, 1912, was known only on the basis of female specimens from Argentina and Brazil (Virla & Olmi, 1998). In 2006 both sexes of this species were reared from Cicadellidae in the following localities: Argentina, Corrientes Province, along Rd. 12, 7 Km W Misiones Province border, C. 26.XI.2006, B. 28.XI.2006, M. Olmi reared from an adult of *Exitianus obscurinervis* (Stål)(Cicadellidae), 1 female (OL); same locality label, 26.XI.2006, B. 28.XI.2006, M. Olmi reared from a nymph of *Exitianus obscurinervis* (Stål)(Cicadellidae), 1 male (OL); Misiones Province, along Rd 2, 19 Km E Colonia Primavera, C. 30.XI.2006, B. 3.XII.2006, M. Olmi reared from a nymph of *Plesiomatta mollicella* (Fowler)(Cicadellidae), 1 female (OL); same locality label, C. 30.XI.2006, B. 2.XII.2006, M. Olmi reared from adults of *Amplicephalus faminoides* Linnavuori (Cicadellidae), 2 females (TU); same locality label, C. 30.XI.2006, B. 3.XII.2006, M. Olmi reared from a nymph of *Planicephalus flavicosta* (Stål)(Cicadellidae), 1 male (OL).

The following is the description of the male of *G. silvestrii*:

DESCRIPTION OF THE MALE: fully winged; length 1.50-1.68 mm.

Head black, except mandibles testaceous; antennae brown; mesosoma black; gaster brown-black; legs brown, except extremities of femora, fore tibiae, extremities of mid and hind tibiae, tarsal segments 1-4 testaceous-withish.

Antennae hairy, filiform; antennal segments in the following proportions: 4:3.5:6:5:5:4.5:4:4:3.5:5.5; antennal segment 3 more than three times as long as broad (6:1.5).

Head shiny, punctate and granulated, laterally with two shiny and smooth areas situated between the posterior ocelli and the eyes; these areas are surrounded by very low keels (these keels never are high); frontal line absent; occipital carina absent; occiput concave; temples distinct; POL = 6; OL = 3; OOL = 3; greatest diameter of posterior ocelli: 2. Scutum dull, granulated; notauli complete, posteriorly separated; minimum distance between the notauli slightly shorter than greatest diameter of posterior ocelli (1.5:2.0), shorter than antennal segment 2 (1.5:3.5). Scutellum and metanotum shiny, finely hairy, very finely punctate, without sculpture among punctures. Propodeum dull, completely reticulate rugose. Forewing hyaline, without dark transverse bands; marginal cell open; stigmal vein regularly curved, with distal part longer than proximal part. Dorsal process of paramere (Fig. 8) long and slender, slightly shorter than penis, approximately as long as paramere, occasionally slightly longer than penis. Palpal formula 4/2. Tibial spurs 1, 1, 2.

REMARKS: the male of *G. silvestrii* is similar to that of *Laberinus paranensis* Ogloblin, 1932 (an *incertae sedis* species, probably belonging to *Gonatopus*), and *Gonatopus chilensis* Olmi, 1984. However, the dorsal process of paramere is broader in *L. paranensis* (Fig. 29) than in *G. silvestrii* (Fig. 8) and the notauli are almost joined in *G. chilensis* (they are distinctly separated in *G. silvestrii*).

For the inclusion of the male of *G. silvestrii* in the key to the males of the Neotropical *Gonatopus*, see below.



Figs 8 - 10. Genitalia (right half removed): 8, *Gonatopus silvestrii* Kieffer (scale bar = 0.03 mm); 9, *Gonatopus fritzi* (Olmi) (scale bar = 0.05 mm); 10, *Gonatopus autumnalis* Olmi (scale bar = 0.07 mm).

Gonatopus fritzi Olmi

Gonatopus fritzi Olmi, 1992, was known only on the basis of female specimens from Argentina (Virla & Olmi, 1998; Virla, 2001). In 2006 both sexes of this species were reared from unidentified Issidae in the following locality: Argentina, Buenos Aires Province, Villa Gesell, Mar Azul, C. 6.XII.2006, B. 9.XII.2006, E. 2.I.2007, M. Olmi reared from an adult of an unidentified Issid, 1 female (OL); same locality label, M. Olmi reared from a nymph of an unidentified Issid, 1 male (OL).

The following is the description of the male of *G. fritzi*:

DESCRIPTION OF THE MALE: fully winged; length 2.12 mm.

Head black, except mandibles testaceous; antennae brown; mesosoma and gaster black; legs testaceous, except coxae, femora and tibiae partly brown.

Antennae filiform; antennal segments in the following proportions: 4.5:4.5:7.5:6:6:6:6:5.5:5.5:8; antennal segment 3 more than three times as long as broad (7.5:2); antennal segment 2 longer than greatest diameter of posterior ocelli (4.5:2).

Head dull, granulated and rugose; frontal line absent; occipital carina absent; POL = 5; OL = 2.5; OOL = 3; greatest diameter of posterior ocelli: 2; temples very short, but distinct. Scutum dull, granulated; notauli complete, posteriorly separated; minimum distance between the notauli shorter than antennal segment 2 (2:4.5) and as long as greatest diameter of posterior ocelli. Scutellum and metanotum shiny, finely punctate, without sculpture among the punctures. Propodeum dull, reticulate rugose, without longitudinal or transverse keels. Forewing hyaline, without dark transverse bands; marginal

cell open; distal part of stigmal vein longer than proximal part (15:7). Dorsal process of paramere (Fig. 9) short and pointed, with distal region broadened. Palpal formula 6/3. Tibial spurs 1, 1, 2.

REMARKS: the male of *G. fritzi* is similar to that of *G. flavipes* Olmi, 1984. However, the dorsal process of paramere is narrower in *G. flavipes* (Fig. 16) than in *G. fritzi* (Fig. 9) and the head of *G. flavipes* shows a shiny and smooth oval area between the eyes and posterior ocelli (this area is absent in *G. fritzi*).

For the inclusion of the male of *G. fritzi* in the key to the males of the Neotropical *Gonatopus*, see below.

Gonatopus hilaris Olmi

Gonatopus hilaris Olmi, 1995, was known only on the basis of female specimens from Brazil (Olmi, 1995). In 2000 both sexes of this species were reared (Sosa et al., 2005) in the following locality: Argentina, Formosa Province, Pirané, XI.2000, Sosa coll., reared from *Megamelus scutellaris* (Berg)(Delphacidae), 2 females and 2 males (TU).

The following is the description of the male of *G. hilaris*:

DESCRIPTION OF THE MALE: fully winged; length 2.06 mm.

Head black, except mandibles, clypeus, genae and a small frontal area near clypeus brown-testaceous; antennae brown; mesosoma black; gaster brown; legs testaceous, except mid and hind coxae partly brown.

Antennae hairy, filiform; antennal segments in the following proportions: 5:5:9:8:7.5:8:8:6.5:7:8; antennal segment 3 more than three times as long as broad: 9:2.

Head shiny; face without sculpture; vertex and lateral areas slightly irregularly striate; frontal line absent; occipital carina absent; POL = 6; OL = 2; OOL = 2; ocelli very large (greatest diameter of posterior ocelli longer than OOL: 3.5:2); vertex with two oval smooth, slightly striate and shiny areas situated on the sides of the posterior ocelli and occupying the areas between the posterior ocelli and the eyes; these areas are not anteriorly surrounded by a high carina. Scutum shiny, punctate, without sculpture among the punctures, or very slightly granulated. Notauli complete, posteriorly joint. Scutellum and metanotum shiny, smooth, punctate, without sculpture among the punctures. Propodeum dull, completely reticulate rugose (with areolae very small); posterior surface without longitudinal or transverse keels. Forewing hyaline, without dark transverse bands; marginal cell open; stigmal vein forming an angle between the distal and proximal parts; distal part of stigmal vein longer than proximal part (17:9). Dorsal process of paramere (Fig. 3) long and broad, with distal apex pointed and slightly serrate. Palpal formula 4/2. Tibial spurs 1, 1, 2.

REMARKS: the male of *G. hilaris* is similar to that of *G. krombeini* Olmi, 1998. However, the inner margin of the dorsal process of paramere is serrate in *G. krombeini* (Fig. 17), not serrate in *G. hilaris* (Fig. 3).

For the inclusion of the male of *G. hilaris* in the key to the males of the Neotropical *Gonatopus*, see below.

Gonatopus autumnalis Olmi

Gonatopus autumnalis Olmi, 1984, was known only on the basis of female specimens from Bolivia (Olmi, 1984) and Argentina (unpublished data). In 2006 both sexes of this species were reared in the following locality: Argentina, Buenos Aires Province, along Rd 11, 12 Km N Pinamar, Km 384 of Rd 11, on dunes, C. 4.XII.2006, B. 10.XII.2006, E. 30.XII.2006, M. Olmi reared from a nymph of *Faltala furcipennis* Cheng (Cicadellidae), 1 female (TU); same locality label and same host, C. 4.XII.2006, B. 9.XII.2006, E. 1.I.2007, 1 female (OL); same locality label and same host, C. 4.XII.2006, B. 9.XII.2006, E. 29.XII.2006, 1 female (OL); same locality label and same host, C. 11.XII.2006, E. 4.I.2007, 1 female (OL); same locality label and same host, C. 11.XII.2006, E. 2.I.2007, 1 male (OL).

The following is the description of the male of *G. autumnalis*:

DESCRIPTION OF THE MALE: fully winged; length 2.25 mm.

Head black, with mandibles testaceous; antennae brown; mesosoma black; gaster brown-dark; legs brown-testaceous.

Antennae hairy, filiform; antennal segments in the following proportions: 4:3.5:8.5:8:8:8:7:7:6.5:8.5; antennal segment 3 more than three times as long as broad (8.5:1.3).

Head shiny, slightly granulated, laterally with two shiny and smooth areas situated between the posterior ocelli and the eyes; frontal line absent; occipital carina absent; occiput concave; temples distinct; POL = 6; OL = 2; OOL = 2.3; greatest diameter of posterior ocelli: 2.3. Scutum dull, granulated. Notauli complete, posteriorly separated; minimum distance between the notauli shorter than greatest diameter of posterior ocelli: 1.5:2.3. Scutellum and metanotum shiny, finely hairy, very finely punctate, without sculpture among punctures. Propodeum dull, reticulate rugose, with dorsal surface partly granulated. Forewing hyaline, without dark transverse bands; marginal cell open; distal part of stigmal vein longer than proximal part (18:6). Dorsal process of paramere (Fig. 10) short and with distal apex rounded. Palpal formula 4/2. Tibial spurs 1, 1, 2.

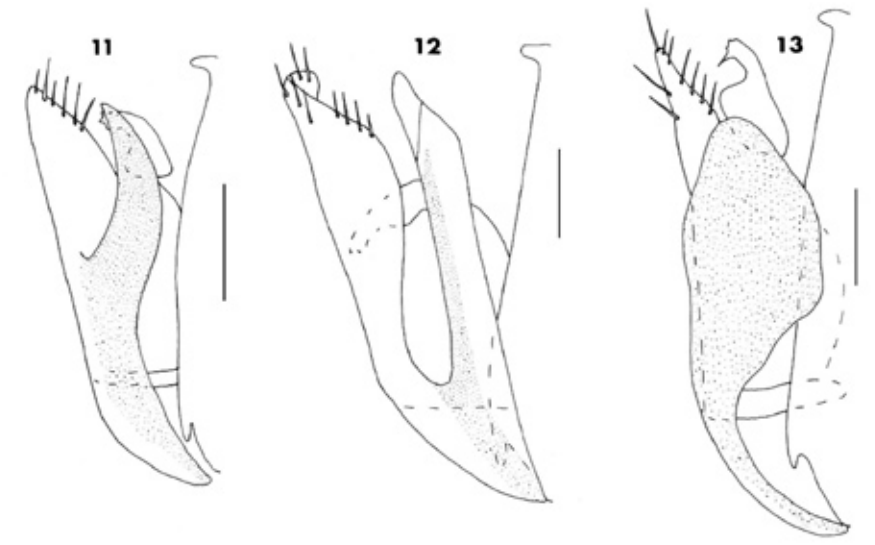
REMARKS: the male of *G. autumnalis* is similar to that of *G. lacualis* Olmi, 1984. However, in *G. autumnalis* the minimum distance between the notauli is much narrower than the greatest diameter of the posterior ocelli (it is as long as in *G. lacualis*).

For the inclusion of the male of *G. autumnalis* in the key to the males of the Neotropical *Gonatopus*, see below.

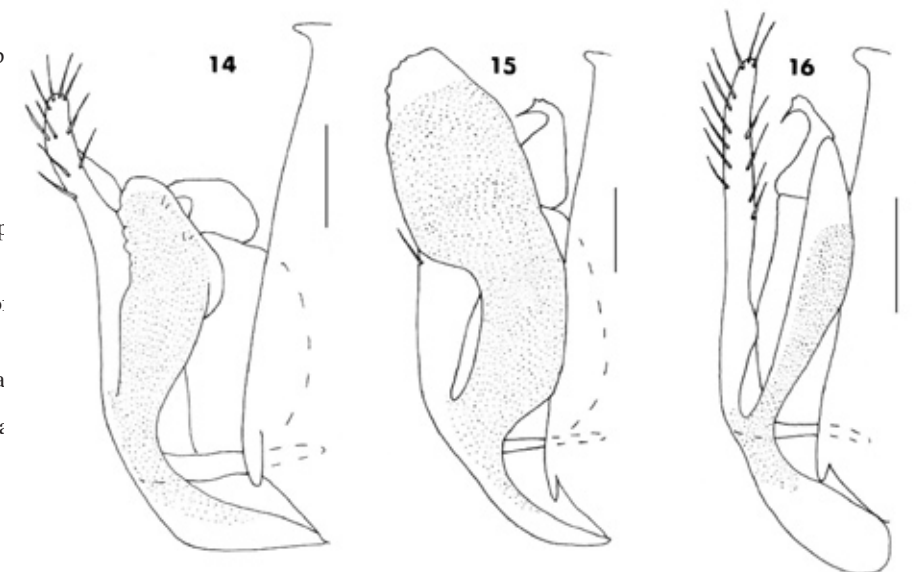
NEW KEY TO THE MALES OF THE NEOTROPICAL SPECIES OF *GONATOPUS* (including *nomina incertae sedis* probably belonging to *Gonatopus*)

1	Antennal segment 3 less than three times as long as broad
–	Antennal segment 3 three times or more times as long as broad
2	Notauli incomplete
granulated	<i>zolnerowichi</i> (Olmi)

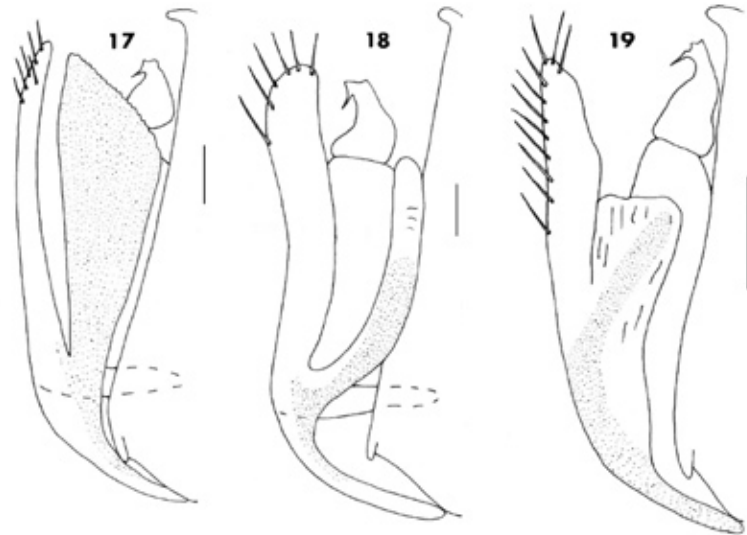
–	Notauli complete; propodeum reticulate rugose or granulated	
3	Propodeum granulated; dorsal process of	
– <i>carabicus</i> (Olmi)	
–	Propodeum reticulate rugose; dorsal	
(Figs 4, 27) 4	
4	Dorsal process of the paramere long and with proximal	
–	<i>sanctivincenti</i> Ashmead	
–	Dorsal process of the paramere short and with proximal	
– <i>moyaraygozai</i> Olmi	
5	Propodeum completely reticulate rugose..... 6	
–	Propodeum at most partly reticulate and	
–	pletely granulated 24	
6	Dorsal process of the paramere long	
29) 7	
–	Dorsal process of the paramere short	
23, 26, 31) 10	
7	Distal and lateral margins of the dorsal process of the paramere without papillae (Figs 8,	
29) 8	
–	Distal region of the dorsal process of p	
(Fig. 5) 9	
8	Dorsal process of paramere slender (Fig. 29)	
–	Dorsal process of paramere slender (Fig. 8)	
9	Distal region of the dorsal process of p	
3 more than four times as long as broad <i>vidanoi</i> Olmi		
–	Distal region of the dorsal process of	
three times as long as broad <i>cuyanus</i> n. sp.		
10	Dorsal process of the paramere with distal	
–	Dorsal process of the paramere with distal	
11	Notauli posteriorly joint..... 12	
–	Notauli posteriorly separated..... 14	
12	Dorsal process of the paramere slender (Fig. 31)	
–	Dorsal process of the paramere broad (Figs 3, 17)	
13	Dorsal process of the paramere with inner margin serrate (Fig. 10)	



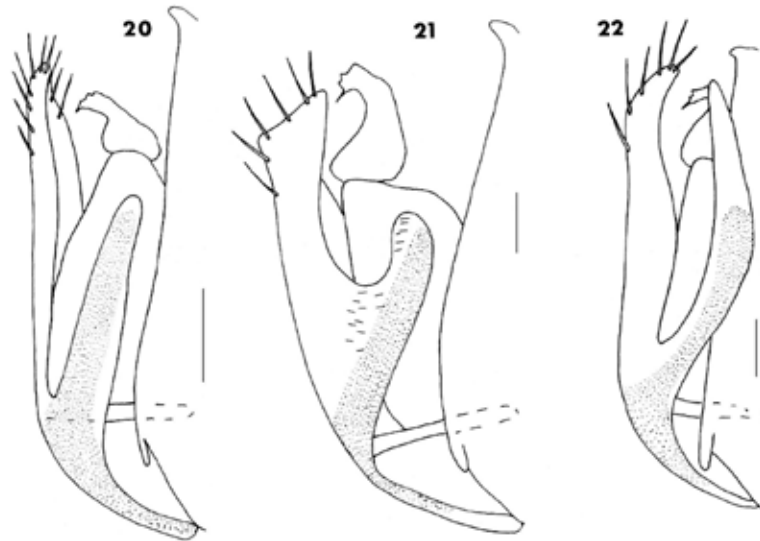
Figs 11 - 13. Genitalia (right half removed): 11, *Gonatopus carabicus* (Olmi) (scale bar = 0.03 mm); 12, *Gonatopus arnaudi* (Olmi) (scale bar = 0.03 mm); 13, *Gonatopus testaceus* Cameron (scale bar = 0.06 mm).



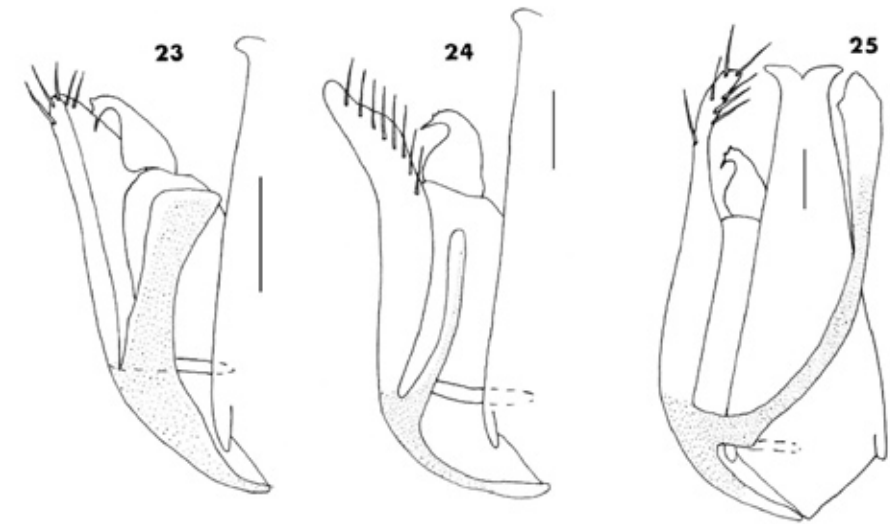
Figs 14 - 16. Genitalia (right half removed): 14, *Gonatopus lacualis* Olmi (scale bar = 0.06 mm); 15, *Gonatopus vidanoi* Olmi (scale bar = 0.04 mm); 16, *Gonatopus flavipes* Olmi (scale bar = 0.07 mm).



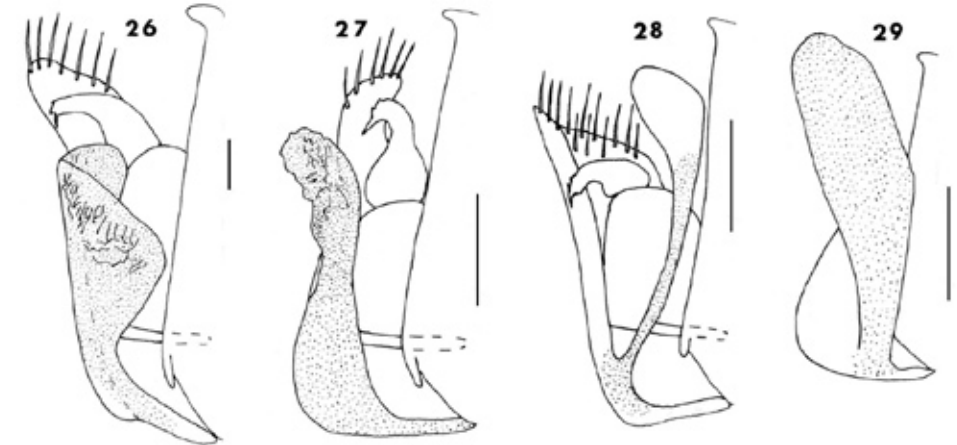
Figs 17 - 19. Genitalia (right half removed): 17, *Gonatopus krombeini* Olmi (scale bar = 0.03 mm); 18, *Gonatopus sandrae* Olmi (scale bar = 0.02 mm); 19, *Gonatopus variistriatus* (Fenton) (scale bar = 0.05 mm).



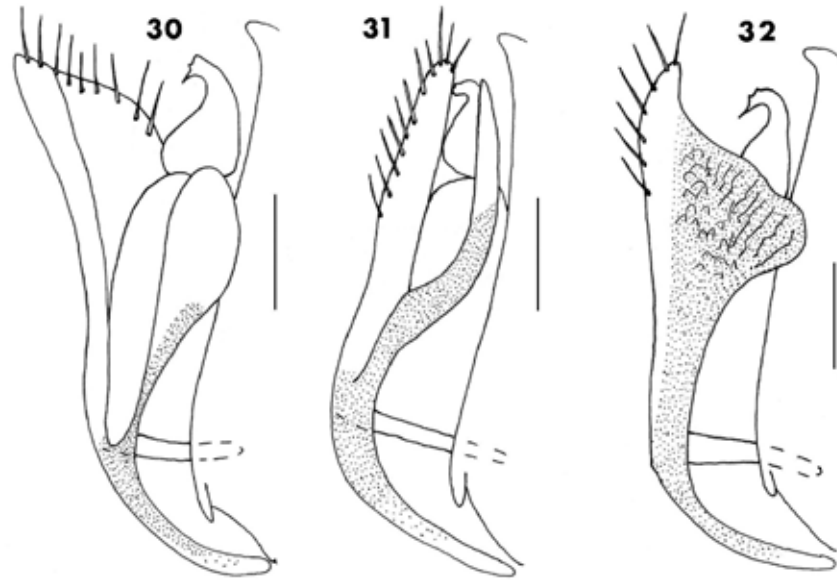
Figs 20 - 22. Genitalia (right half removed): 20, *Gonatopus costaricanus* (Olmi) (scale bar = 0.06 mm); 21, *Gonatopus zolnerowichi* (Olmi) (scale bar = 0.02 mm); 22, *Gonatopus breviforceps* Kieffer (scale bar = 0.02 mm).



Figs 23 - 25. Genitalia (right half removed): 23, *Gonatopus tijucanus* (Arlé) (scale bar = 0.09 mm); 24, *Gonatopus fernandinae* Olmi (scale bar = 0.03 mm); 25, *Gonatopus bartletti* Olmi (scale bar = 0.04 mm).



Figs 26 - 29. Genitalia (right half removed): 26, *Labeo grenadensis* Ashmead (scale bar = 0.03 mm); 27, *Labeo sanctivincenti* Ashmead (scale bar = 0.05 mm); 28, *Labeo simulans* Ashmead (scale bar = 0.06 mm); 29, *Laberinus paranensis* Ogloblin (scale bar = 0.11 mm).



Figs 30 - 32. Genitalia (right half removed): 30, *Gonatopus desantisi* Olmi & Virla (scale bar = 0.05 mm); 31, *Gonatopus chilensis* (Olmi) (scale bar = 0.06 mm); 32, *Gonatopus carabicus* (Olmi) (scale bar = 0.06 mm).

14 Head black, with mandibles testaceous 15

15 Dorsal process of the paramere much shorter than paramere and with medial region broadened (Figs 9, 16) 16

16 Dorsal process of the paramere slender, approximately as long as the paramere (Figs 8, 12, 31) 17

16 Dorsal process of the paramere less broad than paramere and with medial region broadened (Fig. 16) 17

16 between the eyes and posterior ocelli *flavipes* Olmi

17 Dorsal process of the paramere broader (Fig. 9); head without a shiny and smooth oval area between the eyes and posterior ocelli *fritzi* Olmi

17 Labial palpi 3-segmented *arnaudi* (Olmi)

18 Labial palpi 2-segmented 18

18 Notauli almost joint at posterior margin of scutum *chilensis* (Olmi)

19 diameter of posterior ocelli *silvestrii* Kieffer

19 Labial palpi 2-segmented 20

20 Labial palpi 3-segmented 21

20 Minimum distance between posterior ocelli *lacualis* Olmi

20 Minimum distance between anterior ocelli *autumnalis* Olmi

21 Dorsal process of the paramere with a distal fold *tijucanus* (Arlé)

21 Dorsal process of the paramere very broadened distally 21

22 Vertex of the head with a shiny and smooth oval area 22

22 dorsal process of the paramere with a proximal very slender region (Fig. 6) *virlai* Olmi

22 Vertex of the head with a shiny and smooth oval area; dorsal process of the paramere with a proximal not slender region (Figs 13, 26) 23

23 Dorsal process of the paramere with a distal fold (Fig. 13) 23

23 Dorsal process of the paramere without a distal fold 23

24 Notauli complete 25

25 Dorsal process of the paramere with distal apex slightly serrate and line complete 33

25 Dorsal process of the paramere with distal apex not serrate and line complete 33

25 Head not testaceous, except for the darkened vertex (Figs 20, 33) 26

26 Dorsal process of the paramere much shorter than paramere and with medial region broadened (Fig. 34) 27

26 Dorsal process of the paramere slender, approximately as long as the paramere (Figs 8, 12, 31) 17

26 Scutum dull, granulated, maculate 26

26 Scutum shiny, finely granulated 26

26 Dorsal process of the paramere less broad than paramere and with medial region broadened (Fig. 16) 17

27 Dorsal process of the paramere broader (Fig. 9); head without a shiny and smooth oval area between the eyes and posterior ocelli *fidalgoi* Virla

27 Dorsal process of the paramere with distal fold 28

28 Dorsal process of the paramere without a distal fold 28

28 Scutum punctate, without shiny area among the punctures 28

29 Scutum granulated *bartletti* Olmi

29 Dorsal process of the paramere much shorter than paramere and with medial region broadened (Fig. 34) 27

- 28) 31
- 30 1.5-2.0 times as broad as OOL; propodeum less smooth *variistriatus* Fenton
- *desantisi* Olmi
- 31 Propodeum dull, completely *ogloblini* (Ogloblin)
- *prophiqui* (Fieber) (Delphacidae), ♀ female (OL).
- 32 Propodeum with dorsal surface not completely
- process of the paramere with distal apex slightly broadened (Fig. 25) *bartletti* Olmi
- *Labeo simulans* Ashmead
- 33 Dorsal process of the paramere much shorter than penis (Figs 18, 24)
- *fernandinae* Olmi
- *sandrae* Olmi
- 35 of tibiae and tarsi yellow *cubensis* (Richards)
- *breviforceps* Kieffer

NEW RECORDS IN ARGENTINA

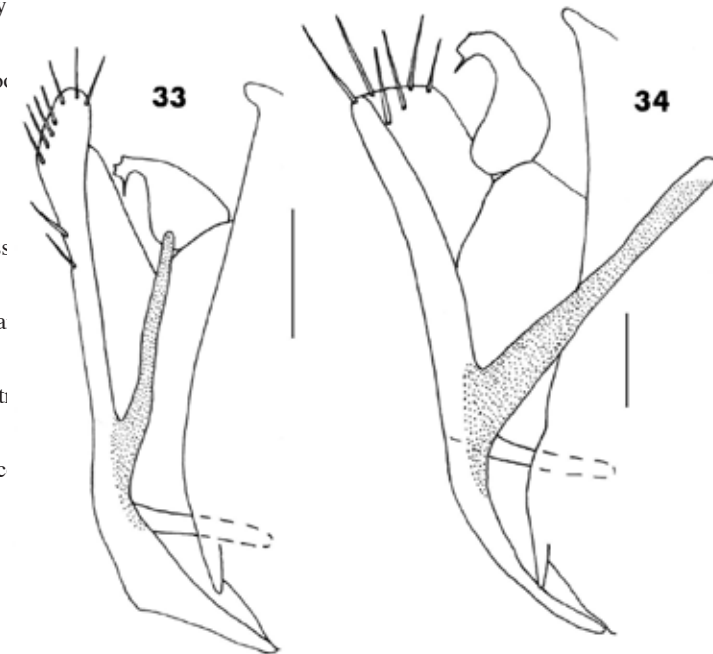
***Trichogonatopus raptor* (Fenton)**

Trichogonatopus raptor (Fenton, 1927) was described on the basis of a single female specimen from Panamá, Porto Bello. Afterwards, further two females specimens were collected respectively in Ecuador (no locality data) and Peru, Tingo María (Olmi et al., 2000). The hosts were unknown. In 2006, an additional female of this rare species was reared from the following locality:

Argentina, Salta Province, at Los Castillos site near Cafayate, C. 22.XI.2006, B. 24.XI.2006, M. Olmi, reared from an adult of *Curtara pagina* De Long & Freytag (Cicadellidae), 1 female (OL).

Dorsal process of the paramere approximately as long as the paramere, ***Gonatopus fidalgoi* Olmi**

Dorsal process of the paramere transverse (Fig. 19); head with anterior ocellus approximately (Olmi, 1984) preoccupied by *Gonatopus flavus* Hedicke, 1926. This species was known only on the basis of female specimens from the following countries: Grenada (Grand Anse, West Indies (Saint Lucia), Guadalupe, Brazil (Sta. Catarina, Nova Teutonia), Chile (Angol). In 2006, a further female of this species was reared from the following locality: Argentina, Jujuy Province, 5.4 Km S La Mendieta, along S. Salvador - S. Pedro Road (Rd 56), C. 24.XI.2006, B. 27.XI.2006, M. Olmi reared from a nymph of *Toya propinquu* (Fieber) (Delphacidae), ♀ female (OL).



Figs 33 - 34. Genitalia (right half removed): 33, *Gonatopus fidalgoi* Virla (scale bar = 0.06 mm); 34, *Gonatopus lautii* Virla (scale bar = 0.03 mm).

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Osservazioni anatomiche sull'apparato genitale femminile in tre eulofidi dell'eucalipto (Hymenoptera Chalcidoidea)

Riassunto - È stato esaminato l'apparato genitale femminile in tre specie di Eulophidae infeudate ad *Eucalyptus camaldulensis* Dehn. in Basilicata e Puglia: *Ophelimus maskelli* (Ashmead), *Leptocybe invasa* Fisher & La Salle, *Quadrastichodella nova* Girault. Tutte presentano un numero elevato di ovaroli e sono in possesso della spermateca; esse mostrano nette differenze interspecifiche sia nella forma delle uova sia nel corredo ghiandolare. Rispetto alla generalità degli Eulophidae, quest'ultimo manifesta alcune particolarità che, secondo l'autore, potrebbero dipendere in parte dalla riproduzione di tipo partenogenetico e in parte dalla dieta fitofaga.

Abstract - *Anatomical observations of female internal genitalia in three eulophids associated to Eucalyptus (Hymenoptera Chalcidoidea)*.

Material was obtained from leaves or capsules of *Eucalyptus camaldulensis* Dehn. in Southern Italy; it refers to 3 species, identified by Dr. J. La Salle (CSIRO Entomology, Canberra) as follows: *Ophelimus maskelli* (Ashmead, 1900), *Leptocybe invasa* Fisher & La Salle, 2004, and *Quadrastichodella nova* Girault, 1922.

Conspicuous interspecific variations were detected concerning egg shape and glandular equipment. Egg shape is typically "hymenopteroid" in *O. maskelli*, "pedunculate" in *L. invasa* and *Q. nova*. Glandular equipment includes: (i) a single gland in *O. maskelli* and *Q. nova*, referred as *ovipositor gland*; (ii) a pair of glands in *L. invasa* and *Q. nova*, referred as *oviduct glands*. As it does not agree with the rule in Eulophidae, the author thinks that the particular glandular equipment in the examined eulophids does depend on the parthenogenetic reproduction and/or on the phytophagous diet.

Key words: ovarioles, egg types, glands, spermatheca, *Ophelimus maskelli* (Ashmead), *Leptocybe invasa* Fisher & La Salle, *Quadrastichodella nova* Girault.

INTRODUZIONE

L'apparato genitale femminile negli Eulophidae è già stato studiato ampiamente da Copland & King (1971), in un lavoro che tratta ben 30 specie di 4 sottofamiglie (Elachertinae, Eulophinae, Entedontinae e Tetrastichinae) e riassume le idee di vari autori riguardo alla funzione delle ghiandole annesse.