

Review of the genus *Clistopyga* Gravenhorst, 1829 of Mexico (Hymenoptera: Ichneumonidae: Pimplinae)

Обзор рода *Clistopyga* Gravenhorst, 1829 Мексики (Hymenoptera: Ichneumonidae: Pimplinae)

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КЛЮЧЕВЫЕ СЛОВА: Ichneumonidae, Pimplinae, *Clistopyga*, Мексика, обзор, новые виды, систематика, определительный ключ.

ABSTRACT. Mexican species of the genus *Clistopyga* Gravenhorst, 1829 are reviewed. Three new species from Mexico, *C. covarrubiasi* sp.n., *C. californica* sp.n. and *C. serricauda* sp.n., are described and illustrated. A key to Mexican species of *Clistopyga* is provided.

РЕЗЮМЕ. Дан обзор мексиканских видов рода *Clistopyga* Gravenhorst, 1829. Три новых вида: *C. covarrubiasi* sp.n., *C. californica* sp.n. и *C. serricauda* sp.n., описаны из Мексики. Предложен определительный ключ для определения мексиканских видов рода *Clistopyga*.

Introduction

Clistopyga Gravenhorst, 1829 is medium sized genus comprising 30 species in the World fauna [Yu et al., 2005]. Eight species were described from Costa Rica [Gauld, 1991; Gauld et al., 1998], and seven species were recorded from U.S.A. and Canada [Townes & Townes, 1960]. Four species, *C. calixtoi* Gauld, 1991, *C. fernandezii* Gauld, 1991, *C. henryi* Gauld, 1991 and *C. nigrifrons* Cushman, 1921, were mentioned for Mexico [Ruíz et al., 2002]. Three new species, *C. covarrubiasi* sp.n., *C. californica* sp.n. and *C. serricauda* sp.n., from northern Mexico are described in this paper, and a data on distribution of previously known four Mexican species is presented. A key to seven Mexican species of *Clistopyga* is provided.

Types of new species are deposited at the Insect Museum of Universidad Autónoma de Tamaulipas in Cd. Victoria, México (UAT), and at the University of California, Riverside, U.S.A. (UCR).

KEY TO SPECIES OF THE GENUS *CLISTOPYGA*

1. Females 2
- Males (male of *C. nigrifrons* unknown) 8
2. Submetapleural carina complete. Face entirely white, sometimes with longitudinal black mark along midline (Fig. 2) 3

- Submetapleural carina absent. Face white or black 4
3. Mesoscutum and propodeum orange-brown. Metasoma almost entirely orange-brown, with first tergite slightly darkened basally *C. californica* sp.n.
- Mesoscutum with lateral lobes reddish and central lobe black. Propodeum black with dorsolateral reddish mark. Metasoma entirely black, sometimes with reddish hue. *C. covarrubiasi* sp.n.
4. Face almost entirely black, with two or four small whitish spots in upper part (Fig. 4). Propodeum and metasomal tergites black 5
- Face entirely white. Propodeum and metasomal tergites red or multicolour 6
5. Face black, with a pair of whitish spots in upper part near eye orbits, and with a pair of spots below antennal sockets (Fig. 4); frons entirely black. Ovipositor sheath with ventral margin distinctly denticulate in basal 0.35 (Fig. 6) *C. serricauda* sp.n.
- Face black, with a pair of whitish spots in upper part near eye orbits; frons black, with whitish stripes near eye orbits. Ovipositor sheath with ventral margin finely denticulate in basal 0.25 *C. nigrifrons* Cushman
6. Ovipositor straight. Propodeum entirely red. Metasomal tergites black, with whitish posterior bands *C. henryi* Gauld
- Ovipositor upcurved apically. Propodeum black and white. Metasomal tergites red 7
7. Lateral parts of mesoscutum black. Ovipositor 2.1–2.3 times as long as hind tibia *C. calixtoi* Gauld
- Lateral parts of mesoscutum reddish. Ovipositor 1.8–1.9 times as long as hind tibia *C. fernandezii* Gauld
8. Face black, with a pair of whitish spots in upper part near eye orbits. Metasomal tergites black. Submetapleural carina absent *C. serricauda* sp.n.
- Face white. Metasoma usually with white marks. Submetapleural carina present or absent 9
9. Metasomal tergites black or orange-brown with narrow black posterior margins. Submetapleural carina complete 10
- Metasomal tergites with white marks. Submetapleural carina incomplete 11
10. Propodeum black with reddish dorsolateral mark. Metasomal tergites black *C. covarrubiasi* sp.n.

- Propodeum orange-brown, slightly darkened anteriorly and posteriorly. Metasomal tergites orange-brown with narrow black posterior margins *C. californica* sp.n.
- 11. Mesosoma more or less entirely black and white. Mesoscutum black with a pair of white stripes that are interrupted where they cross the notauli *C. calixtoi* Gauld
- Mesosoma extensively marked with red. Mesoscutum more or less entirely red 12
- 12. Tergites 2–5 entirely black except for posterolateral spots just before the hind margin. Propodeum more or less entirely black *C. henryi* Gauld
- Tergites 2–5 black with hind margin centrally narrowly white, and usually with anterolateral corners white also. Propodeum laterally extensively white
..... *C. fernandezi* Gauld

Clistopyga californica Khalaim et Hernández sp.n.

MATERIAL. Holotype: ♀, “Mex. Baja Cal. Sur Las Barracas [México, Baja California Sur, Barracas] 20-XI-1964”, “Coll. P. DeBach Pan trap”, “Univ. Calif. Riverside Ent. Res. Museum UCRC ENT 88836” (UCR). Paratype: same data as in holotype, but 27.IV.1985 and no. 88837, 1 ♂ (UCR).

DESCRIPTION. Female (holotype). Clypeus narrow flat in profile, with lower margin truncate, smooth and shining, with rare fine setiferous punctures. Mandible strongly tapered in basal half and moderately tapered in apical half, with upper tooth longer than the lower tooth. Malar space as long as basal width of mandible. Face evenly convex, smooth and shining, with fine setiferous punctures. Frons, vertex and temple polished, with sparse fine setiferous punctures. Head in dorsal view strongly and straightly narrowed behind eyes, temple 0.43 times as long as eye width. Occipital carina complete. Flagellum of antenna slender, filiform, with 25 segments; all flagellomeres elongate.

Mesosoma smooth and shining, mostly finely and sparsely punctate. Pronotum polished, impunctate. Epomia as short vertical carina. Notaulus deep anteriorly, almost reaching the middle of mesoscutum. Mesoscutum smooth anteriorly and laterally, and shagreened posteriorly. Scutellum roundly convex, finely punctate. Upper end of prepectal carina slightly curved backward. Mesopleuron finely and sparsely punctate in lower part, polished and impunctate in upper part. Propodeum elongate, in profile, weakly convex anteriorly and almost flat in posterior 0.6, shagreened and transversely striate antero-medially, finely punctate anteriorly, polished and impunctate posteriorly, without carinae, with round spiracle adjoining to pleural carina. Submetapleural carina present, not raised in anterior part.

Hind leg with femur 0.96 mm long, tibia 0.91 mm long. Tarsal claws with a basal tooth.

Fore wing length about 4.0 mm. Nervulus of fore wing interstitial. Areola absent. Vein *2rs-m* very short. Vein *2m-cu* weakly arcuate, with two bullae. Nervellus of hind wing intercepted in its posterior third.

First tergite 0.65 mm long, almost 1.28 times as long as posteriorly broad, polished anteriorly, finely punctate and smooth to shagreened posteriorly and laterally, with spiracle near basal 0.4, with median longitudinal carina short, not reaching the level of spiracle. Second and third tergites with sharp oblique basolateral grooves, and with weaker and more transverse apicolateral grooves. Fourth tergite with more shallow basolateral and apicolateral grooves than in tergites second and third. Second and following tergites and hypopygium mostly smooth and shining, with more or less dense setiferous punctures, rather densely pubescent. Ovipositor stout, upcurved in apical 0.4, matt; sheath 1.3 mm long, about 1.4 times as long as hind tibia.

Body primarily orange-brown. Head black, with palpi, basal half of mandible, clypeus, face (excepting brownish median spot in upper part), frontal and upper orbits and cheek whitish. Antenna brownish, with scape, pedicel and basal flagellomeres whitish ventrally. Propleuron and pronotum mostly black; propleuron whitish posteriorly; pronotum with whitish mark anteriorly and longitudinal band dorsally. Mesoscutum almost entirely orange-brown, with central lobe somewhat blackish anteriorly. Scutellum red, with whitish mark posteriorly. Metanotum with median whitish mark. Mesopleuron mostly orange-brown, with black mark dorso-posteriorly and whitish longitudinal mark in upper part (below tegula). Tegula and base of wings whitish. Metapleuron almost entirely orange-brown, somewhat blackish in lower part. Propodeum orange-brown, slightly darkened anteriorly and posteriorly. Fore and mid legs with coxae entirely whitish, with femora and tibia whitish ventrally and brownish dorsally, with tarsi slightly infuscate. Hind coxa mostly reddish brown, whitish dorsally; femur more or less brownish, whitish ventrally in apical half; tibia narrowly infuscate basally and widely infuscate apically, whitish medially; tarsomeres mostly fuscous, whitish basally. Pterostigma pale brown. Tergites orange-brown; first tergite darkened basally and postero-laterally; second tergite with narrow blackish posterior band, and the third tergite with the same band vestigial. Ovipositor sheath fuscous.

Male. Similar to female. Face without brownish median mark. Flagellum of antenna with 24 segments. Pterostigma brown. Metasomal tergites longer and more coarsely punctate than in female. Tergites 2–6 with blackish posterior bands, and tergite 7 evenly darkening from reddish anteriorly to blackish posteriorly.

DIAGNOSIS. *C. californica* sp.n. is very distinctive species which may easily be recognized by its predominantly orange-brown coloration and a complete submetapleural carina.

Clistopyga calixtoi Gauld, 1991

MATERIAL. 2 ♀♀, México, Tamaulipas, Gómez Farías, Alta Cima, Malaise trap, 27.III–3.IV, 19–26.VI.1999, S. Hernández A.; 1 ♀, Tamaulipas, El Madroño, 02.V.2008, A.I. Khalaim.

DISTRIBUTION. Costa Rica, México (Tamaulipas).

Clistopyga covarrubiasi Khalaim et Hernández sp.n.

Figs 1–3

MATERIAL. Holotype: ♀, México, Tamaulipas, Gómez Farías, Alta Cima, Malaise trap, 27.II–20.III.1999, S. Hernández A. (UAT). Paratypes: 11 ♀♀, 25 ♂♂, same data as in holotype, but 27.II–17.VII.1999 (UAT); 2 ♀♀, Tamaulipas, EEW Cd. Victoria, El Madroño, 28.IV, 25.V.1985, H. Ruíz C., E. Ruíz C. (UAT).

DESCRIPTION. Female (holotype). Clypeus narrow, weakly convex, flattened in lower part, with lower margin truncate (Fig. 2), smooth, with rare setiferous punctures. Mandible tapered, with upper tooth distinctly longer than the lower tooth. Malar space somewhat shorter than basal width of mandible. Face weakly and evenly convex, smooth, finely and moderately densely punctate. Frons polished, impunctate. Vertex and temple polished, mostly with fine sparse setiferous punctures; vertex impunctate medio-posteriorly, temple impunctate along eye orbit. Head in dorsal view strongly and straightly narrowed behind eyes, temple very short, 0.37 times as long as eye width (Fig. 3). Occipital carina complete. Flagellum of antenna weakly and evenly tapered towards apex, with 30 segments; all flagellomeres more or less elongate.

Mesosoma almost entirely smooth and shining, partly punctate. Pronotum polished, impunctate. Epomia as short vertical carina. Notaulus deep anteriorly, almost reaching the middle of mesoscutum. Mesoscutum indistinctly punctate,



Fig. 1. *Clistopyga covarrubiasi* sp.n., female (holotype) — habitus and coloration.
Рис. 1. *Clistopyga covarrubiasi* sp.n., самка (голотип) — габитус и окраска.

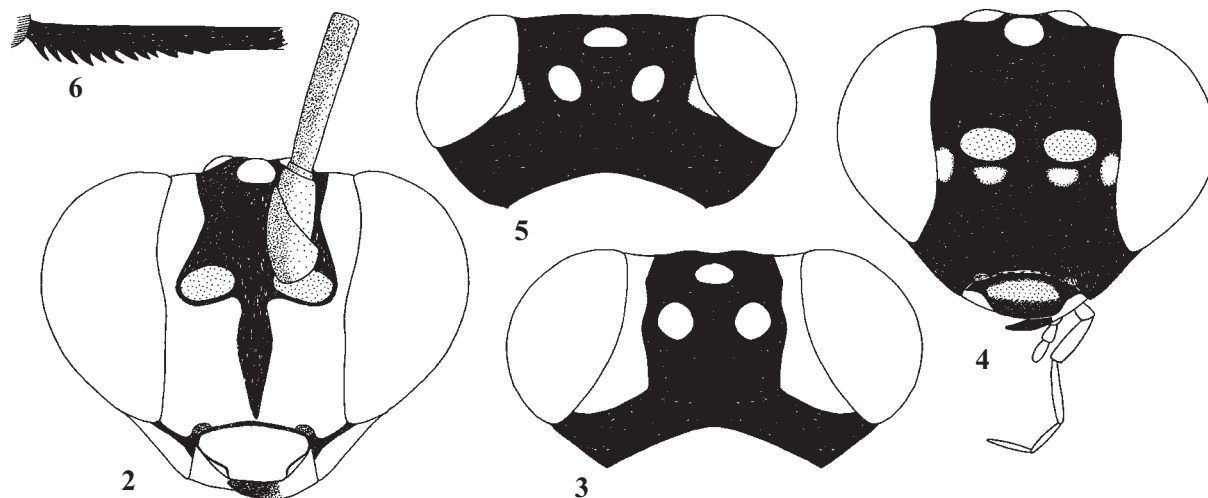
smooth. Scutellum weakly and roundly convex, finely punctate. Upper end of prepectal carina curved backward. Prepectus smooth and finely punctate. Mesopleuron mostly smooth and shining, finely punctate in its lower part anteriorly, polished and impunctate in its upper part posteriorly. Propodeum elongate, in profile, weakly convex, transversely striate dorsally, smooth and indistinctly punctate laterally, and polished and impunctate posteriorly, almost ecarinate (only lateral longitudinal carina developed posteriorly), with

round spiracle adjacent to pleural carina. Submetapleural carina complete, anteriorly somewhat broadened.

Hind leg with femur 1.5 mm long, tibia 1.45 mm long. Tarsal claws with a basal tooth.

Fore wing length 6.0 mm. Nervulus of fore wing interstitial. Areola absent. *2m-cu* vein arcuate, with two short bullae. Nervellus of hind wing intercepted in its posterior 0.3.

First tergite 1.08 mm long, almost 1.4 times as long as posteriorly broad, polished and impunctate dorso-anteriorly,



Figs 2–6. *Clistopyga* spp., females: 2–3 — *C. covarrubiasi* sp.n. (holotype); 4–6 — *C. serricauda* sp.n. (holotype); 2–5 — head, frontal (2, 4) and dorsal (3, 5) view; 6 — base of ovipositor sheath, lateral view.

Рис. 2–6. *Clistopyga* spp., самки: 2–3 — *C. covarrubiasi* sp.n. (голотип); 4–6 — *C. serricauda* sp.n. (голотип); 2–5 — голова, спереди (2, 4) и сверху (3, 5); 6 — основание ножен яйцеклада, сбоку.

indistinctly punctate posteriorly and laterally, with spiracle near basal third, with median longitudinal carina very short, distinct. Second tergite with sharp oblique basolateral grooves, and with weaker and more transverse apicolateral grooves. Tergites 3 and 4 with more shallow basolateral and apicolateral grooves than in second tergite. Tergites 2–5 with epipleura separated by a crease. Second and following tergites and hypopygium more or less distinctly punctate, rather densely pubescent. Ovipositor stout, stronger upcurved apically; sheath 2.0 mm long, 1.38 times as long as hind tibia, without ventral teeth, with numerous oblique long black hairs.

Coloration as in Figs 1–3. Body primarily black. Palpi, basal half of mandible and clypeus whitish. Face whitish, with black median longitudinal mark, with narrow black stripe from base of mandible to eye. Lower gena, frontal and upper eye orbits whitish. Antenna brownish; scape, pedicel and basal flagellomeres whitish beneath. Propleuron with whitish posterior mark. Pronotum with whitish narrow transverse stripe anteriorly, and wide longitudinal band dorsally. Mesoscutum with lateral lobes mostly red, blackish peripherally. Scutellum red, with posterior whitish mark. Metanotum with median whitish mark. Mesosoma mostly red, black in upper part, subtegular prominence whitish, prepectus black. Mesosternum narrowly black anteriorly and widely black posteriorly. Tegula and base of wings whitish. Metapleuron widely red, blackish anteriorly and ventrally. Propodeum with a pair of reddish elongate marks dorsolaterally. Fore and mid legs whitish; femora, tibia and tarsi more or less infuscate, stronger darkened dorsally. Hind leg with coxa and femur reddish brown, tibia fuscous basally, reddish in apical half, with wide median whitish band; tarsomeres mostly fuscous, whitish basally. Pterostigma brown. Tergites black, mostly with reddish hue. Ovipositor sheath black.

Variation. Fore wing length 3.15–8.3 mm. Flagellum with 26–32 segments in females, and with 22–26 segments in males. Face of males almost entirely whitish, with pale and narrow blackish longitudinal median stripe in upper half. Mesoscutum sometimes with central lobe mostly red. Mesopleuron sometimes mostly red. Propodeum sometimes entirely black. Metasomal tergites sometimes more or less

reddish, longer in males than in females. Hind femur in males reddish brown, whitish apically; tibia whitish medially, widely darkened basally, subbasally and apically; all tarsomeres whitish basally and darkened apically.

DIAGNOSIS. The new species is closely related to the Nearctic *C. recurva* Say as both have a complete submetapleural carina, a face whitish with longitudinal black mark along midline, and a metasoma back. Unlike this species *C. covarrubiasi* sp.n. has a white face, and a first tergite with a very short median longitudinal carinae.

ETYMOLOGY. This species is named in honour of C.A. Covarrubias D., the husband of the junior author.

Clistopyga fernandezi Gauld, 1991

MATERIAL. 1 ♀, 3 ♂♂, México, Tamaulipas, Gómez Farías, Alta Cima, Malaise trap, 24.IV–1.V, 15–22.V, 19–26.VI, 21–28.VIII.1999, S. Hernández A.; 1 ♀, same locality, 4–11.XI.2000, D.R. Kasparyan; 1 ♀, Tamaulipas, R. El Cimarrón, Villa de Casas, 28.XII.1986, E. Ruíz C.

DISTRIBUTION. Costa Rica, México (Tamaulipas).

Clistopyga henryi Gauld, 1991

MATERIAL. 1 ♀, México, Tamaulipas, Gómez Farías: Canindo, Malaise trap, 21–22.VII.1994, J.B. Woolley; 1 ♀, Alta Cima, Malaise trap, 10–17.VIII.1999, S. Hernández A.

DISTRIBUTION. Costa Rica, México (Tamaulipas).

Clistopyga nigrifrons Cushman, 1921

MATERIAL. 1 ♀, México, Tamaulipas, NE Miquihuana, Km 22–25, 2800 m, Pinus, 12.V.2000, D.R. Kasparyan.

DISTRIBUTION. Canada, U.S.A. (California), México (Tamaulipas).

Clistopyga serricauda Khalaim et Hernández sp.n.

Figs 4–6

MATERIAL. Holotype: ♀, México, Tamaulipas, Miquihuana, Km 19, Aserradero, 4.XI.1988, R. Thompson F. (UAT). Paratype: 1 ♂, México, Tamaulipas, Gómez Farías, 3.5 km San Jose, Red Entom., 12.V.1995, S. Nino, M-H. Hernández MTZ. (UAT).

DESCRIPTION. Female (holotype). Clypeus narrow, weakly convex in upper half, and flat in lower half, with lower margin truncate (Fig. 4), smooth and shining, with rare

setiferous punctures. Mandible strongly tapered in basal half and moderately tapered in apical half, with upper tooth distinctly longer than the lower tooth. Malar space 1.2 times as long as basal width of mandible. Face evenly convex, smooth and shining, with fine sharp punctures. Frons polished, with sparse fine punctures medially and lateromedially. Vertex and temple smooth and shining, with fine sparse setiferous punctures. Head in dorsal view strongly narrowed behind eyes, temple 0.62 times as long as eye width (Fig. 5). Occipital carina complete. Flagellum of antenna with more than 17 segments (tips of both antennae broken); all flagellomeres more or less elongate.

Mesosoma smooth and shining, mostly finely and sparsely punctate. Pronotum polished, impunctate. Epomia as short vertical carina. Notaulus deep anteriorly, almost reaching the middle of mesoscutum. Mesoscutum finely and very sparsely punctate. Scutellum weakly and roundly convex, finely punctate. Upper end of prepectal carina slightly curved backward. Mesopleuron mostly finely and sparsely punctate, polished and impunctate in its upper part posteriorly. Propodeum elongate, in profile, weakly convex, impunctate dorsally along midline and posteriorly, finely punctate laterally, without carinae, with round spiracle somewhat above pleural carina. Submetapleural carina absent.

Hind leg with femur 1.28 mm long, tibia 1.36 mm long. Tarsal claws with a basal tooth.

Fore wing length 6.2 mm. Nervulus of fore wing interstitial. Areola absent. *2m-cu* vein arcuate, with two short bullae. Nervellus of hind wing intercepted in its posterior 0.3.

First tergite 0.98 mm long, almost 1.13 times as long as posteriorly broad, smooth and finely punctate posteriorly and laterally, with spiracle near basal 0.4, without median longitudinal carina. Second tergite with sharp oblique basolateral grooves, and with weaker and more transverse apicolateral grooves. Tergites 3–5 with more shallow basolateral and apicolateral grooves than in second tergite. Second and following tergites and hypopygium with more or less dense setiferous punctures, rather densely pubescent. Ovipositor stout, weakly and evenly upcurved in apical 0.4; sheath 2.2 mm long, 1.6 times as long as hind tibia; sheath with ventral margin distinctly denticulate in basal 0.35 (Fig. 6), with numerous oblique long black hairs.

Body primarily black. Palpi, basal half of mandible and clypeus centrally and ventrally (Fig. 4) whitish. Face black, with a pair of whitish spots in upper part near eye orbits, and with a pair of spots below antennal sockets (Fig. 4). Frons and temple entirely black. Vertex black, with a pair of whitish marks at top of eyes (Fig. 5). Antenna brownish; pedicel whitish beneath. Pronotum with whitish longitudinal band dorsally. Mesoscutum with lateral lobes mostly red, blackish peripherally; central lobe mostly black, red anterolaterally. Scutellum red, with narrow whitish band posteriorly. Metanotum with median whitish mark. Mesopleuron mostly red, with subsquare black mark dorso-posteriorly, with whitish longitudinal mark in upper part (below tegula); prepectus black. Tegula and base of wings whitish. Metapleuron from

blackish anteriorly to dark red posteriorly, with posterior yellowish mark. Propodeum black. Legs with fore coxa whitish, mid coxa reddish brown basally and whitish apically, and hind coxa reddish brown, darkened basally and dorsally, with all femora reddish brown, whitish basally and apically, with fore and mid tibia reddish brown, infuscate dorsally, with hind tibia fuscous basally and apically, whitish medially, and with all tarsi fuscous (tarsomeres usually paler basally). Pterostigma pale brown. Tergites black with brownish hue; tergites 1–5 with hind margin very narrowly white. Ovipositor sheath black.

Male. Similar to female. Face black, with a pair of whitish spots in upper part near eye orbits (between antennal sockets and eye orbits), and with a pair of very small spots somewhat below antennal sockets. Flagellum of antenna evenly tapered towards apex, with 24 segments; all flagellomeres elongate. Pedicel entirely blackish. Nervellus of hind wing intercepted in its posterior 0.25. Metasomal tergites, excepting the first one, longer and more sparsely punctate than in female, without posterior whitish band.

DIAGNOSIS. The new species differs from the Nearctic *C. nigrifrons* Cushman in having the face with four whitish marks, the frons entirely black, without whitish orbital stripes (Fig. 4), and the ovipositor sheath with ventral margin distinctly denticulate basally (Fig. 6).

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References

- Ruiz E.C., Kasparyan D.R. & Coronado Blanco J.M. 2002. 37. Ichneumonidae // Llorente Bousquets J., Morrone J.J. (eds.). Biodiversidad, Taxonomía y Biogeografía de Artrópodos de México: Hacia una síntesis de su conocimiento. Conabio-Ecosur-Bayer, México. P.631–646.
- Gauld I.D. 1991. The Ichneumonidae of Costa Rica, 1. Introduction, keys to subfamilies, and keys to the species of the lower pimpliform subfamilies Rhyssinae, Poemeniinae, Acaenitinae and Cylloceriinae // Mem. Amer. Entomol. Inst. Vol.47. P.1–589.
- Gauld I.D., Ugalde Gómez J.A. & Hanson P. 1998. Guía de los Pimplinae de Costa Rica (Hymenoptera: Ichneumonidae) // Revista de Biología Tropical. Vol.46. Suppl.1. P.1–189.
- Townes H. & Townes M. 1960. Ichneumon-Flies of America North of Mexico: 2. Subfamilies Ephialtinae, Xoridinae, Acaenitinae // United States National Museum Bulletin. No.216. Pt.2. P.1–676.
- Yu D.S., van Achterberg K. & Horstmann K. 2005. World Ichneumonoidea 2004. Taxonomy, Biology, Morphology and Distribution. CD/DVD. Taxapad, Vancouver, Canada. www.taxapad.com