Illustrated key to the subfamilies of the Braconidae (Hymenoptera: Ichneumonoidea)

C. van Achterberg

Achterberg, C. van. Illustrated key to the subfamilies of the Braconidae (Hymenoptera: Ichneumonoidea).

Zool. Verh. Leiden 283, 30.x.1993: 1-189, figs 1-66, photos 1-140, plates 1-102.— ISSN 0024-1652/ISBN 90-73239-15-X.

Key words: Braconidae; subfamilies; key; distribution; biology; Afrotropical; Australian; Nearctic; Neotropical; Oriental; Palaearctic.

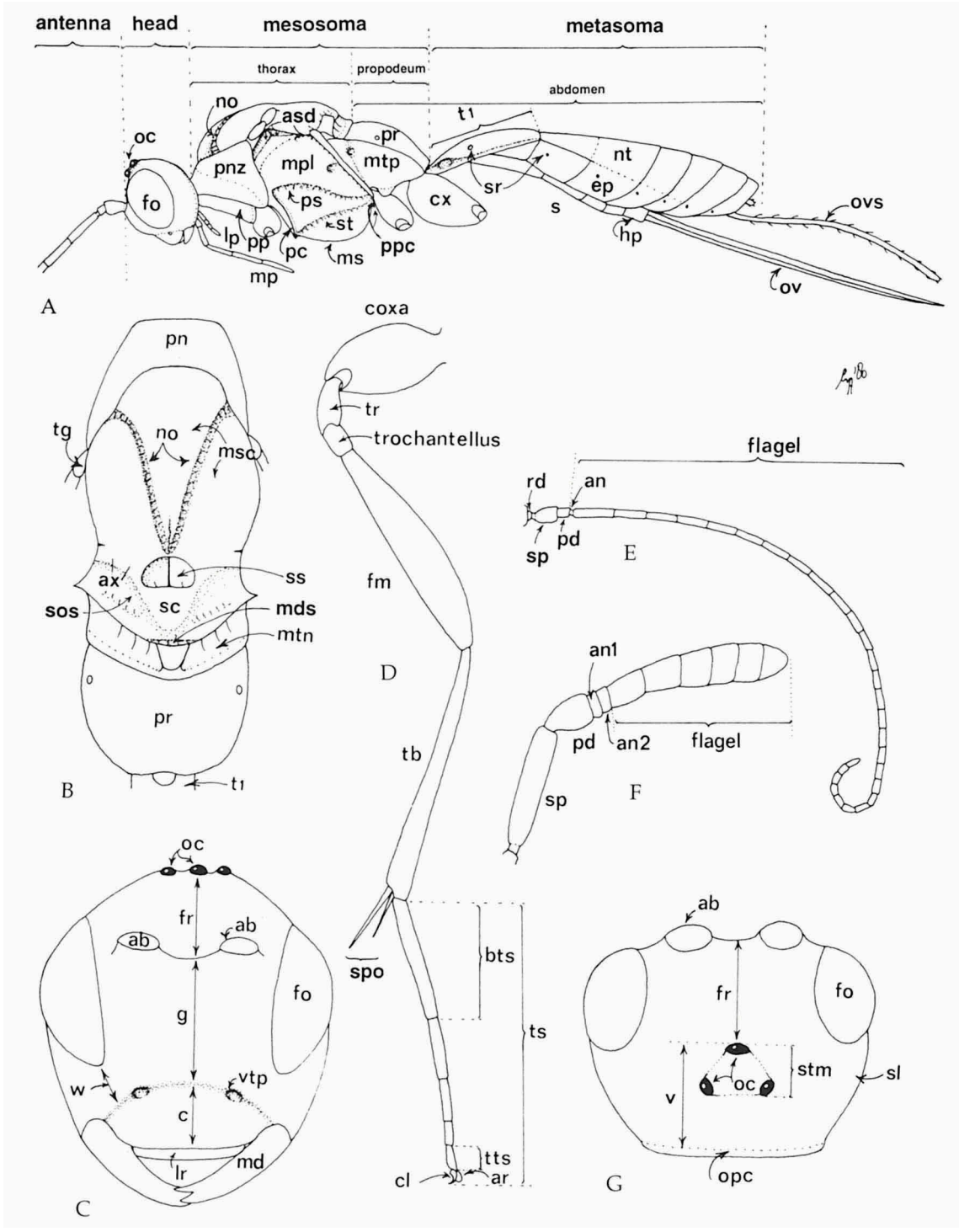
An illustrated key to the 43 subfamilies of the family Braconidae (Hymenoptera: Ichneumonoidea) is given.

C. van Achterberg, Nationaal Natuurhistorisch Museum, Postbus 9517, 2300 RA Leiden, The Netherlands.

Introduction

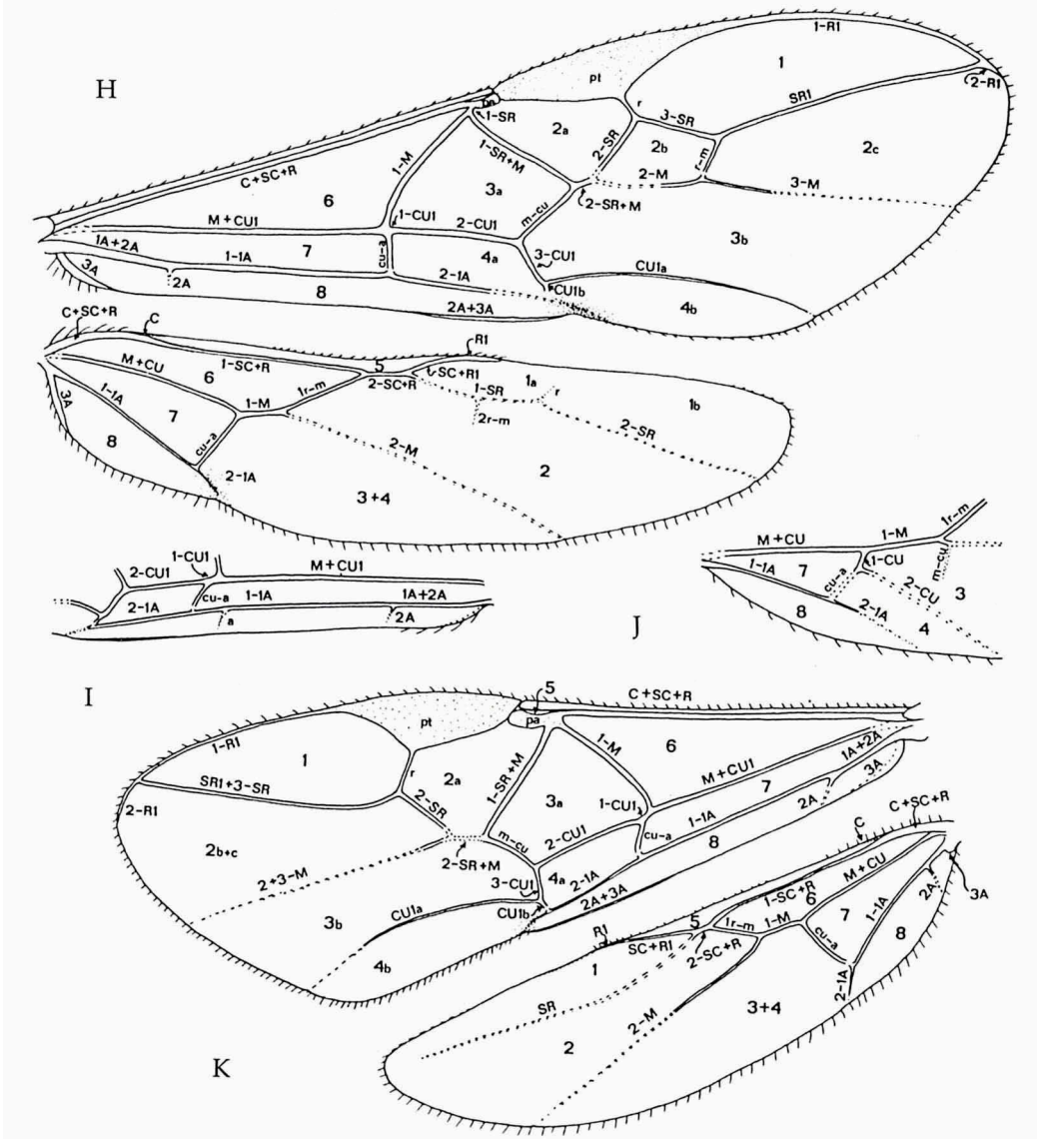
Since the publication of the last complete key to the subfamilies of the Braconidae (Hymenoptera: Ichneumonoidea) in 1976 by van Achterberg several papers on the phylogeny of the Braconidae have been published (e.g., Edson & Vinson, 1979; van Achterberg, 1984 & 1988a; Maetô, 1987; Quicke & van Achterberg, 1990). As a result several changes of the number of recognised subfamilies has taken place and the need for an updated key to the subfamilies of the Braconidae is obvious. A key to the subfamilies of the Braconidae from the Holarctic region was published recently (van Achterberg, 1990), which I decided to extend for this paper. A set of drawings of a member for every subfamily and tribe is added to facilitate recognition if no reference collection is present. To facilitate the use of the key I have asterisked the couplets which can be safely ignored for 99% of the specimens in ordinary samples. Specimens problematical to identify to subfamily with this key can be sent to the author for confirmation.

Only the first character of the couplet of the key needs to be consulted if it is clear and this should be decisive. If in bold "**and**" is added, then the first two characters should be used in combination. The additional characters should be used only for confirmation. If the first character is not easily to discover, proceed to the second character. The identification of wingless specimens may be problematical, but nearly all can be identified with this key by skipping the wing characters of the couplet and using the others. Most collected wingless Braconidae belong to the subfamilies Alysiinae, Betylobraconinae, Rhyssalinae and Doryctinae, groups that will key out early in the key. In this paper the Hormiini and Pambolinae are treated as a separate subfamilies because they are well separable groups by anatomical differences (Quicke, in litt.) and to a lesser degree by external differences of the adults and they seem not to be that closely related to the Exothecinae and Rhyssalinae, respectively, wherein they were included by Quicke & van Achterberg (1990). For a concise overview of the biology of Braconidae, see Shaw & Huddleston (1991). For the morphological terms used in this paper, see the figures A-K at the beginning of this key. If e.g. the third tergite is mentioned, it refers to the third metasomal tergite.



Figs A-G, morphology of Hymenoptera. A, body, lateral aspect; B, mesosoma, dorsal aspect; C, head, frontal aspect; D, leg; E, F, antenna, Ichneumonoid and Chalcidoid type, respectively; G, head, dorsal aspect. Legenda: ab= base of antenna; an= anellus (1, 2= first and second, respectively); ar= arolium; asd= anterior subalar depression; ax= axilla; bts= basitarsus; c= clypeus; cl= tarsal claw; cx= coxa; ep= epipleuron (or latero-tergite); flagel= flagellum; fm= femur; fo=eye; fr= frons; g= face; hp= hypopygium;

lp= labial palp; lr= labrum; md= mandible; mds= medio-posterior depression of scutellum; mp= maxillary palp; mpl= mesopleuron; ms= mesosternum; msc= mesoscutum; mtn= metanotum; mtp= metapleuron; nt= notum; no= notauli; oc= ocelli; ov= ovipositor; ovs= ovipositor sheath; opc= occipital carina; pc= prepectal carina; pd= pedicellus; pn= pronotum; pnz= side of pronotum; pp= propleuron; ppc= postpectal carina; pr= propodeum; ps= precoxal sulcus; rd= radix; s= sternite; sc= scutellum; sl= temple; sos= side of scutellum; sp= scapus; spo= spurs; sr= spiracle; ss= scutellar sulcus; st= sternaulus; stm= stemmaticum; t= tergite (t1= first tergite); tb= tibia; tg= tegula; th= thorax; tr= trochanter; ts= tarsus; tts= telotarsus; v= vertex; vtp= anterior tentorial pit; w= malar space.

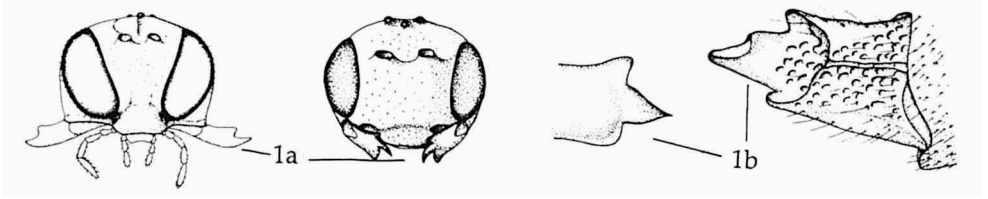


Figs H-K, terminology of wing venation according to the modified Comstock-Needham system (Eady, 1974; van Achterberg, 1979). A= analis; C= costa; CU= cubitus; M= media; R= radius; SC= subcosta; SR= sectio radii (or RS of "radial sector"); a= transverse anal vein; cu-a= transverse cubito-anal vein; m-cu= transverse medio-cubital vein; r= transverse radial vein; r-m= transverse radio-medial vein; pa= parastigma; pt= pterostigma. Cells: 1= marginal cell; 2= submarginal cell; 3= discal cell; 4= subdiscal cell; 5= costal cell; 6= basal cell; 7= subbasal cell; 8= plical cell or (if protruding) lobe; a, b, and c indicate first, second and third cell, respectively.

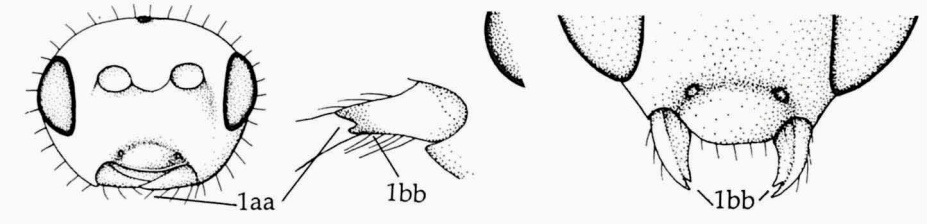
Key to subfamilies of Braconidae

1. Mandibles straight or curved outwards, their tips not touching when closed (fig. 1a), and with 3 or 4 (exceptional 2 teeth or lobes; fig. 1b: "exodont braconids") .... **Alysiinae**

Very large cosmopolitan subfamily of endoparasites of cyclorrhaphous Diptera. Very frequently collected. The only other known subfamily of Braconidae containing true exodont species is the Ichneutinae (the genus *Anaprixia* Mason, 1991 from SE U.S.A.). It can be recognized by the typically curved vein 1-M of fore wing (fig. 49a), which is straight among Alysiinae and first and second metasomal tergites have no spiracles.

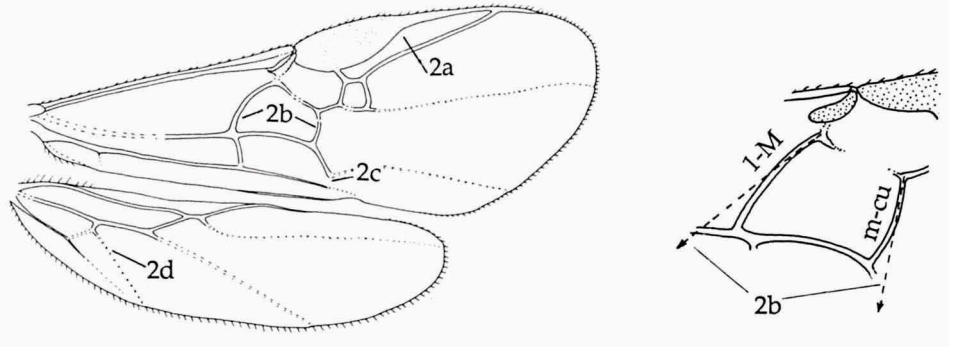


- Mandibles curved inwards, their tips touching when closed (fig. 1aa), and with 1 or 2 teeth (fig. 1bb), if very exceptionally mandibles are bent outwards then still touching each other when closed 2

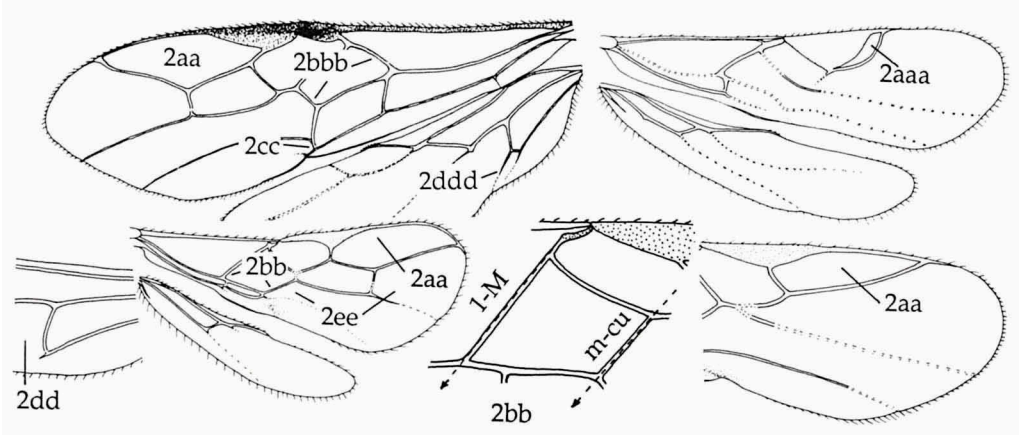


2. Marginal cell of fore wing extremely narrow and rather long (fig. 2a); vein m-cu of fore wing more or less diverging posteriorly, from direction of anterior half of vein 1-M (fig. 2b); vein CU1b of fore wing (fig. 2c) absent; trace of vein 2-CU of hind wing nearly always present and nearly always situated at or above level of vein cu-a (fig. 2d); (no wingless or brachypterous specimens are known) ..... **Agathidinae**

Large cosmopolitan subfamily of endoparasites of larvae of Lepidoptera. Rather frequently collected. The subfamily contains two well separable tribes, the Agathidini with fore tarsal claws simple or with medial lobe, and the Vipionini with the fore claws with subapical tooth (= claws bifurcated). If the International Commission for Zoological Nomenclature restrict the use of the name *Vipio* to a group of Braconinae, then the tribe Vipionini Gahan, 1917 has to be renamed.

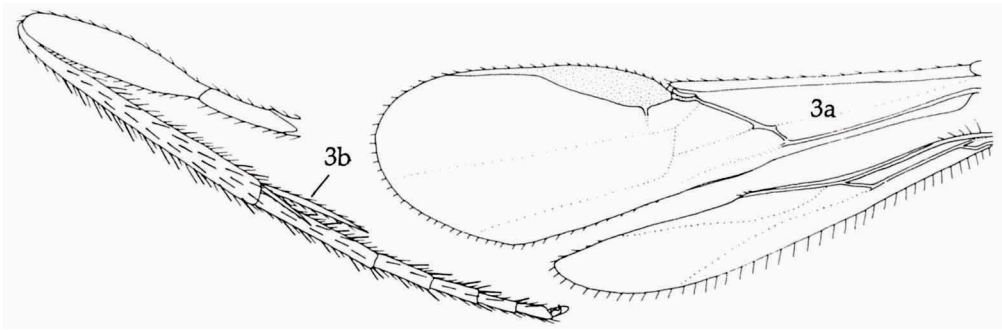


- Marginal cell of fore wing of different shape, wider (fig. 2aa), or comparatively short (fig. 2aaa); vein m-cu of fore wing (if present) converging posteriorly or parallel to vein 1-M (fig. 2bb), if diverging posteriorly (fig. 2bbb), then vein CU1b of fore wing (fig. 2cc) present; vein 2-CU of hind wing nearly always absent (fig. 2dd), or vein 2-CU near level of vein 2A, far below middle of vein cu-a (fig. 2ddd), exceptionally medially situated; (wingless or brachypterous specimens belong here) 3

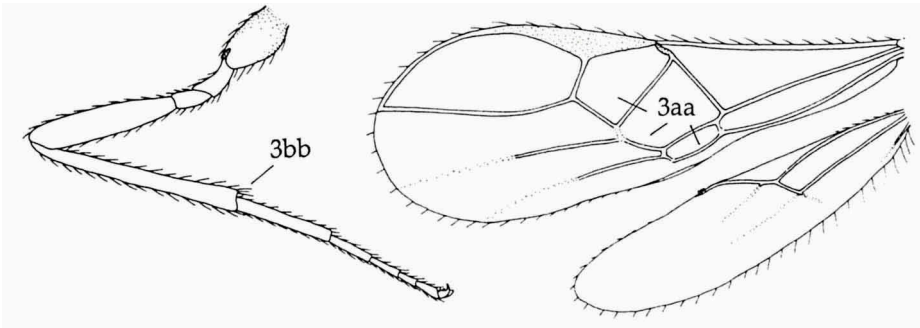


*3. Fore wing with only one or two closed cells (fig. 3a) **and** hind tibial spurs conspicuous and usually very long (fig. 3b); (no wingless or brachypterous specimens are known) ..... **Agathidinae-Agathidini-Mesocoelina**

Small circumtropical subtribe of endoparasites of larvae of Lepidoptera. Rarely collected.

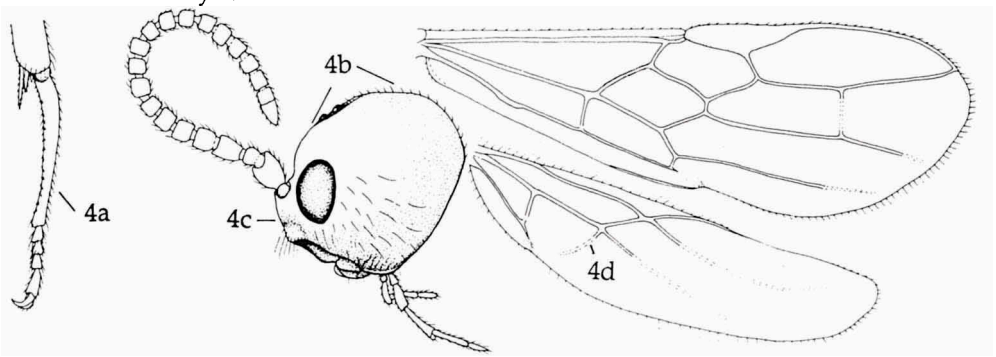


- Fore wing with at least three closed cells (fig. 3aa), **if** fewer than three then hind tibial spurs inconspicuous (fig. 3bb), or wings absent or reduced 4

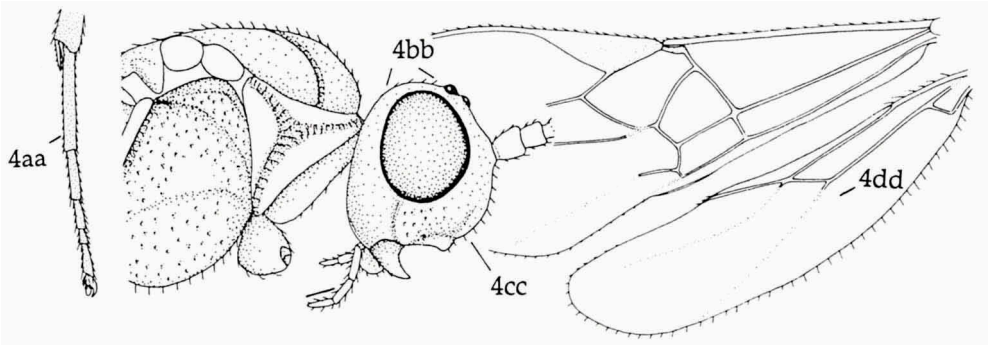


4. Hind basitarsus about twice as long as combined length of following segments of tarsus (fig. 4a); head nearly prognathous (fig. 4b); face short (fig. 4c); vein m-cu of hind wing rather curved inwards (fig. 4d) ..... **Histeromerinae**

Small Holarctic and Indo-Australian subfamily of (?ecto)parasites of larval Coleoptera in wood. Rarely collected.

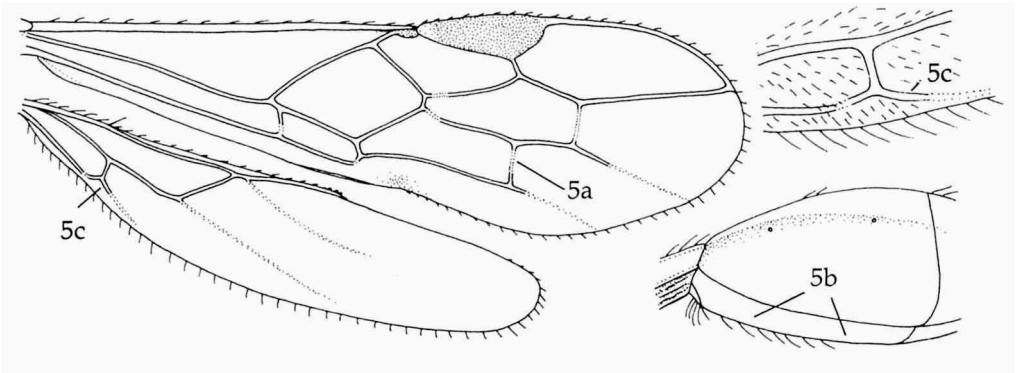


- Hind basitarsus shorter than combined length of following segments (fig. 4aa); head normal (fig. 4bb); face medium-sized to long (fig. 4cc), very exceptionally short; vein m-cu of hind wing absent (fig. 4dd) or straight when present, exceptionally curved basad (e.g. Rogadini-Yeliconini, figs 16a-c) 5

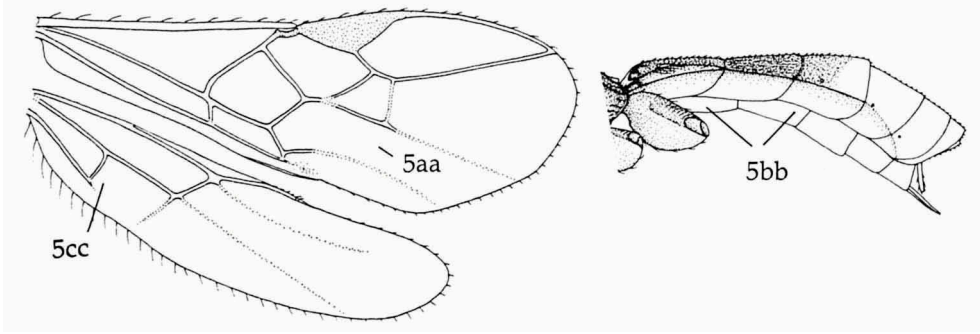


*5. Vein 2m-cu of fore wing present (fig. 5a) **and** second and third metasomal sternites united and evenly sclerotized (fig. 5b); vein 2-CU of hind wing present (fig. 5c); (no wingless or brachypterous specimens are known) ..... **Apozyginae**

Small Neotropical subfamily (known only from Chile); rarely collected. The biology is unknown. Note. Exceptionally Doryctinae may have vein 2m-cu of fore wing present but vein 2-CU of hind wing is absent.

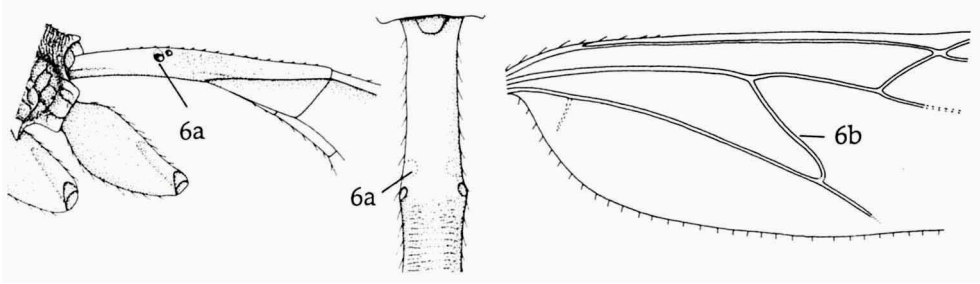


- Vein 2m-cu of fore wing absent (fig. 5aa); second and third metasomal sternites separated and weakly sclerotized (fig. 5bb); vein 2-CU of hind wing usually absent (fig. 5cc), or wingless or brachypterous 6



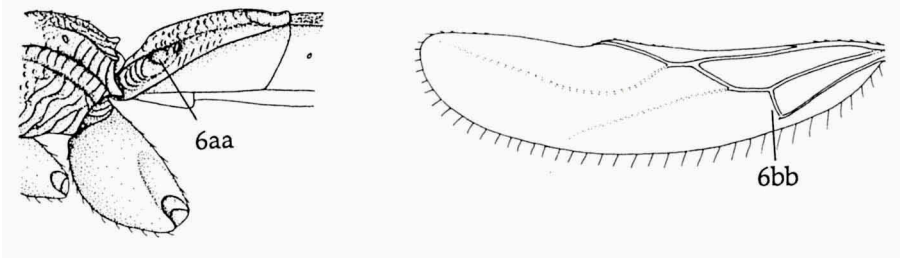
*6. Laterope round, deep and far removed from base of first metasomal tergite (fig. 6a); vein cu-a of hind wing very long and strongly reclivous (fig. 6b) ..... **Xiphozelinae**

Small Indo-Australian and East Palaearctic subfamily, containing endoparasites of larval Lepidoptera. Rarely collected and mostly at light.

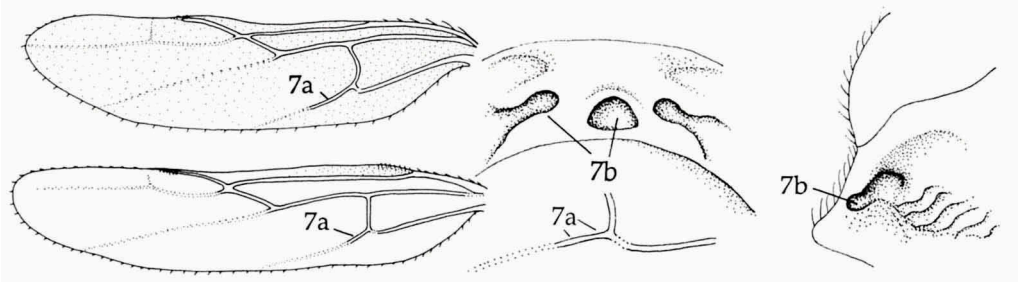


- Laterope more or less elliptical and nearly always subbasally situated at first tergite (fig. 6aa) **or** laterope absent; vein cu-a of hind wing usually straight and medium-sized (fig. 6bb) 7

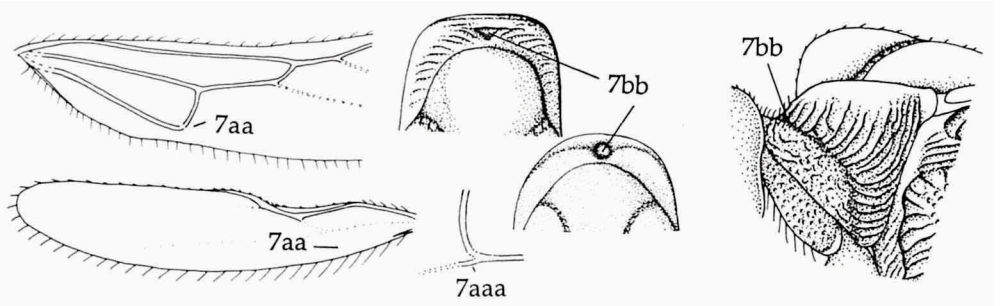
Note. Some Euphorinae may have the laterope far from the base of the tergite, but these species have vein cu-a of hind wing straight and medium-sized.



7. Vein 2-CU of hind wing sclerotized (tubular) and situated above bulla (fig. 7a); pronotum usually with large dorsal pronope and pair of lateral pronope antero-laterally (fig. 7b); (no wingless or brachypterous specimens are known) 8

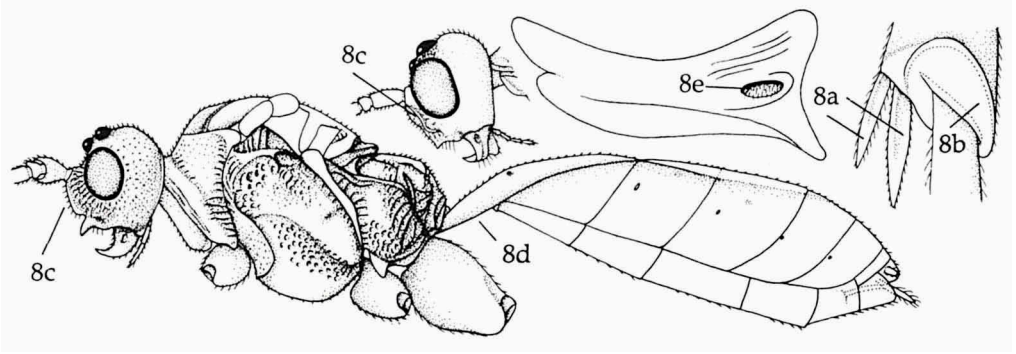


- Vein 2-CU of hind wing absent, at most with a fold (fig. 7aa), no tubular vein above bulla, but below it a short vein may be present (fig. 7aaa); pronotum usually without dorsal pronope, dorsal pronope small, or pair of lateral pronope antero-laterally absent (fig. 7bb), or wingless/brachypterous 12

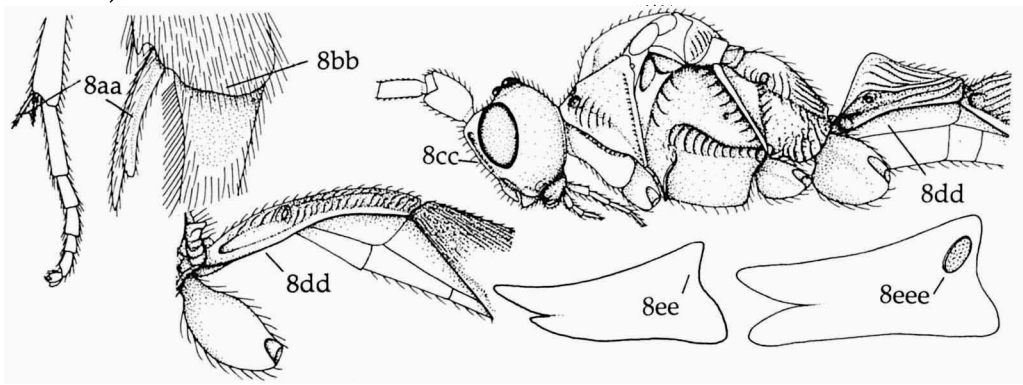


*8. Hind spurs flattened, lamelliform (fig. 8a); apex of hind tibia with peculiar flattened area ventrally (fig. 8b); face with small spoon-like protuberance (fig. 8c); basal half of first metasomal tergite cylindrical and closed (fig. 8d); mandibular sensillar plate present and situated in a depression (fig. 8e) ..... **Trachypetinae-Cercobarconini**

Small Australian tribe of large yellowish and nocturnal Braconidae. The biology is unknown; rarely collected.

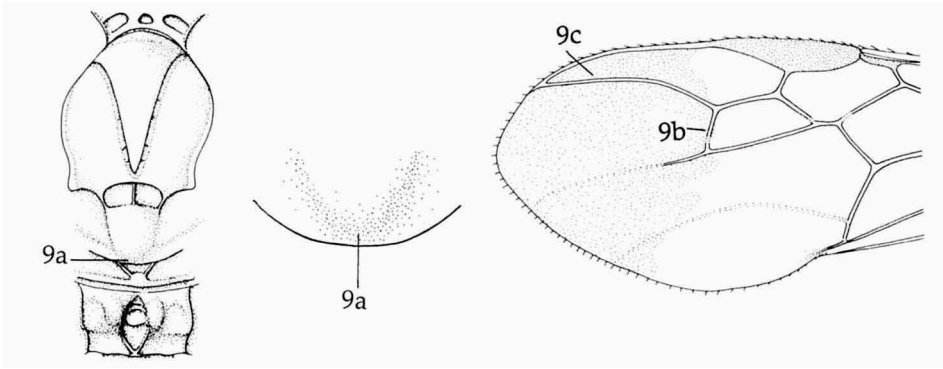


- Hind spurs cylindrical (fig. 8aa); apex of hind tibia normal, cylindrical and setose, without flattened area ventrally (fig. 8bb); face without protuberance (fig. 8cc); basal half of first metasomal tergite open ventrally (fig. 8dd); mandibular sensillar plate absent (fig. 8ee), **or** if present then not situated in a depression (fig. 8eee) 9

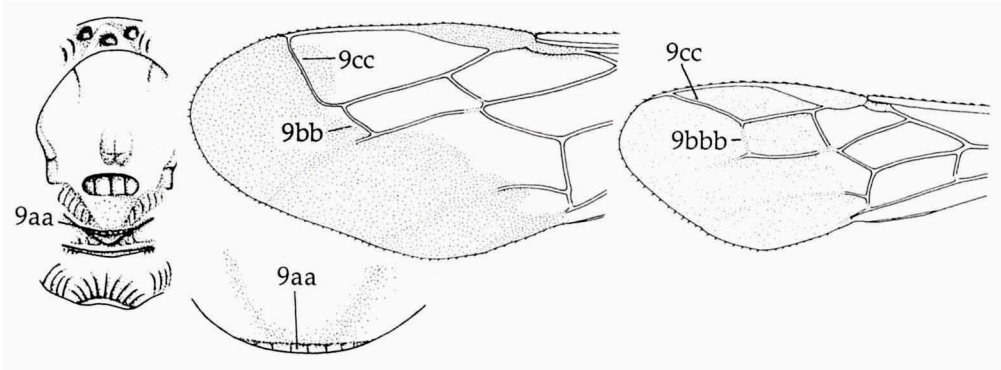


*9. Scutellum without medio-posterior depression (fig. 9a); vein r-m of fore wing inclivous (fig. 9b); vein SR1 of fore wing long (fig. 9c) ..... **Pselaphaninae**

Small Neotropical subfamily. The biology is unknown; rarely collected.

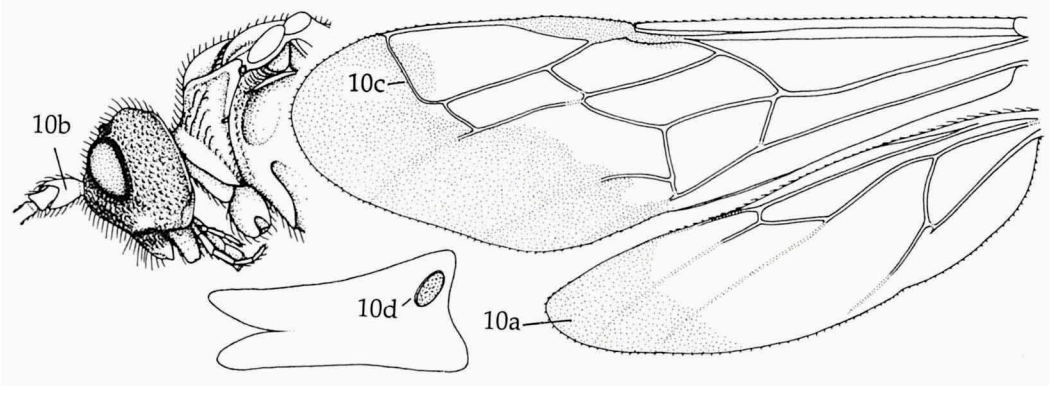


- Scutellum with medio-posterior depression (fig. 9aa); vein r-m of fore wing reclivous (fig. 9bb) or vertical (fig. 9bbb); vein SR1 of fore wing short (fig. 9cc) 10

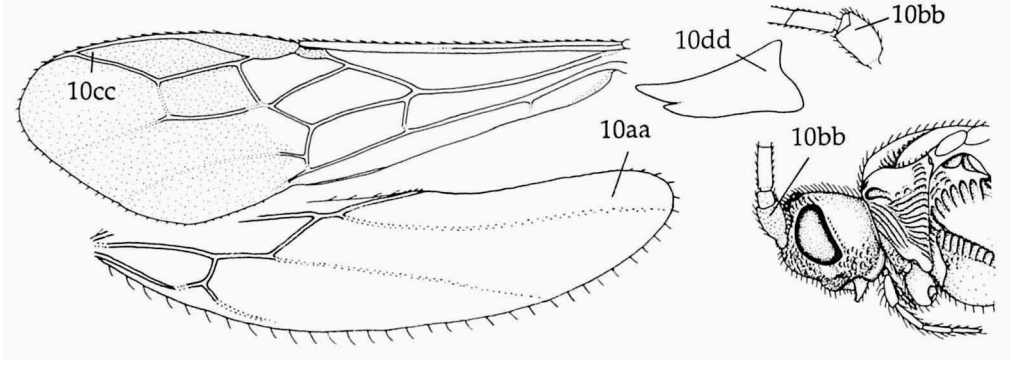


*10. Marginal cell of hind wing widened apically (fig. 10a); scapus deeply concave apically (fig. 10b); marginal cell of fore wing truncate apically, because vein SR1 is rather sharply bent (fig. 10c); mandibular sensillar plate present (fig. 10d) ..... **Trachypetinae-Trachypetini**

Small Australian tribe of rarely collected, large Braconidae, which are most likely diurnal (considering their morphology and colouration). The biology is unknown.

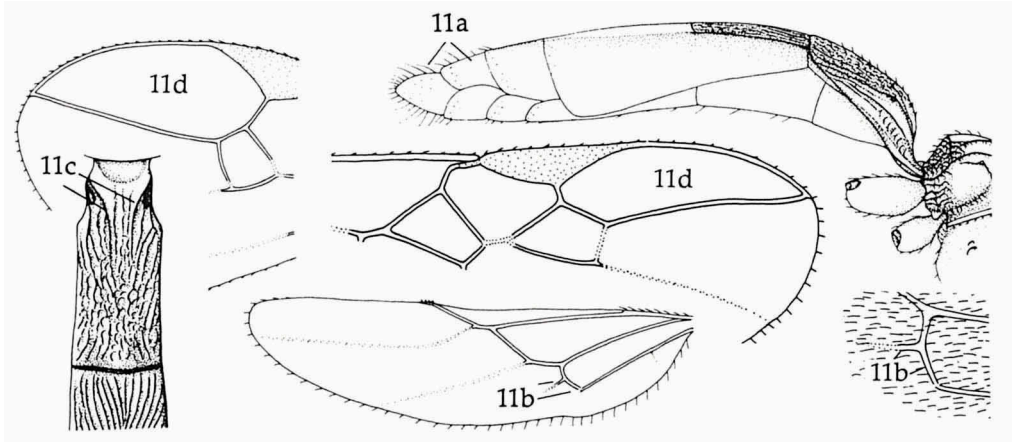


- Marginal cell of hind wing parallel-sided or narrowed apically (fig. 10aa); scapus truncate apically (fig. 10bb), or shallowly concave; marginal cell of fore wing acute apically (fig. 10cc); mandibular sensillar plate absent (fig. 10dd) 11



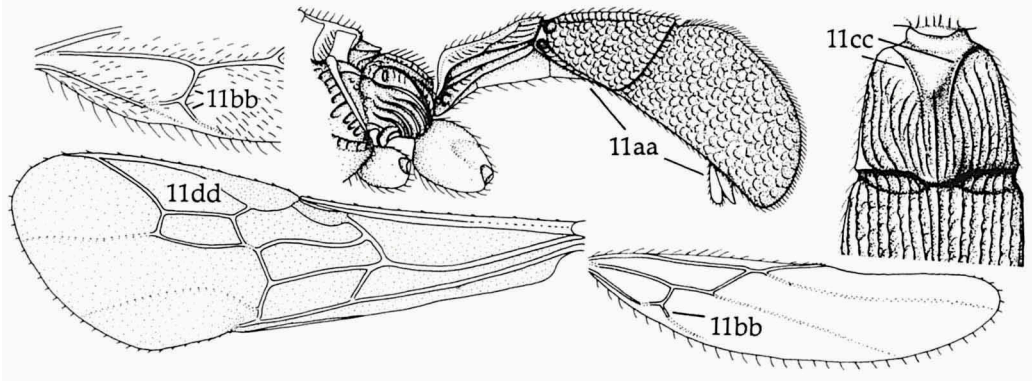
11. Fourth and following metasomal tergites well exposed (fig. 11a); vein 2-CU of hind wing situated far above level of vein 2A, near middle of vein cu-a (fig. 11b); dorsal carinae of first metasomal tergite absent or obsolescent (fig. 11c); marginal cell of fore wing normal, and comparatively long (fig. 11d) ..... **Meteorideinae**

Small and nearly cosmopolitan subfamily of larva-pupal endoparasites off Lepidoptera. Rarely collected.



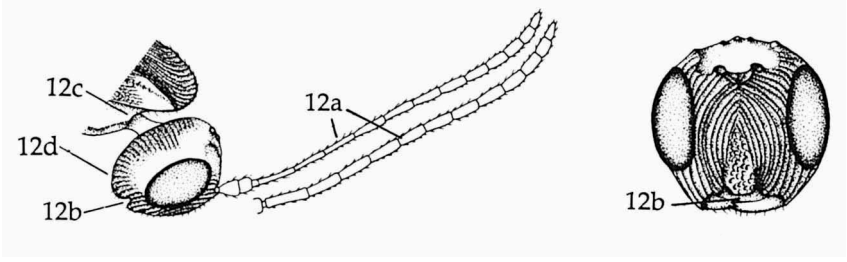
- Fourth and following tergites largely or completely retracted below third tergite (fig. 11aa); vein 2-CU of hind wing situated near lower level of vein 2A, far below middle of vein cu-a (fig. 11bb); dorsal carinae of first metasomal tergite usually strongly developed (fig. 11cc); marginal cell of fore wing short (fig. 11dd) .... **Sigalphinae**

Small cosmopolitan subfamily of endoparasites of larval Lepidoptera. Rather rarely collected.

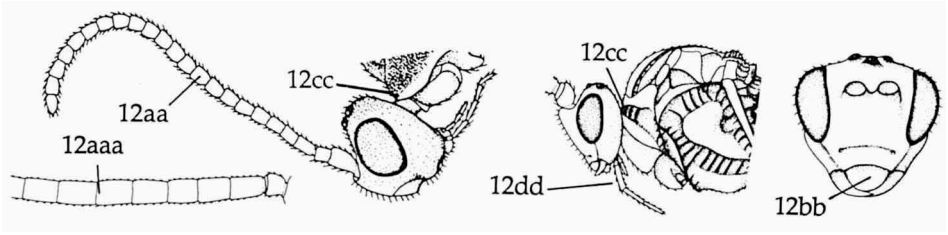


*12. Antenna distinctly compressed, its third and following basal segments at least twice wider than thick (fig. 12a) **and** below clypeus with a (hypoclypeal) depression present, small and orientated ventrally (fig. 12b); pronotum virtually absent anteriorly (fig. 12c); palpi reduced and usually hardly visible (fig. 12d) .... **Mesostoinae**

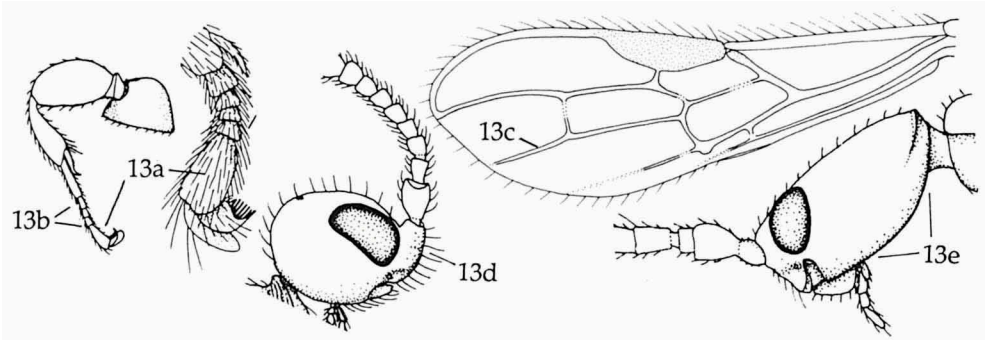
Small and rarely collected Australian subfamily; has been reared from unidentified galls.



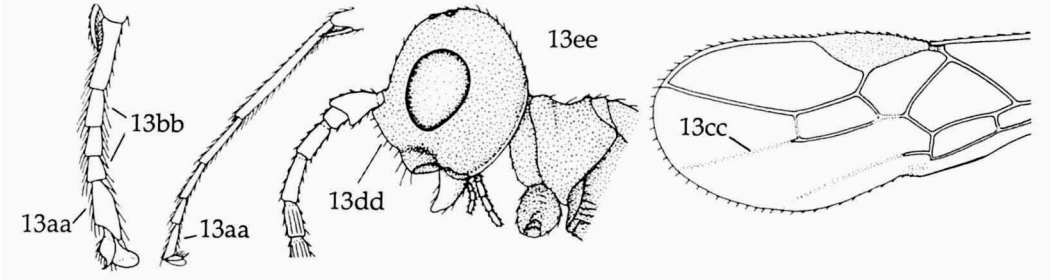
- Antenna cylindrical (fig.12aa), not wider than thick, and if very exceptionally compressed (fig. 12aaa) then area below clypeus flat (fig. 12bb); pronotum nearly always distinctly developed anteriorly (fig. 12cc); palpi nearly always distinctly developed and easily visible (fig. 12dd) 13



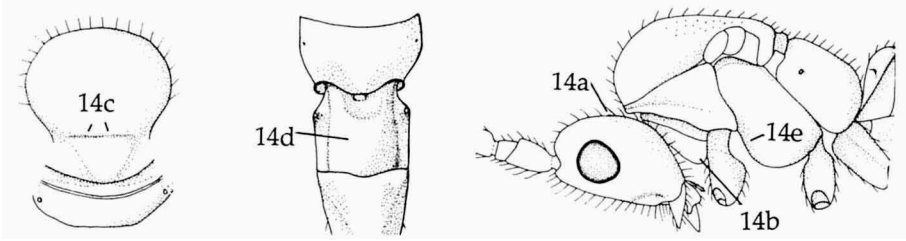
13. Telotarsus enlarged compared to basitarsus (fig. 13a); second-fourth segments of fore tarsus more or less shortened (fig. 13b), usually about as long as fore basitarsus or shorter; vein 3-M of fore wing often largely sclerotized (fig. 13c); if wingless then antenna on a facial prominence (fig. 13d) or head prognate (fig. 13e) 14



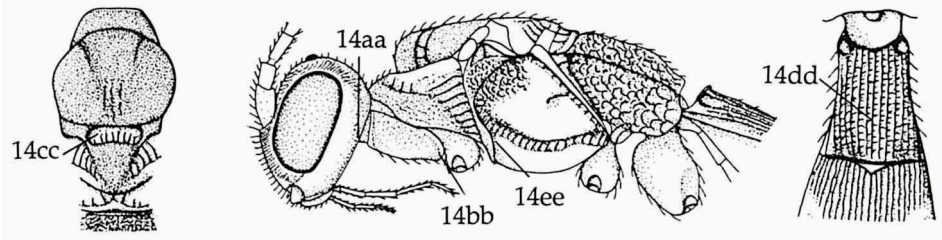
- Telotarsus normal (fig. 13aa); second-fourth segments of fore tarsus normal (fig. 13bb), usually distinctly longer than fore basitarsus; vein 3-M of fore wing often largely unsclerotized (fig. 13cc); if wingless then antenna normally inserted (fig. 13dd), not on a distinct prominence or head hypognate (fig. 13ee) 19



*14. Occipital carina absent (fig. 14a); posterior flange of propleuron absent (fig. 14b); scutellar sulcus absent or only as a narrow suture (fig. 14c); head normal; first metasomal tergite flat (fig. 14d); prepectal carina absent (fig. 14e) 15

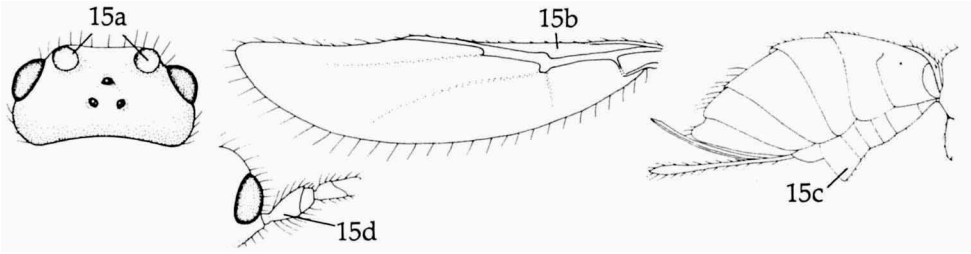


- Occipital carina present (fig. 14aa); posterior flange of propleuron present (fig. 14bb); scutellar sulcus medium-sized to large (fig. 14cc); **if** absent then head prognate (fig. 13e); first metasomal tergite distinctly convex medially (fig. 14dd); prepectal carina usually present (fig. 14ee) 16



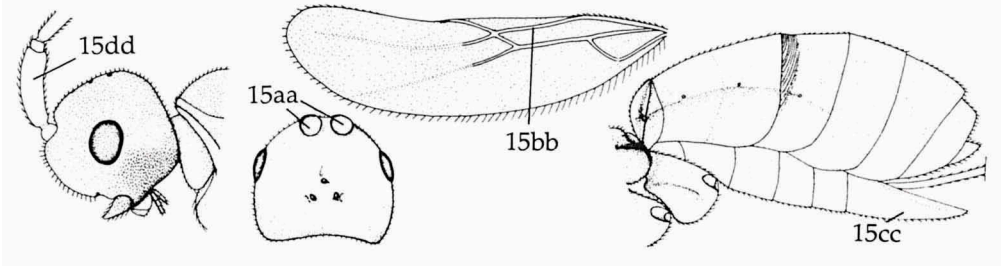
*15. Antennal sockets much closer to eyes than to each other (fig. 15a); vein 1-SC+R of hind wing reduced (fig. 15b); hypopygium of ♀ strongly retracted under metasoma (fig. 15c); scapus small or medium-sized (fig. 15d) .. **Doryctinae-Ypsistocerini**

Small and rare Neotropical tribe of parasites that have been collected from termite-nests, in which their role is unclear. It possesses the peculiar subapical double nodus and apical sclerotization of the ovipositor, and the two separate insertions of the venom glands on the non-annulated part of the reservoir, both unique features of the subfamily Doryctinae (Quicke et al, 1992).

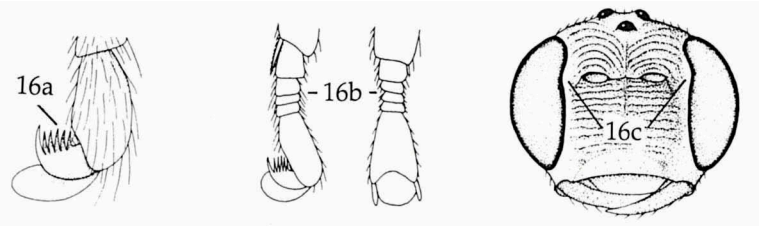


- Antennal sockets much closer to each other than to eyes (fig. 15aa); vein 1-SC+R of hind wing complete (fig. 15bb); position of hypopygium of ♀ normal (fig. 15cc); scapus strongly enlarged (fig. 15dd) ..... **Vaepellinae**

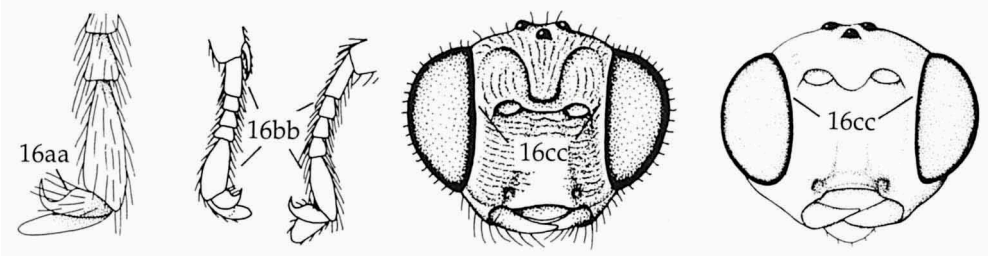
Small and very rarely collected Afrotropical subfamily; the biology is unknown. According to Tobias (1988) an aberrant group of the subfamily Braconinae, and since the males have vein 1-M of hind wing widened (Quicke, in litt.) this may be correct.



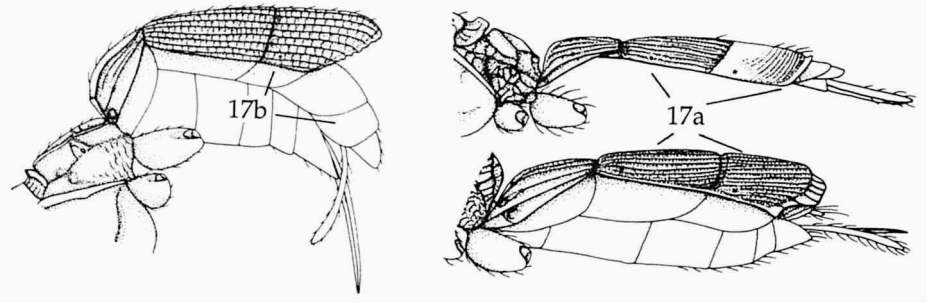
16. Tarsal claws coarsely pectinate (fig. 16a); fore tarsus extremely shortened (fig. 16b); inner sides of eyes distinctly emarginate (fig. 16c) ..... **Rogadinae-Yeliconini**
Small cosmopolitan tribe, containing solitary endoparasites of lepidopterous larvae, which pupate inside the mummified host larva (Čapek, 1970).



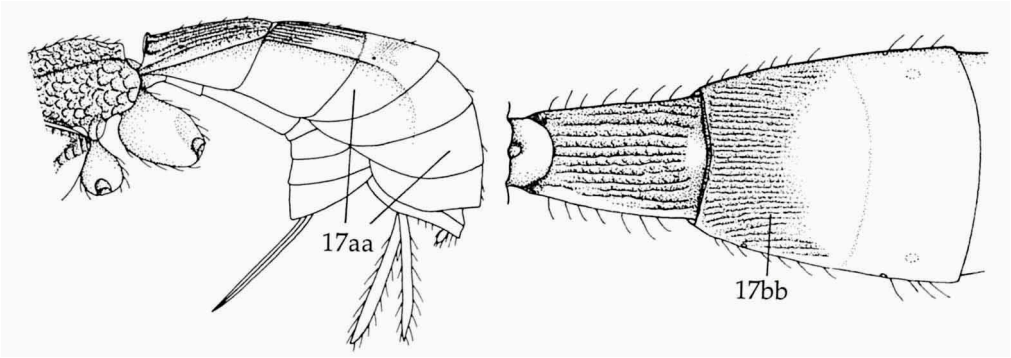
- Tarsal claws simple, without distinct pectination (fig. 16aa); fore tarsus at most moderately shortened (fig. 16bb); eyes not emarginate (fig. 16cc) 17



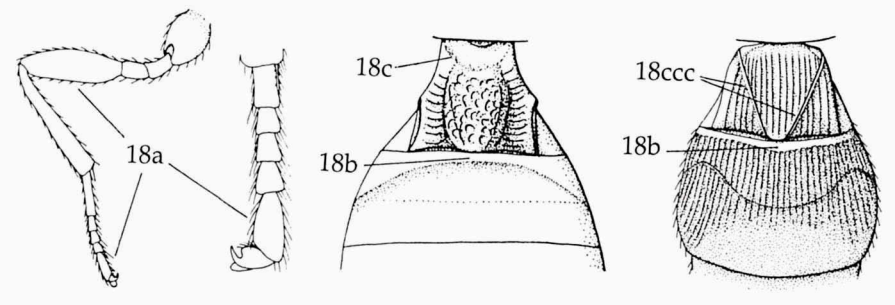
17. First three metasomal tergites carapace-like, covering most of following tergites (fig. 17a); at least both basal tergites of metasoma distinctly sculptured, usually longitudinally striate with interconnecting sculpture or completely granulate (fig. 17b) 24



- Metasoma without carapace, fourth and following tergites largely visible (fig. 17aa); sculpture of metasoma variable, not granulate, if longitudinally striate then without interconnecting sculpture (fig. 17bb) 18



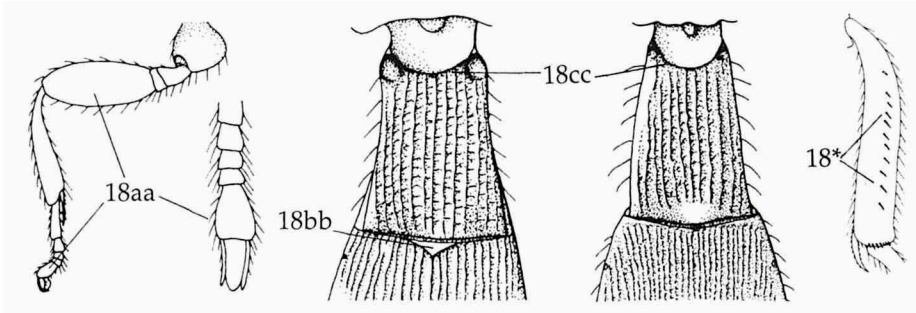
*18. Femur and telotarsus of fore leg at most moderately widened (fig. 18a); second metasomal tergite without area medio-basally (fig. 18b); dorsal carinae of first tergite variable (fig. 18c, 18ccc) 24



- Femur and telotarsus of fore leg strongly widened (fig. 18aa); **if** rather slender then second metasomal tergite with small triangular area medio-basally (fig. 18bb); dorsal carinae of first tergite united basally or nearly so (fig. 18cc) .... **Betylobraconinae**

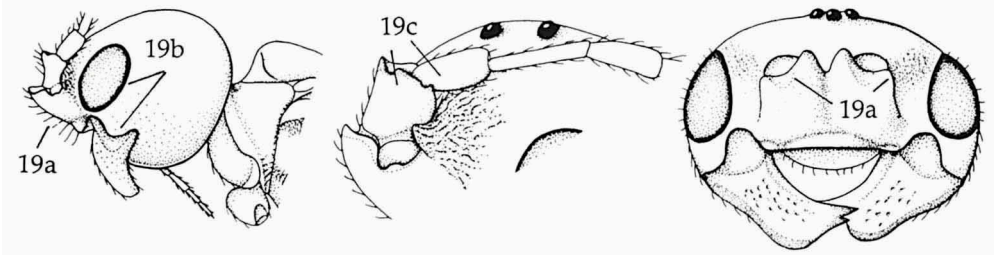
Small subfamily of which the biology is unknown. Cosmopolitan, but rarely collected; most species occur in Australia and S. America. The Betylobraconinae are related to the Rogadinae, by e.g. their similar structure of venom apparatus (D.L.J. Quicke, pers. comm.).

Note. If the face is distinctly protruding, no distinct hypoclypeal depression is present, and the females are wingless, then it belongs to a new subfamily to be described in a forthcoming paper. If the dorsal carinae of the first metasomal tergite are enclosing a triangular area and the propodeum with long median carina, cf. subfamily Rogadinae. If the anterior face of the fore tibia bears a row of (tiny) pegs (fig. 18*) and propodeum with transverse carina, cf. subfamily Doryctinae (the genus *Stenocorse* Marsh, 1968).

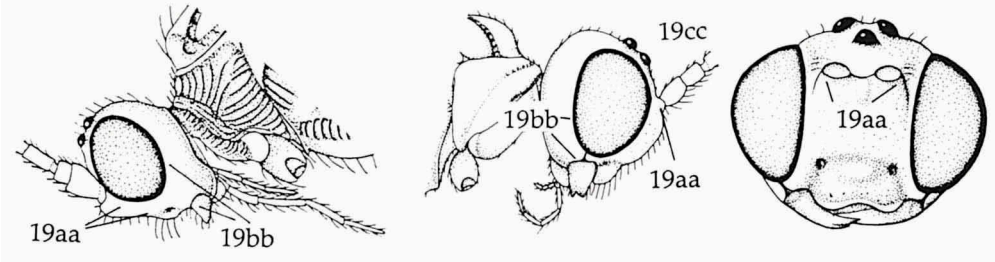


*19. Antenna on a strongly protruding shelf (fig. 19a); eyes as wide as base of mandible (fig. 19b); scapus short, enlarged anteriorly and much wider than pedicellus (fig. 19c) ..... **Euphorinae-Cosmophorini**

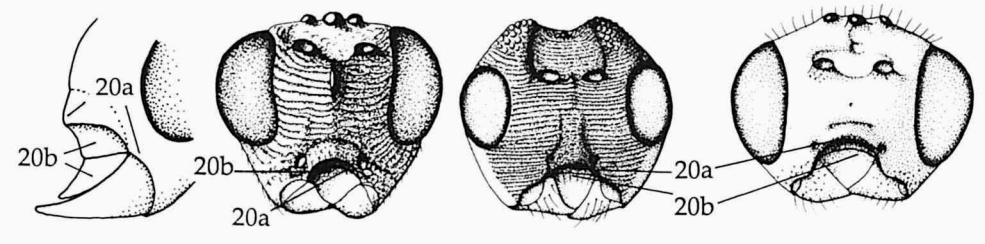
Small and very rarely collected Holarctic tribe; parasite of adults of bark and wood boring Scolytidae. Aberrant in the Euphorinae, because of the structure of the antennal sensillae (no internal floor; D.L.J. Quicke, pers. comm.), the position of the labrum, the absence of the medio-posterior depression of the scutellum and of the prepectal carina. It uses the aberrantly shaped mandibles in combination with the back-slanted labrum to grasp the beetle near the pronotum to held it tightly during oviposition.



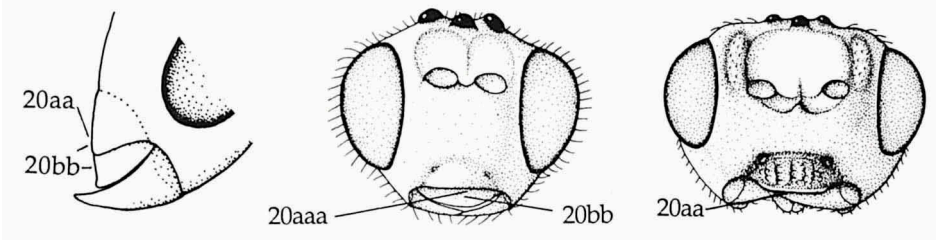
- Antenna not inserted on a shelf, at most a somewhat protruding part of face (fig. 19aa); eyes wider than base of mandible (fig. 19bb); scapus usually longer than pedicellus, differently shaped, and usually nearly as wide as pedicellus (fig. 19cc) 20



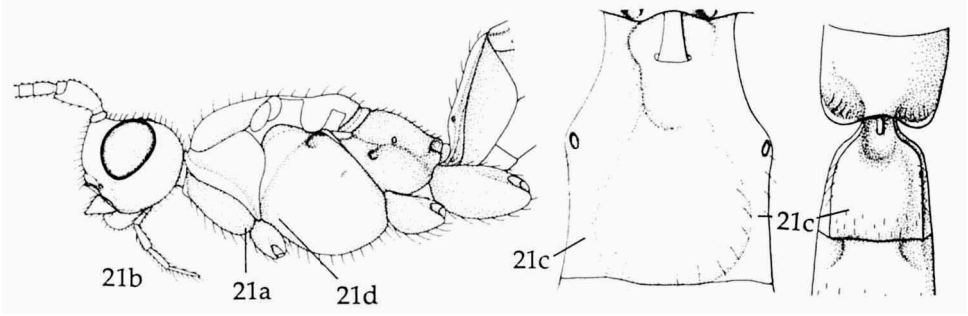
20. Hypoclypeal depression deep and wide, and middle of apparent ventral margin of clypeus distinctly above upper level of mandibular bases (fig. 20a); bottom of hypoclypeal depression consists of the concave labrum and usually a depressed part of clypeus (fig. 20b: "cyclostome braconids") 21



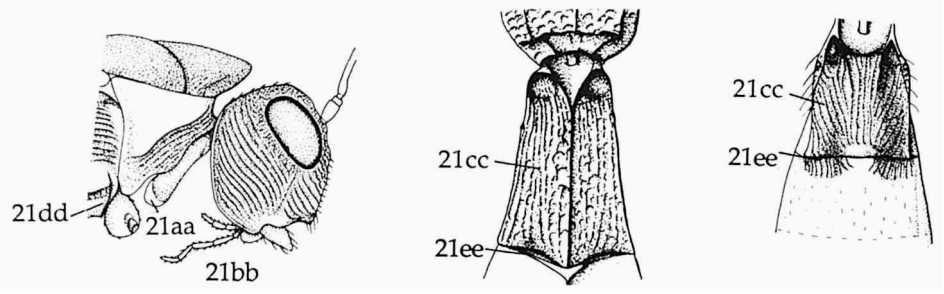
- Hypoclypeal depression absent (fig. 20aa); if present then shallow, indistinct, and medio-ventral margin of clypeus close to upper level of mandibular bases (fig. 20aaa); labrum flat and ventral part of clypeus not part of a hypoclypeal depression (fig. 20bb) 33



21. Posterior flange of propleuron absent (fig. 21a), only very exceptionally present: maxillary palp with 5 segments (fig. 21b); first metasomal tergite with lateral parts flattened (fig. 21c), **or** tergite immovably connected to second tergite; prepectal carina absent laterally (fig. 21d) 22

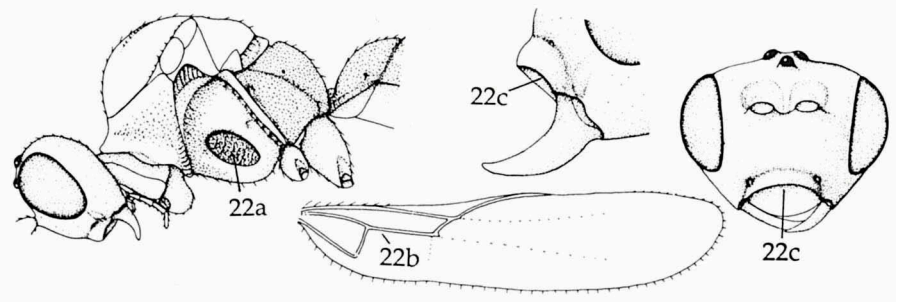


- Posterior flange of propleuron present (fig. 21aa); maxillary palp with 6 segments (fig. 21bb); first metasomal tergite with convex lateral parts (fig. 21cc) and movably connected to second tergite (fig. 21ee), **if** exceptionally immovably connected then prepectal carina present laterally (fig. 21dd) 23



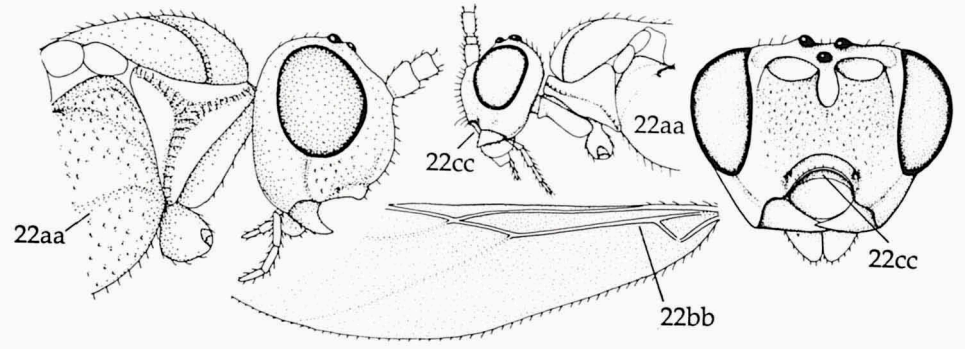
22. Mesopleuron with wide elliptical depression (fig. 22a); length of vein 1-M of hind wing subequal to vein M+CU and not widened basally (fig. 22b); ventral part of clypeus not depressed and not part of hypoclypeal depression (fig. 22c) ..... **Telengaiinae**

Small subfamily from Central Asia, of which the biology is unknown. Very rarely collected.



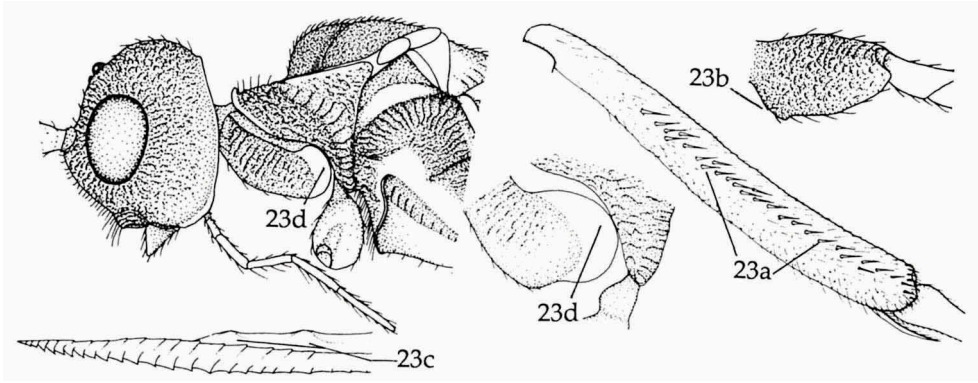
- Mesopleuron without wide depression, usually completely flat (fig. 22aa); length of vein 1-M of hind wing at least 1.5 times vein M+CU and usually more or less widened basally (fig. 22bb); ventral part of clypeus depressed, forming dorsal part of hypoclypeal depression (fig. 22cc) ..... **Braconinae**

Very large cosmopolitan subfamily of ectoparasites of larval Coleoptera, Diptera, Lepidoptera and phytophagous Hymenoptera. Exceptionally endoparasitism occurs. Very frequently collected.

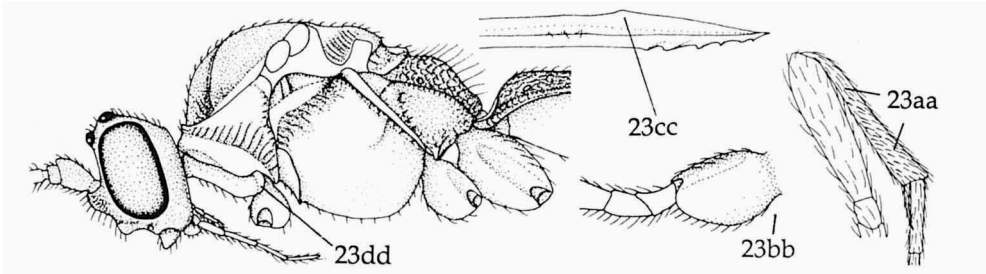


23. Fore tibia with row of (usually) stout pegs or spines, which are at most as long as about 6 times their width (fig. 23a), **or** hind coxa angulate antero-ventrally, frequently with a ventral tubercle (fig. 23b); ovipositor dorsally nearly always with double nodus subapically (fig. 23c); posterior flange of propleuron largely dorsally situated (fig. 23d) ..... **Doryctinae**

Large cosmopolitan subfamily of ectoparasites of concealed larval Coleoptera and less commonly Lepidoptera and phytophagous Hymenoptera (exceptionally of Embioptera or phytophagous in seeds). Rather rarely collected, except the tribe Spathiini Parfitt, 1881. Included in this subfamily is the aberrant tribe Evaniodini Fischer, 1981 from S. America. The metasoma is highly inserted on the propodeum, the vein cu-a of hind wing very is long and reclivous, and the propodeum is completely smooth. The aberrant shape of the ovipositor of the Doryctinae is a synapomorphy of nearly all Doryctinae, including the Ypsistocerini and Evaniodini (Quicke et al., 1992).

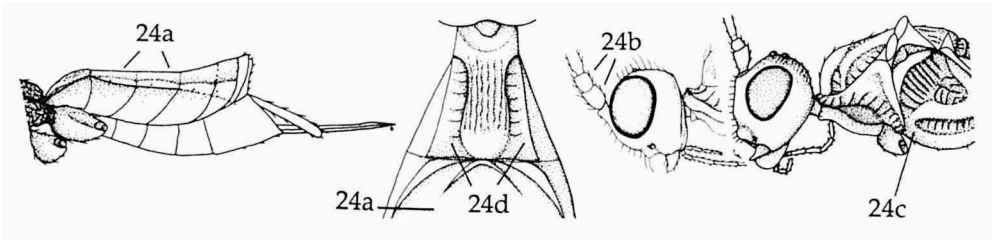


- Fore tibia without row of pegs or spines (fig. 23aa), but frequently bristly, or with a cluster of bristly spines (fig. 16a) and length of bristles at least about 8 times their width; hind coxa not angulate and without tubercle antero-ventrally (fig. 23bb); ovipositor at most with a single nodus subapically (fig. 23cc); posterior flange of propleuron situated posteriorly (fig. 23dd) or obsolescent 24

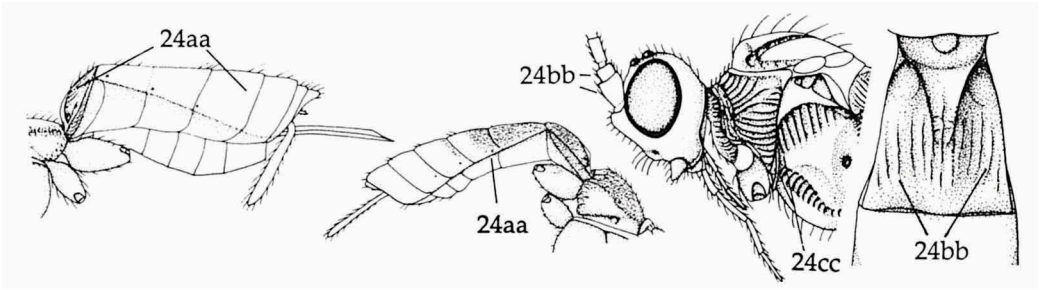


24. Second and third metasomal tergites largely membranous dorsally (fig. 24a), nearly always less sclerotized than their epipleura **and** median carina of propodeum short or absent (fig. 24e); pedicellus nearly as long as scapus (fig. 24b), **and/or** prepectal carina absent (fig. 24c); lateral areas of first metasomal tergite flattened and usually wide (fig. 24d) ..... **Hormiinae** s.s.

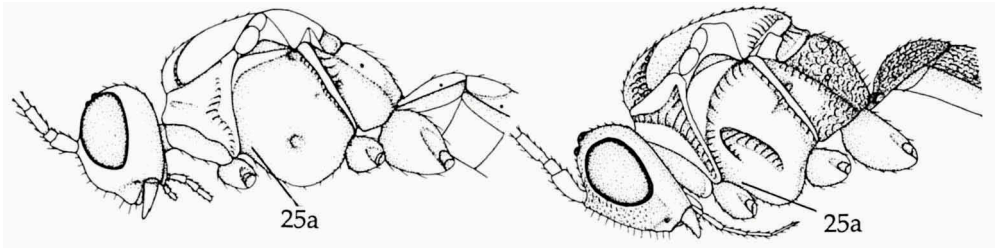
Small cosmopolitan subfamily, which contains idiobiont ectoparasites of larvae of Lepidoptera. Rather frequently collected.



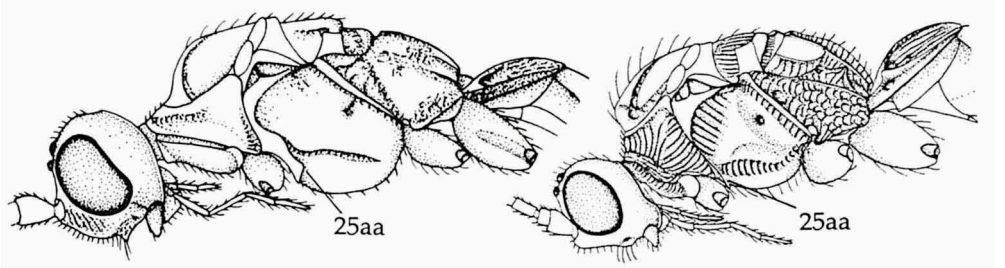
- Second and third tergites similarly or more strongly sclerotized than their epipleura (fig. 24aa), **if** exceptionally tergites are desclerotized then median carina of propodeum long (fig. 24cc); pedicellus distinctly shorter than scapus (fig. 24bb), **or** if comparatively long then prepectal carina present (fig. 24cc); first tergite more or less evenly convex, its lateral areas usually narrow or absent (fig. 24dd) 25



25. Prepectal carina completely absent (fig. 25a) 26

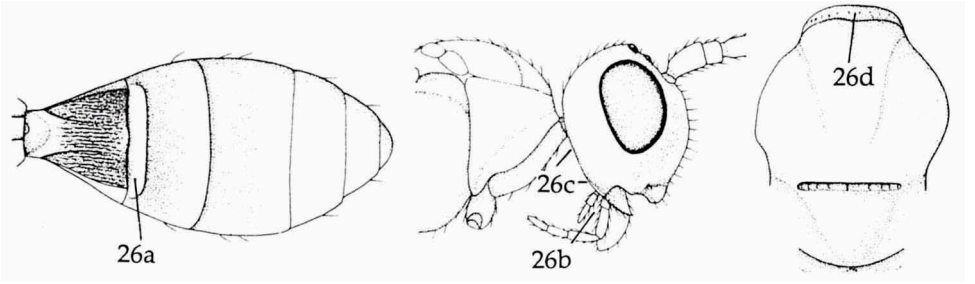


- Prepectal carina present (fig. 25aa), at least partly 29

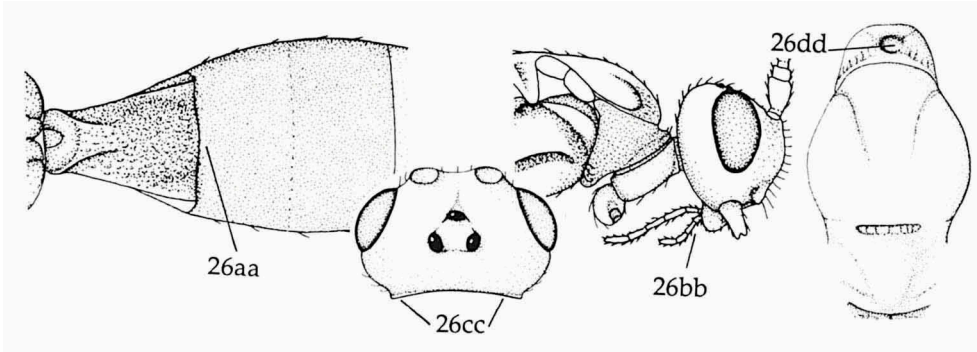


26. Second metasomal tergite with transverse elevated area basally (fig. 26a); labial palp with 3 segments (fig. 26b); occipital carina largely absent (fig. 26c); pronope absent (fig. 26d) ..... **Gnamptodontinae**

Small cosmopolitan subfamily of (?endo-)parasites of larval Lepidoptera. Rarely collected.

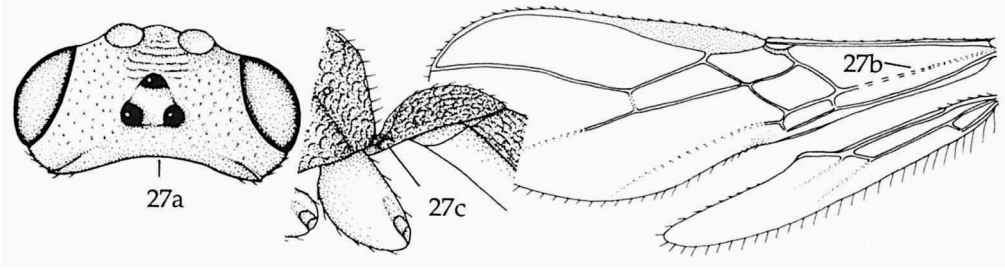


- Second tergite without transverse elevated area basally (fig. 26aa); labial palp with 4 segments (fig. 26bb); occipital carina usually present laterally (fig. 26cc); dorsal pronope more or less developed (fig. 26dd), but may be completely absent 27



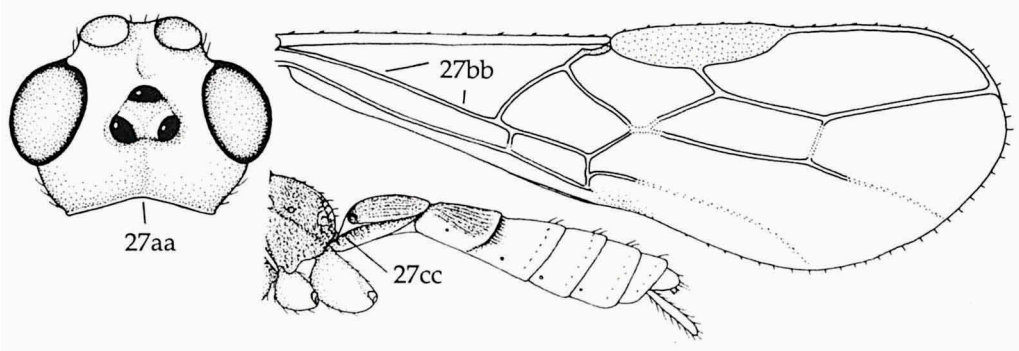
27. Occipital carina absent medio-dorsally (fig. 27a); vein M+CU1 of fore wing largely unsclerotized (only pigmented and not tubular; fig. 27b); **if** completely tubular and fully sclerotized then laterope of first metasomal tergite distinct (fig. 27c) .... **Opiinae**

Large cosmopolitan subfamily of endoparasites of larval cyclorraphous Diptera. Frequently collected.

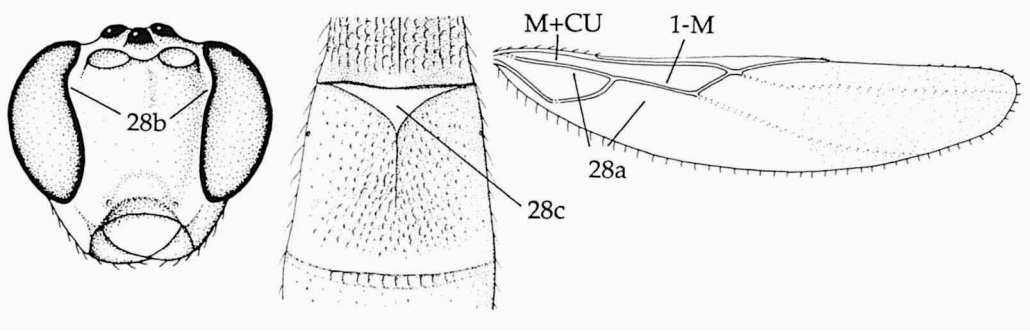


- Occipital carina complete medio-dorsally (fig. 27aa) or absent; **if** absent medio-dorsally **then** vein M+CU1 of fore wing completely tubular (fig. 27bb) and laterope of first tergite absent or indistinct (fig. 27cc) 28

Note. Some Hormiinae s.s. may key out here but these species have the eyes not emarginate and have either vein cu-a of the hind wing absent, or (when present) vein M+CU of the hind wing distinctly longer than vein 1-M.

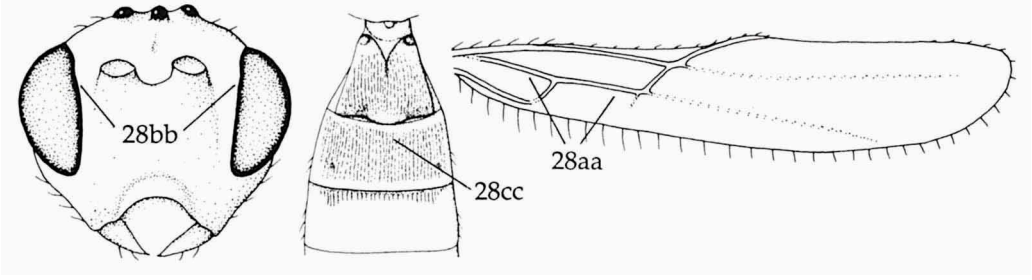


28. Vein M+CU of hind wing (slightly) longer than vein 1-M (fig. 28a); inner side of eyes more or less emarginate (fig. 28b); second metasomal tergite usually with smooth triangular area medio-basally (fig. 28c) ..... few **Rogadinae**



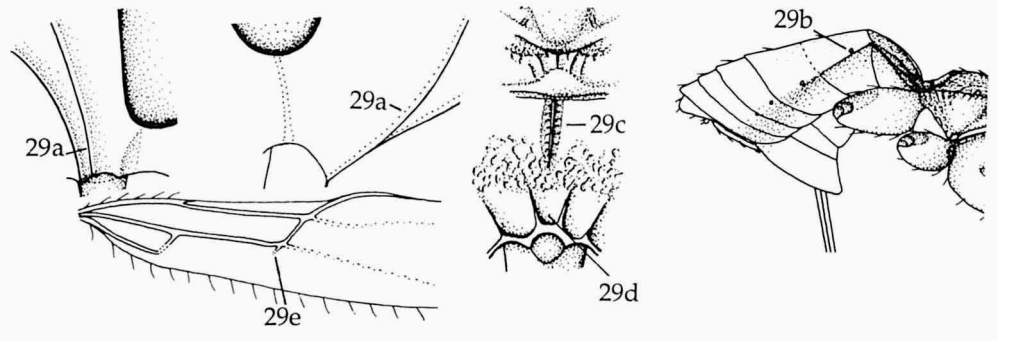
- Vein M+CU of hind wing about as long as vein 1-M or shorter (fig. 28aa); eyes not distinctly emarginate (fig. 28bb); second tergite without smooth triangular area medio-basally (fig. 28cc) ..... **Exothecinae-Exothecini**

Rather small cosmopolitan tribe, which contains idiobiont ectoparasites of larval Lepidoptera, Diptera, Hymenoptera and Coleoptera. Rather frequently collected.

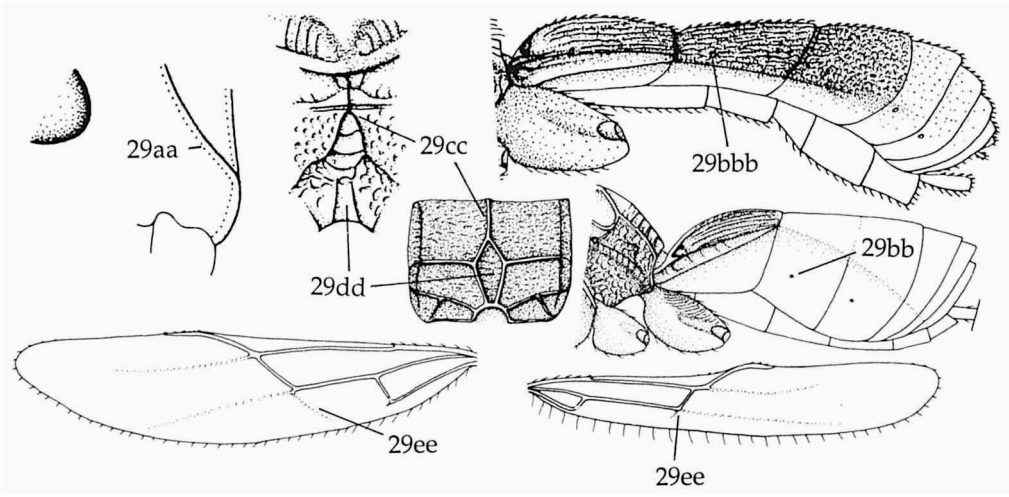


29. Ventral third of occipital carina directly running to base of mandible, straight (fig. 29a); second metasomal spiracle at border of tergite, not surrounded by sculpture (fig. 29b); median carina of propodeum long (fig. 29c); medial areola of propodeum small or incomplete (fig. 29d); vein m-cu of hind wing absent (fig. 29e) or nearly so ..... **Exothecinae-Rhysipolini**

Small, mainly Holarctic tribe, which contains koinobiont ectoparasites of larval Lepidoptera. Rather infrequently collected.

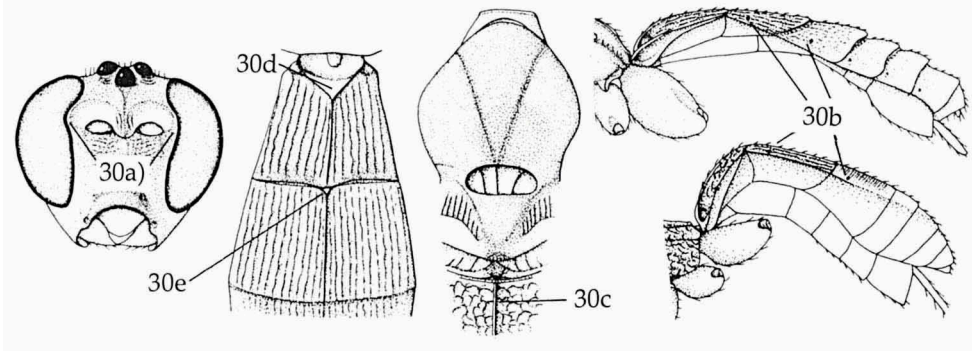


- Ventral third of occipital carina curved towards hypostomal carina (fig. 29aa) or occipital carina absent ventrally; second metasomal spiracle in epipleuron (fig. 29bb) or in notum of tergite, surrounded by sculpture (fig. 29bbb); median carina of propodeum (fig. 29cc), medial areola of propodeum (fig. 29dd), and vein m-cu of hind wing (fig. 29ee) variable 30

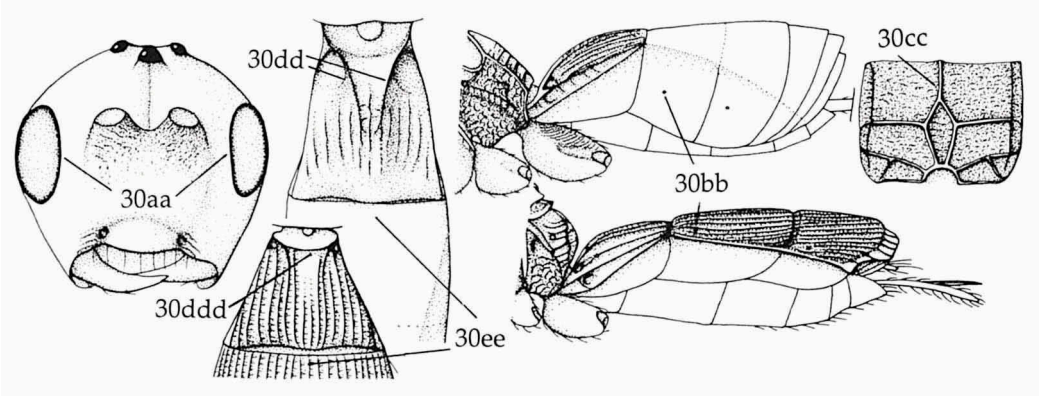


30. Inner side of eyes distinctly emarginate (fig. 30a) **and/or** second metasomal spiracle in notum of tergite (fig. 30b); median carina of propodeum usually at least half as long as propodeum (fig. 30c); dorsal carinae of first metasomal tergite meeting each other and pointing posteriad (fig. 30d); second metasomal tergite frequently with small triangular area medio-basally (fig. 30e); second metasomal tergite may be granulate ..... **Rogadinae**

Rather large cosmopolitan subfamily, which contains koinobiont endoparasites of larval Lepidoptera. The host caterpillar is mummified. Included in the Rogadinae are the Rogadini, Yeliconini, Clinocentrini and the new tribe Stiropiini (including the genus *Stiropius* Cameron, 1912 and its relatives, a group restricted to the New World and mainly parasites of Lyonetiidae). The Stiropiini has been provisionally included in the Lysitermini (van Achterberg, 1991), but the Lysitermini are ectoparasites and no mummification of the host larva is known. The Stiropiini are characterized by the granulate sculpture of the body and the long median carina of the propodeum connected to a medium-sized areola.

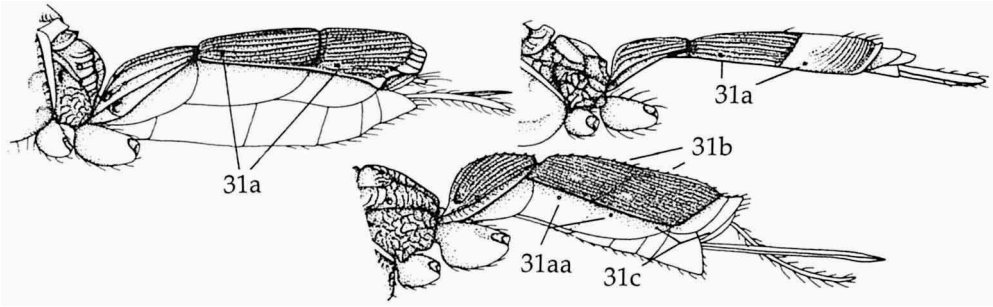


- Inner side of eyes not or slightly emarginate (fig. 30aa); position of second metasomal spiracle variable (fig. 30bb); median carina of propodeum shorter than half length of propodeum (fig. 30cc); dorsal carinae of first metasomal tergite not meeting each other (fig. 30dd), or if united then enclosing a semicircular area not pointed posteriad (fig. 30ddd); second metasomal tergite without triangular area medio-basally (fig. 30ee) 31

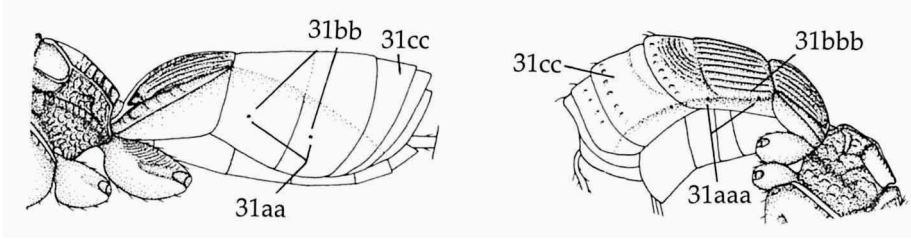


31. Spiracles of second and third metasomal tergites situated in their notum **and** surrounded by striae (fig. 31a); if exceptionally in their epipleuron (fig. 31aa) then metasoma longitudinally striate with interconnecting sculpture (fig. 31b) **and** fourth and following tergites largely retracted under third tergite (fig. 31c)..... ..... **Lysiterminae**

Small nearly cosmopolitan subfamily (unknown from the Neotropics), with two tribes: Lysitermini Tobias, 1968, and Pentatermini Belokobylskij, 1990. Formerly included in the Rogadinae, but does not fit well there, e.g. because of their biology (ectoparasites instead of endoparasites, and no mummification of host larva). The morphology of the reproductive organs indicates close relationship to the Hormiinae (Quicke, in litt.)

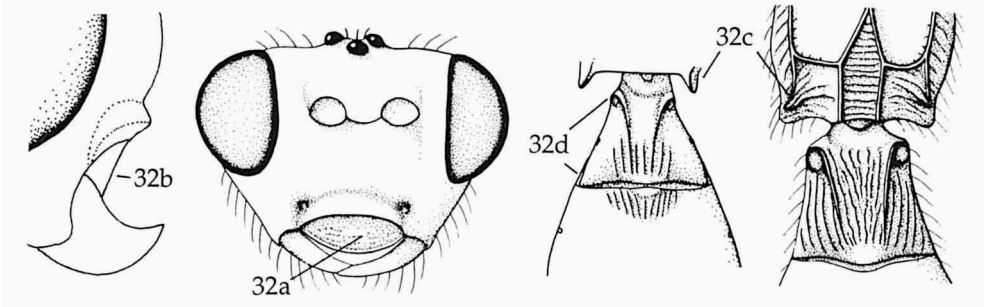


- Spiracles of second and third metasomal tergites situated in their epipleuron, distinctly below lateral fold (fig. 31aa), or near lateral fold (fig. 31aaa), not surrounded by striae (fig. 31bb); metasoma without interconnecting sculpture if longitudinally striate (fig. 31bbb); fourth and following tergites usually largely exposed behind third tergite (fig. 31cc) 32



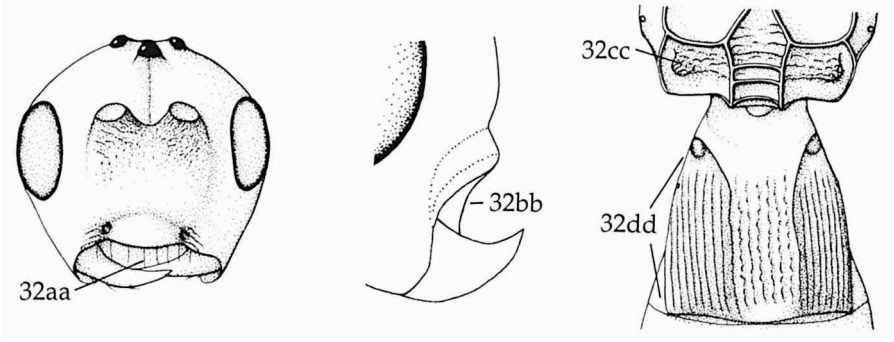
32. Antennal segments 11-14; **if** more than 14 then is labrum sculptured (fig. 32a), labrum usually (nearly) flat (fig. 32b), propodeum with pair of distinct, acute tubercles (fig. 32c) and/or first metasomal tergite distinctly widened apically (fig. 32d) ... . **Pambolinae**

Small cosmopolitan subfamily, which contains idiobiont ectoparasites of larval Coleoptera and Lepidoptera. Rather infrequently collected; specimens often wingless or brachypterous.



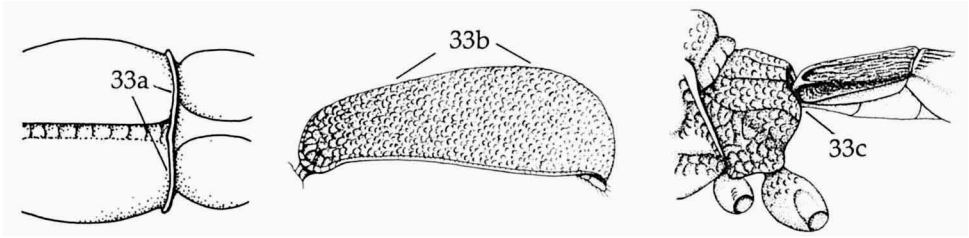
- Antennal segments with more than 14 segments; labrum smooth (fig. 32aa), and (slightly) concave (fig. 32bb); propodeum usually without tubercles, **if** exceptionally tubercles are present then are these obtuse (fig. 32cc); first tergite variable (fig. 32dd), usually differently shaped ..... **Rhyssalinae** s.s.

Small cosmopolitan subfamily, which contains idiobiont ectoparasites of larval Coleoptera and Lepidoptera, probably also of Diptera (Acrisidini). Rather infrequently collected.

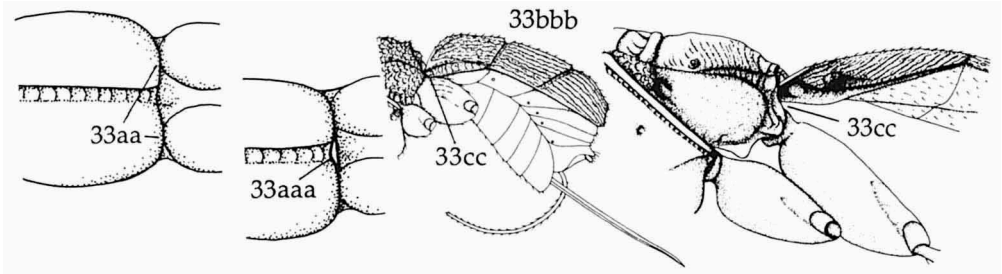


33. Postpectal carina complete in front of middle coxae ventrally (fig. 33a); metasoma with a carapace (fig. 33b) **or** metasoma inserted near level of dorsal face of propodeum (fig. 33c) 34

Note. Some Cenocoeliinae from S America have the postpectal carina (largely) absent, but these can be recognized by the high insertion of the metasoma (fig. 34a).

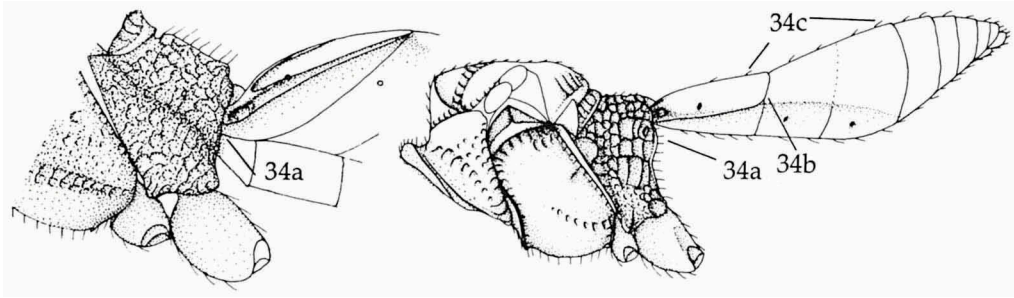


- Postpectal carina absent (fig. 33aa), at most a short carina medio-ventrally (fig. 33aaa); metasoma usually without a carapace (fig. 35b) or differently shaped (fig. 33bbb); metasoma near hind coxae inserted (fig. 33cc) 35



34. First metasomal tergite inserted near level of dorsal face of propodeum, far above hind coxae (fig. 34a); first metasomal tergite movably joined to second tergite (fig. 34b); metasoma without carapace (fig. 34c) ..... **Cenocoeliinae**

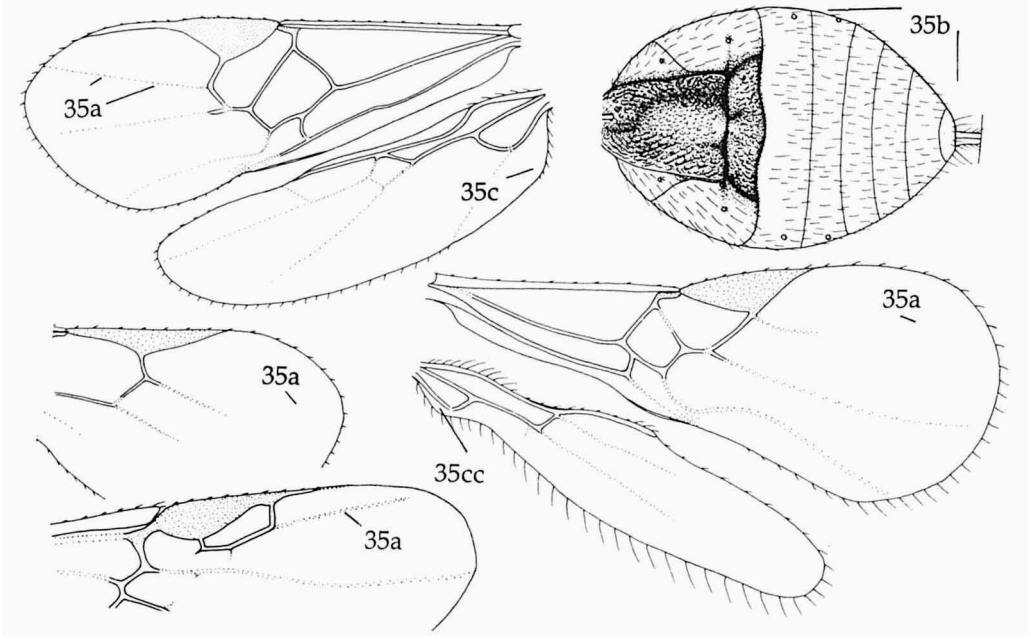
Small cosmopolitan subfamily of endoparasites of larvae of Coleoptera living in wood. Rarely collected.



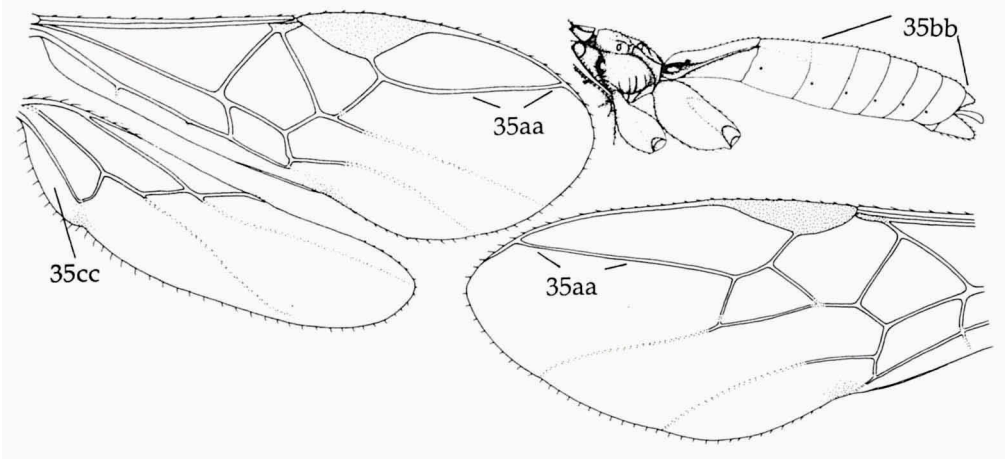
- First metasomal tergite inserted close to hind coxae, distinctly below dorsal level of propodeum (fig. 34aa); first and second tergites immovably joined (fig. 34bb); metasoma forming a rigid carapace (fig. 34cc) ..... **Cheloninae**

Rather large cosmopolitan subfamily of endoparasites of larval Lepidoptera. Very frequently collected, e.g. in Malaise-traps.

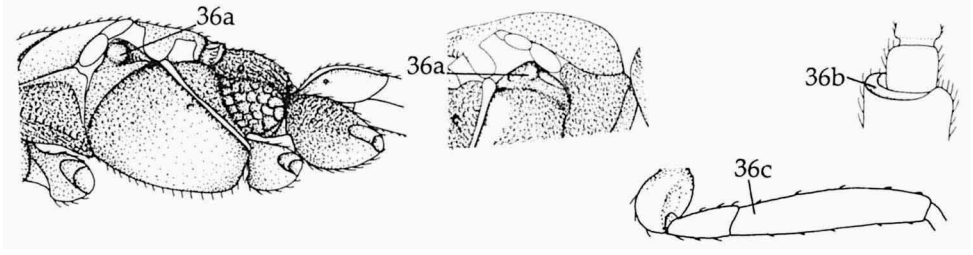
35. Vein SR1 of fore wing partly or completely unsclerotized, resulting in a distally open marginal cell distally (fig. 35a); metasoma often short (fig. 35b); plical lobe of hind wing may be large (fig. 35c); (no wingless or brachypterous specimens known) 36



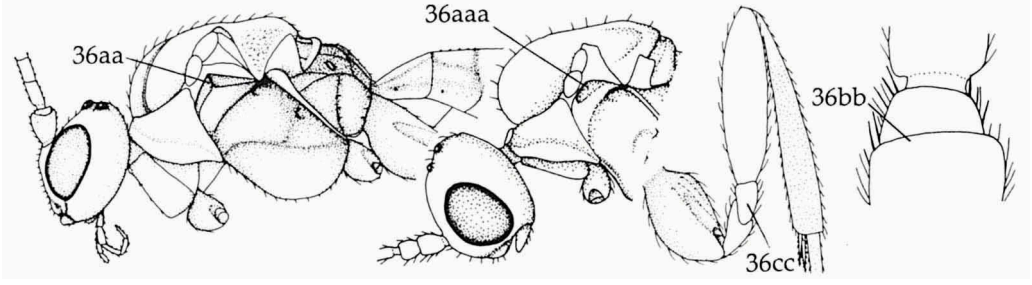
- Vein SR1 of fore wing completely sclerotized, tubular, reaching margin of wing, resulting in a closed marginal cell distally (fig. 35aa); metasoma usually elongate (fig. 35bb); plical lobe of hind wing usually small (fig. 35cc); (wingless or brachypterous specimens included here) 46



*36. Anterior subalar depression with smooth tubercle (fig. 36a); **either** scapus with secondary edge apically (fig. 36b), **or** hind trochantellus absent or obsolescent (fig. 36c) 37

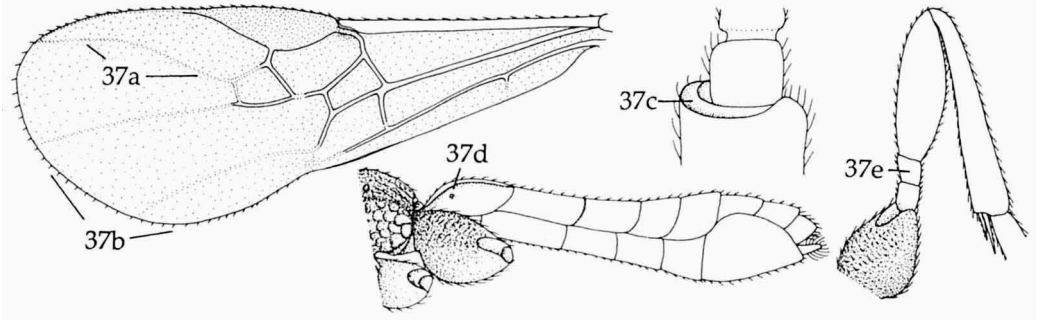


- Anterior subalar depression with carina(e) (fig. 36aa) or depressed and smooth (fig. 36aaa); scapus without secondary edge apically (fig. 36bb); hind trochantellus distinct (fig. 36cc) 38



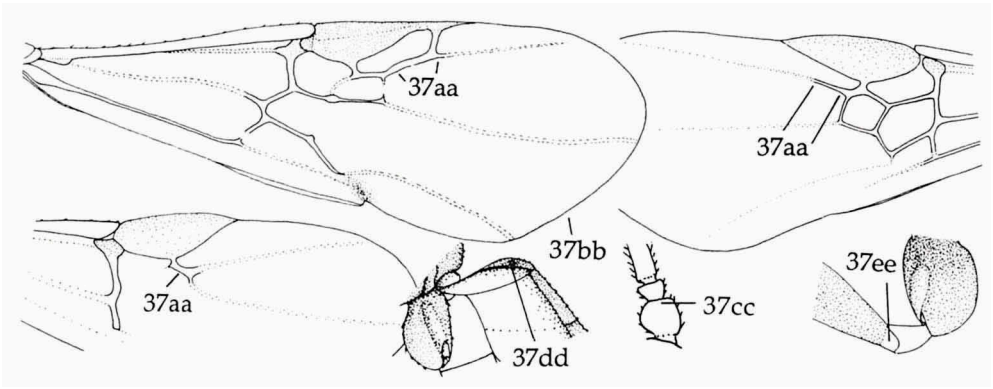
*37. Vein SR1 of fore wing completely unsclerotized (fig. 37a); fore wing with fringe (fig. 37b); inner side of scapus with secondary edge apically (fig. 37c), remaining distinctly removed from pedicellus; first metasomal spiracle in epipleuron (fig. 37d); trochantellus distinct (fig. 37e); prosternum large, about as wide as fore coxa ..... **Khoikhoiinae**

Small, southern African subfamily; rarely collected. The biology is unknown.



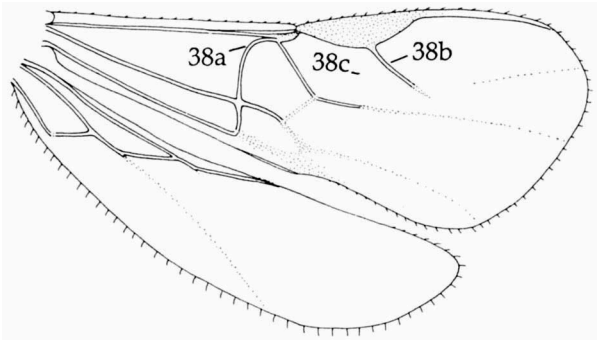
- Vein SR1 of fore wing sclerotized basally (fig. 37aa); fore wing without fringe (fig. 37bb); inner side of scapus without secondary edge apically (fig. 37cc), not removed from pedicellus; first metasomal spiracle in notum (fig. 37dd); trochantellus absent or obsolescent (fig. 37ee); prosternum minute or scarcely visible at 80 × .. .. **Neoneurinae**

Small Holarctic subfamily, all are probably endoparasites of adult ants (Formicidae). Rarely collected.

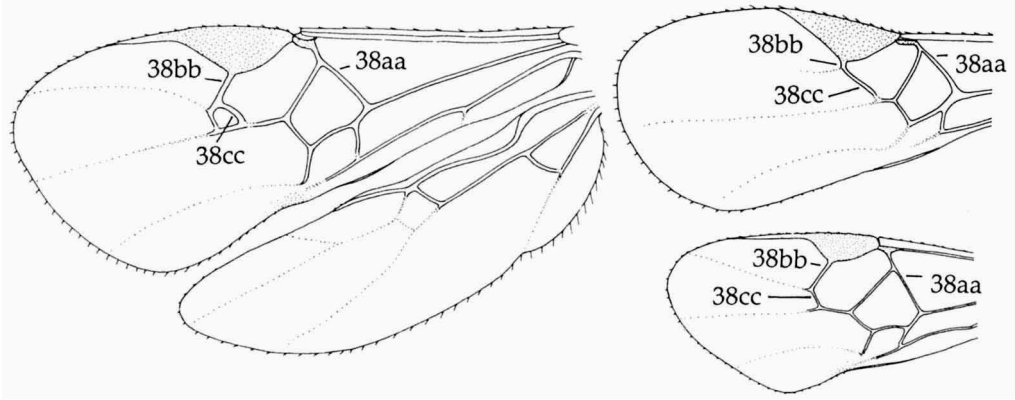


*38. Vein 1-M of fore wing abruptly curved at its anterior end (fig. 38a); vein r of fore wing long (fig. 38b); vein 2-SR of fore wing absent (fig. 38c) ..... **Ichneutinae-Muesebeckiini**

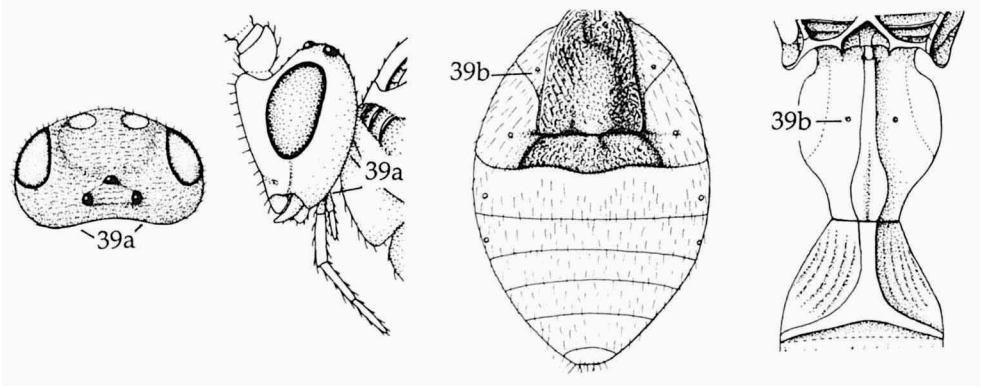
Small, nearly cosmopolitan tribe, all are probably endoparasites of lepidopterous larvae. Rarely collected.



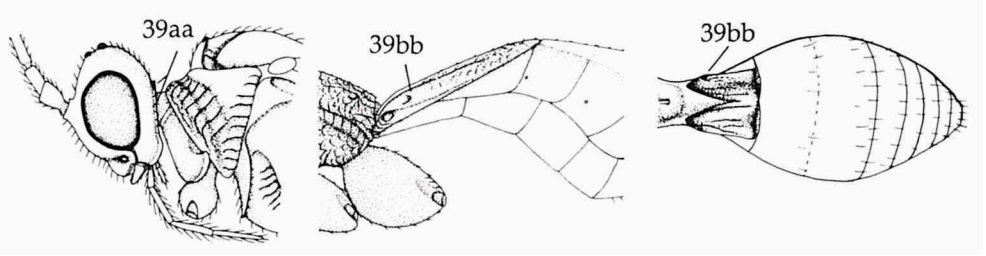
- Vein 1-M of fore wing straight at its anterior end (fig. 38aa); vein r of fore wing medium-sized, short or absent (fig. 38bb); vein 2-SR of fore wing present (fig. 38cc) 39



39. Occipital carina completely absent (fig. 39a); spiracles of first metasomal tergite in its weakly sclerotized epipleuron (= latero-tergite) (fig. 39b) 40

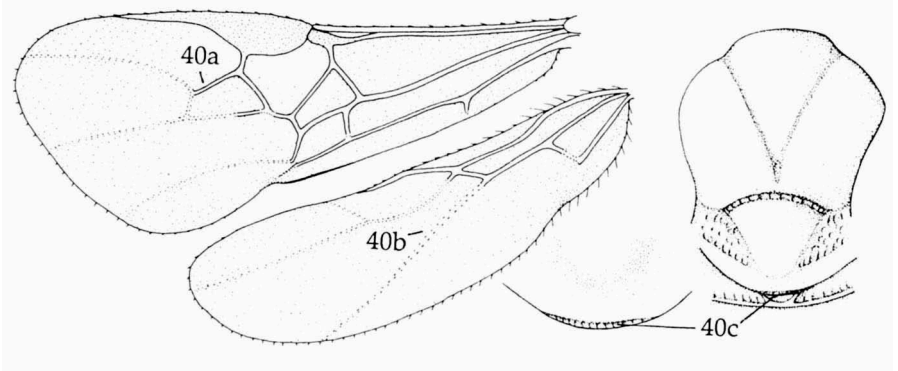


- Occipital carina present laterally (fig. 39aa); spiracles of first tergite in its distinctly sclerotized notum (fig. 39bb) 42

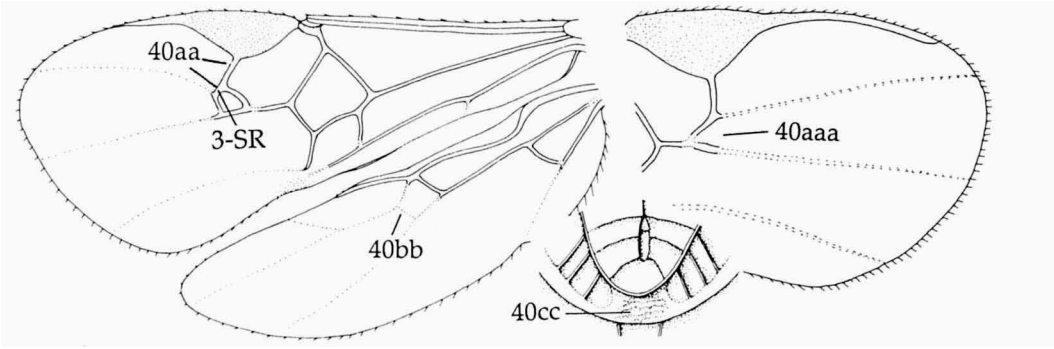


40. Vein 3-SR of fore wing much longer than vein r and sclerotized (fig. 40a); antenna with 20-51 segments, number not fixed; maxillary palp with 6 segments; vein 2r-m of hind wing absent (fig. 40b); scutellum with a more or less developed medio-posterior depression (fig. 40c) ..... **Cardiochilinae**

Small cosmopolitan subfamily of endoparasites of larval Lepidoptera. In semi-arid (sub)tropical areas rather frequently collected.

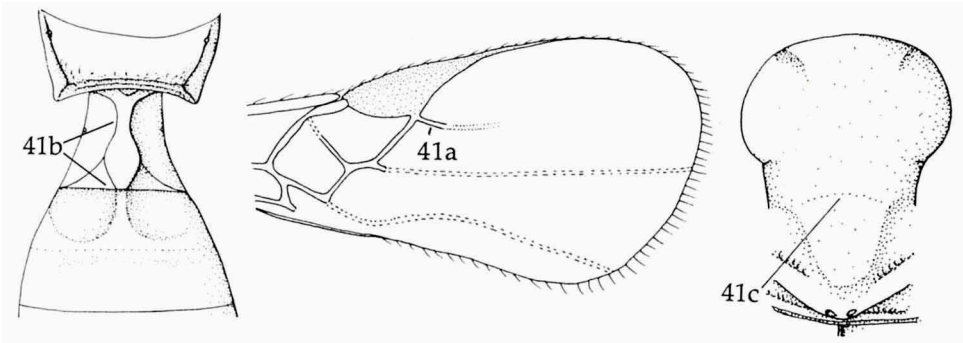


- Vein 3-SR of fore wing shorter than vein r (fig. 40aa) or vein r-m absent (fig. 40aaa); number of antennal segments fixed to 14 or 18; maxillary palp with 5 segments; vein 2r-m of hind wing usually present (fig. 40bb); scutellum without a medio-posterior depression (fig. 40cc), but area may be sculptured 41



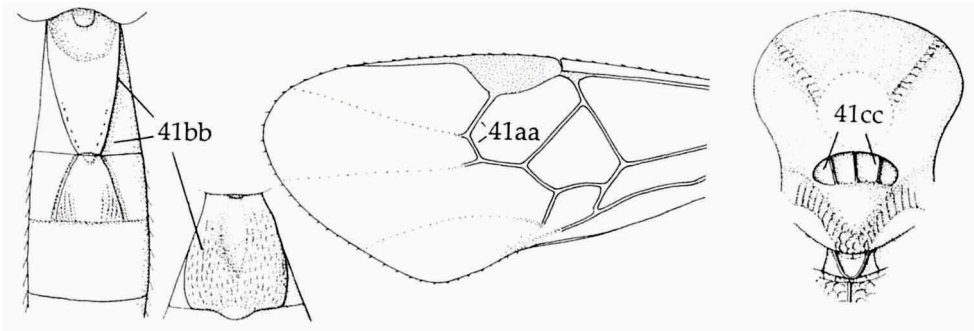
41. Antennae with 14 segments; vein 2-SR of fore wing connected with pterostigma or nearly so (fig. 41a); notum of first metasomal tergite strongly narrowed towards apex and medially (fig. 41b); scutellar sulcus absent (fig. 41c) ..... **Miracinae**

Small cosmopolitan subfamily of endoparasites of larval Lepidoptera. Rather rarely collected.



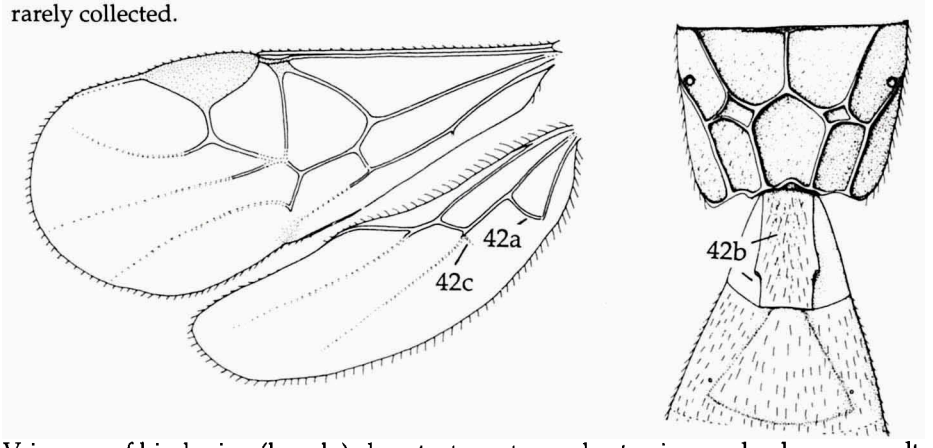
- Antennae with 18 segments; vein 2-SR of fore wing connected to vein r (fig. 41aa); shape of notum of first tergite different, even if strongly narrowed posteriorly (fig. 41bb); scutellar sulcus more or less developed (fig. 41cc) ..... **Microgastrinae**

Very large cosmopolitan subfamily of endoparasites of larval Lepidoptera. This group is very common; among the earliest Braconidae in spring.

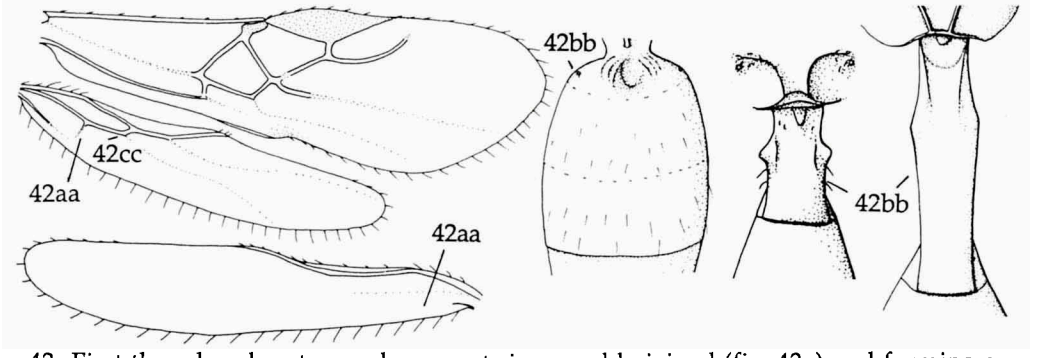


*42. Vein cu-a of hind wing present as a medium-sized tubular vein, forming a closed subbasal cell (fig. 42a); notum of first metasomal tergite constricted behind spiracles (fig. 42b); short trace of vein m-cu of hind wing present (fig. 42c) ..... **Dirrhopinae**

Small Holarctic and Oriental subfamily of endoparasites of larval Lepidoptera. Very rarely collected.

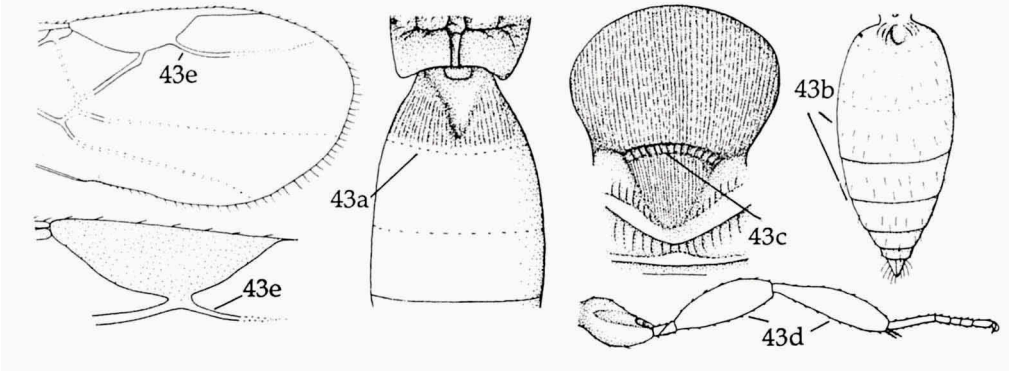


- Vein cu-a of hind wing (largely) absent, at most as a short vein, nearly always resulting in a open subbasal cell (fig. 42aa); notum of first metasomal tergite not constricted behind spiracles (fig. 42bb); without any trace of vein m-cu of hind wing (fig. 42cc) 43

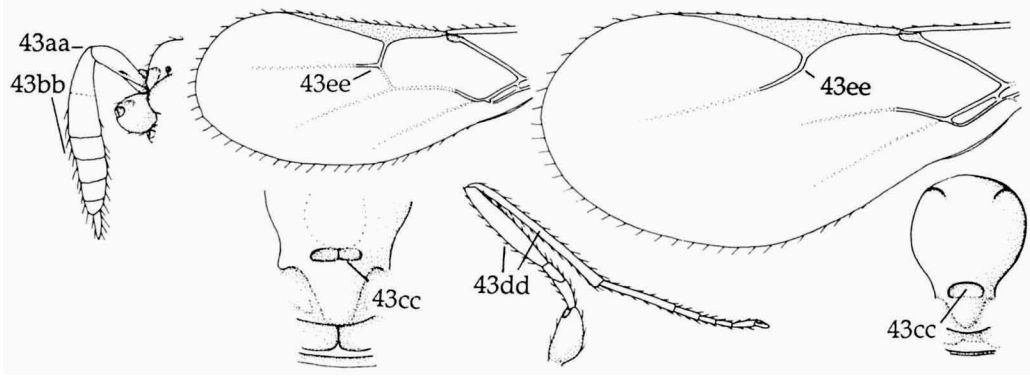


43. First three basal metasomal segments immovably joined (fig. 43a) and forming a flat shield that covers about two-thirds of metasoma (fig. 43b); scutellar sulcus narrow, groove-like and crenulated (fig. 43c); hind leg very robust (fig. 43d); antennal segments 20; vein SR1 of fore wing departing usually from pterostigma or nearly so (fig. 43e) ..... **Adeliinae**

Small cosmopolitan subfamily of endoparasites of larval Lepidoptera. Rarely collected.

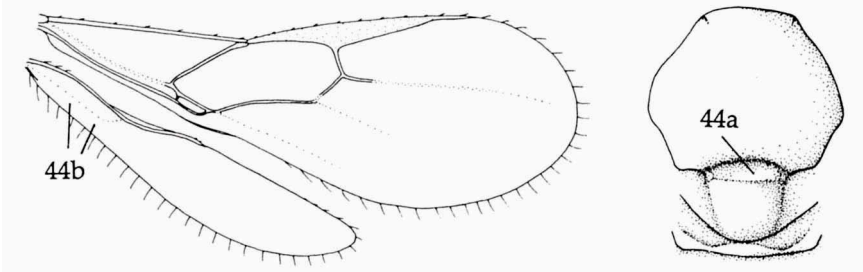


First-third basal segments not forming a shield, first segment movably connected to second tergite (fig. 43aa), not covering covering two-thirds of metasoma (fig. 43bb); scutellar sulcus wide, smooth or with one medial carina (fig. 43cc); hind leg normal (fig. 43dd); antennal segments variable; vein SR1 of fore wing (as far as recognizable) departing usually from vein r (fig. 43ee) 44

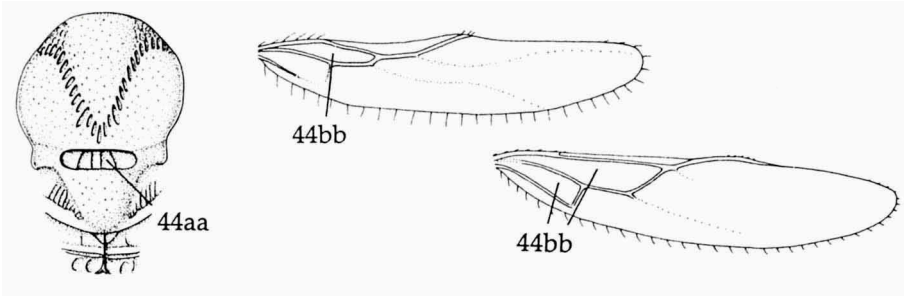


44. Scutellar sulcus smooth (fig. 44a); hind wing usually without a closed cell (fig. 44b) ..... **Aphidiinae**

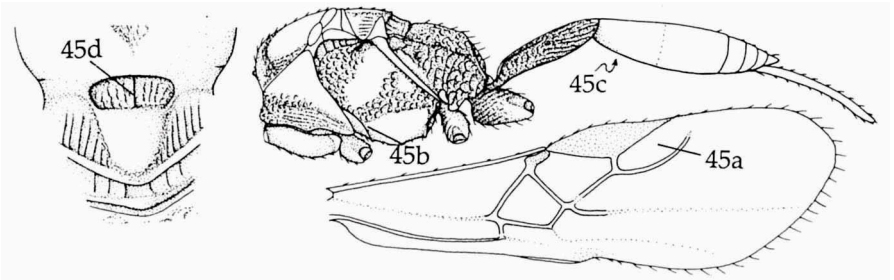
Rather small cosmopolitan subfamily of endoparasites of adult and nymphal (= larval) aphids (Aphididae). Frequently collected.



- Scutellar sulcus with median carina or crenulate (fig. 44aa); hind wing usually with one or two closed cells (fig. 44bb) 45

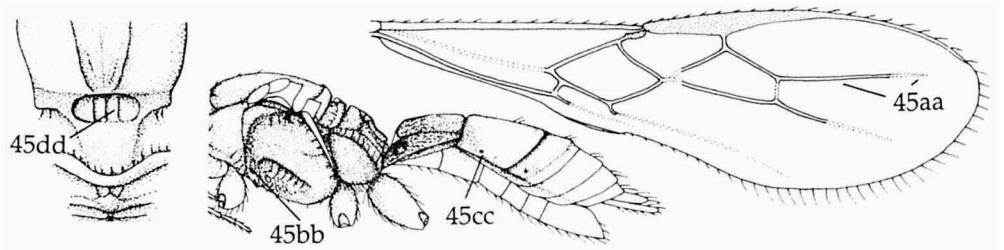


45. Vein SR1 of fore wing curved (fig. 45a); prepectal carina present laterally (fig. 45b); second spiracle of metasoma in epipleuron (fig. 45c); scutellar sulcus with a median carina (fig. 45d) ..... few **Euphorinae**



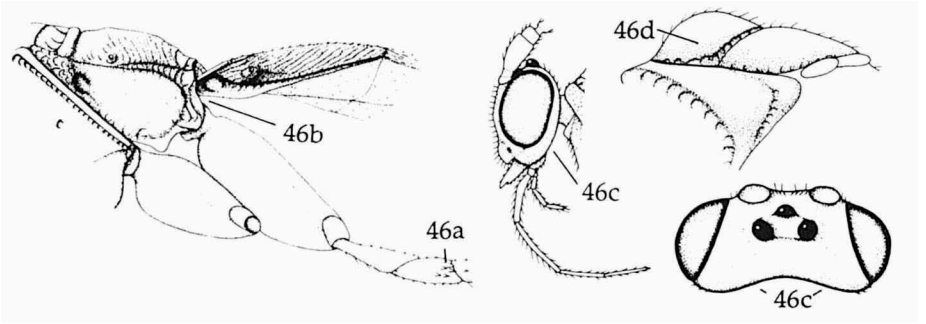
- Vein SR1 of fore wing straight (fig. 45aa); prepectal carina absent laterally (fig. 45bb); second spiracle of metasoma in notum (fig. 45cc); scutellar sulcus with several carinae (fig. 45dd) ..... **Opiinae-Ademonini**

  Small Holarctic tribe of endoparasites of larvae of Ephydriidae living in aquatic plants. Rarely collected.

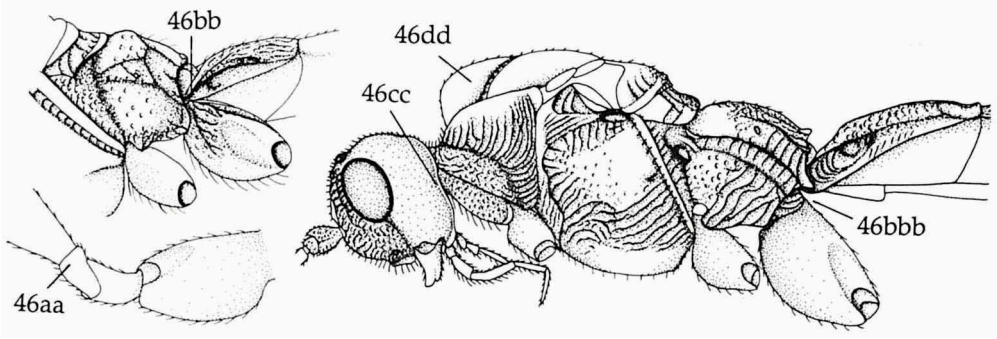


46. Anterior side of all trochantelli with (sub)apical comb of short pegs (fig. 46a), exceptionally pegs absent on hind trochantellus; metasoma connected to propodeum somewhat above hind coxae (fig. 46b); occipital carina absent (fig. 46c); middle lobe of mesoscutum more or less protruding above lateral lobes (fig. 46d) ..... **Macrocentrinae**

  Medium-sized cosmopolitan subfamily of endoparasites of larval Lepidoptera. Rather frequently collected.

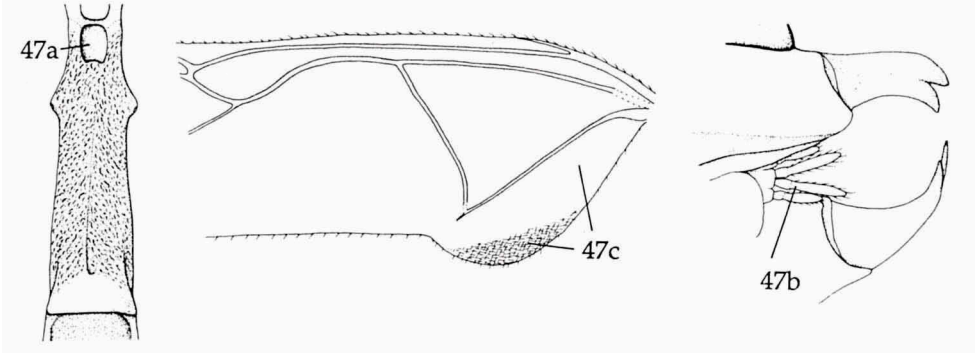


- Trochantelli without pegs (fig. 46aa); metasoma at least partly inserted between hind coxae (fig. 46bb); **if** slightly above hind coxae (fig. 46bbb) **then** occipital carina present (fig. 46cc); middle lobe of mesoscutum similarly convex as lateral lobes (fig. 46dd) 47

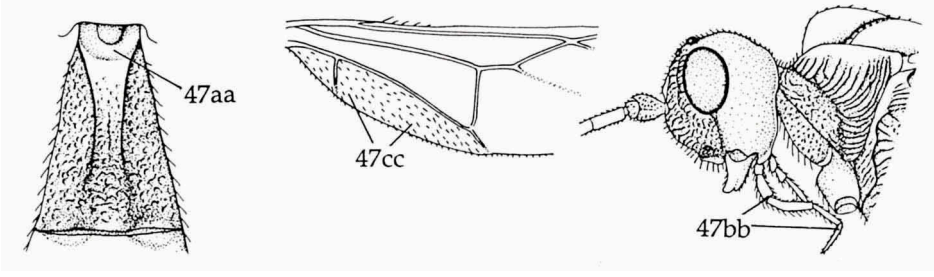


*47.First metasomal tergite with a deep medio-basal hole behind the medio-basal depression (fig. 47a); maxillary palp consists of one segment (fig. 47b); plical lobe of hind wing large and reticulate setose (fig. 47c) ..... **Amicrocentrinae**

Small Afrotropical subfamily, containing endoparasites of boring larvae of Lepidoptera. Rarely collected, usually at light.

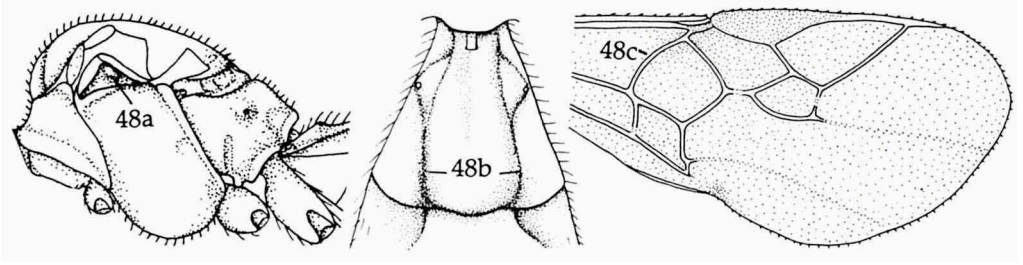


- First metasomal tergite without medio-basal hole behind the medio-basal depression (fig. 47aa); maxillary palp consists of 2-5 segments (fig. 47bb); plical lobe of hind wing at most medium-sized and unidirectional setose (fig. 47cc) 48

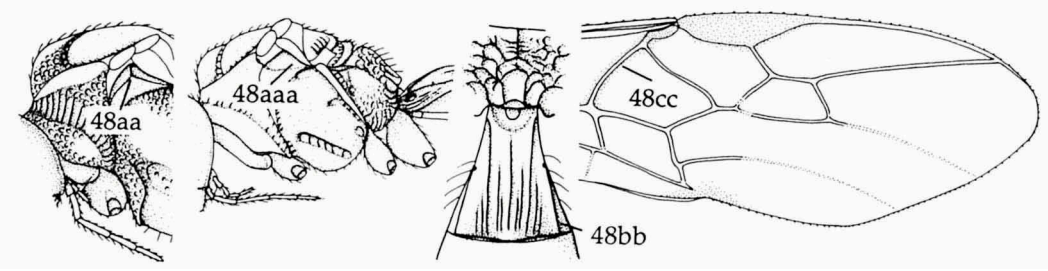


48. Anterior subalar depression with minute smooth and elliptical tubercle (fig. 48a), frequently confluent with anterior subalar prominence; notum of first metasomal tergite not sharply differentiated from its epipleuron (fig. 48b); vein 1-M of fore wing evenly curved (fig. 48c) ..... **Proteropinae**

Small subfamily of koinobiont endoparasites of larval Hymenoptera (Symphyta: Tenthredinoidea: mainly Argidae). Rarely collected; occurring in the New World, Palaearctic and Oriental regions.

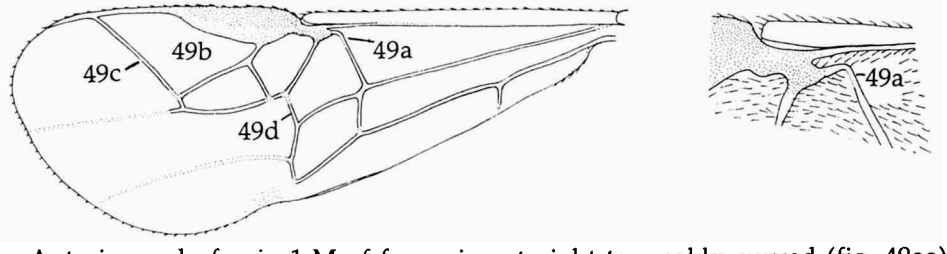


- Anterior subalar depression with carina(e) (fig. 48aa) or completely smooth (fig. 48aaa); notum differentiated from its epipleuron (fig. 48bb); vein 1-M of fore wing straight (fig. 48cc), at least partially if abruptly curved anteriorly (fig. 49a) 49

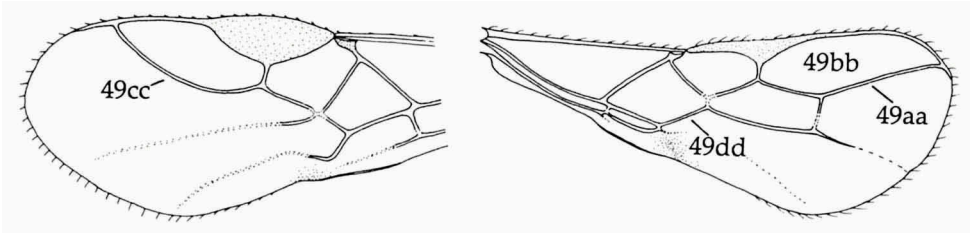


49. Anterior end of vein 1-M of fore wing abruptly curved (fig. 49a); marginal cell of fore wing short (fig. 49b) and vein SR1 nearly straight (fig. 49c); vein m-cu of fore wing nearly vertical (fig. 49d); (macropterous) ..... **Ichneutinae-Ichneutini**

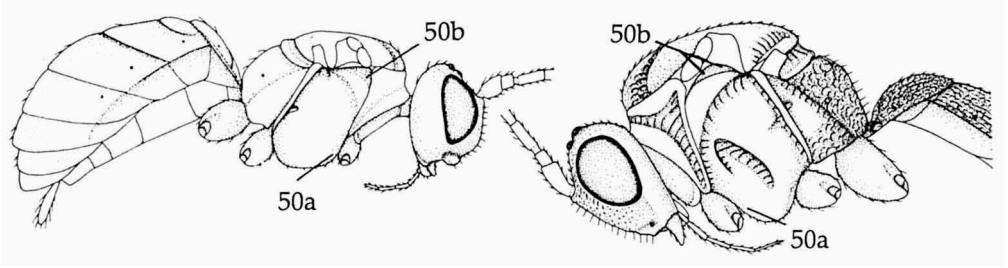
Small cosmopolitan tribe of endoparasites of larval Hymenoptera (Symphyta: Tenthredinoidea). Rarely collected.



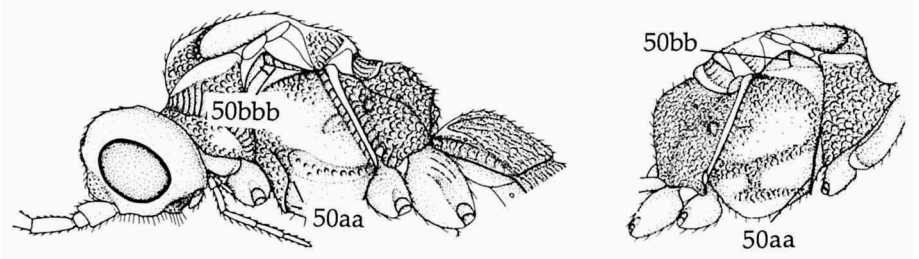
- Anterior end of vein 1-M of fore wing straight to weakly curved (fig. 49aa); marginal cell of fore wing usually longer (fig. 49bb) or vein SR1 curved (fig. 49cc); vein m-cu of fore wing nearly vertical (fig. 49dd); (wingless or brachypterous specimens included here) 50



50. Prepectal carina absent laterally (fig. 50a); anterior subalar depression smooth (fig. 50b) 51

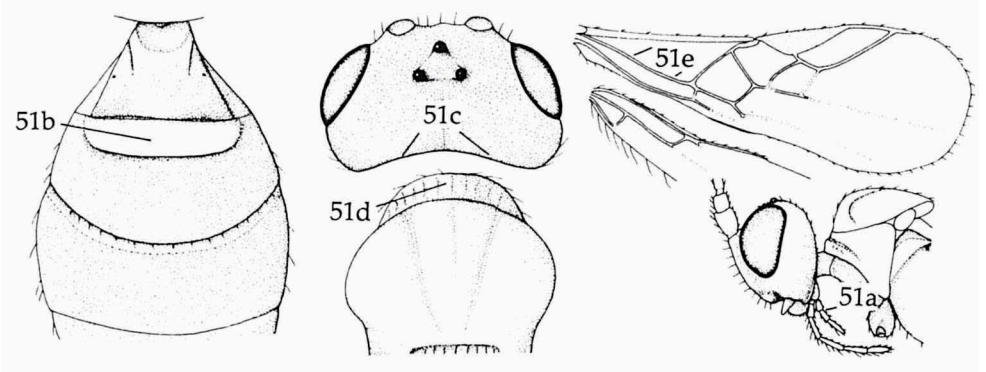


- Prepectal carina present laterally (fig. 50aa); anterior subalar depression usually with median carina (fig. 50bb), or crenulated (fig. 50bbb) 52



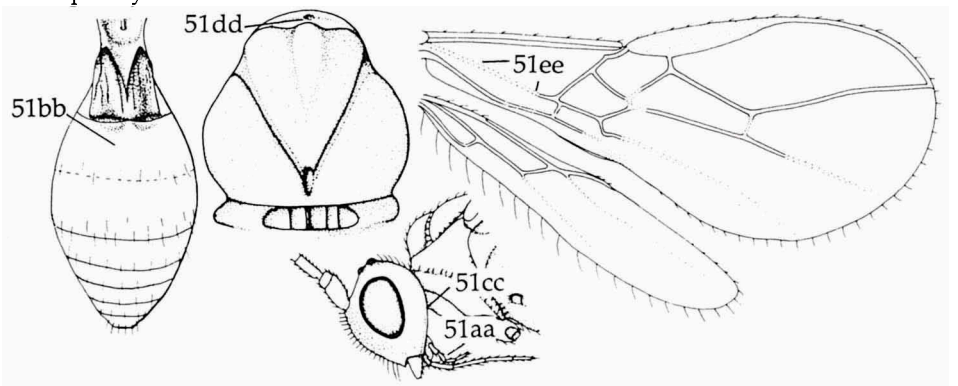
51. Labial palp with 3 segments (fig. 51a); second metasomal tergite usually with a transverse elevated area basally (fig. 51b); main part of occipital carina (fig. 51c) and pronope (fig. 51d) absent; vein M+CU1 of fore wing completely sclerotized (fig. 51e) ..... **Gnamptodontinae**

Small cosmopolitan subfamily of (?endo-)parasites of larval Lepidoptera. Rarely collected.



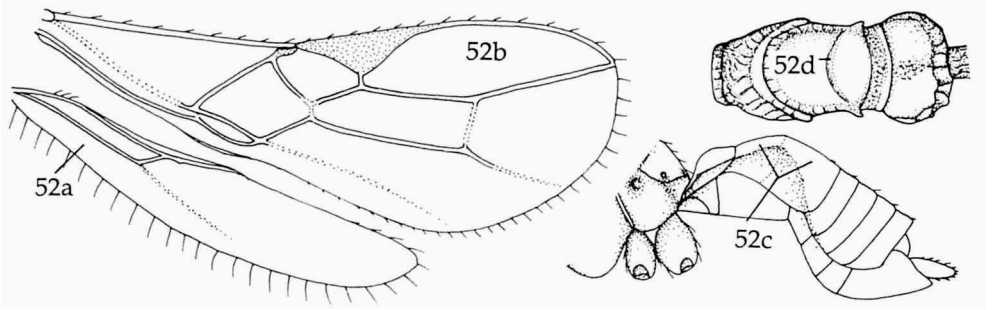
- Labial palp with 4 segments (fig. 51aa); second tergite without transverse elevated area (fig. 51bb); occipital carina usually present laterally (fig. 51cc); pronope more or less developed (fig. 51dd); vein M+CU1 of fore wing often (partly) unsclerotized (fig. 51ee) ..... **Opiinae**

  Large cosmopolitan subfamily of endoparasites of larval cyclorraphous Diptera. Frequently collected.

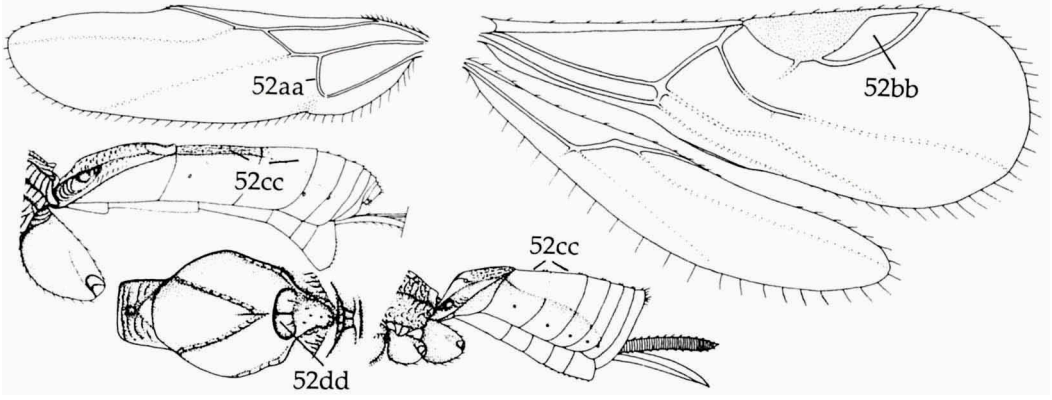


52. Vein cu-a of hind wing absent (fig. 52a); marginal cell of fore wing moderately long (fig. 52b); metasomal tergites weakly sclerotized (fig. 52c); maxillary palp with 4 segments; **if** wingless then scutellar sulcus smooth (fig. 52d, belonging to the Aphidiini) ..... **Aphidiinae-Ephedrini**

  Small nearly cosmopolitan tribe (except S America) of endoparasites of adult and nymphal (= larval) aphids (Aphididae). Rather frequently collected.

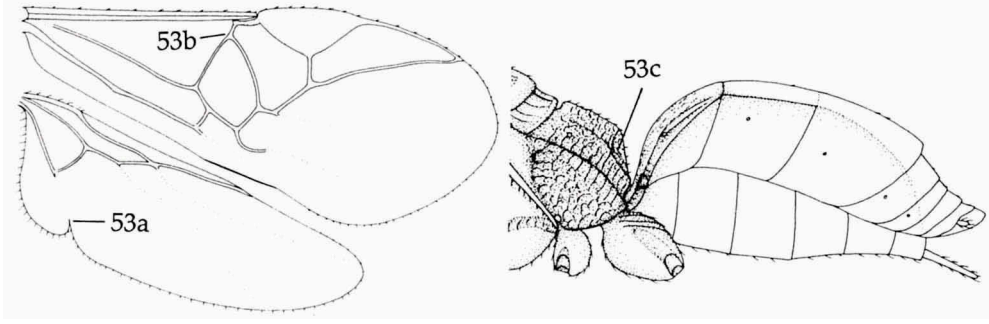


- Vein cu-a of hind wing present (fig. 52aa); **or** marginal cell of fore wing very short (fig. 52bb); metasomal tergites moderately to strongly sclerotized (fig. 52cc); maxillary palp with 5-6 segments, exceptionally fewer than 5; if wingless then scutellar sulcus with median carina (fig. 52dd) 53

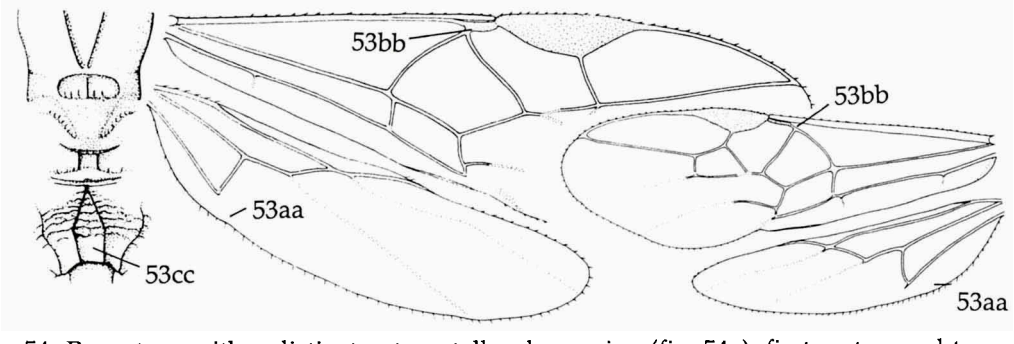


*53. Plical cell of hind wing separated from the rest of wing by a distinct cleft apically (fig. 53a); vein 1-SR of fore wing vertical and medium-sized (fig. 53b); areola of propodeum very large (fig. 53c); (no wingless or brachypterous specimens known) ..... **Ecnomiinae**

Small Palaeotropical and East Palaearctic subfamily. The biology is unknown and specimens are rarely collected.

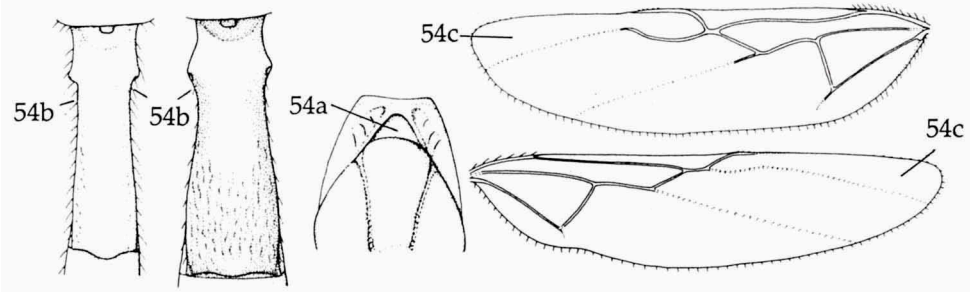


- Plical cell of hind wing without a distinct cleft apically (fig. 53aa); vein 1-SR of fore wing absent or short (fig. 53bb) or medium-sized and oblique (fig. 53bbb); areola of propodeum absent or at most medium-sized (fig. 53cc); wingless or brachypterous specimens included here 54

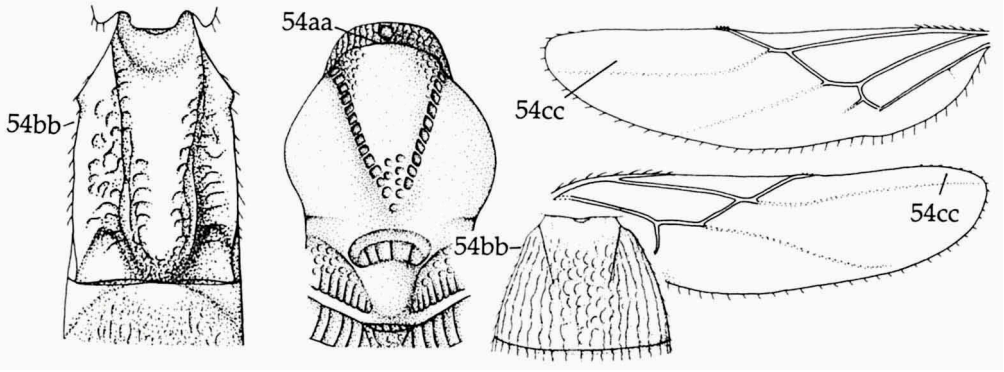


54. Pronotum with a distinct antescutellar depression (fig. 54a); first metasomal tergite distinctly narrowed behind spiracles (fig. 54b); marginal cell of hind wing widened apically (fig. 54c) ..... **Homolobinae** s.s.

Small cosmopolitan subfamily of endoparasites of exposed living larval Lepidoptera. Mainly and rather frequently collected at light.

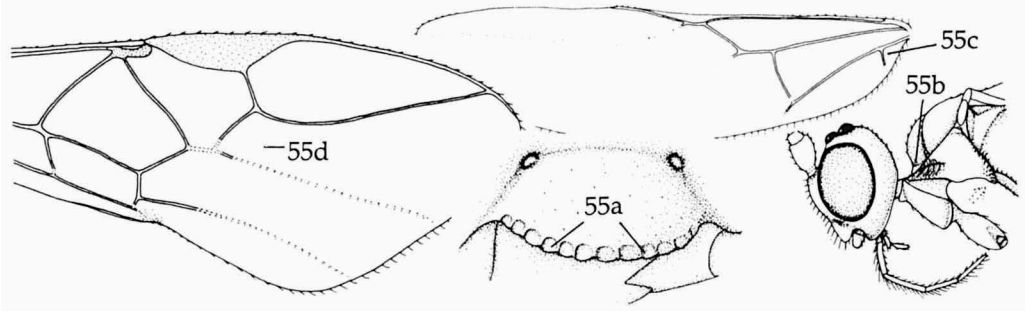


- Antescutellar depression of pronotum absent (fig. 54aa); first tergite almost always not or only slightly narrowed behind spiracles (fig. 54bb); marginal cell of hind wing usually parallel-sided or narrowed apically (fig. 54cc) 55

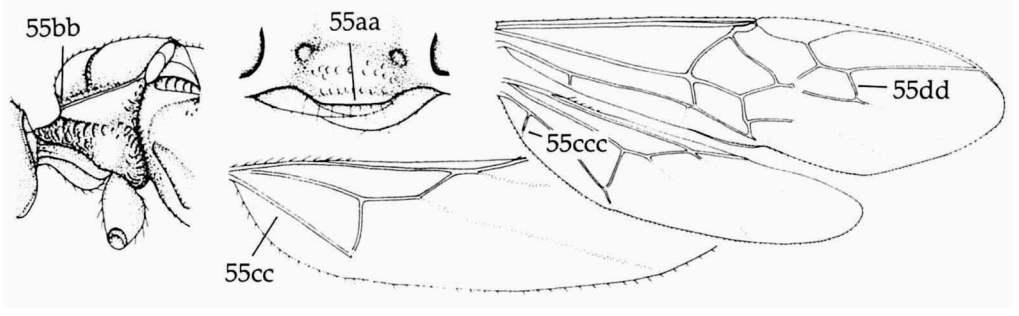


55. Ventral rim of clypeus with row of almost confluent punctures (fig. 55a); mesoscutum protruding anteriorly (fig. 55b); vein 2A of hind wing present (fig. 55c) **and** vein r-m of fore wing absent (fig. 55d) ..... **Charmontinae**

Small cosmopolitan subfamily of endoparasites of hidden living larval Lepidoptera. In the Holarctic region rather frequently collected; rarely on the southern hemisphere.

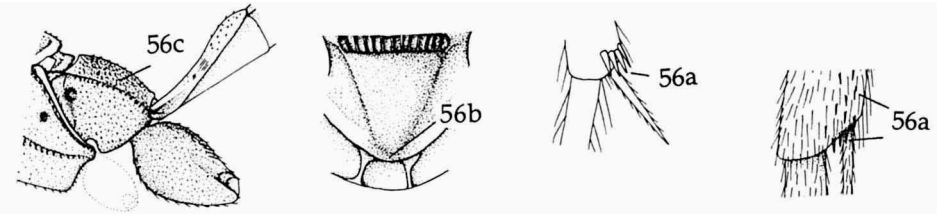


- Clypeus without such a row of punctures ventrally (fig. 55aa); mesoscutum not protruding anteriorly (fig. 55bb); vein 2A of hind wing usually absent (fig. 55cc), **if** present (fig. 55ccc) then is vein r-m of fore wing present (fig. 55dd) 56

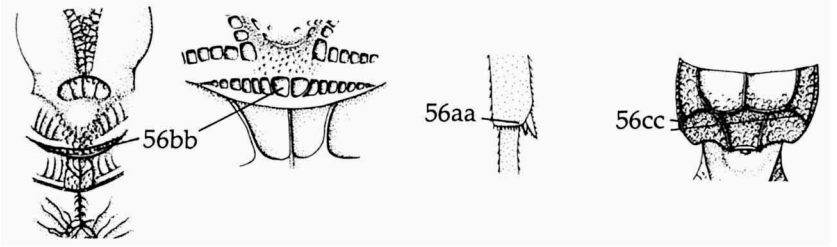


56. Hind tibia with pegs near base of spurs (fig. 56a); **if** very exceptionally absent, **then** scutellum without crenulate depression medio-posteriorly (fig. 56b); costulae of propodeum absent or nearly so (fig. 56c) ..... **Orgilinae**

Small cosmopolitan subfamily of endoparasites of larval Lepidoptera. Rather frequently collected in the Holarctic region.

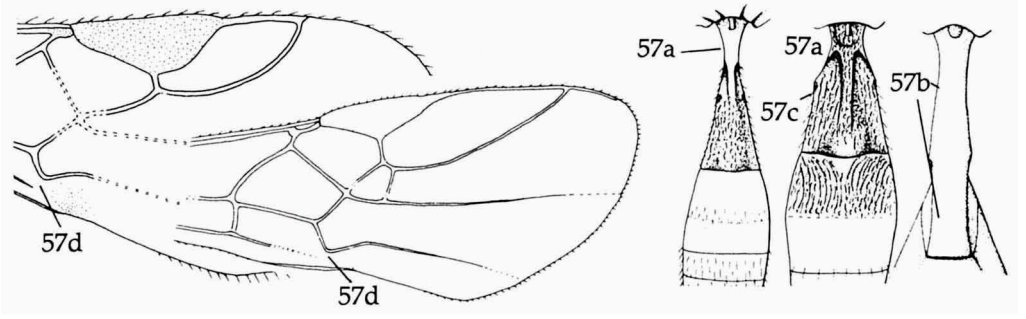


- Hind tibia without pegs near base of spurs (fig. 56aa); scutellum with crenulate depression medio-posteriorly (fig. 56bb); marginal cell of fore wing wide (fig. 56cc) or absent; **if** with narrow cell, **then** vein SR1 distinctly curved (fig. 56dd); costulae of propodeum usually present (fig. 56ee) 57

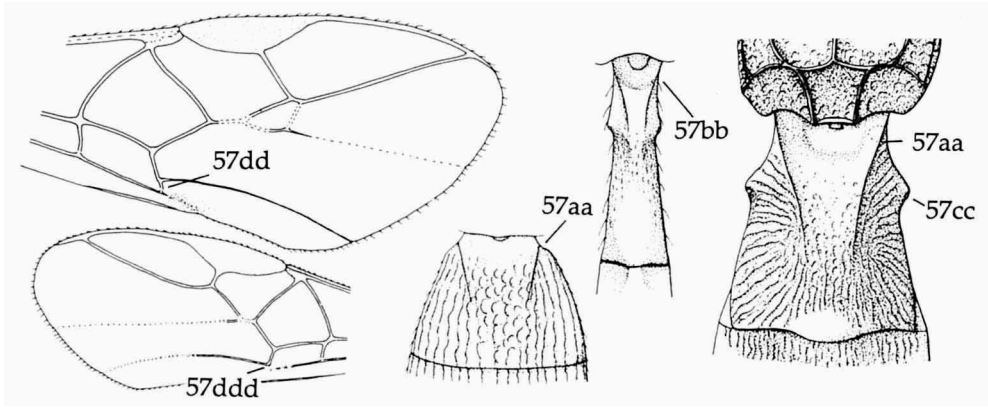


57. First metasomal tergite distinctly petiolate (fig. 57a) or very elongate (fig. 57b); spiracle of first tergite usually medially or behind middle of tergite (fig. 57c); vein CU1b of fore wing absent or nearly so (fig. 57d) ..... **Euphorinae**

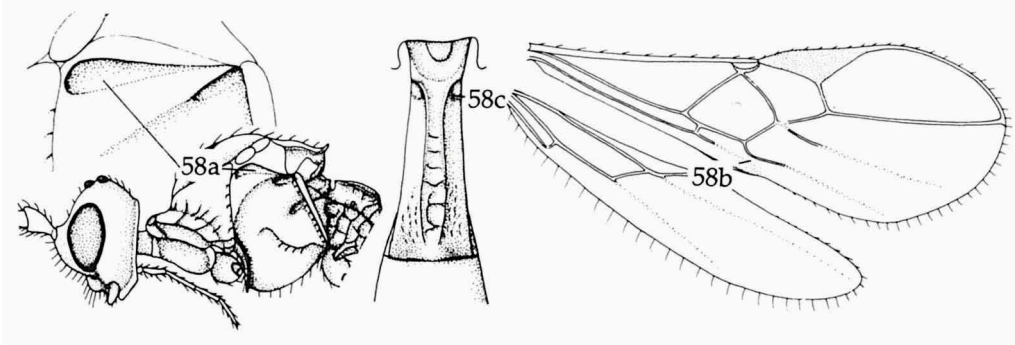
Rather large cosmopolitan subfamily of endoparasites of larval Lepidoptera (Meteorini), of larval and adult Coleoptera, and of mainly adult Heteroptera, Hymenoptera, Neuroptera, Psocoptera and Orthoptera. Frequently collected.



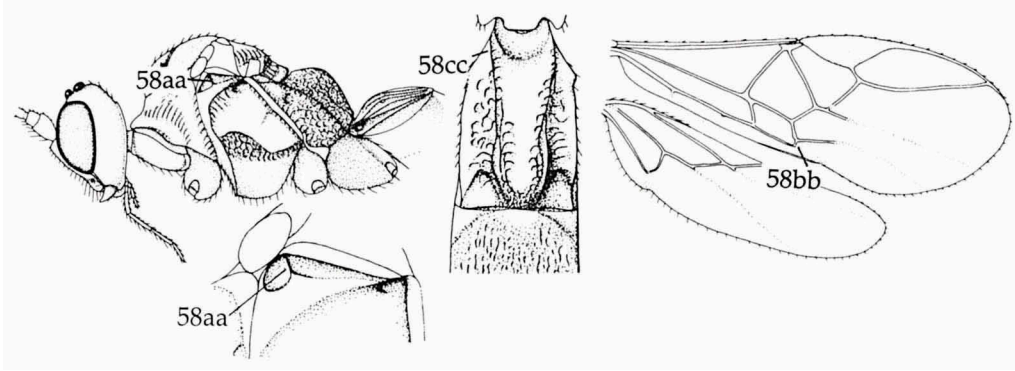
- First tergite sessile (fig. 57aa), and at most moderately elongate (fig. 57bb); spiracle of first tergite situated before middle of tergite, exceptionally medially (fig. 57cc); vein CU1b of fore wing variable (fig. 57dd, 57ddd) 58



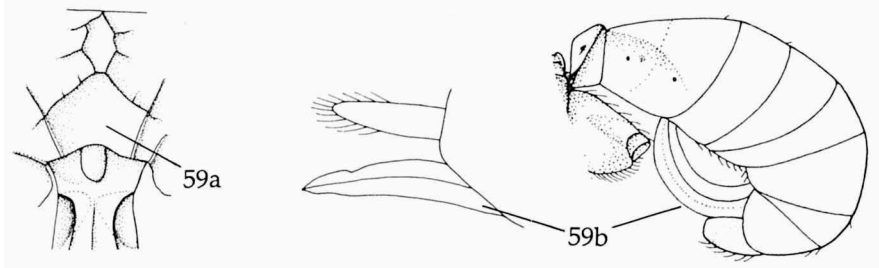
58. Anterior subalar depression smooth (fig. 58a); vein CU1b of fore wing absent (fig. 58b); dorsope nearly always present (fig. 58c) 59



- Anterior subalar depression with at least one carina (fig. 58aa); vein CU1b of fore wing usually present (fig. 58bb); dorsope usually absent (fig. 58cc) 60

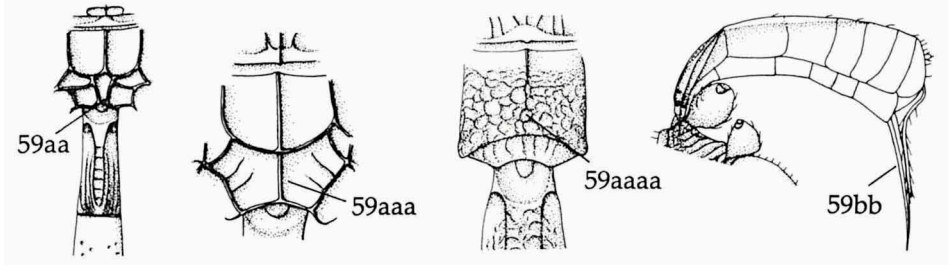


59. Propodeum with a wide areola posteriorly (fig. 59a); ovipositor comparatively deep in lateral view (fig. 59b) ..... few **Euphorinae**



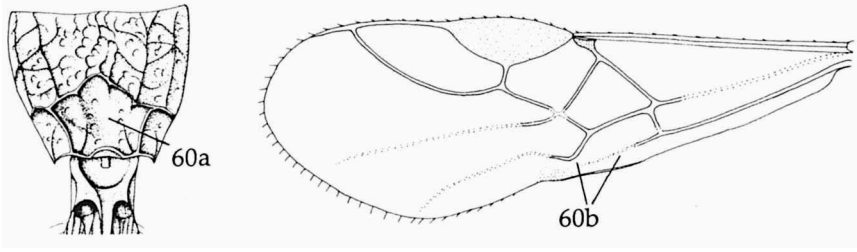
- Propodeum with a comparatively narrow areola (fig. 59aa), or with a median carina (fig. 59aaa), or surface largely and densely reticulate (fig. 59aaaa); ovipositor slender (fig. 59bb) ..... **Blacinae**

  Rather small cosmopolitan subfamily of endoparasites of larval Coleoptera and Mecoptera. Rather frequently collected.

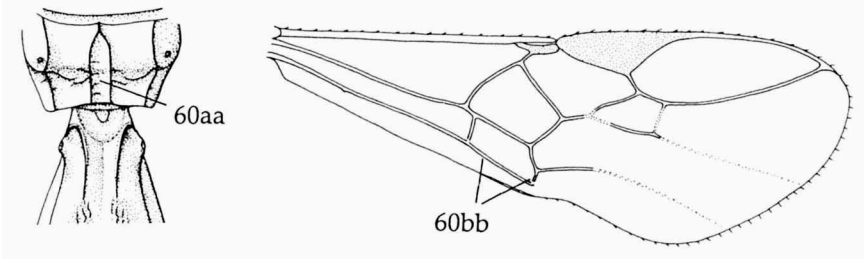


60. Propodeum with comparatively wide areola (fig. 60a); vein CU1b and usually most of vein 2-1A unsclerotized or absent (fig. 60b) ..... **Euphorinae**

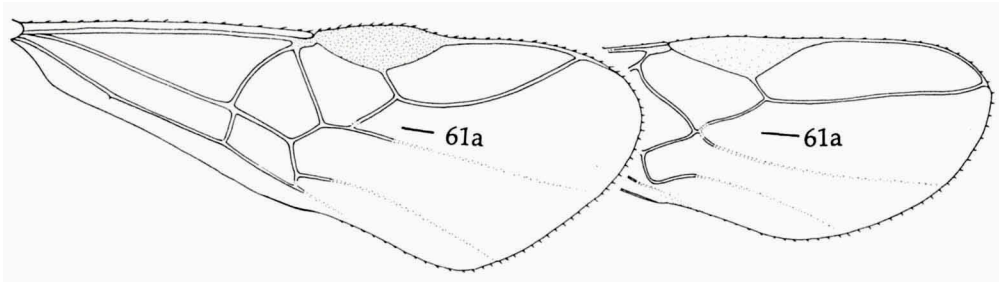
  Rather large cosmopolitan subfamily of endoparasites of larval Lepidoptera (Meteorini), of larval and adult Coleoptera, and of mainly adult Heteroptera, Hymenoptera, Neuroptera, Psocoptera and Orthoptera. Frequently collected.



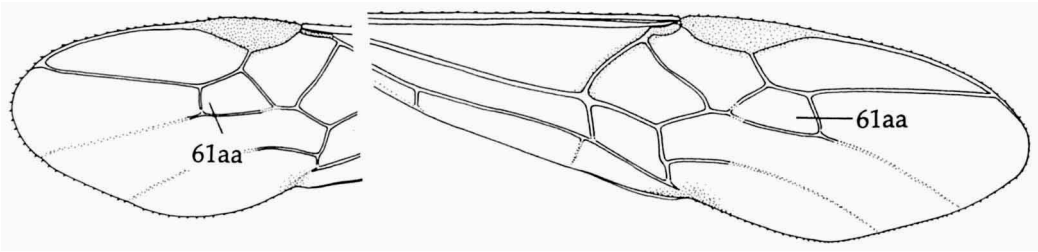
- Propodeum with narrow areola (fig. 60aa) or areola obsolescent; veins CU1b and 2-1A usually sclerotized (fig. 60bb) 61



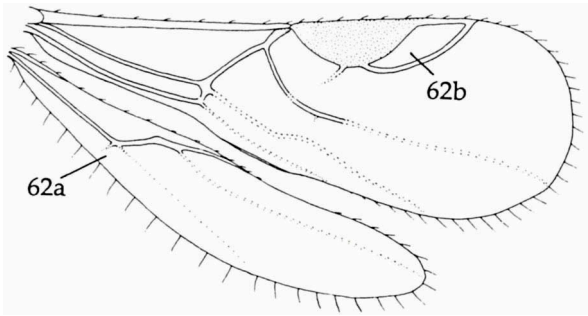
61. Vein r-m of fore wing absent, as a result without closed second submarginal cell (fig. 61a) 62



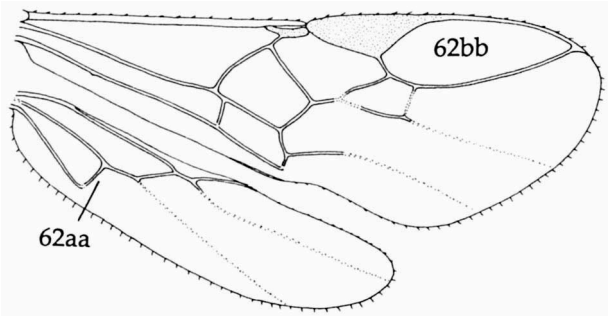
- Vein r-m of fore wing present, resulting in a closed second submarginal cell (fig. 61aa) 65



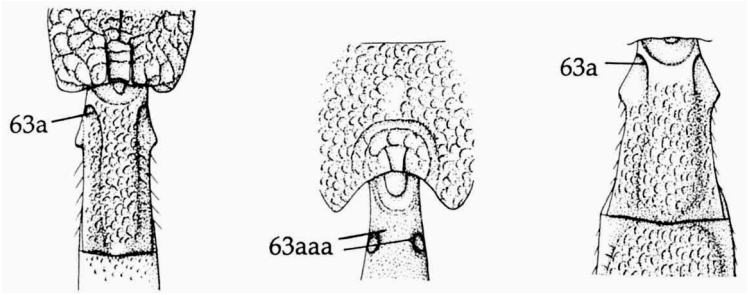
62. Vein cu-a of hind wing absent or only indicated by a very weak, unsclerotized spur (fig. 62a); marginal cell of fore wing small (fig. 62b) ..... few **Euphorinae**



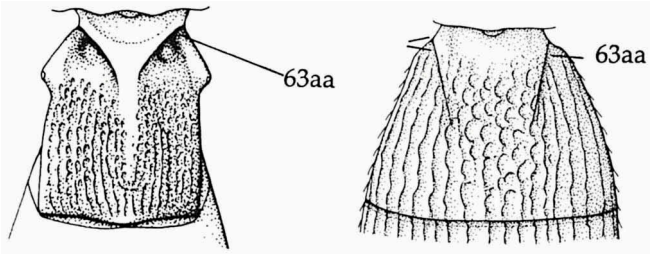
- Vein cu-a of hind wing present and tubular (fig. 62aa); marginal cell of fore wing medium-sized to large (fig. 62bb) 63



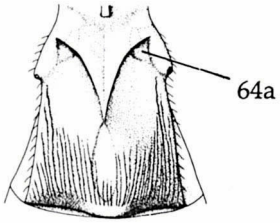
63. Dorsal carinae of first metasomal tergite more or less curved anteriorly (fig. 63a) or dorsal carina absent (fig. 63aaa) ..... few **Blacinae**



- Dorsal carinae of first tergite running directly to margin of tergite anteriorly and at least basally distinct (fig. 63aa) 64

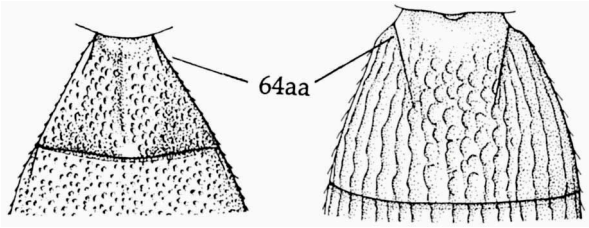


64. Dorsope of first metasomal tergite present (fig. 64a) ..... few **Euphorinae**

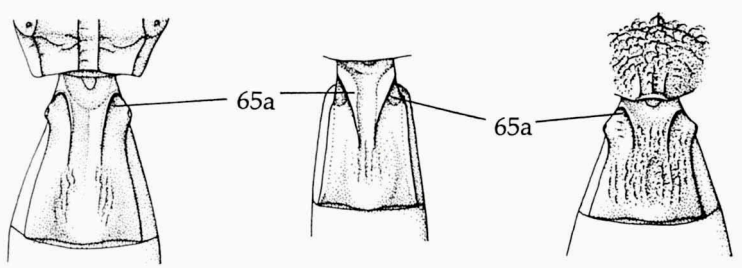


- Dorsope of first tergite absent (fig. 64aa) ..... **Helconinae-Brachistini**

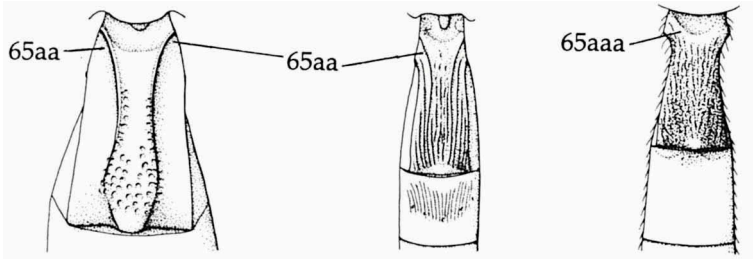
Rather small cosmopolitan tribe of parasites of larval Coleoptera. Rather frequently collected.



65. Dorsal carinae of first metasomal tergite (weakly) curved anteriorly (fig. 65a) .... few **Blacinae**

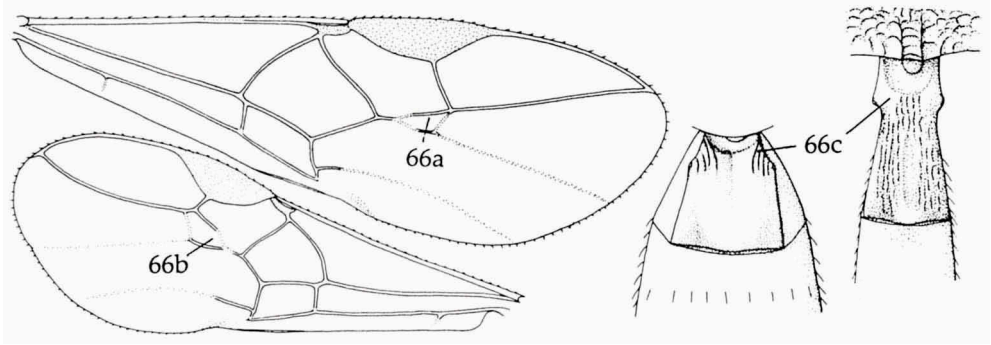


- Dorsal carinae of first tergite running directly to margin of tergite anteriorly (fig. 65aa) or carinae absent anteriorly (fig. 65aaa) 66



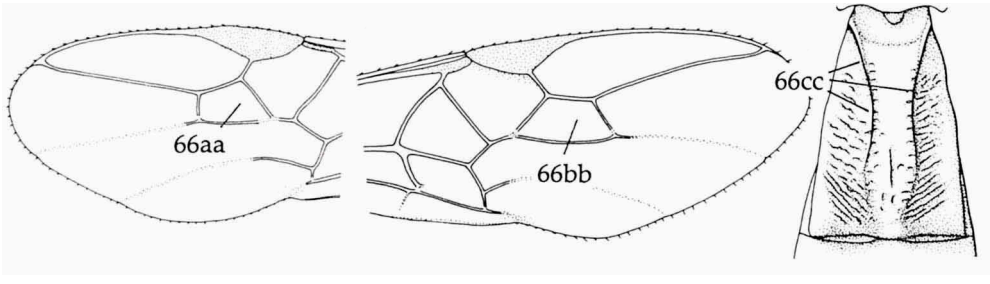
66. Second submarginal cell of fore wing small and triangular (fig. 66a) or narrow trapezoid (fig. 66b); dorsal carinae of first metasomal tergite weakly developed or absent basally (fig. 66c) ..... **Microtypinae**

Small cosmopolitan subfamily of endoparasites of larval Lepidoptera. Rather infrequently collected, mostly at light.



- Second submarginal cell of fore wing medium-sized and quadrangular (fig. 66aa), or wide trapezoid (fig. 66bb); dorsal carinae of first tergite usually distinctly developed basally (fig. 66cc) ..... **Helconinae**

Rather small cosmopolitan subfamily of parasites of larval Coleoptera. Rather frequently collected.



Acknowledgements

I am grateful to Dr D.L.J. Quicke (Sheffield) for his numerous valuable suggestions and remarks, for creating the opportunity for testing the key during the courses on parasitic Hymenoptera in Sheffield, for the permission to use part of his unpublished results and for using some of his SEM-photographs; to Dr M.R. Shaw (Edinburgh) for the numerous suggestions on an earlier draft; Ms I. Henneke and Mr A. Marks for the reproduction and manufacturing of the SEM-photographs.

References

Achterberg, C. van, 1976. A preliminary key to the subfamilies of the Braconidae (Hymenoptera).— Tijdschr. Ent. 119: 33-78, figs 1-123.

Achterberg, C. van, 1984. Essay on the phylogeny of Braconidae (Hymenoptera: Ichneumonoidea).— Ent. Tidskr. 105: 41-58, figs 1-17.

Achterberg, C. van, 1988a. Parallelisms in the Braconidae (Hymenoptera) with special reference to the biology.— Advances Par. Hym. Res.: 85-115, figs 1-101.

Achterberg, C. van, 1988b. Revision of the subfamily Blacinae Foerster (Hymenoptera, Braconidae).— Zool. Verh. Leiden 249: 1-324, figs 1-1250.

Achterberg, C. van, 1990. Illustrated key to the subfamilies of the Holarctic Braconidae (Hymenoptera: Ichneumonoidea).— Zool. Med. Leiden 64: 1-20, figs 1-26.

Eady, R.D., 1974. The present state of nomenclature of wing venation in the Braconidae (Hymenoptera),; its origins and comparison with related groups.— J. Ent. (B)43: 63-74, figs 1-10.

Edson, K.M. & S.B. Vinson, 1979. A comparative morphology of the venom apparatus of female braconids (Hymenoptera: Braconidae).— Can. Ent. 111: 1013-1024, figs 1-2, table 1.

Maetô, K., 1987. A comparative morphology of the male internal reproductive organs of the family Braconidae (Hymenoptera, Ichneumonoidea).— Kontyû 55: 32-42.

Quicke, D.L.J. & C. van Achterberg, 1990. Phylogeny of the subfamilies of the family Braconidae (Hymenoptera: Ichneumonoidea).— Zool. Verh. Leiden 258: 1-95, figs 1-180.

Quicke, D.L.J., L. Ficken & M.G. Fitton, 1992. New diagnostic ovipositor characters for doryctine wasps (Hymenoptera, Braconidae).— J. nat. Hist. 26: 1035-1046, figs 1-29.

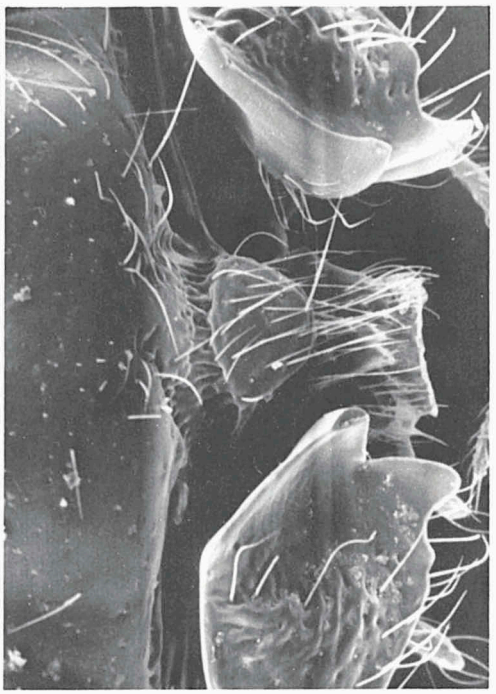
Shaw, M.R. & T. Huddleston, 1991. Classification and biology of braconid wasps (Hymenoptera: Braconidae).— Handbk Ident. Br. Ins. 7(11): 1-126, figs 1-126.

Tobias, V.I., 1988. Novoe podsemejstvo Brakonid (Hymenoptera, Braconidae) iz Avstralii.— Ent. Obozr. 67: 644-648.

Received: 24.iii.1992, revised 26.v.1992
Accepted: 9.vi.1993
Edited: R. de Jong

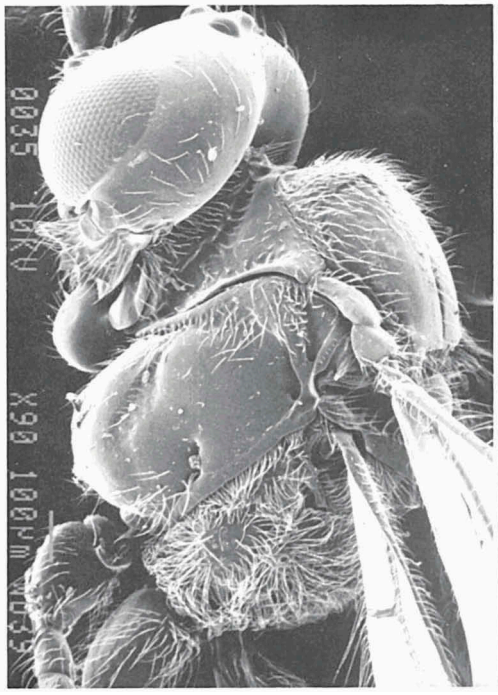
ALYSIINAE-DACNUSINI

Photo 1. *Lepton* spec., ♀.



ALYSIINAE-ALYSIINI

Photo 2. *Gnathopleura ridibunda* (Say), ♀.



ALYSIINAE-DACNUSINI

Photo 3. *Chorebus* spec., ♀.

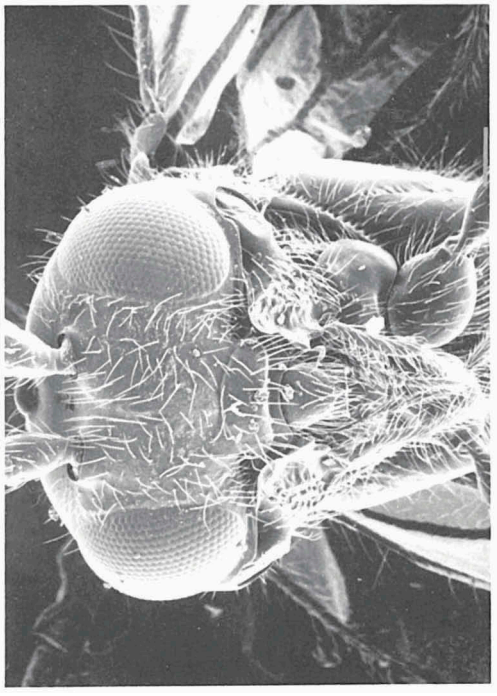


Photo 4. *Chorebus* spec., ♀.

Photo 5. *Agathis malvacearum* Latreille, ♀.

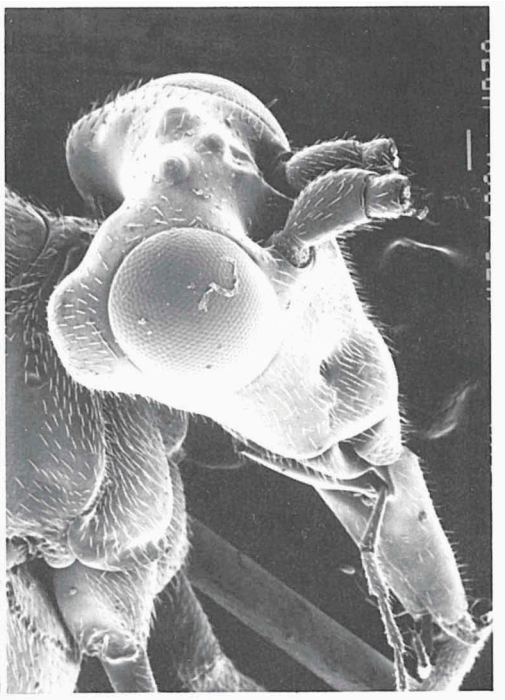


Photo 6. *Agathis malvacearum* Latreille, ♀.

AGATHIDINAE-AGATHIDINI

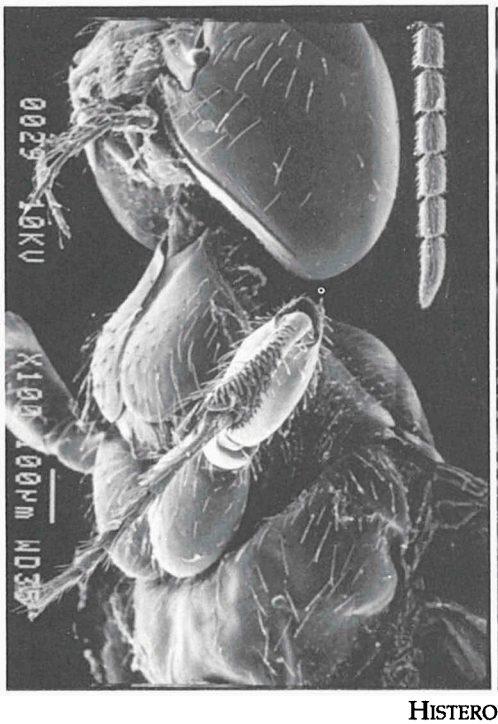


Photo 7. *Histeromerus canadensis* Ashmead, ♀.

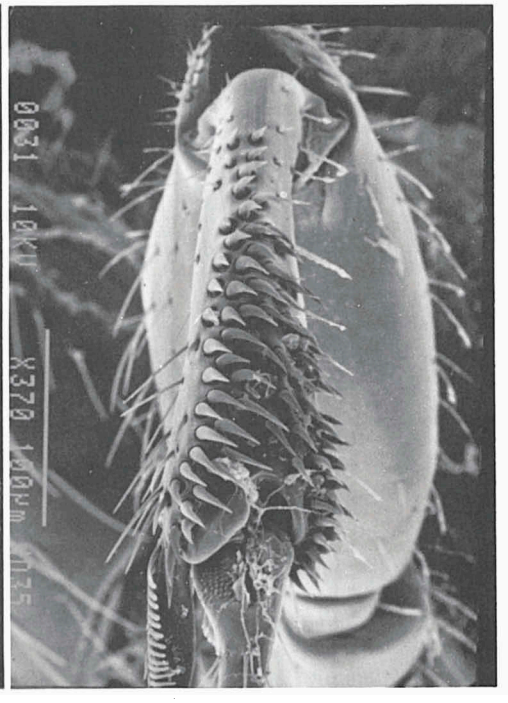
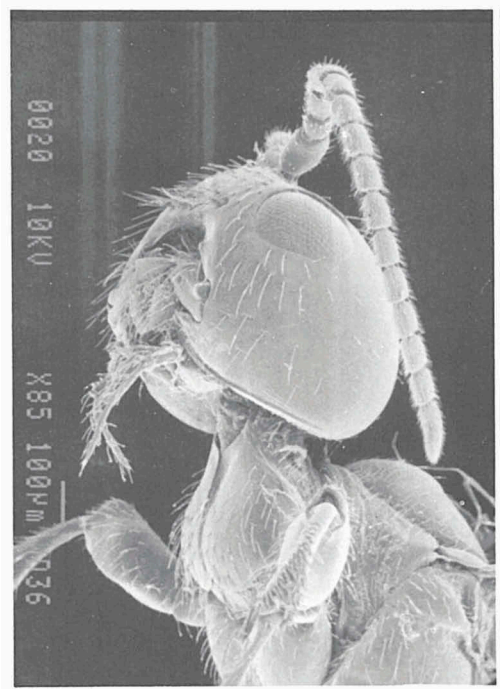
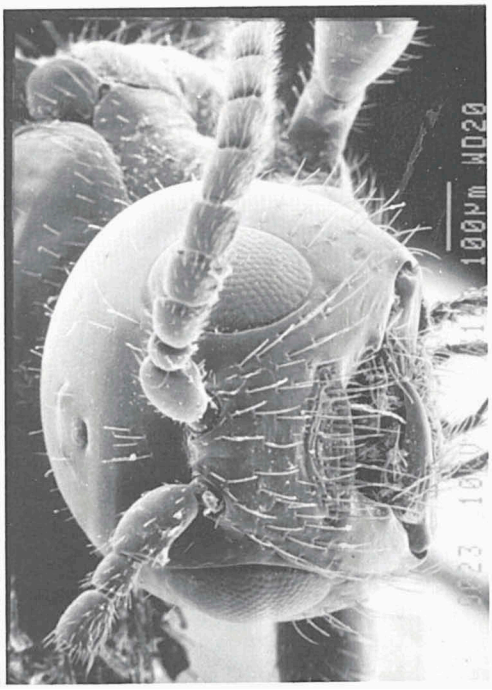


Photo 8. *Histeromerus canadensis* Ashmead, ♀.

HISTEROMERINAE

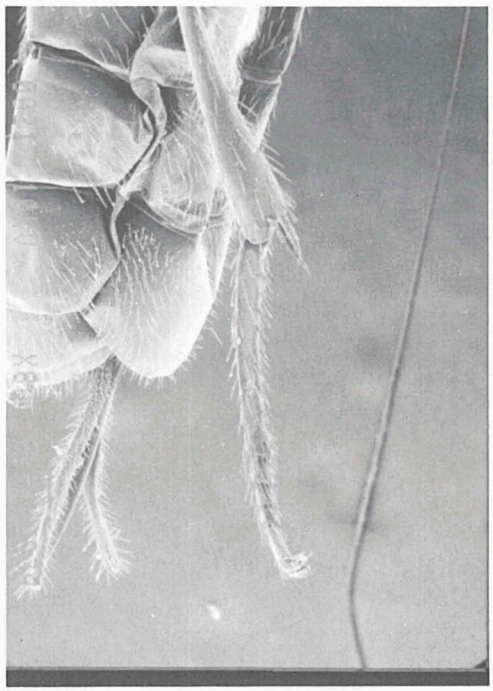


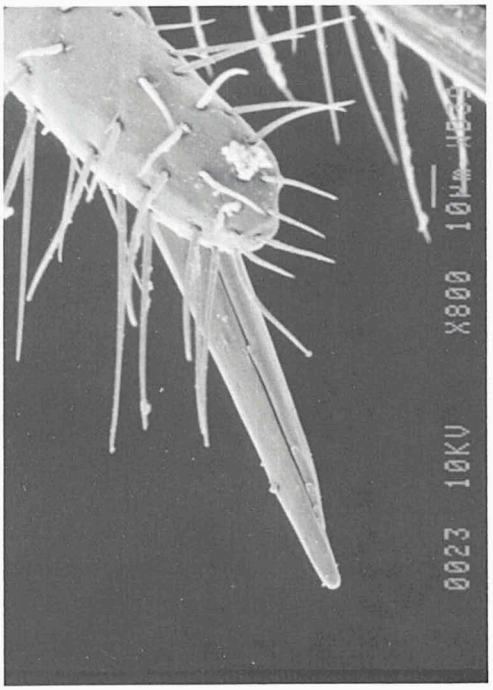


HISTEROMERINAE

Photo 9. *Histeromerus canadensis* Ashmead, ♀.

Photo 10. *Histeromerus canadensis* Ashmead, ♀.





HISTEROMERINAE

Photo 11. *Histeromerus canadensis* Ashmead, ♀.

Photo 12. *Histeromerus canadensis* Ashmead, ♀.

EUPHORINAE-COSMOPHORINI

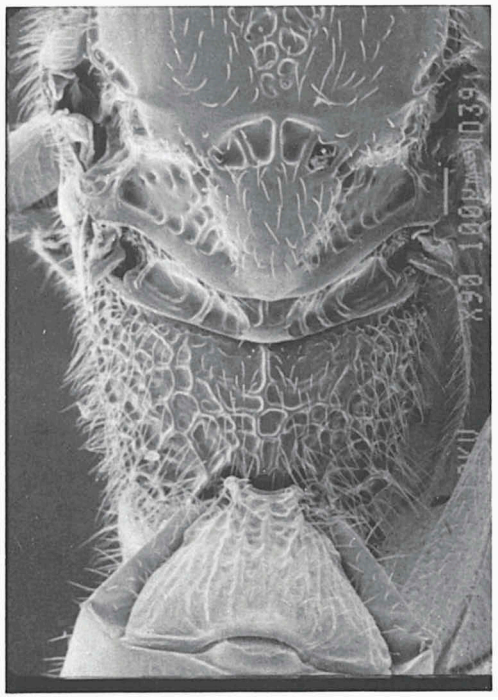
Photo 13. *Cosmophorus cembrae* Ruschka, ♀.

Photo 14. *Cosmophorus cembrae* Ruschka, ♀.

MESOSTOINAE

Photo 15. *Mesostoa kerri* Austin & Wharton, ♀.

Photo 16. *Mesostoa kerri* Austin & Wharton, ♀.



CENOCOELIINAE

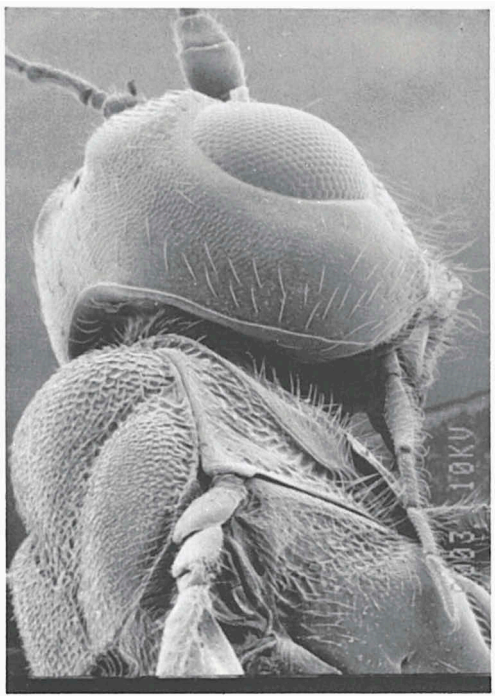
Photo 17. *Cenocoelius analis* (Nees), ♀.

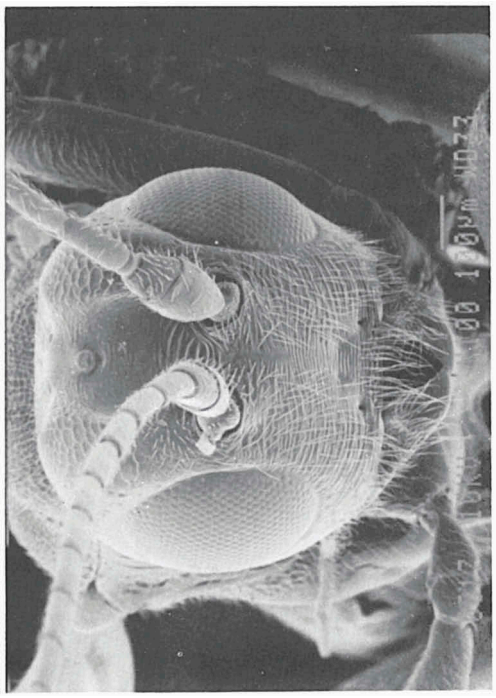
Photo 18. *Cenocoelius analis* (Nees), ♀.

CENOCOELIINAE

Photo 19. *Cenocoelius analis* (Nees), ♀.

Photo 20. *Cenocoelius analis* (Nees), ♀.

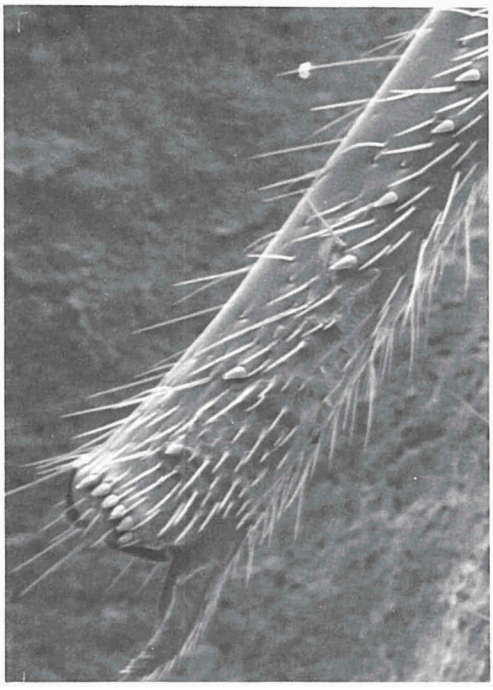


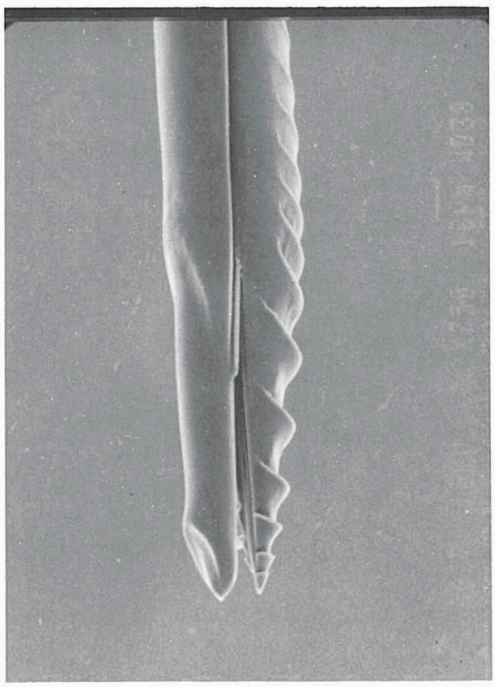


DORYCTINAE-DORYCTINI

Photo 21. *Dendrosoter protuberans* (Nees), ♀.

Photo 22. *Dendrosoter protuberans* (Nees), ♀.



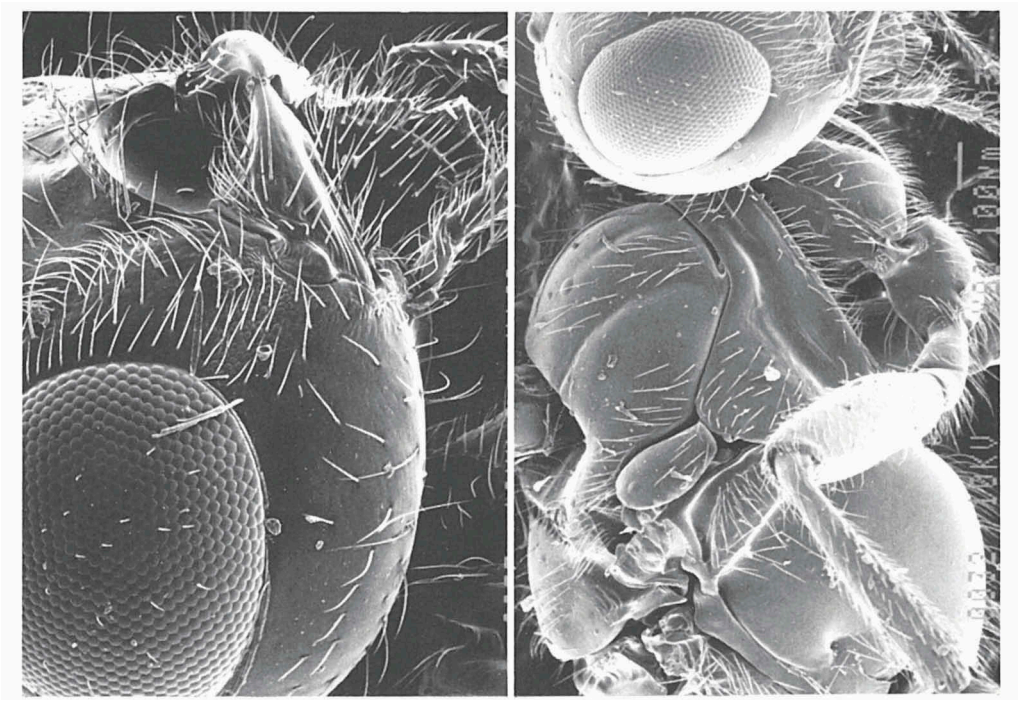


DORYCTINAE-SYNGASTRINI

Photo 23. *Syngaster* spec., ♀.

DORYCTINAE-DORYCTINI

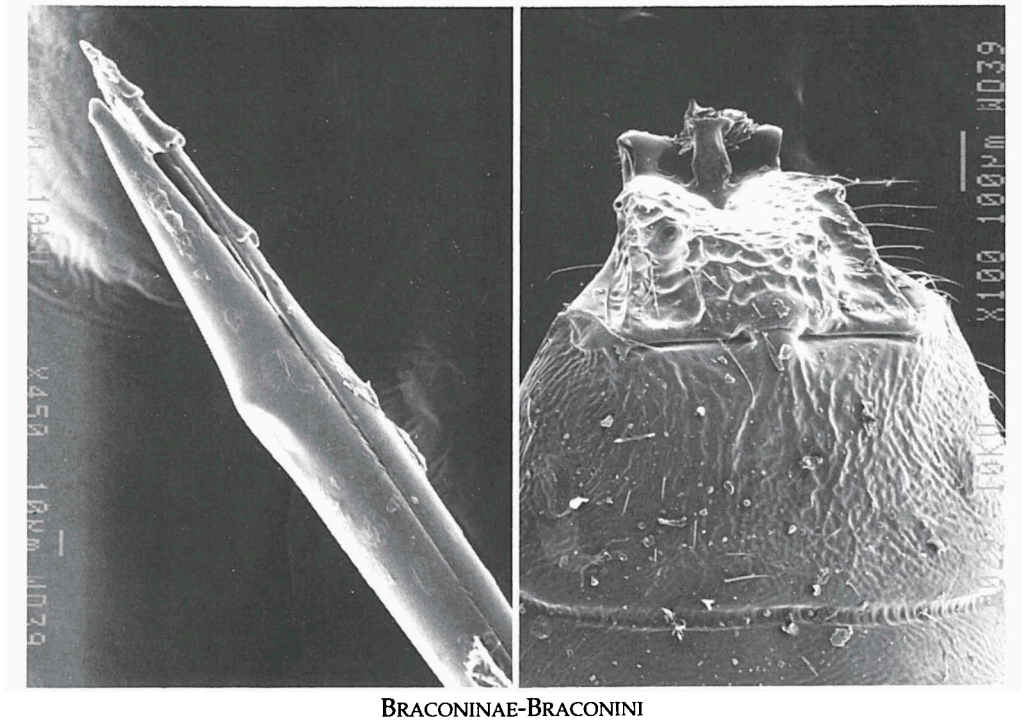
Photo 24. *Dendrosoter protuberans* (Nees), ♀.



BRACONINAE-BRACONINI

Photo 25. *Bracon fulvipes* (Nees), ♀.

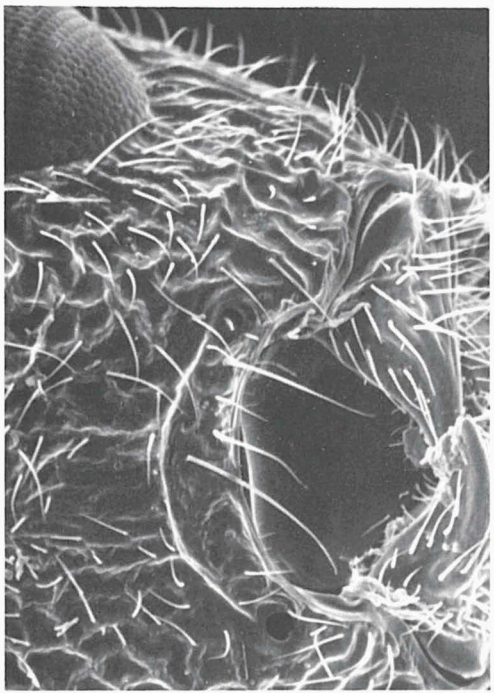
Photo 26. *Bracon fulvipes* (Nees), ♀.



BRACONINAE-BRACONINI

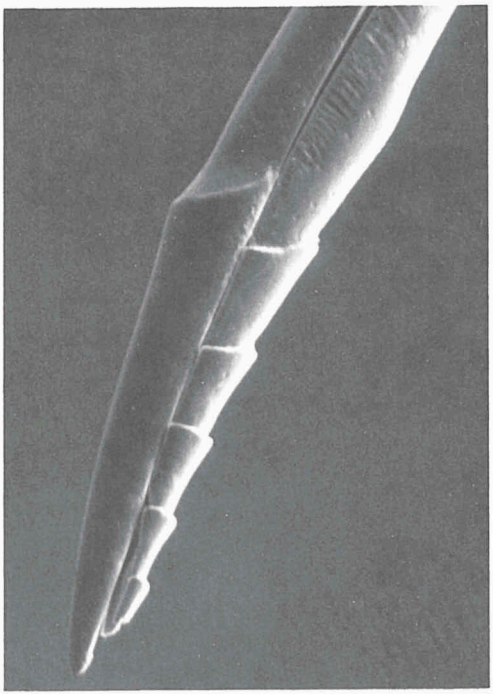
Photo 27. *Bracon fulvipes* (Nees), ♀.

Photo 28. *Bracon fulvipes* (Nees), ♀.



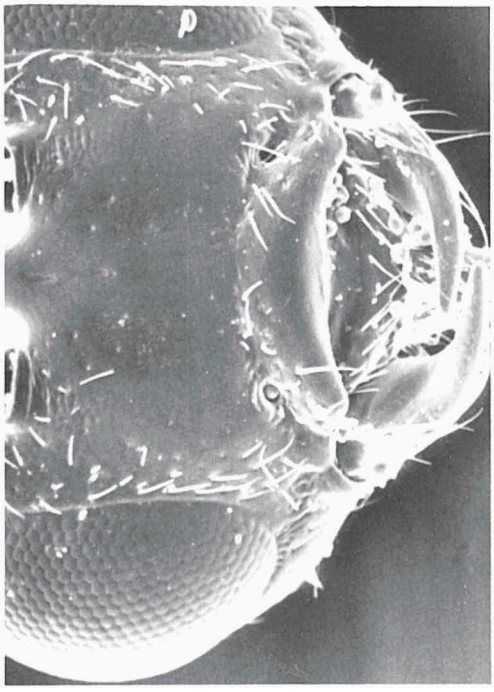
BRACONINAE-BRACONINI

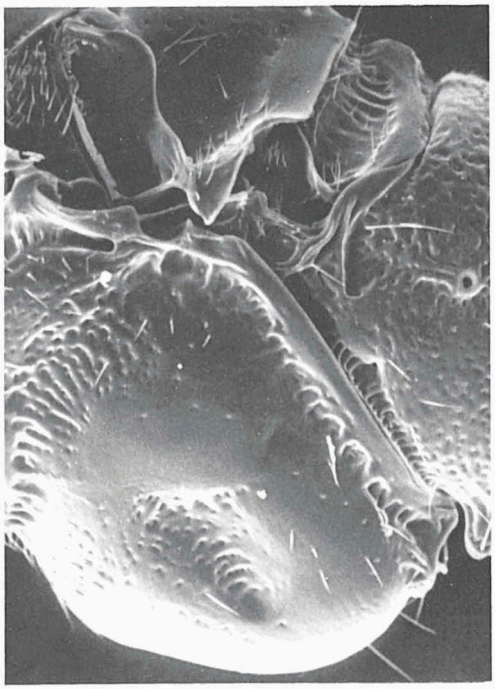
Photo 29. *Physaraia* spec.



BRACONINAE-APHRASTOBRACONINI

Photo 30. *Compsobracon* spec.





TELENGAIINAE

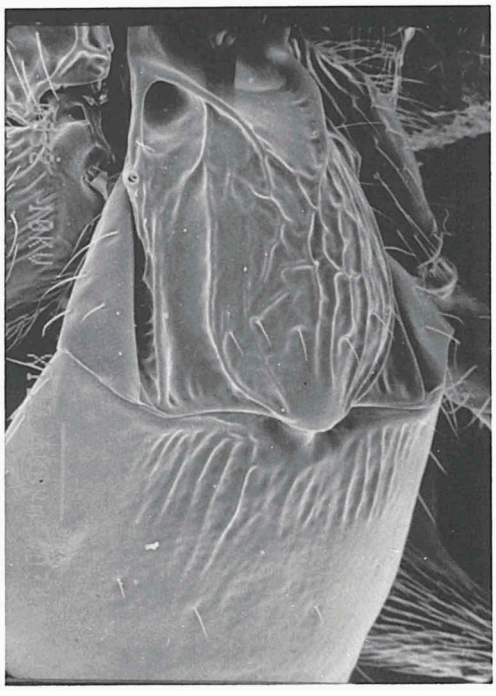
Photo 31. *Telengaia ventralis* Tobias.

Photo 32. *Telengaia ventralis* Tobias.

RHYSSALINAE-ONCOPHANINI

Photo 33. *Oncophanes minutus* (Wesmael), ♀.

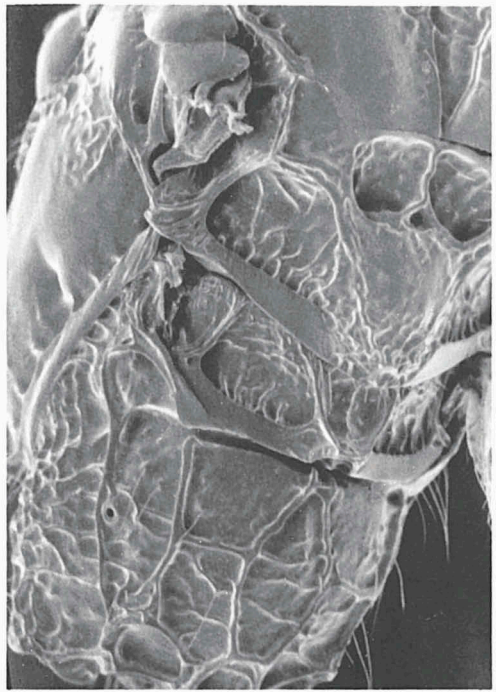
Photo 34. *Oncophanes minutus* (Wesmael), ♀.



RHYSSALINAE-ONCOPHANINI

Photo 35. *Oncophanes minutus* (Wesmael), ♀.

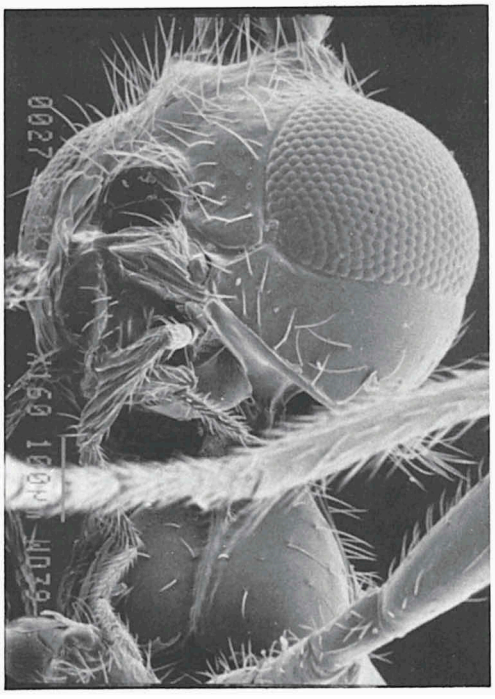
Photo 36. *Oncophanes minutus* (Wesmael), ♀.



RHYSSALINAE-RHYSSALINI

Photo 37. *Rhyssalus clavator* Haliday, ♀.

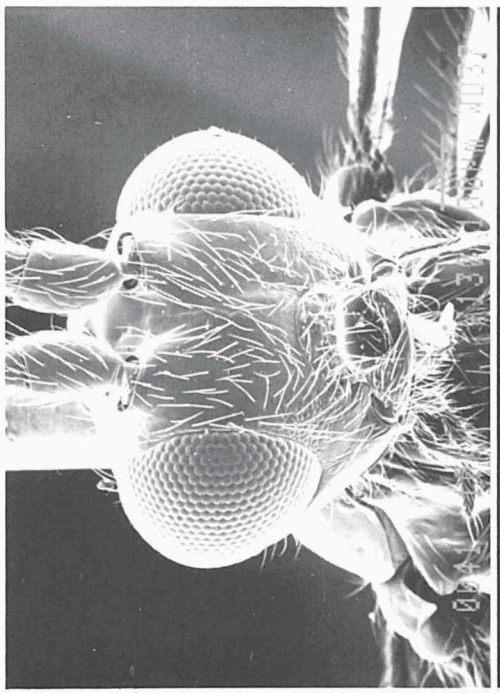
Photo 38. *Rhyssalus clavator* Haliday, ♀.



EXOTHECINAE-RHYSIPOLINI

Photo 39. *Rhysipolis hariolator* (Haliday), ♀.

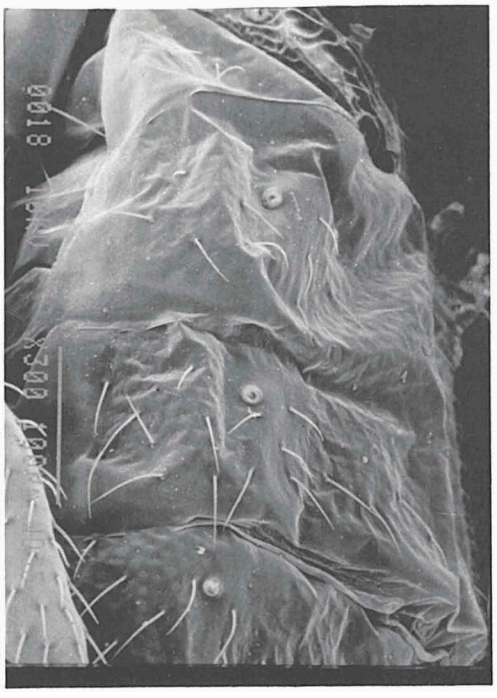
Photo 40. *Rhysipolis hariolator* (Haliday), ♀.



EXOTHECINAE-EXOTHECINI

Photo 41. *Colastes braconius* Haliday, ♀.

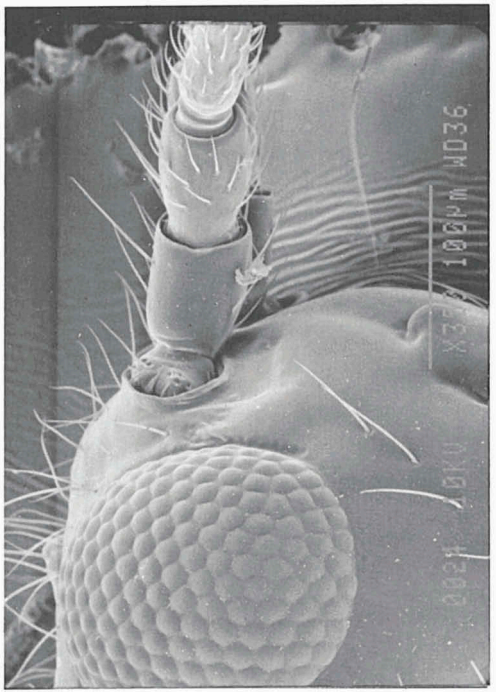
Photo 42. *Colastes braconius* Haliday, ♀.



HORMIINAE-HORMIINI

Photo 43. *Hormius* spec., ♀.

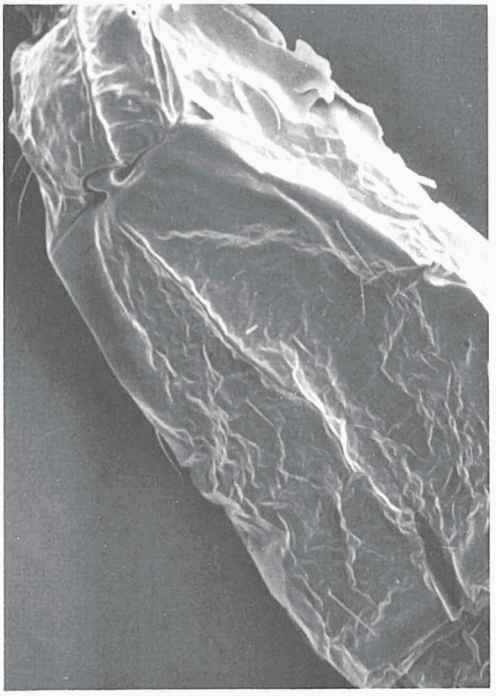
Photo 44. *Hormius* spec., ♀.



HORMIINAE-HORMIINI

Photo 45. *Hormius* spec., ♀.

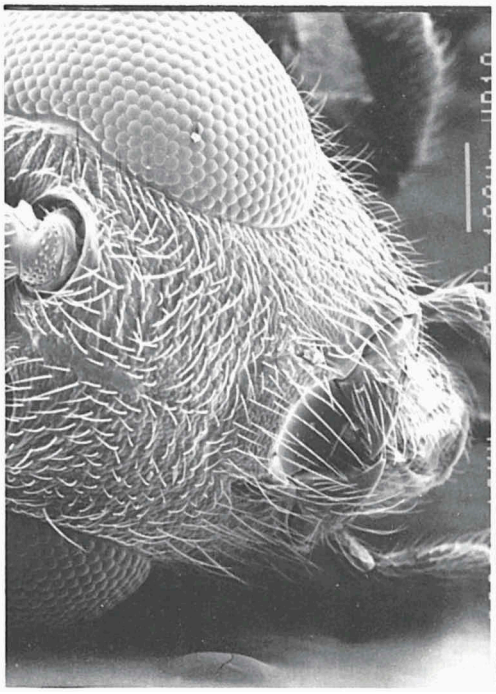
Photo 46. *Hormius* spec., ♀.



HORMIINAE-HORMIINI

Photo 47. *Hormius* spec., ♀.

Photo 48. *Hormius* spec., ♀.



ROGADINAE-ROGADINI

Photo 49. *Aleiodes* spec. aff. *similis* (Curtis), ♀.

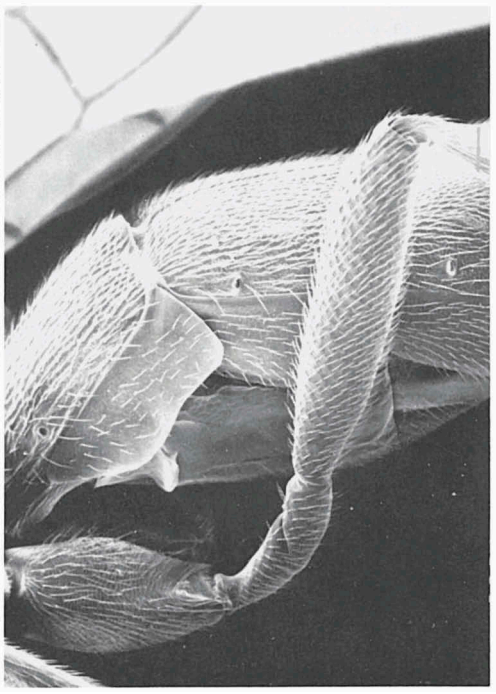
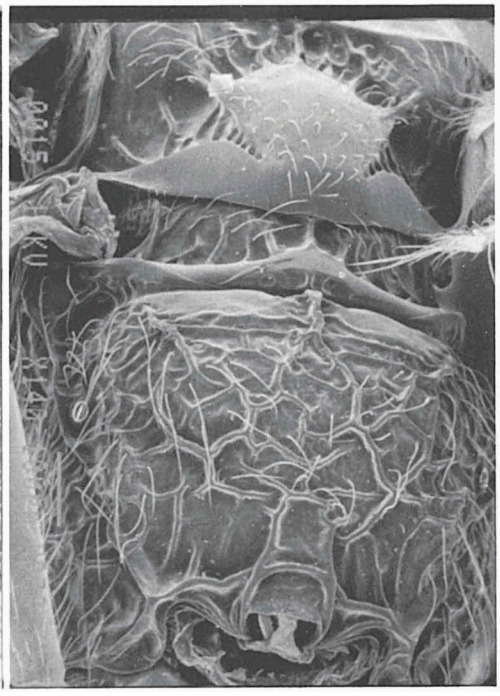


Photo 50. *Aleiodes* spec. aff. *similis* (Curtis), ♀.

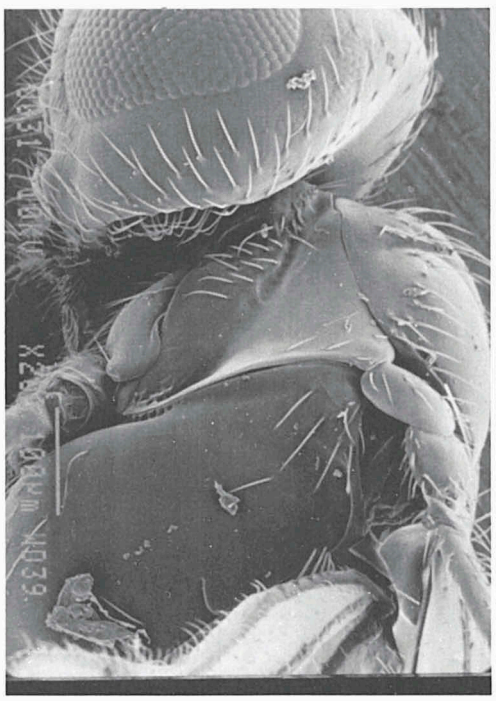
ROGADINAE-ROGADINI

Photo 51. *Aleiodes* spec. aff. *similis* (Curtis), ♀.



ROGADINAE-CLINOCENTRINI

Photo 52. *Clinocentrus cunctator* (Haliday), ♀.



GNAMPTODONTINAE

Photo 53. *Gnamptodon pumilio* (Nees), ♀.

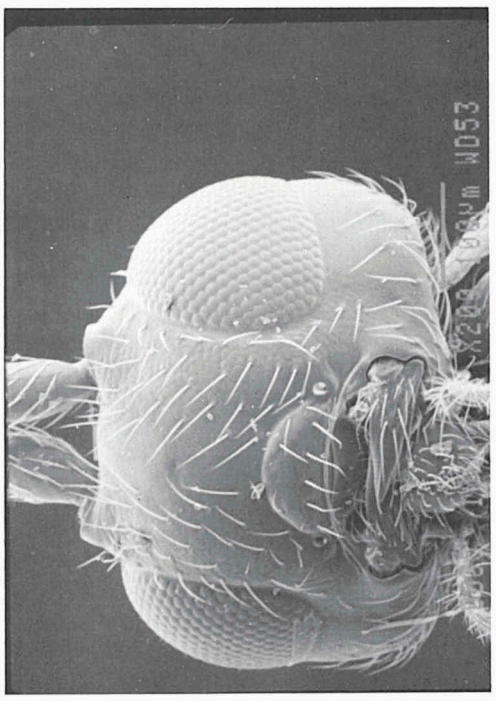
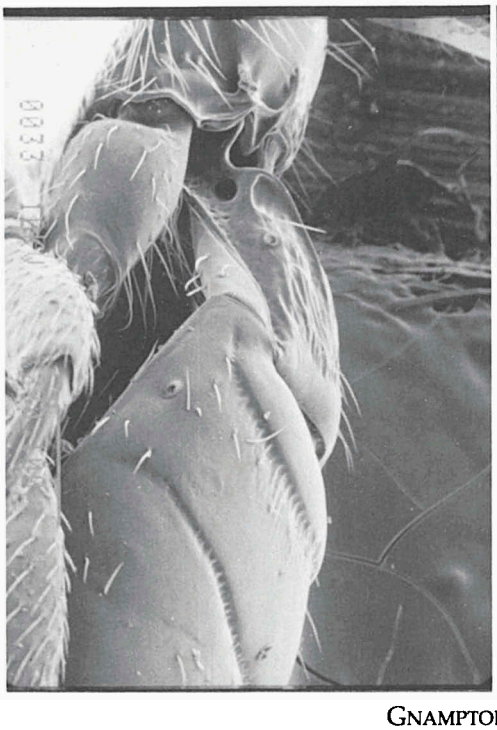


Photo 54. *Gnamptodon pumilio* (Nees), ♀.



GNAMPTODONTINAE

Photo 55. *Gnamptodon pumilio* (Nees), ♀.

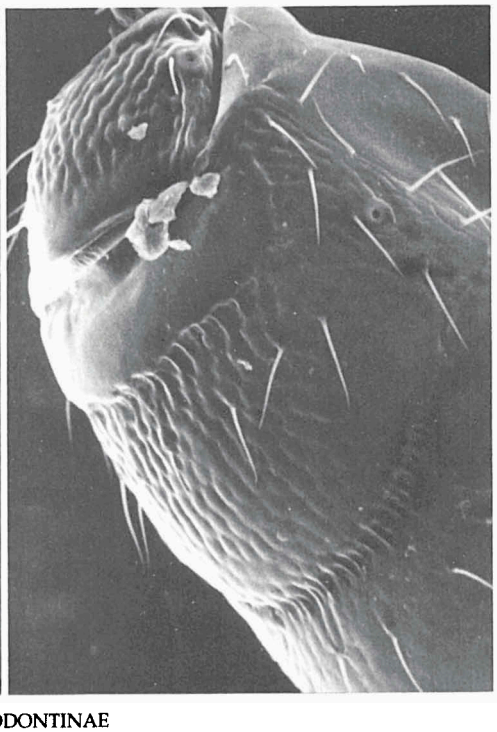


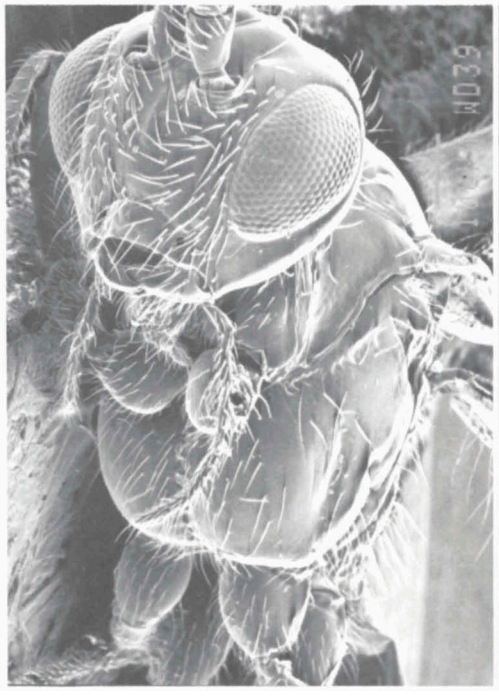
Photo 56. *Gnamptodon* spec. (Nees), ♀.

GNAMPTODONTINAE

Photo 57. *Gnamptodon pumilio* (Nees), ♀.

OPIINAE-OPIINI

Photo 58. *Apodesmia irreguilaris* (Wesmael), ♀.



OPIINAE-OPIINI

Photo 59. *Apodesmia irreguilaris* (Wesmael), ♀.

Photo 60. *Apodesmia irreguilaris* (Wesmael), ♀.

APHIDIINAE-APHIDIINI

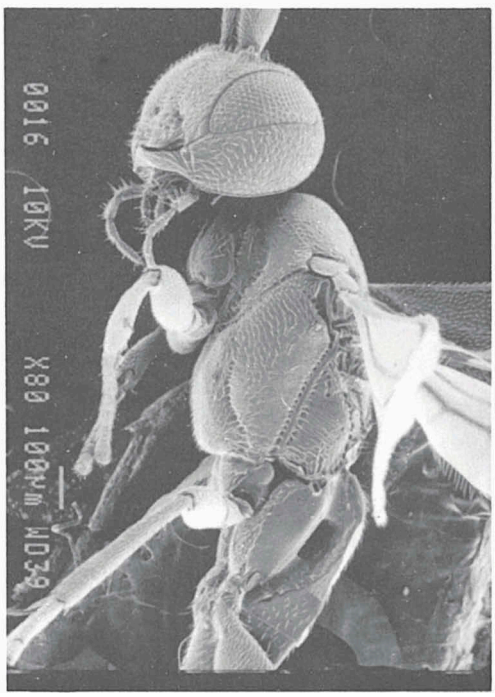
Photo 61. *Aphidius ervi* Haliday, ♀.

Photo 62. *Aphidius ervi* Haliday, ♀.

APHIDIINAE-APHIDIINI

Photo 63. *Aphidius ervi* Haliday, ♀.

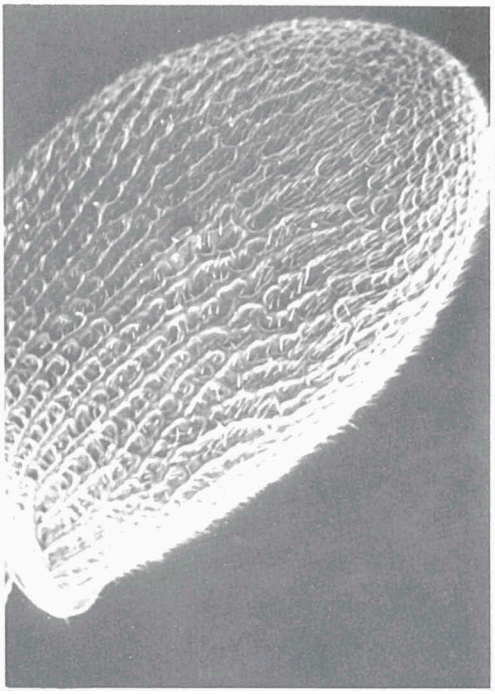
Photo 64. *Aphidius ervi* Haliday, ♀.

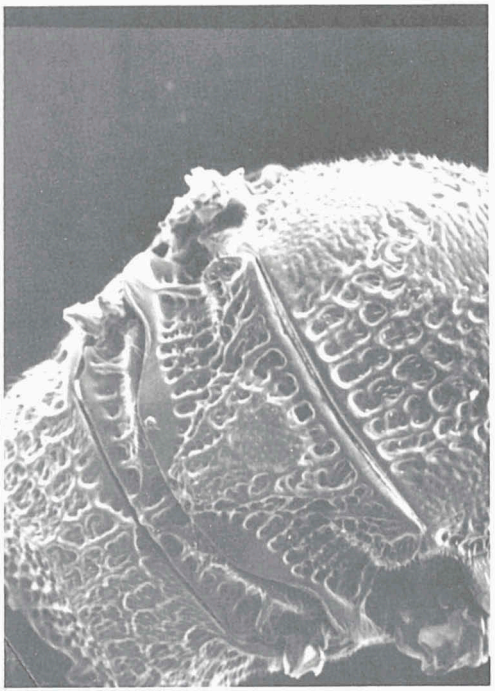


ADELIINAE

Photo 65. *Adelius* spec., ♀.

Photo 66. *Adelius* spec., ♀.





CHELONINAE-CHELONINI

Photo 67. *Chelonus rostratus* (Tobias), ♀.

Photo 68. *Chelonus rostratus* (Tobias), ♀.

ICHNEUTINAE-ICHNEUTINI

Photo 69. *Ichneutes brevis* Wesmael, ♀.

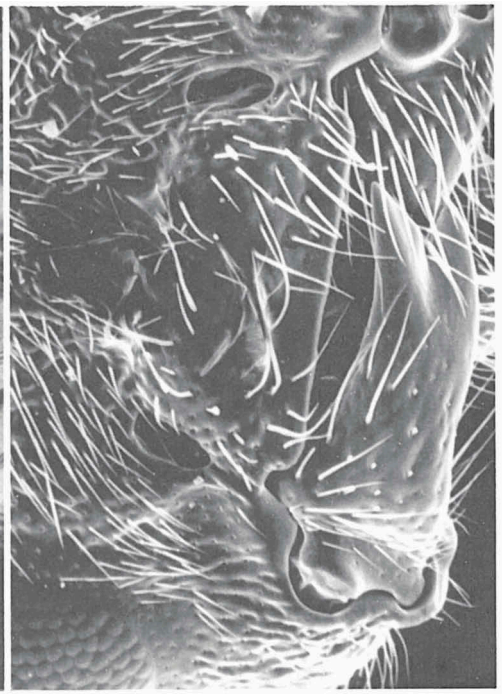
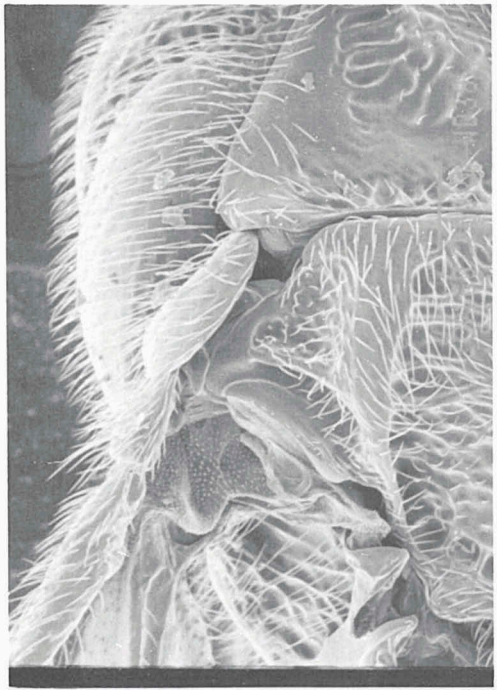


Photo 70. *Ichneutes* spec., ♀.



ICHNEUTINAE-ICHNEUTINI

Photo 71. *Ichneutes brevis* Wesmael, ♀.

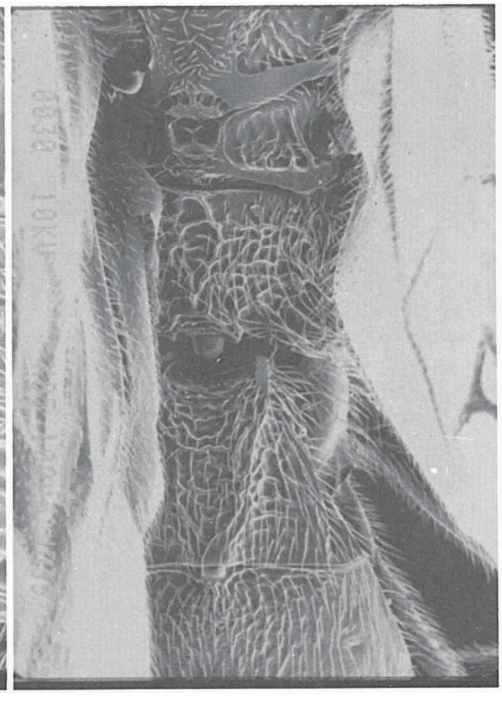
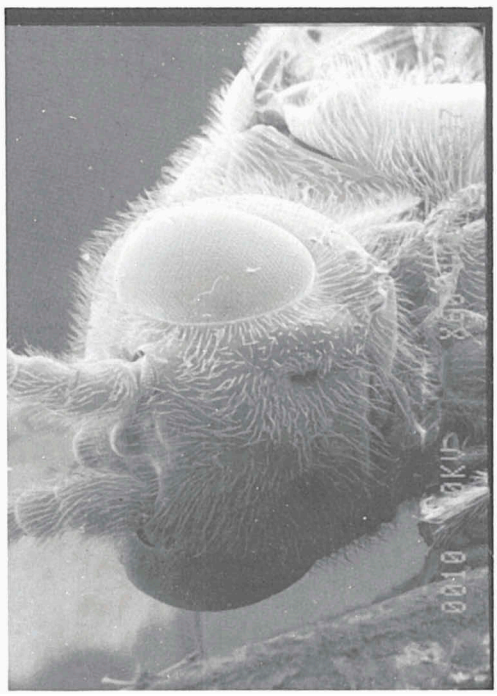


Photo 72. *Ichneutes brevis* Wesmael, ♀.



PROTEROPINAE

Photo 73. *Proterops nigripennis* Wesmael, ♀.

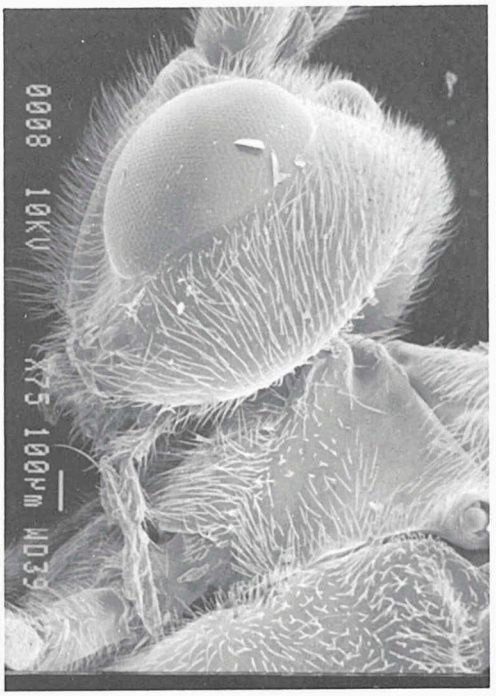
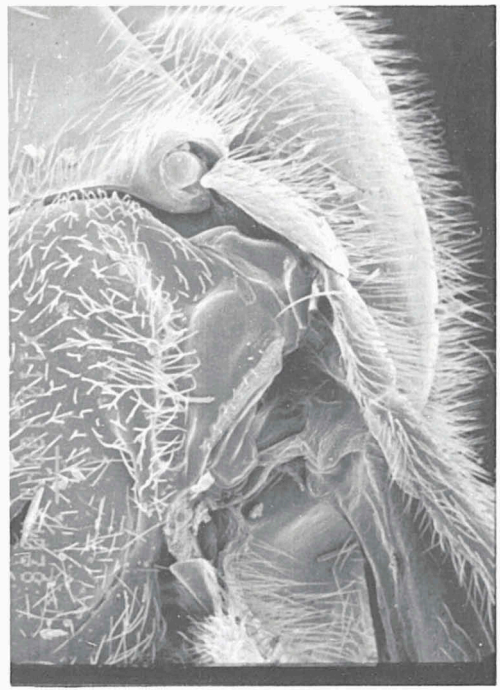


Photo 74. *Proterops nigripennis* Wesmael, ♀.



PROTEROPINAE

Photo 75. *Proterops nigripennis* Wesmael, ♀.

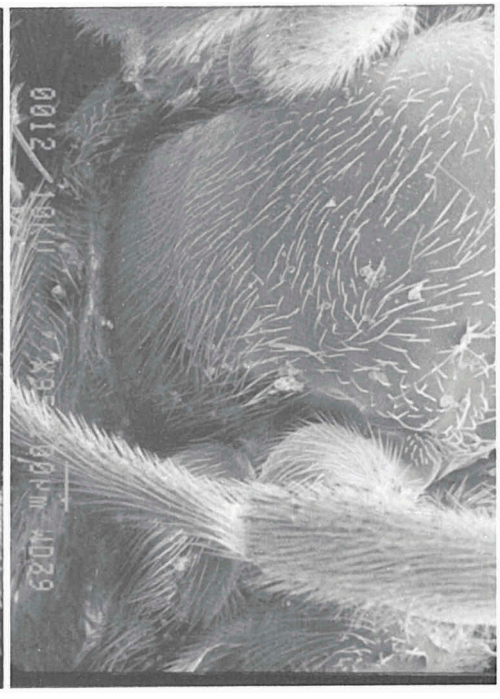
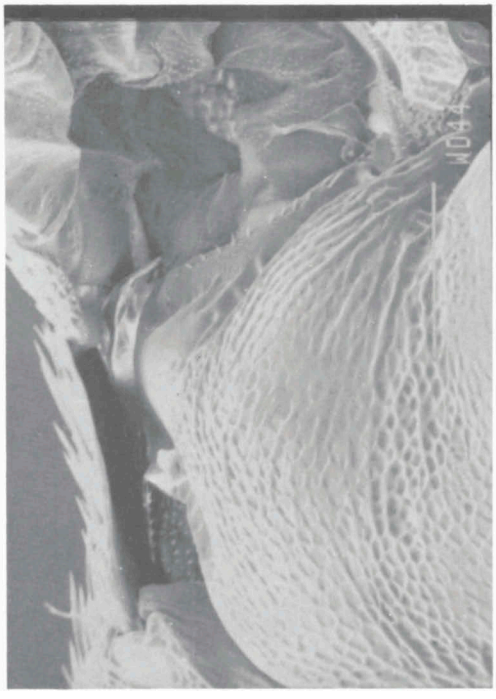


Photo 76. *Proterops nigripennis* Wesmael, ♀.

NEONEURINAE

Photo 77. *Neoneurus auctus* (Thomson), ♂.

Photo 78. *Neoneurus auctus* (Thomson), ♂.



NEONEURINAE

Photo 79. *Neoneurus auctus* (Thomson), ♂.

Photo 80. *Neoneurus auctus* (Thomson), ♂.

MIRACINAE

Photo 81. *Mirax* spec., ♂.

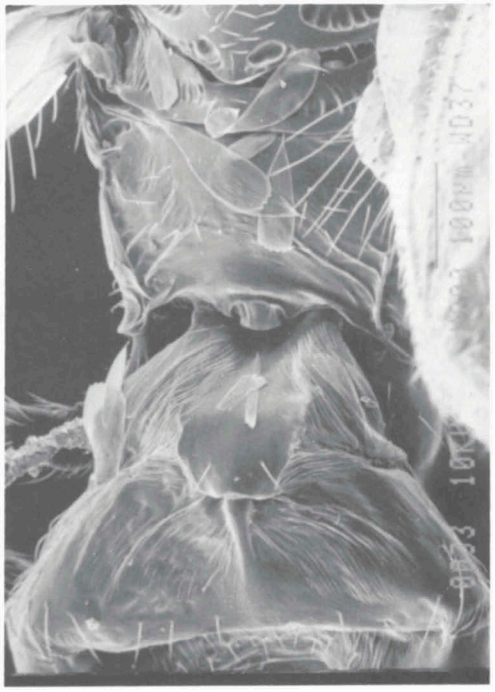
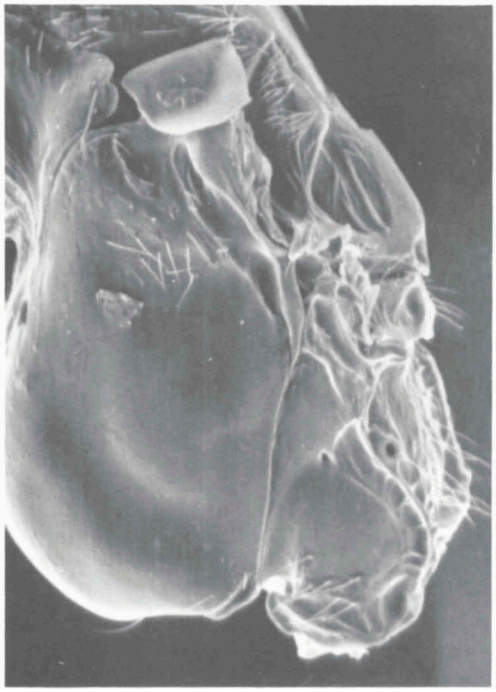


Photo 82. *Mirax* spec., ♂.



MIRACINAE

Photo 83. *Mirax* spec., ♂.

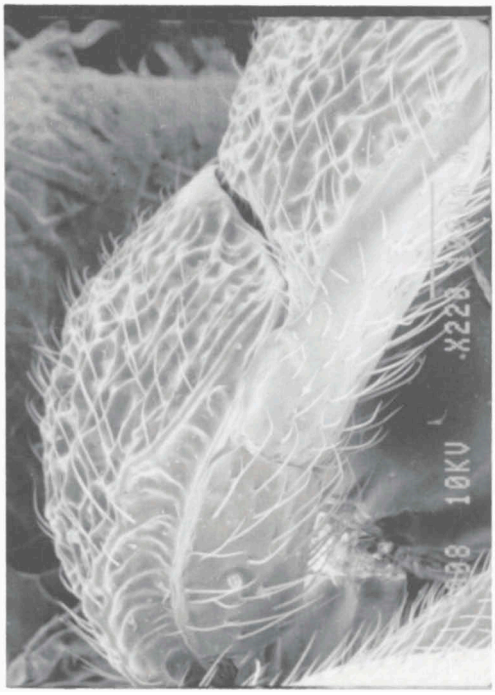
MICROGASTRINAE-MICROGASTRINI

Photo 84. *Microgaster stictica* Ruthe, ♀.

MICROGASTRINAE-MICROGASTRINI

Photo 85. *Microgaster stictica* Ruthe, ♀.

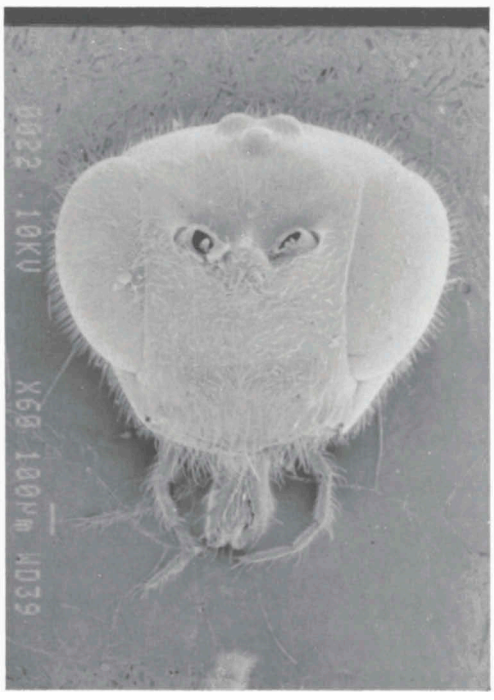
Photo 86. *Microgaster stictica* Ruthe, ♀.



MICROGASTRINAE-MICROGASTRINI

Photo 87. *Microgaster stictica* Ruthe, ♀.

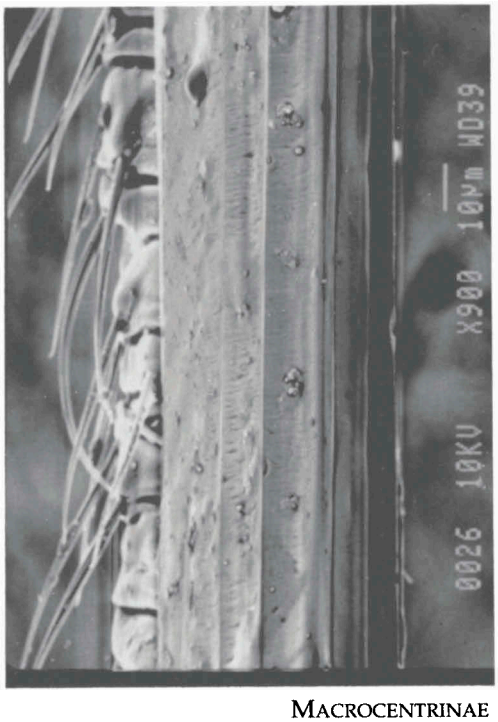
Photo 88. *Microgaster stictica* Ruthe, ♀.



CARDIOCHILINAE

Photo 89. *Cardiochiles punctatus* Szépligeti, ♀.

Photo 90. *Cardiochiles punctatus* Szépligeti, ♀.



CHARMONTINAE

Photo 91. *Charmon cruentatus* Haliday, ♀.

MACROCENTRINAE

Photo 92. *Macrocentrus collaris* (Spinola), ♀.

CHARMONTINAE

Photo 93. *Charmon cruentatus* Haliday, ♀.

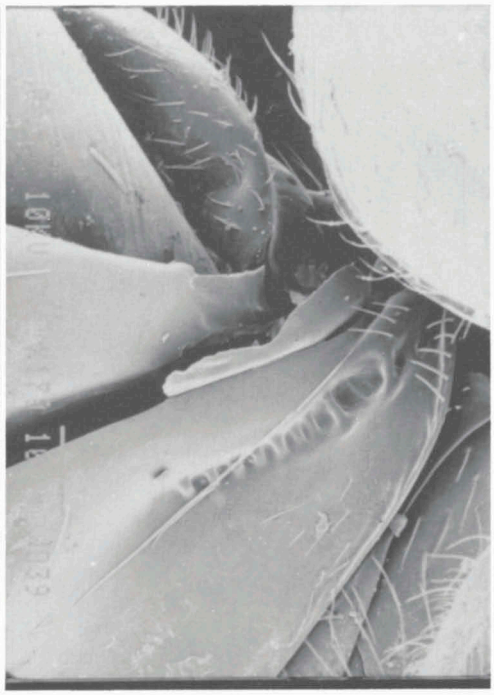
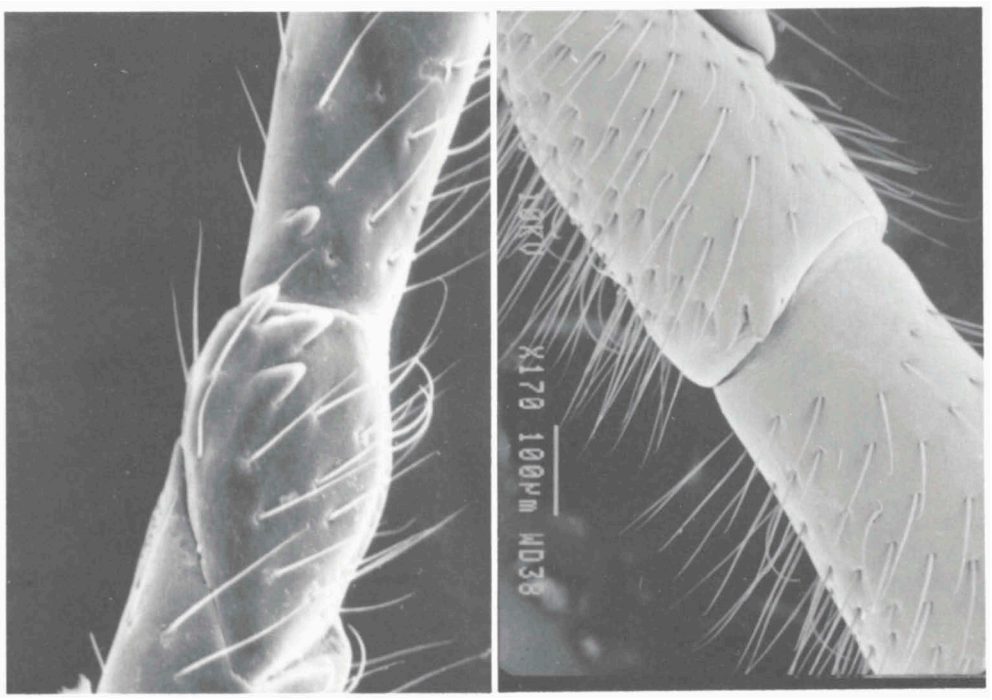


Photo 94. *Charmon cruentatus* Haliday, ♀.

CHARMONTINAE

Photo 95. *Charmon cruentatus* Haliday, ♀.

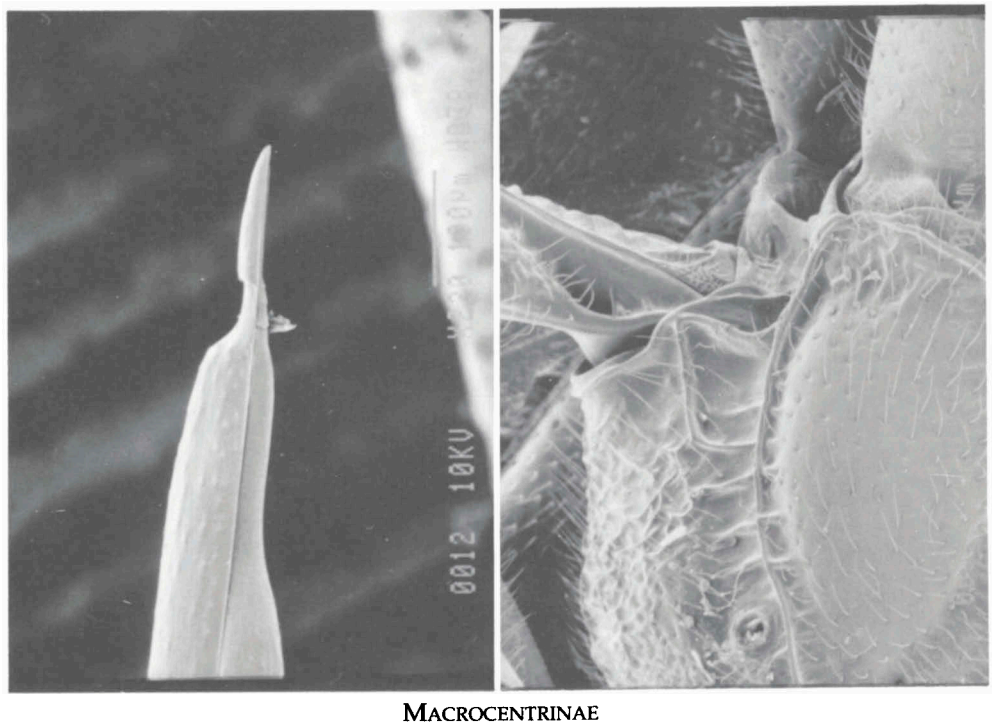
Photo 96. *Charmon cruentatus* Haliday, ♀.



MACROCENTRINAE

Photo 97. *Macrocentrus pallipes* (Nees), ♀.

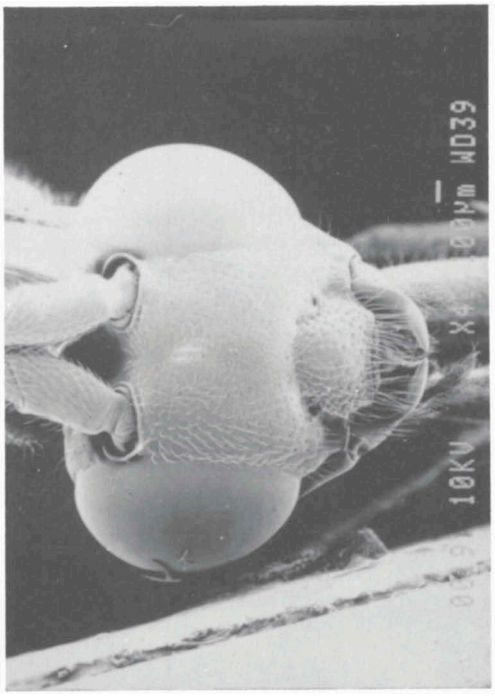
Photo 98. *Austrozele uniformis* (Provancher), ♀.



MACROCENTRINAE

Photo 99. *Austrozele uniformis* (Provancher), ♀.

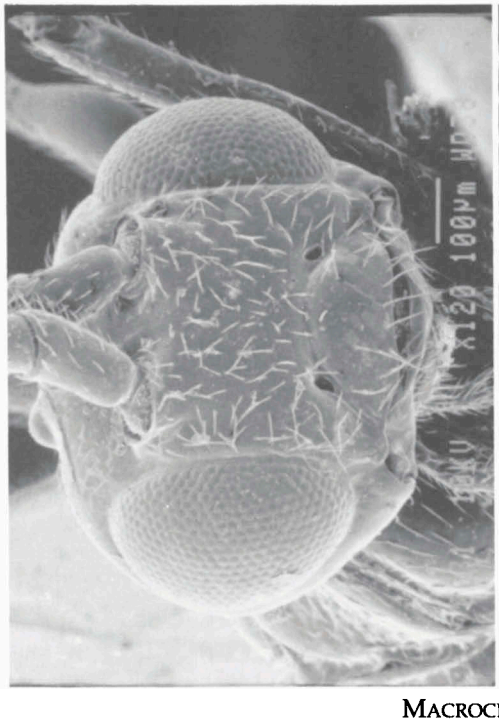
Photo 100. *Austrozele uniformis* (Provancher), ♀.

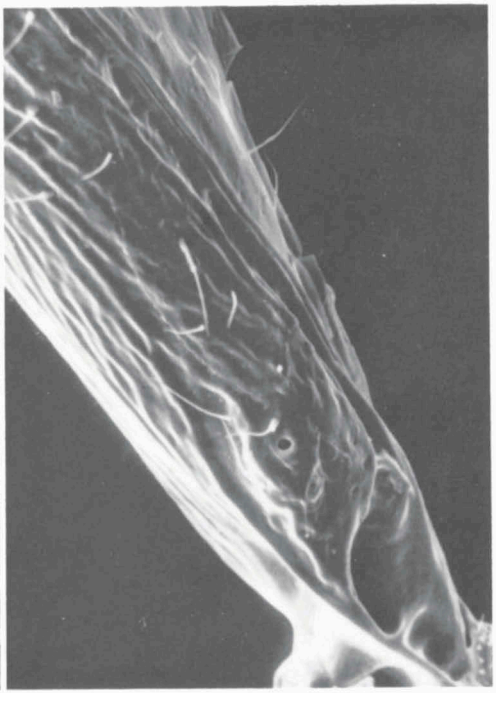


MACROCENTRINAE

Photo 101. *Austrozele uniformis* (Provancher), ♀.

Photo 102. *Austrozele uniformis* (Provancher), ♀.

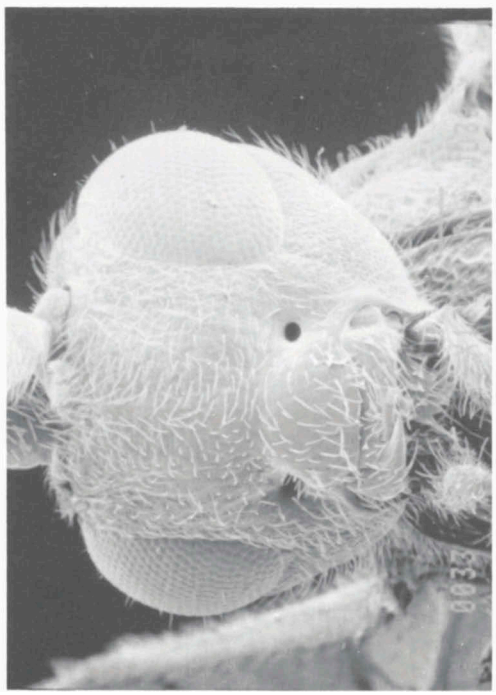




MACROCENTRINAE

Photo 103. *Macrocentrus collaris* (Spinola), ♀.

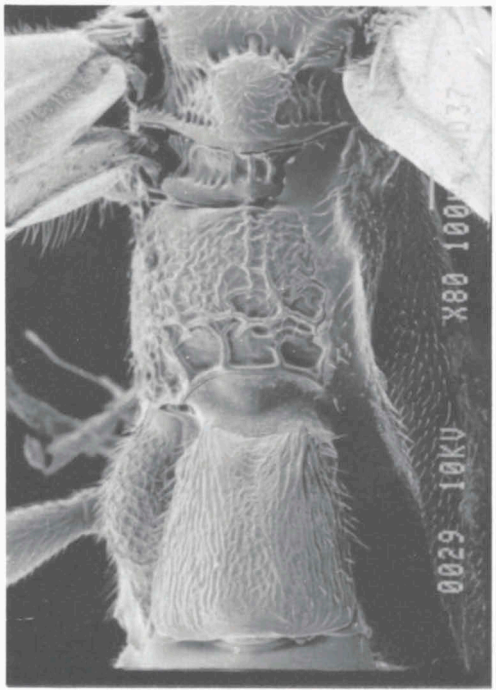
Photo 104. *Macrocentrus pallipes* (Nees), ♀.



ORGILINAE-ORGILINI

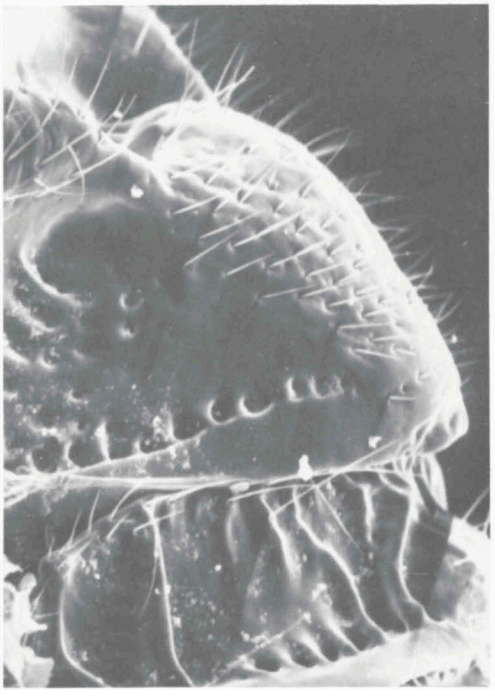
Photo 105. *Orgilus pimpinellae* Niezabitowski, ♀.

Photo 106. *Orgilus pimpinellae* Niezabitowski, ♀.



ORGILINAE-ORGILINI

Photo 107. *Orgilus pimpinellae* Niezabitowski, ♀.



ORGILINAE-MIMAGATHIDINI

Photo 108. *Stantonia* spec., ♀.

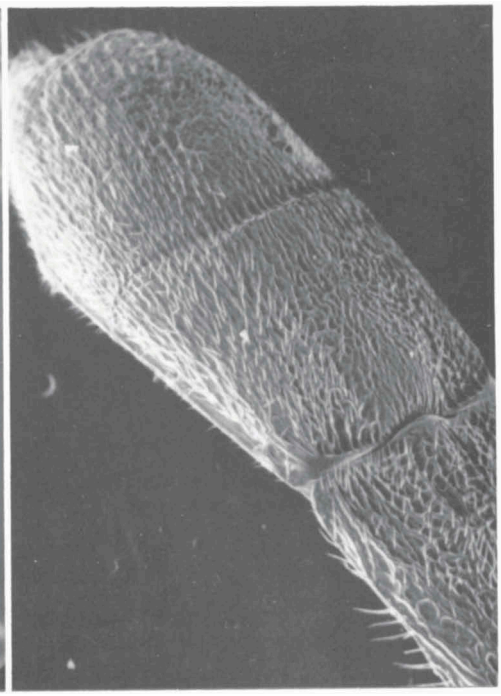
MICROTYPINAE

Photo 109. *Microtypus wesmaelii* Ratzeburg, ♀.

Photo 110. *Microtypus wesmaelii* Ratzeburg, ♀.

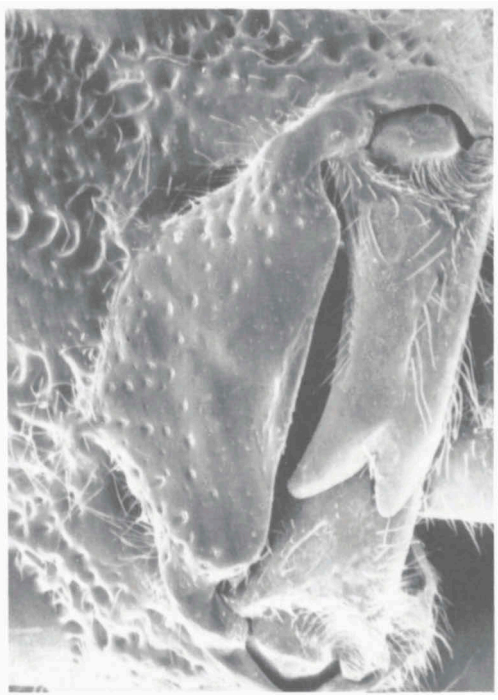
MICROTYPINAE

Photo 111. *Microtypus wesmaelii* Ratzeburg, ♀.



SIGALPHINAE-ACAMPSINI

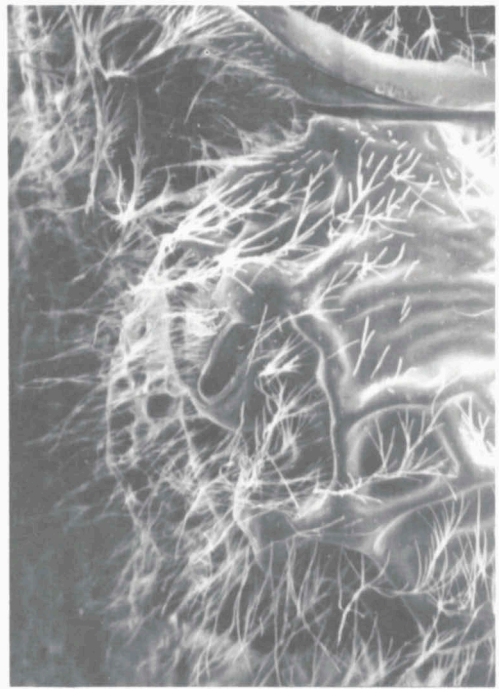
Photo 112. *Acampsis alternipes* (Nees), ♀.

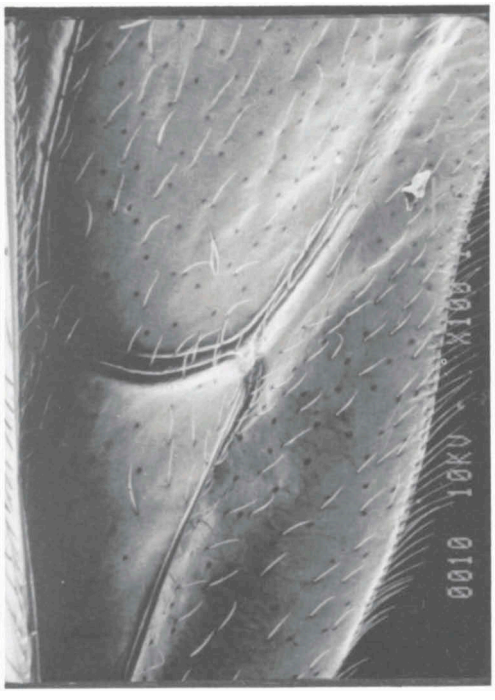


TRACHYPETINAE-TRACHYPETINI

Photo 113. *Trachypetus clavatus* Guérin-Méneville.

Photo 114. *Trachypetus clavatus* Guérin-Méneville.





TRACHYPETINAE-TRACHYPETINI

Photo 115. *Trachypetus clavatus* Guérin-Méneville.

SIGALPHINAE-SIGALPHINI

Photo 116. *Sigalphus irrorator* (Fabricius), ♀.

SIGALPHINAE-SIGALPHINI

Photo 117. *Sigalphus irrorator* (Fabricius), ♀.

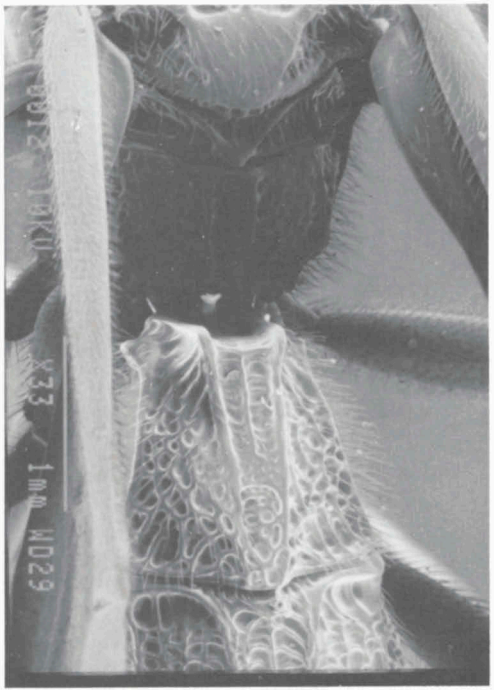
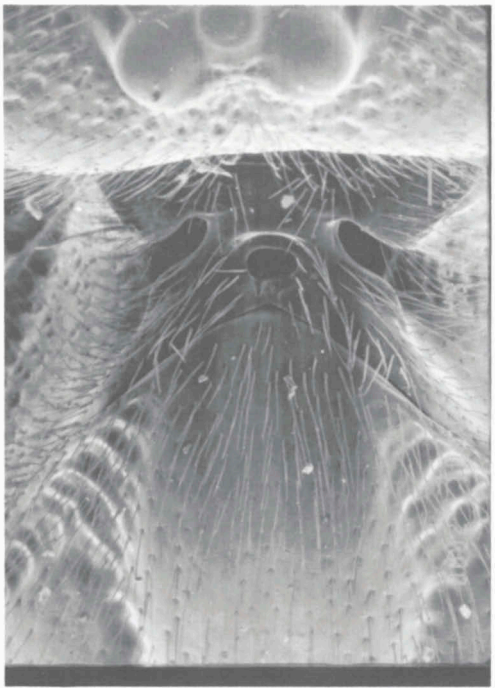


Photo 118. *Sigalphus irrorator* (Fabricius), ♀.



SIGALPHINAE-SIGALPHINI

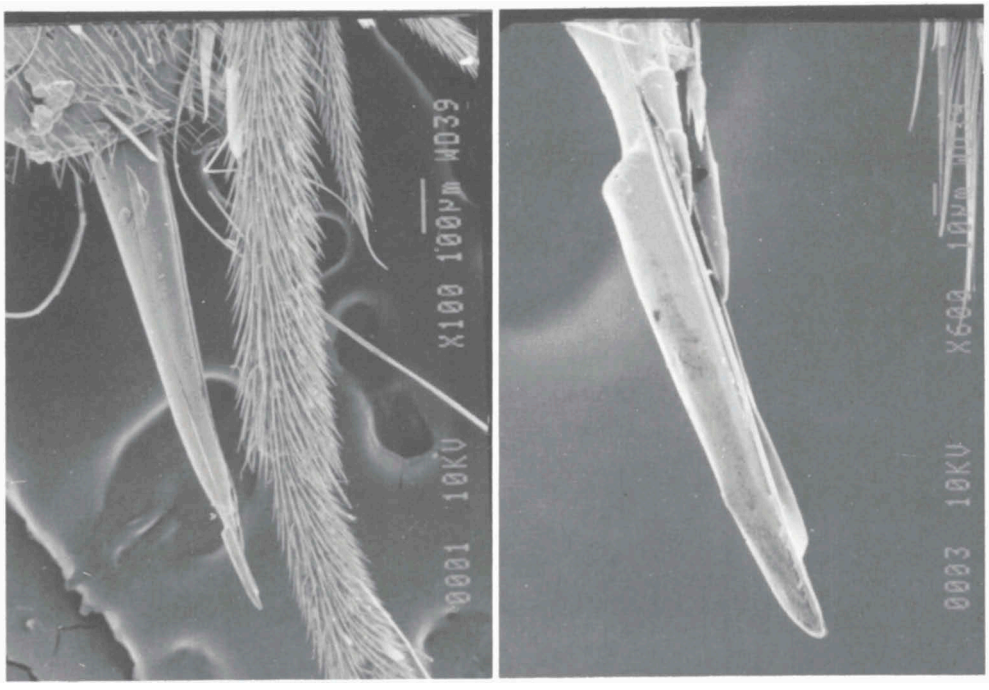
Photo 119. *Sigalphus irrorator* (Fabricius), ♀.

Photo 120. *Sigalphus irrorator* (Fabricius), ♀.

HOMOLOBINAE-HOMOLOBINI

Photo 121. *Homolobus infumator* (Lyle), ♀.

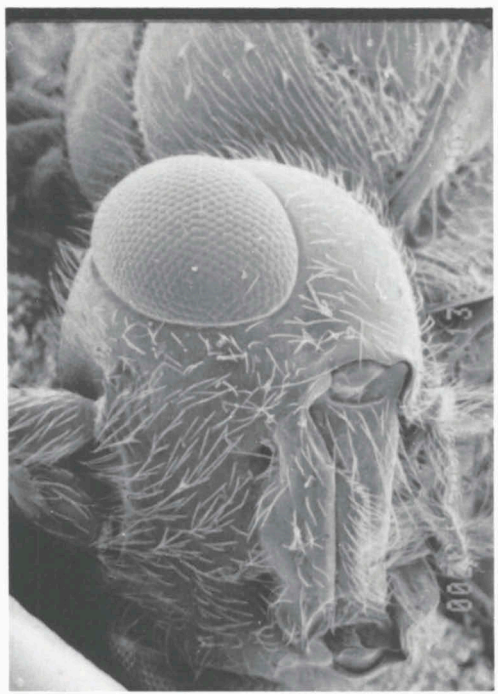
Photo 122. *Homolobus infumator* (Lyle), ♀.

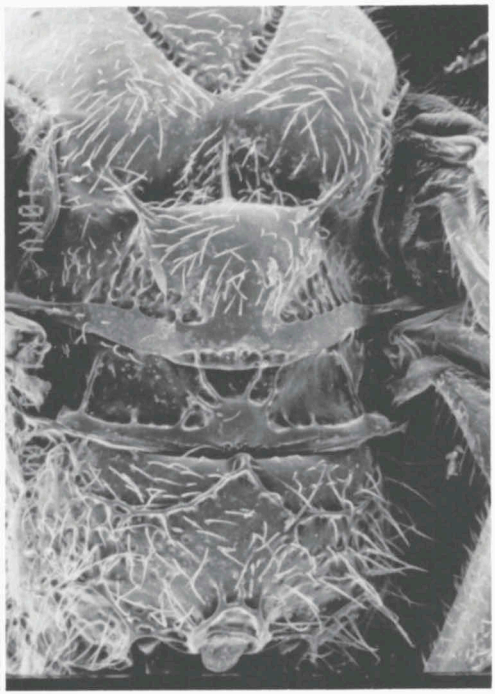


HOMOLOBINAE-HOMOLOBINI

Photo 123. *Homolobus infumator* (Lyle), ♀.

Photo 124. *Homolobus infumator* (Lyle), ♀.

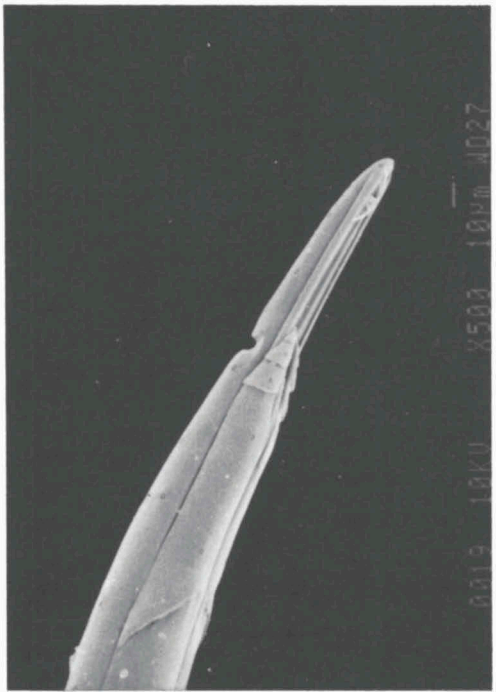


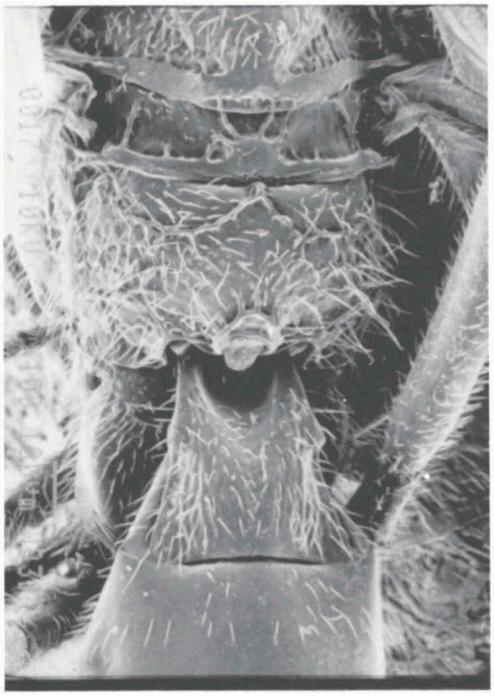


HELCONINAE-DIOSPILINI

Photo 125. *Diospilus* sp. aff. *nigricornis* (Wesmael), ♀.

Photo 126. *Diospilus* sp. aff. *nigricornis* (Wesmael), ♀.

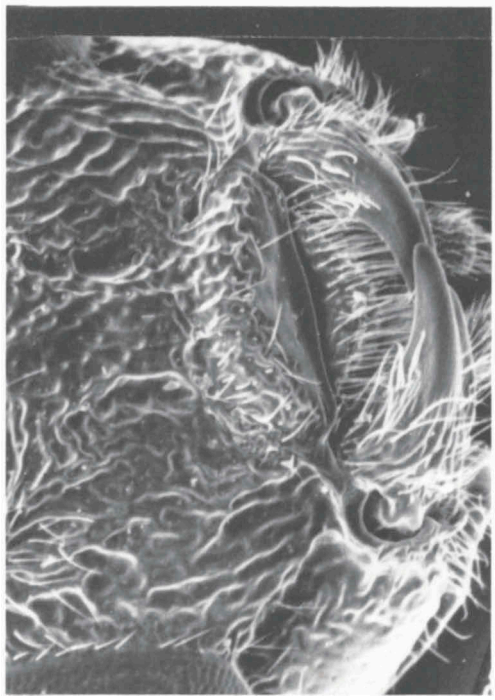




HELCONINAE-DIOSPILINI

Photo 127. *Diospilus* sp. aff. *nigricornis* (Wesmael), ♀.

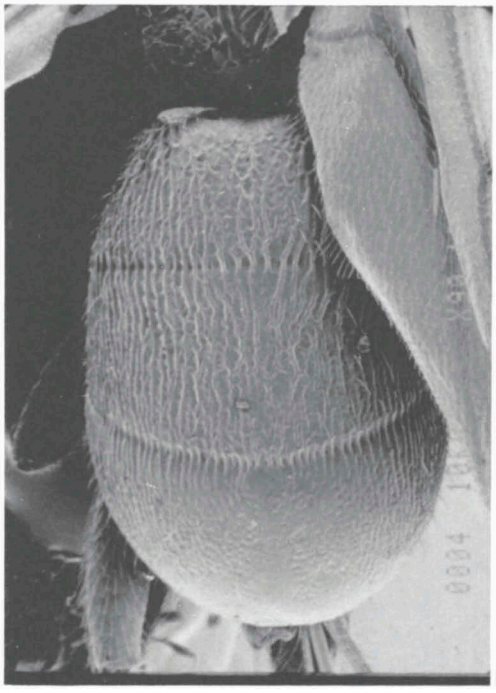
Photo 128. *Diospilus* sp. aff. *nigricornis* (Wesmael), ♀.



HELCONINAE-HELCONINI

Photo 129. *Helcon nunciator* (Fabricius), ♂.

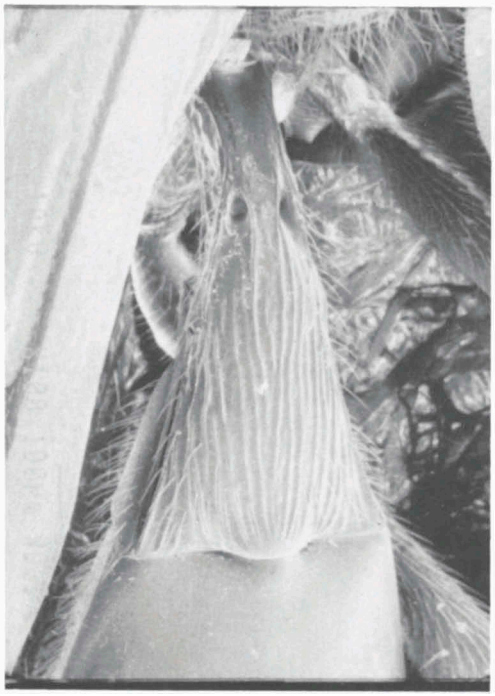
Photo 130. *Helcon nunciator* (Fabricius), ♂.



HELCONINAE-BRACHISTINI

Photo 131. *Triaspis obscurella* (Nees), ♀.

Photo 132. *Triaspis obscurella* (Nees), ♀.



EUPHORINAE-METEORINI

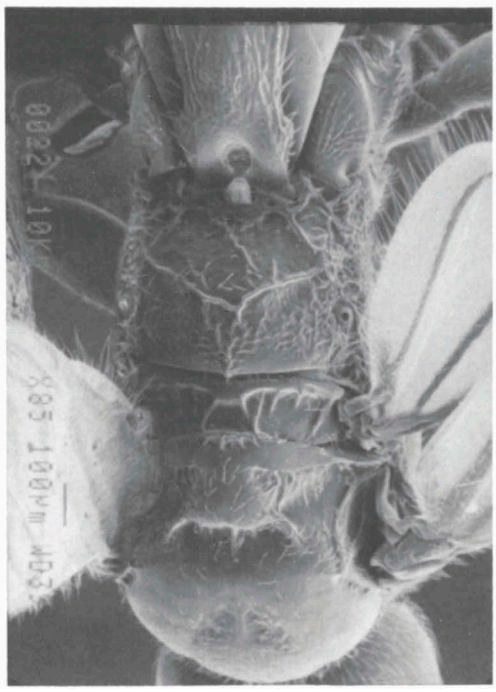
Photo 133. *Meteorus gyrator* (Thunberg), ♀.

Photo 134. *Meteorus gyrator* (Thunberg), ♀.

EUPHORINAE-CENTISTINI

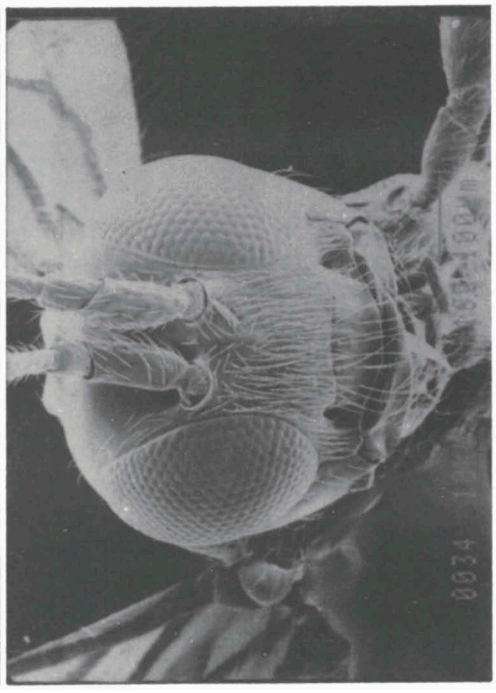
Photo 135. *Centistes ater* (Nees), ♀.

Photo 136. *Centistes ater* (Nees), ♀.



EUPHORINAE-CENTISTINI

Photo 137. *Centistes ater* (Nees), ♀.



EUPHORINAE-EUPHORINI

Photo 138. *Euphorus pallidistigma* (Curtis), ♀.

EUPHORINAE-EUPHORINI

Photo 139. *Euphorus pallidistigma* (Curtis), ♀.

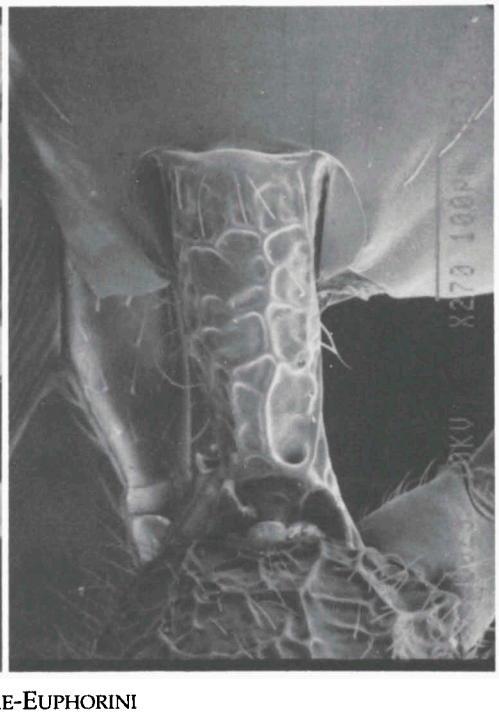


Photo 140. *Euphorus pallidistigma* (Curtis), ♀.

Legenda of photographs 1-140

Head, ventro-anterior aspect: 1, 13, 93; id., but frontal aspect: 5, 18, 39, 51, 72, 82, 107, 111, 118, 122, 128; id., but dorso-lateral aspect: 6, 21; id. lateral aspect: 9, 57, 74; id., but dorso-anterior aspect: 73; id., but ventral aspect: 58.

Clypeus, anterior aspect: 2, 15, 29, 31, 70, 113, 125, 129.

Labrum, latero-anterior aspect: 25, 35, 49; labrum and mandibles, anterior aspect: 14, 16.

Scapus and pedicellus: 46.

Occipital and hypostomal carinae: 33, 40, 45.

Head and mesosoma, lateral aspect: 3, 7, 26, 42, 53, 65, 81, 86, 101, 109; id., but antero-lateral aspect: 59.

Mesosoma, lateral aspect: 19, 32, 34, 47, 61, 83; id., but dorso-lateral aspect: 37, 38; id., but dorsal aspect: 60, 121, 126, 137, 139.

Pronotum, dorsal aspect: 119.

Anterior part of mesoscutum: 94, 110.

Anterior subalar depression: 71, 75, 79.

Mesosternum, latero-ventral aspect: 76; id., but ventral aspect: 20.

Scutellum, dorsal aspect: 62, 68; id., dorso-lateral aspect: 108; medio-posterior depression of scutellum (anterior) and metanotum medially, dorsal aspect: 114, 130.

Mesosoma and metasoma, dorsal aspect: 88.

Propodeum, dorsal aspect: 52; propodeal spiracle, lateral aspect: 115.

Fore leg: 77; fore tibia: 8, 23.

Hind legs: 66; hind femur and tibia: 84; apex of hind tibia, outer aspect: 106, 134; hind trochanter and trochantellus: 95; hind trochantellus: 97, 98; hind tarsus: 11; hind tarsal claws: 120.

Vein 2-CU of hind wing: 116.

Metasoma, lateral aspect: 17, 63, 132; id., but dorsal aspect: 131; id., but latero-dorsal aspect: 67.

Base of metasoma, dorsal aspect: 28, 36, 80, 133; id., but lateral aspect: 50, 55, 100, 104; id., but lateral aspect: 87, 90; first metasomal tergite, dorsal aspect: 96, 140.

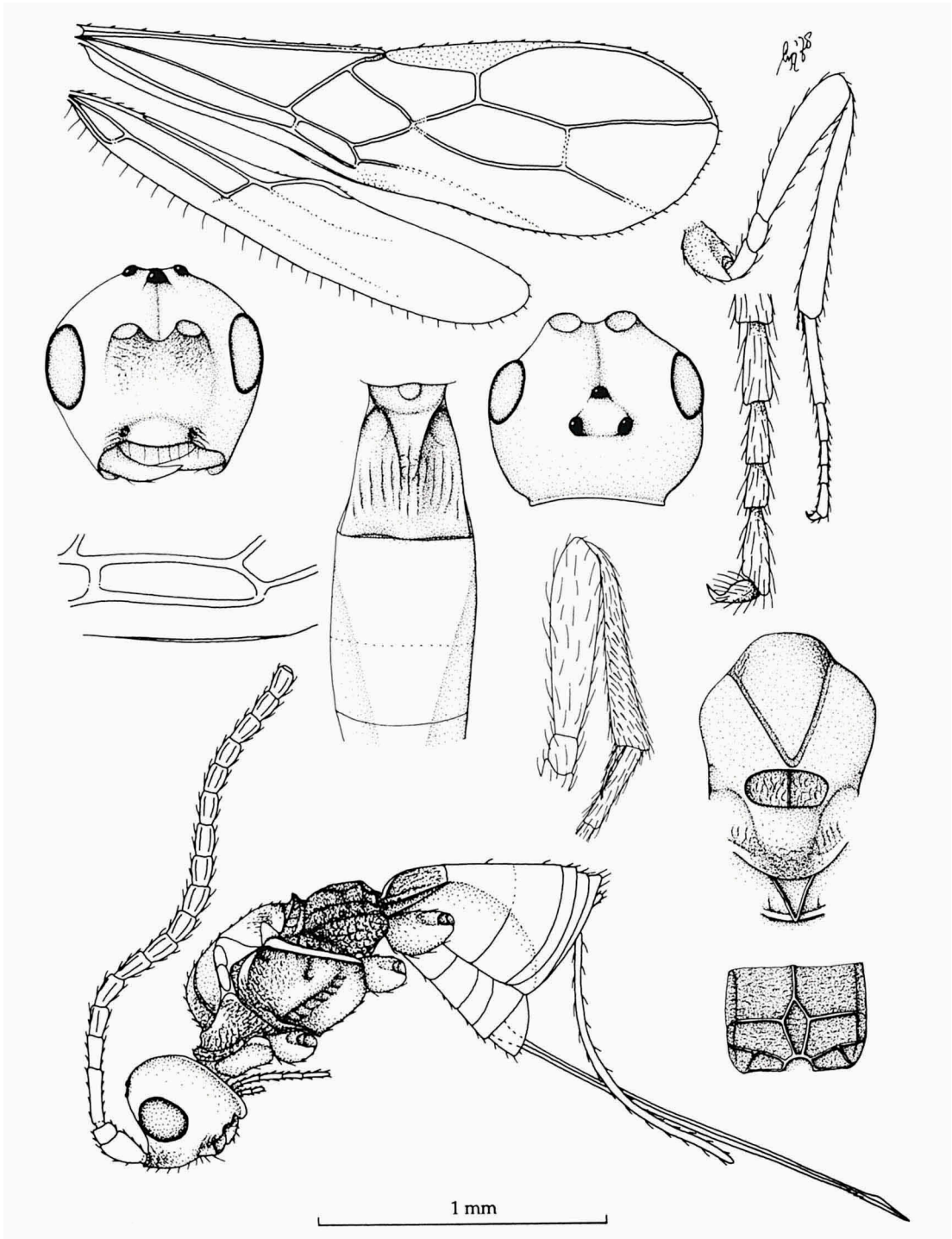
Second and third metasomal tergites, dorso-lateral aspect: 44, 48, 56, 64, 112, 117.

Apex of ovipositor, lateral aspect: 12, 23, 27, 30, 99, 124, 127; ovipositor, lateral aspect: 123, 136; central part of ovipositor: 91, 92.

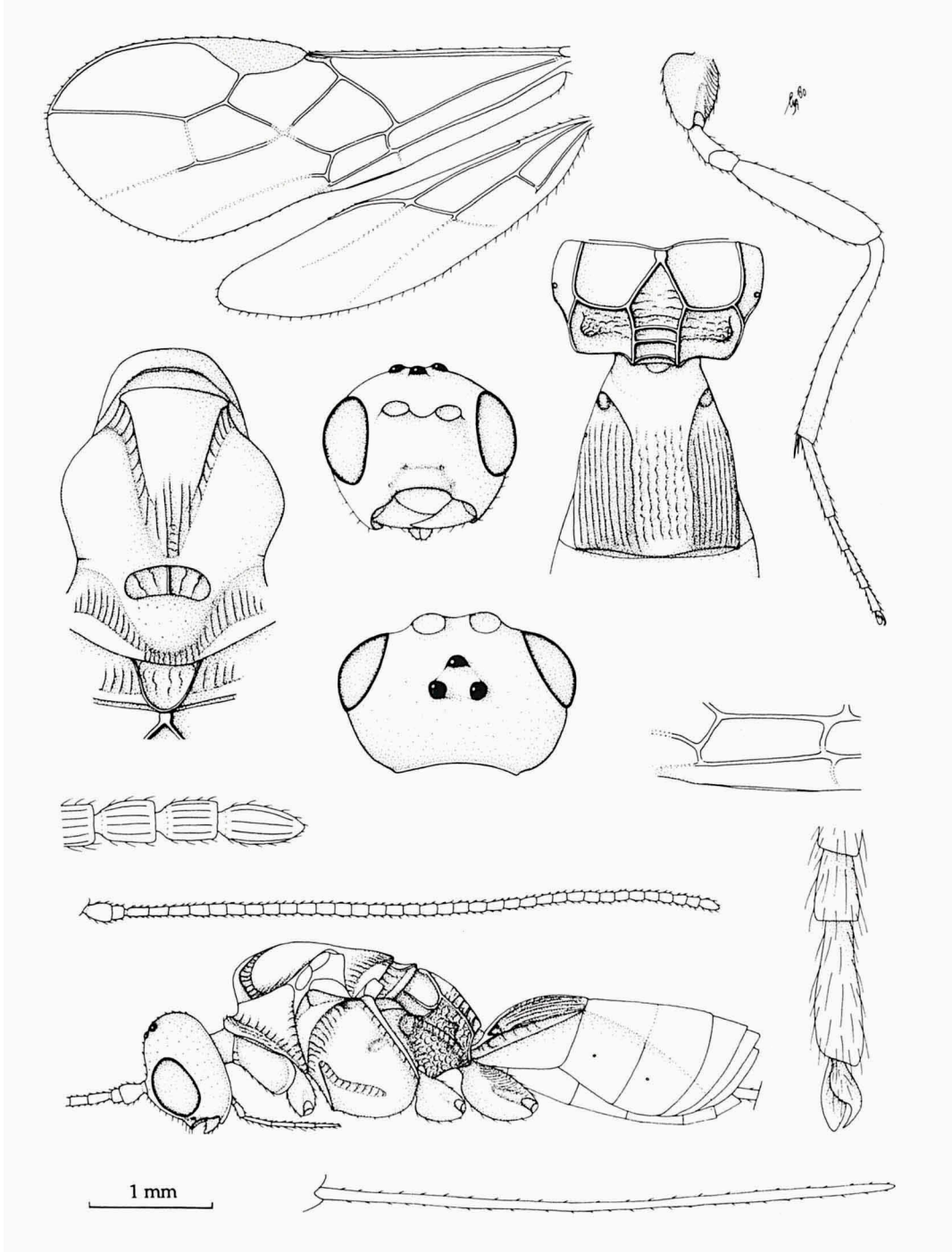
Habitus, lateral aspect: 43.

Note to the plates:

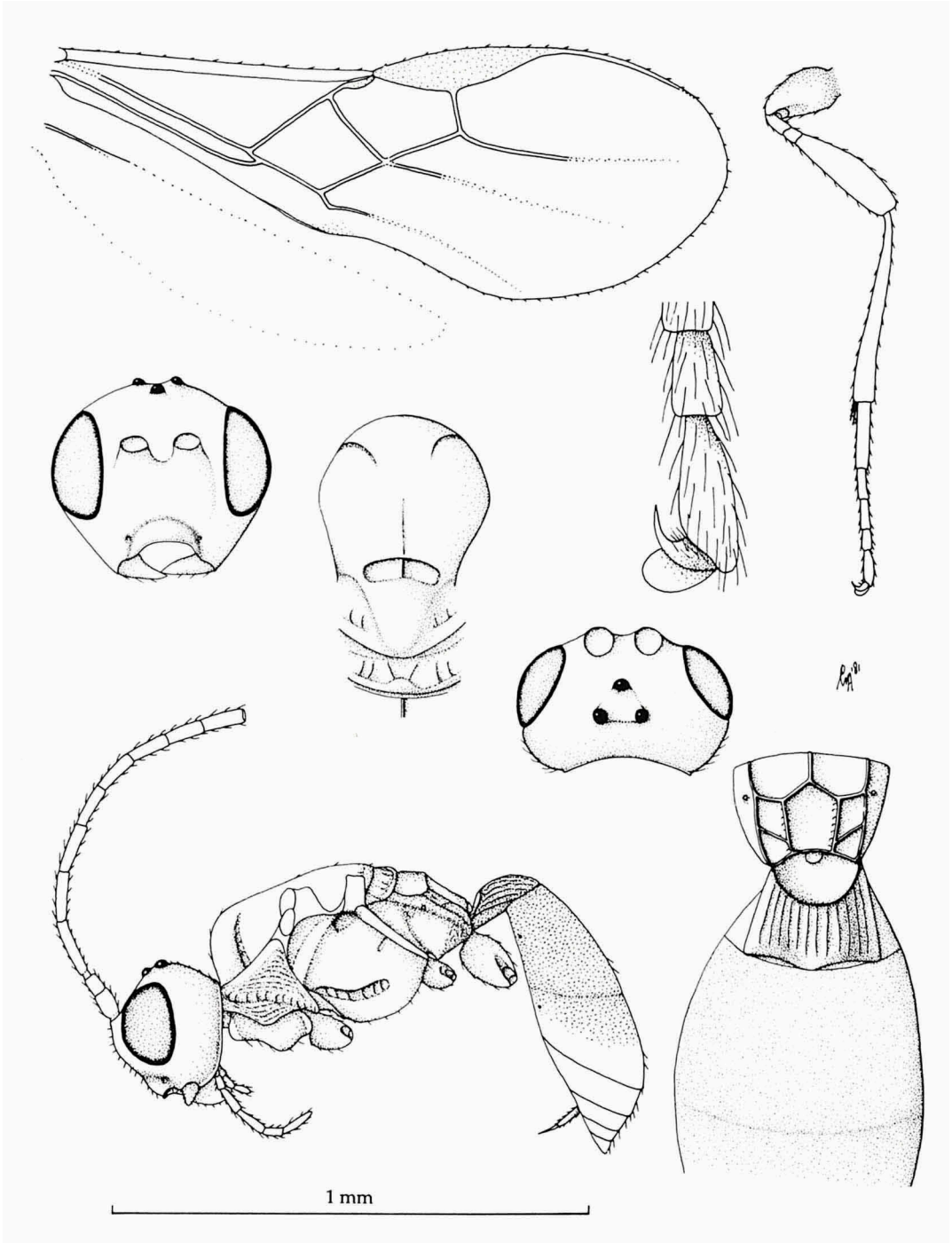
The scale-line refers only to the figures of the habitus, wings and hind leg.



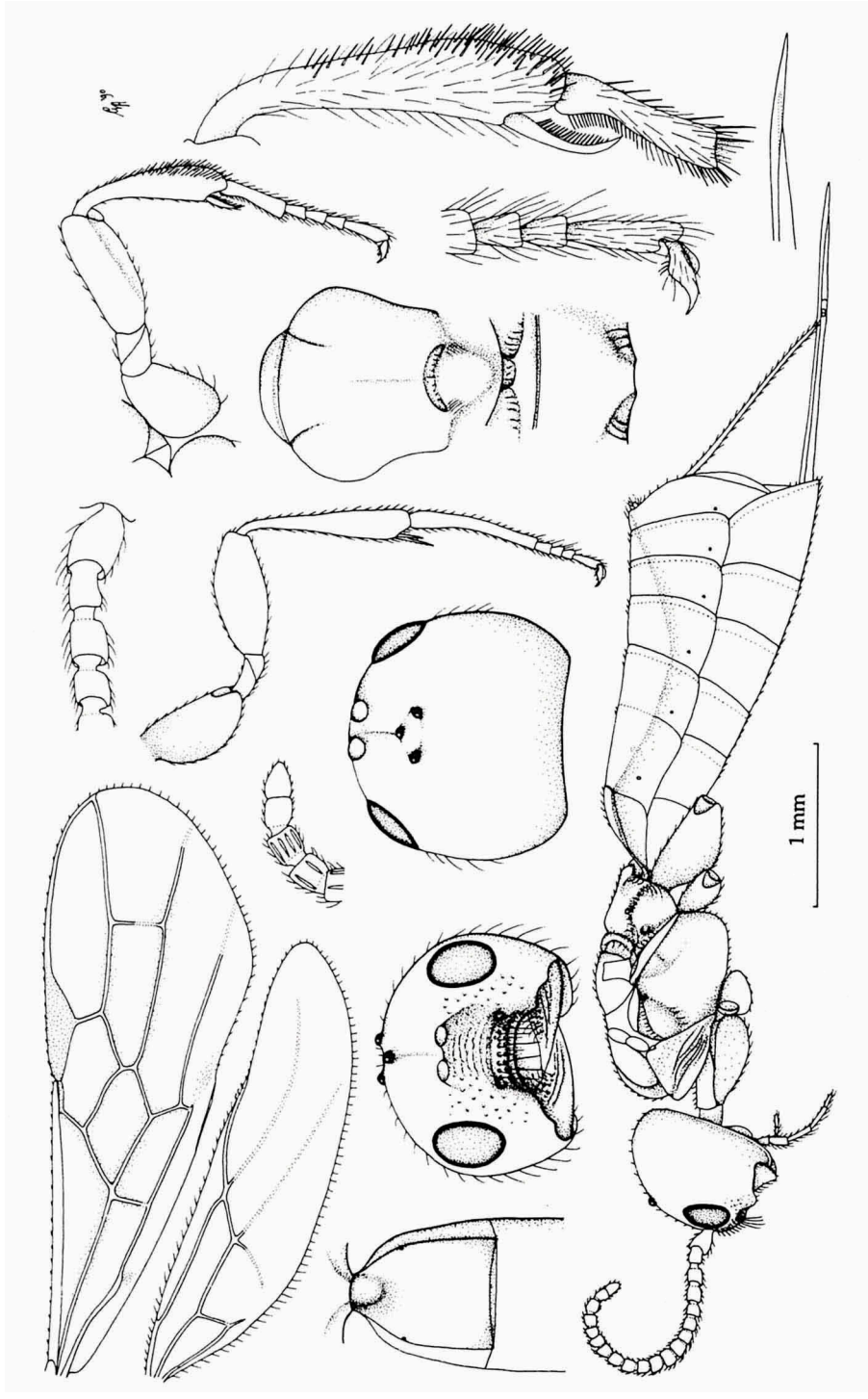
RHYSSALINAE-RHYSSALINI
Plate 1. *Rhyssalus kerzhneri* (Tobias), ♀.



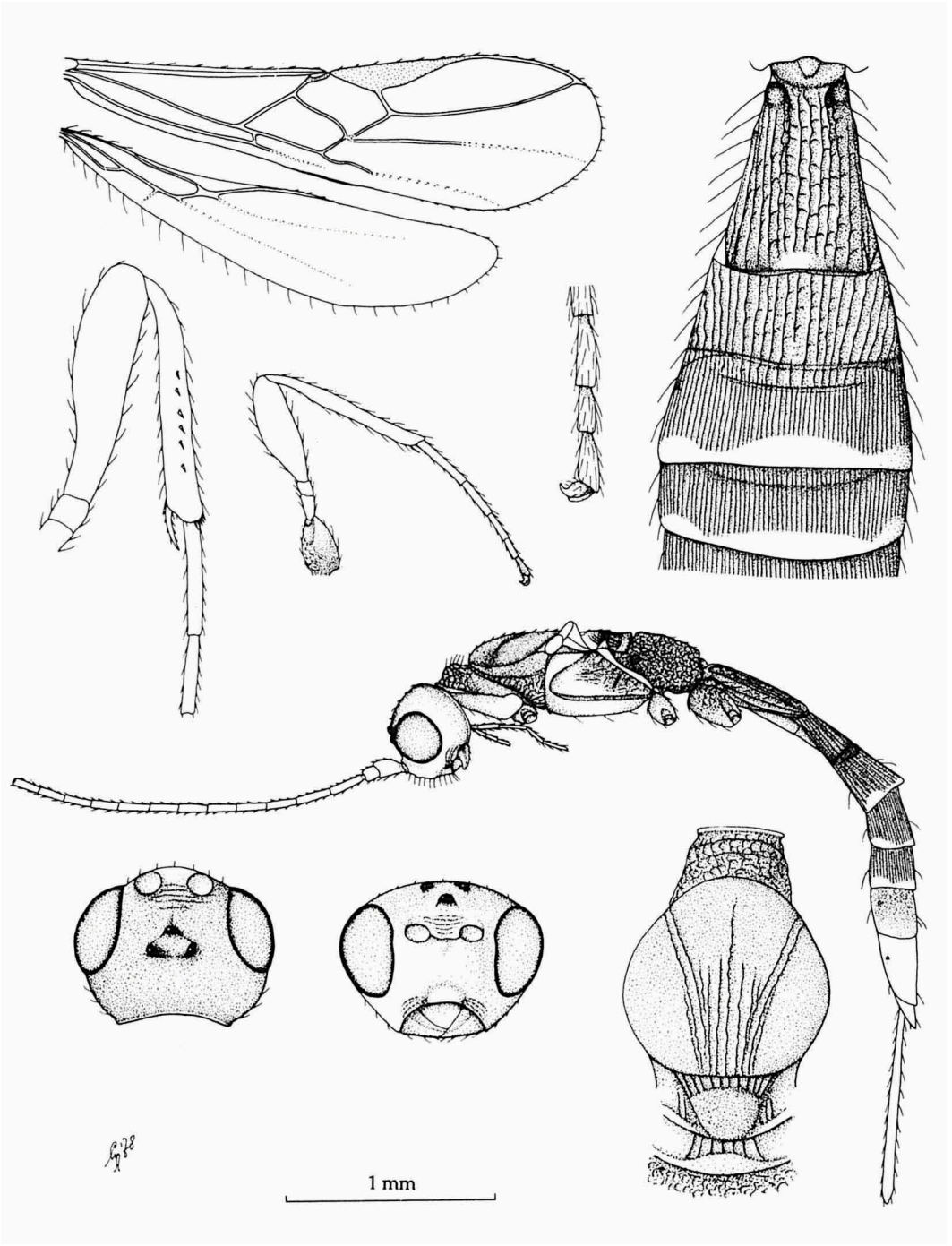
RHYSSALINAE-RHYSSALINI
Plate 2. *Dolopsidea indagator* (Haliday), ♀.



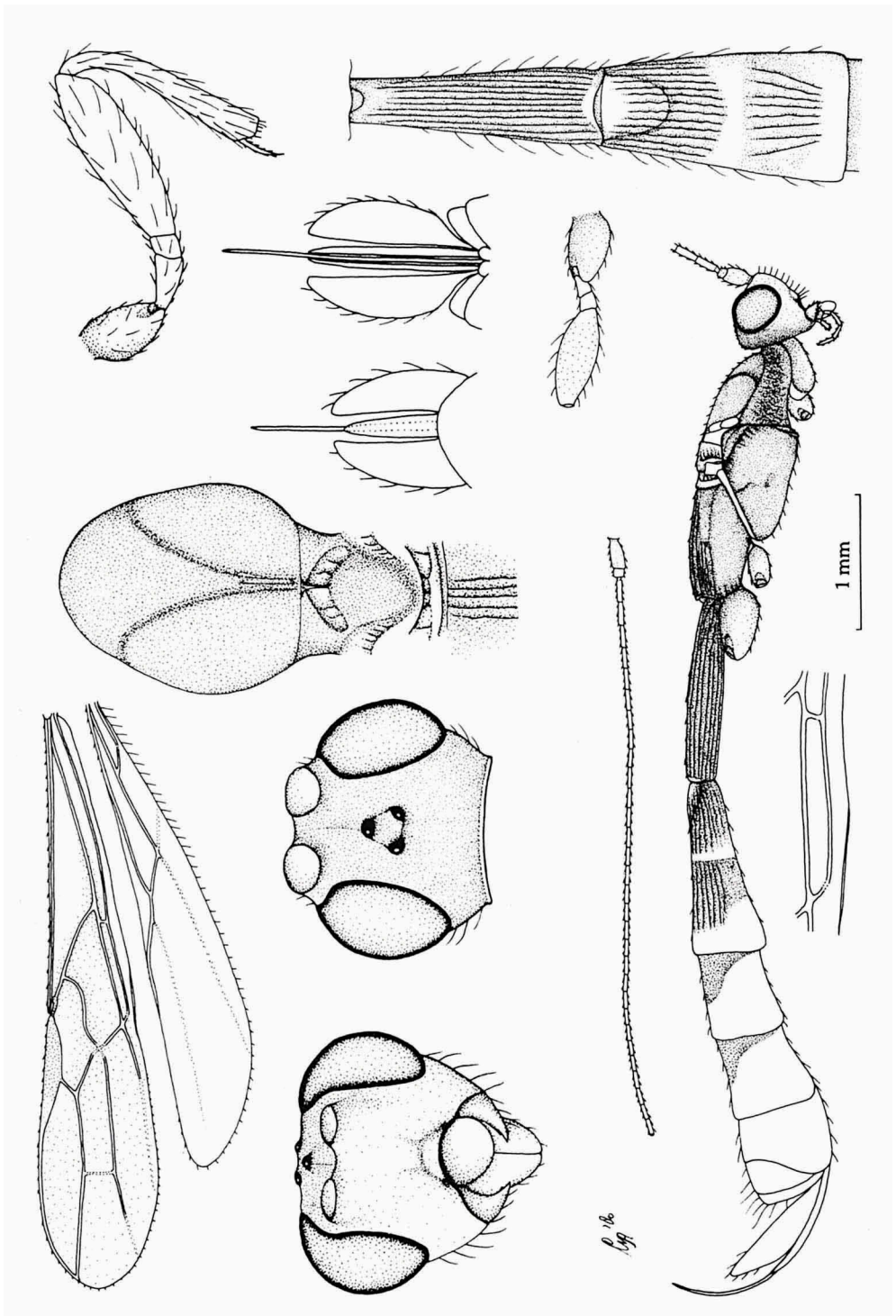
RHYSSALINAE-ACRISIDINI
Plate 3. *Acrisis minutissimus* (Ashmead), ♀.



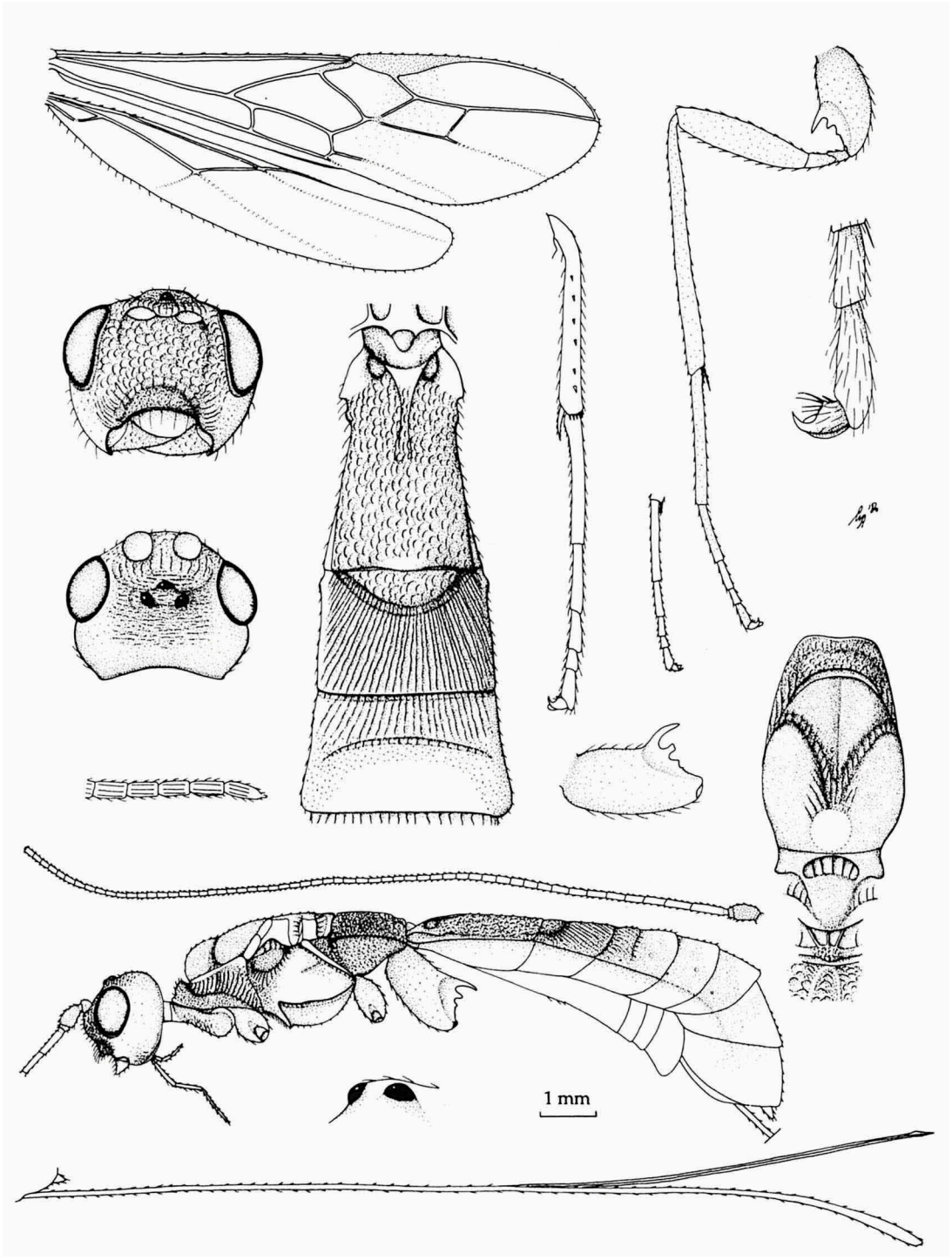
HISTEROMERINAE
Plate 4. *Histeromerus mystacinus* Wesmael, ♀.



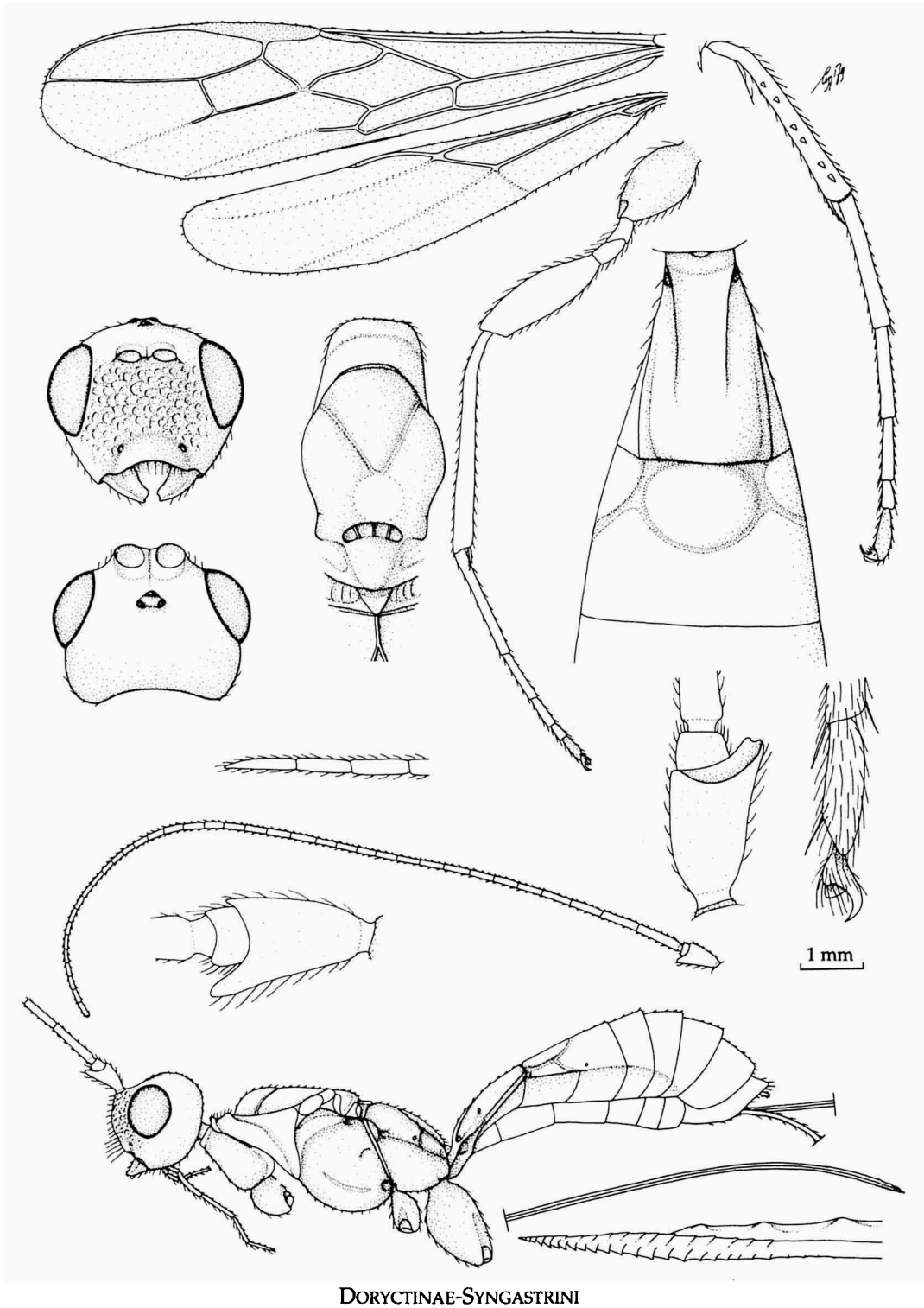
DORYCTINAE-HECABOLINI
Plate 5. *Pareucorystes varinervis* Tobias, ♀.



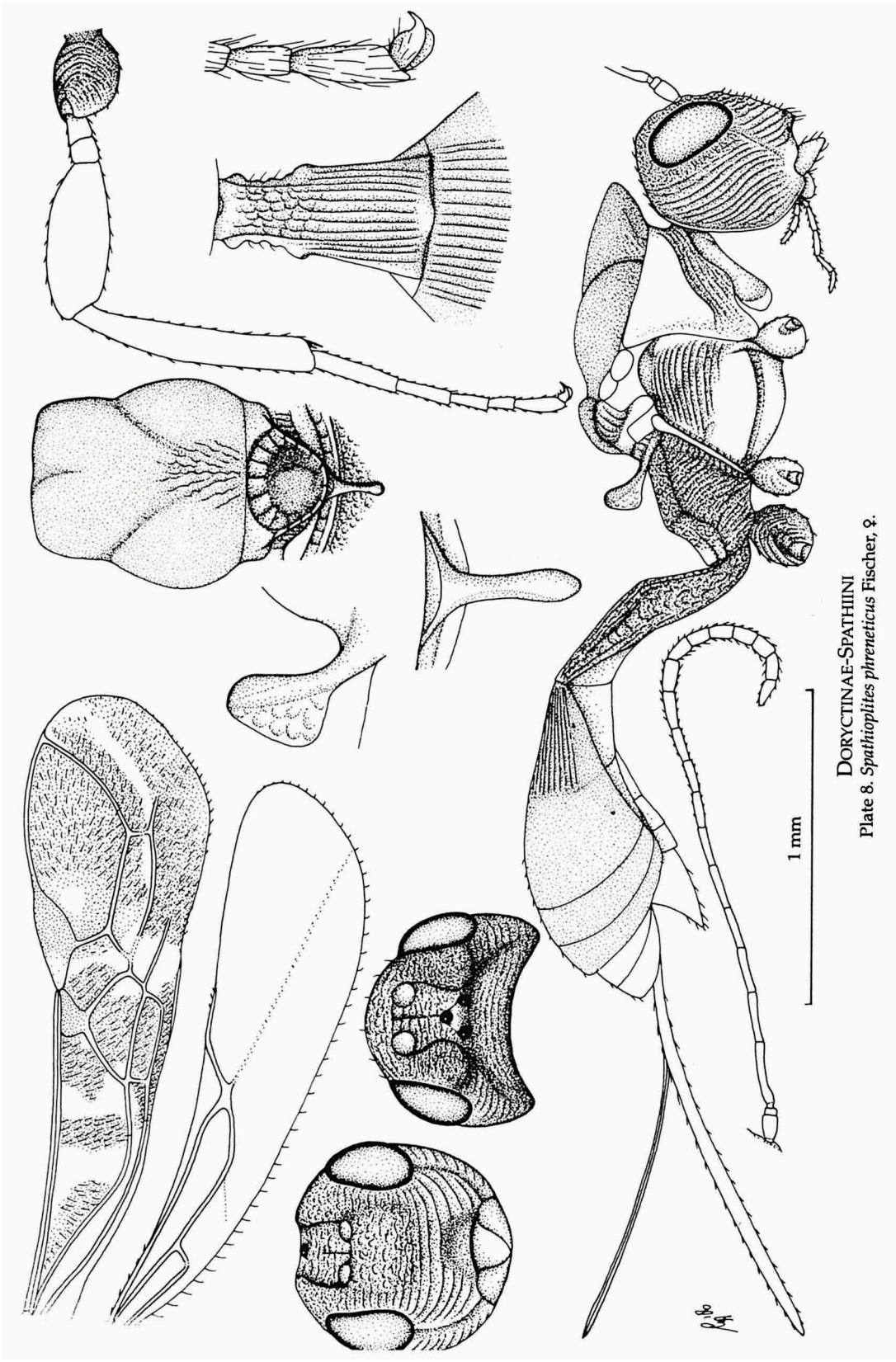
DORYCTINAE-LEPTORHACONOTINI
Plate 6. *Leptorhaconotus brunneus* Granger, ♀.



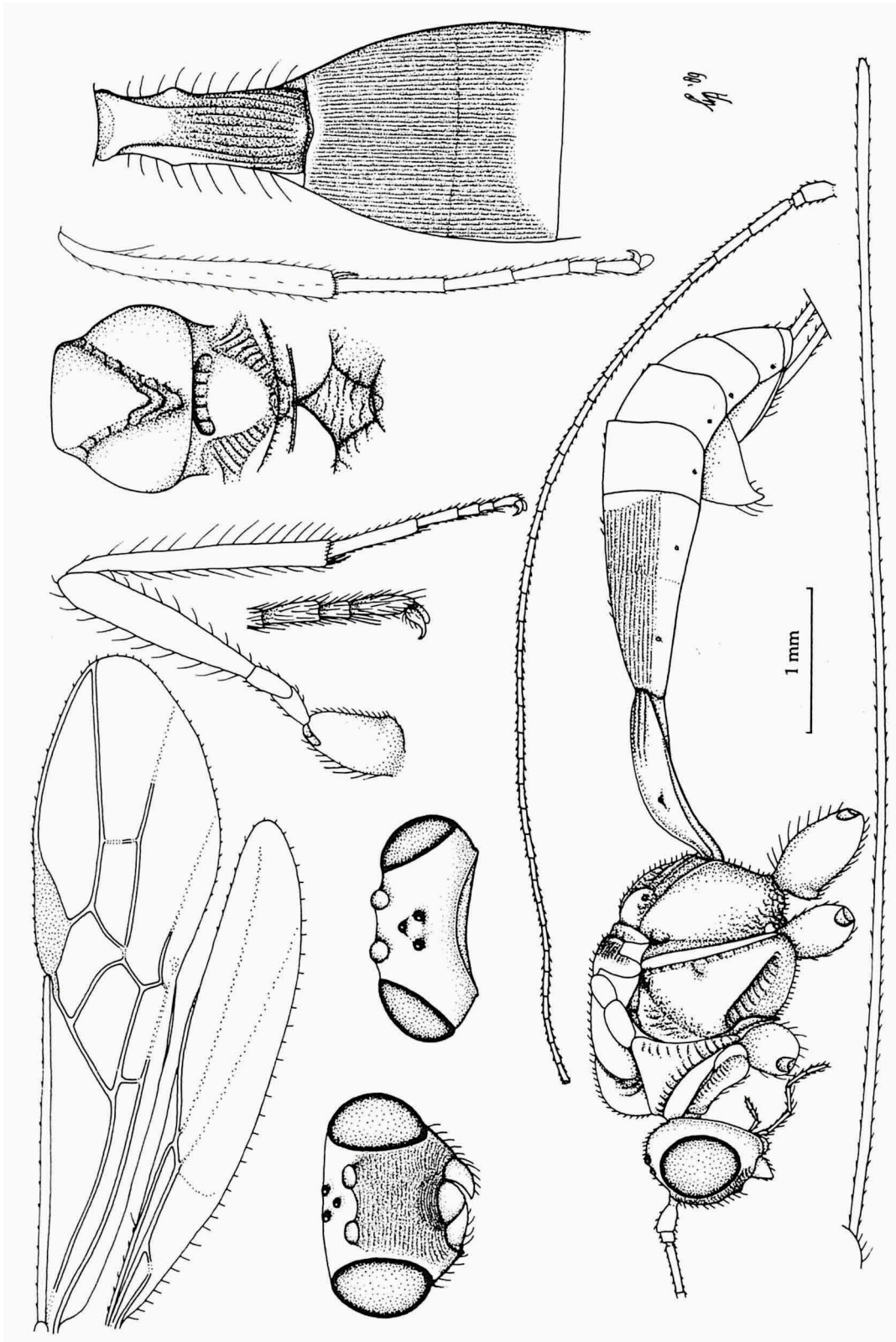
DORYCTINAE-DORYCTINI
Plate 7. *Priosphys biannulatus* (Granger), ♀.



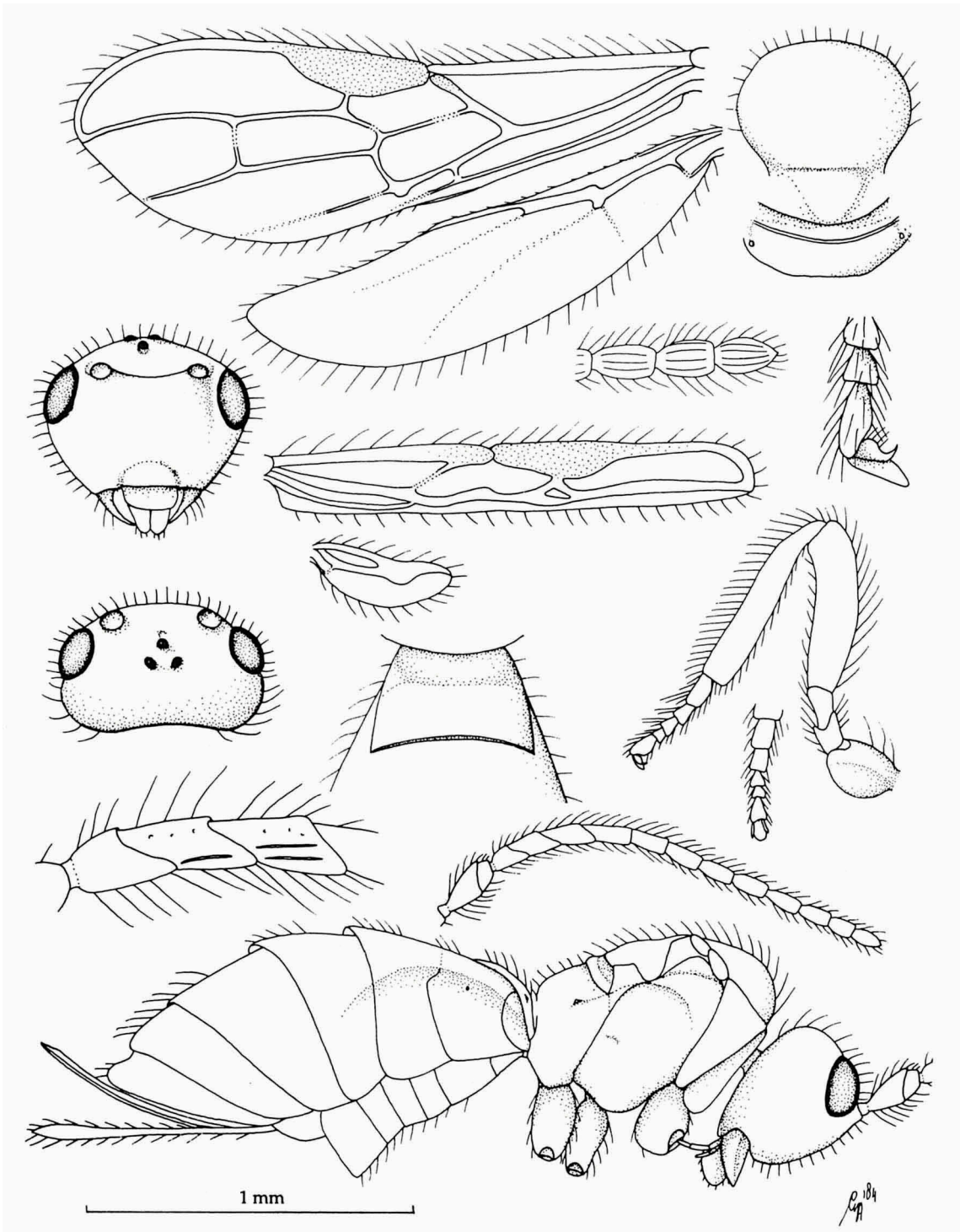
DORYCTINAE-SYNGASTRINI
Plate 9. *Siragra nitida* Cameron, ♀.



DORYCTINAE-SPATHIINI
Plate 8. *Spathioplites phreneticus* Fischer, ♀.

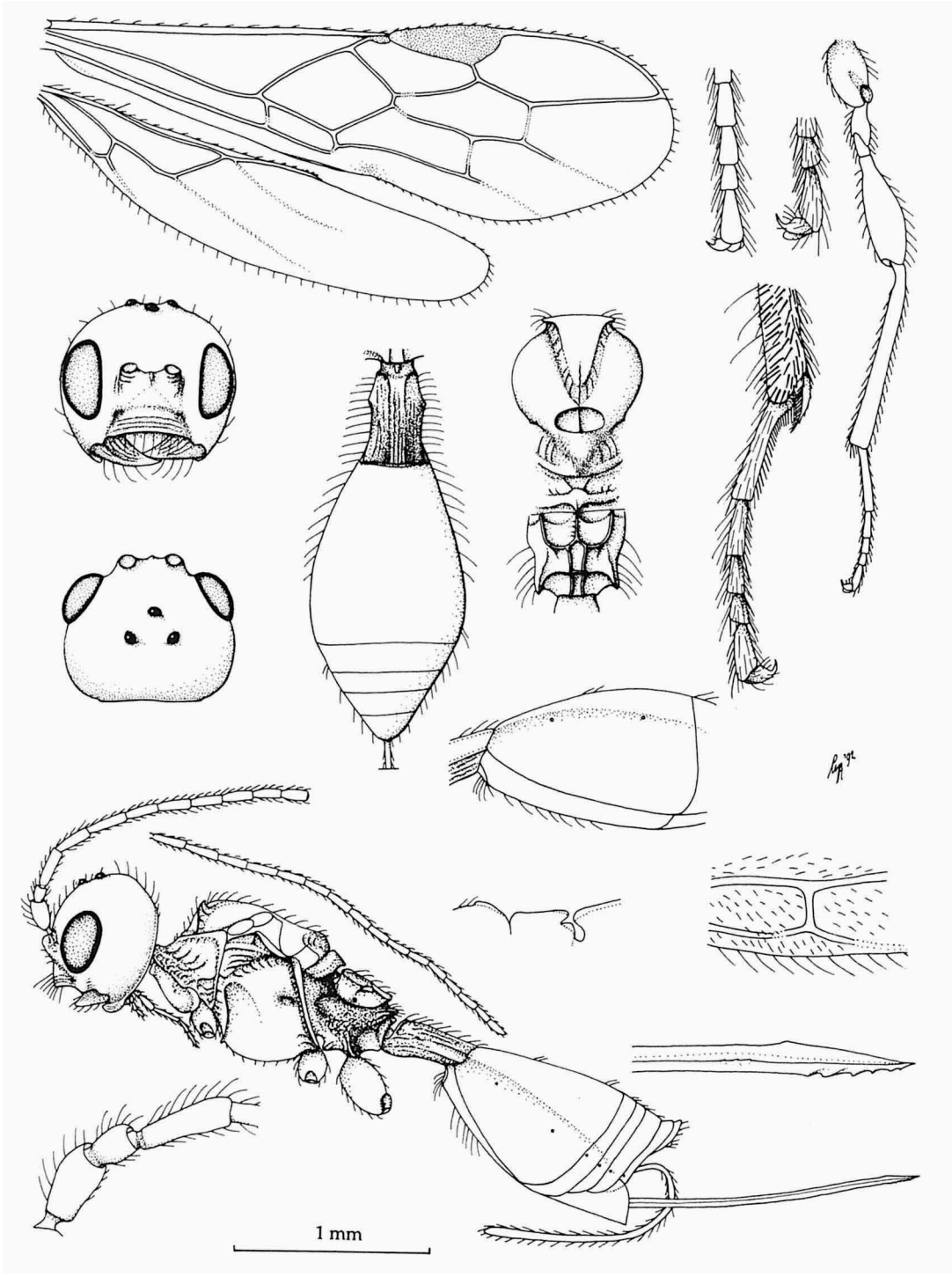


DORYCTINAE-EVANIODINI
Plate 10. *Evaniodes areolatus* Szépligeti, ♀.

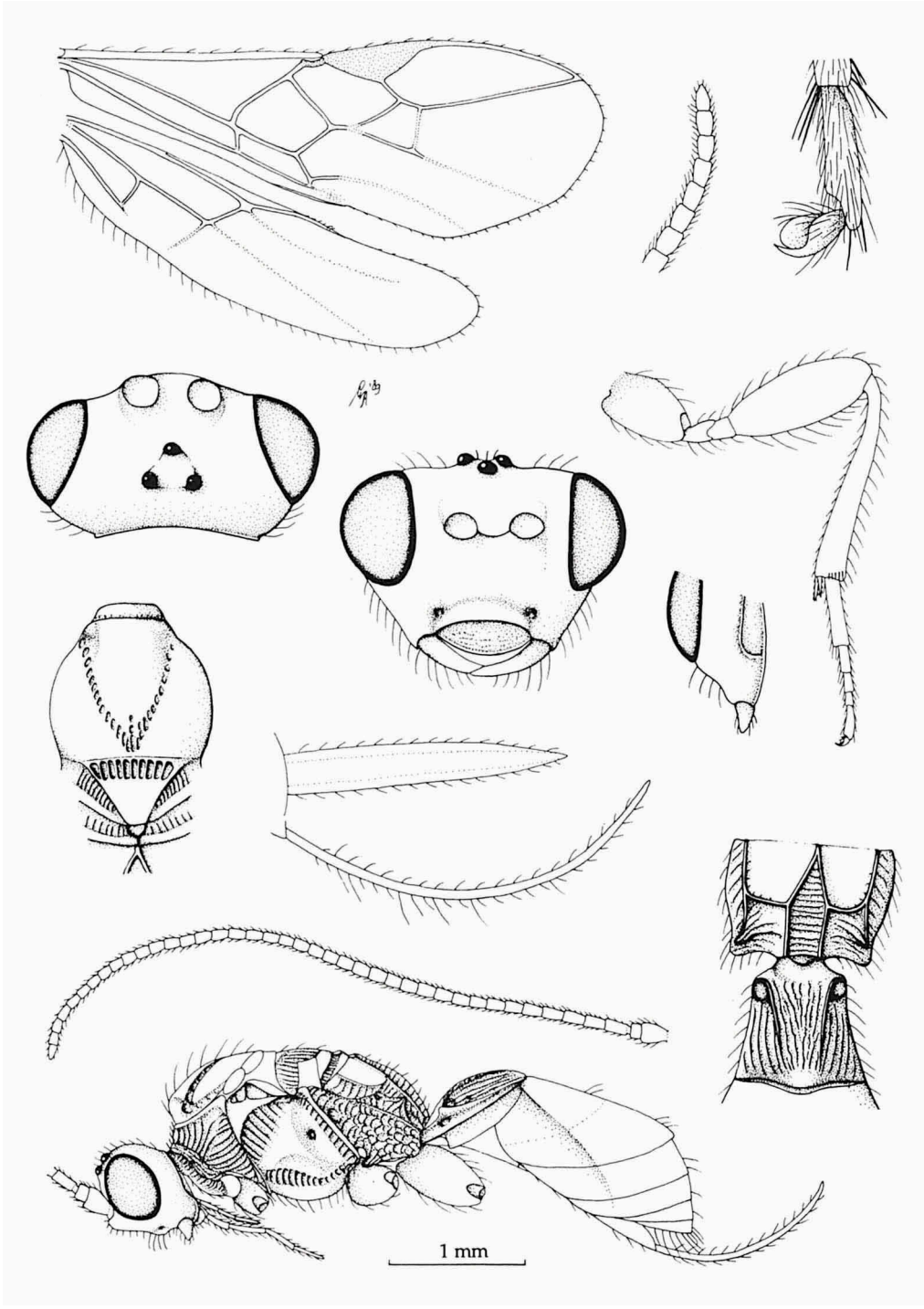


DORYCTINAE-YPSISTOCERINI

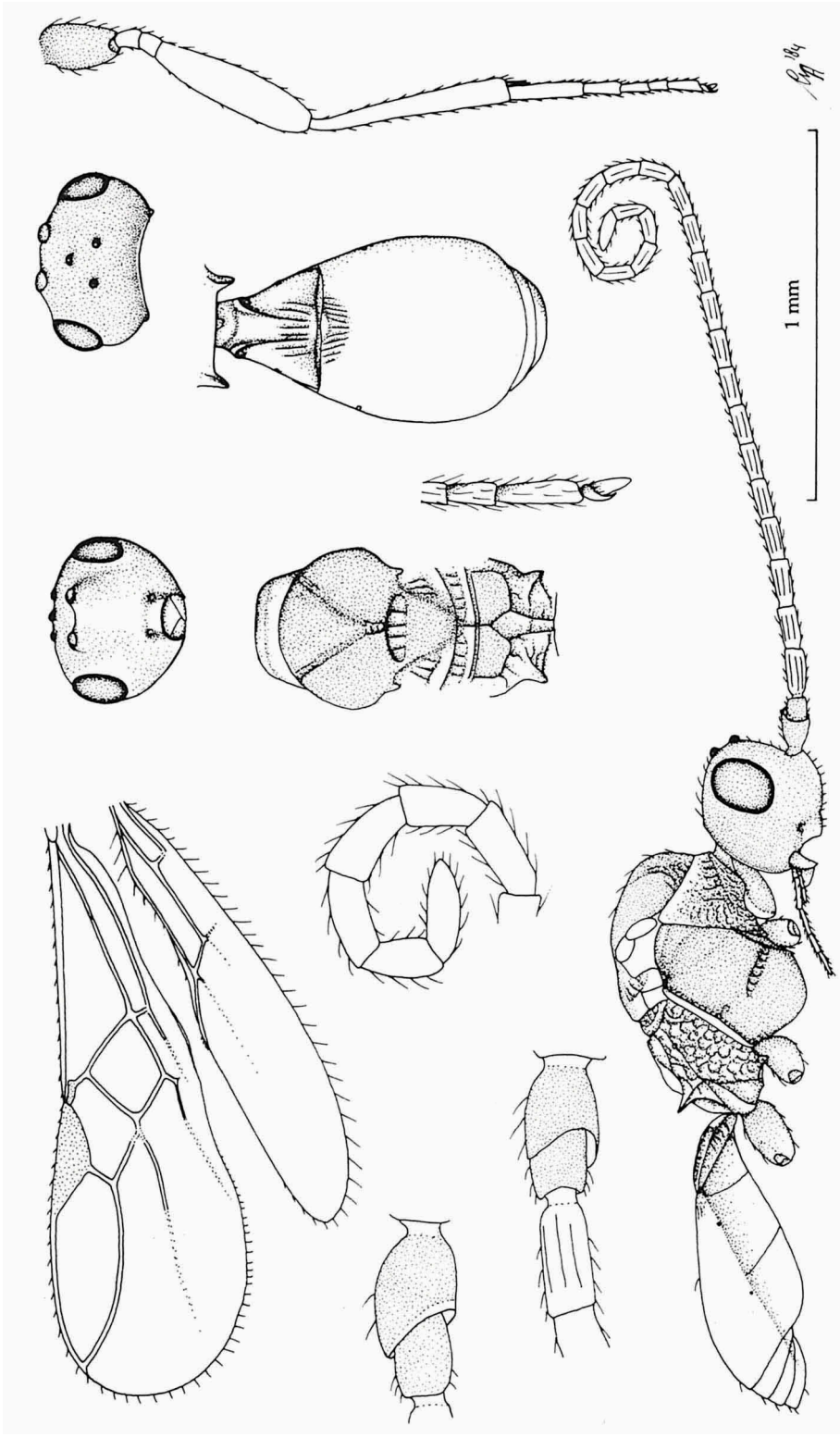
Plate 11. *Termitobracon emersoni* Brues, ♀, but lower pair of wings of ♂.



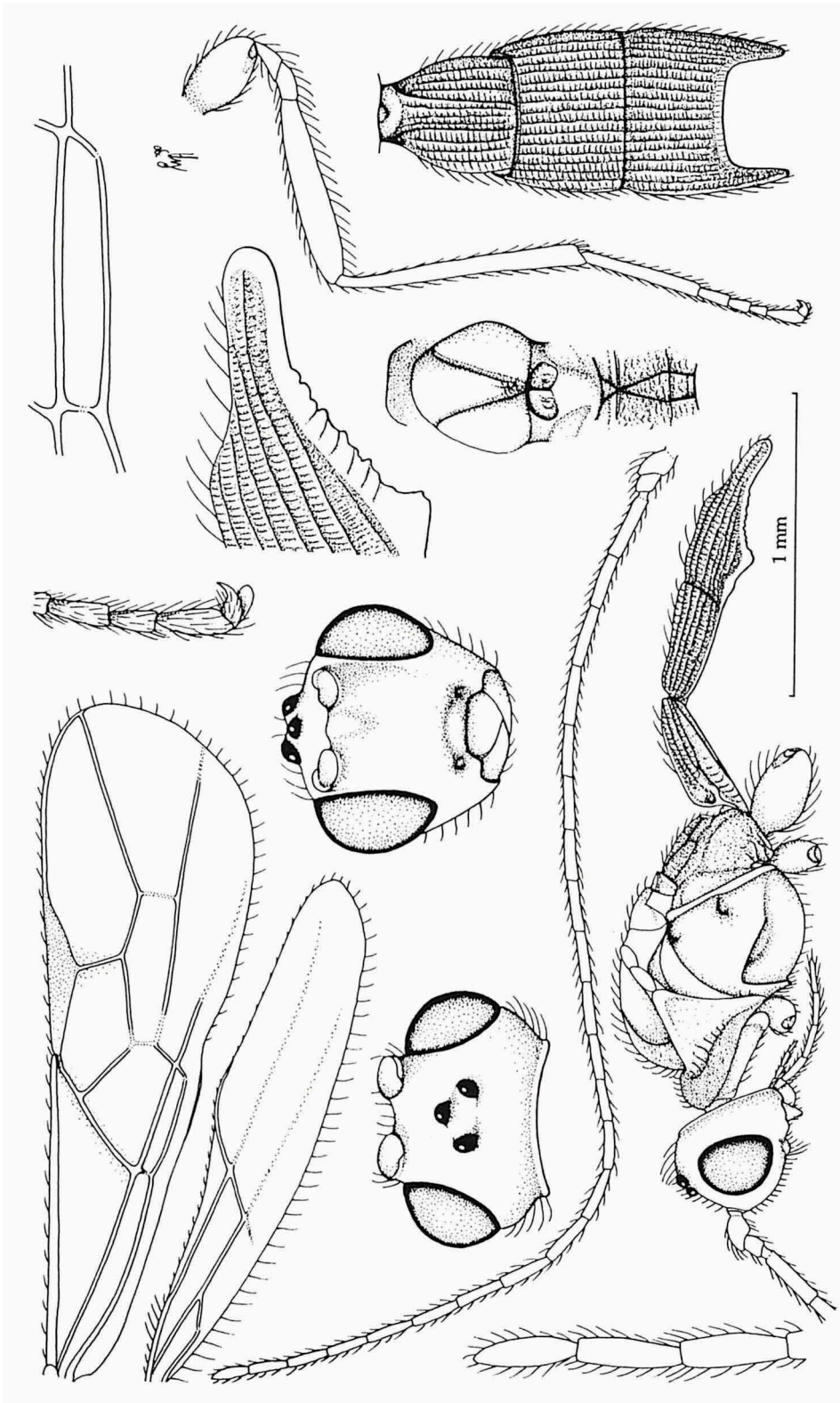
APOZYGINAE
Plate 12. *Apozyx penyai* Mason, ♀.



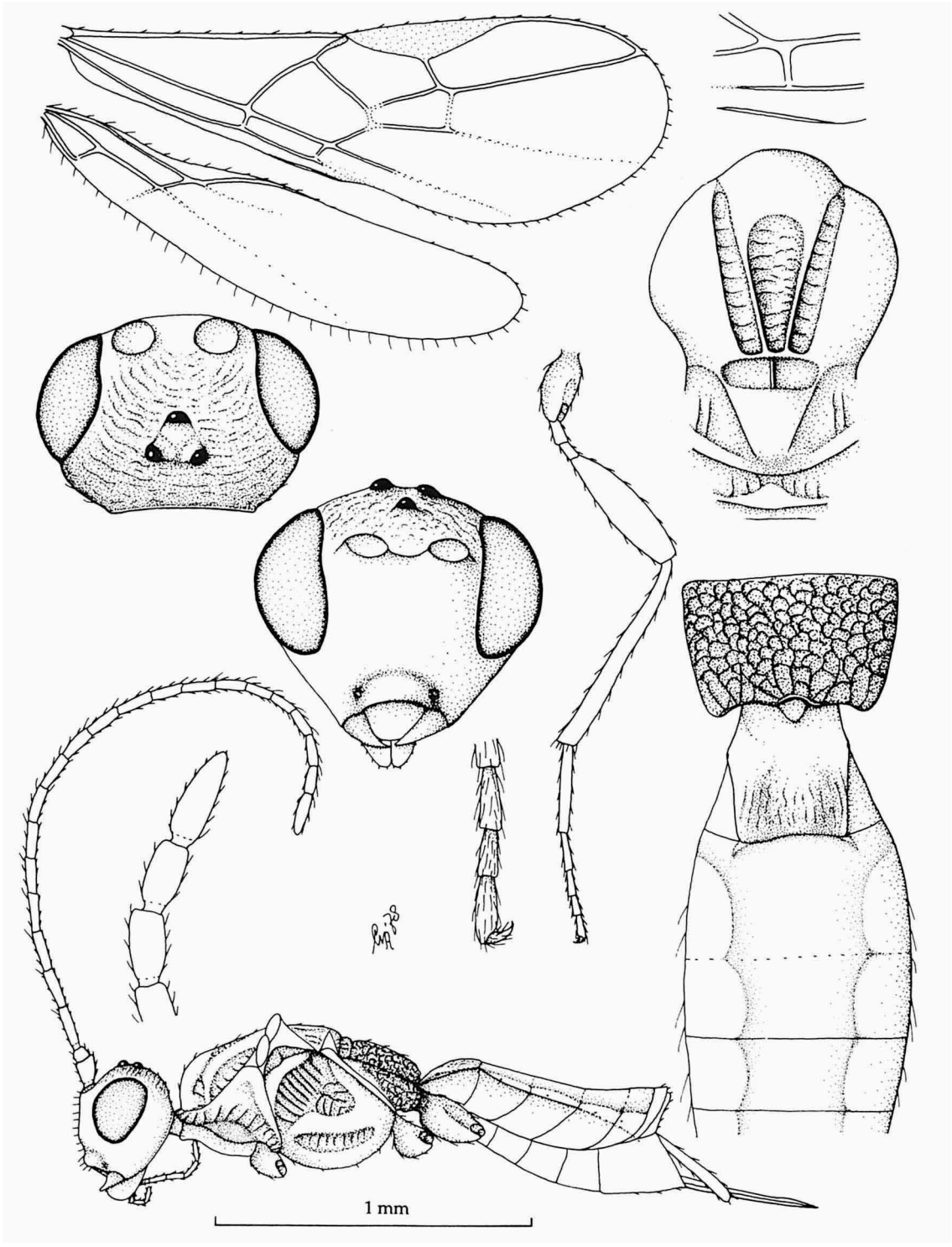
PAMBOLINAE
Plate 13. *Notiopambolus depressicauda* van Achterberg & Quicke, ♀.



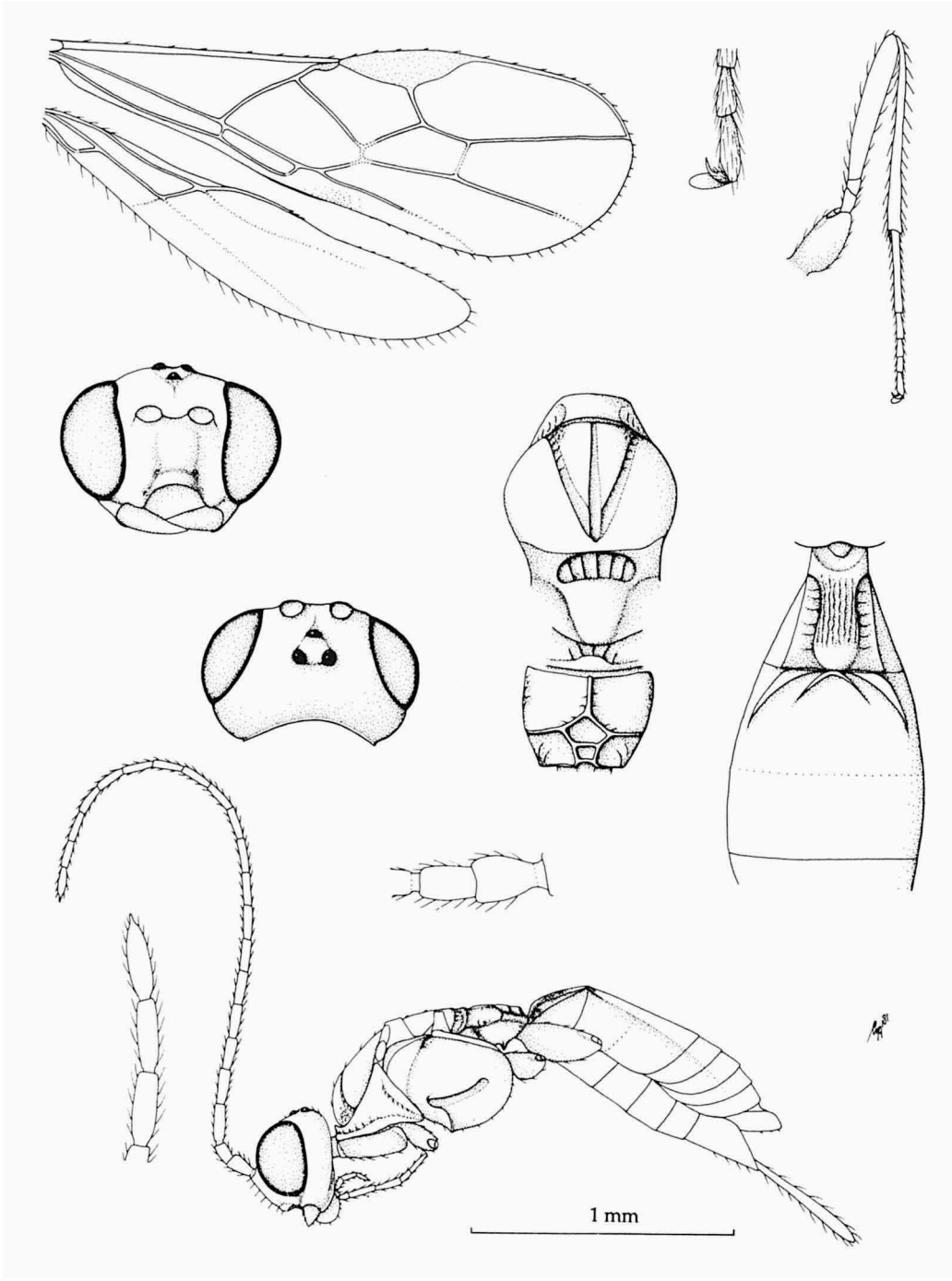
PAMBOLINAE
Plate 14. *Pambolus biglumis* Haliday, ♀.



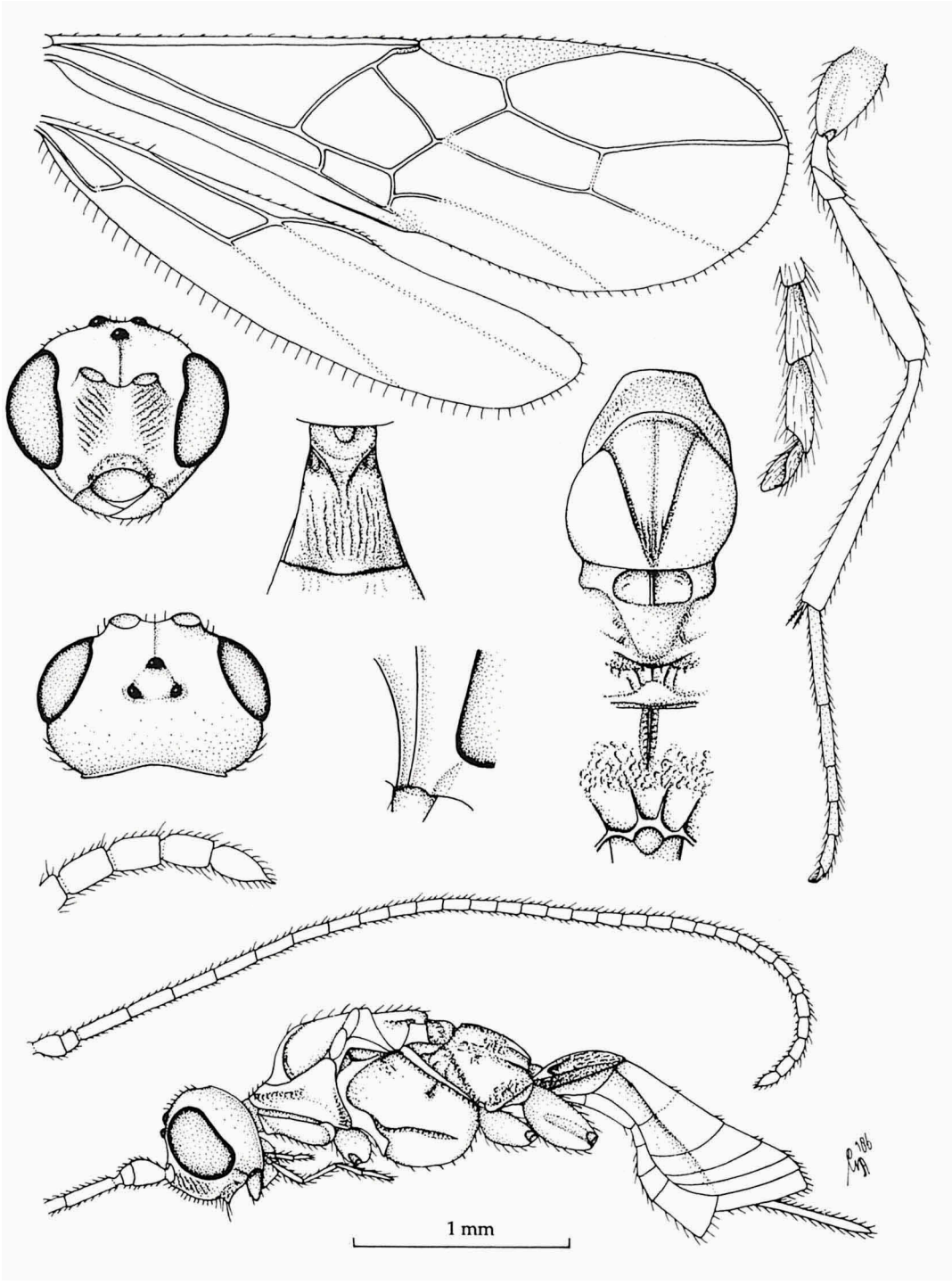
LYSITERMINAE-LYSITERMINI
Plate 15. *Acanthormius sumatrensis* van Achterberg, ♀.



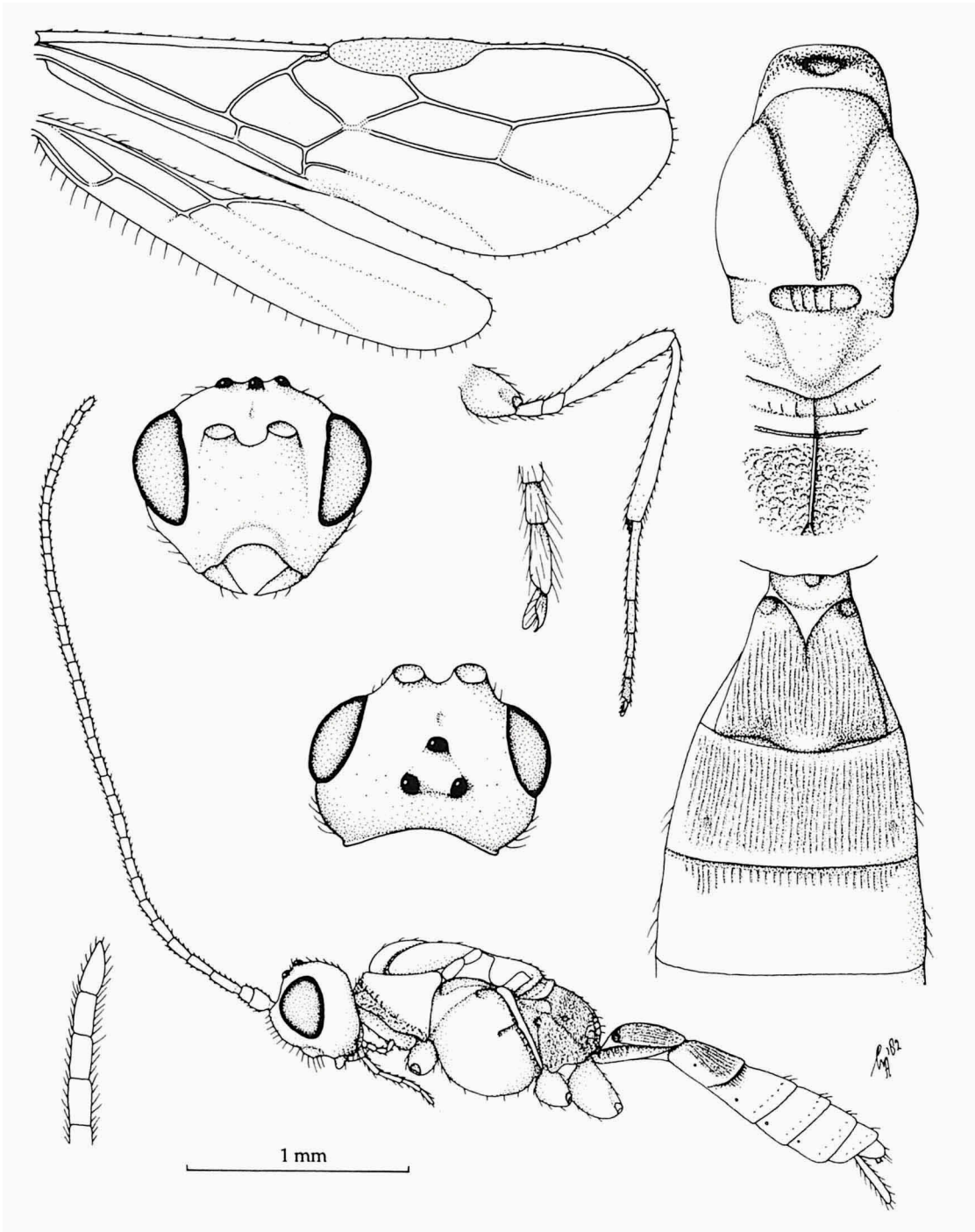
HORMIINAE-HORMIINI
Plate 16. *Pseudohormius turkmenus* Tobias, ♀.



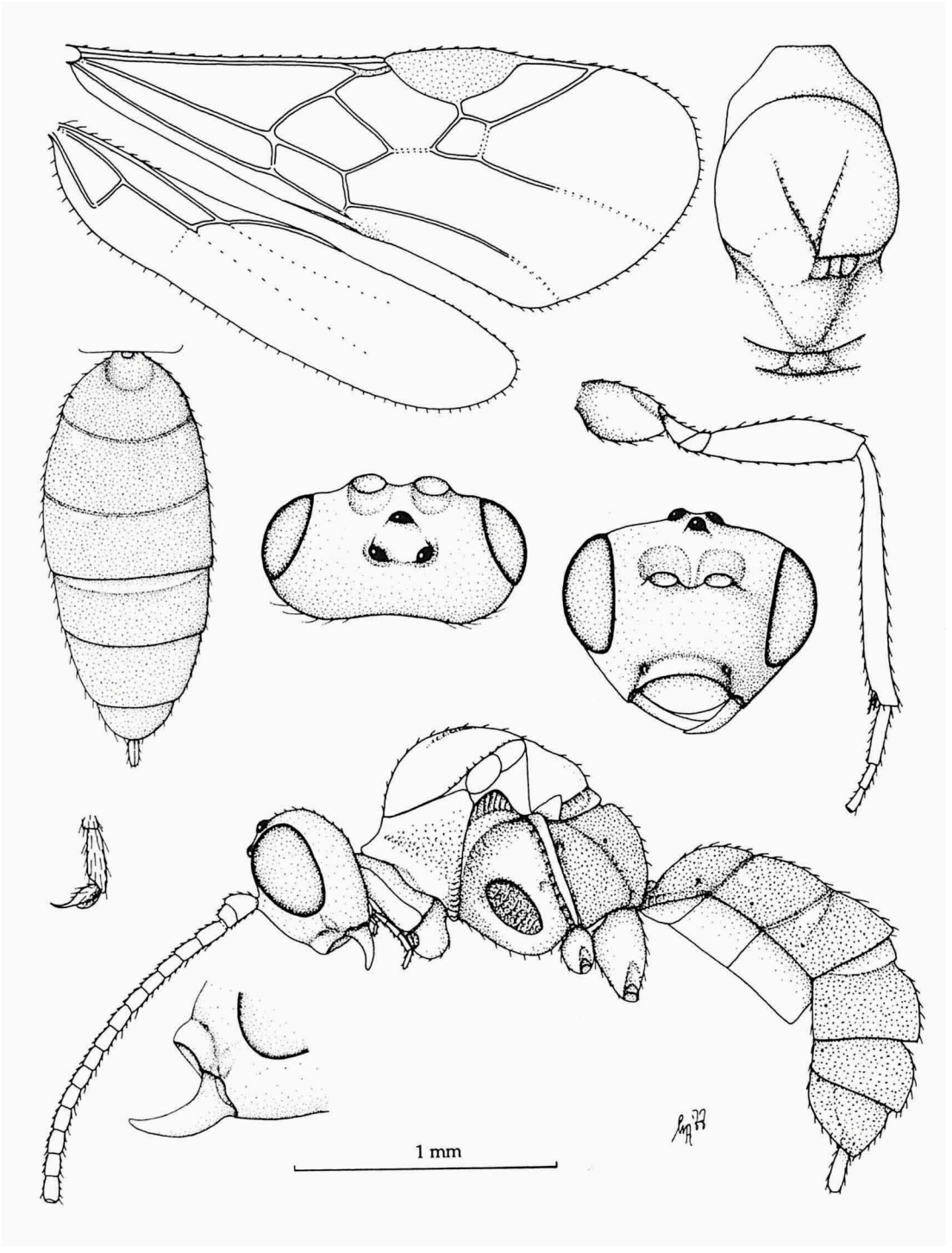
HORMIINAE-HORMIINI
Plate 17. *Hormius romani* (Hedqvist), ♀.



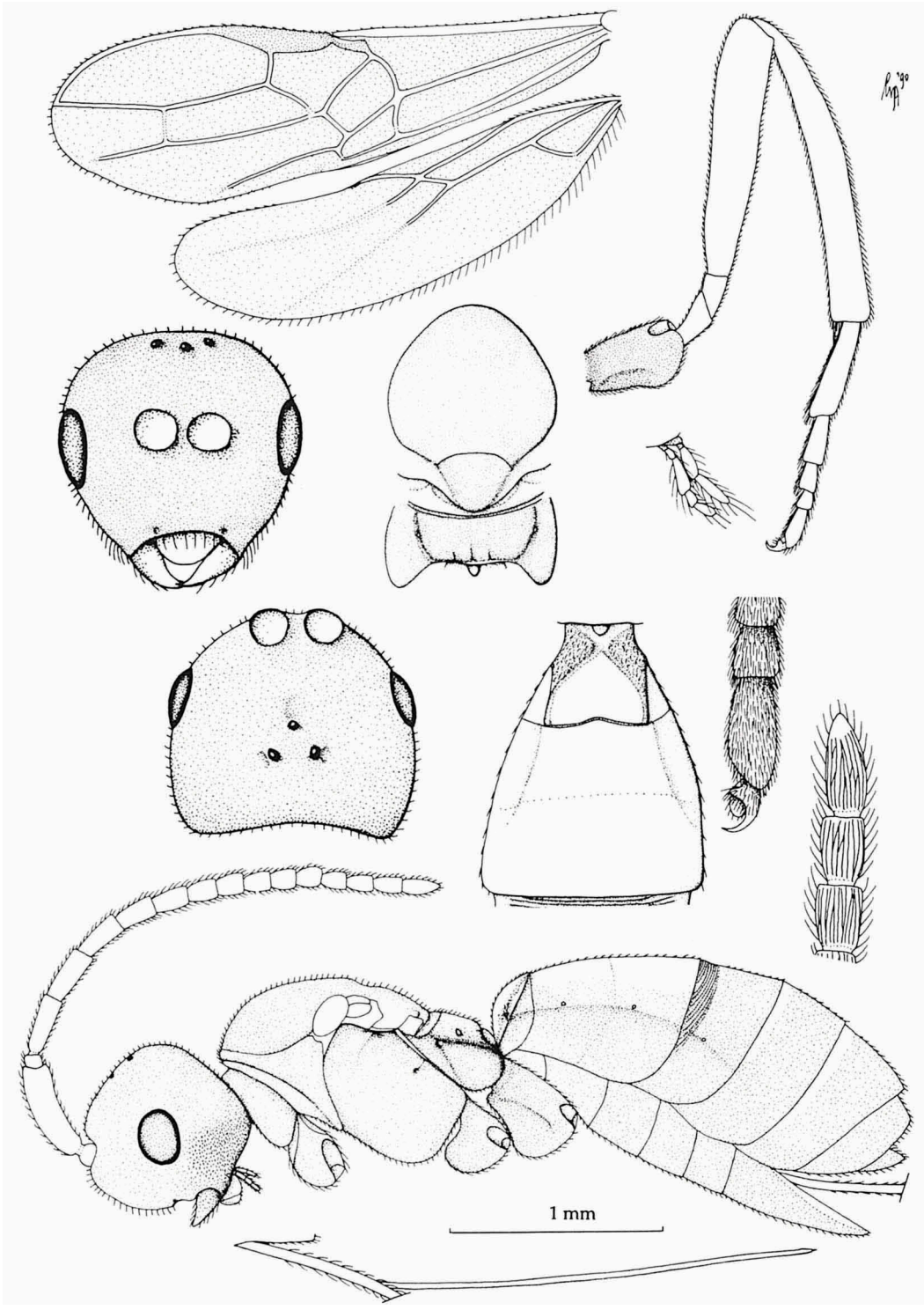
EXOTHECINAE-RHYSIPOLINI
Plate 18. *Rhysipolis meditator* (Haliday), ♀.



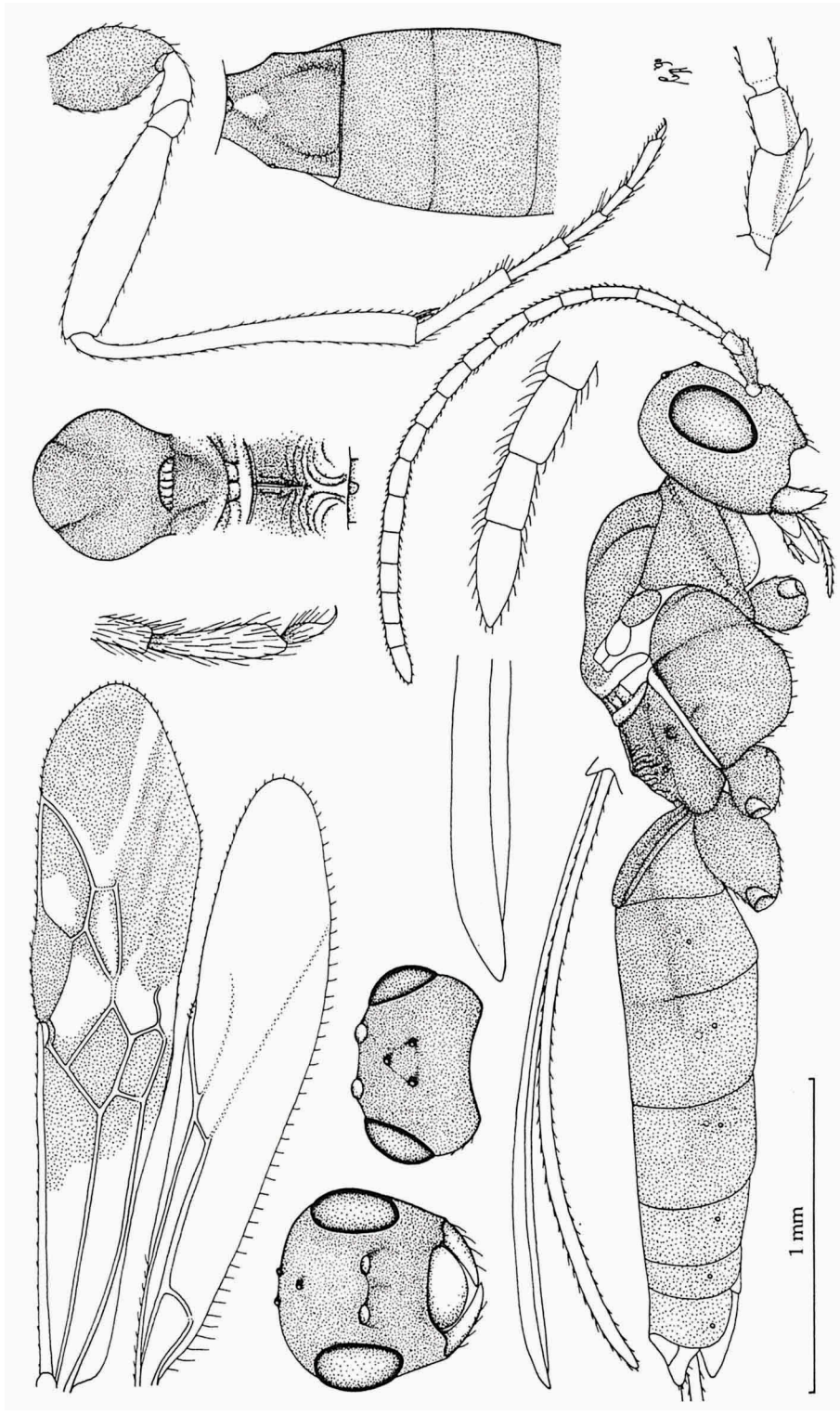
EXOTHECINAE-EXOTHECINI
Plate 19. *Xenarcha abnormis* (Wesmael), ♀.



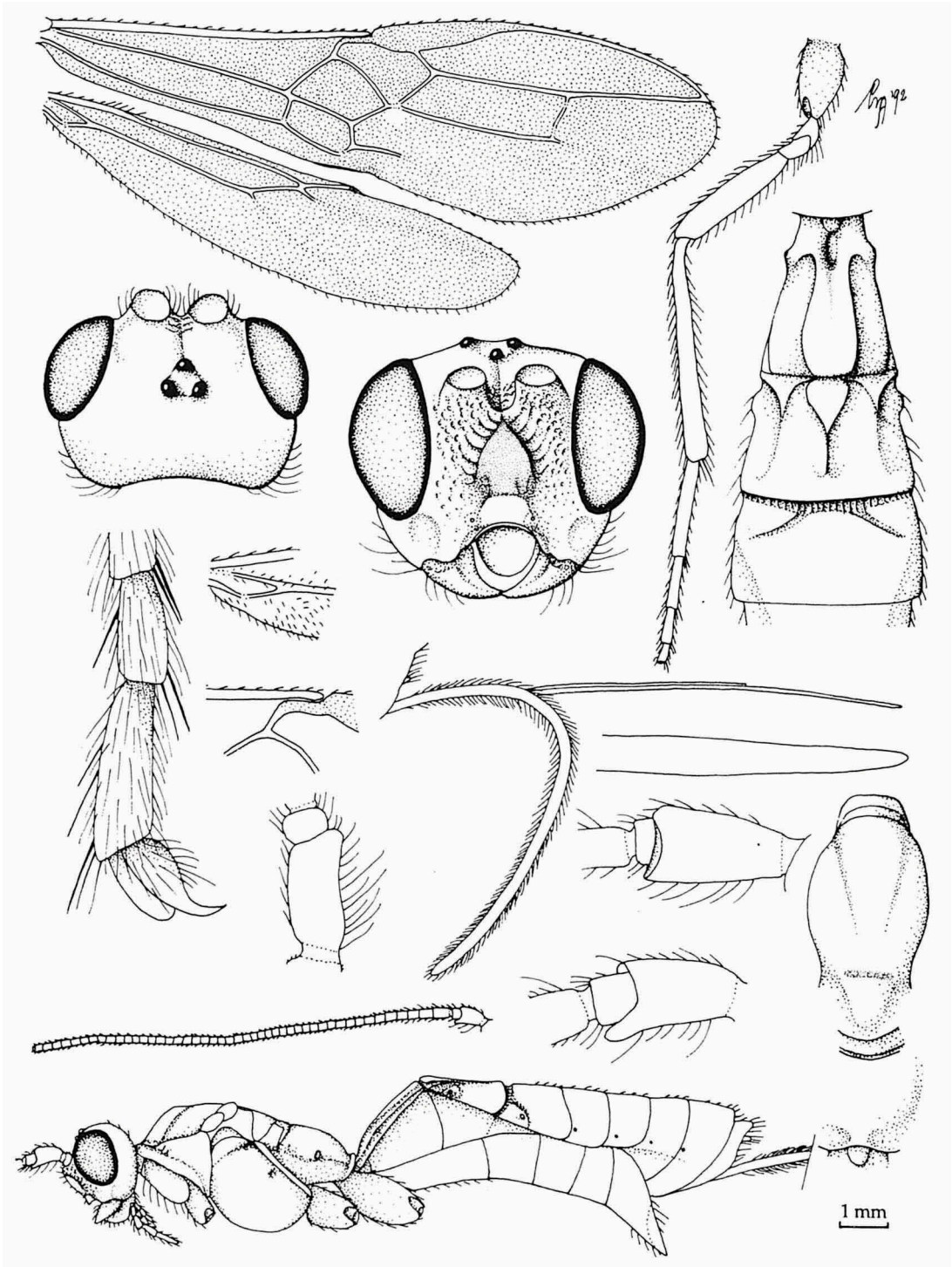
TELENGAIINAE
Plate 20. *Telengaia ventralis* Tobias, ♀.



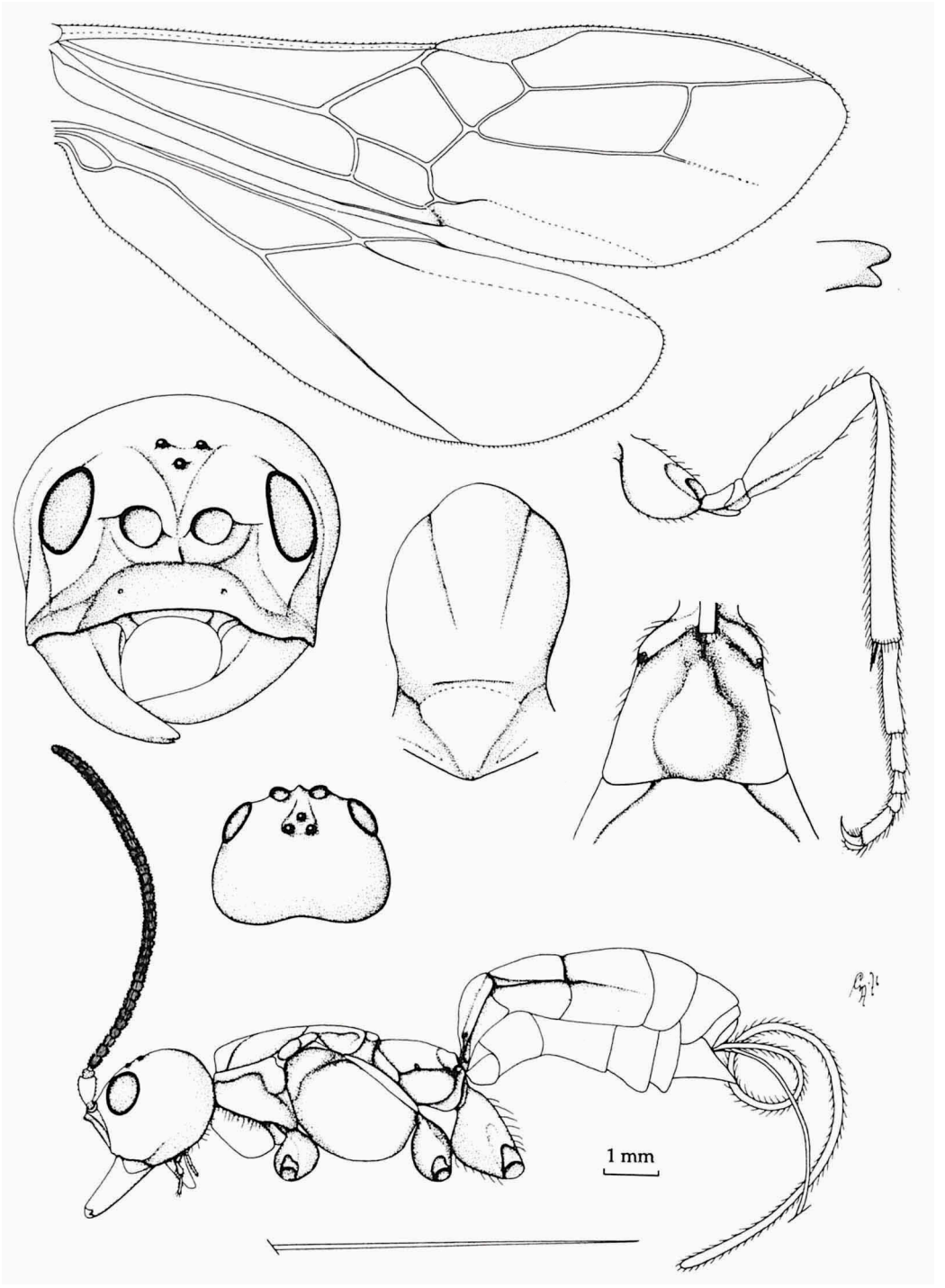
VAEPELLINAE
Plate 21. *Vaepellis varica* Quicke, ♀.



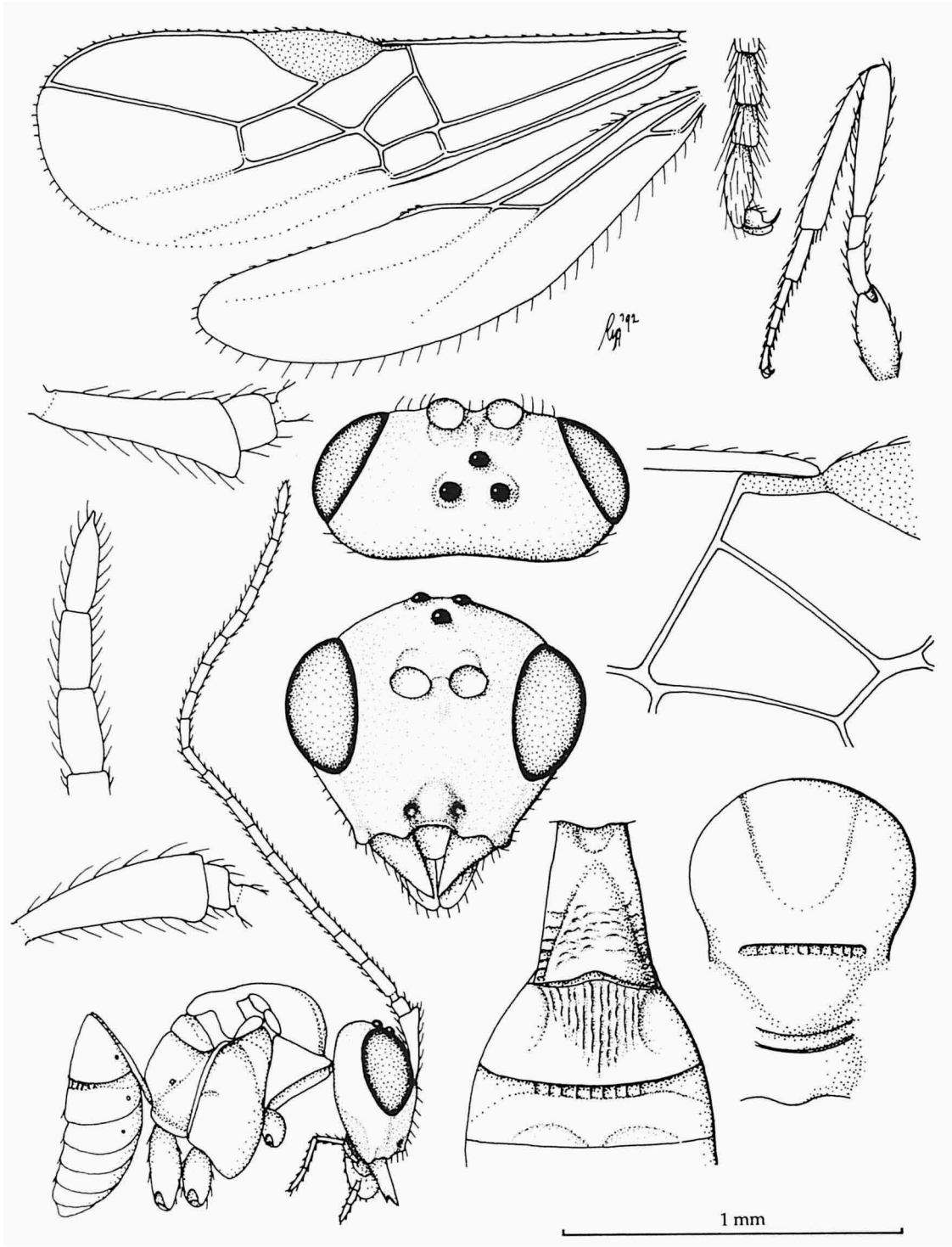
BRACONINAE-ARGAMANIINI
Plate 22. *Argamania aereus* Papp, ♀.



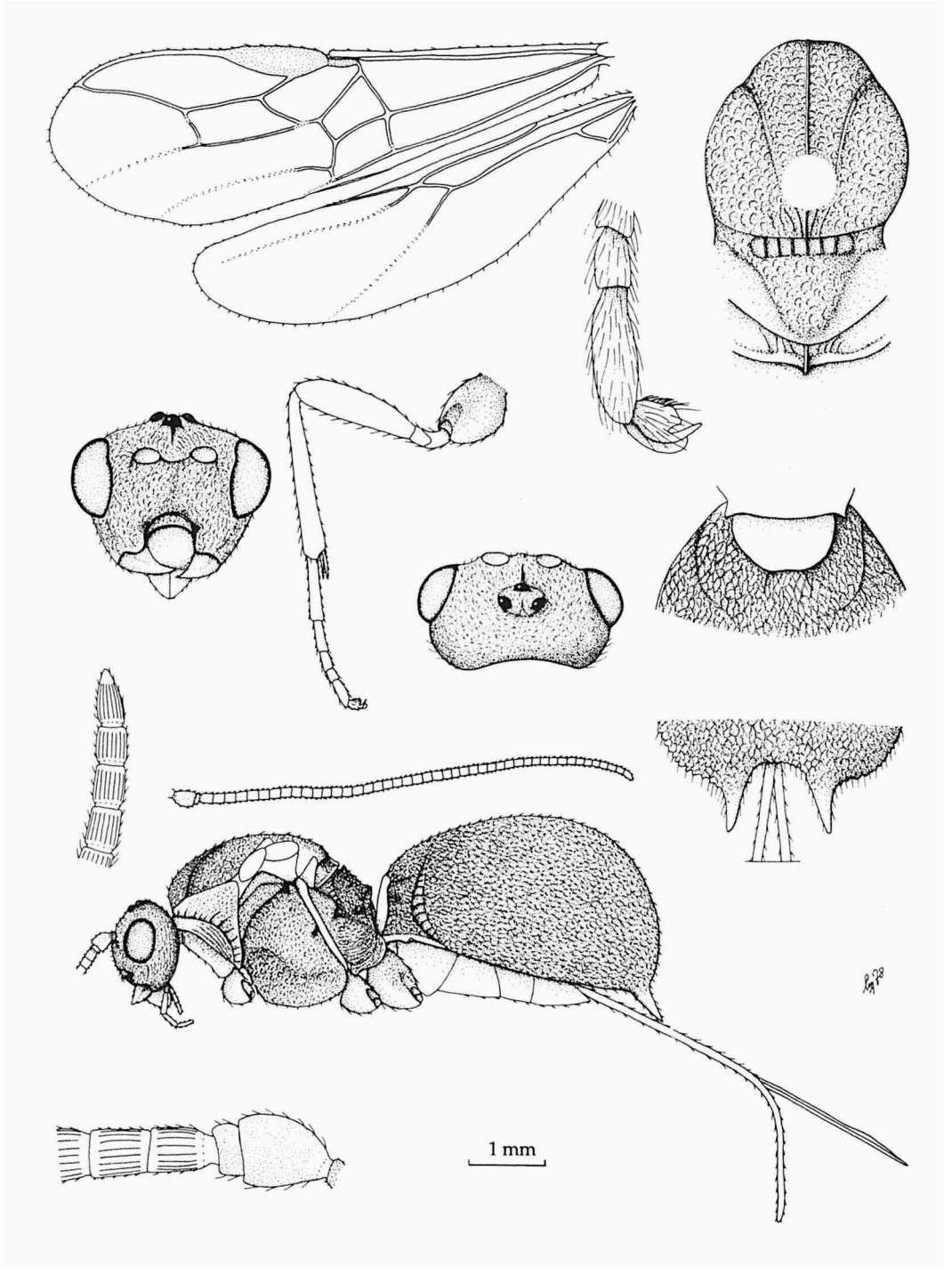
BRACONINAE-APHRASTOBRACONINI
Plate 23. *Floralibracon floralis* (Smith), ♀.



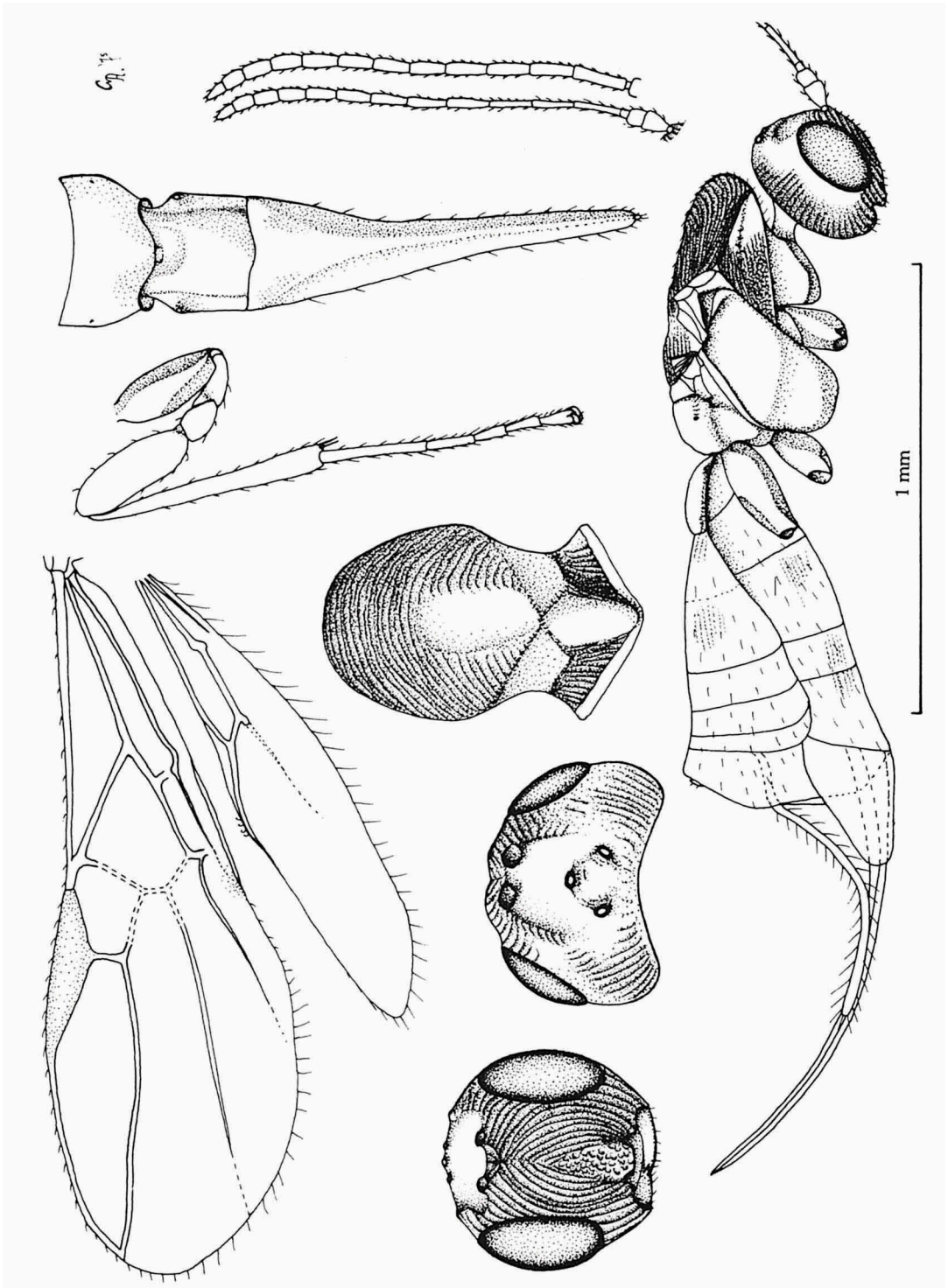
BRACONINAE-APHRASTOBRACONINI
Plate 24. *Pseudodicrogenium monstrosum* Fahringer, ♀.



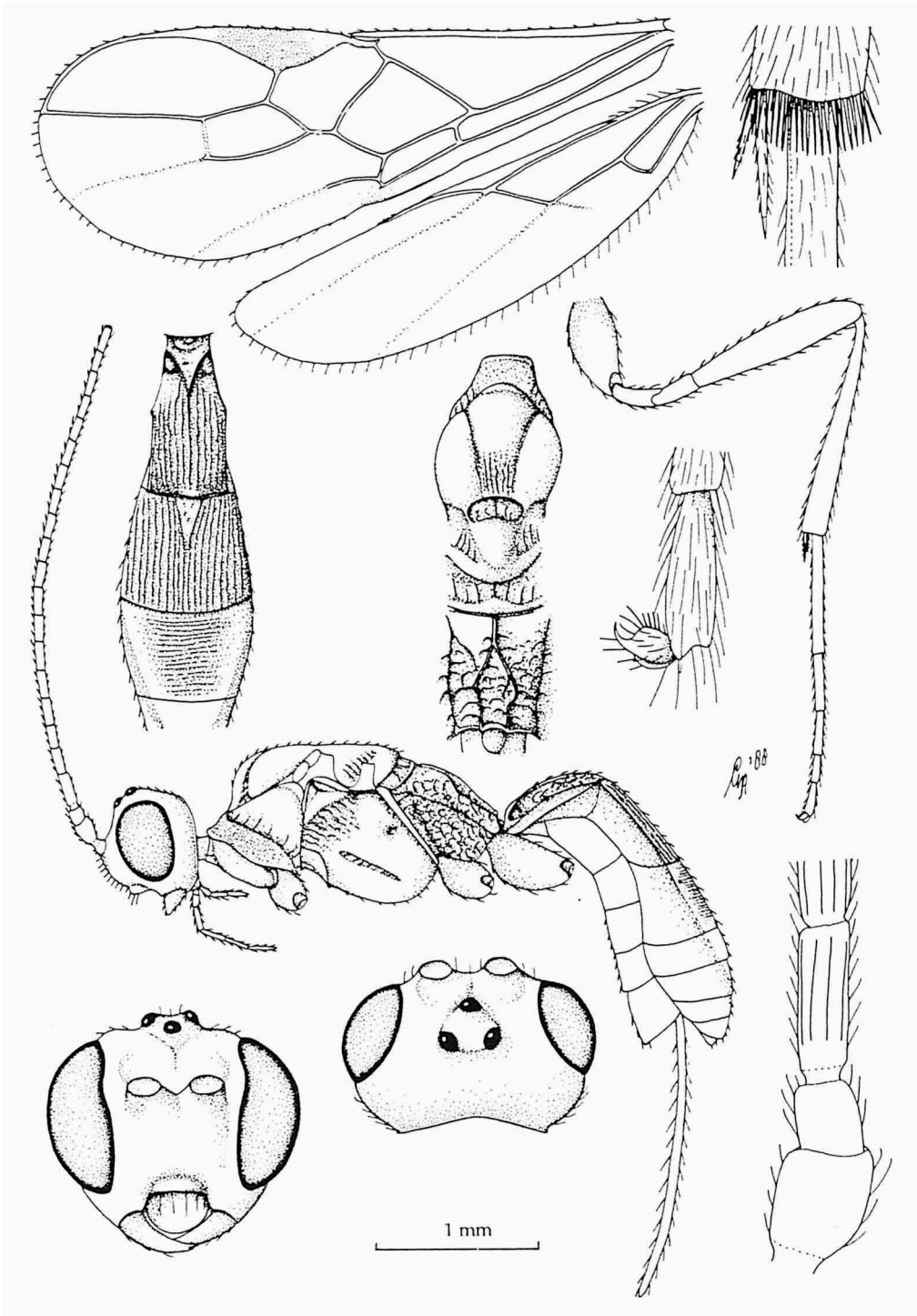
BRACONINAE-BRACONINI
Plate 25. *Simra cecidophila* Quicke, ♀.



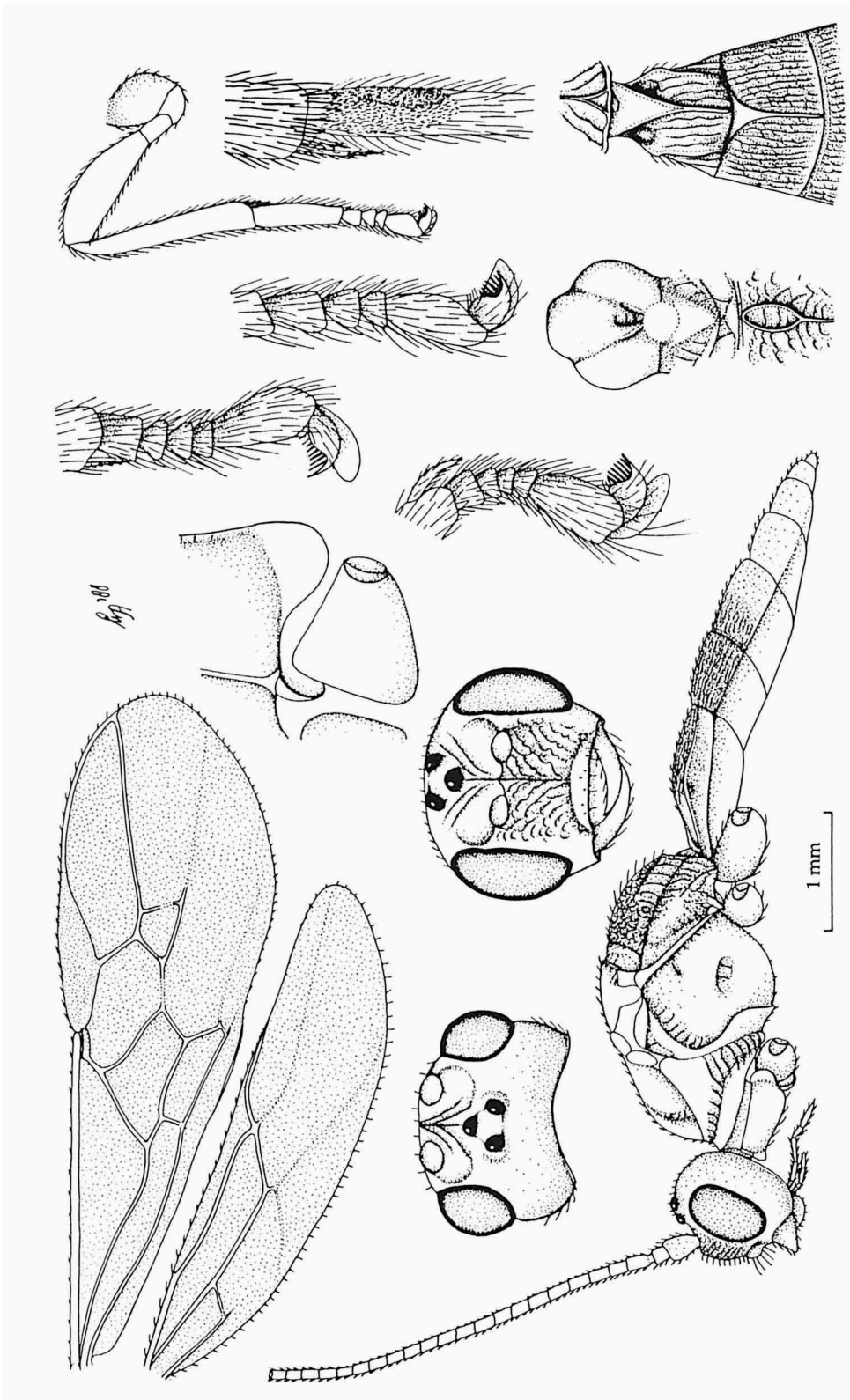
BRACONINAE-BRACONINI
Plate 26. *Physaraia furcata* (Guérin-Méneville), ♀.



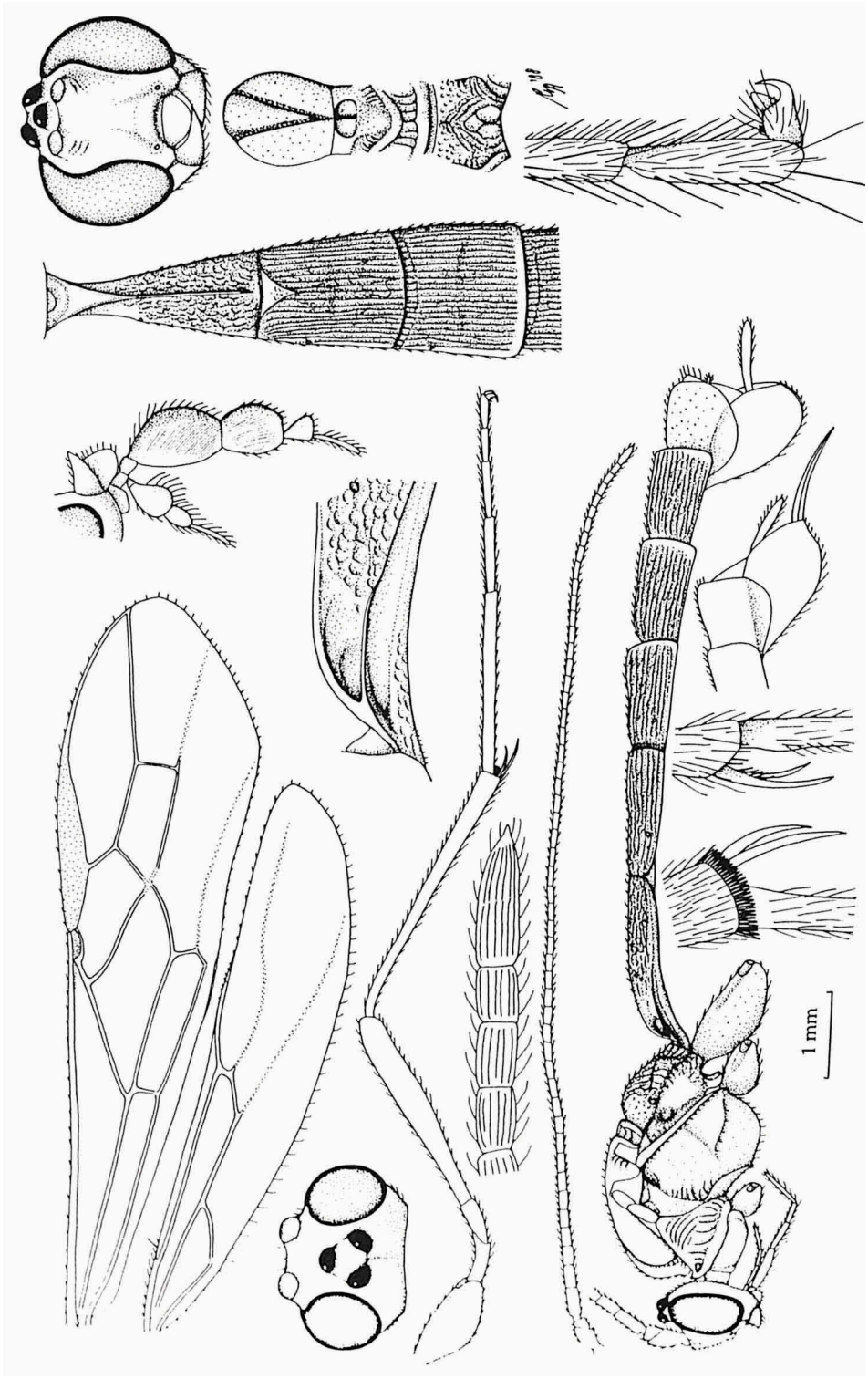
MESOSTOINAE
Plate 27. *Mesostoa compressa* van Achterberg, ♀.



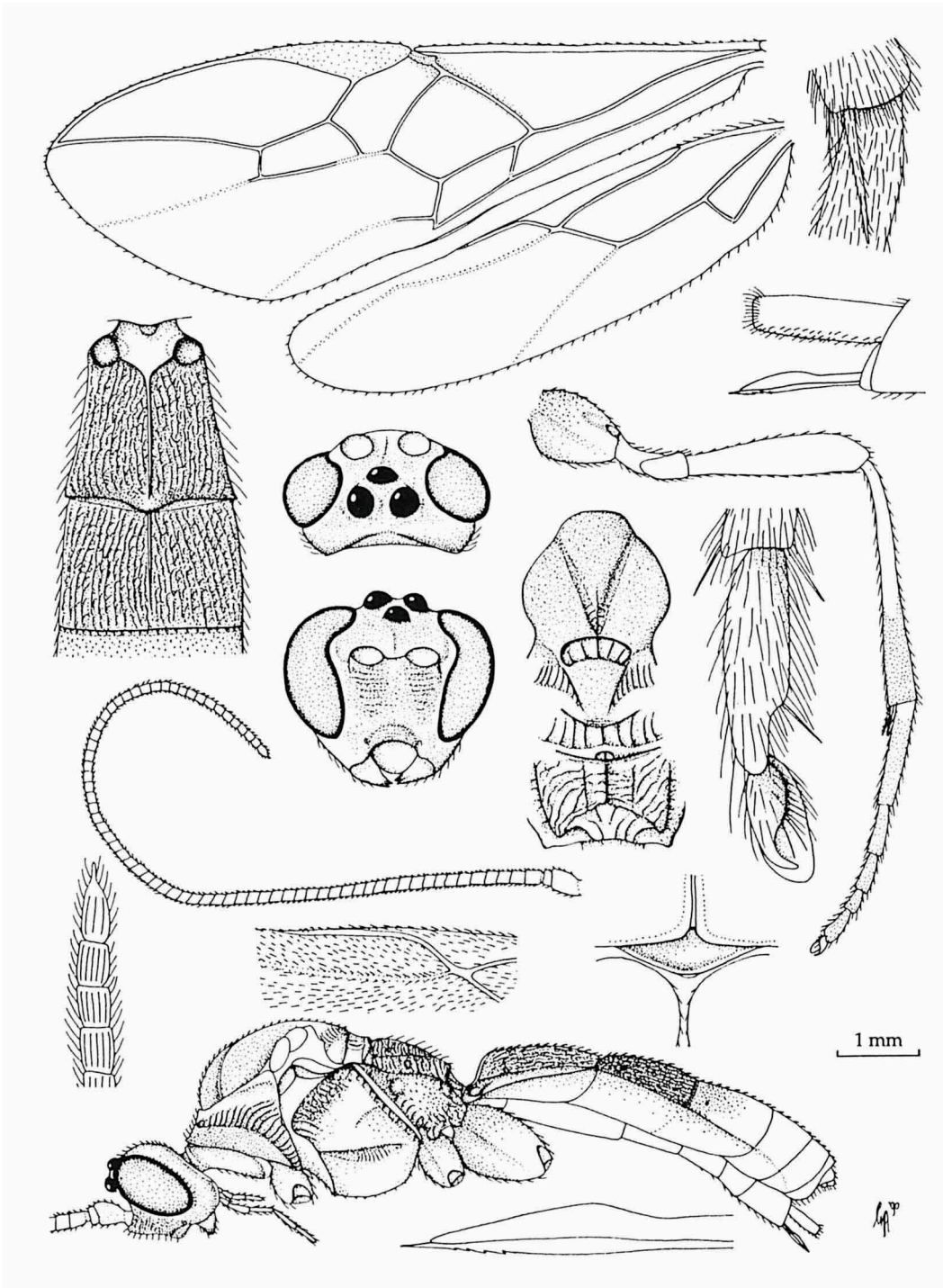
ROGADINAE-CLINOCENTRINI
Plate 28. *Clinocentrus umbratilis* Haliday, ♀.



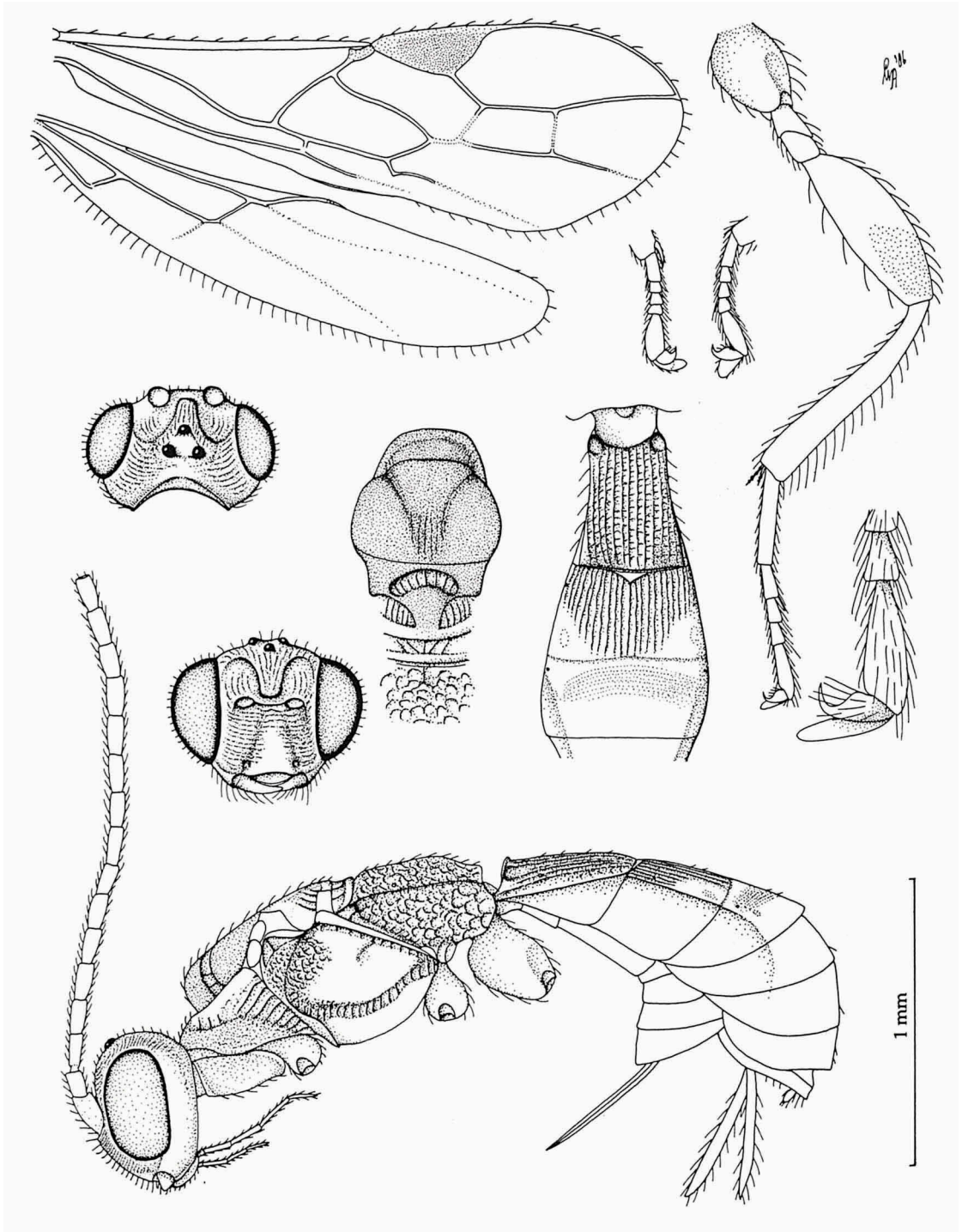
ROGADINAE-YELICONINI
Plate 29. *Yelicones violaceipennis* Cameron, ♂.



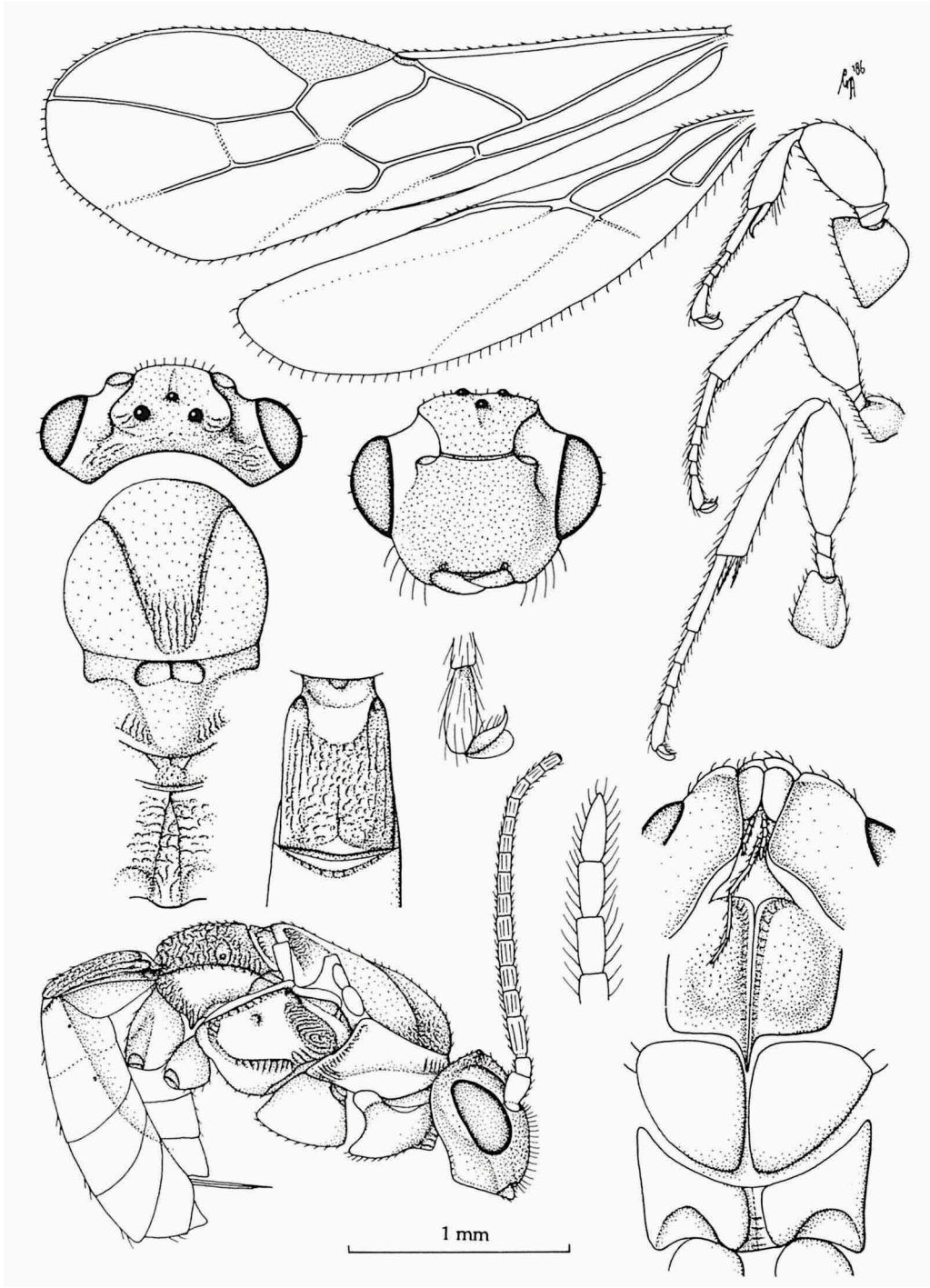
ROGADINAE-ROGADINI
Plate 30. *Colastomion bicoloricorne* (Granger), ♀.



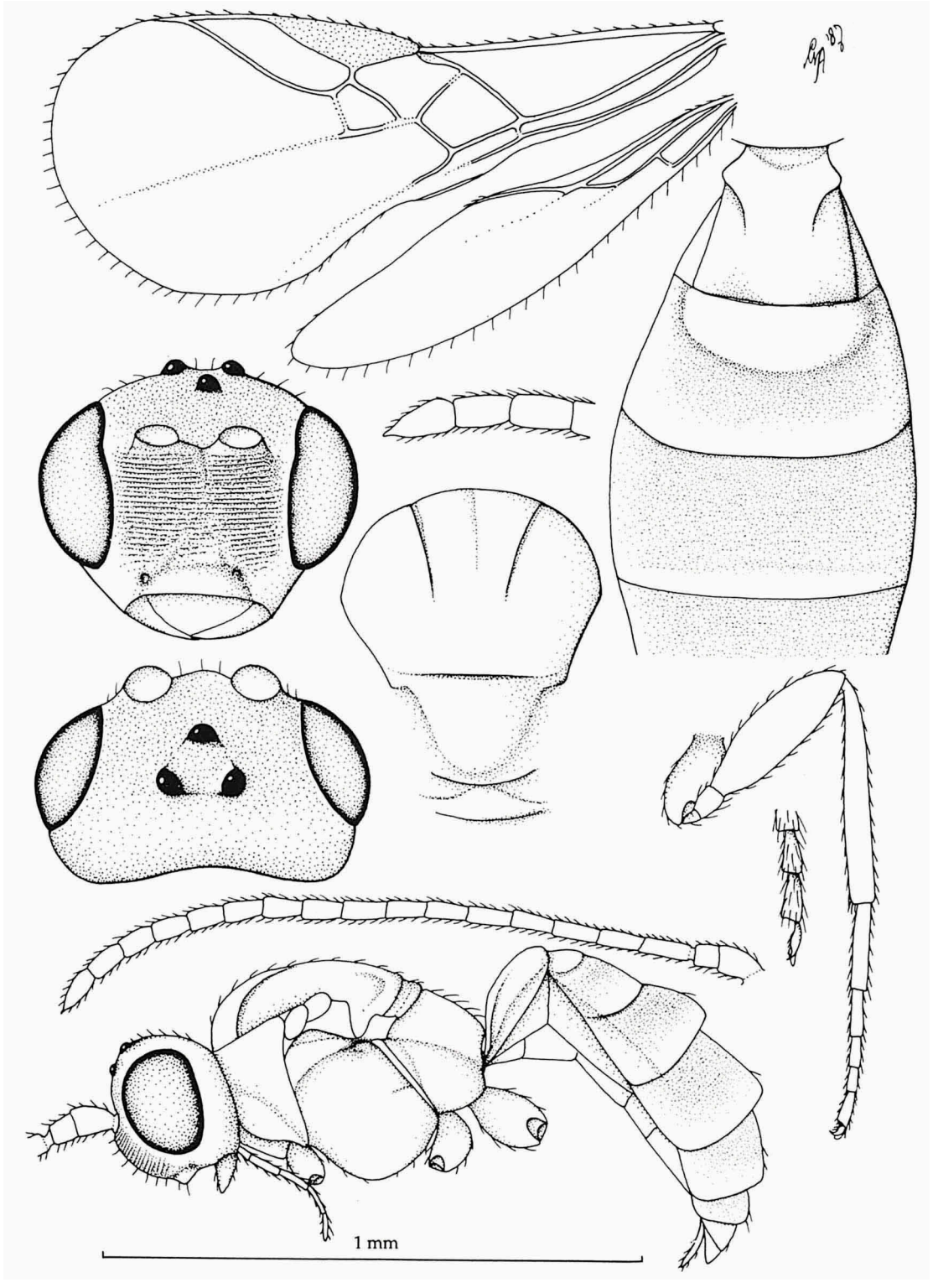
ROGADINAE-ROGADINI
Plate 31. *Aleiodes praetor* (Reinhard), ♀.



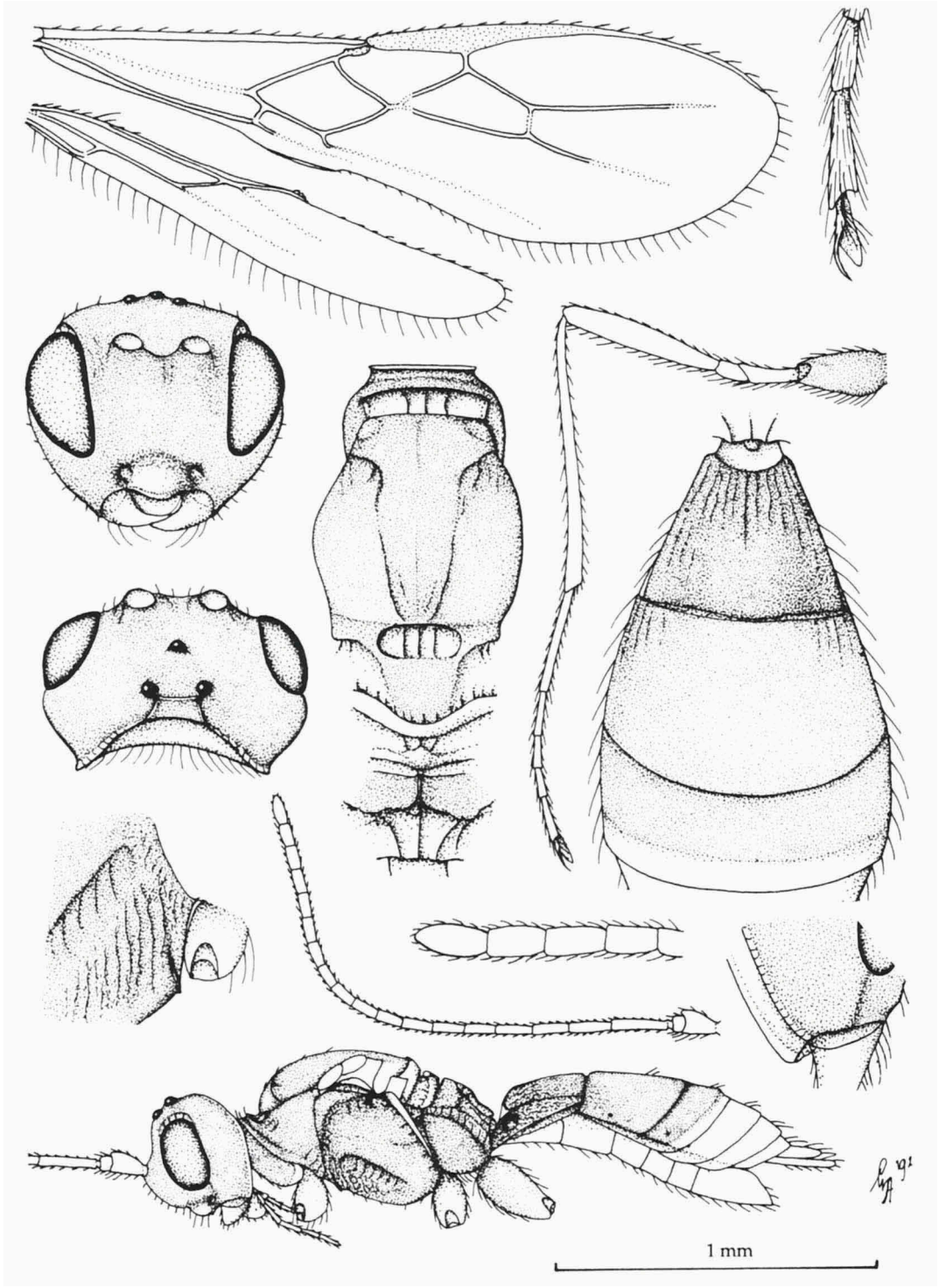
BETYLOBRACONINAE
Plate 32. *Mesocentrus crassipes* Szépligeti, ♀.



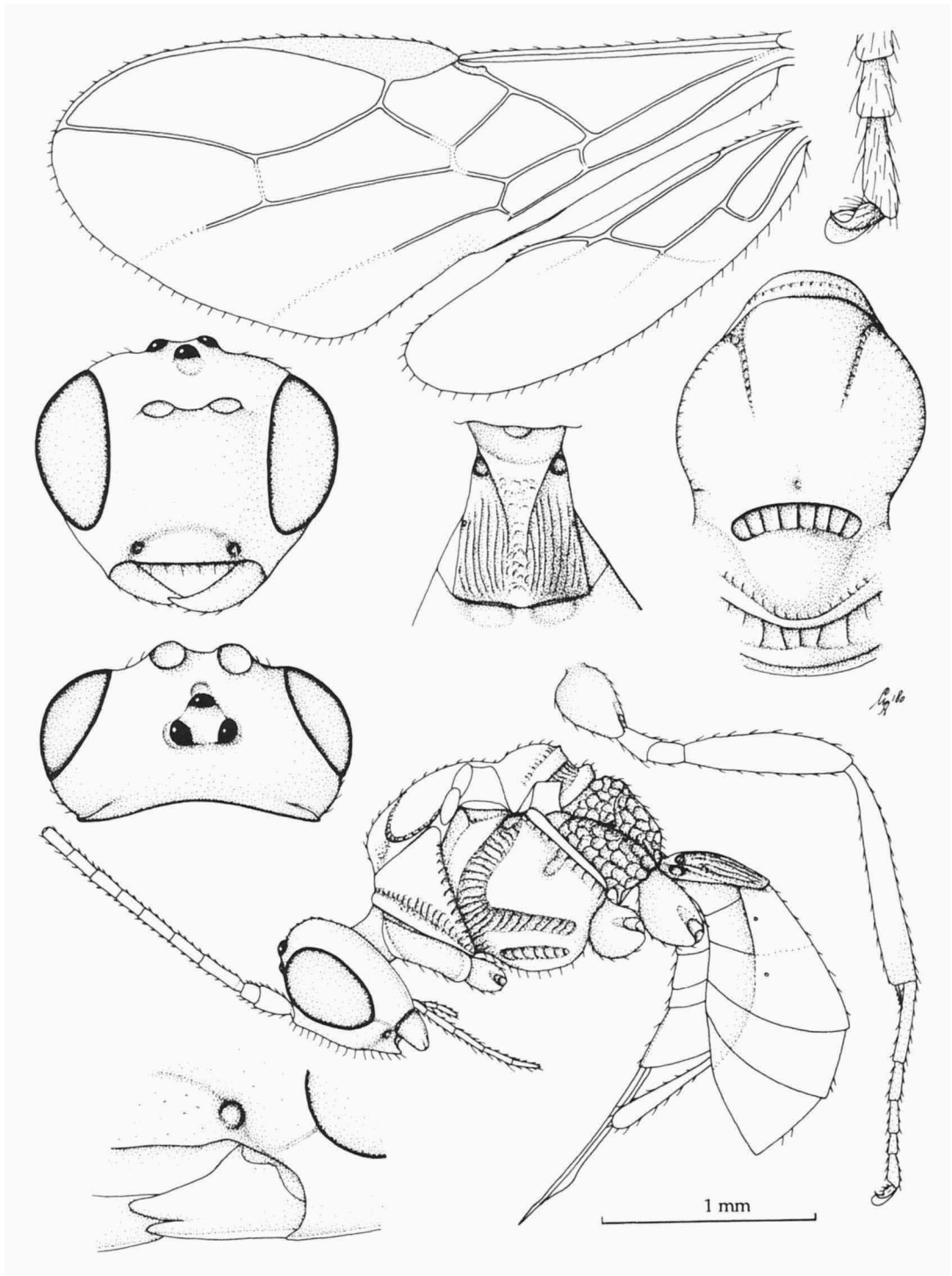
BETYLOBRACONINAE
Plate 33. *Betylobracon waterhousei* Tobias, ♀.



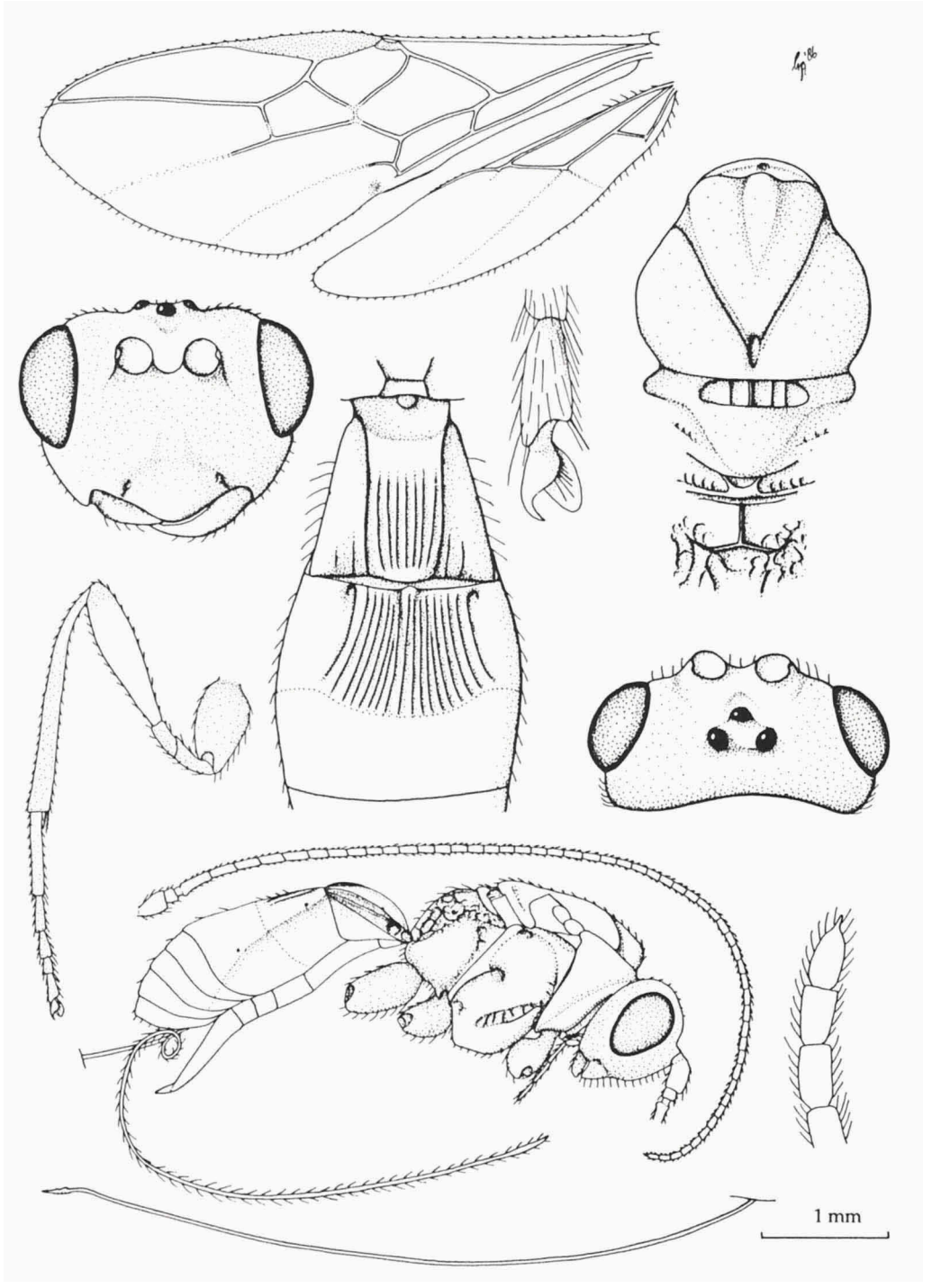
GNAMPTODONTINAE
Plate 34. *Gnamptodon molestus* van Achterberg, ♀.



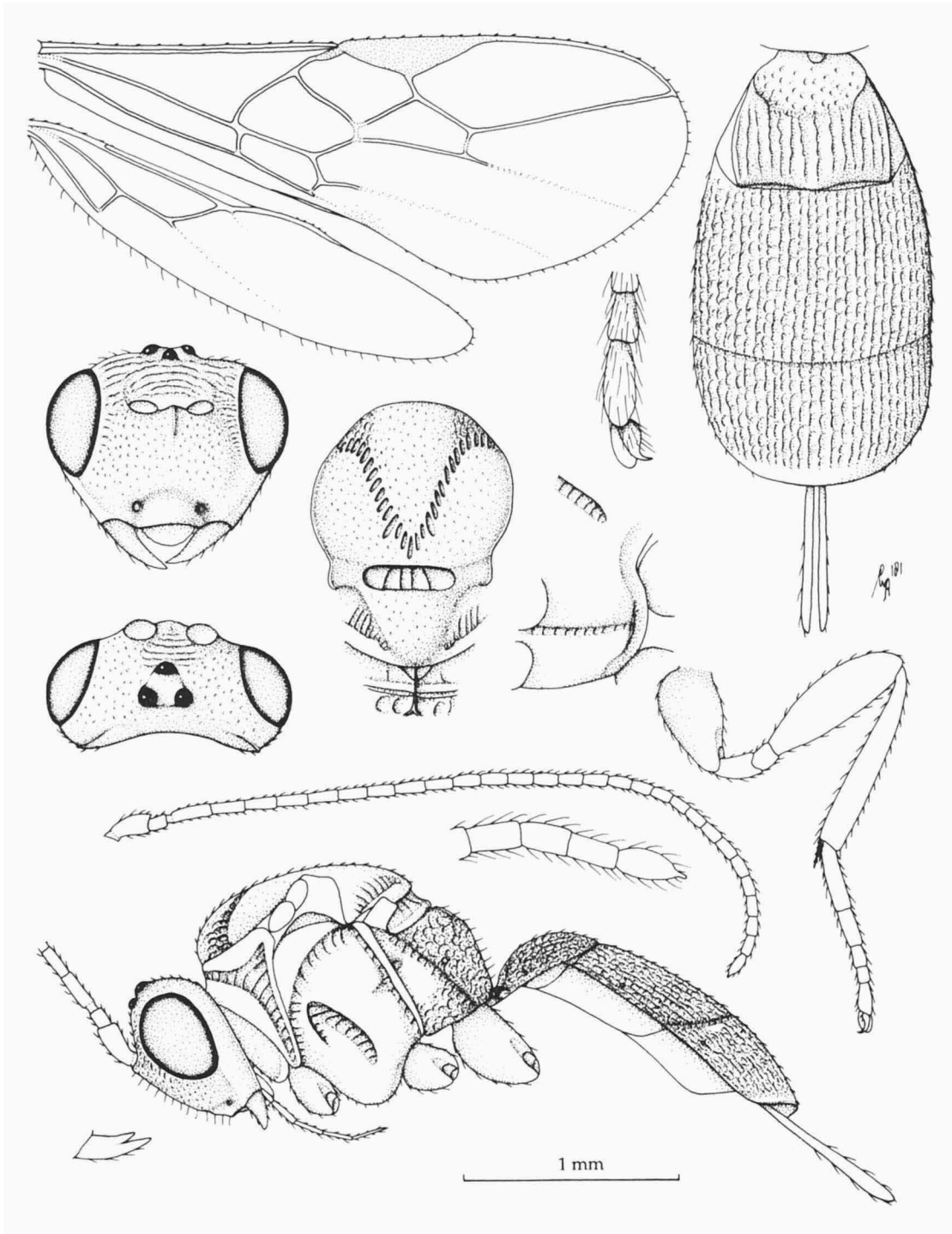
OPIINAE-ADEMONINI
Plate 35. *Ademon decrescens* (Nees), ♀.



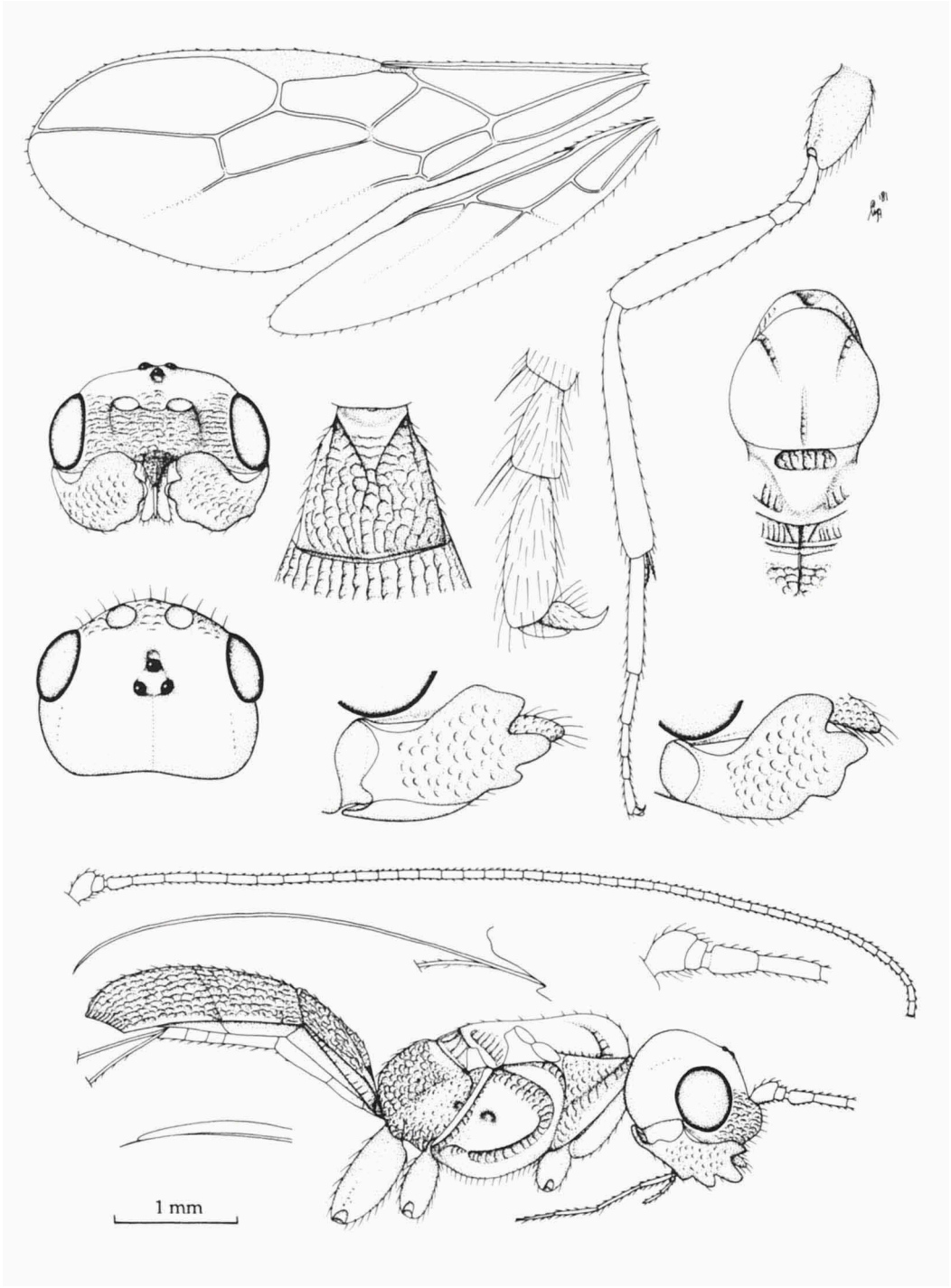
OPIINI-BIOSTERINI
Plate 36. *Sternaulopius bisternaulicus* Fischer, ♀.



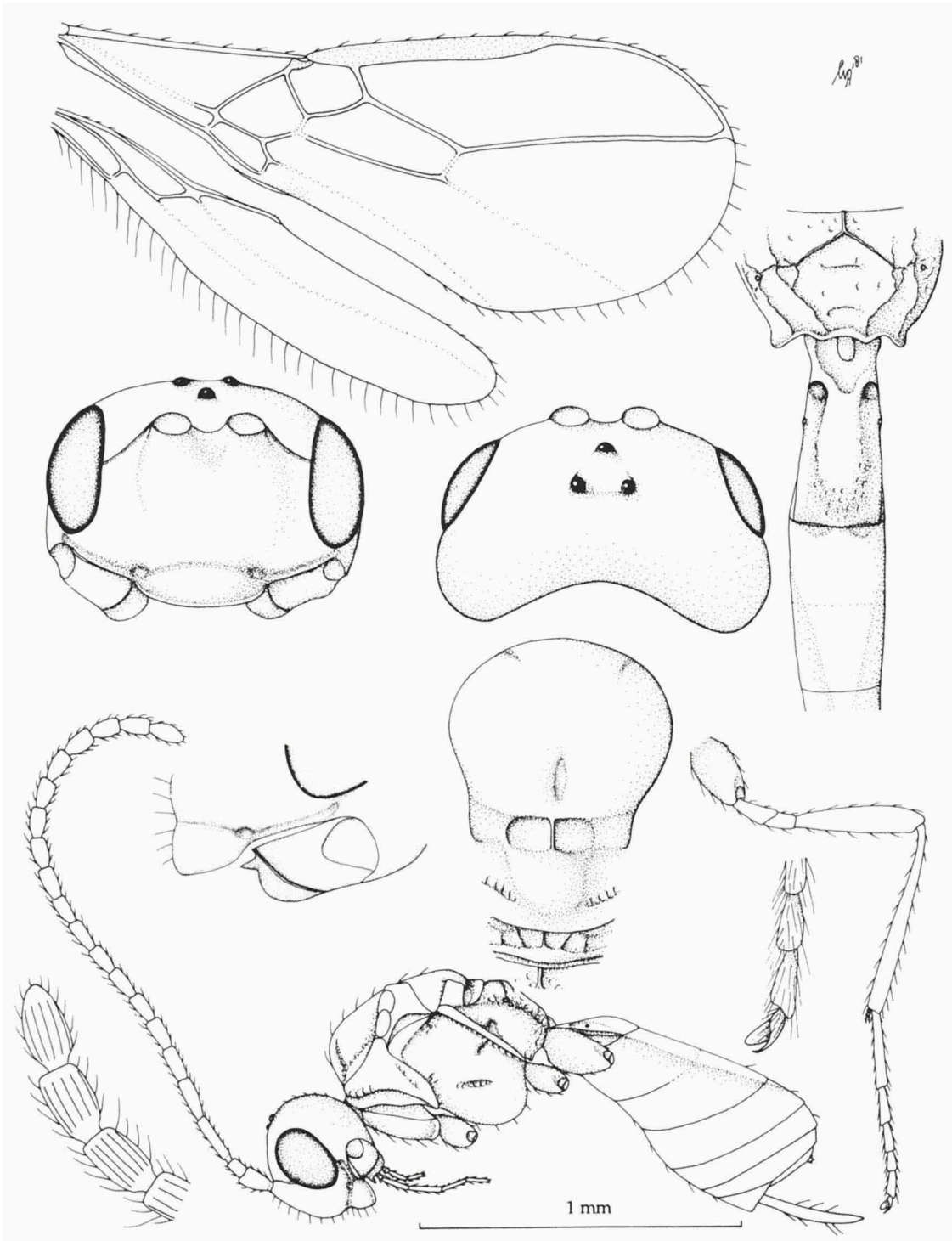
OPIINAE-OPIINI
Plate 37. *Diachasmimorpha comperei* Viereck, ♀.



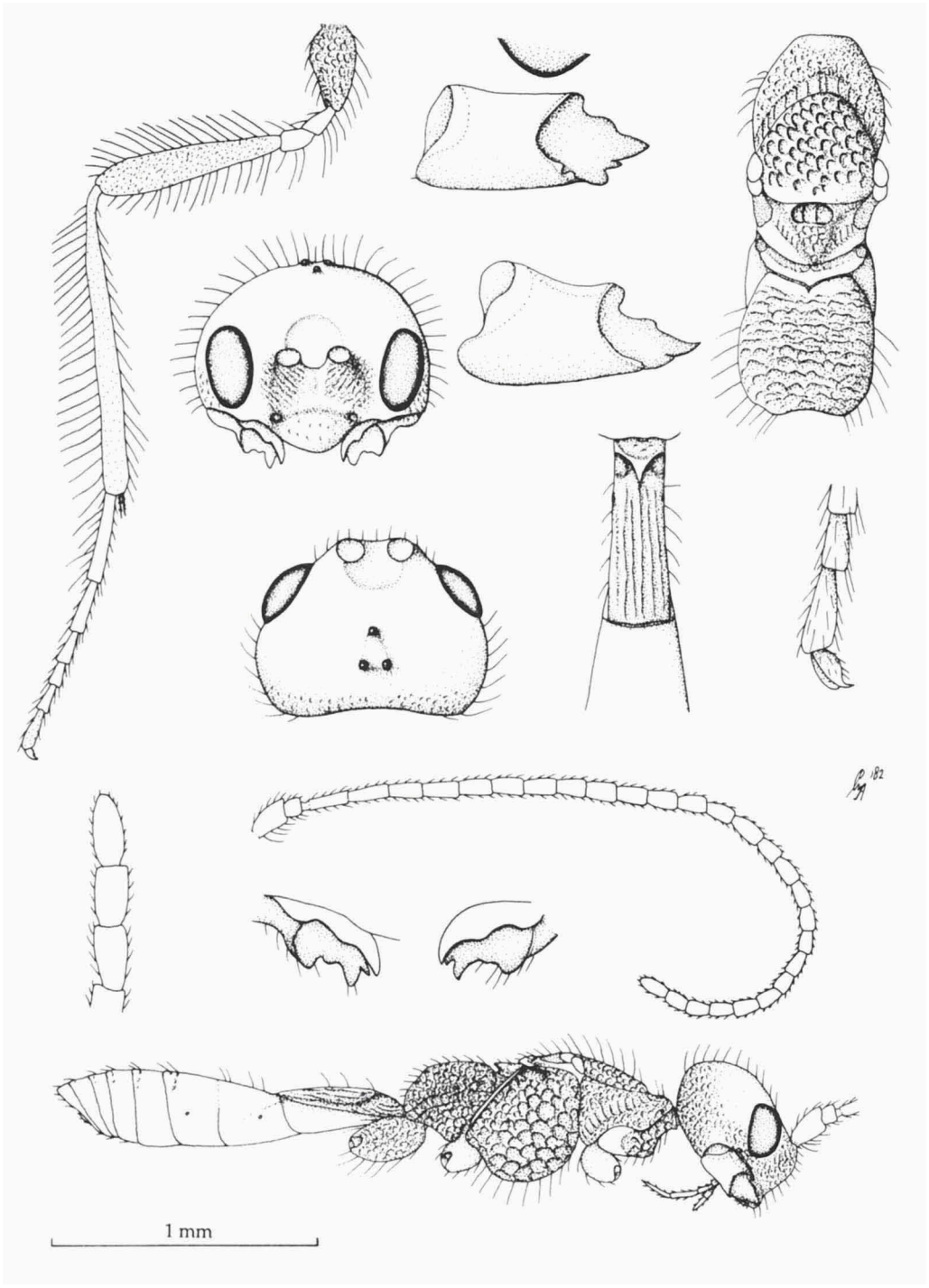
OPIINAE-OPIINI
Plate 38. *Coleopius grangeri* Fischer, ♀.



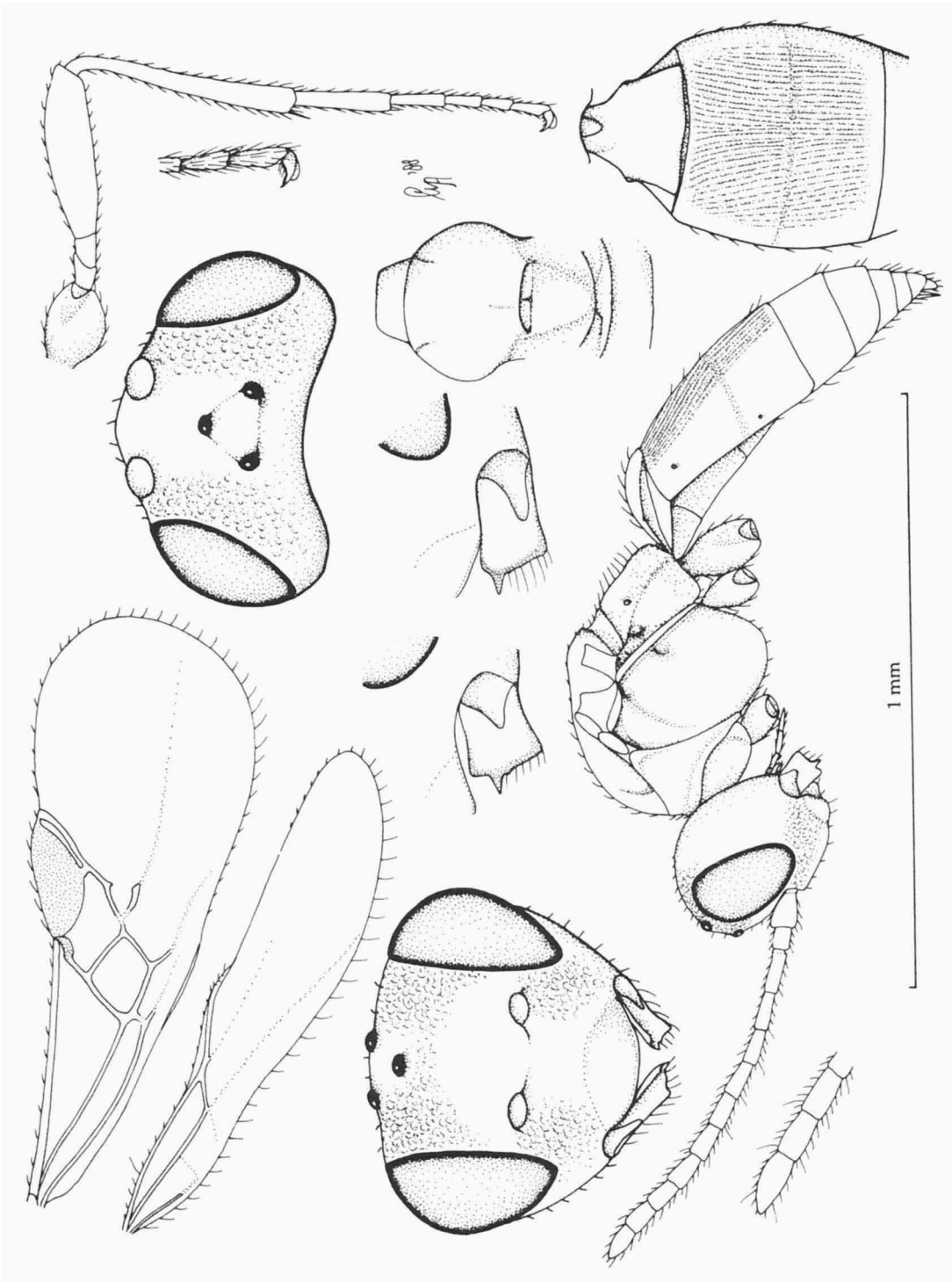
ALYSIINAE-ALYSIINI
Plate 39. *Hylcalosia maetoi* van Achterberg, ♀.



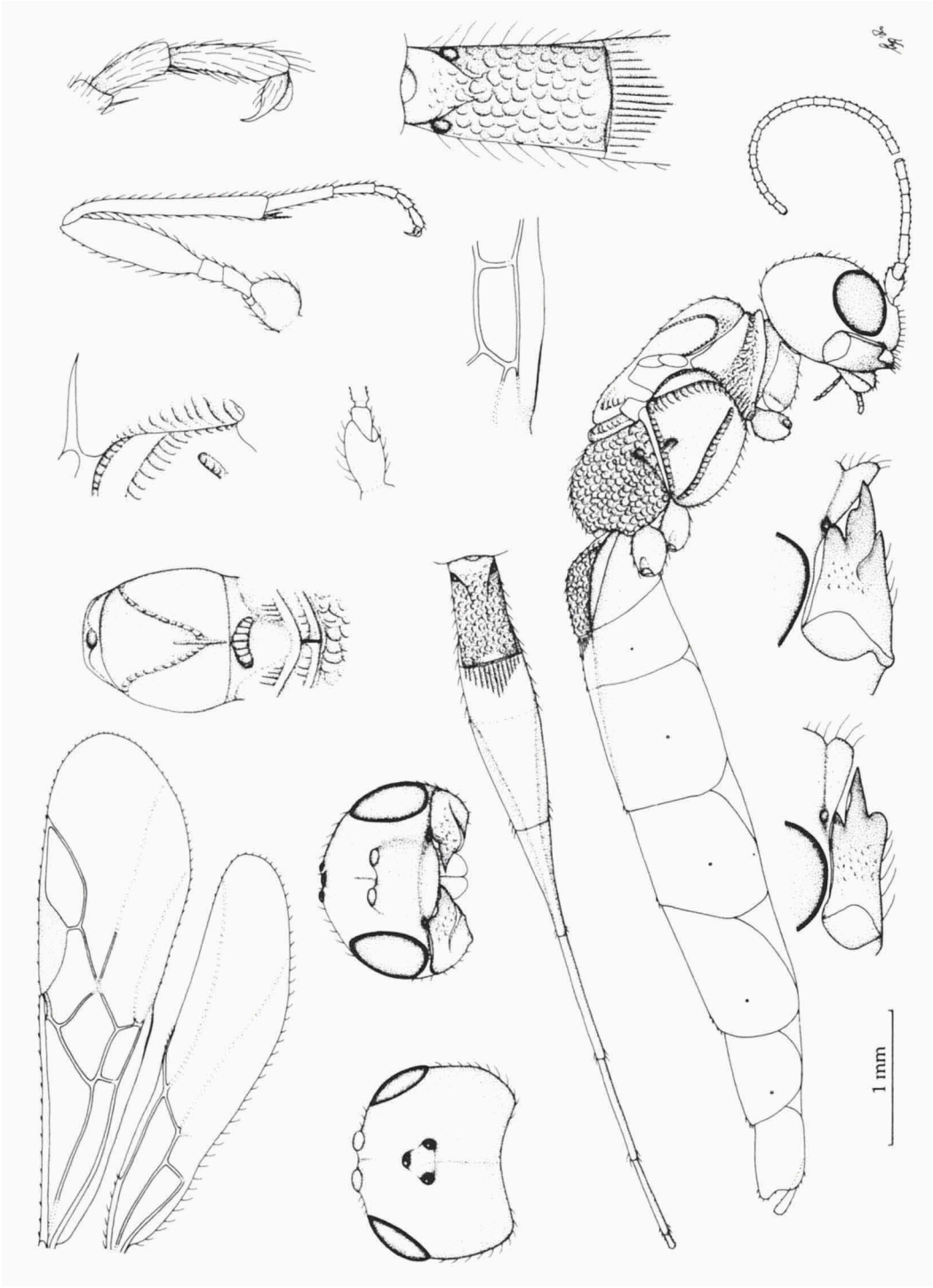
ALYSIINAE-ALYSIINI
Plate 40. *Orthostigma imperator* van Achterberg, ♀.



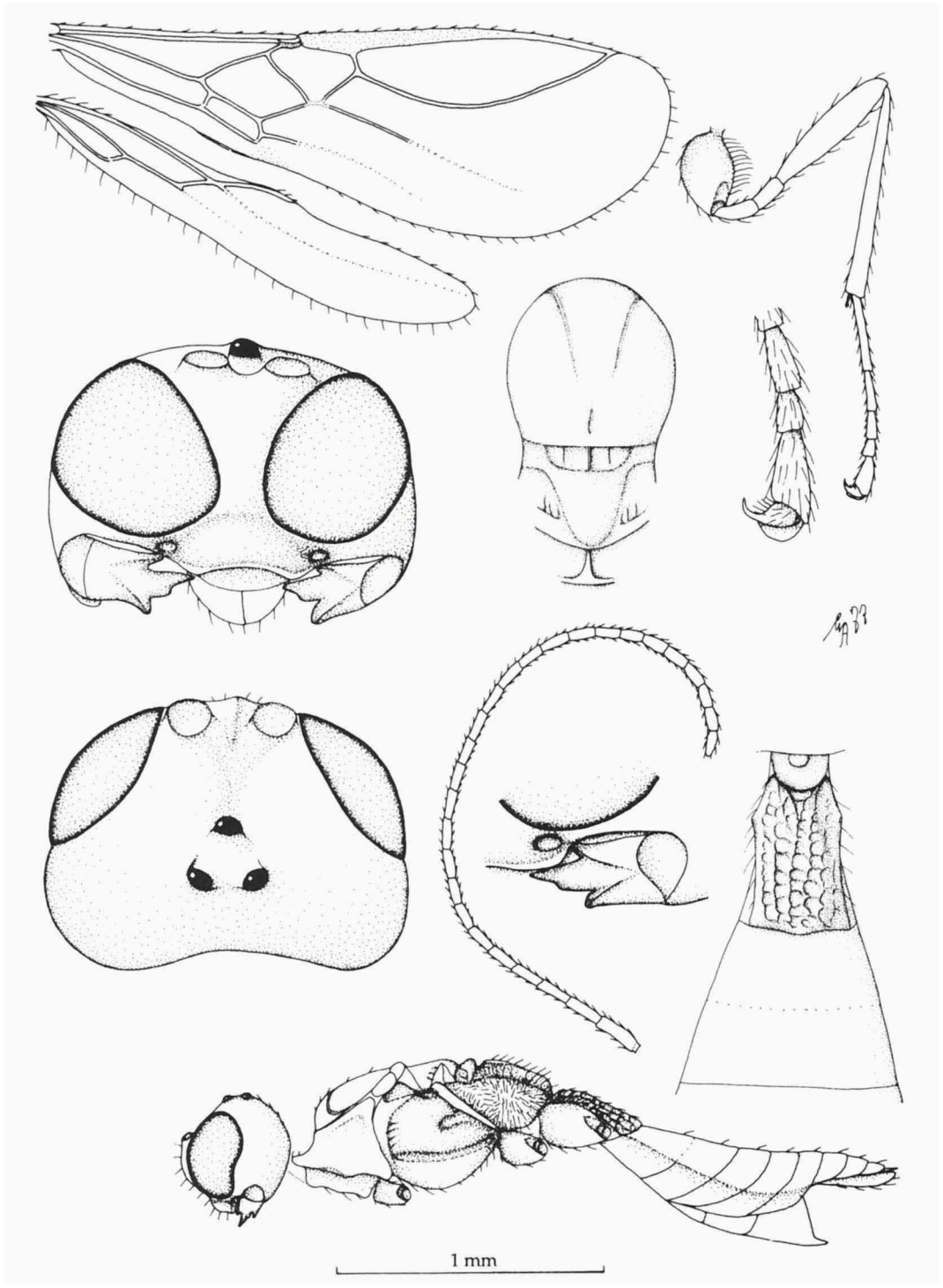
ALYSIINAE-ALYSIINI
Plate 41. *Lodbrokia hirta* Hedqvist, ♂.



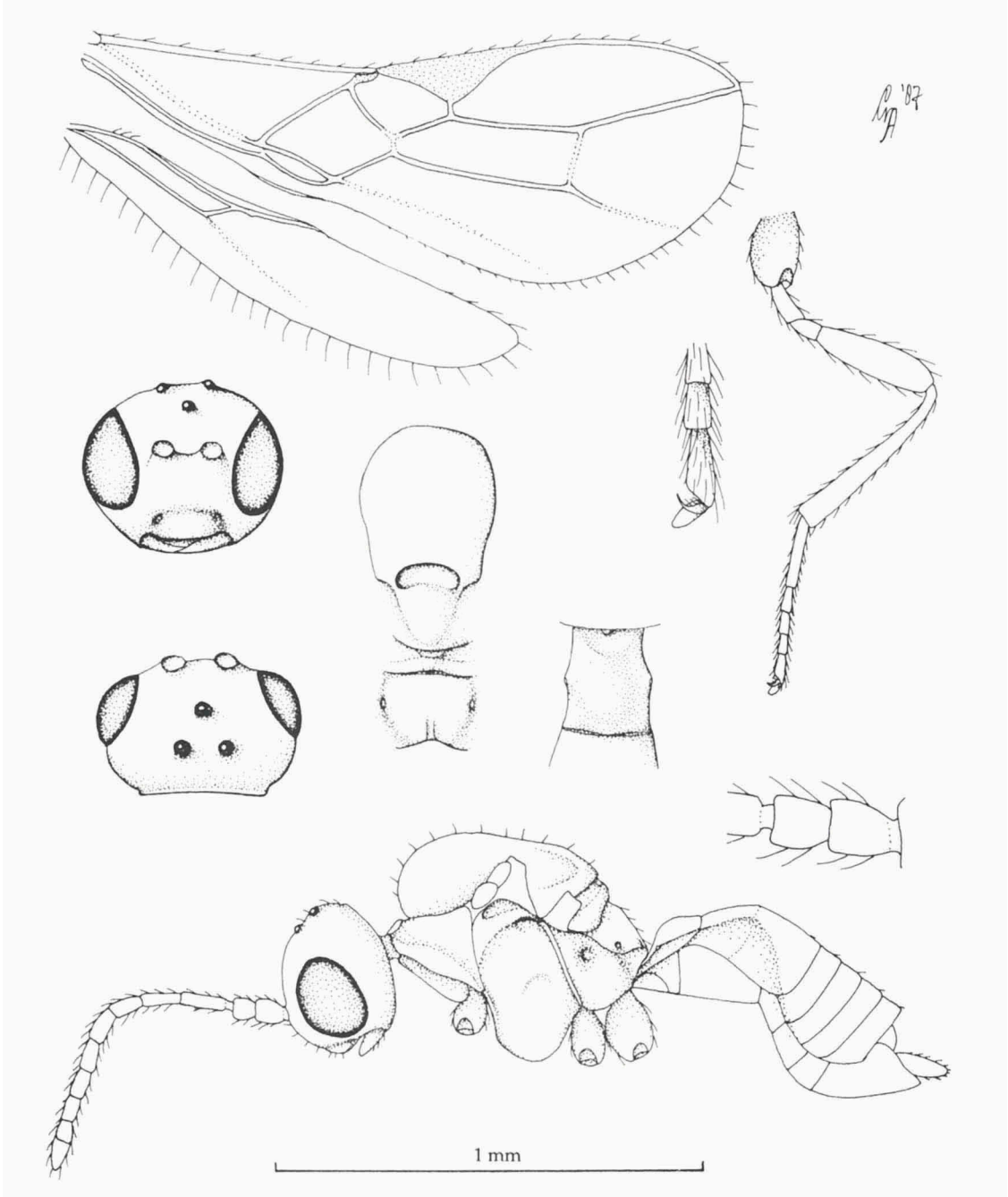
ALYSIINAE-EXODONTIELLINI
Plate 42. *Exodontiella deserticola* Wharton, ♀.



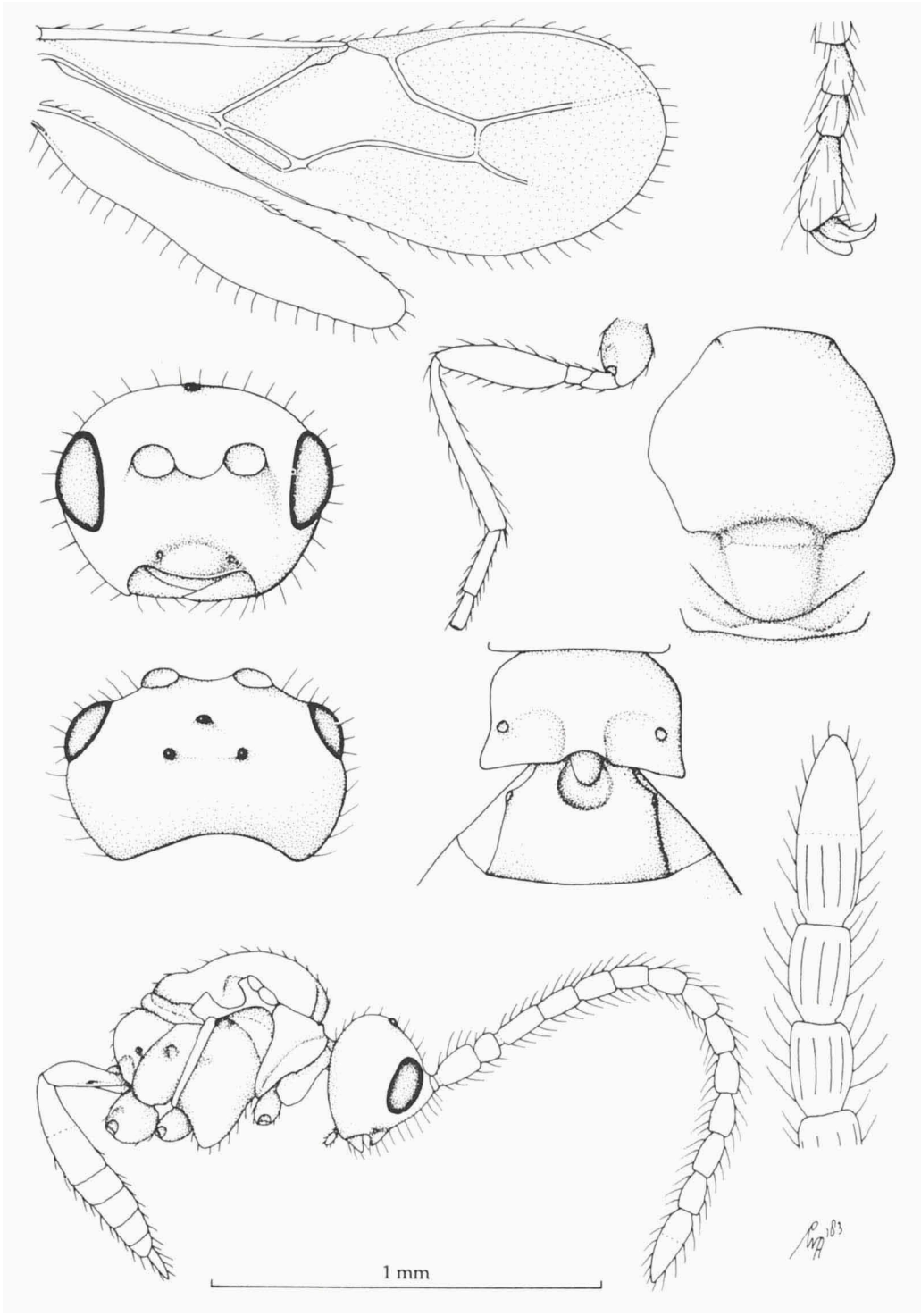
ALYSIINAE-DACNUSINI
Plate 43. *Eucoelinidea compressa* Tobias, ♀.



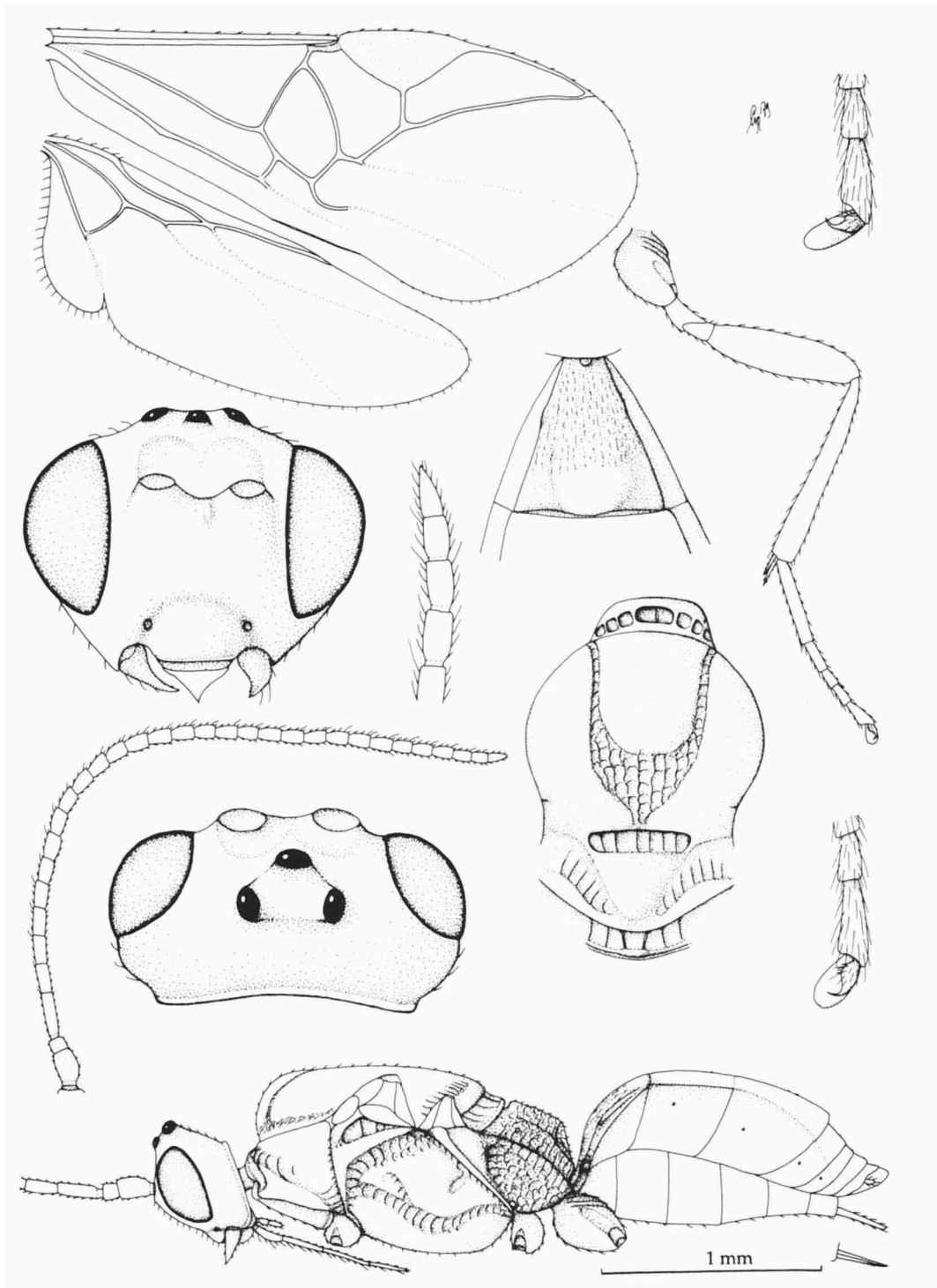
ALYSIINAE-DACNUSINI
Plate 44. *Chorebus ophthalmicus* (Tobias), ♀.



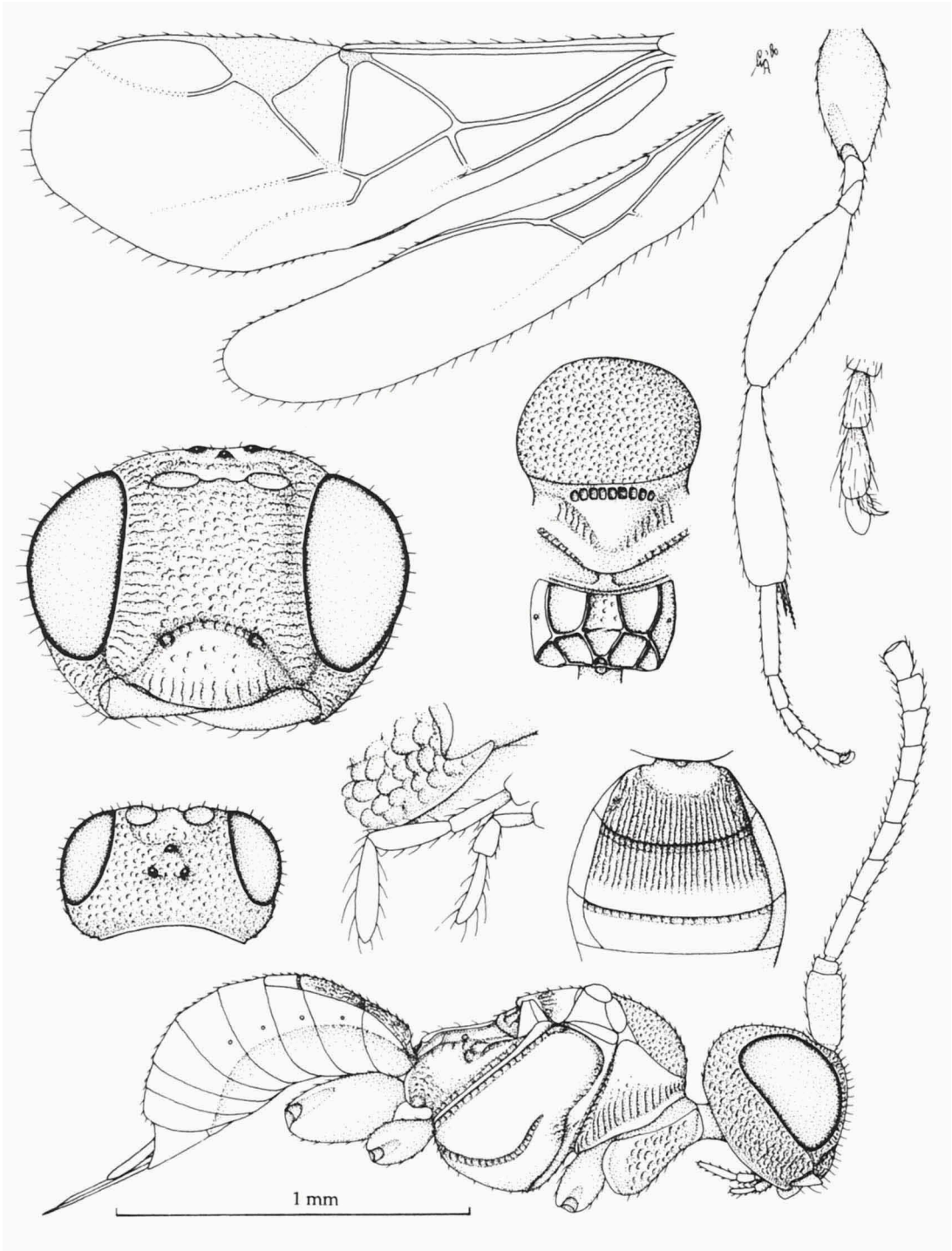
APHIDIINAE-EPHEDRINI
Plate 45. *Parephedrus relictus* Starý & Carver, ♀.



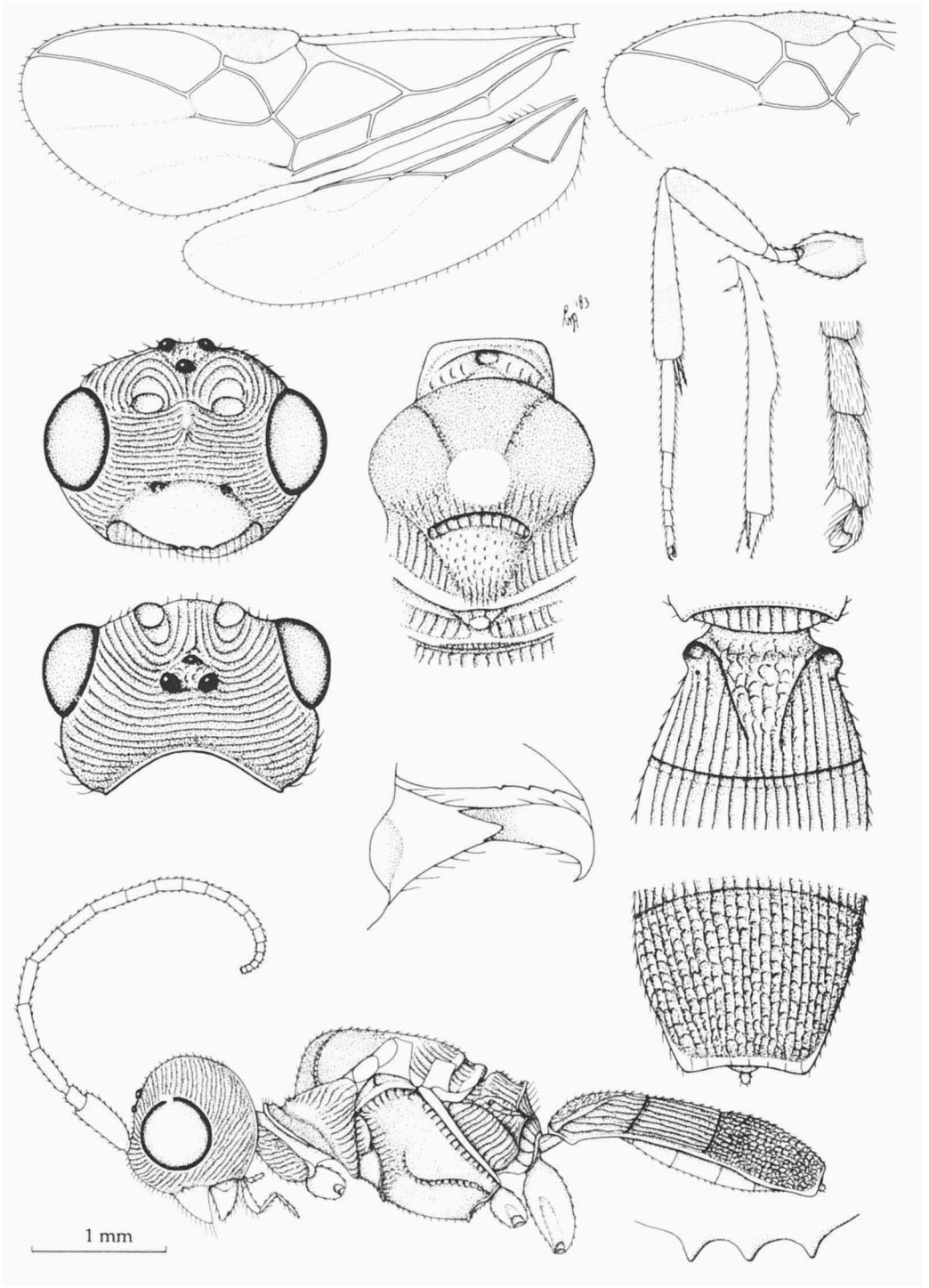
APHIDIINAE-APHIDIINI
Plate 46. *Aclitis obscuripennis* Foerster, ♀.



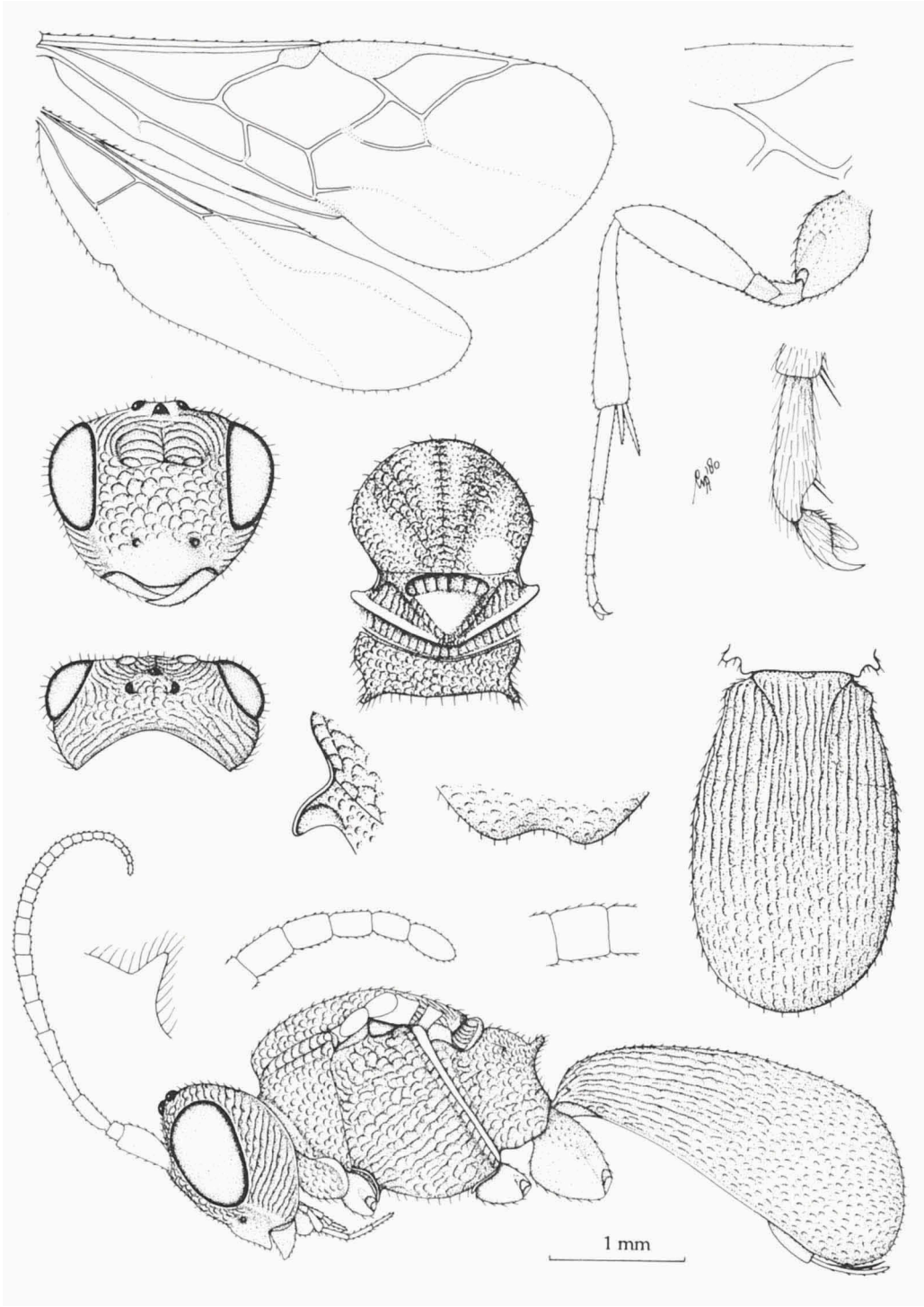
ECNOMIINAE
Plate 47. *Ecnomios papuensis* Mason, ♀.



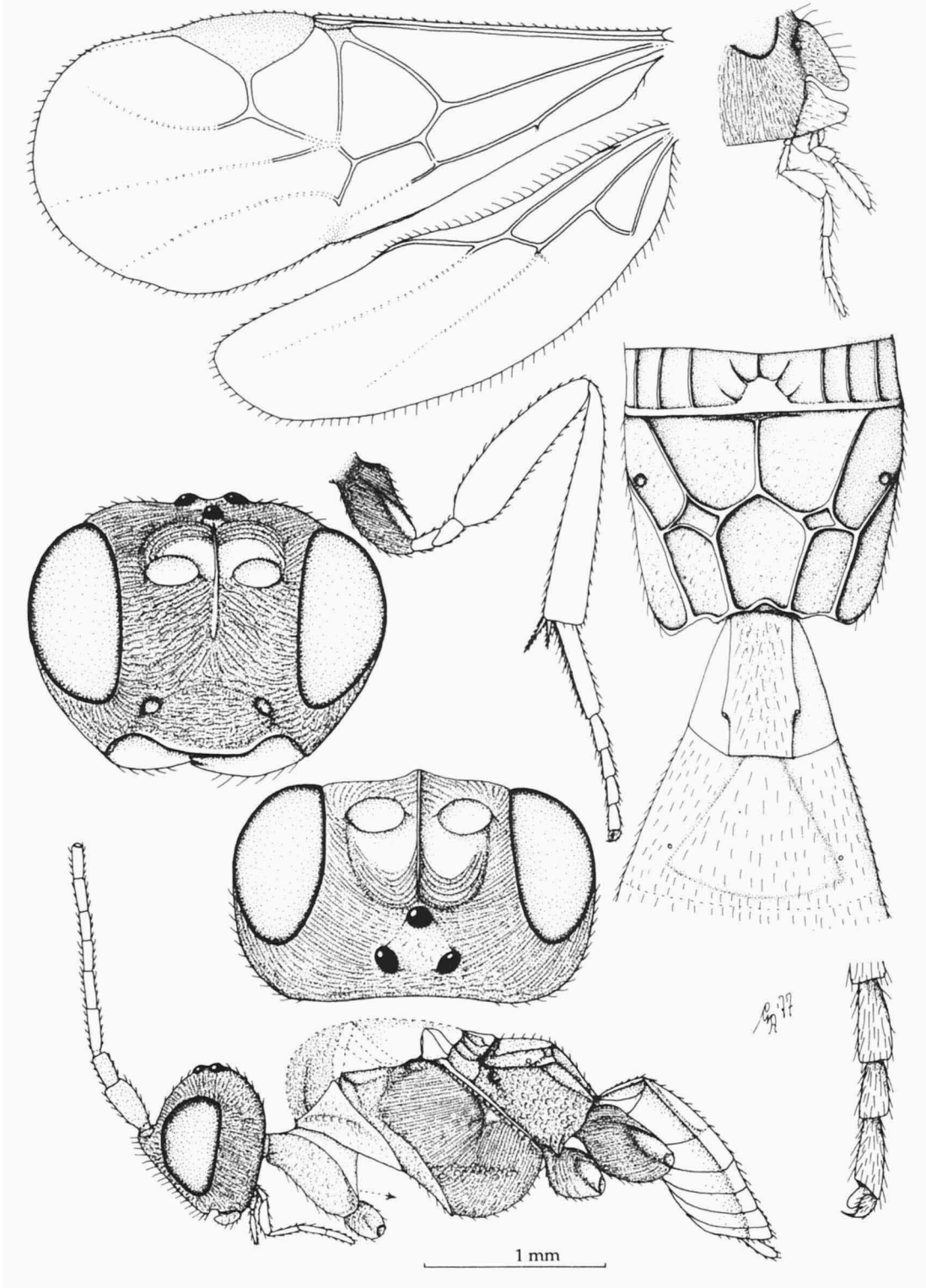
ADELIINAE
Plate 48. *Paradelius ghesquierei* DeSaeger, ♀.



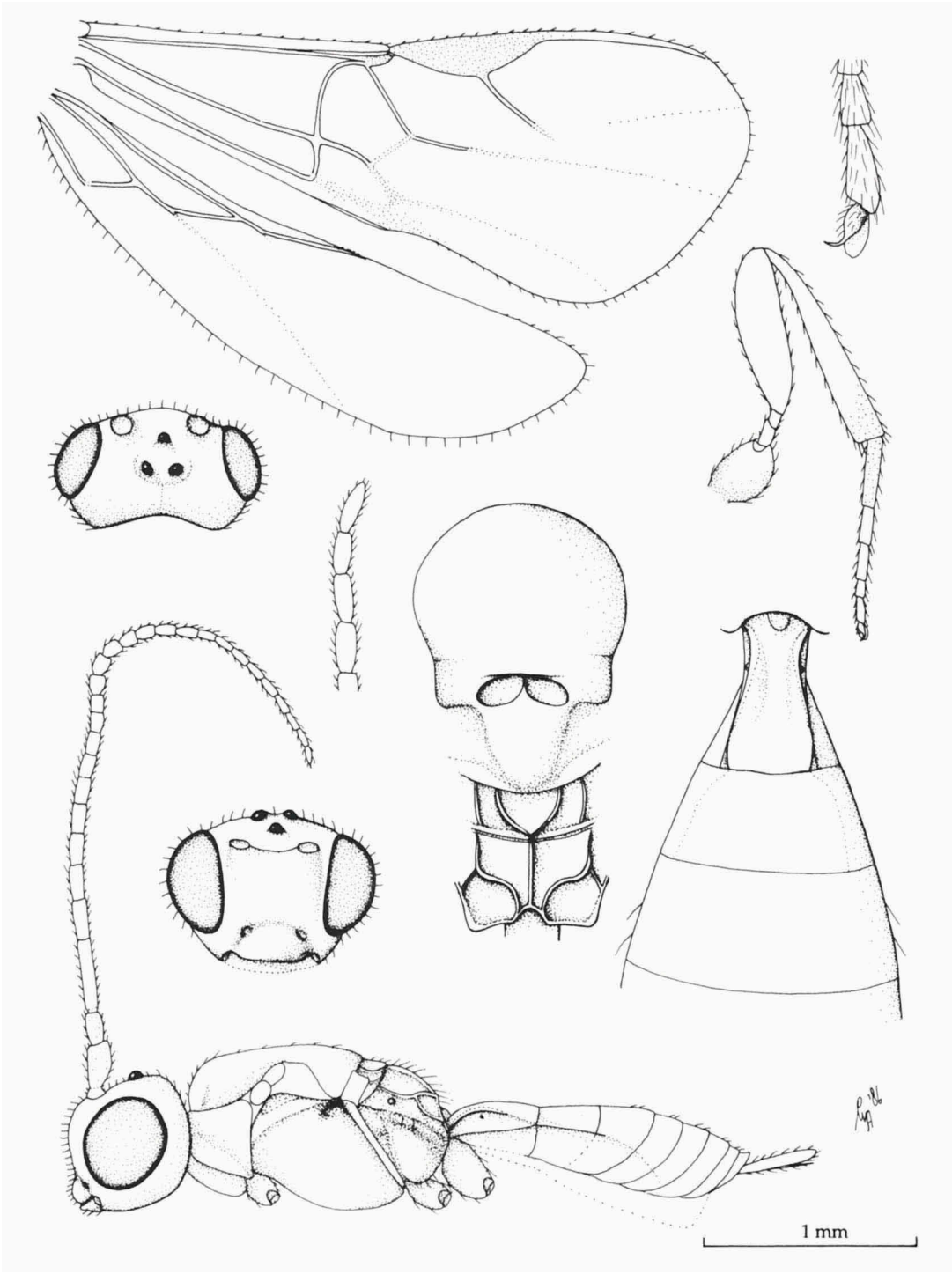
CHELONINAE-PHANEROTOMINI
Plate 49. *Phanerotoma rufescens* (Latreille), ♀.



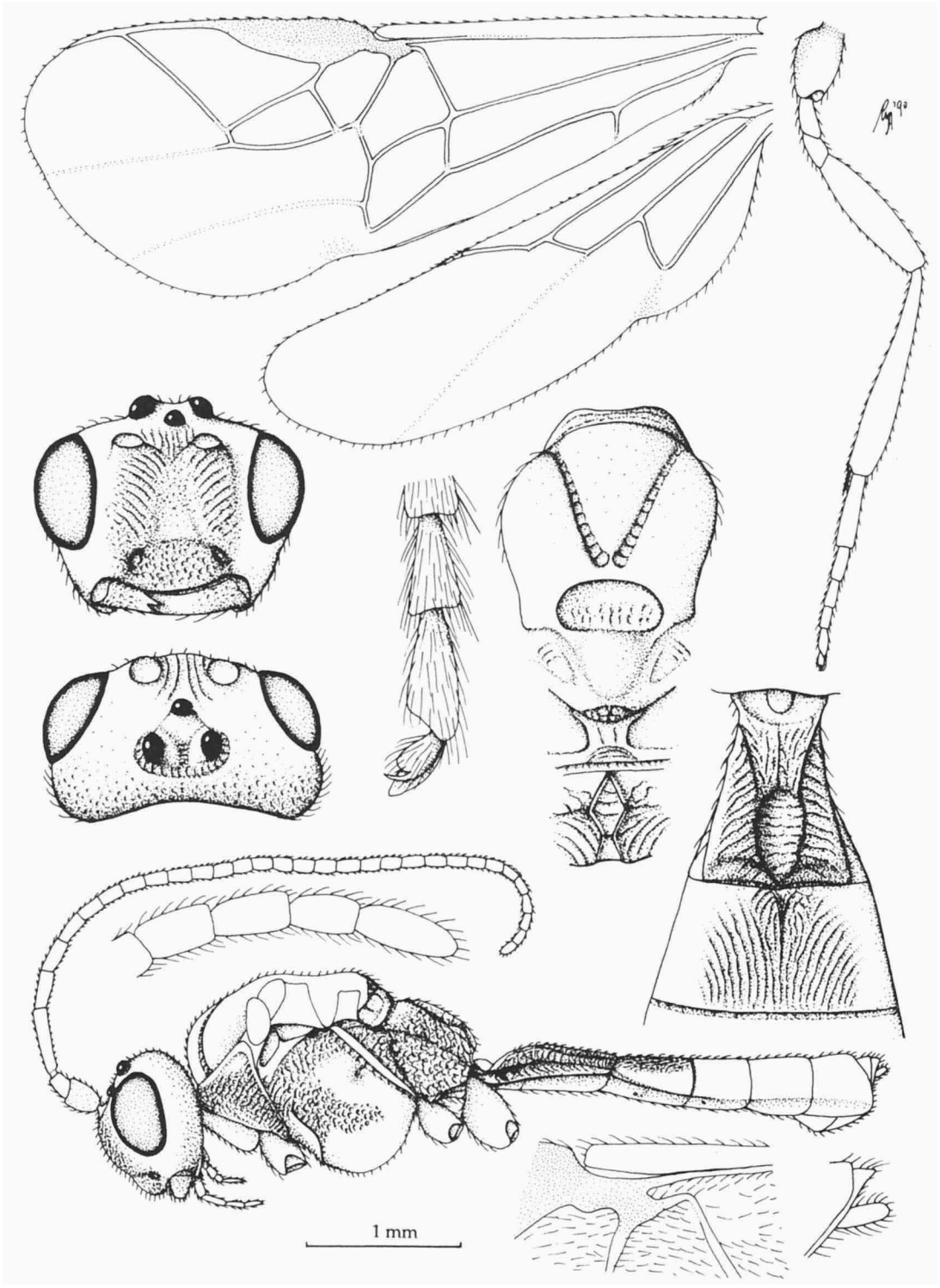
CHELONINAE-CHELONINI
Plate 50. *Chelonus oculator* (Fabricius), ♀.



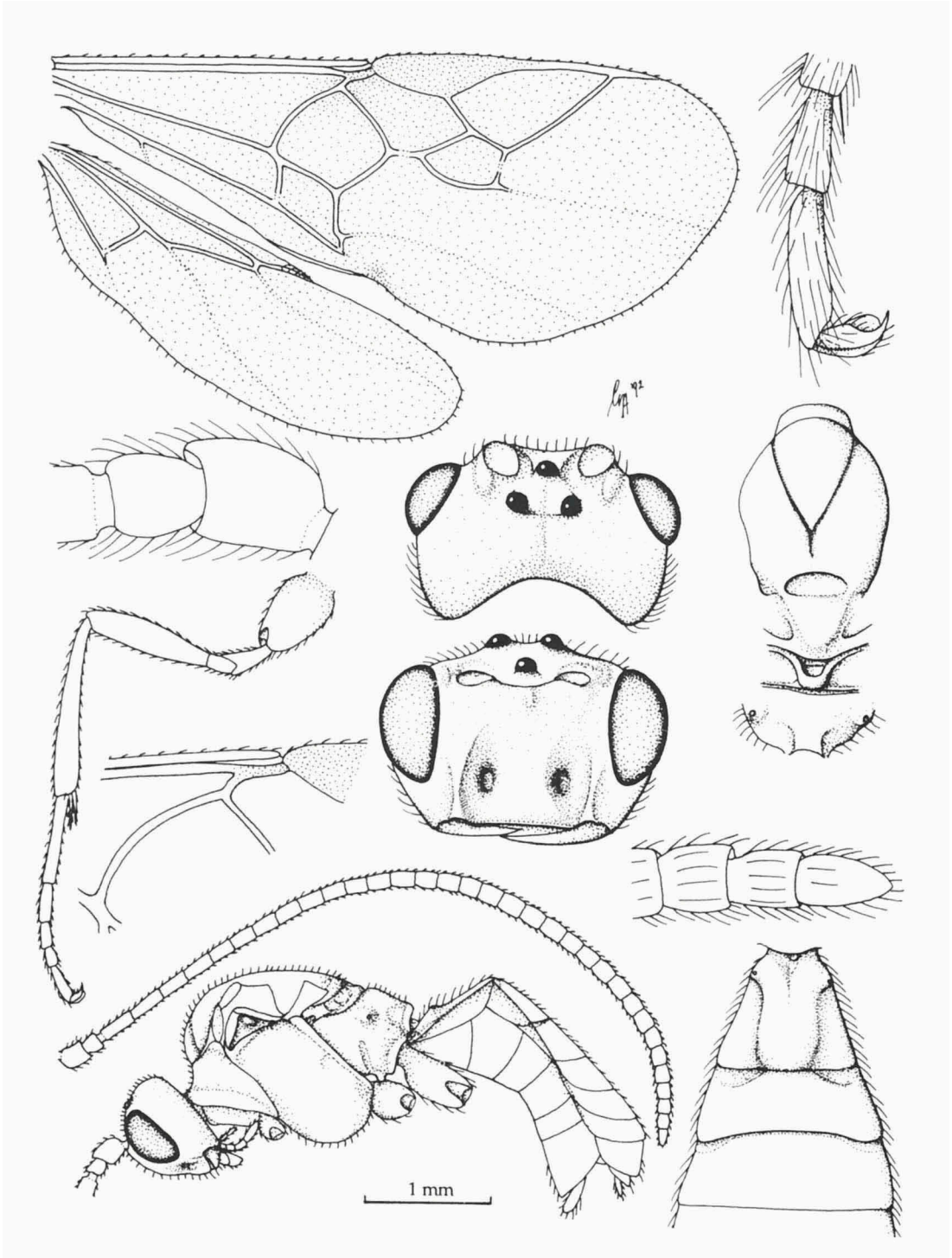
DIRRHOPINAE
Plate 51. *Dirrhope rufa* Foerster, ♀.



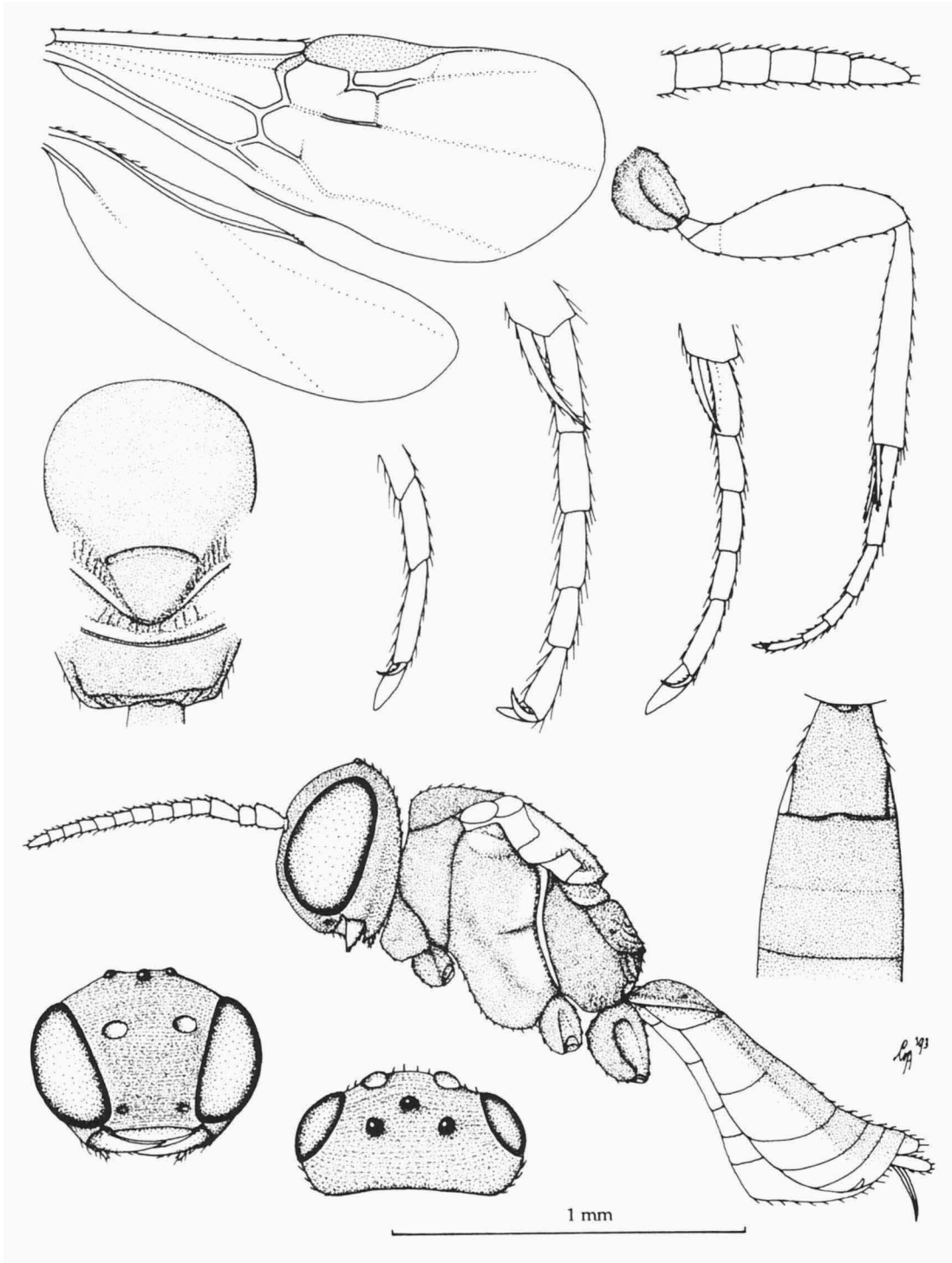
ICHNEUTINAE-MUESEBECKIINI
Plate 52. *Oligoneurus concolor* Szépligeti, ♀.



ICHNEUTINAE-ICHNEUTINI
Plate 53. *Ichneutes reunitor* Nees, ♀.

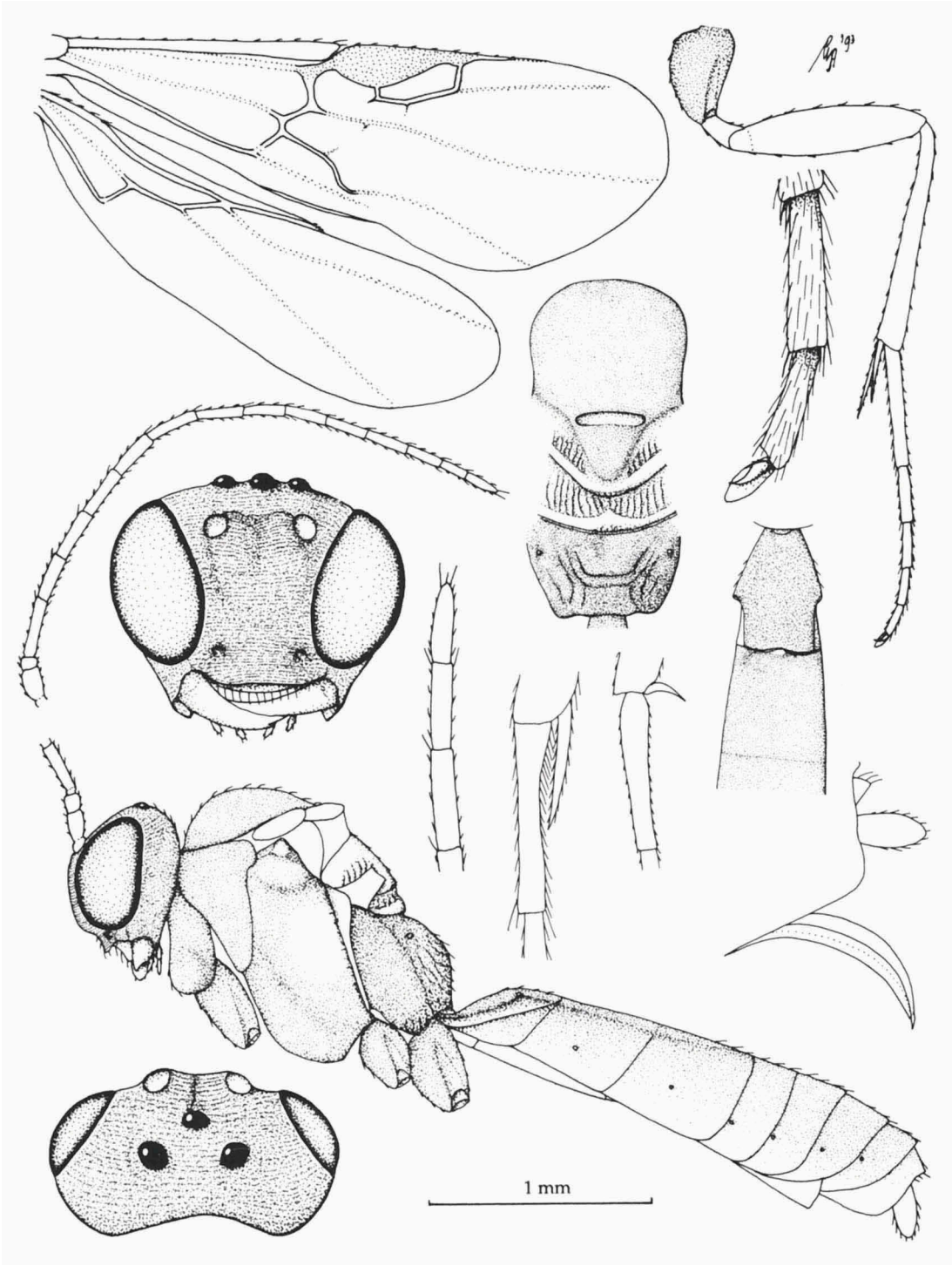


PROTEROPINAE
Plate 54. *Proterops nigripennis* Wesmael, ♀.



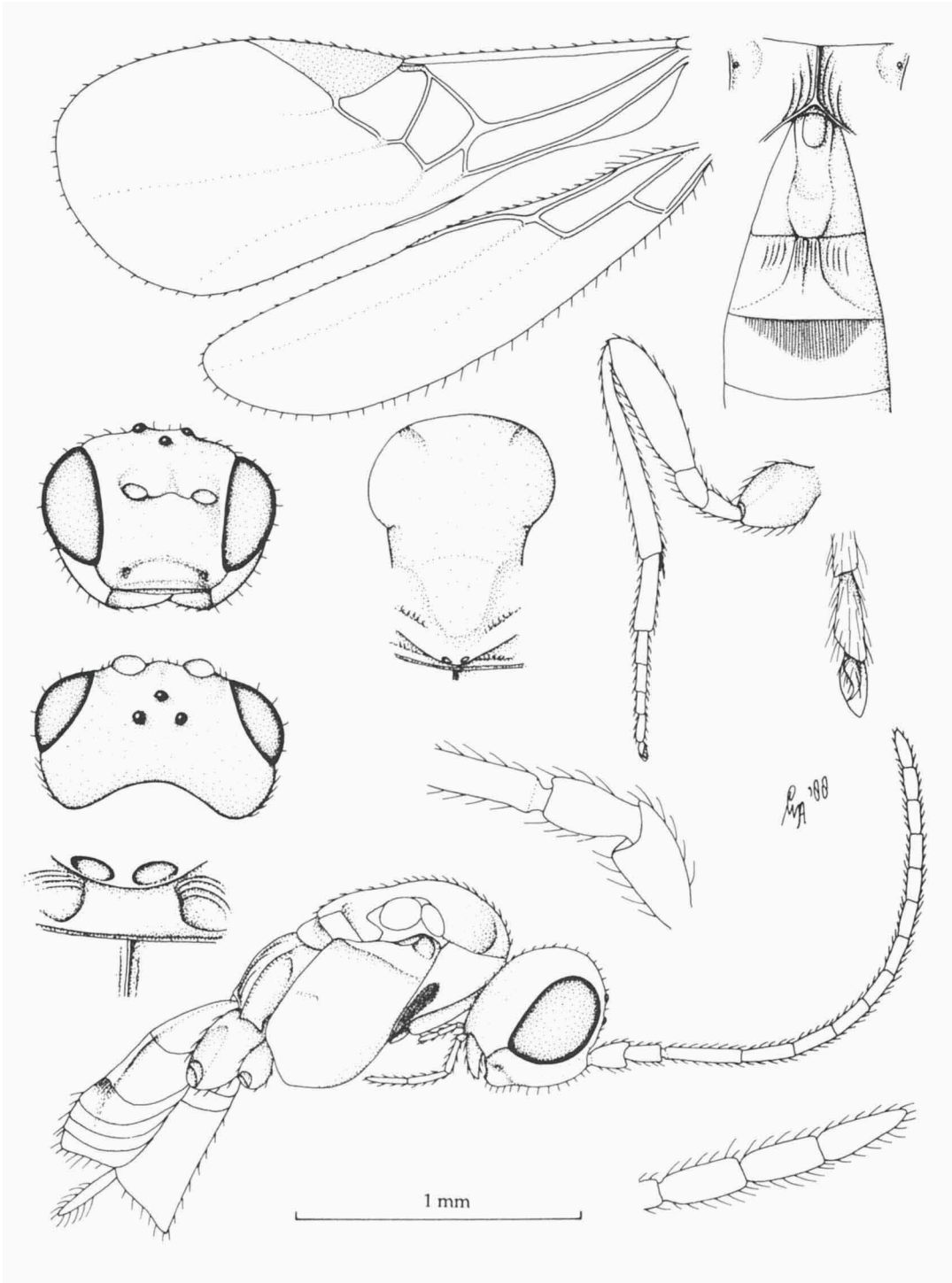
NEONEURINAE

Plate 55. *Elasmosoma berolinense* Ruthe, ♀, but left and middle fore tarsus of ♂.

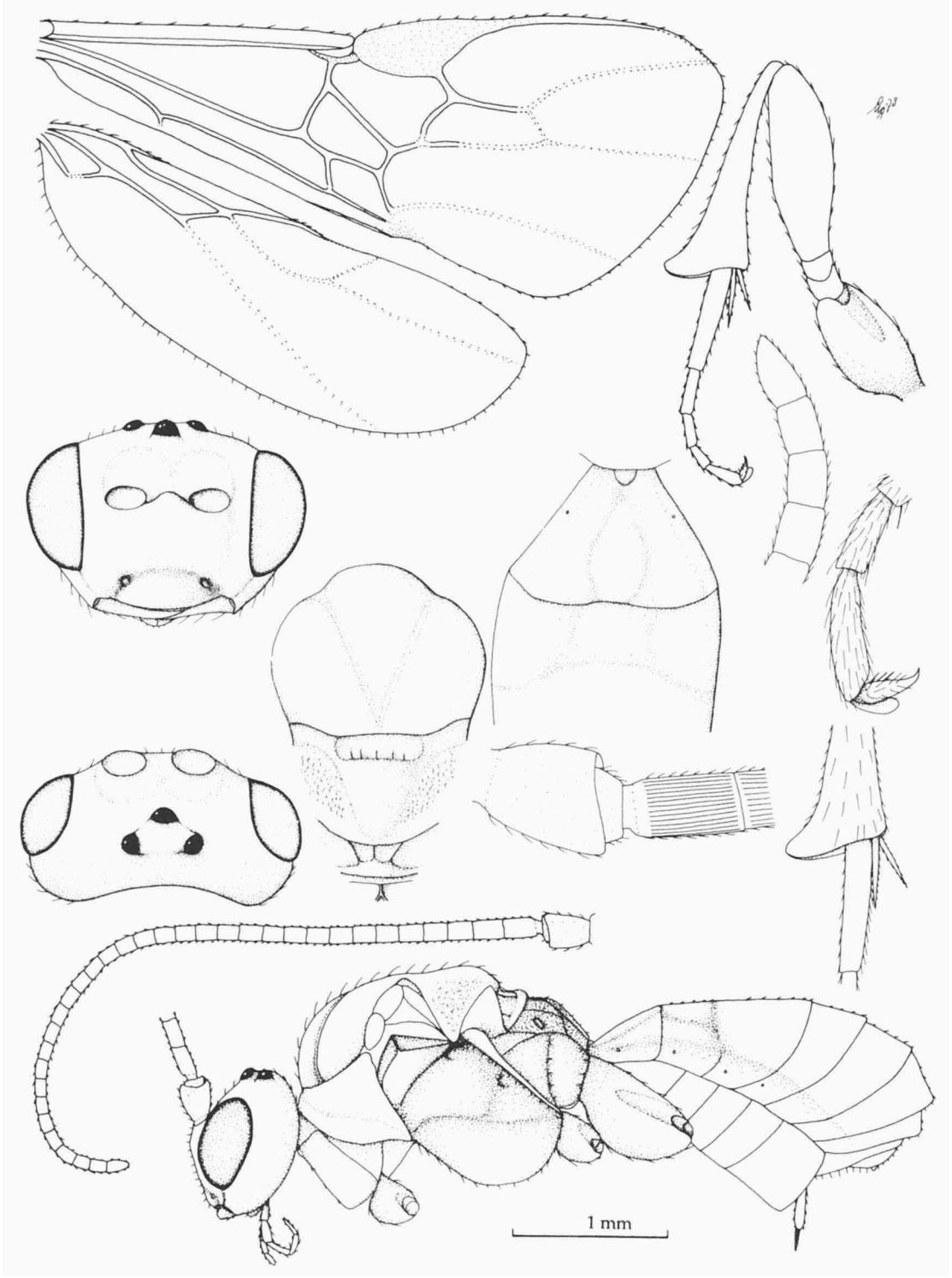


NEONEURINAE

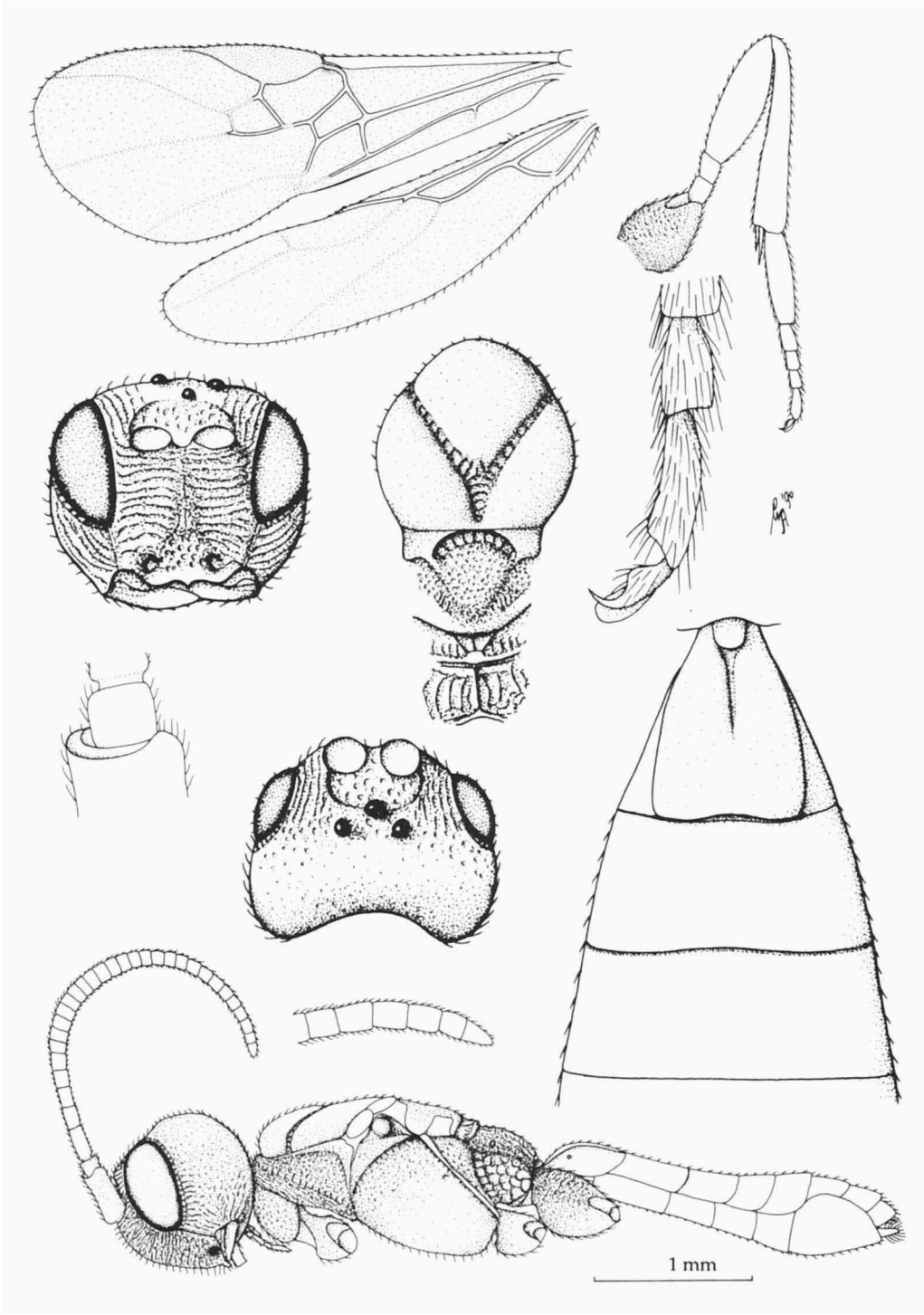
Plate 56. *Neoneurus auctus* (Thomson), ♀, but left detail of fore spur of ♂.



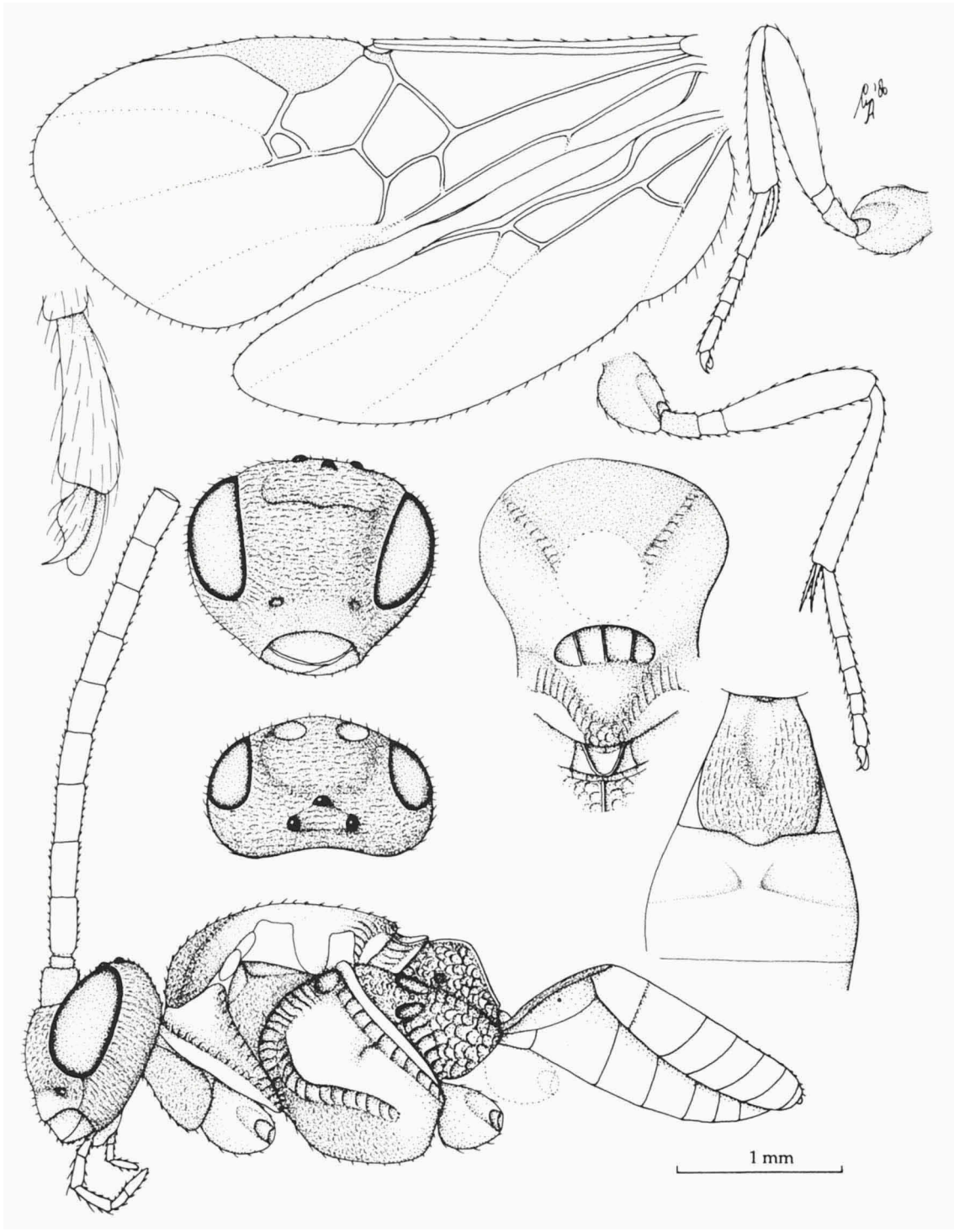
MIRACINAE
Plate 57. *Centistidea ectoedemiae* Rohwer, ♀.



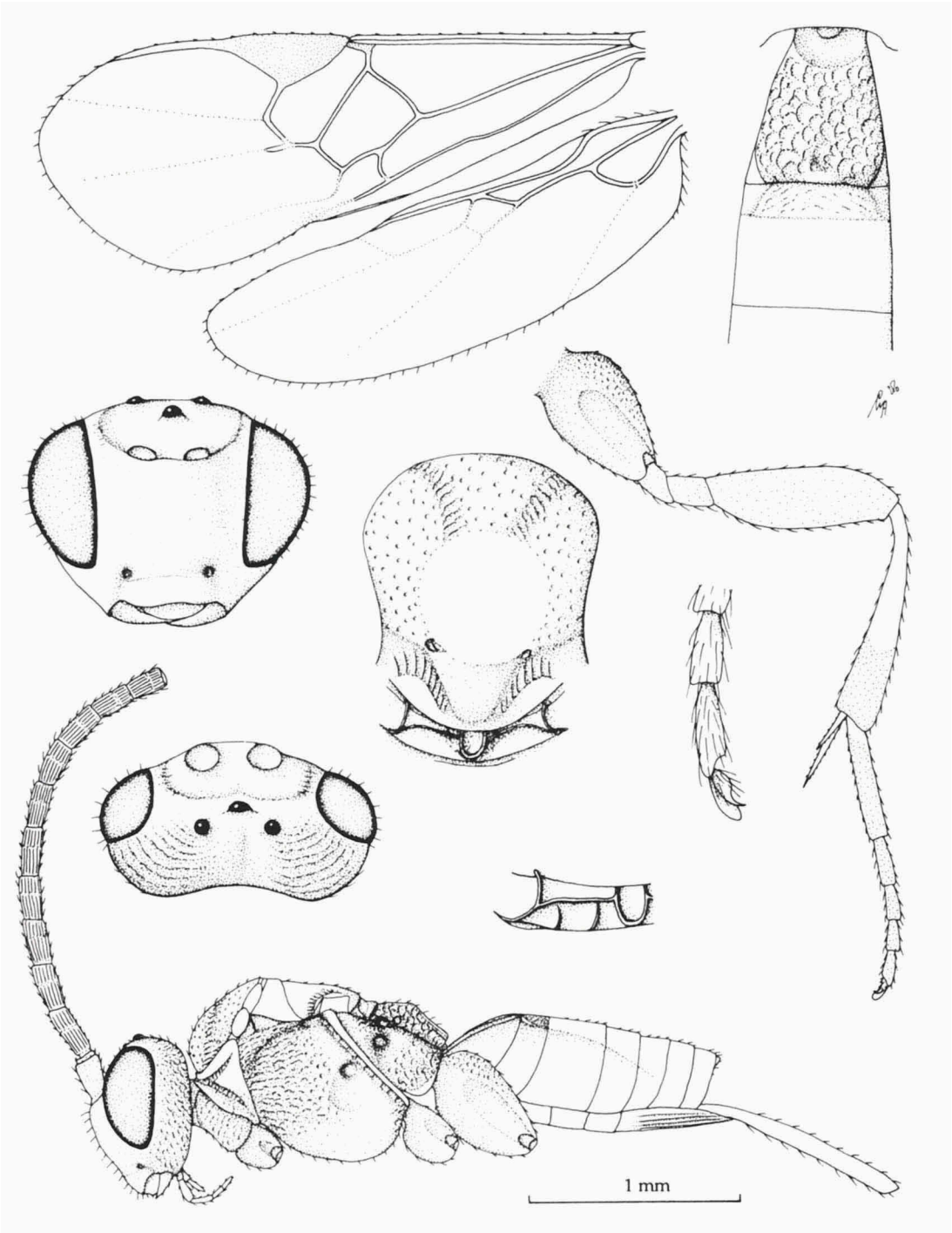
CARDIOCHILINAE
Plate 58. *Pseudcardiochiles abnormipes* Hedwig, ♀.



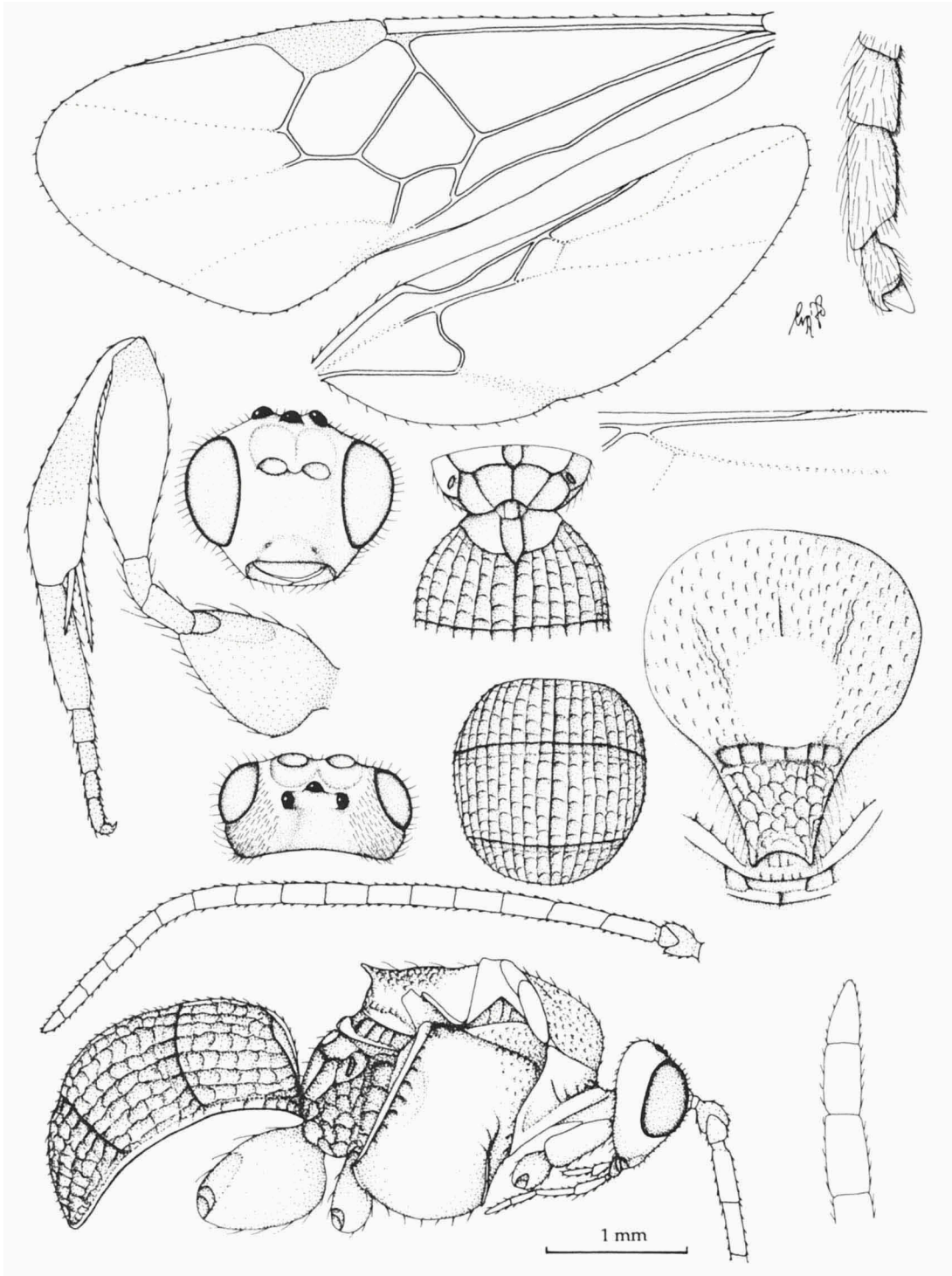
KHOIKHOIINAE
Plate 59. *Khoikhoia lission* Mason, ♀.



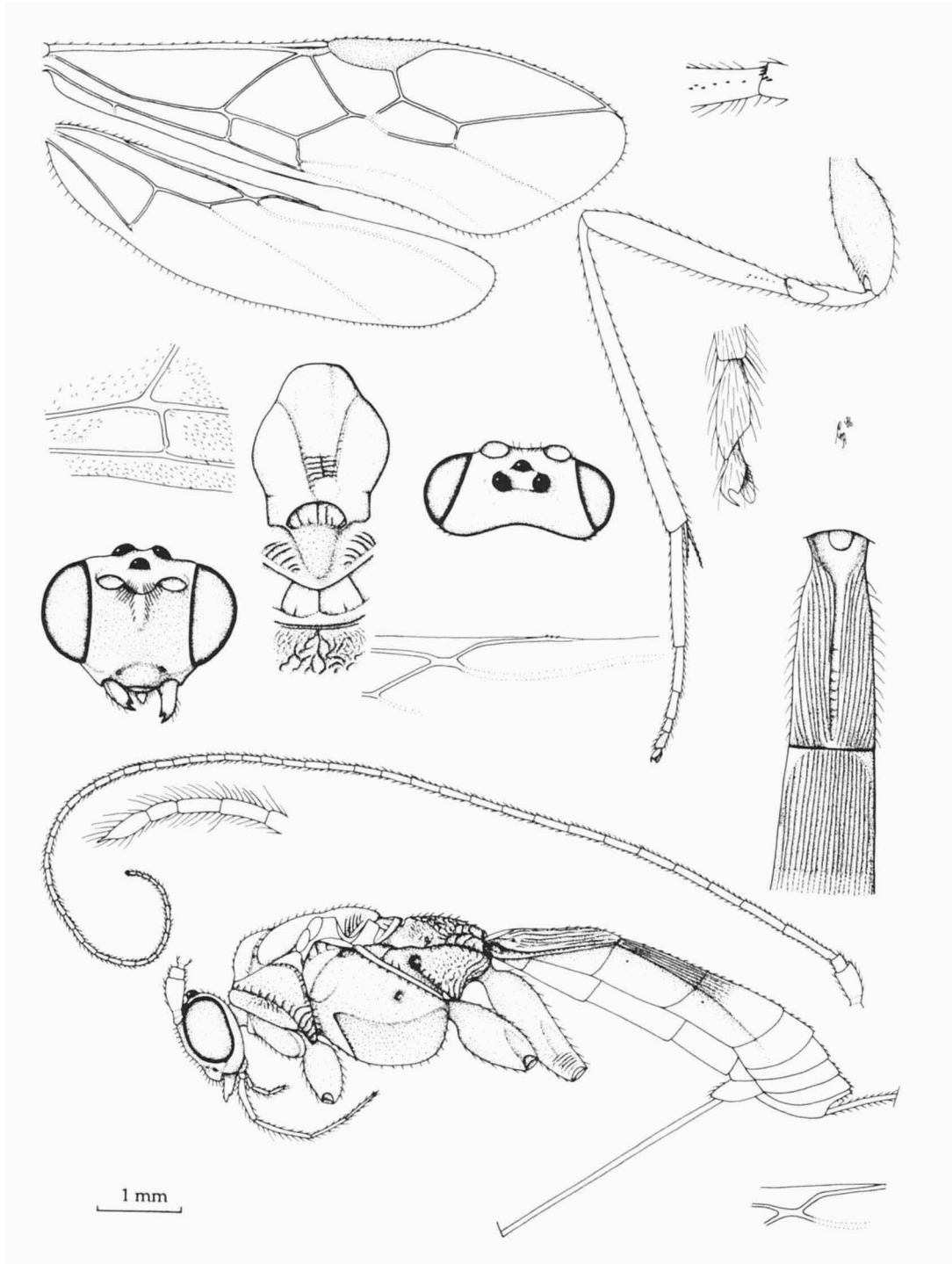
MICROGASTRINAE-MICROPLITINI
Plate 60. *Microplitis deprimator* (Fabricius), ♀.



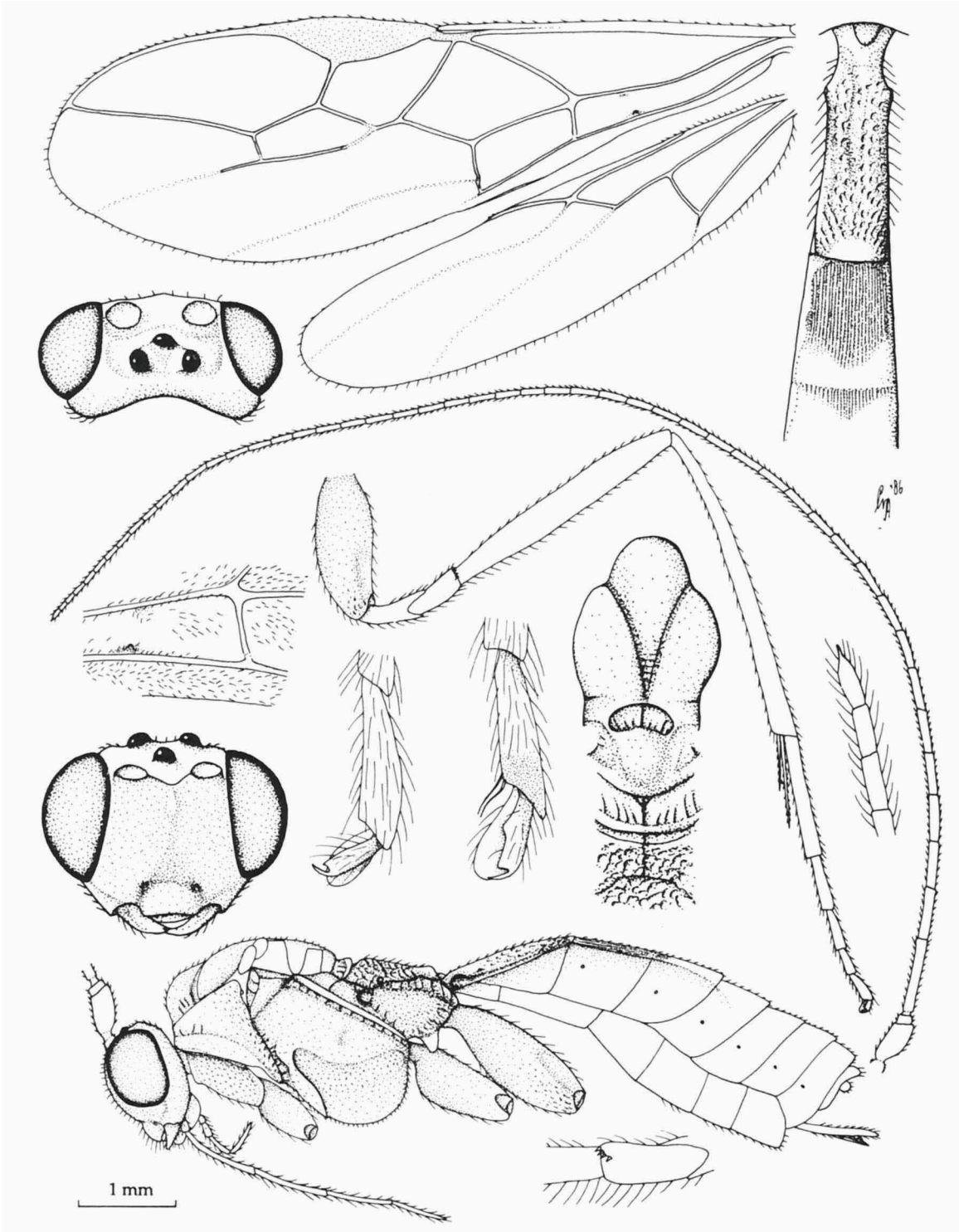
MICROGASTRINAE-APANTELINI
Plate 61. *Apanteles obscuripes* (Nees), ♀.



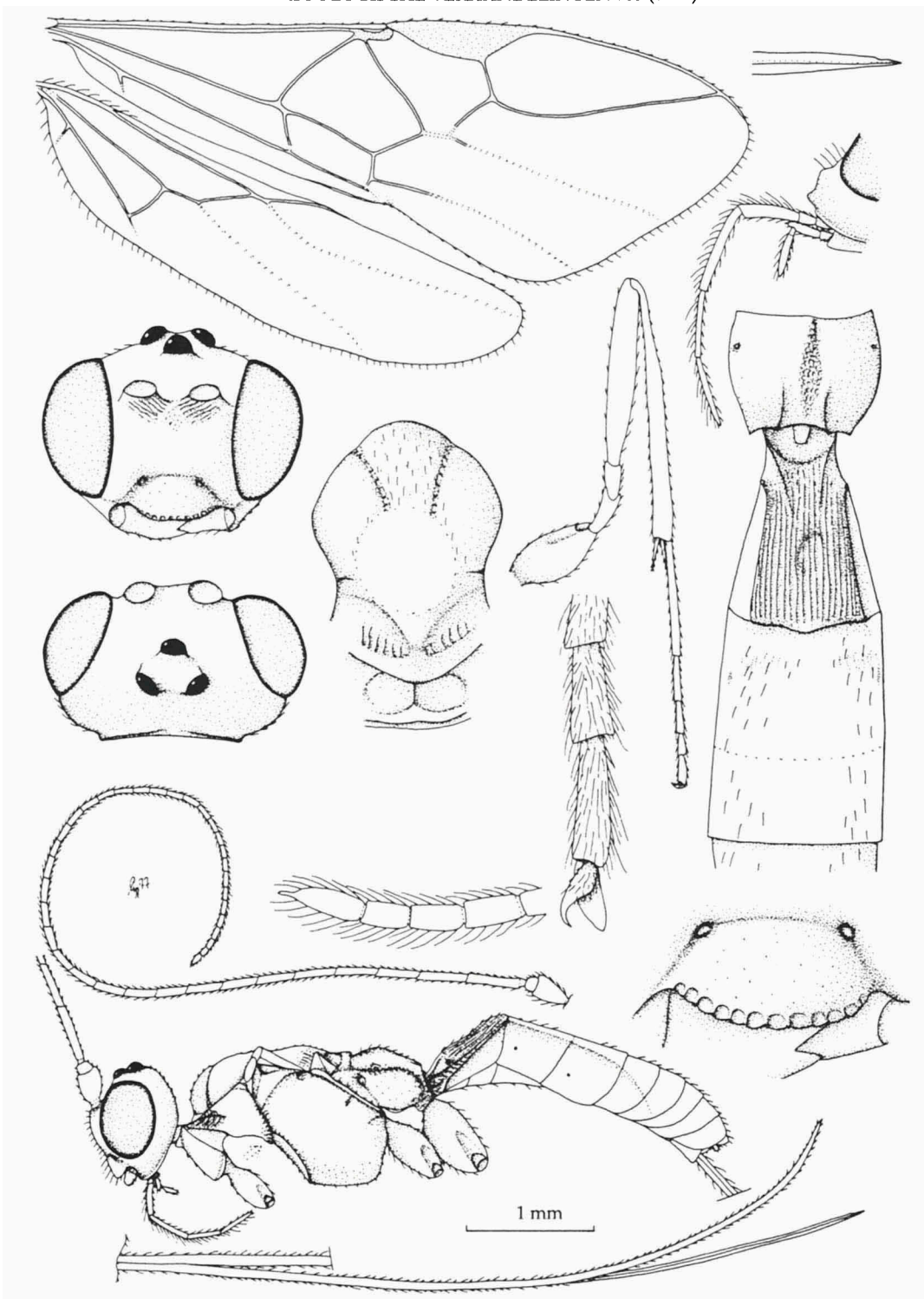
MICROGASTRINAE-COTESIINI
Plate 62. *Fornicia clathrata* Brullé, ♂.



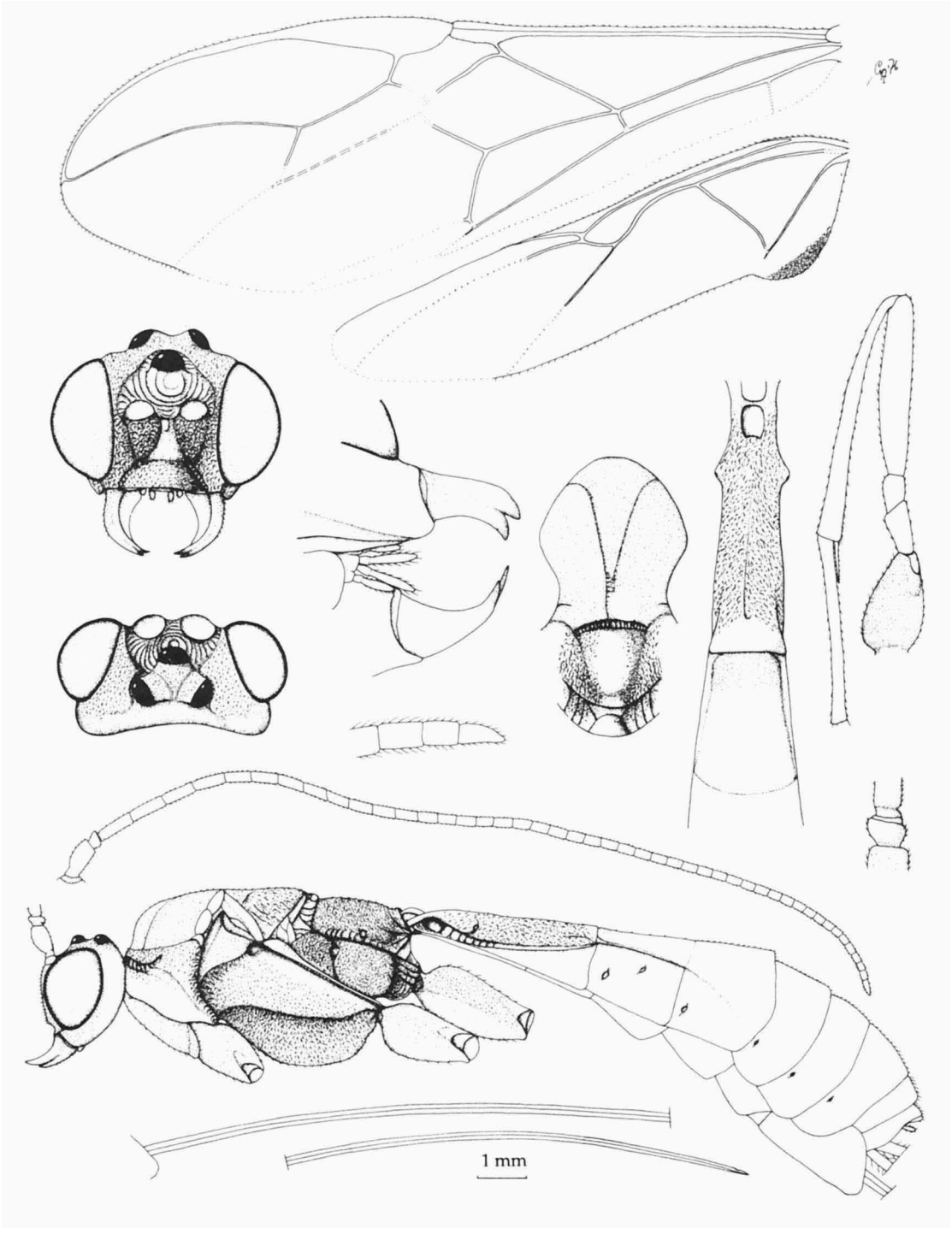
MACROCENTRINAE
Plate 63. *Macrocentrus alox* van Achterberg & Belokobylskij, ♀.



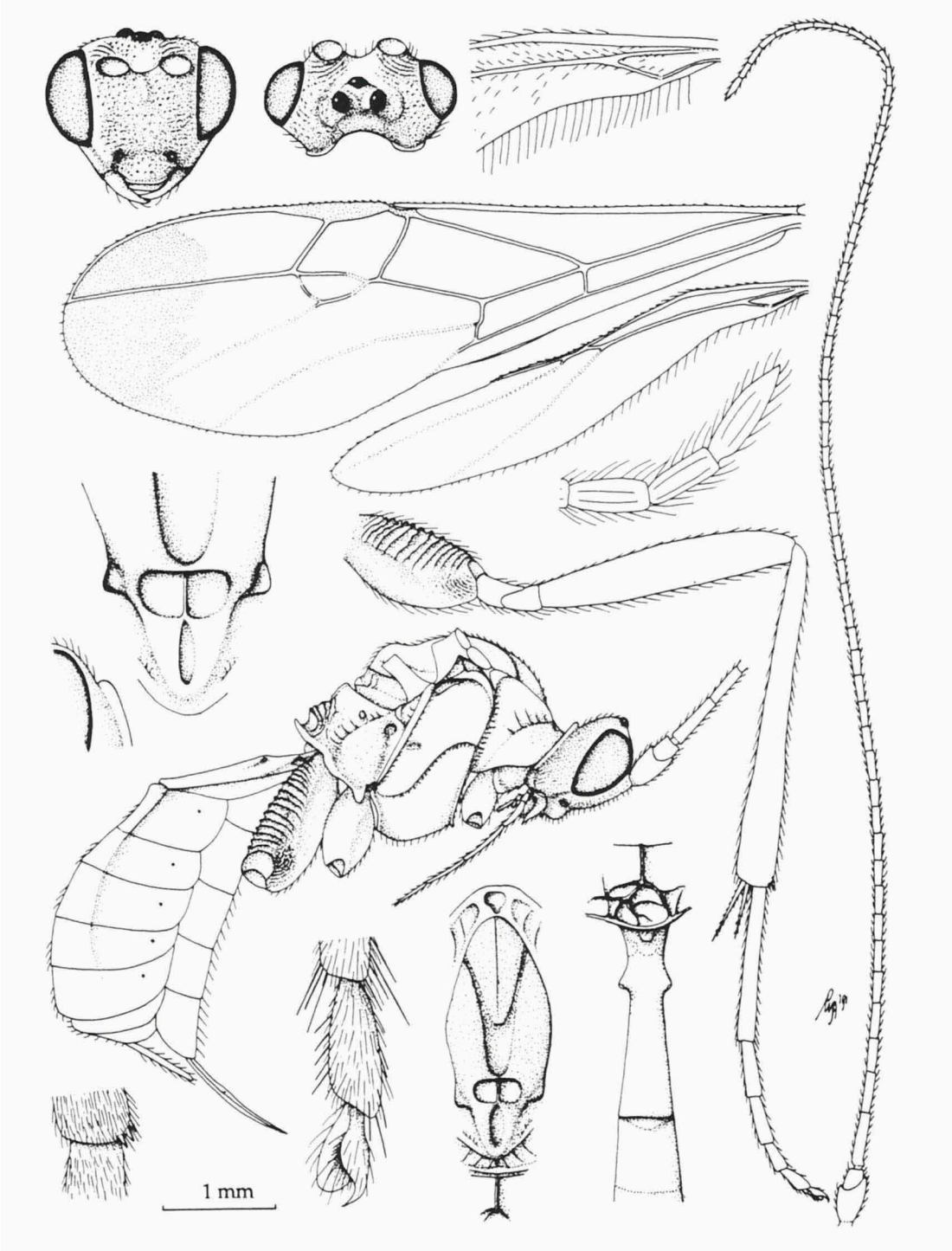
MACROCENTRINAE
Plate 64. *Austrozele takasuae* van Achterberg, ♀.



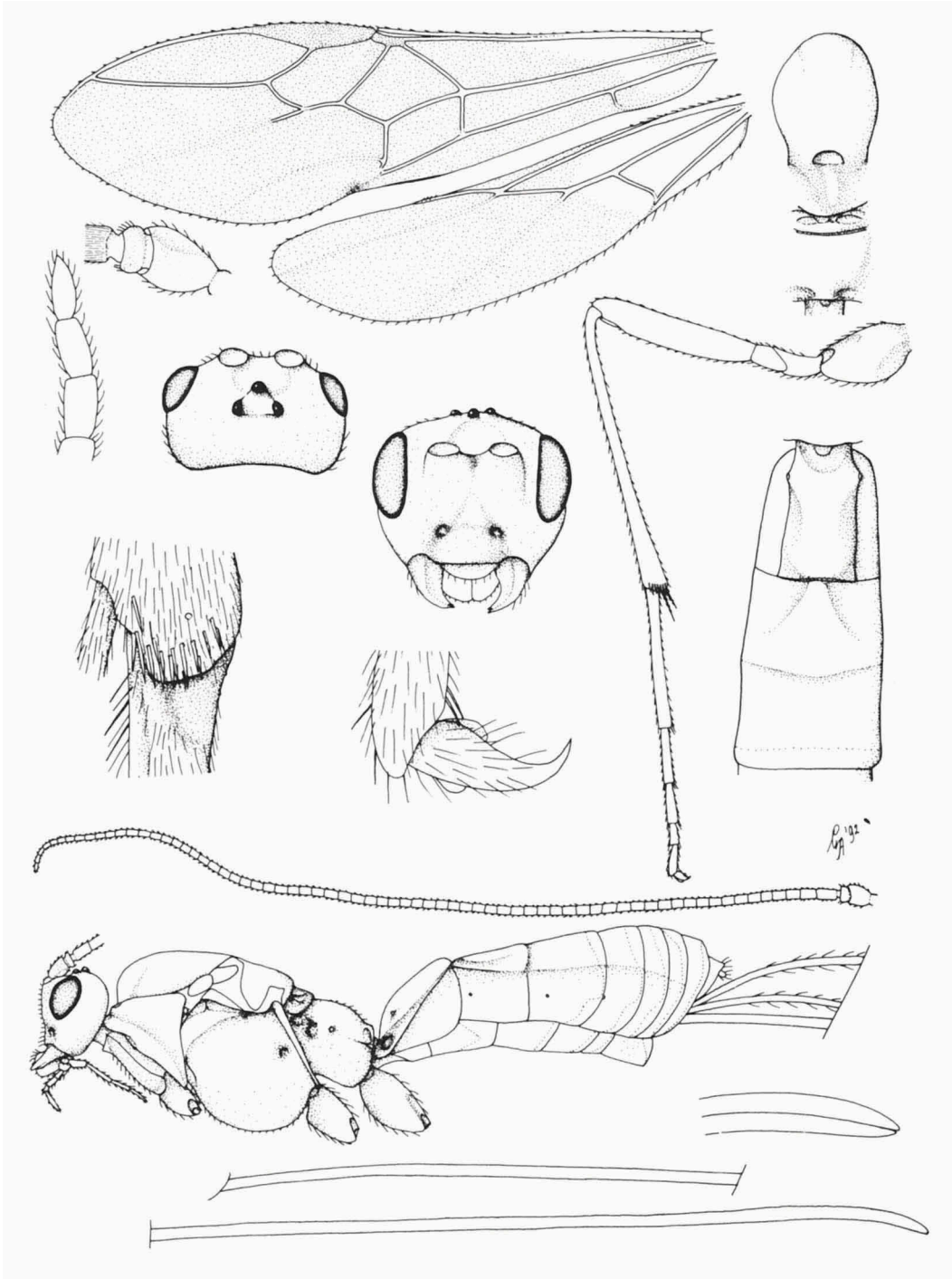
CHARMONTINAE
Plate 65. *Charmon cruentatus* Haliday, ♀.



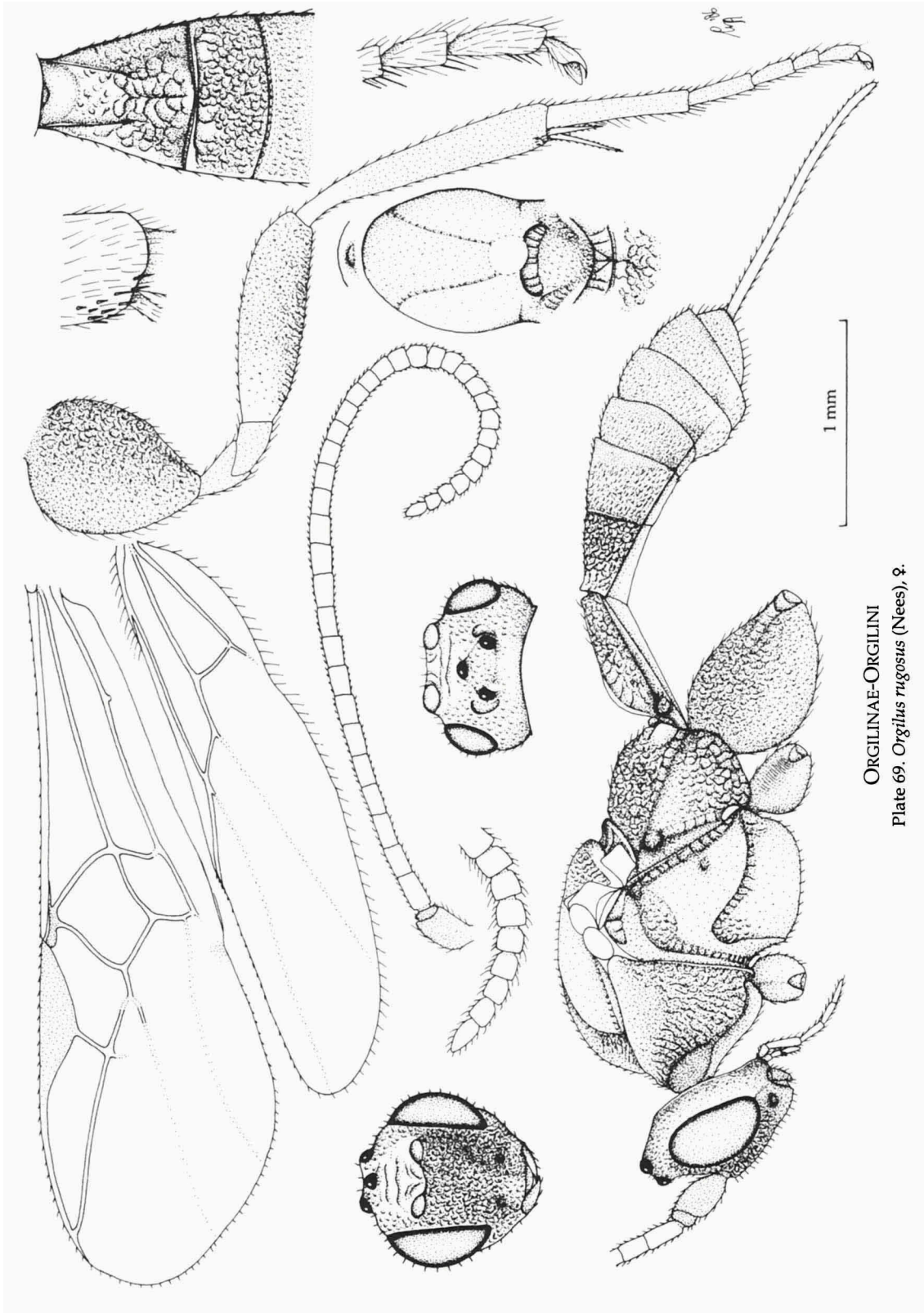
AMICROCENTRINAE
Plate 66. *Amicrocentrum concolor* (Szépligeti), ♀.



ORGILINAE-MIMAGATHIDINI
Plate 67. *Bentonia longicornis* van Achterberg, ♀.

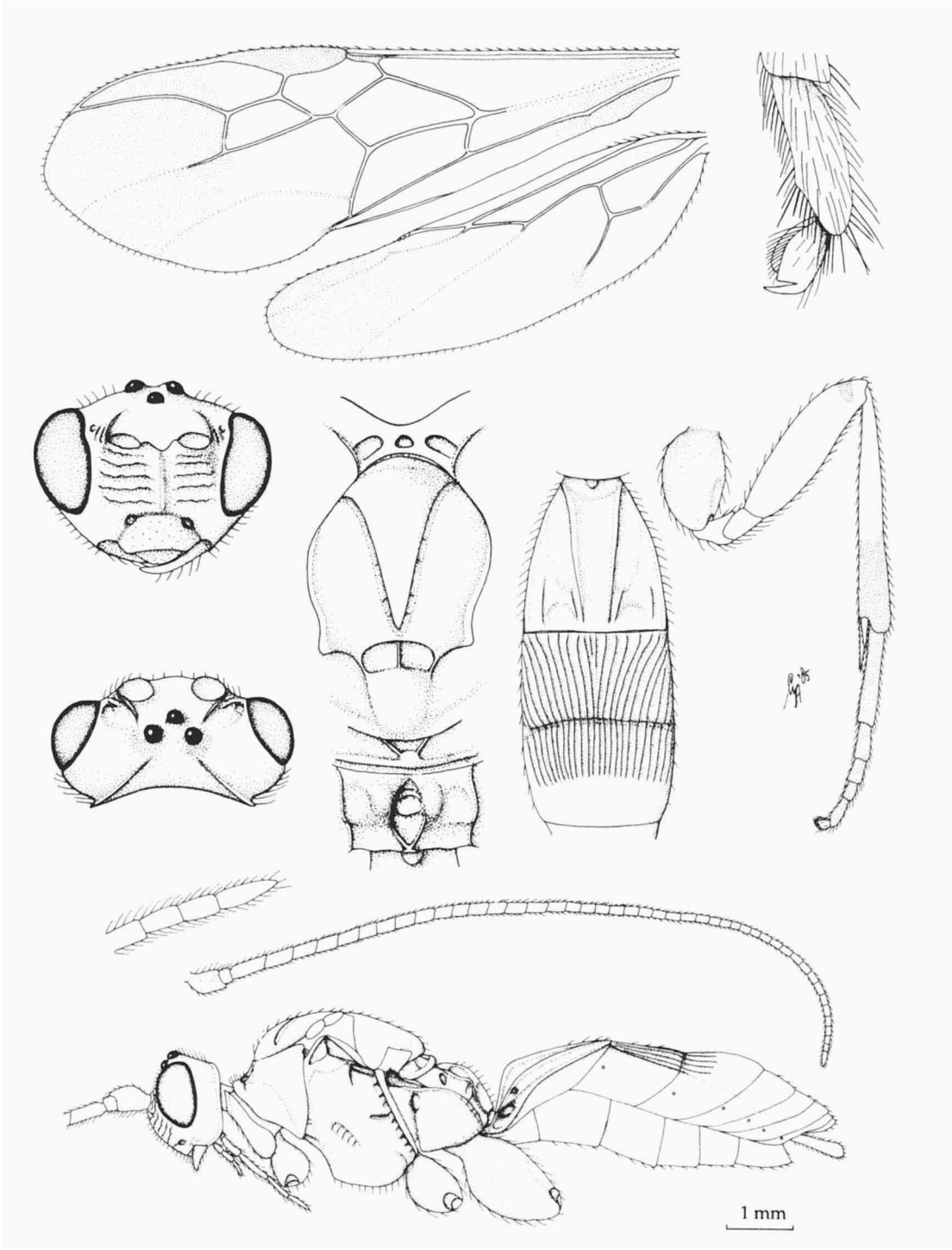


ORGILINAE-ORGILINI
Plate 68. *Declotila albomarginata* van Achterberg & Quicke, ♀.

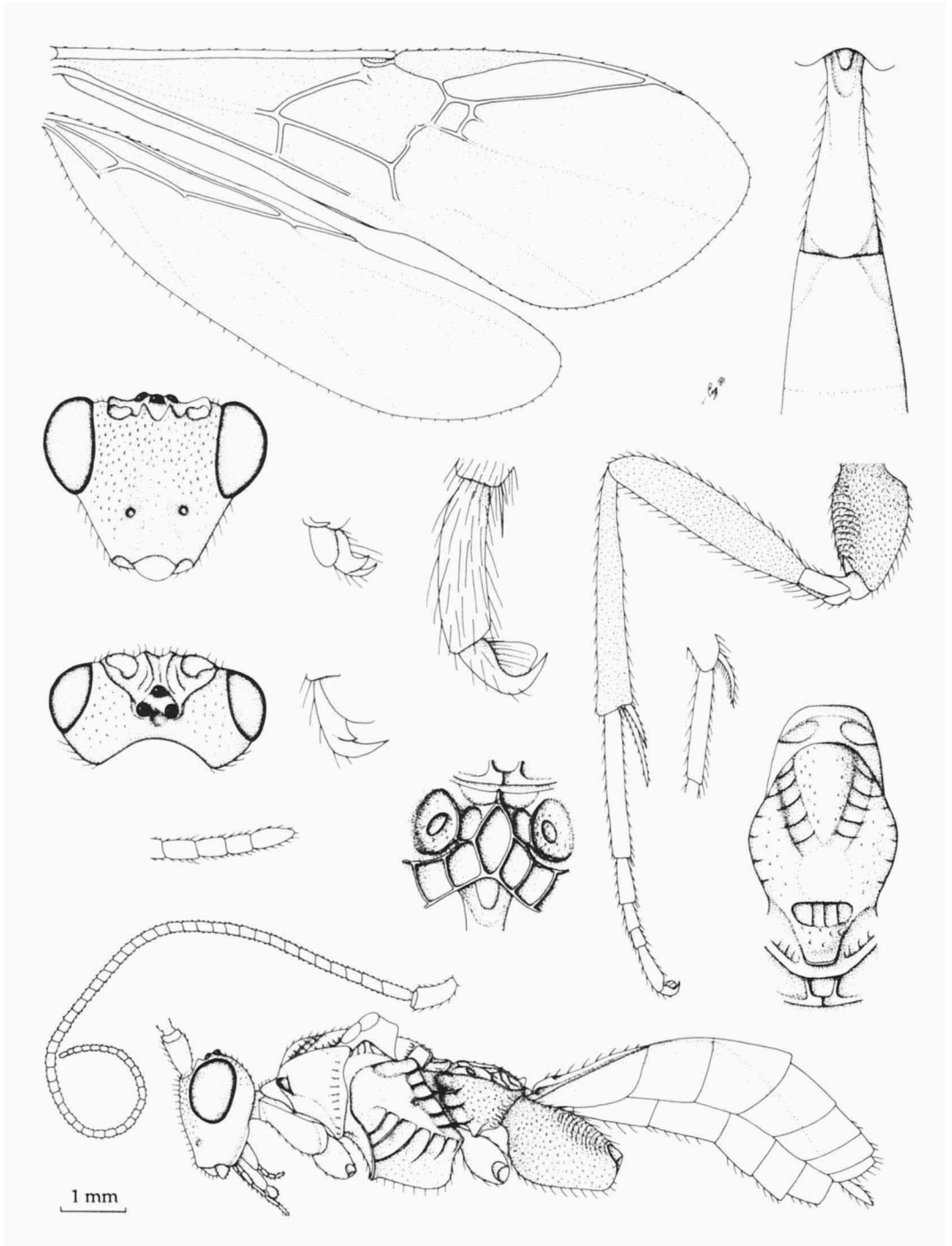


ORGILINAE-ORGILINI

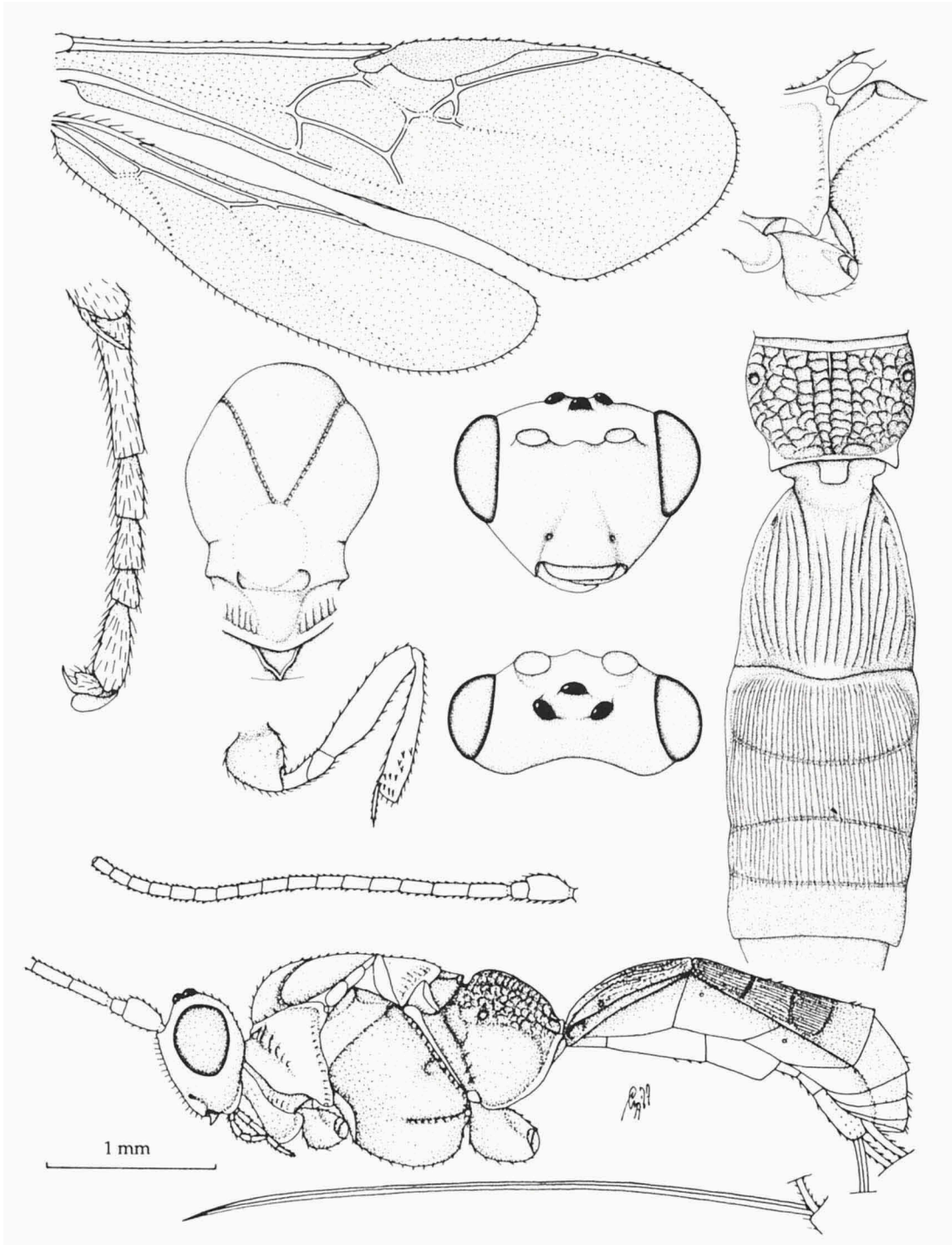
Plate 69. *Orgilus rugosus* (Nees), ♀.



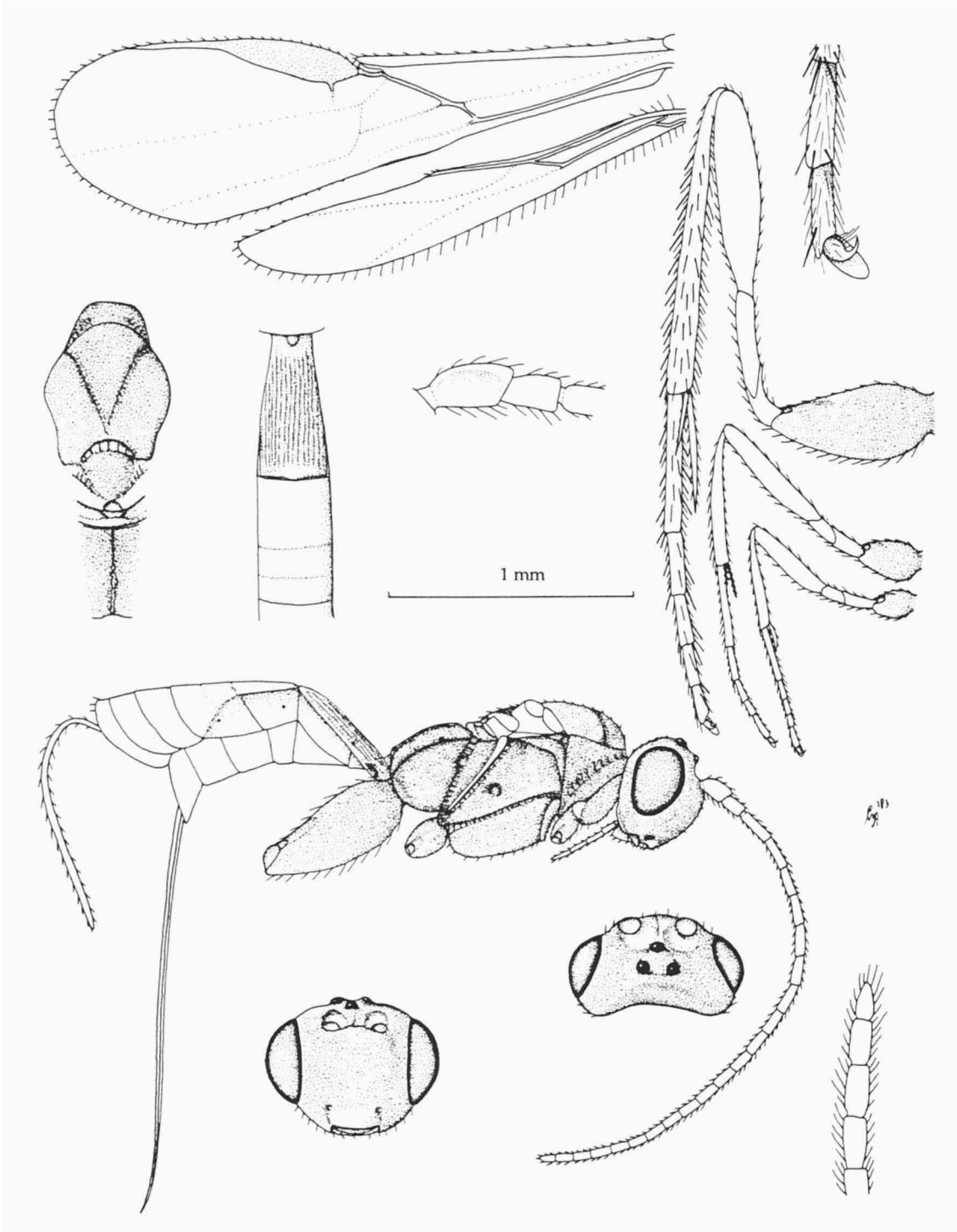
PSELAPHANINAE
Plate 70. *Pselaphanus trogoides* Szépligeti, ♀.



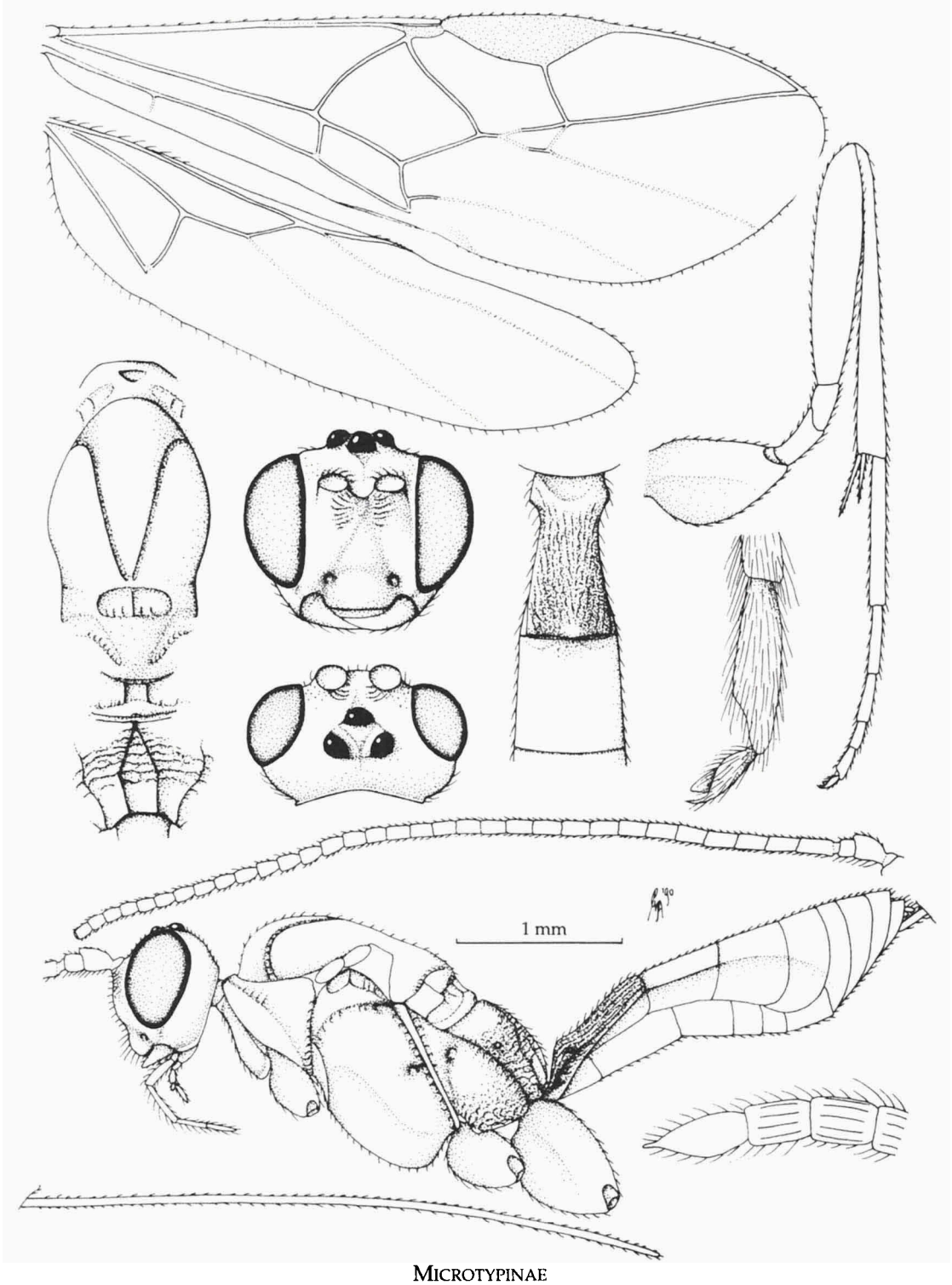
AGATHIDINAE-VIPIONINI
Plate 71. *Pseudocremnops atripennis* Szépligeti, ♀.



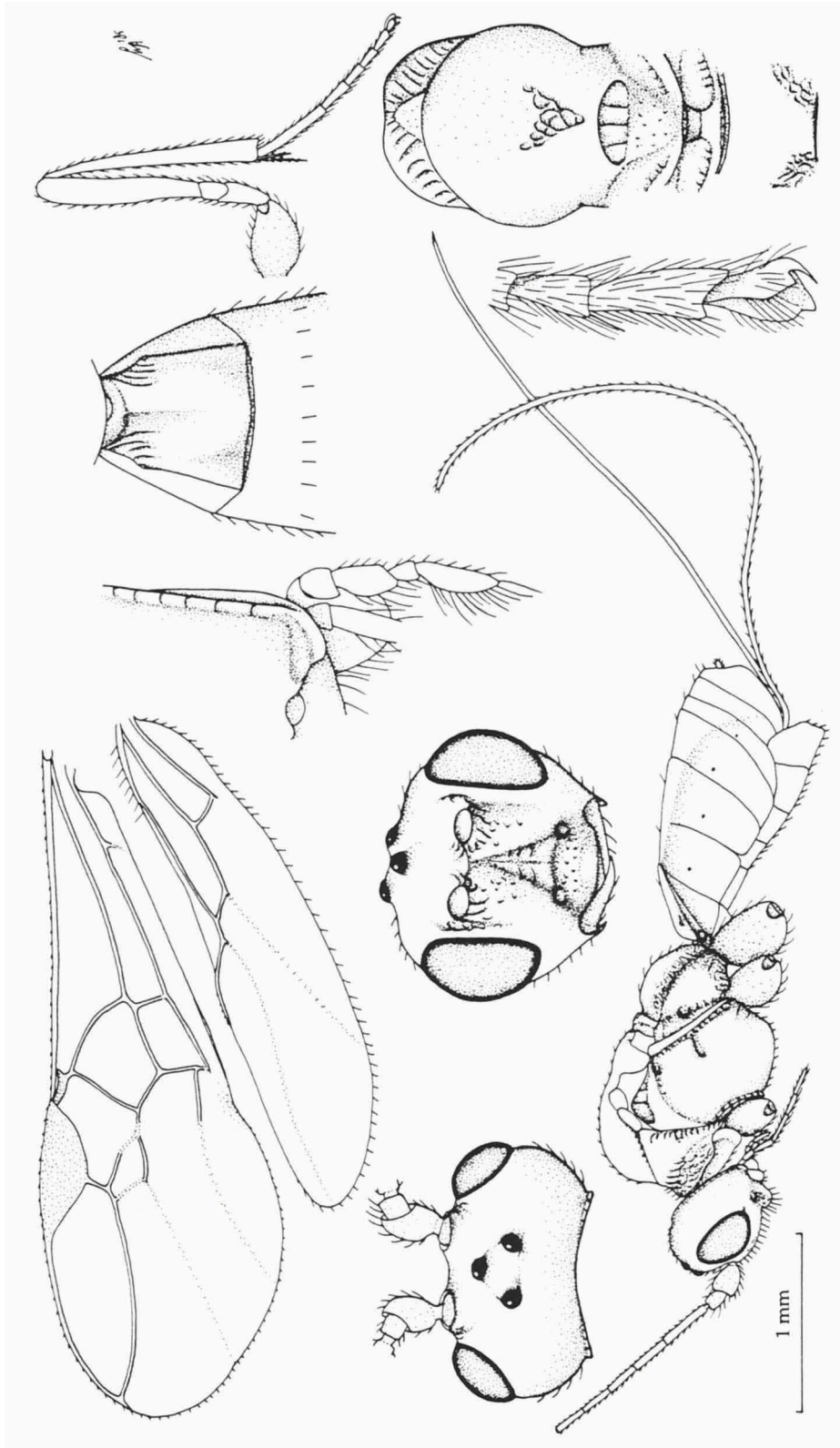
AGATHIDINAE-AGATHIDINI
Plate 72. *Bassus melleus* (Brues), ♀.



AGATHIDINAE-AGATHIDINI-MESOCOELINA
Plate 73. *Aneurobracon annulipes* van Achterberg, ♀.

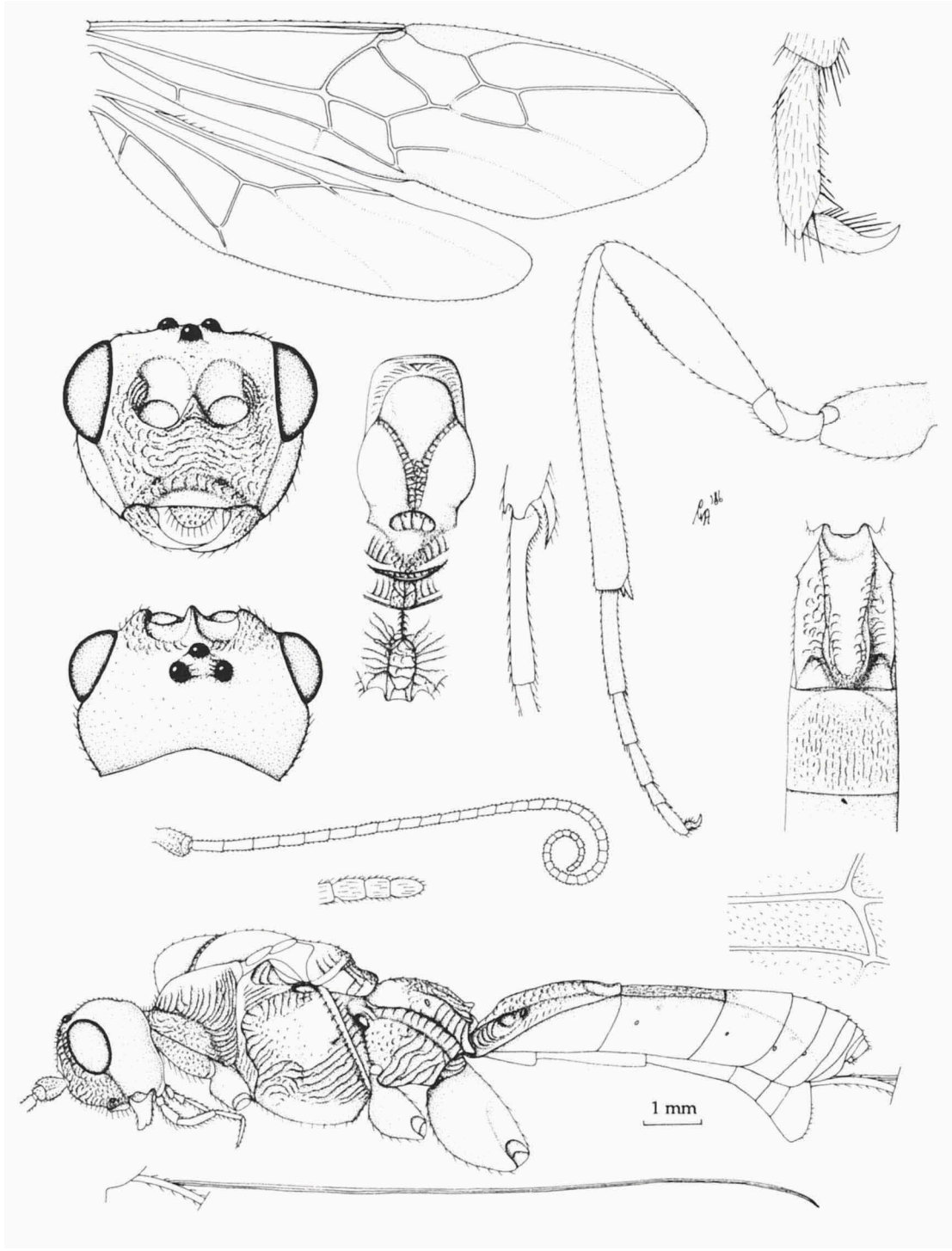


MICROTYPINAE
Plate 74. *Microtypus wesmaelii* Ratzeburg, ♀.

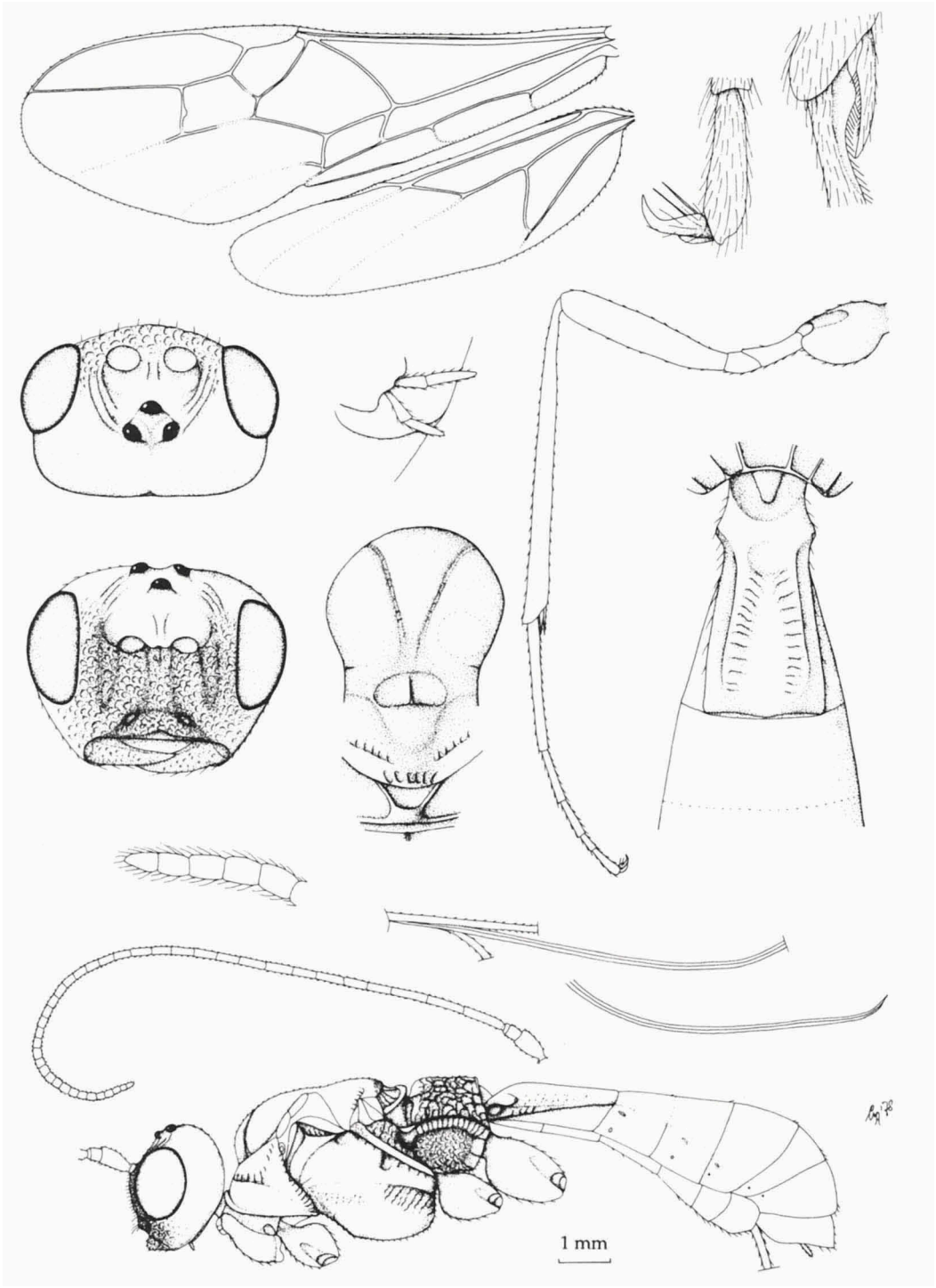


MICROTYPINAE

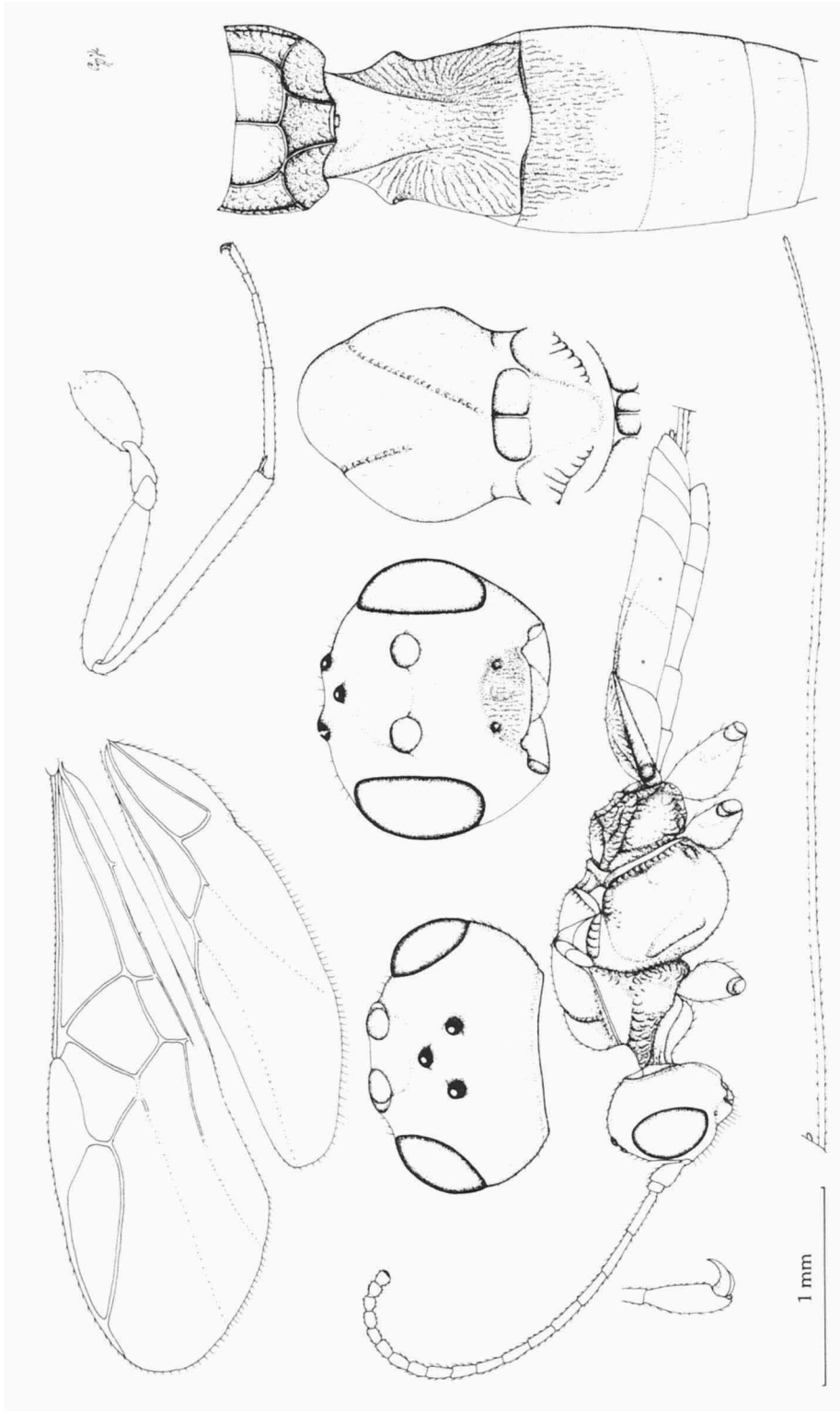
Plate 75. *Neomicrotypus penai* van Achterberg, ♀.



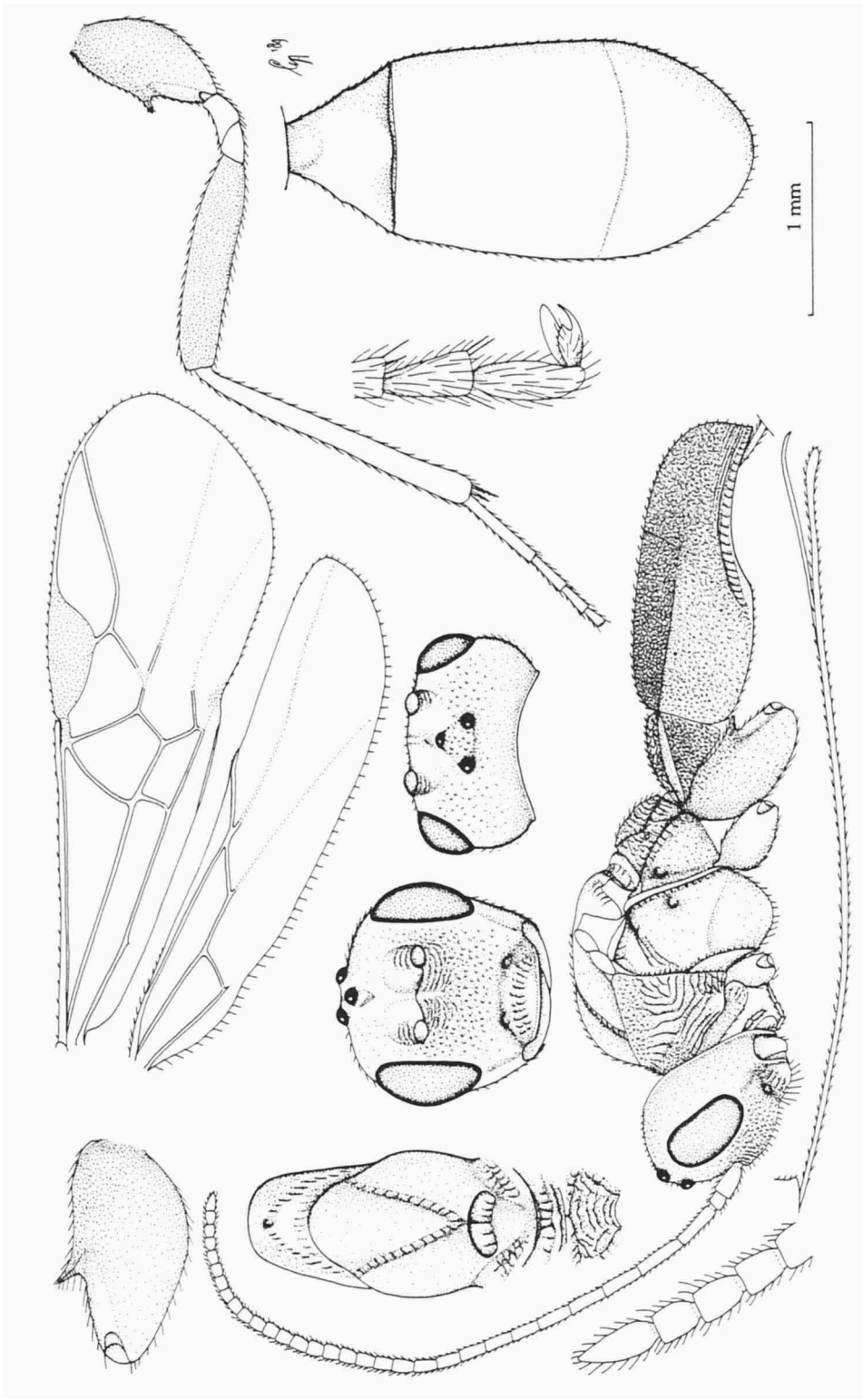
HELCONINAE-HELCONINI
Plate 76. *Helcon tardator* Nees, ♀.



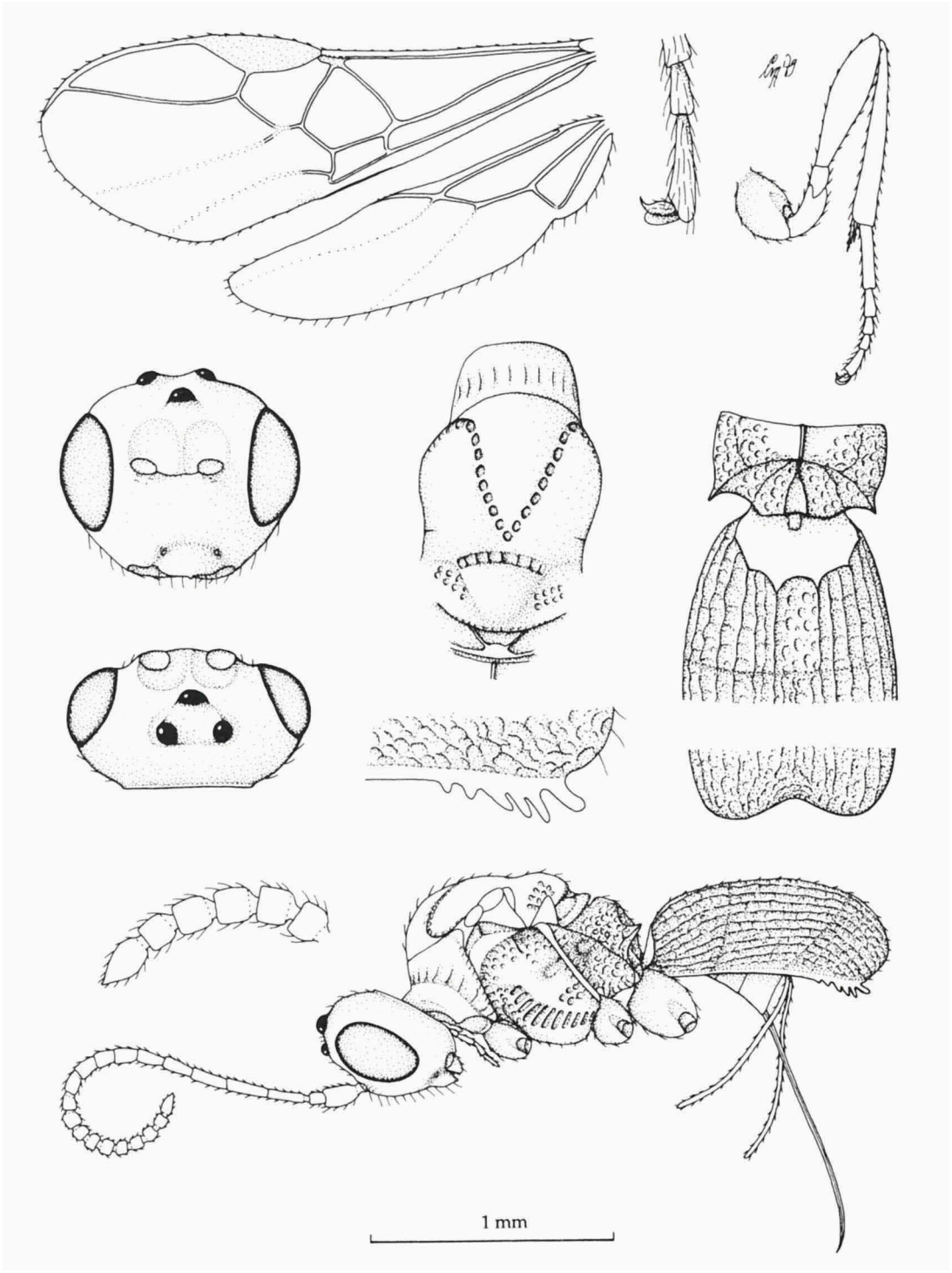
HELCONINAE-BRULLEIINI
Plate 77. *Brulleia melanocephala* Szépligeti, ♀.



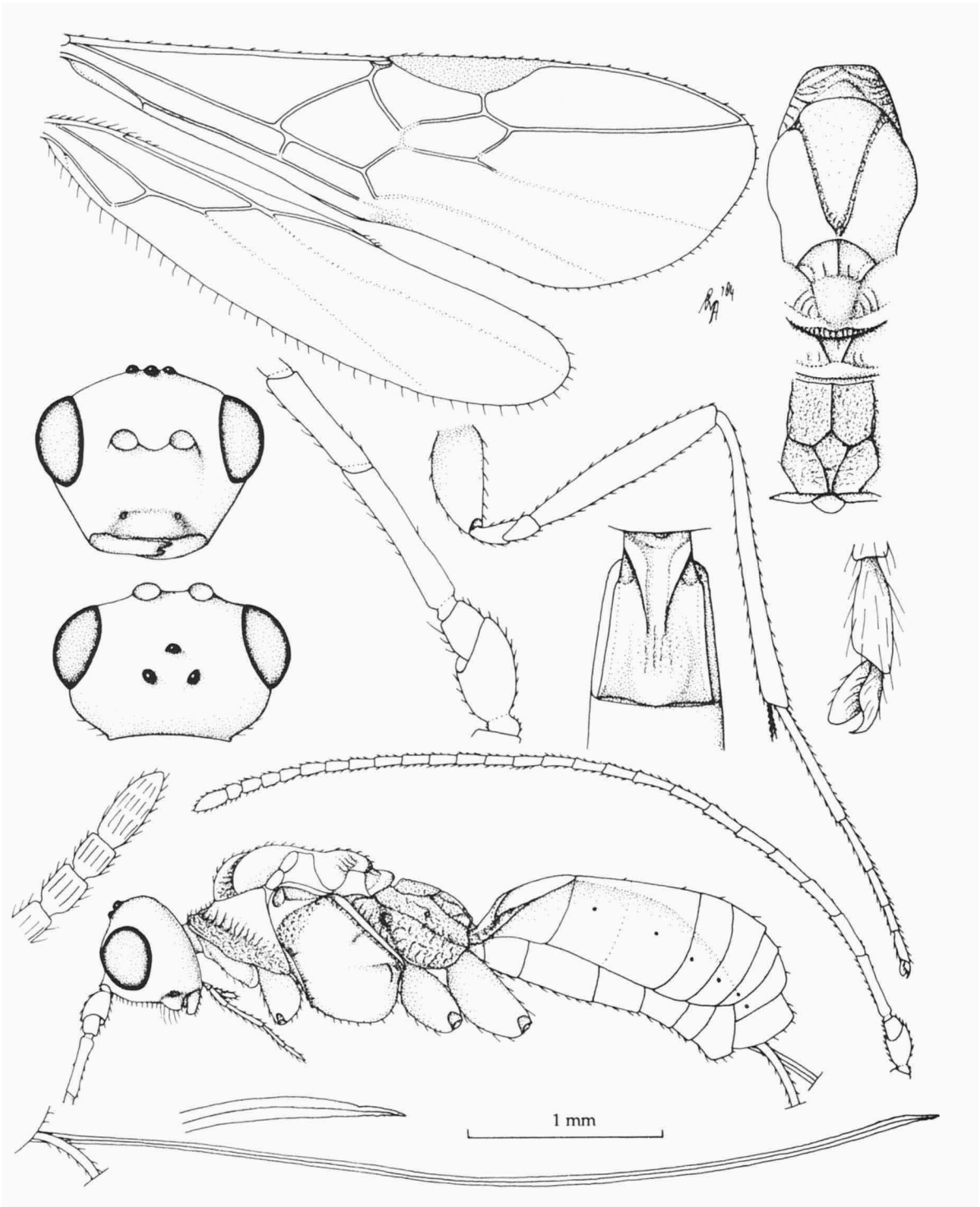
HELCONINAE-BRACHISTINI
Plate 78. *Eubazus pallipes* Nees, ♀.



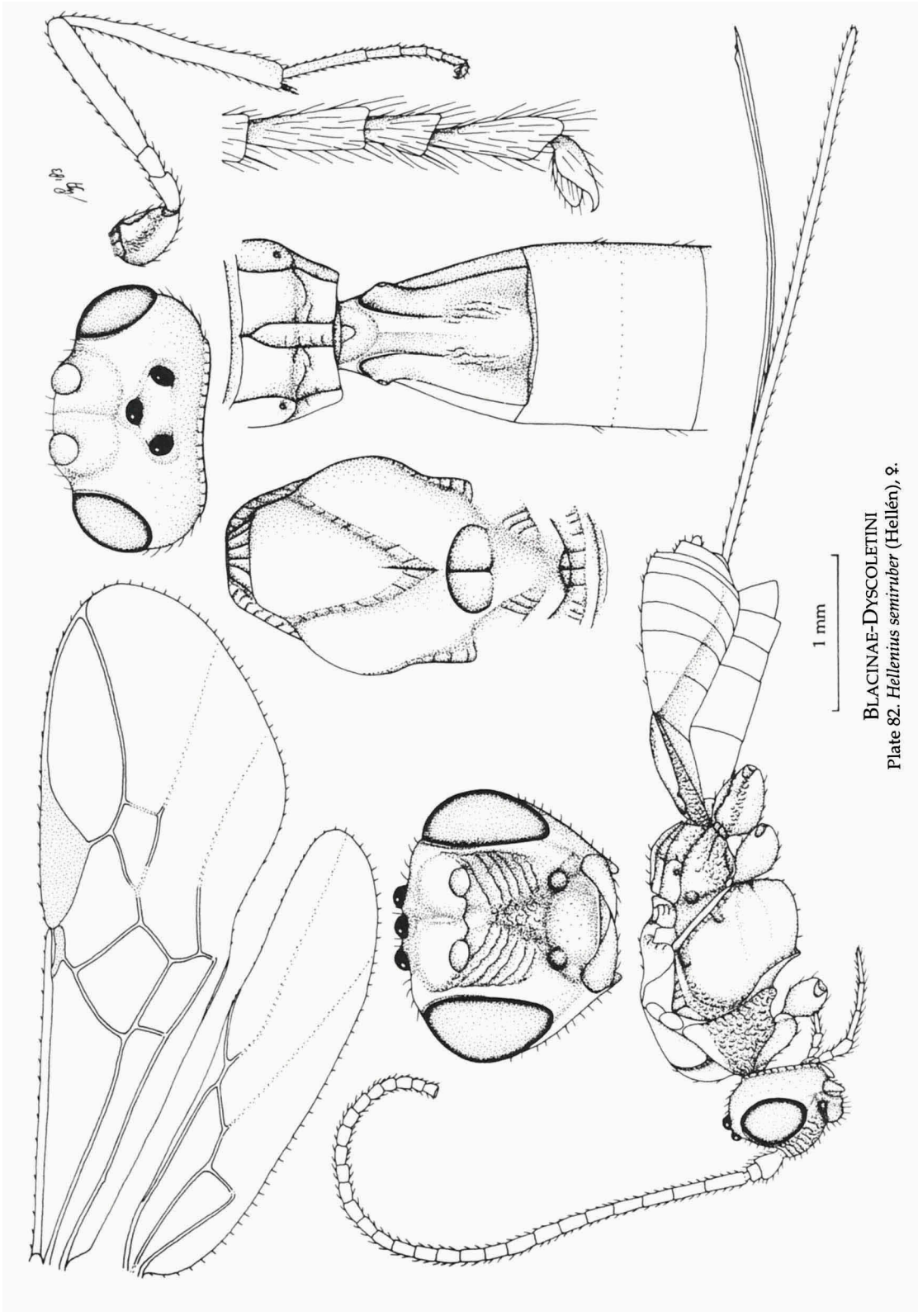
HELCONINAE-BRACHISTINI
Plate 79. *Polydegmon sinuatus* Foerster, ♀.



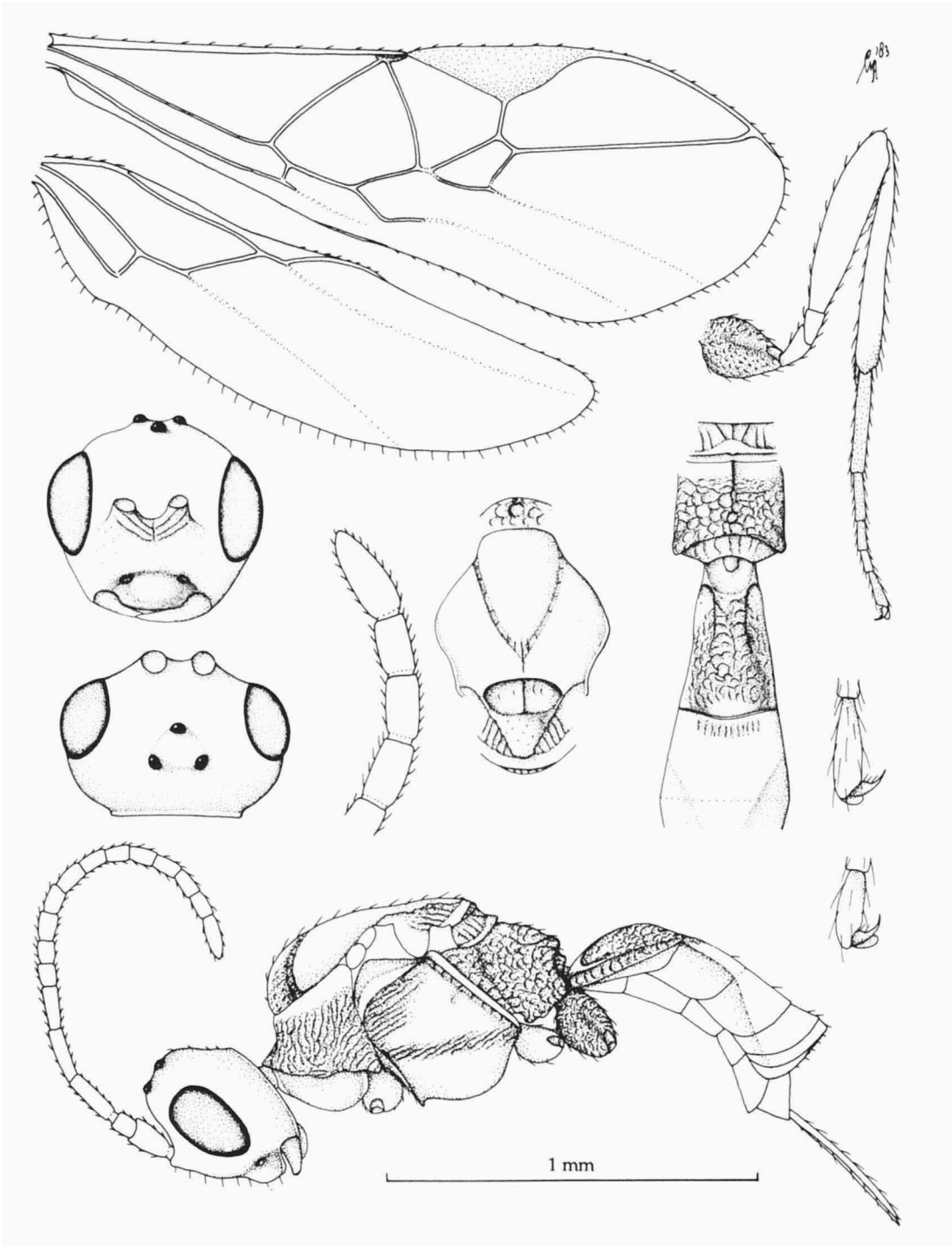
HELCONINAE-BRACHISTINI
Plate 80. *Muirella concisa* Fullaway, ♀.



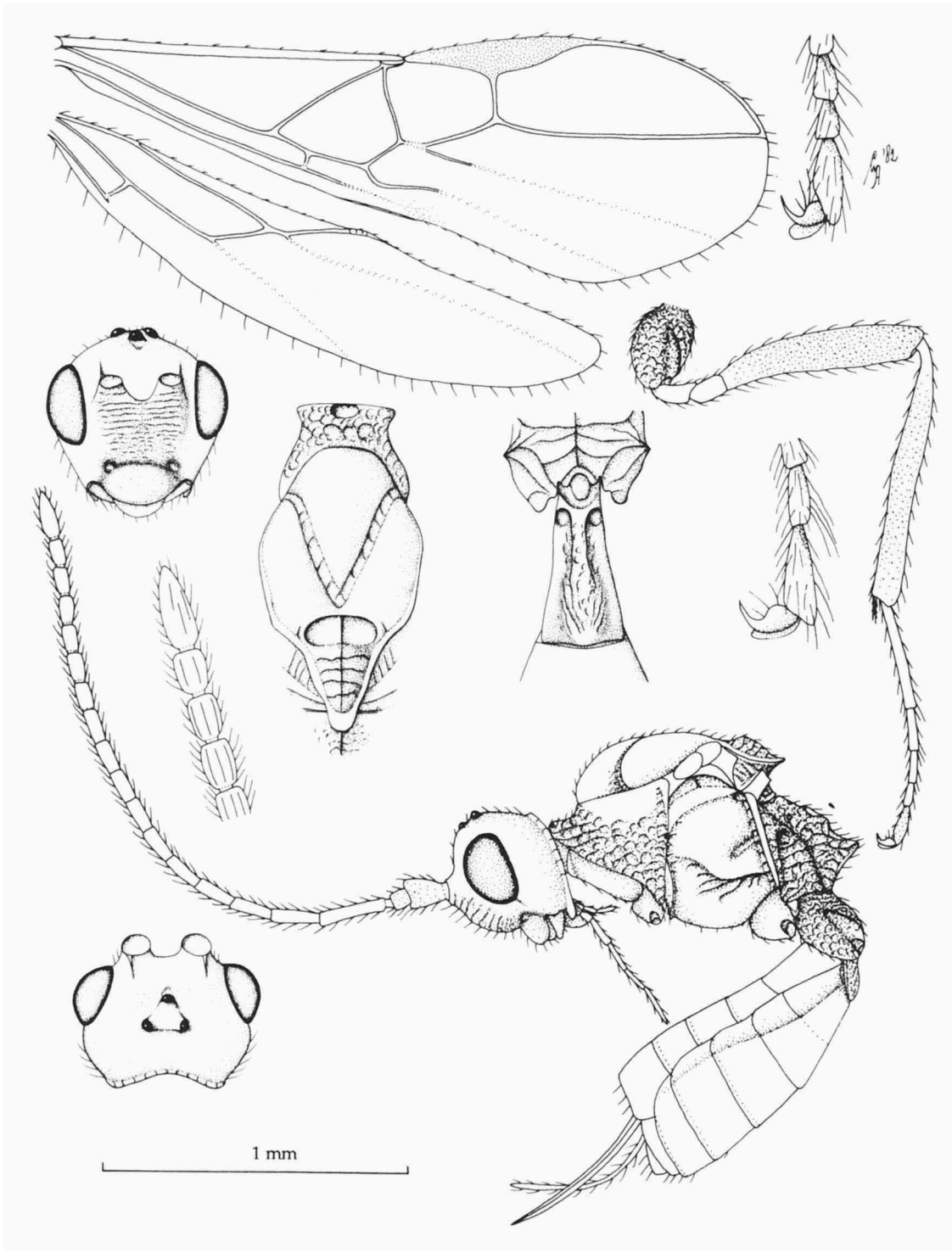
BLACINAE-DYSCOLETINI
Plate 81. *Dyscoletes canadensis* Mason, ♀.



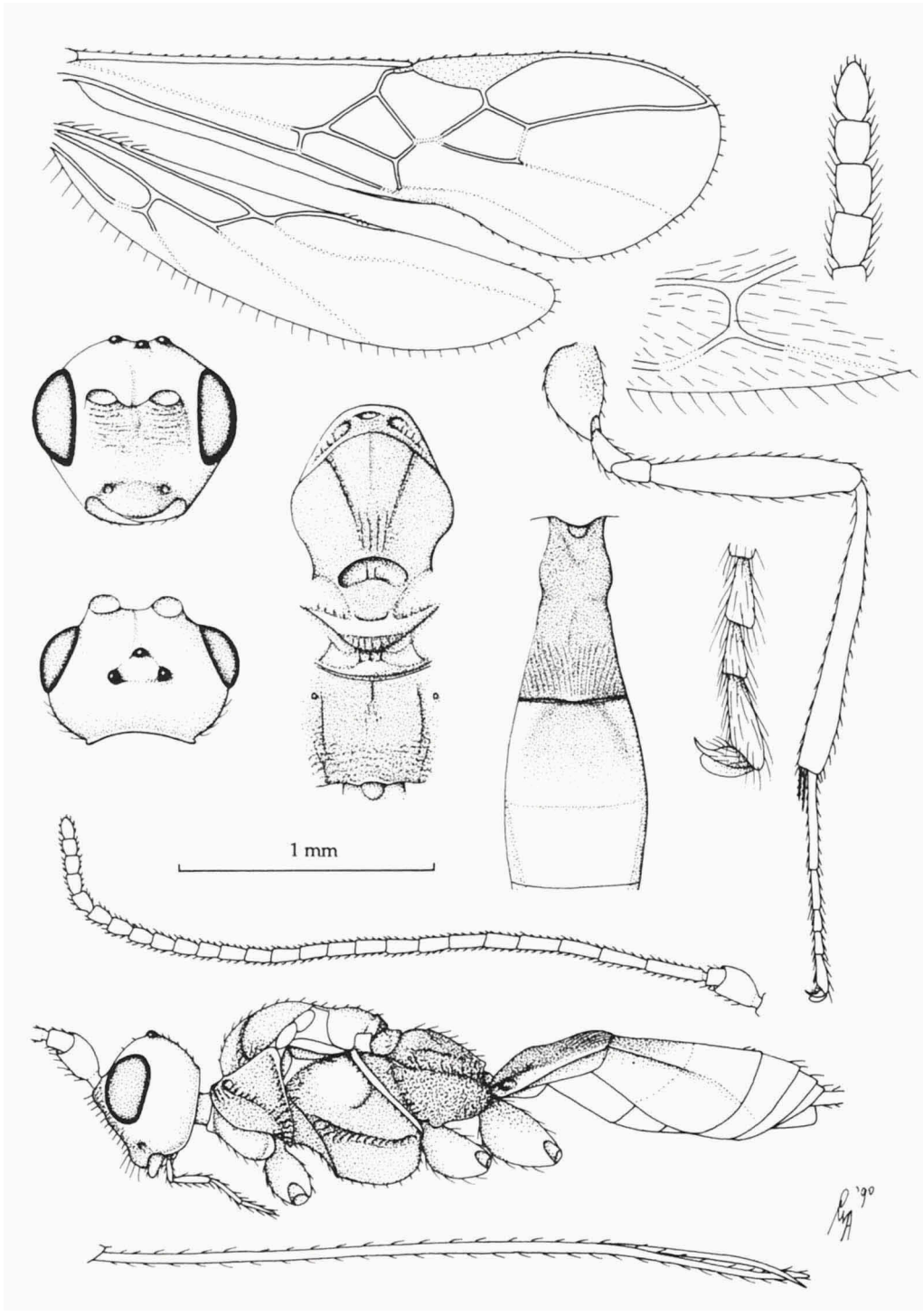
BLACINAE-DYSCOLETINI
Plate 82. *Hellenius semiruber* (Hellén), ♀.



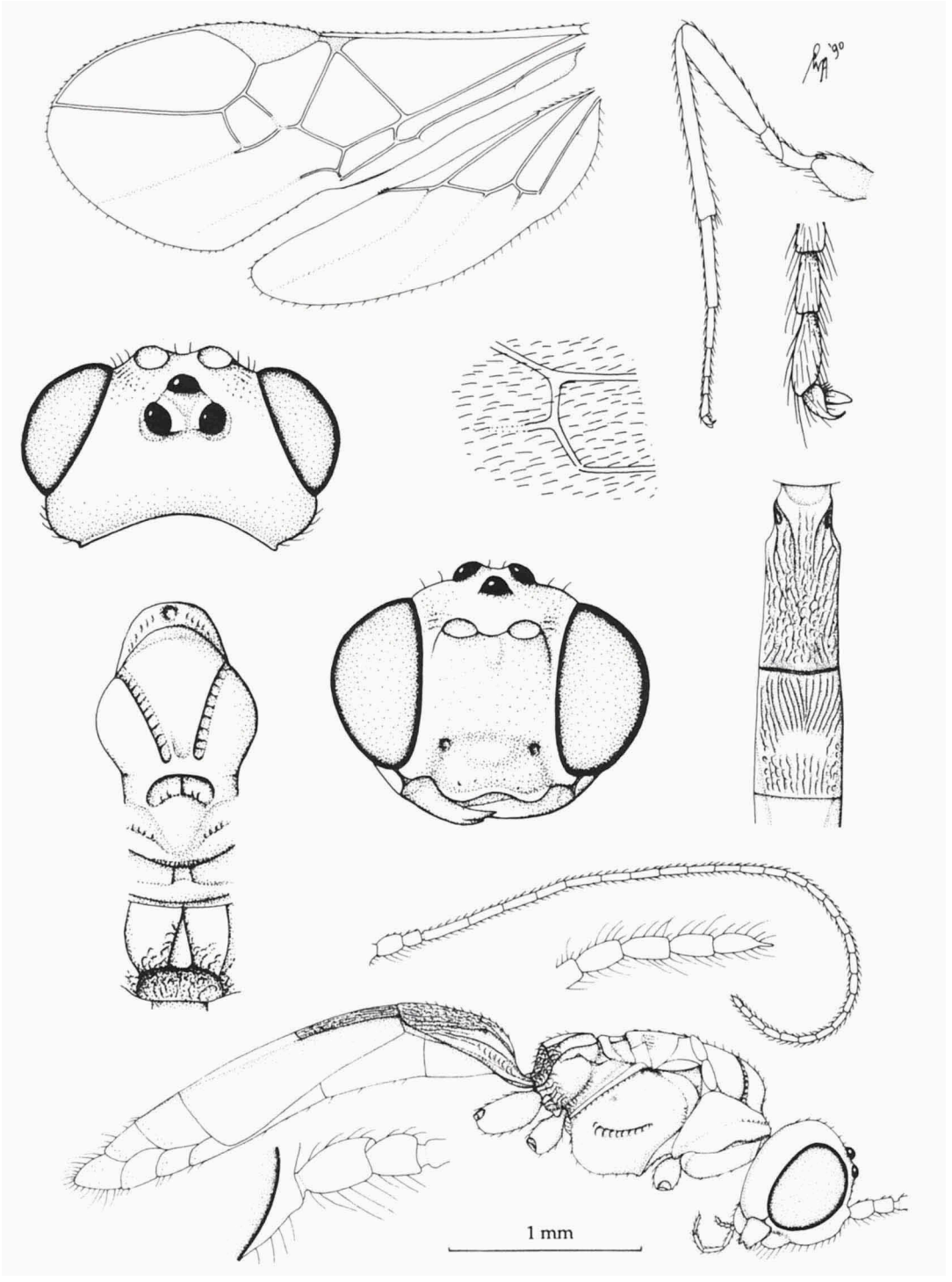
BLACINAE-BLACINI
Plate 83. *Blacometeorus brevicauda* (Hellén), ♀.



BLACINAE-BLACINI
Plate 84. *Blacus fuscitibialis* van Achterberg, ♀.

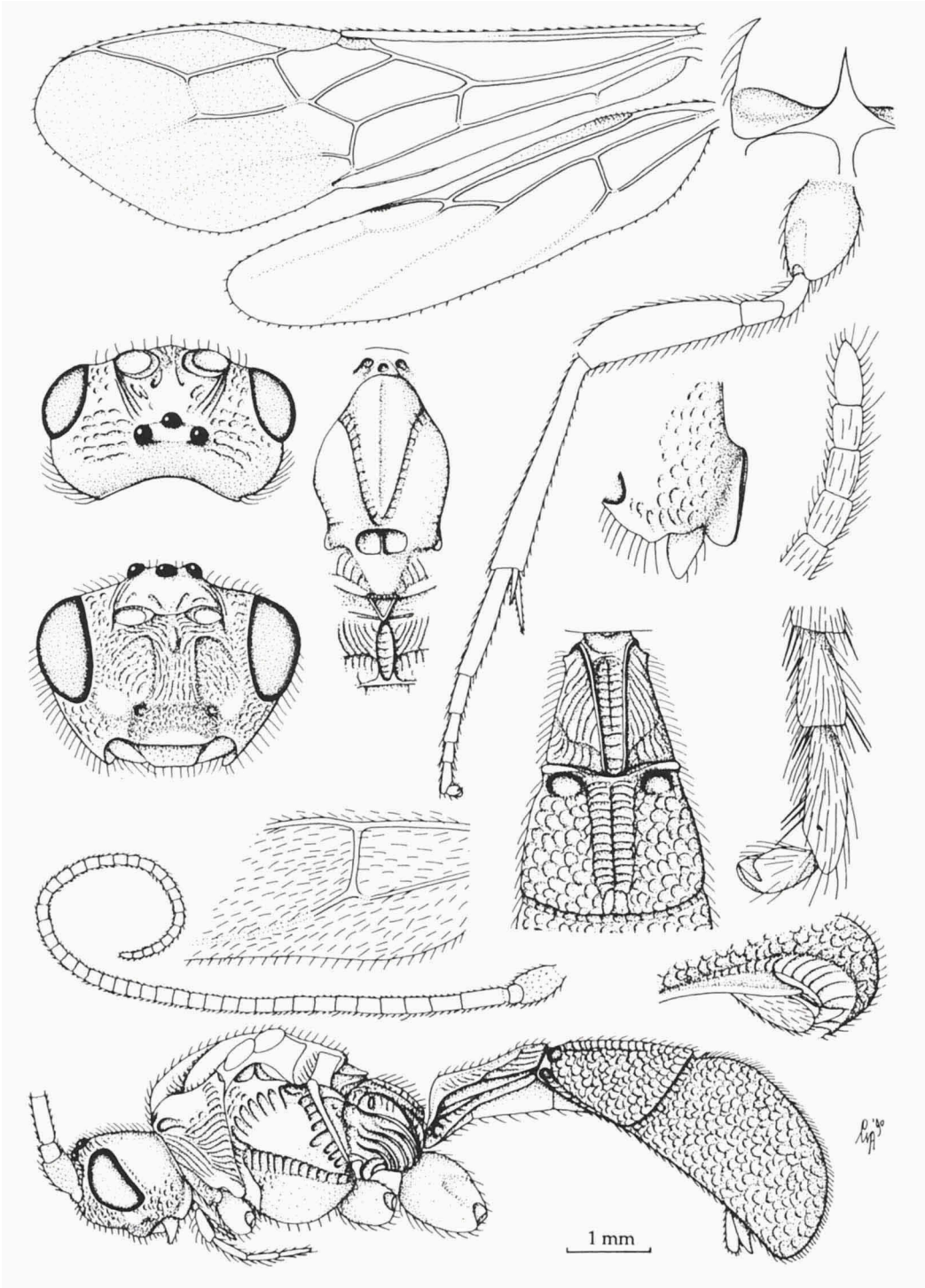


METEORIDEIINAE-PRONKIINI
Plate 85. *Pronkia antefurcalis* van Achterberg, ♀.

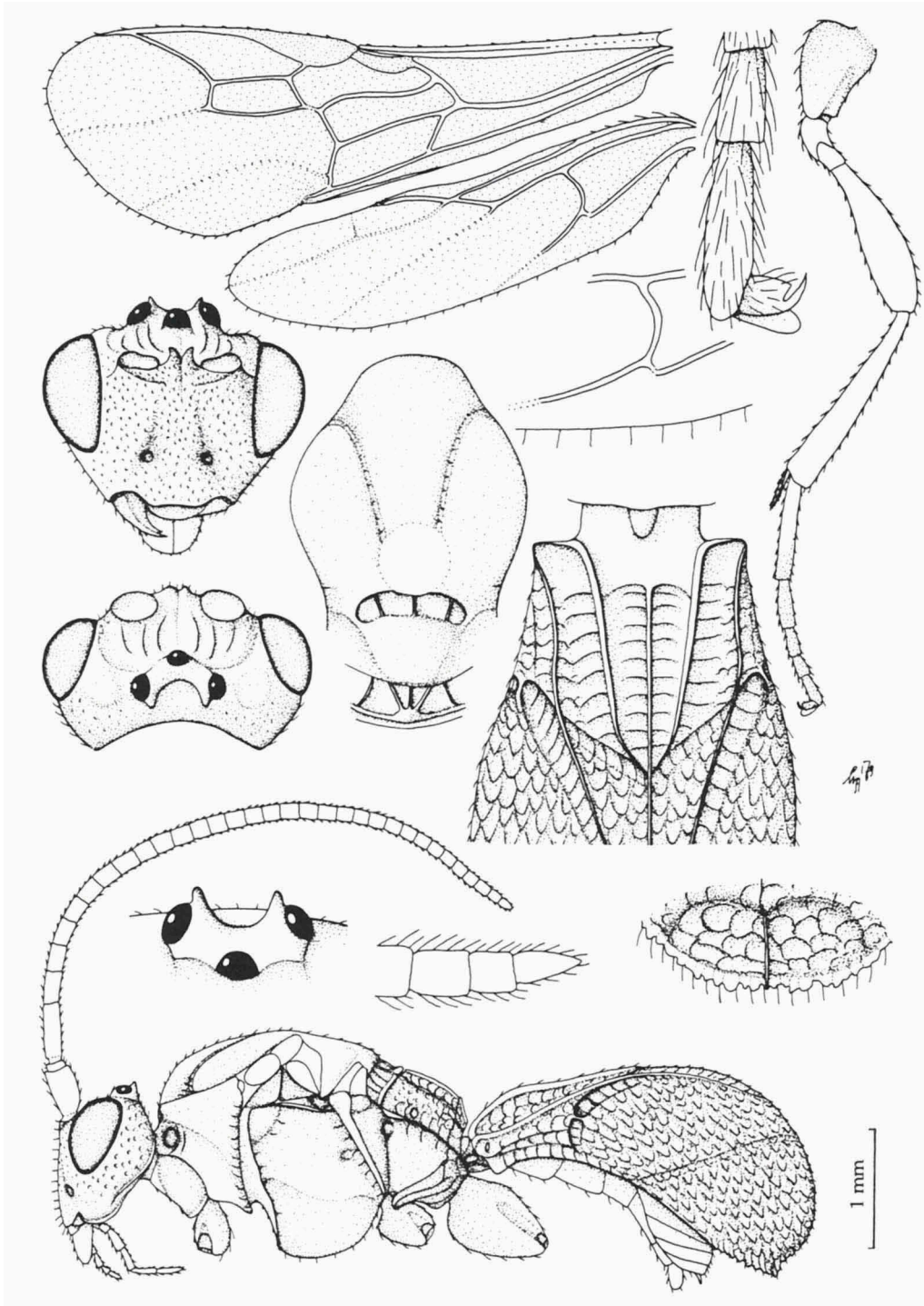


METEORIDEINAE-METEORIDEINI
Plate 86. *Meteoridea hutsoni* (Nixon), ♀.

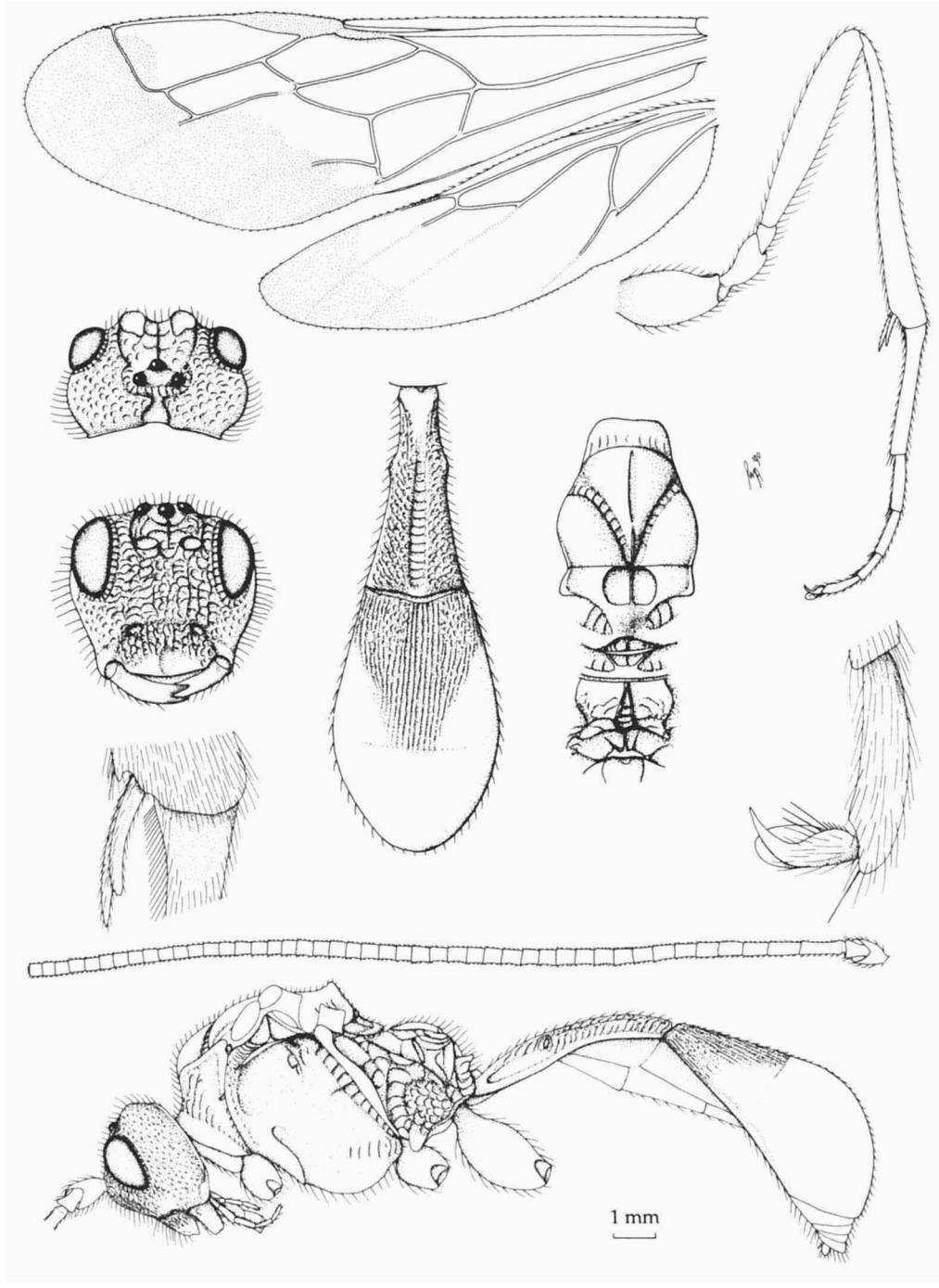
SIGALPHINAE-ACAMPSINI
Plate 87. *Acampsis chinensis* Chen & He, ♀.



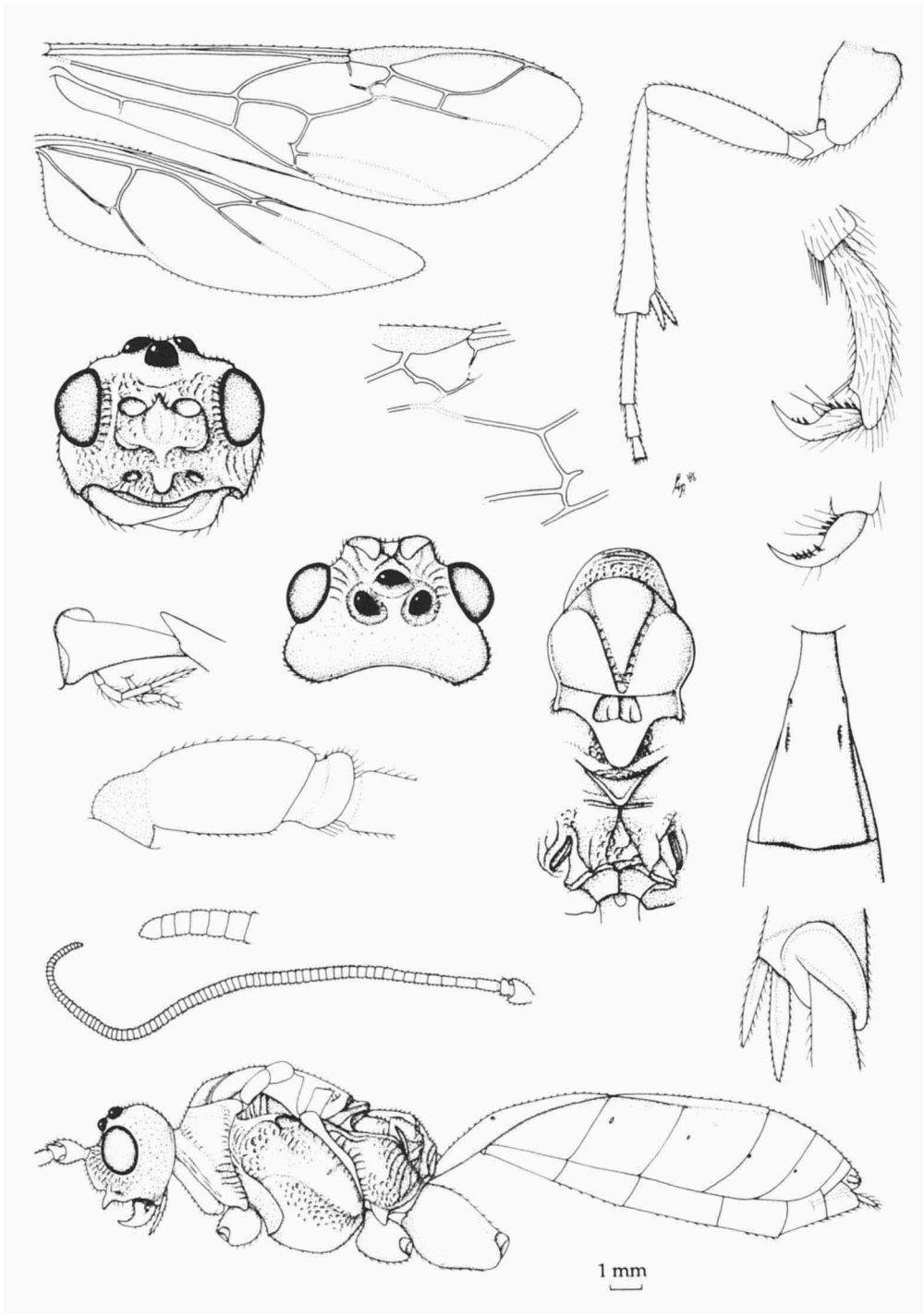
SIGALPHINAE-SIGALPHINI
Plate 88. *Sigalphus irrorator* (Fabricius), ♀.



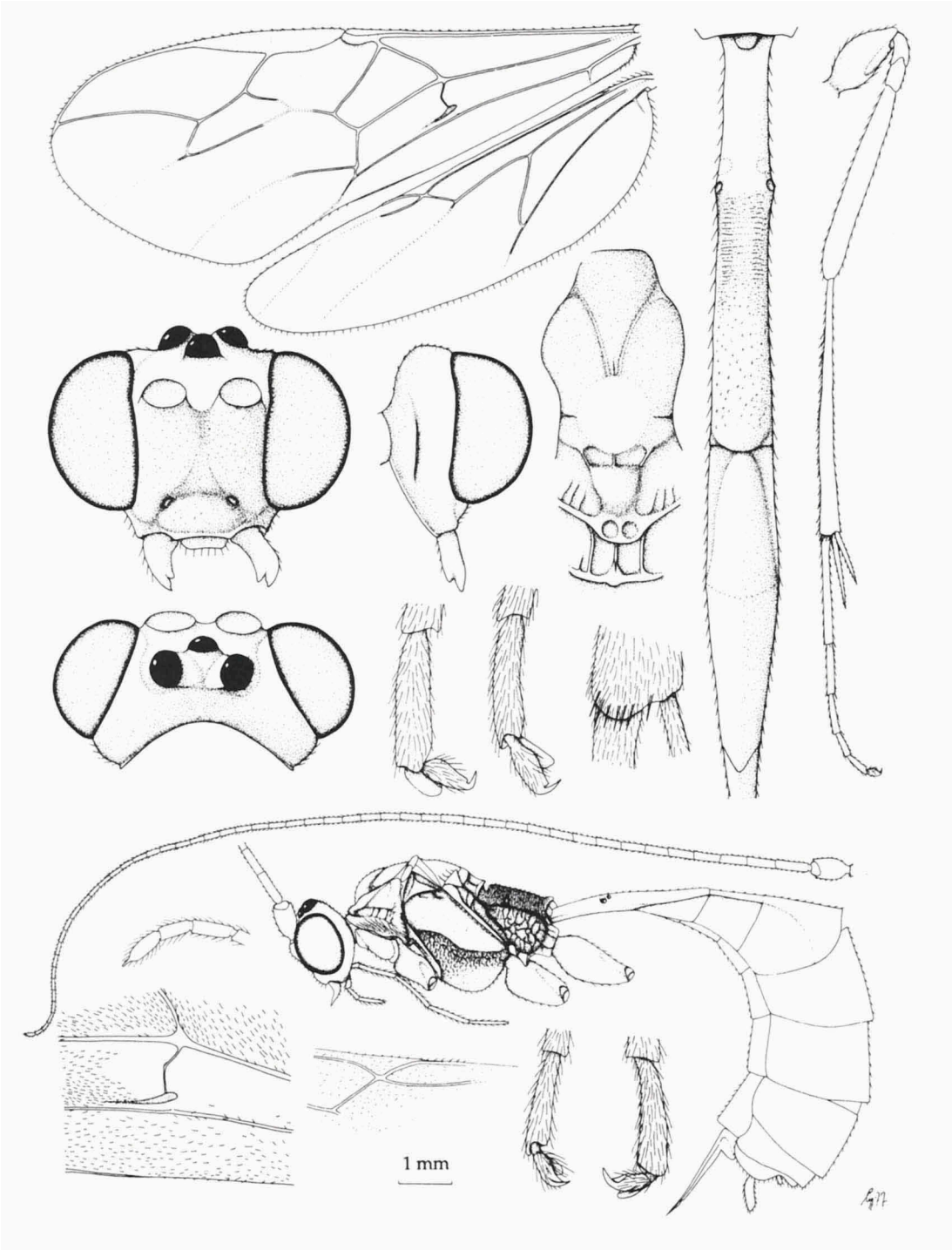
SIGALPHINAE-MINANGINI
Plate 89. *Minanga serrata* Cameron, ♂.



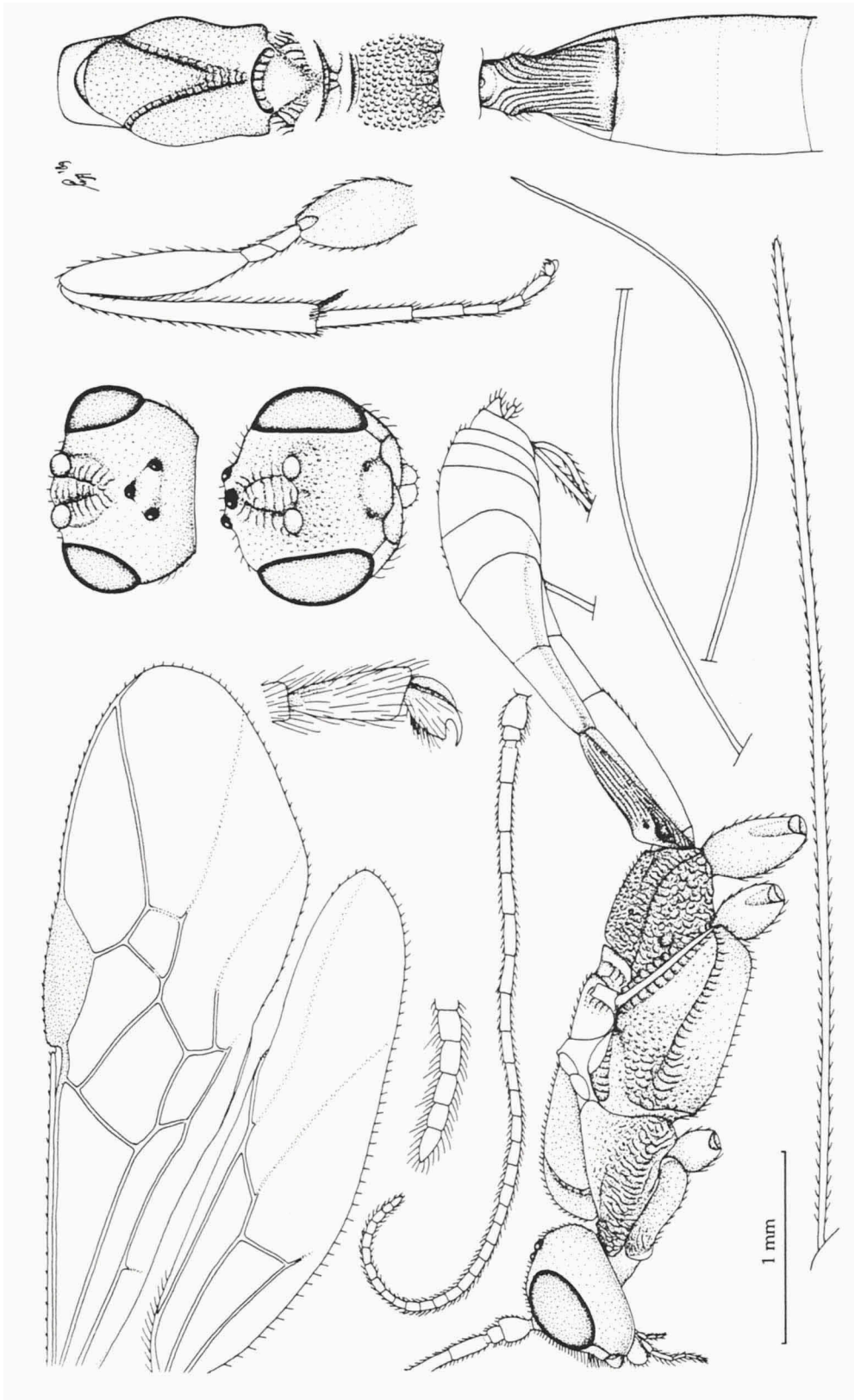
TRACHYPETINAE-TRACHYPETINI
Plate 90. *Trachypetus clavatus* Guérin-Méneville, ♂.



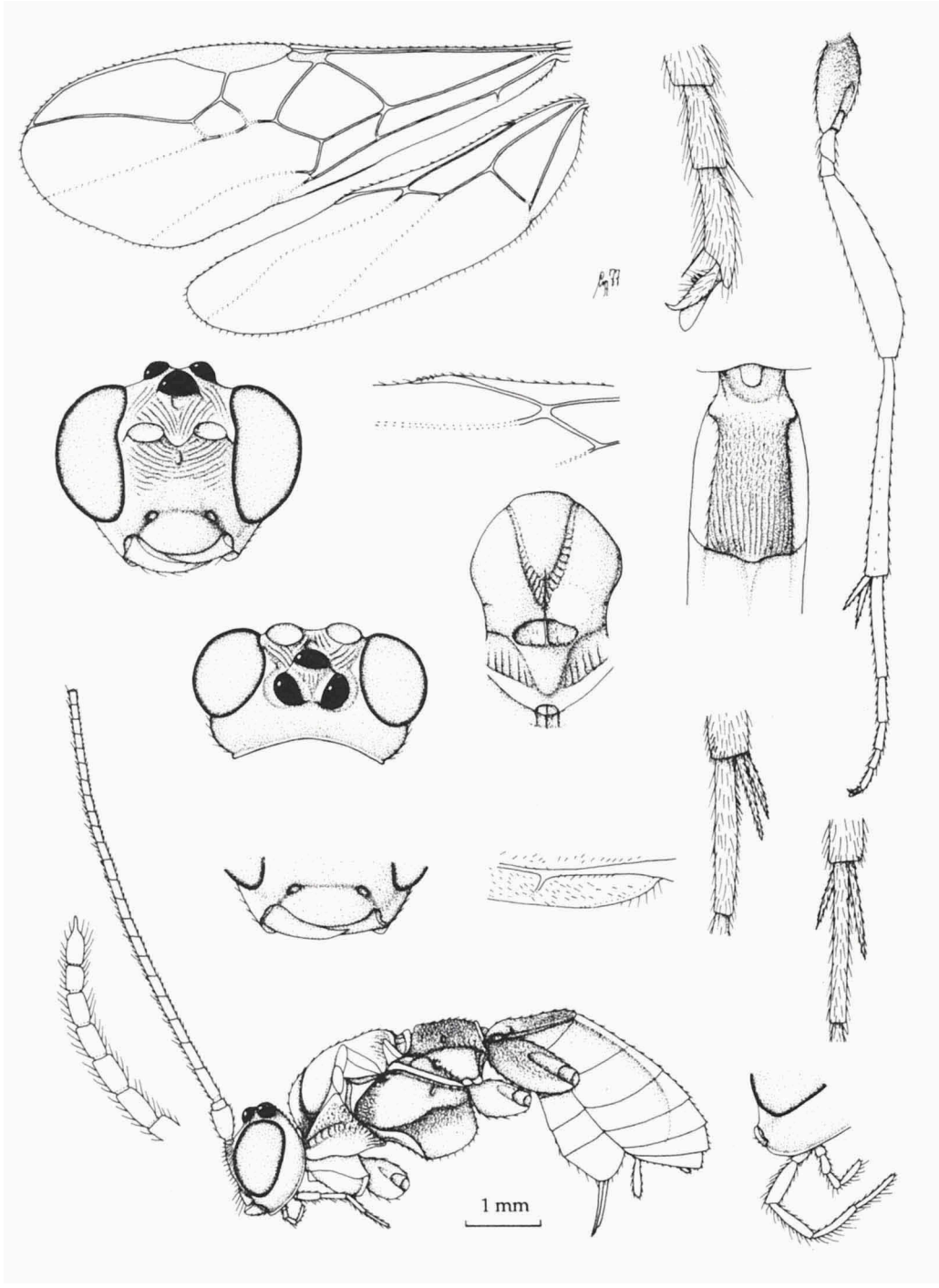
TRACHYPETINAE-CERCOBARCONINI
Plate 91. *Cercobarcon rieki* Tobias, ♀.



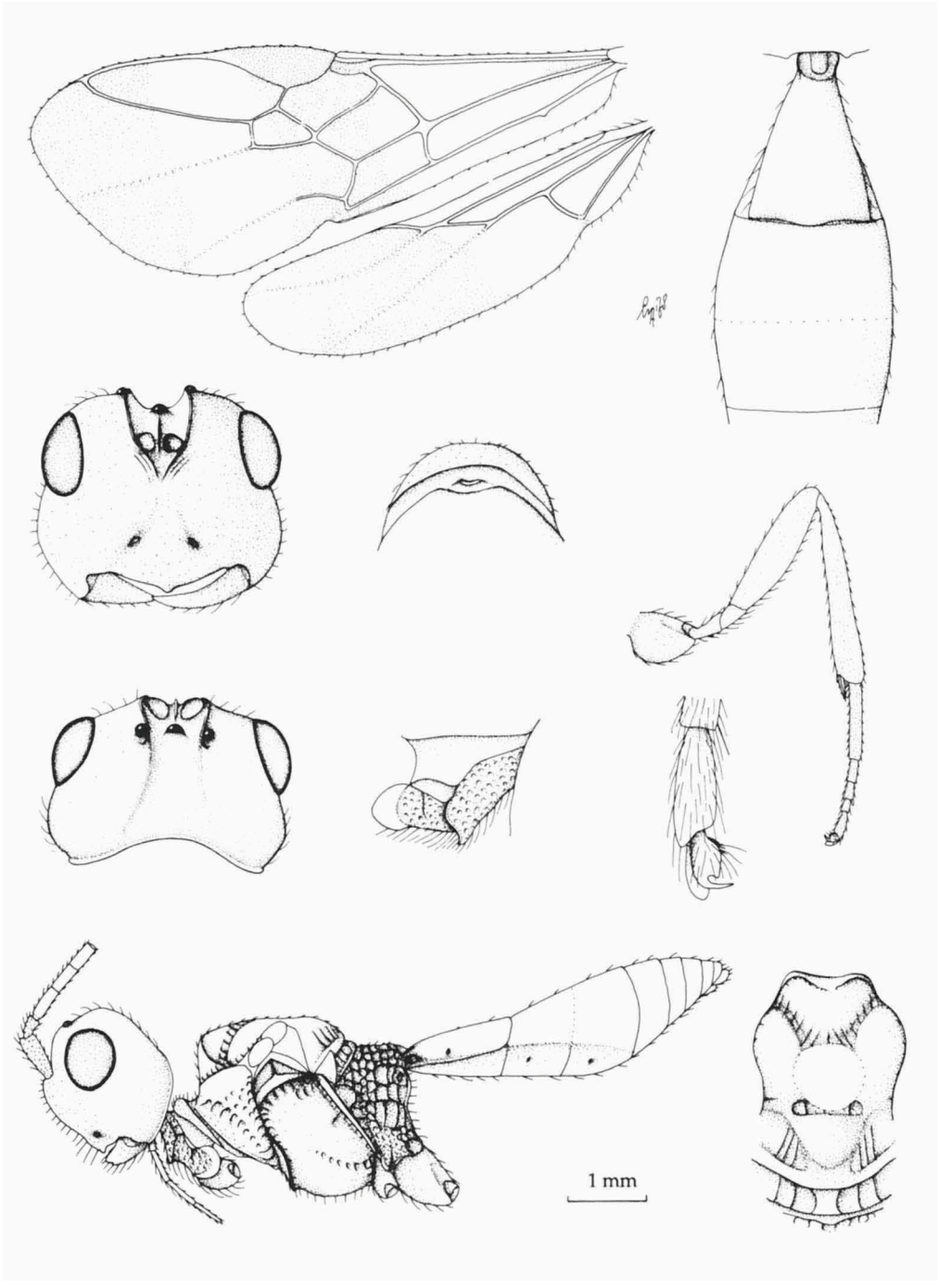
XIPHOZELINAE
Plate 92. *Xiphozele compressiventris* Cameron, ♀.



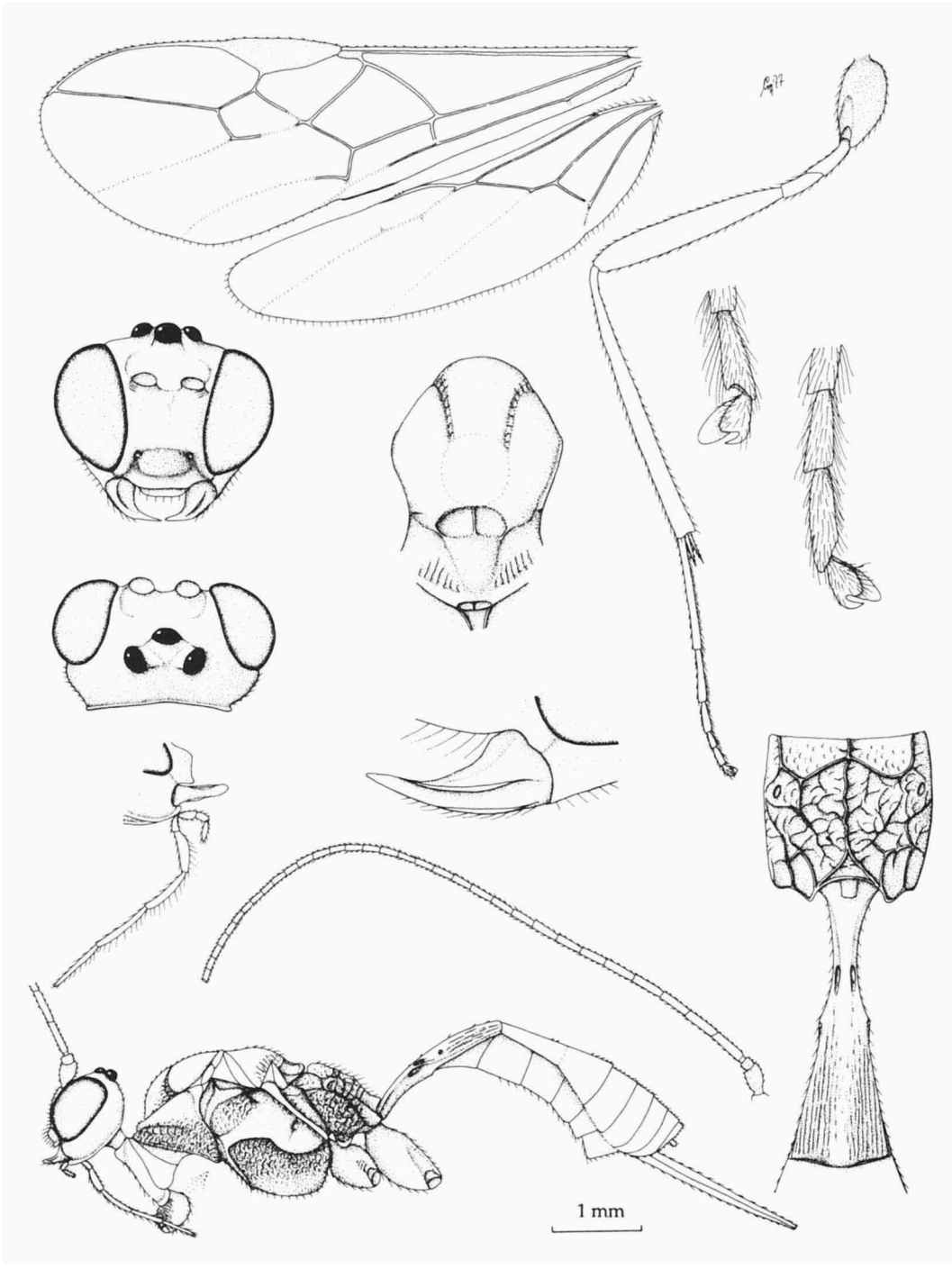
HOMOLOBINAE-WESTWOODIELLINI
Plate 93. *Westwoodiella bicolor* Szépligeti, ♀.



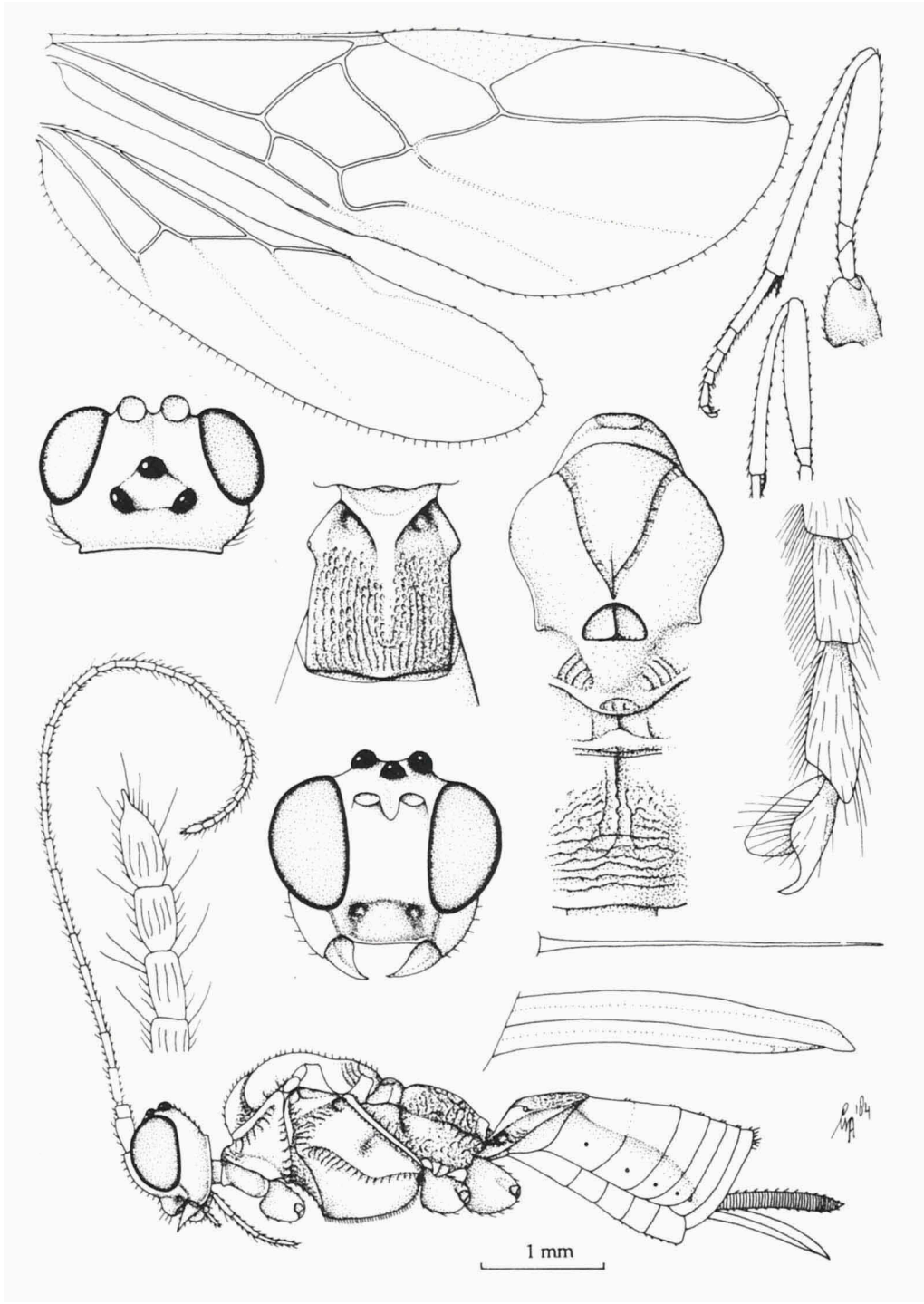
HOMOLOBINAE-HOMOLOBINI
Plate 94. *Homolobus huddlestoni* van Achterberg, ♀.



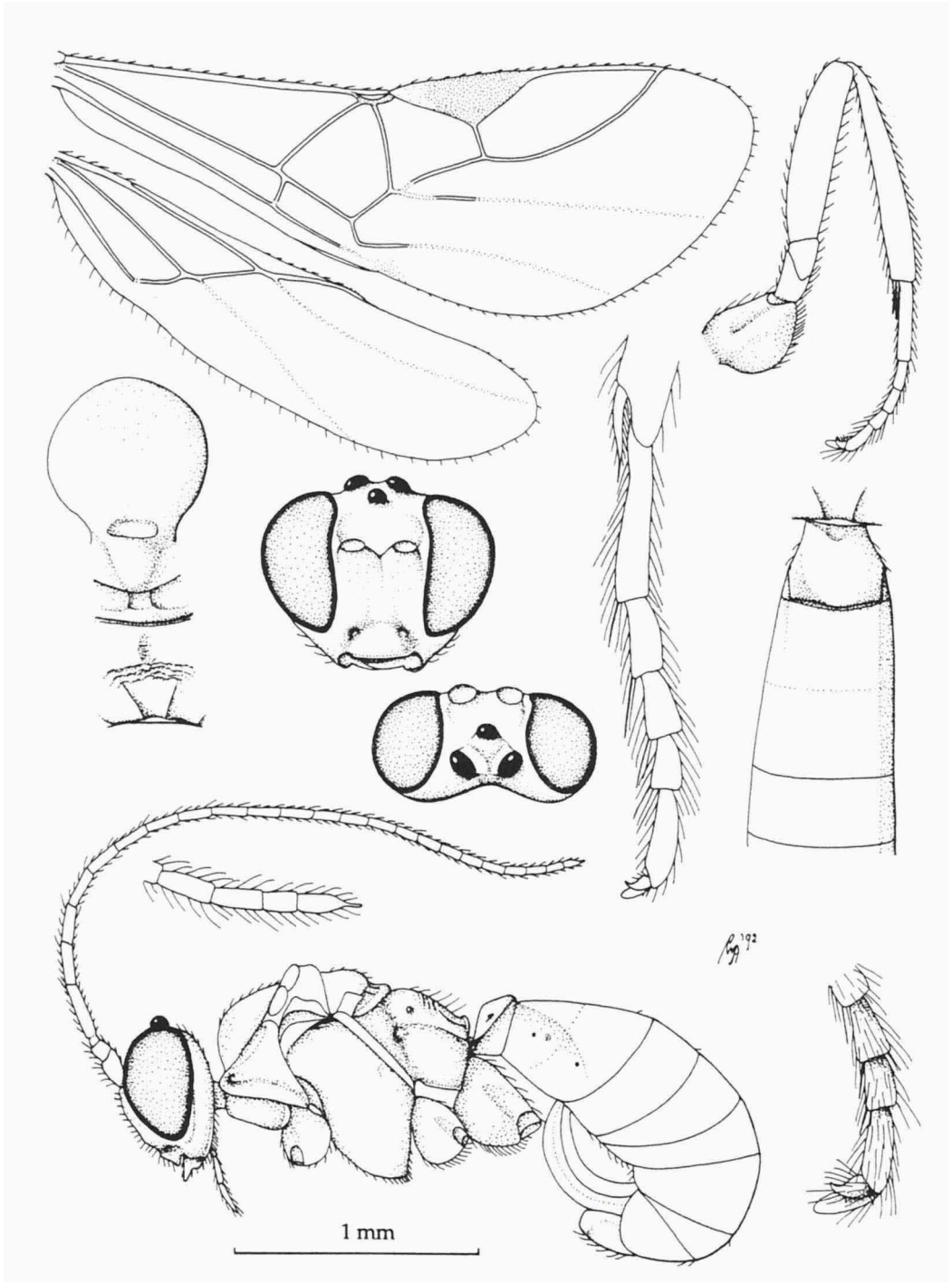
CENOCOELIINAE
Plate 95. *Capitonius bifasciatus* Brullé, ♀.



EUPHORINAE-METEORINI
Plate 96. *Zele deceptor* (Wesmael), ♀.

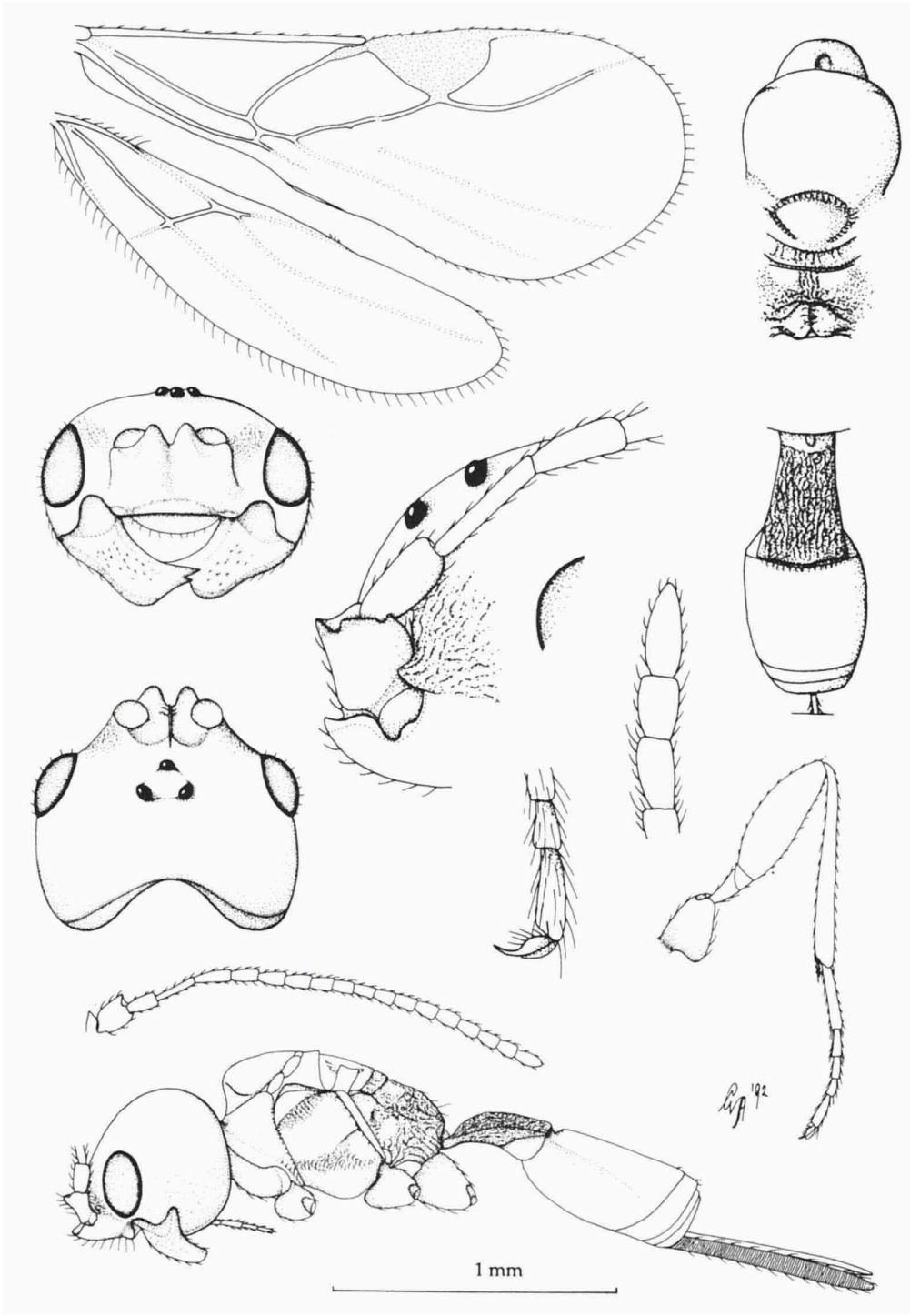


EUPHORINAE-CENTISTINI
Plate 97. *Pygostolus sticticus* (Fabricius), ♀.



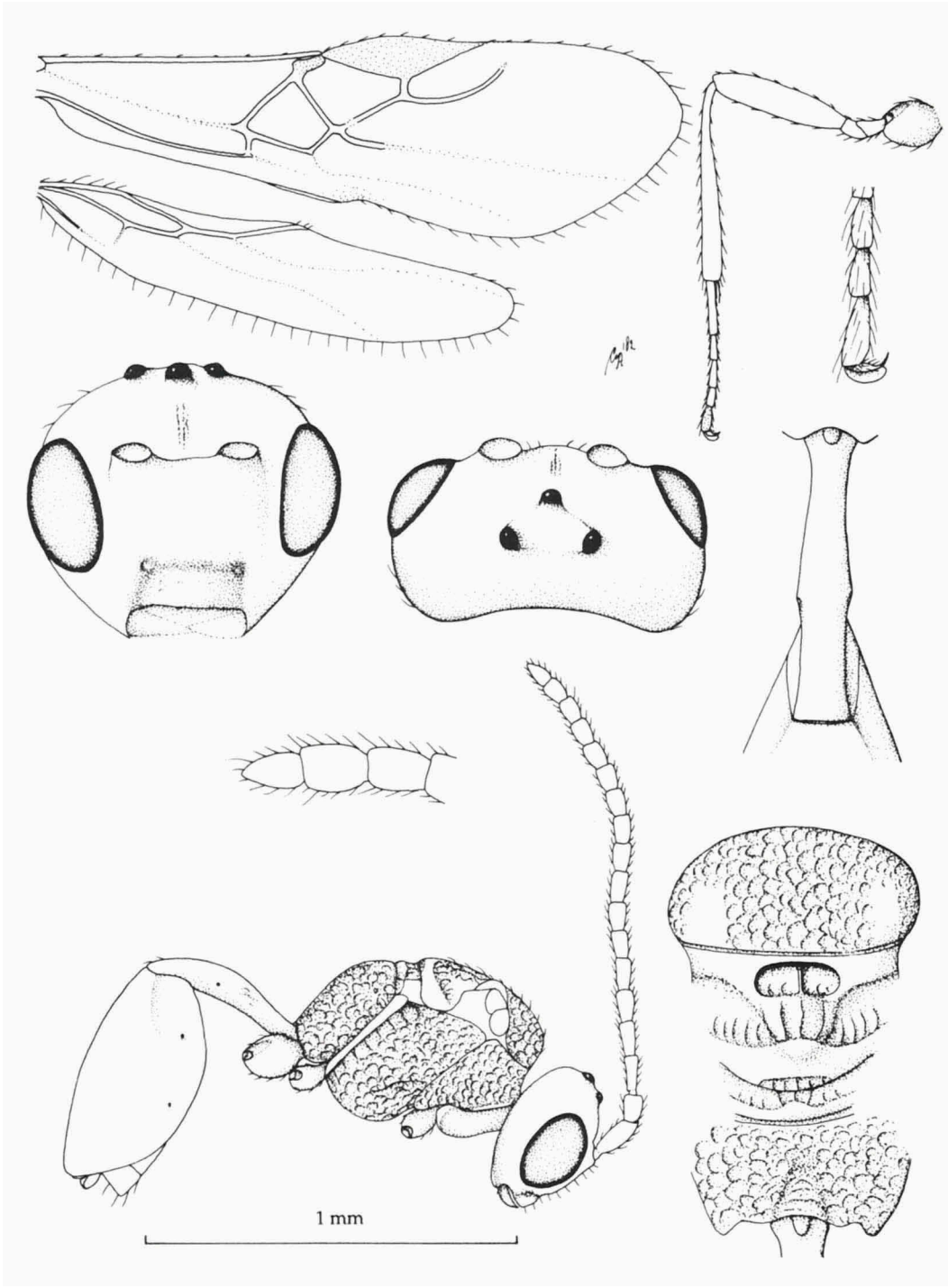
EUPHORINAE-CENTISTINI

Plate 98. *Centistoides doesburgi* van Achterberg, ♀.



EUPHORINAE-COSMOPHORINI
Plate 99. *Cosmophorus klugii* Ratzeburg, ♀.

EUPHORINAE-EUPHORINI
Plate 101. *Proclithrophorus mandibularis* Tobias & Belokobylskij, ♀.



EUPHORINAE-EUPHORINI
Plate 101. *Ussuraridelus minutus* Tobias & Belokobylskij, ♀.

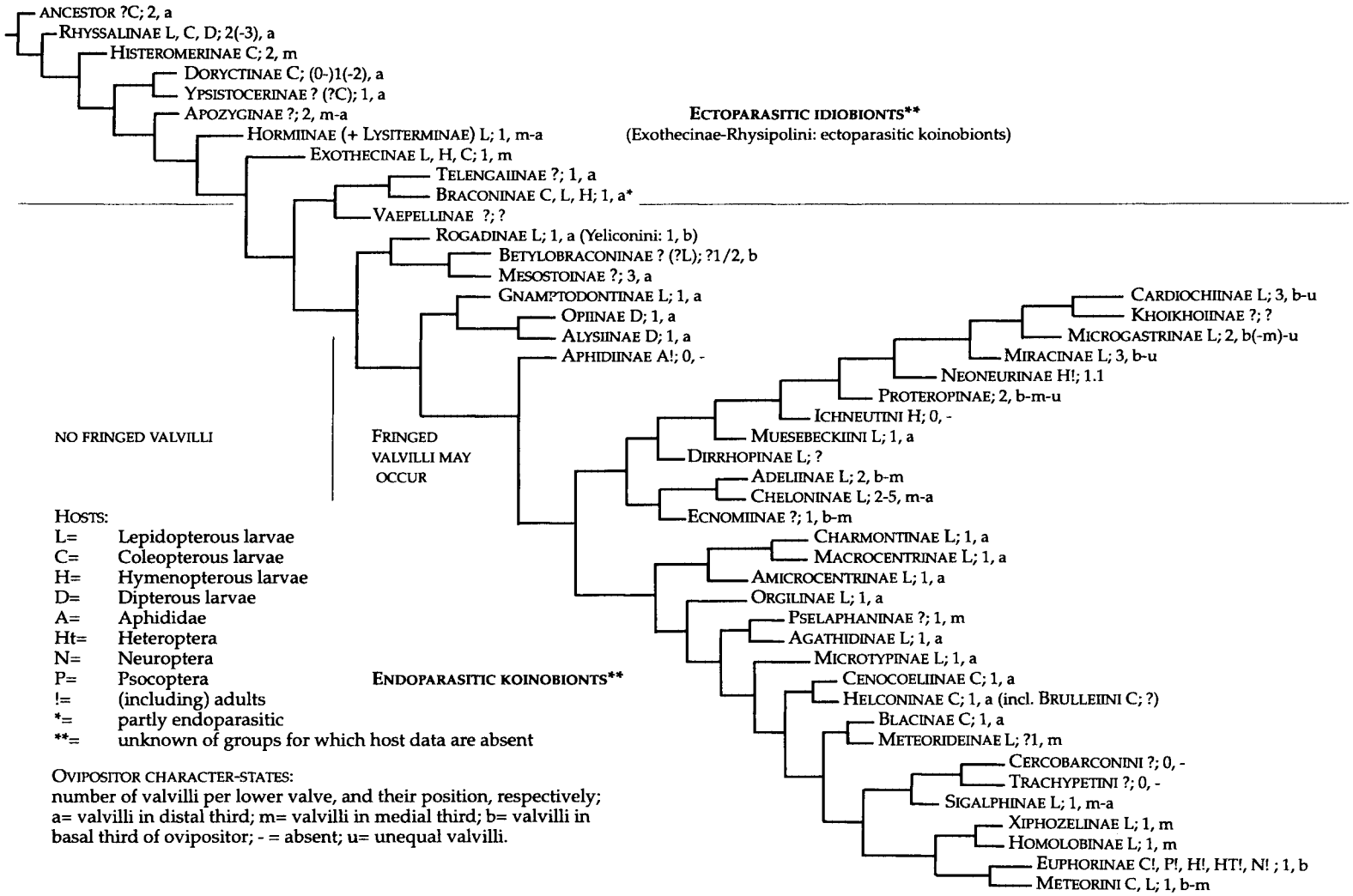


Plate 102. One of the many equally parsimonious trees found when using the data-matrix by Quicke & van Achterberg (1990) and PAUP 3.1; with some modifications because of recent findings. Some data on the hosts and on the valvilli of the ovipositor (Quicke et al., 1992) are added.

Index of names of subfamilies and tribes of Braconidae

❄ ❄ ❄ ❄ ❄