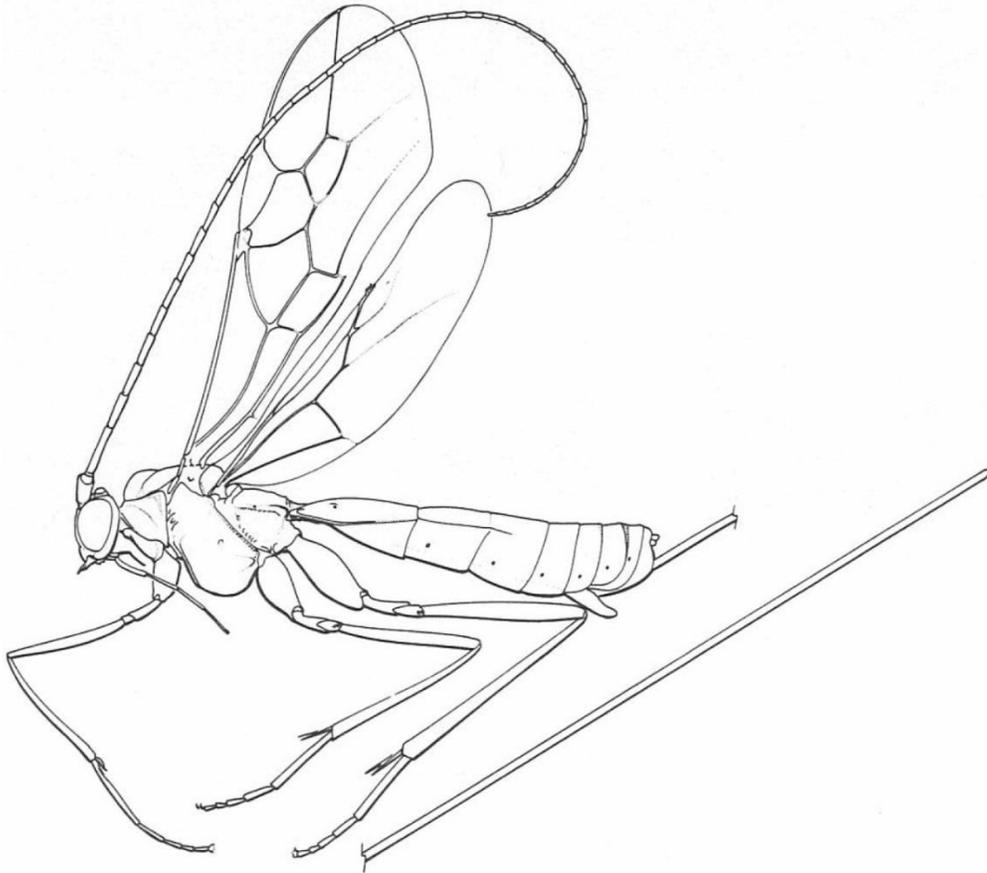


SUBFAMILY MACROCENTRINAE

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INTRODUCTION. The Macrocentrinae is a moderately diverse subfamily containing four genera in the New World. Most of the described species belong to the genus *Macrocentrus* Curtis, 1933. Ahlstrom (2005) revised the species of North America north of Mexico, updating that of Muesebeck (1932). The latest generic synopsis is by van Achterberg (1993). Shaw and Huddleston (1991) provide a useful summary of the literature, with special reference to the biology.

PHYLOGENY. No phylogenetic analyses have been conducted.

BIOLOGY. The Macrocentrinae include both solitary and gregarious koinobiont endoparasitoids of lepidopterous larvae (Clausen, 1940; Shaw and Huddleston, 1991). Where known, the gregarious species are polyembryonic. Detailed biological information is available for two species, *M. ancylivorus* Rohwer (Daniel, 1932; Finney et al., 1947) and *M. cingulum* Brischke (as referred to in recent literature (van Achterberg, 1993; Farahani et al., 2012)) or with authorship incorrectly attributed to Reinhard or as *M. grandii* Goidanich (Parker, 1931; Ding et al., 1989) or as *M. gifuensis* Ashmead (a misidentification) in some of the more important earlier publications. Although only a single individual of *M. ancylivorus* emerges from its host, initial development is polyembryonic (Daniel, 1932). Details of the development of other macrocentrines are largely unknown. It is possible, however, that those species that emerge as solitary parasitoids (at least in *Macrocentrus* and *Hymenochaonia* Dalla Torre) are initially polyembryonic in their development. New World macrocentrines have been reared from 10 families of Lepidoptera.

Many macrocentrines are pale colored and crepuscular to nocturnal. Species of *Macrocentrus* and *Hymenochaonia* have long ovipositors, often laying their eggs in early instars of hosts concealed in leaf whorls, stems, tubers, or rolled leaves. *Austrozele* Roman and *Dolichozele* Viereck, on the other hand, have short ovipositors, and the available records indicate that they attack exposed caterpillars, e.g., Arctiidae and Noctuidae.

COMMON GENERA. *Macrocentrus* and *Hymenochaonia* are the major New World genera. There are about 190 described species of *Macrocentrus* worldwide, and about one-fourth of these occur in the New World. The remaining 46 species of described macrocentrines are divided amongst seven other genera worldwide. We estimate that there are several hundred or more undescribed New World species.

DISTRIBUTION. Macrocentrines are cosmopolitan. *Dolichozele* and *Hymenochaonia* are endemic to the New World.

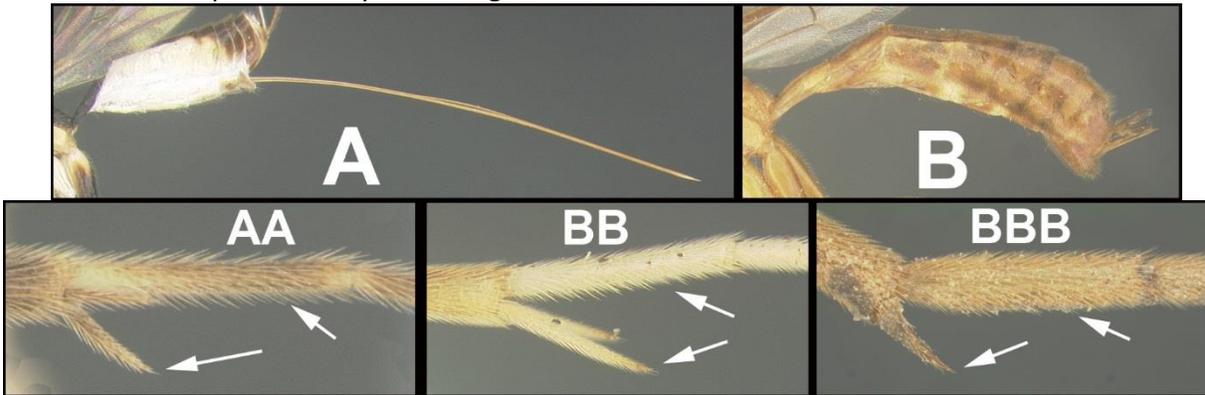
DISTINGUISHING FEATURES. Macrocentrines can be recognized by the absence of an occipital carina and the presence of small teeth on the trochantellus. With the exception of *M. incompletus* Muesebeck, all described species have three submarginal cells.

KEY TO THE NEW WORLD GENERA OF THE SUBFAMILY MACROCENTRINAE

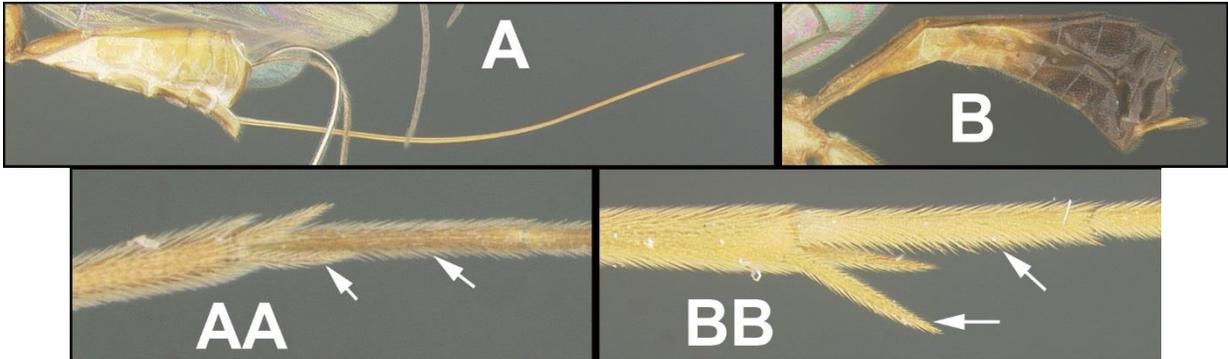
1. **A.** Petiole with laterope shallow or absent; petiole flat or convex basal-medially..... 2
 - **B.** Petiole with laterope deep; petiole nearly always slightly concave basal-medially 3



- 2(1). **A.** Ovipositor long, ovipositor sheath at least as long as metasoma. **AA.** Length of inner (longest) spur of hind tibia 0.4-0.6 times length of hind basitarsus.....*Hymenochoania*
 - **B.** Ovipositor short, about equal to apical height of metasoma. **BB.** Length of inner (longest) spur of hind tibia usually (80%) 0.6-0.8 times length of hind basitarsus, if shorter then, BBB. Apex of the spur lacking setae*Dolichozele*



- 3(1). **A.** Ovipositor long, ovipositor sheath nearly always at least as long as metasoma. **AA.** Length of inner (longest) spur of hind tibia 0.3- 0.5 times length of hind basitarsus.*Macrocentrus*
 - **B.** Ovipositor short, about equal to apical height of metasoma. **BB.** Length of inner (longest) spur of hind tibia 0.5-0.8 times length of hind basitarsus.....*Austrozele*



GENERIC TREATMENTS

Austrozele Roman, 1910

Diagnosis. Petiole with laterope deep; ovipositor short, about equal to apical height of metasoma.

Biology. Solitary parasitoids of Noctuidae (van Achterberg, 1993).

Diversity. Sixteen described species worldwide and many undescribed.

Distribution. Cosmopolitan.

Publications. Ahlstrom (2005) revised the Nearctic species occurring north of Mexico.

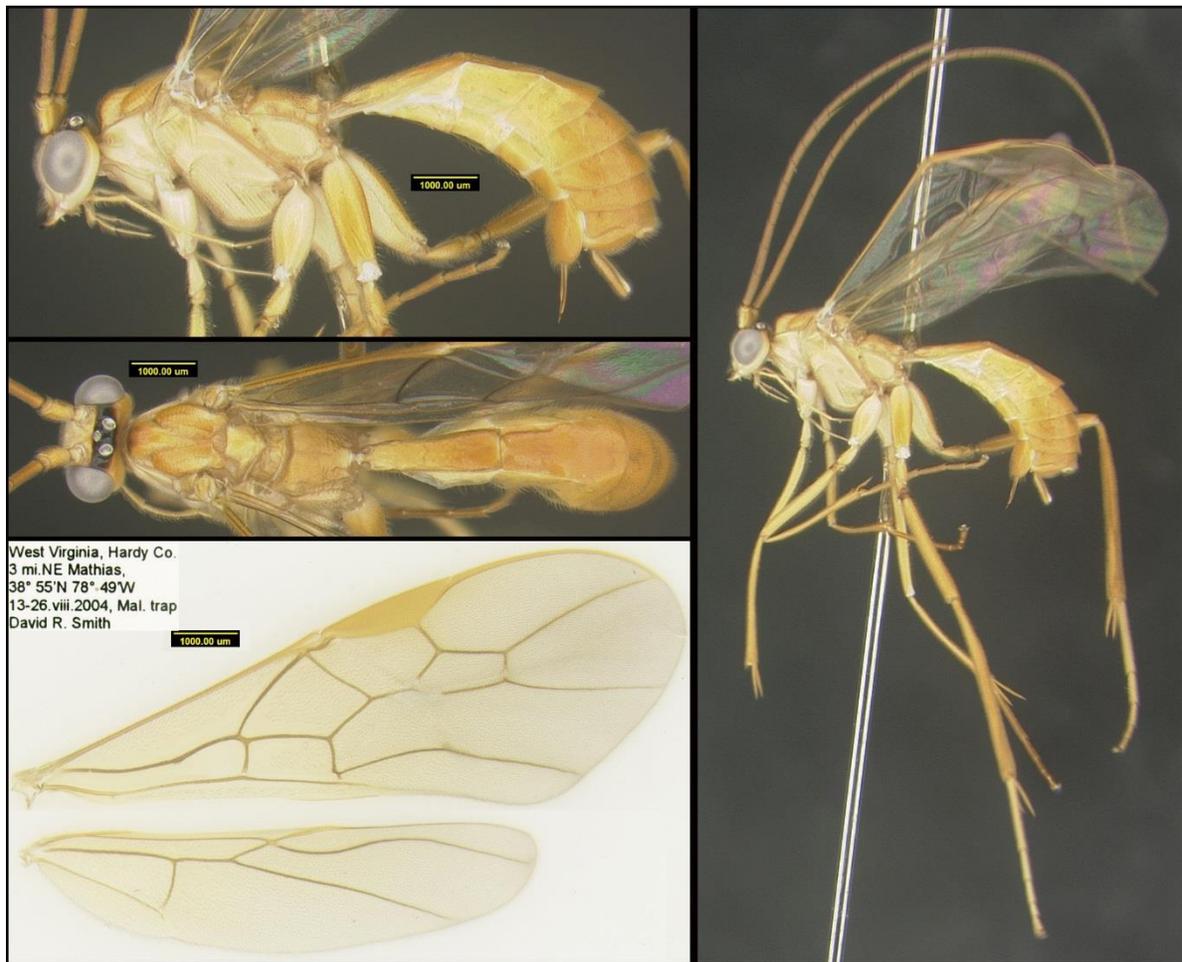


Figure 1. *Austrozele* sp.

Dolichozele Viereck, 1911

Diagnosis. Ovipositor much shorter than metasoma. Laterope weakly impressed or absent.

Biology. Solitary parasitoids of Arctiidae.

Diversity. Seven described species, perhaps several dozen more undescribed, primarily in the Neotropics.

Distribution. Restricted to the New World, from western Canada (British Columbia) south to Brazil.

Publications. Ahlstrom (2005) revised the Nearctic species occurring north of Mexico.

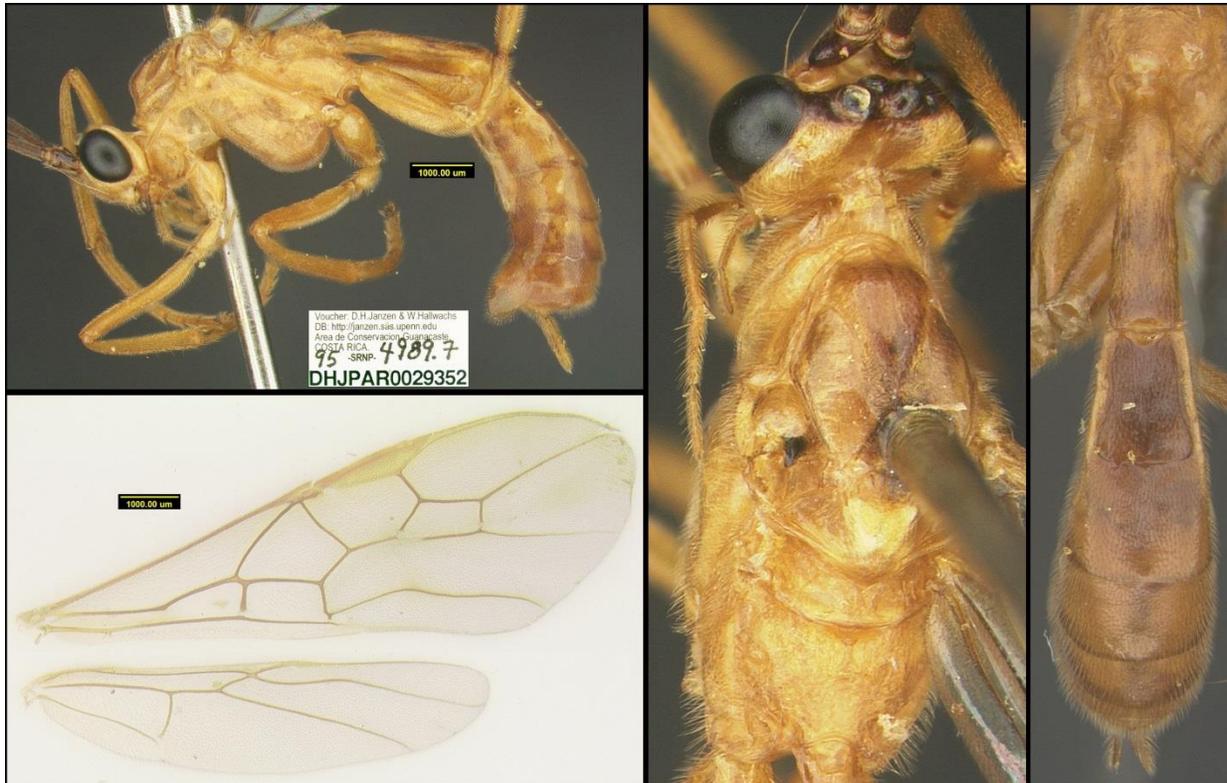


Figure 2. *Dolichozele* sp.

Hymenochaonia Dalla Torre, 1898

Diagnosis. Ovipositor as long as or longer than the metasoma, usually at least as long as the body. Laterope weakly impressed or absent.

Biology. Reared primarily from Pyralidae and Tortricidae. Allen (1962) summarized the biology of *H. delicata* (as *Macrocentrus delicatus*).

Diversity. Ten described species.

Distribution. Nearctic, Neotropical (southern Canada to Argentina), and introduced into Europe for biological control of the Oriental fruit moth, *Grapholita molesta*, but not recovered.

Publications. Ahlstrom (2005) revised the Nearctic species occurring north of Mexico.

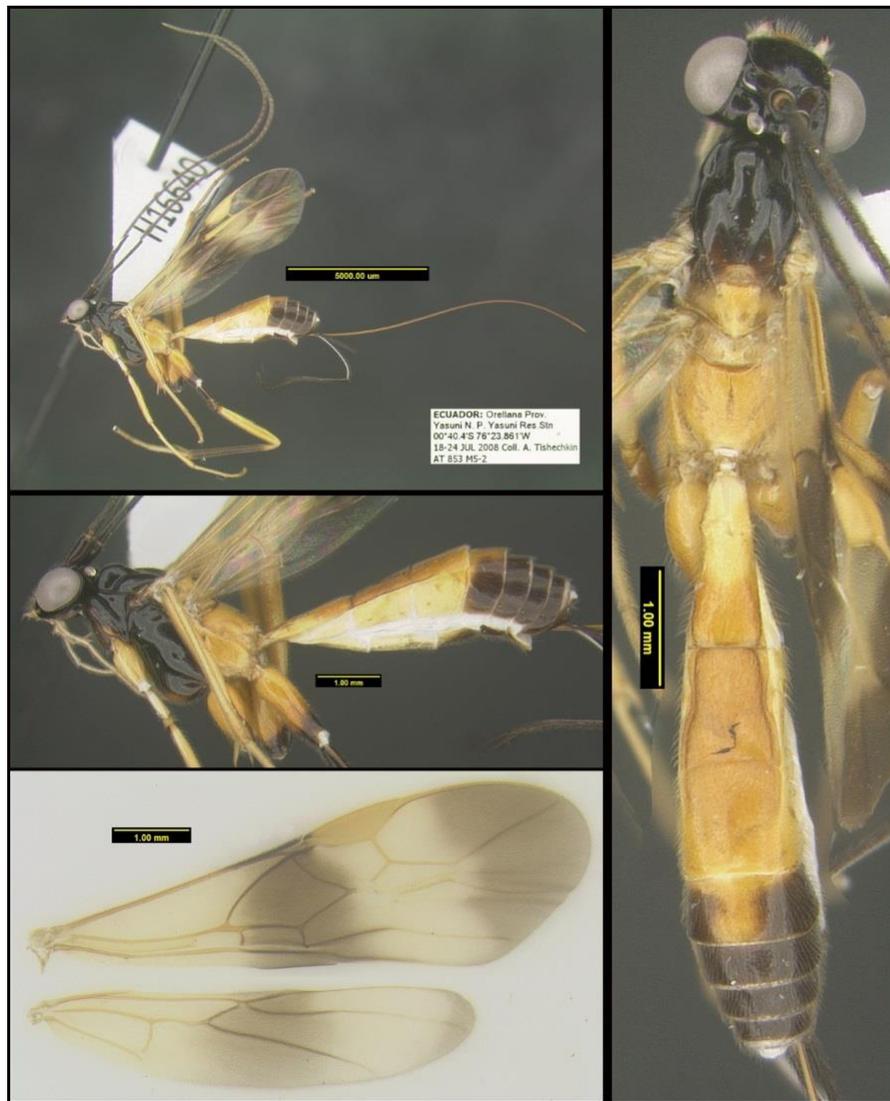


Figure 3. *Hymenochaonia* sp.

***Macrocentrus* Curtis, 1833**

Diagnosis. Ovipositor as long as or longer than the metasoma, usually at least as long as the body. Laterope deeply impressed. Most of the small species (less than 5 mm.) belong to this genus.

Biology. Most of the detailed work has been on polyembryonic species (overview in Shaw and Huddleston, 1991); Tortricidae and Pyralidae are the most frequently recorded hosts.

Diversity. 190 species described worldwide; 46 in the Nearctic region, and eight in the Neotropical. Hundreds more species are undescribed.

Distribution. Cosmopolitan.

Publications. Ahlstrom (2005) revised the Nearctic species occurring north of Mexico.

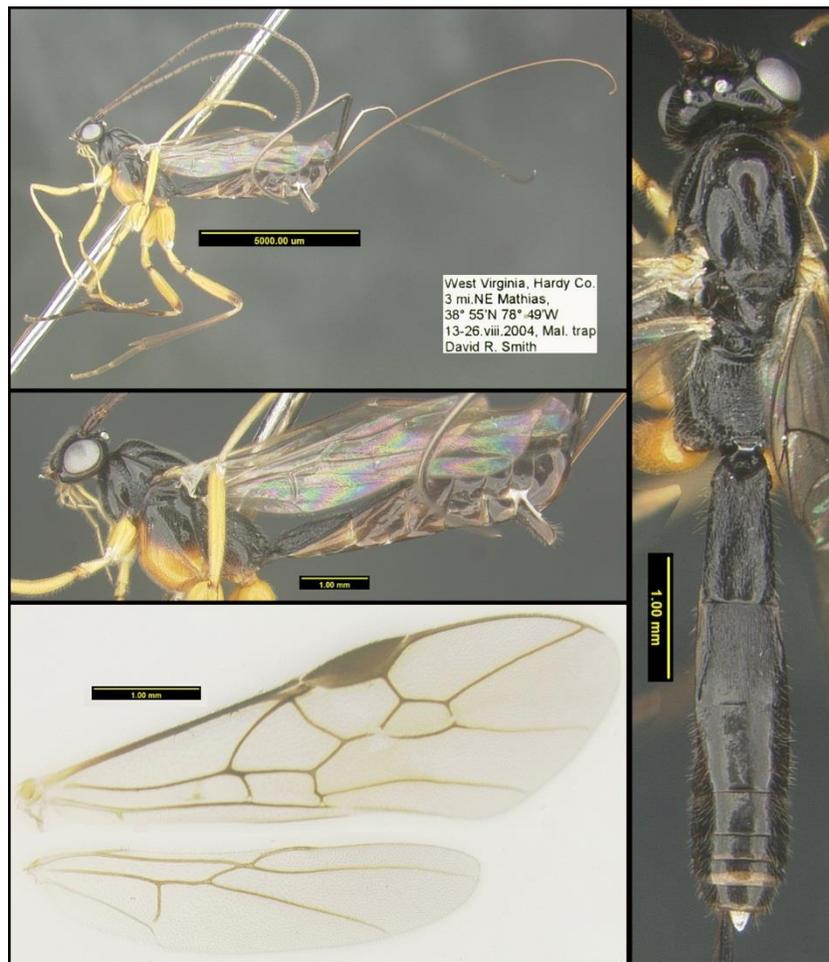


Figure 4. *Macrocentrus aegeriae*.

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