

# Genera of New World subfamilies of Braconidae (Hymenoptera): single-genus subfamilies Acampsohelconinae, Apozyginae, Dirrhopinae, Masoninae, and Meteorideinae

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## Abstract

This is an overview of the five New World (Western Hemisphere) braconid subfamilies that include only a single genus: Acampsohelconinae (*Urosigalphus* Ashmead), Apozyginae (*Apozyx* Mason), Dirrhopinae (*Dirrhope* Foester), Masoninae (*Masona* van Achterberg), and Meteorideinae (*Meteoridea* Ashmead). Synopses for each genus are updates or revisions from the treatments in Wharton et al. (1997) and include sections on phylogeny, biology, diversity, distribution, diagnosis, and important publications.

Wharton, R.A., Marsh, P.M., and Sharkey, J.J. (eds.) 1997. Manual of the New World Genera of Braconidae (Hymenoptera). Special Publication of the International Society of Hymenopterists. 439 pp.

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## Introduction

This publication is part of a series that updates the Manual of New World Braconidae (Wharton et al. 1997) and includes the five braconid subfamilies that have only a single genus represented in the New World. The key by Sharkey et al. (2023) may be used to confirm a subfamily identification. Readers using that key will be automatically directed here if they obtain an identification of Acampsohelconinae, Apozyginae, Dirrhopinae, Masoninae, or Meteorideinae.

*Urosigalphus* Ashmead is the only member of Acampsohelconinae found in the New World. It was included in Helconinae in the original version of the Manual (Sharkey, 1997b). Acampsohelconinae was erected by Tobias (1987) for a fossil (*Acampsohelcon* Tobias) in Baltic amber. Van Achterberg (2002) added three extant genera to the subfamily, i.e., *Afrocampsis* van Achterberg & Quicke, *Canalicephalus* Gibson, and *Urosigalphus*. Gibson's (1972a) key is useful for the identification of species in the United States and Canada; however, his keys to the Central American (Gibson 1972b, 1982a), and South American (Gibson 1974, 1982b) fauna treat only a small fraction of the species. Arias-Penna and Whitfield (2012) give a complete introduction to all aspects of the subfamily and revised the Colombian species.

The updated overview of Apozyginae in the New World is a revision of the treatment by Sharkey (1997a). Apozyginae contains one species, *Apozyx penyai* Mason. Mason (1978) proposed a new family, Apozygidae, for

this species and later described the previously unknown female of the same species (Mason 1987).

The updated overview of Dirrhopinae in the New World is a revision of the treatment by Whitfield (1997a). Van Achterberg (1984) erected a new subfamily for *Dirrhope* which had been placed in several different subfamilies previously. Only a single relatively rare genus, *Dirrhope* Foester, 1851 is known.

The updated overview of Masoninae in the New World is a revision of the treatment by van Achterberg (1997). Two tribes were recognized by van Achterberg (1995): Mannokeraiini (restricted to Australia) and Masonini (widespread). Mannokeraiini has since been shown to belong to the Euphorinae (Belshaw and Quicke, 2002; Sharanowski et al., 2011; Stigenberg et al., 2015).

The updated overview of Meteorideinae in the New World is a revision of the treatment by Sharkey (1997c). Meteorideinae is a small subfamily with two genera, *Meteoridea* Ashmead and *Pronkia* van Achterberg. Only *Meteoridea* is found in the New World. Van Achterberg (1990) proposed the genus *Pronkia* and presented a key to separate members of *Pronkia* from those of *Meteoridea*.

General morphological terminology can be found in Sharkey et al. (2023). More detailed information is in the morphology chapter of the New World manual (Sharkey and Wharton, 1997) and in the Hymenoptera Anatomy Ontology Portal (<http://portal.hymao.org/projects/32/public/ontology/>). All images are by M. Sharkey unless noted otherwise.



Figure 1. *Urosigalphus* sp.

## ACAMPSOHELCONINAE

M. Sharkey and D.C. Arias-Penna

### *Urosigalphus* Ashmead, 1889

**Phylogeny.** *Urosigalphus* (Fig. 1) is currently placed in Acampsohelconinae, although it was traditionally included in the tribe Brachistini of Helconinae. A recent molecular phylogeny based on ribosomal DNA (28S and 18S) and nuclear protein-coding genes (CAD and ACC) elevated Brachistini to subfamily level and suggested that *Urosigalphus* (and presumably other acampsohelconines, which were not included in the analyses) is sister to a large clade including all helconoids (Helconinae, Brachistinae) and the macrocentroid subcomplex. This subcomplex is within the helconoid complex and includes Orgilinae, Homolobinae, Microtypinae, Charmontinae, Amicrocentrinae, Xiphozelinae, and Macrocentrinae (Sharanowski et al. 2011). This placement was also recovered by Jasso-Martínez et al. (2022).

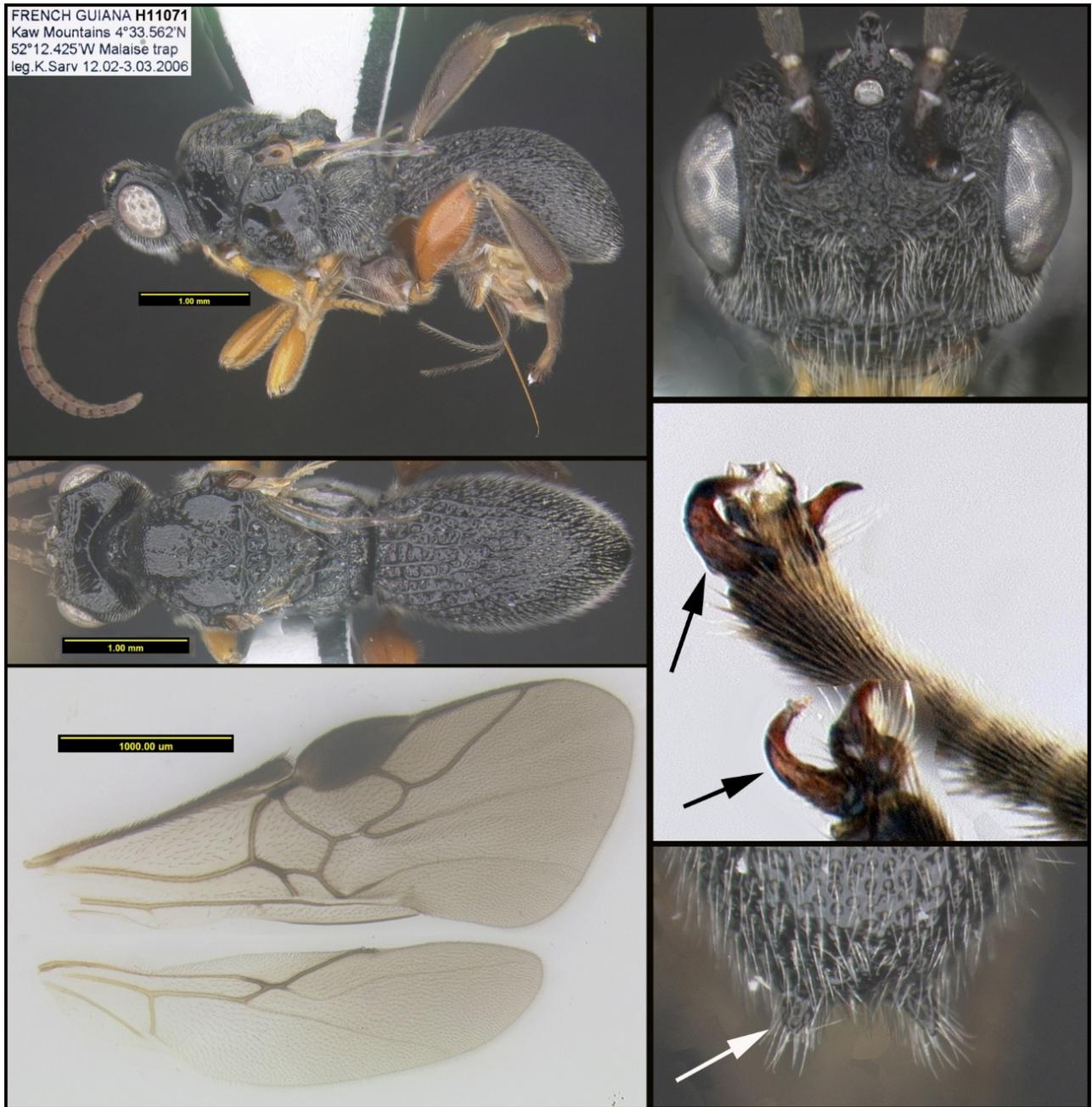
**Biology.** Unknown for all other genera but members of *Urosigalphus* are endoparasitoids of the larval stage, perhaps egg-larval parasitoids, of Curculionidae and Bruchinae (Chrysomelidae). A complete list of the host records for *Urosigalphus* is contained in Table 1 of Arias-Penna and Whitfield (2012).

**Diversity.** There are 104 described species (Yu et al., 2016; Arias-Penna and Whitfield, 2012), but many more are undescribed.

**Distribution.** *Urosigalphus* is restricted to and widespread in the Nearctic and Neotropical realms. *Afrocampsis* (Afrotropical) and *Canalicephalus* (Indo-Australian) are Old World genera.

**Diagnosis.** (Fig. 2). The hind claws are dimorphic, i.e., the outer claw is longer than the inner claw. There are sometimes other differences between the two claws as well, e.g., different curvature and the presence of a basal lobe on the inner claw. Vein Cub of the hind wing is present. The metasoma is in the form of an unsegmented carapace. The second submarginal cell and crossvein 2cu-a of the forewing are absent.

**Publications.** Gibson (1972a, b, 1974, 1982a, b) described and keyed the New World species of *Urosigalphus*. Arias-Penna (2007) reported on the altitudinal range and geographic distribution of the genus in Colombia as well as the variation in body length and coloration among New World species. Arias-Penna and Whitfield (2012) described 23 new species from Colombia and presented a key to all South American species.



**Figure 2.** *Urosigalphus* spp. Arrows indicate hind claws with dimorphic inner and outer claws, and tubercles at the apex of the metasoma that are present on many species.



**Figure 3.** *Apozyx penyai* Mason, male. Image by Koorosh McCormack via Donald L.J. Quicke, courtesy of the facilities of the Angela Marmont Centre for Nature UK.

## APOZYGINAE

M. Sharkey

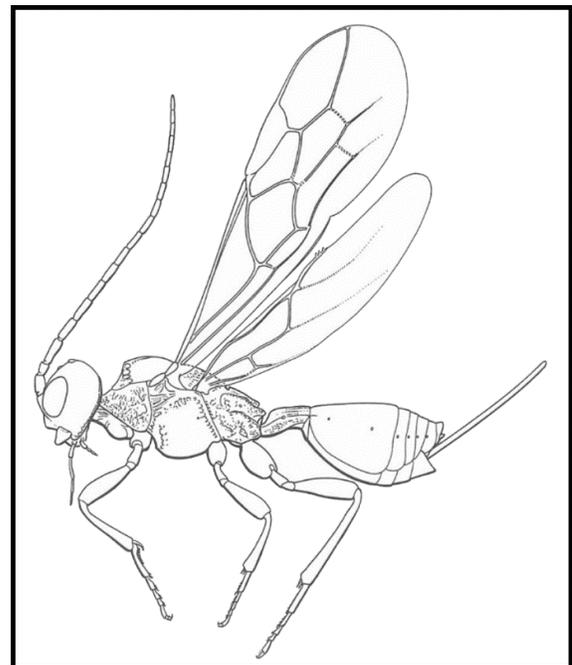
### *Apozyx penyai* Mason

**Phylogeny.** In a phylogenomic analysis, Jasso-Martínez et al. (2022) recovered Apozyginae as sister to all other braconid subfamilies as suggested by Mason (1978) on morphological grounds.

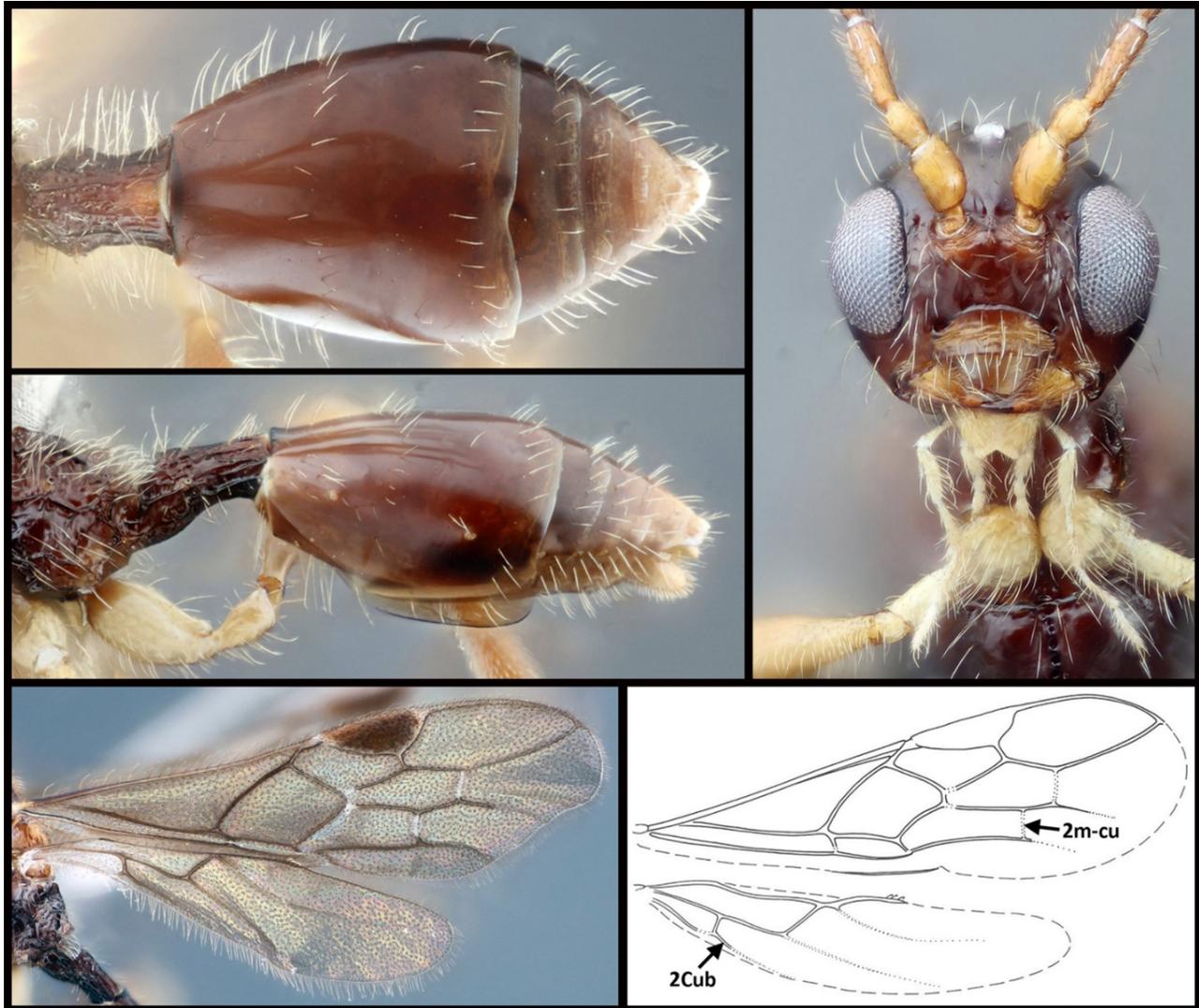
**Biology.** The biology of *A. penyai* is unknown but due to its basal phylogenetic position within Braconidae and its general similarity to some members of Doryctinae it may be an idiobiont ectoparasitoid of xylophagous coleopterous larvae.

**Diversity and Distribution.** Apozyginae contains one rare species from Chile, *Apozyx penyai* Mason (Figs 3–5).

**Diagnosis** (Figs 4–5). This is the only extant braconid in which forewing crossvein 2m-cu (the second recurrent vein) is present. Additionally, vein 2Cub is present in the hind wing, and the oral cavity is cyclostome.



**Figure 4.** *Apozyx penyai* female. Image from Sharkey (1997a).



**Figure 5.** *Apozyx penyai* male. Images by Koorosh McCormack via Donald Quicke, courtesy of the facilities of the Angela Marmont Centre for Nature UK, except the line drawing which is from Sharkey (1997a).

## DIRRHOPINAE

J.B. Whitfield and M. Sharkey

### *Dirrhope* Foester

**Phylogeny.** Within Braconidae, Dirrhopinae is clearly a part of the microgastroid clade (Quicke and van Achterberg, 1990; Wharton et al., 1992; Whitfield and Mason, 1994). Recently *Dirrhope* was included in a molecular phylogenetic analysis which found it to be the sister taxon to Cheloninae, confirming the microgastroid placement (Jasso-Martínez et al. 2023).

**Biology.** These are koinobiont endoparasitoids of Nepticulidae (Lepidoptera) (van Achterberg 1984; Whitfield and Wagner 1991).

**Diversity.** Only a single genus, *Dirrhope* Foester, 1851

(Fig. 6) is known. There are six described species, and probably a dozen or two are undescribed. There is only one New World species described, *D. americana* Muesebeck, which is widespread in the USA but rare.

**Distribution.** Cosmopolitan, reported here from Africa and the Neotropical region for the first time (Madagascar, South Africa, and Costa Rica, all in the Hymenoptera Institute Collection).

**Diagnosis.** Specimens of *Dirrhope* resemble those of *Adelius* (Cheloninae), Miracinae, and small Microgastriinae in size and reduced venation. *Dirrhope* species differ from these taxa in their unique forewing venation (Figs 7–8).

**Publications.** Muesebeck (1936) described *D. americana*. Ranjith et al. (2021) revised and keyed the six world species.



Figure 6. *Dirrhope* sp.

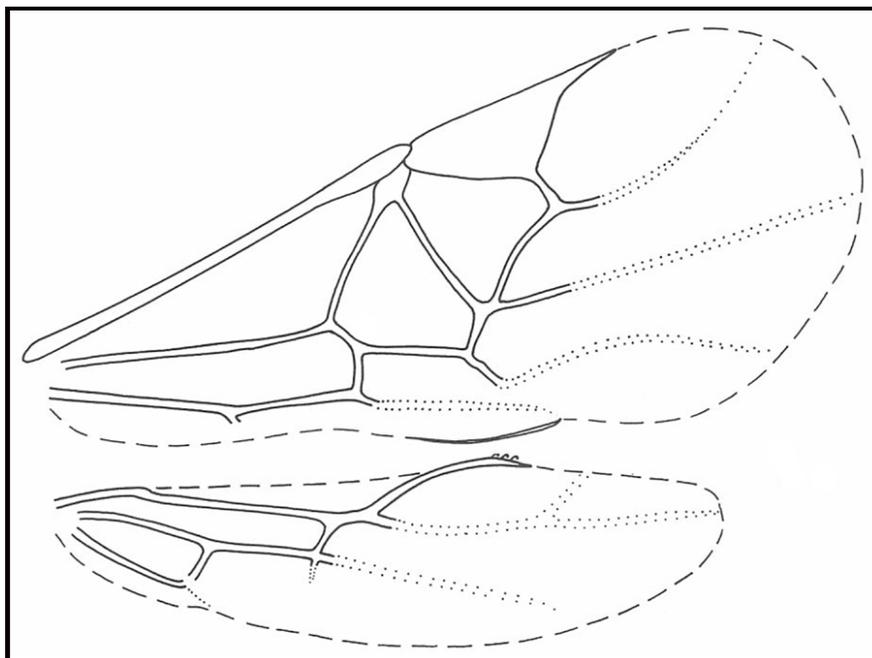


Figure 7. Wings of *Dirrhope* sp. From Whitfield (1997a).

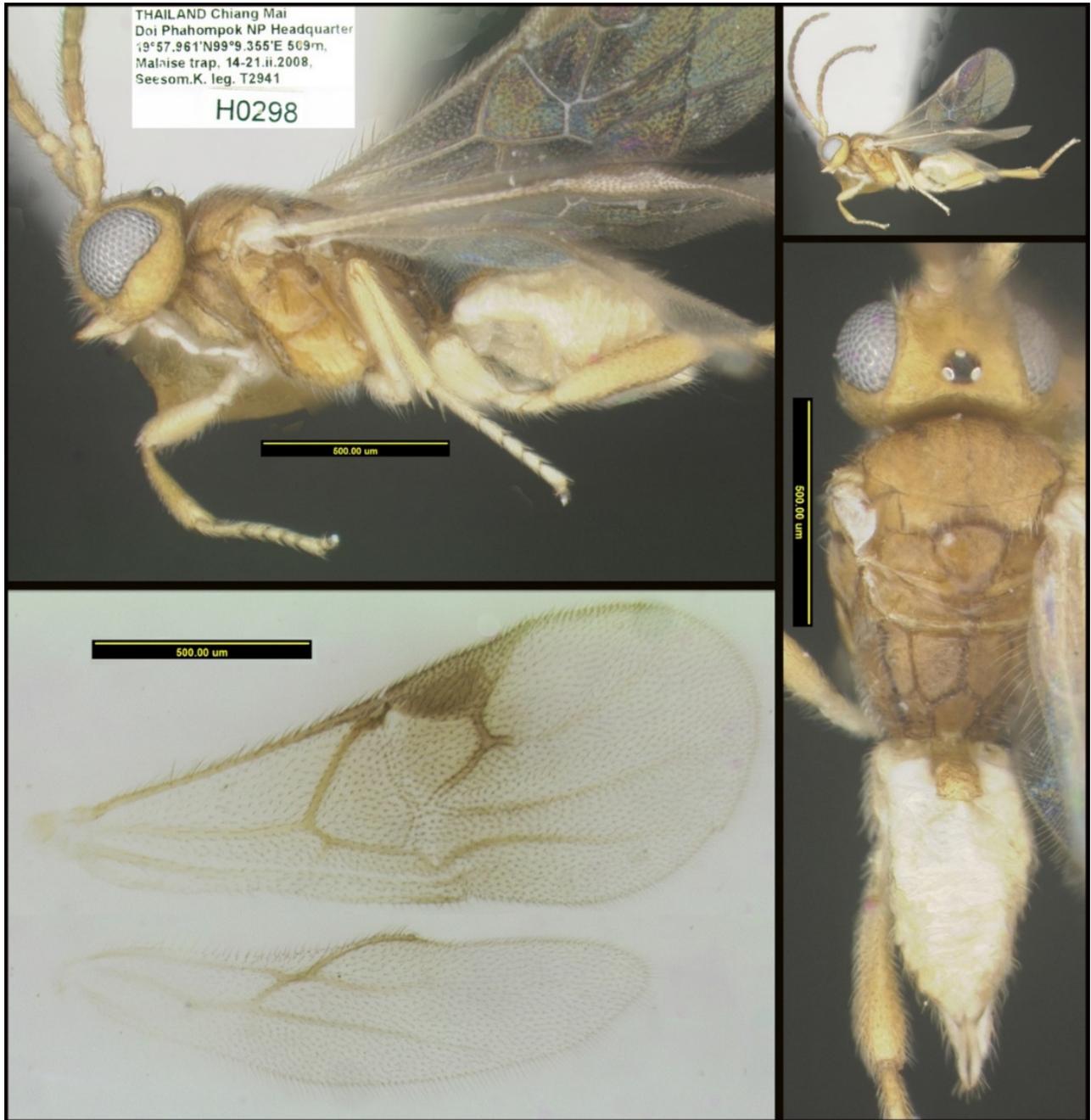


Figure 8. *Dirrhope* n. sp.



Figure 9. *Masona* sp.

## MASONINAE

M. Sharkey, C. van Achterberg, and D.L.J. Quicke

### *Masona* van Achterberg

**Phylogeny.** Quicke et al. (2019b) suggested, using multiple molecular markers, that Masoninae belongs in Ichneumonidae. Jasso-Martínez et al. (2022) recovered Masoninae as sister to Aphidiinae and we follow their placement here.

**Biology.** Unknown.

**Diversity.** *Masona* van Achterberg (Fig. 9) is the only extant genus, and it has seven described species. It has been collected rarely, primarily in flight-interception traps (including the wingless females) and Winkler traps.

**Distribution.** Two of the seven described extant species occur in southeastern USA. Two species are known from Australia. Quicke et al. (2019a) described a new species from Brazil, and Dal Pos et al. (2024) described a new species from Puerto Rico. There is also a report of an undescribed species from Tanzania (van Achterberg, 1995) and Asia (Quicke et al., 2019b). The specimen shown in Fig. 10 represents a new species from Colombia and the specimen in Fig. 9 is from California, USA.

**Diagnosis.** *Masona* is a small genus with specimens 1–2 mm long. They are sexually dimorphic. Females are wingless (Figs 10, 12) with an ant-like habitus, head elongated behind eyes, antenna distinctly shorter than body and with 14–19 segments, and the head in New World species distinctly prognathous. The winged males are mainly characterized by the short face and head and the wings are almost devoid of venation (Fig. 11). The upcurved ovipositor, the shortened foretarsus of females, and the labial palp with one segment in both sexes are diagnostic. The occipital carina is present dorsally and absent lateroventrally.

**Publications.** Van Achterberg (1995) erected the subfamily and genus and described four species. Two amber fossils from the New World have been described from Miocene Dominican amber, one in the extant genus



Figure 10. *Masona* n. sp., female.

*Masona* (van Achterberg, 2001) and one in a new, probably extinct, genus, *Anoblepsis* (Engel and Bennett, 2008). Dal Pos et al. (2024) revised the world species, included a key, described two new species, and transferred *M. timpaynei* Quicke *incertae sedis* to Neorhacodinae (Ichneumonidae).

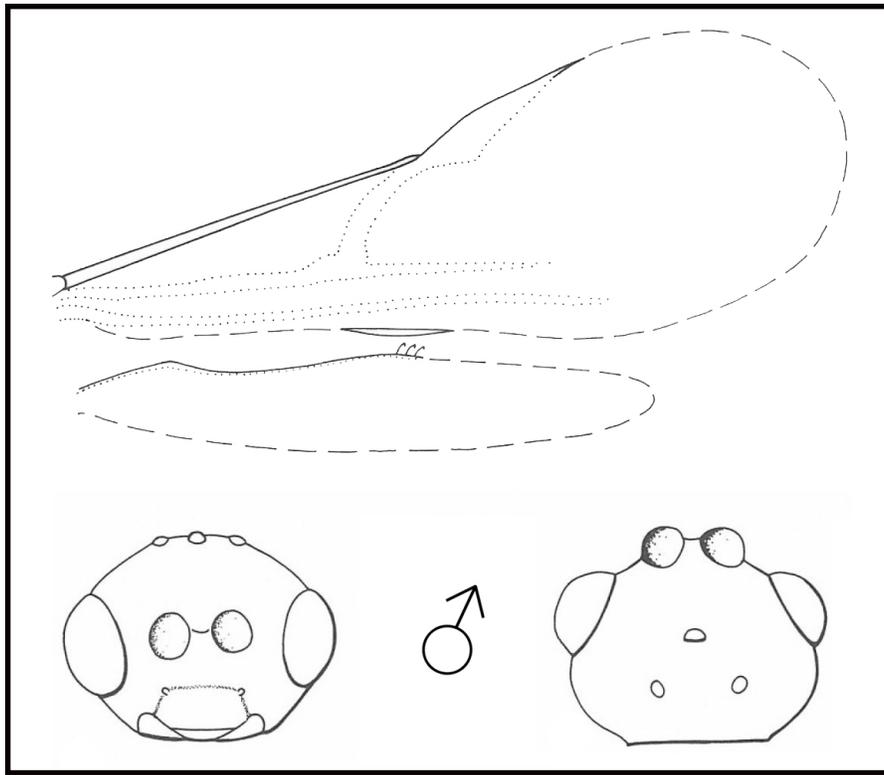


Figure 11. *Masona* sp., male. From van Achterberg (1997).

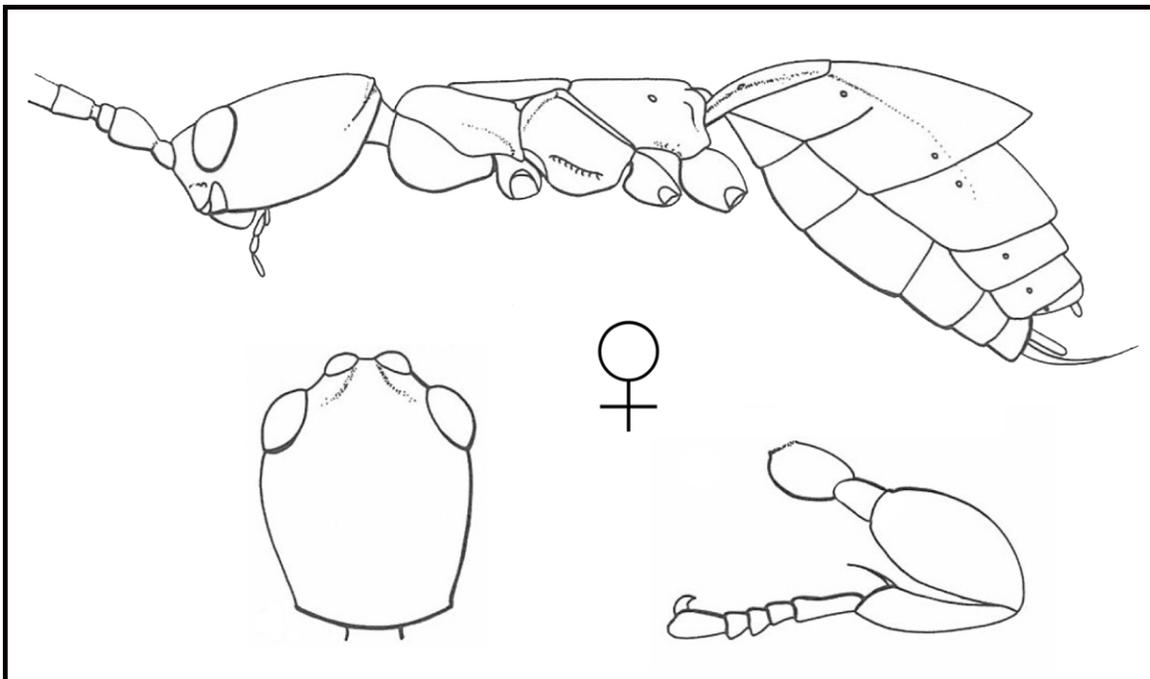


Figure 12. *Masona* sp., female. From van Achterberg (1997).



Figure 13. *Meteoridea compressiventris* Shenefelt and Muesebeck.

## METEORIDEINAE

M. Sharkey

### *Meteoridea* Ashmead, 1900

**Phylogeny.** Sharanowski et al. (2011) found a sister-group relationship between *Meteoridea* and the Sigalphoid + Microgastroid clade. Jasso-Martínez et al. (2022) recovered Meteorideinae, represented by *Meteoridea hutsoni* Nixon, as sister to all other non-cyclostome braconids.

**Biology.** Members are known to be gregarious or solitary, larval-pupal endoparasitoids of Lepidoptera (Nixon 1941, Ghosh and Abdurahiman 1984). Eggs are laid into the host larva, and the adult parasitoid emerges from the pupal stage of the host. These generalities are based primarily on studies of *Meteoridea hutsoni*, a parasite of *Opisina arenosella* Walker, a pest of coconut. The largest collections of *Meteoridea* (Canadian National Collection) have been taken from light traps, suggesting that at least some species are nocturnal.

**Diversity.** Only *Meteoridea* (Fig. 13) is found in the New World. There are 16 described species worldwide, two from the Neotropics and two from the Nearctic region. There are many more undescribed species, but probably 30–70 in the New World. Yu et al. (2016) catalogued the world species of *Meteoridea*.

**Distribution.** Cosmopolitan and much more diverse in the Neotropics, as are most braconid subfamilies.

**Diagnosis.** Meteorideines can be recognized by the following combination of characters: hind wing with vein Cub present although often very small and difficult to see; forewing with second submarginal cell quadrate; terminal segments of metasoma laterally compressed; ovipositor very small, barely (if at all) exerted from the apex of the metasoma.

**Publications.** Pentead-Dias (1996) described the two Neotropical species and included a key to the four described New World species.

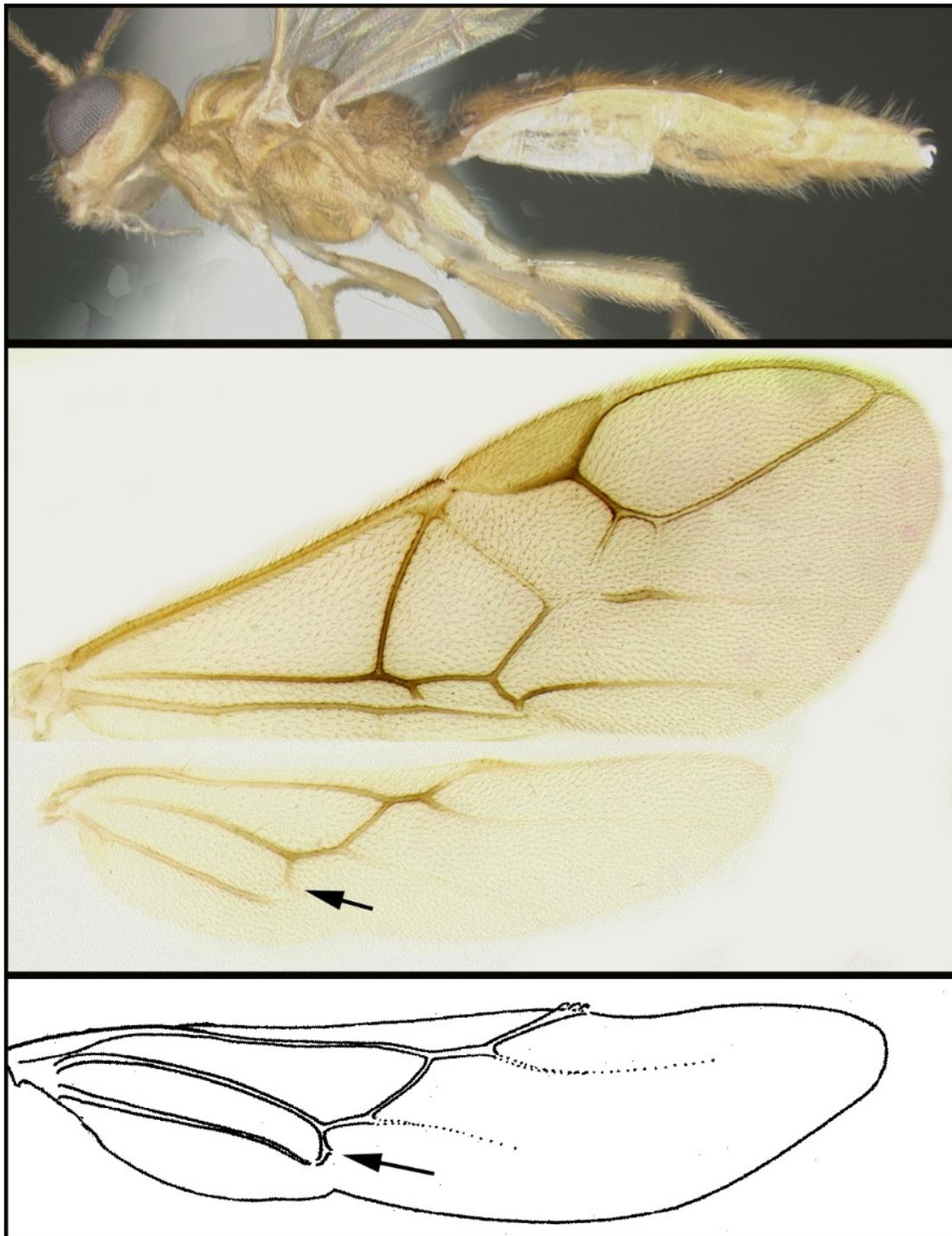


Figure 14. *Meteoridea* sp. Line drawing from Sharkey (1997c).

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