

**Braconinae**

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**INTRODUCTION.** The Braconinae is a large subfamily of moderately small to large wasps with more than 2000 described species and almost 200 genera worldwide (Shaw and Huddleston, 1991). They are most diverse in the Old World tropics but are also well represented in the New World. Comparatively few studies have been made on the New World fauna. Many New World species are included under the generic names *Iphiaulax* Förster (a genus that in reality has an entirely Old World distribution), *Ipobracon* Thomson (a junior synonym of *Cyanopterus* Haliday), or *Bracon* Fabricius, with *Iphiaulax* and *Bracon* (= *Microbracon* Ashmead) used in a far wider sense than they are today. Many of these species have subsequently been reclassified by Quicke (1988a, 1989a, 1991) and Quicke and Genise (1994) mostly into *Digonogastra* Ashmead. The aberrant Neotropical genus *Gnathobracon* Costa was redescribed and transferred formally from the Rogadinae to the Braconinae (Quicke and Huddleston, 1991). Several new genera have been described recently by Shenefelt (in Mason, 1978), Quicke (1988b, 1989b, 1994, 1995), van Achterberg (1989), Quicke and Sharkey (1989), and Quicke and Delobel (1995).

**PHYLOGENY.** Belshaw et al. (2001) conducted a phylogenetic analysis on a limited number of genera using morphological characters. The subfamily needs a comprehensive analysis based on sequence data.

**BIOLOGY.** As far as is known, all New World braconines are idiobiont ectoparasitoids of concealed holometabolous insect larvae, especially of the Lepidoptera and Coleoptera, though a few species, mostly in the genus *Bracon*, attack concealed dipterous or sawfly larvae. Indeed, this is true for the whole subfamily with the exception of the small, entirely Old World tropical subtrube Aspidobraconina which are endoparasitic in butterfly pupae. Braconines are synovigenic and their large eggs are usually laid on the host which was previously paralyzed by injection of venom (Shaw and Huddleston, 1991). Host feeding appears to be quite common among the smaller species and sometimes involves the construction of feeding tubes. Both solitary and gregarious parasitism occur, sometimes with closely related species displaying different strategies (Wharton et al., 1989). Some genera appear to be somewhat specialized in their host range though most species are at least oligophagous. For example, the species of *Myosoma* Brullé, are parasitoids of stem-boring Lepidoptera (Pyralidae and Sesiidae), while species of *Coeloides* Wesmael are specialized on bark-boring beetle larvae. The biologies of many of the Neotropical genera are still unknown, but members of one recently described genus, *Cyclaulacidea* Quicke and Delobel, have been reared from bruchine beetle larvae.

Several species have been utilized in biocontrol programs in the New World. Various species of *Bracon*, *Habrobracon* Ashmead and *Pigeria* van Achterberg have been released to control a range of insects including stored product and stem borer pests. For example, *H. brevicornis* (Wesmael) has been released in the U.S.A. on numerous occasions against *Heliothis virescens* (F.), *Helicoverpa zea* (Boddie), *Ostrinia nubilalis* (Hubner) and *Pectinophora gossypiella* (Saunders) while *Pigeria piger* (Wesmael) has been released against *Etiaella zinckenella* (Treit) and *Cnephasia sp.*. *Bracon mellitor* Say is one of the most important natural parasitoids of the boll weevil, *Anthonomus grandis* Boheman, in the United States (Tillman and Gate, 1989) while various other braconines are important in the natural regulation of bark beetle pests in North American forests. Members of several endemic New World genera are at least locally important parasitoids of pyralid cane borers, *Diatraea* spp., in Central and South America,
including *Digonogastra kimballi* Kirkland, *Palabracon diairaeaphilus* Quicke and *Myosomatoides myersi* Quicke (= *pennipes* Myers).

**COMMON GENERA.** The majority of New World genera are only infrequently collected but members of two speciose genera, *Bracon* and the generally larger and more brightly colored *Digonogastra*, are abundant virtually everywhere.

**DISTRIBUTION.** The Braconinae have a cosmopolitan distribution, with the greatest generic and probably specific diversity being in the Old World tropical regions. The Nearctic fauna is similar in its generic composition to that of the Palaeartctic but in the Neotropics, most genera are endemic.

**DISTINGUISHING FEATURES.** Most, if not all Braconinae, produce a distinctive smell when handled while alive. All New World species are distinctly cyclostome (i.e. have a large, dorsally rounded depression above the mandibles formed by a ventrally recessed clypeus and an exposed, concave and usually glabrous labrum), though in both *Alienoclypeus* Shenefelt and *Gnathobracon* the lower face and clypeal configuration are somewhat modified. The occipital carina is always absent (except in one aberrant Old World genus). The epicnemial carina is also always absent. The first median tergite is usually distinctly flattened laterally with a domed apicomedial area and a depression basomedially, the hind wing cross vein m-cu is always absent and the hind wing vein M+Cu is less than 0.5 times the length of vein 1M (the latter nearly always being markedly thicker basally than distally).
KEY TO THE NEW WORLD GENERA OF THE SUBFAMILY BRACONINAE

The shape of the antennal scape is important for identification of genera. For determination of the relative lengths of the dorsal and ventral sides (couplets 4, 12, and 16), the antenna should be positioned as in couplet 12.

1.  
   - A. Face with a median projection that is approximately round in cross section ................. *Lasiophorus*
   - B. Face with large, horizontal, dorsally concave plate-like projection ........................................ 2
   - C. Face without a projection ........................................................................................................... 3

2(1).  
   - A. First flagellomere with thorn-like, pre-apical projection ...................................................... *Cervellus*
   - B. First flagellomere simple or occasionally apically flared ..................................................... *Palabracon*

3(1)  
   - A. Basal flagellomere (1) expanded ventrally .............................................................................. 4
   - B. Basal flagellomeres simple, not expanded ventrally ............................................................... 5
4(3). A. Scape shorter ventrally than dorsally (antenna directed anteriorly); flagellum uniformly dark, without white or cream-colored band at midlength............................................................Coeloides
- B. Scape longer ventrally than dorsally (antenna directed anteriorly); flagellum with white or cream-colored band at midlength............................................................Megacoeloides

5(3). A. Scape with false sub-apical margin, well-separated from the real margin, and scape basally abruptly and concavely narrowing. ..............................................................................................................6
- B. Scape without false sub-apical margin, and scape basally gradually narrowing towards base...10

6(5). A. Antennal sockets greatly protruding in profile. Scape as wide as long. Temples wider than eye. .................................................................................................................................Calobrachon
- B. Antennal sockets slightly protruding in profile. Scape longer than wide. Temple shorter than eye. .................................................................................................................................7
7(6). A. Tergum 2 with triangular or (rarely) quadrate raised area that is narrowing posteriorly............8
- B. Tergum 2 smooth and flat or with a smooth posteriorly widening “pinched-up” area.............9

![Images showing tergum 2 with triangular or quadrate raised area and smooth and flat tergum 2.]

8(7). A. Raised median area of tergum 1 with semi-circular emargination postero-laterally...Hemibraccon
 B. Raised median area of petiole without abrupt emarginate postero-laterally............ Atanycolus

![Images showing raised median area of tergum 1 and petiole.]

9(7). A. Metasomal tergum 2 strongly 'pinched-up' antero-medially..........................Gracilibracon
 - B. Metasomal tergum 2 not or hardly 'pinched-up' antero-medially.......................Cyclaulax (pt)

![Images showing metasomal tergum 2 with and without pinched-up area.]

10(5). A. Middle part of face clearly demarked from lateral parts by a pair of sub-medial, longitudinal carinae running ventrally from the antennal sockets. AA. Metasomal tergum 2 without medial, basal, posteriorly-narrowing triangular area. 
- B. Middle part of face not clearly demarked from lateral parts by longitudinal grooves or carinae. BB. Metasomal tergum 2 often with medial, basal, posteriorly-narrowing triangular area.

11(10). A. Hypopygium truncated in lateral aspect. 

B. Hypopygium acutely pointed in lateral aspect. 

Compsobracon

12(11). A. Scape shorter ventrally (V) than dorsally (D) (antenna directed anteriorly). 

- B. Scape longer ventrally (V) than dorsally (D) (antenna directed anteriorly).
13(12). A. Propodeum simple, entirely smooth. Second metasomal tergite flat or weakly pinched anteromedially. ............................... *Compsobraconoides*
- B. Propodeum with a distinct longitudinal carina posteromedially. Second metasomal tergite more pinched-up medio-anteriorly. ........................................... *Gozmanycomp*

![Image](image1.png)

14(12). A. Length of tergum 2 more than \( \frac{1}{2} \) length of tergum 3...............................15
- B. Length of tergum 2 less than \( \frac{1}{2} \) length of tergum 3............................... *Cyclaulax* (pt.)

![Image](image2.png)

15(14A). A. Face rugose with a lot of granulate sculpture, often with a raised granulate area medially.
- AA. Raised median area of petiole rather square in cross-section, lateral margin more or less carinate posteriorly.................................................................*Cyclaulacidea*
- B. Face coarsely carinate-rugose medially with little or no granulate sculpture and without a raised granulate area medially. BB. Raised median area of petiole more rounded in cross-section ................................................................. *Sacirema*

![Image](image3.png)

16(10). A. Scape not, or only weakly, emarginate apico-laterally. Scape shorter ventrally than dorsally (antenna directed anteriorly). .................................................................17
- B. Scape apico-laterally emarginate. Scape longer ventrally than dorsally (antenna directed anteriorly). .................................................................25

![Image](image4.png)
17(16). A. Marginal cell of fore wing short, vein 3RSb reaching wing margin at most 0.7 times distance between apex of stigma and wing tip. AA. Clypeus with pair of long setae arranged in a cluster and often touching apically and/or AAA. Metasomal tergum 4 with characteristic pattern of fine striae that curve away from the midline. .................................................................Vipio
- B. Marginal cell of fore wing usually longer, vein 3RSb reaching wing margin at least 0.8 times distance between apex of stigma and wing tip; if shorter, then... BB. Clypeus without pair long setae arranged in two clusters (clypeal guard setae evenly spaced and not touching apically. BBB. Metasomal tergum 4 without fine striae that curve away from the midline. ..................18

18(17). A. Hind tibia strongly laterally compressed, very broad in lateral aspect with especially long setae. B. Metasomal tergum 2 with a mid-longitudinal ridge .......................Myosomatoides
- AA. Hind tibia usually not strongly laterally compressed and usually without especially long marginal setae. BB. If rather strongly compressed with long marginal setae (most Myosoma species) then metasomal tergum 2 has no mid-longitudinal ridge ...........................................19
19(18). A. Body very strongly dorso-ventrally depressed, mesosoma more than 2.8 times longer than maximally high........................................................................................................................................... Chartobracon
  - B. Body not or only moderately dorso-ventrally depressed, mesosoma less than 2.3 times longer than maximally high........................................................................................................................................... 20

A

B

20(19). A. Median tergite of petiole very long and narrow, more than 2.0 times longer than maximally wide. AA. First tergum usually (in dead specimens) almost vertical and abutting propodeum, and therefore difficult to see........................................................................................................................................... 21
  - B. Petiole with median tergite not especially elongate, less than 2.0 times longer than maximally wide........................................................................................................................................... 22

A

AA

B

21(20). A. Hind femur and tibia with short pale setae as usually in Braconinae. ................. Amyosoma
  - B. Hind femur and hind tibia with long black setae........................................................................................................................................... Myosoma

A

B
22(20). A. Propodeum and metanotum both with a complete lamelliform mid-longitudinal carina. B. Sternaulus deep and crenulate..................................................Lapicida
- AA. Propodeum and metanotum both simple, or at most propodeum with a short mid-longitudinal carina posteriorly and/or with metanotum forming a short carina mid-anteriorly.
- BB. Sternaulus not impressed or if weakly impressed then not crenulate........................................23

23(22). A. Posterior part of propleuron with a longitudinal carina or ridge sub-laterally ..........Pigeria
- B. Posterior part of propleuron smooth, without a longitudinal carina or ridge sub-laterally ........24

24(23). A. Fore wing 3RSa less than 1.5 times length of r (usually less than 1.2 times). Antenna usually with fewer than 25 flagellomeres. .................................................................Habrobracon
- B. Fore wing 3RSa more than 1.6 times length of r (usually more than 1.8 times). Antenna often with more than 25 flagellomeres. .........................................................Bracon
25(16). Propodeum coarsely sculptured. Fore wing marginal cell short, 3RSb reaching wing margin less than 0.8 times distance between apex of stigma and wing tip; fore wing (RS+ M)a straight

- Propodeum smooth and shiny, at most with weak punctures at bases of setae. Fore wing marginal cell long, Vein 3RSb reaching wing margin more than 0.8 times distance between apex of stigma and wing tip; fore wing (RS+ M)a variable, but often distinctly curved or angled posteriorly shortly after arising from 1M ................................................................. Vipiomorpha

26

26(25). Ventral border of clypeus sinuate in frontal aspect. Flagellum with fewer than 50 flagellomeres.

- Ventral border of clypeus arched in frontal aspect. Flagellum usually with more than 60 flagellomeres .............................................................................................. Alienoclypeus

27

27(25). A. Mandibles massive ........................................................................................................ Gnathobracon

- B. Mandibles of normal size ........................................................................................................ 28
28(27). A. With three very long pseudo-ovipositors (more than 5 times longer than body) extending from anal region (true ovipositor and ovipositor sheaths much shorter (arrows in images below))

Pheloura

- B. Without pseudo-ovipositors

29

29(28). A. Scape very long, more than 2.5 times longer than mid-width. Megabracon

- B. Scape much shorter, less than 2.0 times longer than mid-width

30

30(28). A. Metasomal terga 2-5 very long and slender, tergum 3 more than 2 times longer than maximally wide; posterior margins of terga 3-5 strongly emarginate and membranous medially, with extremely long internal apodemes. A long, slender wasp.

Leptobracon

- B. Metasomal terga 2-5 never so long and slender, tergum 3 less than 2 times longer than maximally wide; posterior margins of terga 3-5 at most weakly emarginate and never with a distinct membranous median zone, and with internal apodemes never more than 2 times longer than medially wide. Habitus otherwise

31
31(30). A. Posterior halves of metasomal terga 3-5 thickly sclerotized and convex in lateral aspect.
   AA. Metasomal terga coarsely sculptured in most species. ........................................... *Digonogastra*
   - B. Posterior halves of metasomal terga 3-5 less thickly sclerotized and straighter in lateral aspect.
   BB. Metasomal terga mostly smooth. .................................................................................. *Cyanopterus*
GENERIC TREATMENTS

Alienoclypeus Shenefelt, 1978

Diagnosis. Ventral border of clypeus sinuate in frontal aspect. Flagellum with fewer than 50 flagellomeres.

Biology. Parasitoid of the weevil Scyphophorus Schoenherr.

Diversity. Uncommon; one described species.


Figure 1. Alienoclypeus insolitus.
**Amyosoma** Viereck, 1913

**Diagnosis.** Similar to *Myosoma* but hind femur and tibia with short setae. Median tergite of petiole very long and narrow, more than 2.0 times longer than maximally wide. Scape shorter ventrally than dorsally (antenna directed anteriorly).

**Biology.** *A. chinense* has been widely introduced to Neotropical areas to control *Diatraea* species (Crambidae) on sugarcane (Bennett, 1971).

**Diversity.** Other than the introduced species one species is described from the New World with probably more than 40 undescribed species.

**Distribution.** Previously thought to be restricted to the Old World, but widespread in the Neotropics.

**Publications.** Papp (2012) described a new species from Honduras.
**Atanycolus** Foerster, 1862

**Diagnosis.** Raised median area of petiole not abruptly emarginate postero-laterally. Tergum 2 with triangular or (rarely) quadrate raised area that is narrowing posteriorly. Scape with false sub-apical margin, well-separated from the real margin, and scape basally abruptly and concavely narrowing

**Biology.** Parasitoids of bark-boring beetles especially Cerambycidae and Buprestidae. Several species have been used to attempt the biological control of the emerald ash borer including *A. cappaerti*, a species described in Marsh et al. (2009).

**Diversity.** 65 described species worldwide; about 40 of these are in the New World most of which are Nearctic. We estimate undescribed species will more than double this number.

**Distribution.** Palaeartctic, Old World tropics (rarely) including Australia, Canada to Costa Rica; common in the Nearctic realm.

**Publications.** Shenefelt (1943) revised the North American species.

![Figure 3. Atanycolus sp.](image-url)
**Bracon** Fabricius, 1804

**Diagnosis.** Fore wing 3RSa more than 1.6 times length of r. Petiole with median tergite not especially elongate, less than 2.0 times longer than maximally wide. Marginal cell of fore wing usually longer, vein 3RSb reaching wing margin at least 0.8 times distance between apex of stigma and wing tip. Scape shorter ventrally than dorsally.

**Biology.** Parasitoids of a wide range of lepidopterous, coleopterous, dipterous and phytophagous hymenopteran larvae. Flores et al. (2006) described the first phytophagous species.

**Diversity.** Very common and highly species-rich. About 1,000 species described worldwide, approximately 200 from the Neotropical and 90 from the Nearctic. Thousands more are undescribed

**Distribution.** Cosmopolitan.

**Publications.** Canadian and USA species were revised by Muesebeck (1925), however, this is of limited use because of the large number of undescribed species.

**Notes.** Several Neotropical species groups are distinctive and some in particular are larger and/or more heavily sculptured than is typical of most Nearctic and Old World species; nevertheless, separation of these into distinct genera would almost certainly render the remainder of Bracon paraphyletic, which they probably are already.

Figure 4. *Bracon* sp.
**Calobracon** Szépligeti, 1902

**Diagnosis.** Antennal sockets protruding and distally acutely angulate in profile. Scape very short and distinctive, flared dorsally and ventrally.

**Biology.** Unknown.

**Diversity.** Two described species, fewer than 10 predicted as undescribed.

**Distribution.** Neotropical, Brazil, Peru, Paraguay, Argentina.

**Publications.** Papp (2011) redescribed the type species.

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**Figure 5. Calobracon sp.**
**Cervellus** Szépligeti, 1904

**Diagnosis.** First flagellomere with thorn-like, pre-apical projection.

**Biology.** Specimens of *Cervellus piranga* were reared from the papaya borer weevil *Pseudopiazurus obesus* associated with *Carica papaya* in Brazil (Penteado-Dias et al., 2007). Another species was reared from a coleopteran larva (Quicke, 1989c).

**Diversity.** Seven described species, perhaps as many undescribed.

**Distribution.** Tropical South America.

**Publications.** Fahringer (1930), provided a key to the species known at that time.

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*Figure 6. Cervellus sp.*
**Chartobracon** van Achterberg, 1983

**Diagnosis.** Body very strongly dorso-ventrally depressed, mesosoma more than 2.8 times longer than maximally high

**Biology.** *C. huggerti* van Achterberg, has been reared from *Callidium* F. (Cerambycidae) tunnels under spruce bark.

**Diversity.** Two described species, only one in the Nearctic.

**Distribution.** Known only from Canada (1 species) and northern Europe.

**Publications.** Van Achterberg (1983) erected the genus; Quicke and Sharkey (1989) described the Nearctic species.

![Figure 7. Chartobracon sp.](image)
**Coeloides** Wesmael, 1838

**Diagnosis.** Scape shorter ventrally than dorsally; flagellum uniformly dark, without white or cream colored band at midlength. Basal flagellomere expanded ventrally.

**Biology.** Parasitoids of bark-boring beetle larvae, especially Scolytidae, Curculionidae and Buprestidae. Some species are probably important in the regulation of bark beetle pests of various coniferous trees.

**Diversity.** 32 described species. 13 New World species, mostly Nearctic.

**Distribution.** Palearctic, Canada, U.S.A., and Mexico

**Publications.** Mason (1978) revised and keyed the species of U.S.A. and Canada.

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Figure 8. *Coeloides* sp.
**Compsobracon** Ashmead, 1900

**Diagnosis.** Hypopygium truncated in lateral aspect. Most are large, brightly colored with long ovipositors and have thus been collected frequently.

**Biology.** One species has been reared from Crambidae (Quicke, 1989c). Another was reared from an unidentified caterpillar boring in a thick branch of *Alibertia concolor* (Santos et al. 2004).

**Diversity.** 18 described species, perhaps twice or more that number undescribed.

**Distribution.** Southern U.S.A. (one record from Texas) to Brazil and Paraguay including Bahamas and Trinidad.

**Publications.** There is not a comprehensive revision.

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Figure 9. *Compsobracon* sp.
**Compsobraconoides** Quicke, 1989  

**Diagnosis.** Propodeum simple, entirely smooth. Second metasomal tergite flat or weakly pinched anteromedially. Scape shorter ventrally than dorsally. Middle part of face clearly demarked from lateral parts by a pair of sub-medial, longitudinal carinae running ventrally from the antennal sockets. Metasomal tergum 2 without medial, basal, posteriorly-narrowing triangular area.  

**Biology.** Yu and Quicke (1997) described a new species parasitizing adult *Azteca ulei* (Formicidae) in plant-formed domatia. The reared species described by Fortier & Nishida (2004) has been transferred to *Gozmanycomp* (q.v.).  

**Diversity.** At least 5 described species; a very variable genus as currently defined, some species have well-developed mid-longitudinal grooves on the petiole, some have claws with rounded basal lobes, some have pale-striped antennae, some have the metasoma distinctly sinuous in dorsal profile, and some have the suture between metasomal terga 2 and 3 strongly buckled medially. This likely a paraphyletic group.  

**Distribution.** Southern U.S.A. to South America including the Caribbean  

**Publications.** There is not a comprehensive treatment of the genus.
**Cyanopterus** Haliday, 1835

**Diagnosis.** Posterior halves of metasomal terga 3-5 mostly smooth, less thickly sclerotized, and relatively straight in lateral aspect, compared to *Digonogastra*. There are many species intermediate in these characters that are difficult to place. Scape less than 2.0 times longer than mid-width. Scape apico-laterally emarginate. Scape longer ventrally than dorsally.

**Biology.** Hosts include larvae of Coleoptera and Lepidoptera.

**Diversity.** Common in the Nearctic and very common in the Neotropics. Seven Nearctic and 25 Neotropical species described but many Nearctic and hundreds of Neotropical species undescribed.

**Distribution.** Widespread in the Nearctic, Neotropical, and Palearctic realms.

**Publications.** There is no comprehensive treatment of the genus in the New World.

Figure 11. **Cyanopterus** sp.
Diagnosis. Face rugose with a lot of granulate sculpture, often with a raised granulate area medially. Raised median area of petiole rather square in cross-section, lateral margin more or less carinate posteriorly.

Biology. Biology: parasitoids of Chrysomelidae (Bruchinae) and Curculionidae in palm fruit and similar situations (Quicke and Delobel, 1995; Villemant and Simbolotti, 2000).

Diversity. Eleven described species, many more undescribed.

Distribution. Neotropical, Mexico south to Brazil.

Publications. Quicke and Delobel (1995) erected the genus and included one species. Leathers et al. (2005) revised and keyed the species of the genus.

Figure 12. Cyclaulacidea sp.
**Cyclaulax** Cameron, 1911

**Diagnosis.** Length of tergum 2 about \(\frac{1}{2}\) length of tergum 3. Scape longer ventrally than dorsally. Middle part of face clearly demarked from lateral parts by a pair of sub-medial, longitudinal carinae running ventrally from the antennal sockets. Metasomal tergum 2 without medial, basal, posteriorly-narrowing triangular area.

**Biology.** Unknown.

**Diversity.** Eleven described species, we estimate about 90 undescribed.

**Distribution.** Restricted to the Neotropics, Central America south to Brazil.

**Publications.** Papp (2007a). The nine *Cyclaulax* species represented by types and deposited in the Hungarian National Museum, Budapest, as well as the type-species of the genus, *Cyclaulax grandiceps* Cameron, housed in the Natural History Museum, London, are redescribed. An identification key to ten (of 11) species is presented.

![Figure 13. Cyclaulax sp.](image)
**Digonogastra** Viereck, 1912

**Diagnosis.** Posterior halves of metasomal terga 3-5 partly sculptured, more thickly sclerotized, and relatively convex in lateral aspect, compared to Cyanopterus. There are many species intermediate in these characters that are difficult to place. Scape less than 2.0 times longer than mid-width. Scape apico-laterally emarginate. Scape longer ventrally than dorsally.

**Biology.** Hosts include larvae of Coleoptera and Lepidoptera, the latter includes pests of sugarcane and sorghum. (Wharton et al., 1989; Quicke, 1988d, 1989a).

**Diversity.** 260 described species, perhaps several thousand undescribed species.

**Distribution.** New World possibly extending into the eastern Palaearctic, and one reported from Africa, especially diverse in the Neotropics.

**Publications.** Species descriptions are scattered in many publications and there is not comprehensive revision of the genus.

**Notes.** Many species were originally included in the genus *Iphiaulax* Foerster, the latter is now redefined and restricted to the Old World (Quicke, 1988c).
**Gnathobracon** Costa, 1864

**Diagnosis.** Mandibles massive.

**Biology.** Unknown.

**Diversity.** Two described species, probably a few others undescribed.

**Distribution.** Neotropical, French Guiana, Peru.

**Publications.** Quicke and Huddleston (1991) described the second species.

Figure 15. *Gnathobracon* sp.
**Gozmanycomp** Papp, 2007

**Diagnosis.** Propodeum smooth with a distinct longitudinal carina posteromedially. Scape shorter ventrally than dorsally. Middle part of face clearly demarked from lateral parts by a pair of sub-medial, longitudinal carinae running ventrally from the antennal sockets. Metasomal tergum 2 without medial, basal, posteriorly-narrowing triangular area.

**Biology.** Fortier and Nishida (2004) described *Gozmanycomp cinnamoni* (as *Compsobraconoides cinnamoni*) reared from galls caused by larvae of the weevil, *Camptocheirus* sp. (Curculionidae), on branches of *Cinnamomum cinnamomifolium* (Lauraceae).

**Diversity.** Two described species, perhaps a dozen more undescribed.

**Distribution.** Neotropical, Costa Rica to Brazil.

**Publications.** Papp (2007b) erected and diagnosed *Gozmanycomp*.

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![Figure 16. Gozmanycomp sp.](image-url)
**Gracilibracon** Quicke, 1995

**Diagnosis.** Metasomal tergum 2 strongly 'pinched-up' antero-medially. Scape with false sub-apical margin, well-separated from the real margin, and scape basally abruptly and concavely narrowing.

**Biology.** Unknown.

**Diversity.** Three described species

**Distribution.** Neotropical.

**Publications.** Quicke (1995) erected the genus and included the three presently included species.

Figure 17. *Gracilibracon* sp.
**Habrobracon** Ashmead, 1895

**Diagnosis.** Fore wing 3RSa less than 1.5 times length of r (usually less than 1.2 times). Antenna usually with fewer than 25 flagellomeres. Scape not, or only weakly, emarginate apico-laterally. Scape shorter ventrally than dorsally.

**Biology.** Hosts include concealed larvae of a wide variety of Coleoptera, Lepidoptera, Diptera and Hymenoptera but is best known for its gregarious parasitism of flour and grain moths. *H. hebetor* has been extensively studied in the laboratory.

**Diversity.** About 35 described species, and 14 in the New World. Perhaps 2 or three times these numbers yet to be described.

**Distribution.** Cosmopolitan.


![Image of Habrobracon sp.](image-url)
Hemibracon Szépligeti, 1906

Diagnosis. Raised median area of tergum 1 semi circularly emarginate postero-laterally. Scape with false sub-apical margin, well-separated from the real margin, and scape basally abruptly and concavely narrowing.

Biology. H. rufidorsum was reared from the cerymbicid Cobelura wappesi (Murgas et al. 2018).

Diversity. 22 described species, perhaps several hundred more undescribed.


Publications. Papp (2011) provided a key to and redescribed the six species of Hemibracon described by Szépligeti.

Figure 19, Hemibracon sp.
Lapicida Quicke, 1989

**Diagnosis.** Propodeum and metanotum both with a complete lamelliform mid-longitudinal carina. Sternaulus deep and crenulate. Scape not, or only weakly, emarginate apico-laterally. Scape shorter ventrally than dorsally.

**Biology.** Associated with aquatic vegetation (*Sagittaria*).

**Diversity.** One described and one undescribed species known rarely collected because of its particular habitat.

**Distribution.** Canada through central U.S.A.

**Publications.** Quicke erected the genus in Quicke and Sharkey (1989).

Figure 20. *Lapicida aquatica.*
**Lasiophorus** Haliday, 1838

**Diagnosis.** Face with a median projection that is approximately round in cross section. Rather large specimens.

**Biology.** Unknown.

**Diversity.** Ten described species and perhaps a few dozen undescribed.

**Distribution.** Neotropical, Mexico to Brazil.

**Publications.** Fahringer (1930) provided a key and Quicke (1989a) transferred two species to *Palabracon.*

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**Figure 21. Lasiophorus sp.**
Leptobracon Szépligeti, 1901

Diagnosis. Metasomal terga 2-5 very long and slender, tergum 3 more than 2 times longer than maximally wide: posterior margins of terga 3-5 strongly emarginate and membranous medially, with extremely long internal apodemes. A long, slender wasp. Biology: unknown. Reference:

Biology. Unknown.

Diversity. Four described species, few undescribed, rarely collected.

Distribution. Neotropical.

Publications. Fahringer (1930) provided a key to species.

Figure 22. Leptobracon sp.
**Megabracon** Szépligeti, 1906

**Diagnosis.** Scape very long, more than 2.5 times longer than mid-width. Scape apico-laterally emarginate. Scape longer ventrally than dorsally. Large specimens.

**Biology.** De Santis and Esquivel (1966) reported *Megabracon* as a parasitoid of the cerambycid beetle *Mallodon spinibarbis* (as *Stenodentes spinibarbis*).

**Diversity.** Nine described species, none since 1920. Probably 2 or 3 times this number of undescribed species.

**Distribution.** Restricted to the Neotropics, Guatemala to Brazil.

**Publications.** There is not a revision of the genus.
Megacoeloides Quicke, 1989

**Diagnosis.** Scape longer ventrally than dorsally (antenna directed anteriorly); flagellum with white or cream-colored band near midlength. Basal flagellomere expanded ventrally.

**Biology.** Unknown.

**Diversity.** One described species, probably less than 10 undescribed.

**Distribution.** Neotropical, French Guiana, Peru and Colombia.

**Publications.** Quicke (1989b) erected the genus and transferred the sole species from *Bracon*.

Figure 24. *Megacoeloides* sp.
Myosoma Brullé, 1846

**Diagnosis.** Similar to Amyosoma but hind femur and tibia with long black setae. Median tergite of petiole very long and narrow, more than 2.0 times longer than maximally wide. Scape shorter ventrally than dorsally.

**Biology.** Parasitoids of lepidopterous borers, especially Pyralidae (Mason 1978).

**Diversity.** 18 described species.

**Distribution.** Widely distributed from southern U.S.A. to Brazil.

**Publications.** Mason (1978) revised the species of North America.

*Figure 25. Myosoma sp.*
**Myosomatoides** Quicke, 1994

**Diagnosis.** Hind tibia strongly laterally compressed, very broad in lateral aspect with especially long setae. Metasomal tergum 2 with a mid-longitudinal ridge.

**Biology.** One species has been reared from larvae of the stem-boring pyralid moth *Diatraea* sp. (Quicke, 1994).

**Diversity.** One described species, few others.

**Distribution.** Neotropical, widely distributed but rarely collected.


![Figure 26. *Myosomatoides* sp.](image-url)
**Palabracon** Quicke, 1988

**Diagnosis.** First flagellomere simple or occasionally apically flared. Face with large, horizontal, dorsally concave plate-like projection.

**Biology.** One species has been reared from *Diatroea* (Lepidoptera: Crambidae) (Quicke, 1988b).

**Diversity.** Three described species, probably a handful more undescribed, rarely collected.

**Distribution.** Neotropical, Mexico, Brazil, Ecuador.

**Publications.** Quicke (1988b) erected the genus and included the three known species.

Figure 27. *Palabracon* sp.
**Pheloura** van Achterberg, 1989

**Diagnosis.** Large specimens with three very long pseudo-ovipositors that are more than 5 times longer than body. True ovipositor and ovipositor sheaths are much shorter.

**Biology.** Unknown.

**Diversity.** Only one species known, rarely collected

**Distribution.** Costa Rica and Colombia.

**Publications.** Van Achterberg (1989) erected the genus and described the sole species.

Figure 28. *Pheloura* sp.
**Pigeria** van Achterberg, 1985

**Diagnosis.** Posterior part of propleuron with a longitudinal carina (ridge) sub-laterally; otherwise much like species of *Bracon*.

**Biology.** Parasitoids of a wide variety of concealed Lepidoptera larvae.

**Diversity.** Two described species, undoubtedly a few undescribed.

**Distribution.** Palaearctic; one species, *P. piger* (Wesmael), has been introduced into California and it seems highly likely that this species may also be native to North America (Quicke and Sharkey, 1989).


![Figure 29. *Pigeria* sp.](image-url)
**Sacirema** Quicke, 1995

**Diagnosis.** Face coarsely carinate-rugose medially with little or no crenulate sculpture and without a raised granulate area medially. Raised median area of petiole rounded in cross-section. Length of tergum 2 subequal to tergum 3. Scape shorter ventrally than dorsally. Middle part of face clearly demarked from lateral parts by a pair of sub-medial, longitudinal carinae running ventrally from the antennal sockets. Metasomal tergum 2 without medial, basal, posteriorly-narrowing triangular area.

**Biology.** Unknown

**Diversity.** Three described species, dozens more undescribed.

**Publications.** Papp (2007c) described a new species from the Lesser Antilles, transferred a species from *Bracon*, redescribed the type species, and provided an illustrated key to the three known species.
**Vipio** Latreille, 1804

**Diagnosis.** Some species cannot be distinguished with certainty from *Vipiomorpha* however; the key above works in more than 90% of the cases. *Vipiomorpha* always have an angular basal lobe on the claws whereas that is true only of approximately 50% of *Vipio*. *Vipiomorpha* never has a pair of long setae or small group of setae above the hypoclypeal depression, and never has an elongate labiomaxillary complex which is present in nearly all *Vipio*.

**Biology.** Parasitoids of concealed lepidopterous, coleopterous, and probably symphytan larvae.

**Diversity.** There are 11 described species in the Nearctic and 16 in the Neotropics with some species overlapping. There are probably 20 to 40 undescribed New World species.

**Distribution.** Palaeartctic, Palaeotropics (occasional), Canada to South America though less common in the southern portion of the range.

**Publications.** Inayatullah et al. (1998) revised the Nearctic species north of Mexico. Quicke et al. (submitted) revise the species from south of Nicaragua.

![Vipio sp.](image)

**Figure 31. Vipio sp.**
**Vipiomorpha** Tobias, 1962

**Diagnosis.** Propodeum coarsely sculptured. Fore wing marginal cell short, 3RSb reaching wing margin less than 0.8 times distance between apex of stigma and wing tip as in *Vipio*; fore wing (RS+ M)a straight. Scape not, or only weakly, emarginate apico-laterally. Scape shorter ventrally than dorsally.

**Biology.** Unknown

**Diversity.** Three described species, few undescribed.

**Distribution.** Widespread but rare in the Neotropical and Palearctic realms, commoner in Afrotropical region, especially southern Africa. Only one undescribed species from South America known.

**Publications.** Tobias (1962) erected the genus.

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![Figure 32. *Vipiomorpha* sp.](image)

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REFERENCES


