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RESEARCH ARTICLE

Two new species of the genera *Acerastes* and *Messatoporus* (Hymenoptera: Ichneumonidae: Cryptini) from Mexico

Два новых вида родов *Acerastes* и *Messatoporus* (Hymenoptera: Ichneumonidae: Cryptini) из Мексики

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Abstract. Two species of the tribe Cryptini (Hymenoptera: Icneumonidae: Cryptinae), *Acerastes nervellatus* **sp. nov.** and *Messatoporus atratus* **sp. nov.**, are described from Mexico. It is shown that Neotropical species of the genera *Messatoporus* Cushman, 1929 (90 species) and *Polycyrtus* Spinola, 1840 (155 species) in North and South Americas are mostly different, and only 2–6% of the species of these genera occur in both faunas. It suggests a high degree of isolation of these faunas from each other.

Резюме. Из Мексики описаны два вида трибы Cryptini (Hymenoptera: Icneumonidae: Cryptinae): *Acerastes nervellatus* **sp. nov.** и *Messatoporus atratus* **sp. nov.** Показано, что неотропические виды родов *Messatoporus* Cushman, 1929 (90 видов) и *Polycyrtus* Spinola, 1840 (155 видов) в Северной и Южной Америке значительно различаются, и только 2–6% видов этих родов встречаются в обеих фаунах, что говорит о высокой степени изолированности этих фаун друг от друга.

Key words: taxonomy, Neotropical region, North America, South America, Cryptinae, new species

Ключевые слова: систематика, Неотропическая область, Северная Америка, Южная Америка, Cryptinae, новые виды

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Introduction

The genera *Acerastes* Cushman, 1929, *Messatoporus* Cushman, 1929 and *Polycyrtus* Spinola, 1840 belong to the tribe Cryptini (Cryptinae), which comprises about 250 genera and is one of the largest groups of the family Ichneumonidae (Yu et al., 2016). These three genera are almost exclusively Neotropical, with only five species known from the Nearctic region, one species of *Acerastes*, three of *Messatoporus*, and one of *Polycyrtus* (Yu et al., 2016).

The Nearctic fauna of the tribe Cryptini was described by Cresson (1872), who examined material mainly from the state of Texas. Subsequently, the species of America north of Mexico were revised by Townes & Townes (1962). The Neotropical species of the tribe (including Mexico) were described mainly by Cameron (1886), Cushman (1929) and Cresson (1874).

The Mexican fauna of the tribe Cryptini was revised by the author (Kasparyan, 2006, 2013; Kasparyan & Ruíz-Cancino, 2004, 2005a, 2005b, 2008) and currently comprises about 55 genera

and 300 species. An excellent revision of the genus *Messatoporus* was recently published by Santos & Aguiar (2013).

This work is an addition to the previously published revisions and contains the descriptions of two new species of *Acerastes* and *Messatoporus* from Mexico and remarks on the geographical distribution of *Messatoporus* and *Polycyrtus*.

Material and methods

The new species are described from the material collected by M. López-Ortega in Xalapa, state of Veracruz, Mexico, by Malaise traps in 2015–2018. The type material is deposited in the Universidad Nacional Autónoma de México, Mexico (UNAM) and the Zoological Institute of the Russian Academy of Sciences, St Petersburg, Russia (ZIN).

Morphological terminology mainly follows that of Townes (1969), with changes according to Kasparyan & Ruíz-Cancino (2008). Layered photographs were taken in ZIN with an Olympus OM-D E-M1 digital camera attached to an Olympus SZX10 stereomicroscope, and partially focused images were assembled with Helicon Focus Pro (Ver. 7.6.6) software.

Taxonomy

Order **Hymenoptera**

Family **Ichneumonidae**

Subfamily **Cryptinae**

Tribe **Cryptini**

Genus ***Acerastes*** Cushman, 1929

Acerastes is a relatively small cryptine genus comprising 12 species (Yu et al., 2016). Nine species, including one taxon described in this paper, are known to occur in Mexico (Cresson, 1874; Cameron, 1886; Kasparyan & Ruíz-Cancino, 2008). One of them, *A. pertinax* (Cresson, 1872), has a range extending from southern USA to Brazil and Paraguay (Townes & Townes, 1962). The distribution of the remaining three species is limited to South America (Szépligeti, 1916; Brèthes, 1928; Townes & Townes, 1966; Townes, 1970).

***Acerastes nervellatus* sp. nov.**
(Figs 1–9)

Holotype. Female (UNAM), **Mexico**, *Veracruz*, Municipio Tejerias, Malaise trap, Jan.–Febr. 2018, coll. M. López-Ortega.

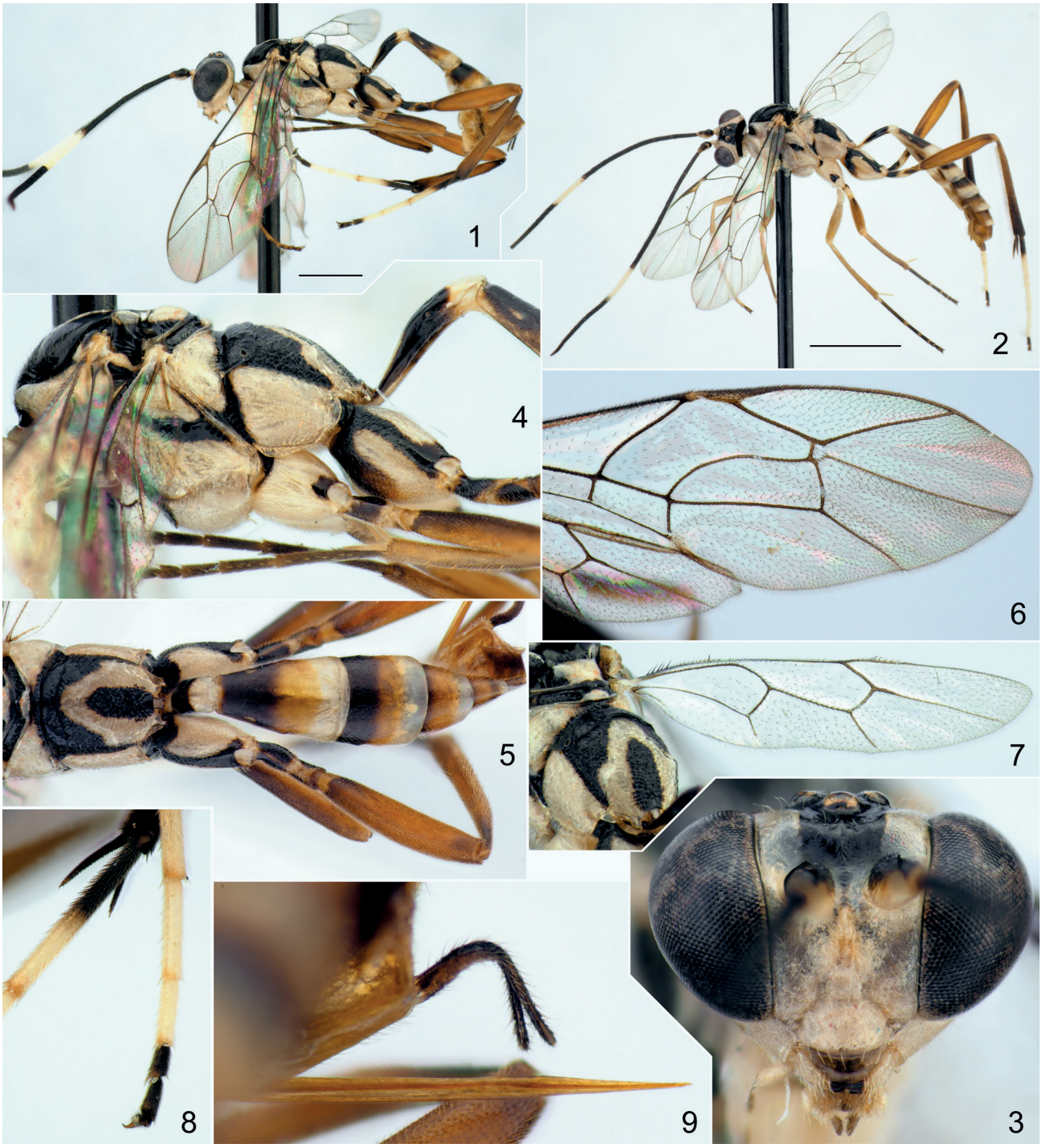
Paratype. Locality and collector as for holotype, Oct. 2017, 1 male (ZIN).

Female (Fig. 1). Fore wing 4.5 mm long.

Antenna with 24 flagellomeres; flagellomeres 1 and 2 combined about 1.4 times as long as maximum diameter of eye. Head posterior to eyes strongly narrowed. Face and malar space with rather coarse and dense granulation, strongly matt; malar space about as long as basal mandibular width. Clypeus matt, strongly convex, with maximum height of convexity at lower 0.2 of clypeus in lateral view, then clypeus sharply bevelled downwards to polished, sharp lower margin. Frons finely and evenly granulate, with subpolished concavity above antennal sockets and with thin median longitudinal carina. Oral carina projecting as thin flange, 1.4 times as long as basal mandibular width, slightly higher than occipital carina.

Pronotum with lateral parts evenly granulate, without any rugosity. Epomia distinct, vertical. Notaulus strong and long. Mesoscutum smooth; central lobe of mesoscutum with dense and coarse punctures at least in anterior half, its median longitudinal groove indistinct; lateral lobe of mesoscutum with sparse distinct punctures in anterior one-quarter, posteriorly polished, with very fine granulation along notaulus. Prescutellar groove with about six strong transverse carinae. Scutellum polished, impunctate. Mesopleuron with coarse and dense punctures on prepectus, anteriorly with moderately fine longitudinal rugosity and punctures between rugae; speculum large, polished. Metapleuron with fine oblique subvertical rugosity and moderately fine punctures. Propodeum anteriorly (in front of basal transverse carina) subpolished, partly covered with irregular rugae posterior to basal transverse carina; anterior to apophyses, rugae tending to be radial, between and posterior to apophyses, rugae transverse, sinuate and subparallel (Figs 5, 7); apophyses weak, in form of low small crests (Figs 4, 7).

Fore wing (Fig. 6) with small areolet which about 0.6 times as high as length of section of second recurrent vein between bulla and areolet;



Figs 1–9. *Acerastes nervellatus* **sp. nov.**, holotype, female (1, 3–9) and paratype, male (2). **1**,**2**, habitus, lateral view; **3**, head, front view; **4**, mesosoma and first tergite, lateral view; **5**, propodeum, base of hind legs and metasoma, dorsal view; **6**, apex of fore wing; **7**, hind wing and posterior part of mesosoma, dorsolateral view; **8**, hind tarsi and spurs; **9**, ovipositor and sheath, lateral view. Scale bars: 1.0 mm (1); 2.0 mm (2).

nervulus interstitial; postnervulus intercepted near its anterior end. Hind wing (Fig. 7) with nervellus not intercepted and cubitella completely absent; brachiella distinct in its proximal 0.65.

First tergite of metasoma subpolished, with very fine smoothed granulation and sparse setiferous punctures; postpetiole dorsally just posterior to level of spiracles with a pair of rounded

Figs 10–12. *Messatoporus atratus* **sp. nov.**, holotype, male. **10**, habitus (without apices of wings and antennae), lateral view; **11**, head and antennae, dorsolateral view; **12**, head and mesosoma, dorsal view. Scale bar: 2.0 mm.

impressions. Second tergite 1.6 times as long as posteriorly broad, matt, evenly granulate, with sparse setiferous punctures (Fig. 5). Tergites 3 and 4 with similar granulation, but their setae somewhat longer and denser than on second tergite; subsequent tergites with smoothened granulation. Ovipositor sheath about 0.35 times as long as hind tibia; dorsal valve of ovipositor with very weak nodus; portion of ovipositor from nodus to apex about as long as second tarsomere of hind leg (Fig. 9).

Antenna black, with flagellomeres 6–10 white (Fig. 1); scape white ventrally and at extreme base. Head white (Figs 1, 3), with broad median longitudinal black mark on frons, extending from antennal sockets to vertex and covering also ocellar area, central part and posterior half of vertex and posterior half of temple in upper 0.3; occiput black except for postgenae. Body and coxae white (or yellowish white) and black (Figs 1, 4, 5). Prothorax white with black mark on posterior half of collar between epomiae, and triangular black mark on hind margin of pronotum. Mesoscutum black with pair of median whitish stripes extending along notauli on lateral lobes. Mesopleuron and mesosternum white; prepectus completely black; large

spot below subtegular ridge and oblique band extending from this spot to mesopleural fovea black; mesopleural suture anterior to epimeron partly blackish. Metanotum black, with postscutellum whitish. Metapleuron white with black anterior wedge-shaped mark; transverse impression between upper and lower parts of metapleuron black. Propodeum black with broad arcuate whitish band along its apical transverse carina (Figs 5, 7).

Fore coxa and trochanters white; femur, tibia and tarsus yellowish rufous ventrally and brownish dorsally. Fore and mid spurs whitish yellow; hind spurs dark brown; all femora at extreme base with small yellowish dorsal spot. Mid coxa white with small black dorsoapical spot; trochanter black, with extreme base and apex whitish; trochantellus whitish with brown marks ventrally; mid femur and tibia reddish brown with dorsal blackish marks; mid tarsus completely dark brown. Hind coxa (Figs 4, 5) predominantly white, with black basal 0.2 and broad dorsoanterior stripe widening towards apical end, and with blackish mark ventroanteriorly in basal half of coxa; hind trochanters blackish; hind femur and tibia reddish brown, both slightly darkened dorsally at bases, tibia also darkened at extreme apex; hind tarsus with apical half of basitarsus and tarsomeres 2 and 3 entirely white; basal half of basitarsus and tarsomeres 4 and 5 entirely black. Pterostigma pale rufous, with anterior margin darkened.

First tergite of metasoma dorsally white, with large median black spot and black laterally except for apex (Fig. 4); first sternite whitish. Tergites 2–4 (or 2–5) blackish nearly in anterior 0.40, rufous nearly in median 0.35, and white in posterior 0.25–0.30; subsequent tergites more or less uniformly rufous (Figs 1, 5); all sternites pale rufous, sternites 2–4 each with a pair of brownish spots laterally.

Male (Fig. 2). Fore wing 4.7 mm long; flagellum 6.0 mm long, with 28 flagellomeres; flagellomeres 10–13 each with linear tyloid (short on flagellomere 13). Colour pattern similar to that of female but with black markings less extensive (Fig. 2). Mesosoma with reduced black spot on hind margin of pronotum, lower margin of prepectus yellowish white, oblique black stripe on mesopleuron interrupted below subtegular ridge and anterior to mesopleural fovea, mesopleural suture completely pale. Hind coxa not darkened posteriorly, tarsomere 4 of hind leg completely white, hind tibia blackish in apical 0.4 (*vs.* apical 0.1 in female). Postpetiole dorsally just posterior to level of spiracles without rounded impressions. Metasomal tergites 2–4 black and white, without intermediate reddish rufous transverse band, that being present in female; tergites 5 and 6 reddish rufous, each with distinct white posterior band and darkened basally; tergites 7 and 8 completely reddish rufous.

Etymology. The specific name is a Latin adjective referring to the nervellus which is not intercepted in this species.

Comparison. *Acerastes nervellatus* **sp. nov.** differs from other congeners in the hind wing with a non-intercepted nervellus and a completely absent cubitella (Fig. 7). The new species is similar to the widespread *A. pertinax* and to the group of closely related Mexican species (*A. faciator* Kasparyan et Ruíz-Cancino, 2008, *A. myartsevae* Kasparyan et Ruíz-Cancino, 2008, and *A. scabrosus* Kasparyan et Ruíz-Cancino, 2008), but *A. pertinax* and *A. faciator* have the entirely reddish metasoma, and *A. scabrosus* has the entirely reddish hind coxa, while the new species possesses the metasoma and hind coxa bi- or tricoloured (Figs 1, 2, 4, 5). The colour pattern of *A. nervellatus* **sp. nov.** is most similar to that of *A. myartsevae*, but in addition to the venation of the hind wing, the new species differs from the latter species in the hind coxa more extensively black marked (Figs 4, 5) and the tergites 3–5 of the male each with a distinct anterior transverse black band (Fig. 2).

Genus ***Messatoporus*** Cushman, 1929

Messatoporus is a large and well-studied cryptine genus with about 90 described species (Kasparyan & Ruíz-Cancino, 2005a; Santos & Aguiar, 2013). Fifty-six species of *Messatoporus* occur in South America and 36 species, in the North American continent.

Messatoporus atratus **sp. nov.**

(Figs 10–12)

Holotype. Male (UNAM), **Mexico**, *Veracruz*, Municipio Teocelo, Tejerias, 9°21′N, 96°54′W, 924 m, Malaise trap, Aug.2016, coll. M. López-Ortega.

Paratypes. Same data as for holotype, 2 males (UNAM, ZIN).

Description. Male. Fore wing 8.4 mm long.

Antenna with 24–27 flagellomeres; antenna black, with scape ventrally dull whitish brown and flagellomeres 10–19 white. Head predominantly whitish; teeth of mandible brown; frons and vertex black, with eye orbits narrowly white; temple with black mark in upper part posteriorly (Figs 11, 12).

Body black with yellowish white markings. Pronotum white with small blackish dorsoposterior mark on collar, and with broad black band posteriorly (Fig. 10). Propleuron white. Mesonotum black with median whitish spot (Fig. 12) and sometimes with short white stripe at anterior end of notaulus; prescutellar carinae and lateral margins of scutellum white (Fig. 12). Tegula white. Mesopleuron black with large white mark extending from subtegular ridge to lower hind corner of mesopleuron (Fig. 10). Metanotum (including postscutellum) black. Upper part of metapleuron white; lower part of metapleuron white, with large black mark extending dorsoanteriorly, anteriorly and in lower part (Fig. 10). Propodeum black with a pair of whitish spots posteriorly behind small crests (Fig. 12). Fore and mid legs predominantly yellowish white; femora brownish posteriorly; fore tarsomere 5 dorsally brown; mid leg with trochantellus, tibial spurs and basitarsus completely dark brown. Hind leg predominantly black; coxa with large dorsoposterior white mark; basal 0.3 of tibia white except for small blackish stripe dorsally at extreme base; tarsus white, with basal half of basitarsus black (Fig. 10). Metasoma black; first tergite slightly whitish on extreme posterior margin; second and following tergites each with whitish posterior transverse band (Fig. 10). Parameres of male genitalia whitish, with basal 0.2–0.5 brown.

Female. Unknown.

Etymology. The specific name is the Latin adjective *atratus* (darkened) referring to the predominantly black colouration of the new species.

Comparison. *Messatoporus atratus* **sp. nov.** differs from its Mexican congeners in the combination of black mesosternum and metasoma, the hind leg with predominantly black hind coxa, trochanters and femur, and completely yellowish white fore and mid coxae and trochanters (Fig. 10).

Only five South American species have colouration of legs similar to that in the new species: *M. andinus* Santos, 2013, *M. bennetti* Santos, 2013, *M. orientalis* Santos, 2013, *M. paeneater* Santos, 2013, and *M. semialbiventris* Santos, 2013. All these species differ from *M. atratus* **sp. nov.** in their partly or completely black fore and mid coxae. *Messatoporus paeneater* and *M. semialbiventris* also differ from the new species in their completely black pronotum and mesopleuron (*vs.* broadly whitish in *M. atratus* **sp. nov.**), and *M. orientalis* is distinct in having the completely bright yellow hind tibia and tarsus (*vs.* white and black in other mentioned in this section species). The colour pattern is usually stable in the tropical species of Cryptini, and it was found to work well for the diagnostics of the species in many genera of the tribe. For example, the exceptional importance of the hind coxa colouration in males of the genus *Lymeon* Förster, 1869 was demonstrated by Kasparyan & Ruíz-Cancino (2008).

Geographical distribution of the genera *Messatoporus* and *Polycyrtus*

Two relatively large and well-studied cryptine genera *Messatoporus* (Kasparyan & Ruíz-Cancino, 2008; Santos & Aguiar, 2013) and *Polycyrtus* (Cushman, 1931; Kasparyan & Ruíz-Cancino, 2004; Zuñiga-Ramirez, 2004) are almost exclusively Neotropical and species-rich in the continents of North and South Americas. The former genus includes 36 species occurring in North America and 56 species, in South America, but only two species (or 2.2% of the total number of species) have been recorded from both the continents, while the distribution of the remaining 88 species is limited either to North or South America. One of these species, *M. discoidalis* (Cresson, 1872), is widely distributed in North America from Canada to Panama, but in South America, it occurs only in the northern part of the continent (Colombia, Venezuela and Ecuador) (Santos & Aguiar, 2013). Another species, *M. transversostriatus* (Spinola, 1851), is widespread in the tropics of South America (with the range extending southward to Uruguay), while in the North American continent, it is only known from Panama (Santos & Aguiar, 2013).

The genus *Polycyrtus* comprises 155 species, of them 94 occur in North America and 66, in South America (Yu et al., 2016). Only nine species (or

5.8% of the total number of species) are known from both the continents: seven species are predominantly South American and are also recorded from Panama and Costa Rica, and two North American species, *P. macer* (Cresson, 1874) and *P. melanoleucus* (Brullé, 1846), are known from the northern part of South America (Yu et al., 2016).

The presented analysis of the geographical distribution of the genera *Messatoporus* and *Polycyrtus* indicates that the North and South American faunas of these genera are highly isolated. Approximately 2–6% of their species are recorded from both the continents, and the distribution of the majority of the species is limited to either North or South America. Presumably, the natural barrier between North and South Americas (i.e. the Isthmus of Panama, but mainly the three branches of the Colombian Andes, separating the isthmus from most of Colombia and the rest of the southern continent) determines the distribution of other Neotropical genera of Cryptini in a similar way.

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