

**KEY TO THE SUBFAMILIES OF NORTH & CENTRAL AMERICAN ICHNEUMONIDAE:
SECTION 2**

- 11(10). Metasoma laterally compressed, segments 3 and 4 higher than wide (figs. 2.01 – 2.04), if indistinctly so **either** tarsal claws conspicuously pectinate (fig. 2.05) **or** areolet of fore wing often present and petiolate (fig. 2.06). Ovipositor almost always with dorsal subapical notch (fig. 2.07).
.....12
- 11'. Metasoma dorsoventrally depressed or cylindrical, segments 3 and 4 wider than high (figs. 2.08 – 2.11). Tarsal claws usually not pectinate. Areolet, when present, almost never petiolate (figs. 2.59, 2.60, 2.63, 2.64)). Ovipositor usually without dorsal subapical notch.
.....21
- 12(11). Areolet of fore wing absent, remaining vein apicad vein 2m-cu by more than 0.4x length of remaining vein (figs. 2.12 – 2.13).
[The areolet (cell 1-2Rs) is laterally defined by veins 2/Rs and 3rs-m, and the loss of one of these veins results in the areolet being considered absent (also the case when both veins have been lost, as in Hybrizontinae and Neorhacodinae). The identity of the remaining vein can be problematical: in the case of Ophioninae, is the remaining vein 3rs-m or has 3rs-m been lost and 2/Rs shifted apicad vein 2m-cu? 'Remaining vein' is thus used as a neutral term to describe the sole vein in the region of the areolet.]
.....13
- 12'. Areolet of fore wing present or absent, if absent then remaining vein basad, opposite, or apicad vein 2m-cu by less than 0.4x length of remaining vein (fig. 2.14).
.....15
- 13(12). Cell 3Cu of fore wing with adventitious vein originating at 2/1A, and parallel to wing margin (fig. 2.12). Ocelli usually large, with lateral ocelli close to or contiguous with eyes (fig. 2.15). Body color usually pale brownish-orange, rarely black. Ovipositor short, barely extending beyond metasomal apex (with rare exceptions) (fig. 2.16). Cell 1M+1R1 of fore wing often with area below stigma lacking setae (*fenestra*) (figs. 2.12 & 2.17) and with sclerotized inclusions (fig. 2.17). Tarsal claws usually densely pectinate (fig. 2.18).
.....**OPHIONINAE**
- 13'. Cell 3Cu of fore wing without adventitious vein, or with only short one. Ocelli not enlarged, lateral ocelli separated from eyes by at least 0.5x their diameter or greater. Otherwise not as above.
.....14
- 14(13). Transverse and longitudinal carinae of propodeum present, background sculpture smooth to granulate (fig. 2.19). Apical margin of clypeus with fringe of long parallel setae (fig. 2.20). Maxillary palpus with 4 segments, labial palpus with 3 segments. Mesopleuron usually with foveate groove (fig. 2.21). Stigma of fore wing enlarged (figs. 2.13).
.....**TERSILOCHINAE** (some)
- 14'. Propodeum with coarse reticulate sculpture, without discernable areas (fig. 2.22). Apical margin of clypeus without fringe of setae. Otherwise not as above.
.....**ANOMALONINAE** (Anomalonini and *Ophiopterus*)
- 15(12). Propodeum with coarse reticulate sculpture, without discernable areas (fig. 2.23). Head in dorsal view with lateral ocelli separated from occipital carina by less than their largest diameter **and** occipital carina approximately level with ocelli (fig. 2.24). Metasoma laterally compressed and almost flattened in dorsal view (fig. 2.04).
.....**ANOMALONINAE** (Gravenhorstiini)

- 15'. Propodeum with regular carinal pattern, or at least with transverse carinae, on smooth/granulate/rugosopunctate surface (fig. 2.25). Head in dorsal view with lateral ocelli usually separated from occipital carina by more than their largest diameter **and/or** occipital carina below level of ocelli (fig. 2.26). Metasoma laterally compressed but rarely almost flattened (figs. 2.02 – 2.03).
.....16
- 16(15). Propodeal region elongate, distance between metanotal posterior margin and propodeal spiracle is equal to length of scutellum; metapostnotum with two prominent triangles, apex of each triangle directed towards propodeal spiracle (fig. 2.27). Fore wing with vein 1cu-a distad vein Rs&M by $\geq 0.5x$ its own length **and** areolet large and pentagonal (fig. 2.28).
..... **NESOMESOCHORINAE** (*Nonnus*)
- 16'. Propodeal area not as figured, with distance between metanotal posterior margin and propodeal spiracle about 0.5x length of scutellum; metapostnotum with triangles very small or absent. Fore wing with vein 1cu-a varying from opposite vein Rs&M to distad by about 0.3x its own length **or** if more distad, **then** areolet variable not large and pentagonal.
.....17
- 17(16). Maxillary palpus long, reaching ventral posterior corner of mesopleuron (fig. 2.29). Metasomal apex of female as figured: hypopygium large, ovipositor sheaths short and elliptical, general appearance compact and pointed (fig. 2.30).
.....**OXYTORINAE** (part)
- 17'. Maxillary palpus shorter, not reaching ventral posterior corner of mesopleuron. Metasomal apex of female not as above: ovipositor sheaths long or short but adhering closely to ovipositor, general appearance as in figs. 2.31 – 2.32.
.....18
- 18(17). Ventral posterior corner of propleuron strongly produced as more or less angulate lobe touching or overlapping pronotum (figs. 2.33 – 2.34). Mesothorax ventrally with posterior transverse carina complete (fig. 2.35), **or** if interrupted before middle coxae (fig. 2.36) **then** clypeus not separated from supraclypeal area by distinct groove (fig. 2.37).
.....19
- 18'. Ventral posterior corner of propleuron not developed as distinct lobe, not angulate, at most with weak groove delimiting it from main area of propleuron (figs. 2.38-2.39). Mesothorax ventrally without posterior transverse carina (fig. 2.40) **or**, if present, carina interrupted before middle coxae (as in fig. 2.36). Clypeus separated from supraclypeal area by groove (fig. 2.41).
.....20
- 19(18). Middle and hind legs with tibial spurs separated from tarsomere 1 by sclerotized bridge, tibial apex thus with two membranous insertions (fig. 2.42a). Clypeus separated from supraclypeal area by groove (figs. 2.34 & 2.43). Supraclypeal area usually with pale (yellowish-white to brownish-red) markings. Stigma of fore wing often short and broadly triangular (fig. 2.44).
.....**CREMASTINAE**
- 19'. Middle and hind legs with tibial spurs not separated from tarsomere 1 by sclerotized bridge, tibial apex thus with one membranous insertion (fig. 2.42b). Clypeus weakly or not separated from supraclypeal area (figs. 2.33 & 2.45). Supraclypeal area usually completely black. Stigma of fore wing elongate (fig. 2.46).
.....**CAMPOPLEGINAE** (most)

- 20(18). Apical margin of clypeus with fringe of long parallel setae (figs. 2.41 & 2.47). Areolet of fore wing absent (fig. 2.14c). Vein M+Cu of hind wing with basal 0.6 nebulous or absent, and vein 2/Cu absent (fig. 2.14c). Mesopleuron usually with foveate groove (figs. 2.21 & 2.48). Ovipositor with dorsal subapical notch (as in fig. 2.7). Maxillary palpus with 4 segments, labial palpus with 3 segments.
.....**TERSILOCHINAE** (most)
- 20'. Apical margin of clypeus without fringe of long parallel setae. Areolet of fore wing usually present. Vein M+Cu of hind wing tubular and complete, vein 2/Cu present at least as spectral vein (as in fig. 2.61). Mesopleuron without foveate groove although sternaulus present. Ovipositor without dorsal subapical notch. Maxillary palpus with 5 segments, labial palpus with 4 segments.
.....**CRYPTINAE** (a few Phygadeuontini)
[See the discussion of 'sternaulus' on the GIN morphology page (www.amentinst.org/GIN/morphology.php) regarding differentiation of the sternaulus from the foveate groove]
- 21(11). Apex of middle tibia with one spur.
.....22
- 21'. Apex of middle tibia with two spurs.
.....23
- 22(21). Apical margin of clypeus with large median tooth (fig. 2.49). Vein r-rs of fore wing originating from base of stigma (fig. 2.50a).
.....**TRYPHONINAE** (*Sphinctus*)
- 22'. Apical margin of clypeus without tooth. Vein r-rs of fore wing originating from middle of stigma (fig. 2.50b).
.....**METOPINIINAE** (*Periope*)
- 23(21). Clypeus not separated from supraclypeal area by distinct groove (figs. 2.33 & 2.45) **and/or** areolet of fore wing petiolate (fig. 2.06).
.....**CAMPOPLEGINAE** (a few)
- 23'. Clypeus separated from supraclypeal area by groove (as in figs. 2.47, 2.52, & 2.77) **or** areolet of fore wing present or absent, not petiolate when present (as in figs. 2.59 & 2.61).
.....24
- 24(23). Eyes of females often with inner margins strongly convergent ventrally (figs. 2.51 – 2.52). Clypeus small, often strongly convex (figs. 2.52 – 2.53). Length of malar space usually equal to or greater than mandibular width at base, usually with distinct subocular groove (figs. 2.51 & 2.53). Mandibles small and delicate, often thin and blade-like (fig. 2.51). Head in anterior view noticeably tapering ventrally, eyes prominent. Small, delicate specimens. Areolet of fore wing sometimes petiolate.
.....**ORTHOCENTRINAE** (a few)
- 24'. Eyes with inner margins not convergent ventrally; other head characters otherwise not as above. Areolet of fore wing sessile or sometimes absent.
.....25
- 25(24). Clypeus large, apical margin with fringe of long parallel setae (NOT to be confused with labral margin) (fig. 2.54) **and/or**: Ventral valve of ovipositor with median membranous region (fig. 2.55). Mesoscutum with notauli long and sharply defined, usually reaching or surpassing center of mesoscutum (fig. 2.56).
.....**TRYPHONINAE** (some Oedemopsini)
- 25'. Clypeus without fringe of setae **and** ovipositor without membranous areas. Mesoscutum with notauli often short and absent, usually not sharply defined and reaching center of mesoscutum.
.....26

- 26(25). Maxillary palpus long, reaching ventral posterior corner of mesopleuron (fig. 2.29). Metasomal apex of female as figured: hypopygium large, ovipositor sheaths short and elliptical, general appearance compact and pointed (fig. 2.30).
.....**OXYTORINAE** (part)
- 26'. Maxillary palpus shorter, not reaching ventral posterior corner of mesopleuron. Metasomal apex of female not as above: ovipositor sheaths long or short but adhering closely to ovipositor, general appearance as in figs. 2.31 – 2.32.
.....27
- 27(26). Female hypopygium large and conspicuous in lateral view (fig. 2.57). Ovipositor with dorsal subapical notch, ventral valve without apical teeth (as in fig. 2.7). Propodeum lacking anterior transverse carina, and with area posterad posterior transverse carina with irregular longitudinal rugae (fig. 2.58).
.....**BANCHINAE** (*Lissocaulus*)
- 27'. Female hypopygium inconspicuous in lateral view. Ovipositor without dorsal subapical notch, ventral valve sometimes with apical teeth. Propodeal carinae variable but at least with anterior **and** posterior transverse carinae present.
.....28
- 28(27). Sternaulus of mesopleuron absent or short, $\leq 0.5x$ as long as mesopleuron (as measured from epicnemial carina to posterior mesopleural margin) (figs. 2.59 – 2.62).
.....29
- 28'. Sternaulus of mesopleuron > 0.5 times as long as mesopleuron (as measured from epicnemial carina to posterior mesopleural margin), usually reaching middle coxa (figs. 2.63 - 2.65).
.....31
- 29(28). Vein 1cu-a of fore wing distad vein Rs&M by 0.5-1.0x its own length (fig. 2.66). Mesosoma in lateral view short and high, metapleuron $\geq 2.0x$ as high as long (measured at midpoint) (fig. 2.66). Hind wing with vein 2/Cu spectral, cell R deep, and vein 1/Rs shorter than vein 1rs-m (fig. 2.66). Dorsal tooth of mandible wider than ventral tooth, more or less distinctly divided by weak notch or impression, mandible thus apparently 3-toothed (fig. 2.67).
.....**BRACHYCYRTINAE**
- 29'. Vein 1cu-a of fore wing sub-opposite base of vein Rs&M (fig. 2.64), or distad to it by $< 0.5x$ its own length (figs. 2.61 & 2.63). Mesosoma in lateral view more elongate (cf. figs. 2.59 – 2.65), metapleuron about as high as long. Hind wing with vein 2/Cu usually pigmented (tubular or nebulous), rarely spectral or absent, and vein 1/Rs as long as or longer than vein 1rs-m (as in fig. 2.63). Dorsal tooth of mandible never subdivided.
.....30
- 30(29). Ovipositor short, barely extending beyond metasomal apex (except for *Crypteffigies* and *Rhabdotus*); sheaths rigid (figs. 2.59 - 2.60). Clypeus often flattened and with clypeal groove absent, apical margin widely truncate or subtruncate and not or only weakly/narrowly impressed (figs. 2.68 - 2.71). Tergite 2 with thyridia usually well developed and with gastrocoeli (figs. 2.72 - 2.75). Areolet of fore wing present (except for *Epitomus* and *Lusius*). Vein M+Cu of hind wing with apical 0.5 almost always straight (fig. 2.59 – 2.60).
.....**ICHNEUMONINAE**

30'. Ovipositor usually extending conspicuously behind metasomal apex by $\geq 0.5x$ length of hind tibia, sheaths flexible (figs. 2.63 – 2.65). Clypeus various, usually moderately to strongly convex and with apical margin usually convex and impressed, apical margin sometimes with median denticles (figs. 2.76 – 2.78). Tergite 2 with thyridia usually small or absent, gastrocoeli absent (figs. 2.79 – 2.80). Areolet of fore wing present or absent. Vein M+Cu of hind wing often strongly arched (figs. 2.62 & 2.65).

*[The cryptine genera **Hidryta**, **Idiolispa**, and **Trychosis** have some species with relatively short ovipositors ($\approx 0.3x$ length of hind tibia) and short sternauli. These have the clypeus small and convex (as in figs. 2.76 & 2.78) and the propodeal carinae reduced to only the anterior and posterior transverse carinae (as in fig. 2.81)]*

.....**CRYPTINAE** (some)

31(28). Anterior margin of propodeum with median denticle (fig. 2.82a). Clypeus wide and with apical margin weakly convex and not impressed (fig. 2.82b). Ovipositor short and barely projecting beyond metasomal apex (as in figs. 2.59 - 2.60), sheath rigid.

.....**ICHNEUMONINAE** (some *Dicaelotus*)

31'. Anterior margin of propodeum without median denticle. Clypeus various, usually moderately to strongly convex and with apical margin usually convex and impressed (figs. 2.76 – 2.78). Ovipositor usually extending conspicuously behind metasomal apex by more than $0.5x$ length of hind tibia, sheath flexible (figs. 2.63 – 2.65).

.....**CRYPTINAE** (most)

Figures

The American Entomological Institute photograph voucher code for an individual specimen follows the species name. For example, '0137-03' is the third photograph taken of voucher specimen 137. All specimens are in the American Entomological Institute collection unless otherwise noted. Line drawings are from *Memoirs of the American Entomological Institute* 11, 12, 13, and 17 unless otherwise noted.

- Fig. 2.01 - *Sinophorus eruficinctus* 0896-03
Fig. 2.02 - *Sinophorus eruficinctus* 0896-02
Fig. 2.03 - *Venturia micraulax* 0897-01
Fig. 2.04 - *Gravenhorstia macilenta* 0913-01
Fig. 2.05 - *Dusona* sp. 0914-01
Fig. 2.06 - *Casinaria tenuiventris*
Fig. 2.07 - *Dusona* sp. 0915-01
Fig. 2.08 - *Diapetimorpha macula* 0898-01
Fig. 2.09 - *Barichneumon neosorex* 0900-01
Fig. 2.10 - *Ischnus cinctipes* 0899-01
Fig. 2.11 - *Oxytorus antennatus* 0916-01
Fig. 2.12 - *Enicospilus texanus* 0041-02
Fig. 2.13 - *Phradis brevis*
Fig. 2.14a - *Prochas theclae*
Fig. 2.14b - *Neleothymus attenuatus*
Fig. 2.14c - *Allophrys oculus*
Fig. 2.15 - *Enicospilus americanus* 0917-01
Fig. 2.16 - *Ophion idoneus* 0022-01
Fig. 2.17 - *Enicospilus purgatus* 0040-04
Fig. 2.18 - *Enicospilus americanus* 0917-02
Fig. 2.19 - *Phradis brevis* 4-42
Fig. 2.20 - *Phradis nitidus* 0918-01
Fig. 2.21 - *Phradis nitidus* 0919-01
Fig. 2.22 - *Anomalon ejuncidium* 0920-01
Fig. 2.23 - *Therion morio* 0921-01
Fig. 2.24 - *Gravenhorstia macilenta* 0913-02
Fig. 2.25 - *Venturia catarinensis* 1052-01
Fig. 2.26 - *Sinophorus* sp. 2 0922-01
Fig. 2.27 - *Nonnus* sp. 1053-01
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Fig. 2.29 - *Oxytorus antennatus* 0923-01
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Fig. 2.33 - *Venturia sakanakiakorum* 0904-01
Fig. 2.34 - *Xiphosomella dubia* 0905-01
Fig. 2.35 - *Hyposoter* sp. 2 0014-05
Fig. 2.36 - *Meloboris* sp. 0924-01
Fig. 2.37 - *Meloboris* sp. 0924-02
Fig. 2.39 - *Allophrys* sp. 0906-01
Fig. 2.39 - *Probles* sp. 1 0907-01
Fig. 2.40 - *Probles* sp. 0925-01
Fig. 2.41 - *Probles* sp. 0925-02
Fig. 2.42a - Hind tibial apex of a cremastine (redrawn from Hanson & Gauld, 1995)
Fig. 2.42b - Hind tibial apex of a campoplegine (redrawn from Hanson & Gauld, 1995)
Fig. 2.43 - *Trathala* sp. 4 0908-01
Fig. 2.44 - *Temelucha cookii*
Fig. 2.45 - *Hyposoter* sp. 2 0014-01
Fig. 2.46 - *Tranosema arenicola*
Fig. 2.47 - *Stethantyx nearctica* 0007-01
Fig. 2.48 - *Stethantyx nearctica* 0007-02
Fig. 2.49 - *Sphinctus serotinus*
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Fig. 2.57 - *Lissocaulus maceratus* 0931-01
Fig. 2.58 - *Lissocaulus maceratus*
Fig. 2.59 - *Coelichneumon comitator*
Fig. 2.60 - *Dirophanes hebe*
Fig. 2.61 - *Glyphicnemis profligator*
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Fig. 2.63 - *Phygadeuon* sp.
Fig. 2.64 - *Cubocephalus distinctor*
Fig. 2.65 - *Lymeon orbis*
Fig. 2.66 - *Brachycyrtus ornatus*
Fig. 2.67 - *Brachycyrtus ornatus* 0107-02
Fig. 2.68 - *Cratichneumon pseudanisotae* 0909-02
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Fig. 2.76 - *Mesostenus thoracicus* 0935-01
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Fig. 2.78 - *Diapetimorpha macula* 0898-02
Fig. 2.79 - *Lanugo retentor* 0937-01
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Fig. 2.82a - *Dicaelotus clypeator*
Fig. 2.82b - *Dicaelotus clypeator*

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