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Illustrated Key to the Western Palearctic Genera of Phaeogenini (Hymenoptera, Ichneumonidae, Ichneumoninae)

Jesús Selfa & Erich Diller

Abstract

In this manuscript, a new key to the 29 genera of Phaeogenini in the Western Palearctic is presented. *Gnathichneumon* AUBERT, 1958, is a subgenus of *Dicaelotus* WESMAEL, [1845], stat. nov.; the subgenus *Proscus* HOLMGREN, [1890], is syn. nov. of *Tycherus* FOERSTER, [1869]; and the subgenus *Rhexidermus* FOERSTER, [1869], is syn. nov. of *Heterischnus* WESMAEL, 1859.

Zusammenfassung

Die vorliegende Arbeit enthält einen Gattungsschlüssel für die Subtribus Phaeogenini der Westpaläarktis. Aus diesem Faunenbereich sind derzeit 29 Genera der Phaeogenini bekannt. *Gnathichneumon* AUBERT, 1958, wurde als ein Subgenus zu *Dicaelotus* WESMAEL, [1845], festgelegt, stat. nov., da die Unterschiede zu *Dicaelotus* - die nach unten gebogenen Mandibulae und beim Weibchen das Fehlen der trennenden Furche zwischen Clypeus und Supraclypealarea - keine deutlichen Gattungsmerkmale, sondern nur die Kriterien einer Untergattung sind. Ebenso wurde das Subgenus *Proscus* HOLMGREN, [1890], ein syn. nov. zu *Tycherus* FOERSTER, [1869], mit der Begründung, daß die Längsriefelung der Basis des zweiten Tergites für die Abtrennung als eigenes Subgenus nicht ausreichend ist. Das Subgenus *Rhexidermus* FOERSTER, [1869], wurde ein syn. nov. zu *Heterischnus* WESMAEL, 1859, da das einzige Unterscheidungsmerkmal zwischen dem

Subgenus und dem Genus der nach oben gebogene Ovipositor ist, was für eine Aufteilung nicht genügt.

Introduction

The tribe Phaeogenini (= Ichneumoninae cyclopneusticae, Phaeogeninae, Alomyini auct.) actually contains 29 genera in the Western Palearctic. It includes the smaller species of the subfamily Ichneumoninae, characterized by circular spiracles in the propodeum. According to DILLER (1981), 6 subtribes of Phaeogenini occur in the world and 5 of them in the Western Palearctic.

The Phaeogenini are closely related to the tribe Alomyini although Alomyini have many different characteristics, e. g. front legs without trochantelli and semicircular spiracles in the propodeum. Some authors confuse convergence with a tribe or subfamily character and incorrectly still use the tribal name of Alomyini for Phaeogenini (sensu WAHL 1994, TOWNES et al. 1965; TOWNES 1969); however, both tribes must be separated.

The first modernized classification of Phaeogenini was given by PERKINS (1959), considering 24 genera. SIITAN (1977) included 33 genera; this author did not separate the genera *Apaeleticus* WESMAEL, [1845], and *Ectopoides* HEINRICH, 1951, which now belong to the tribe Platylabini. RASNITSYN (1981) did so and proposed 31 genera according to SIITAN, but did not distinguish the genera of *Phaeogenes* auct. (*Dirophanes* FOERSTER, [1869], *Phaeogenes* WESMAEL, [1845], and *Tycherus* FOERSTER, [1869]). DILLER (1981), parallel to their preliminary catalogue, listed these genera. He added the genera *Auberteterus* DILLER, 1981, and *Dilleritonus* AUBERT, 1979, considered synonyms the genera *Cinxaelotus* HOLMGREN, [1890], *Deloglyptus* FOERSTER, [1869], *Glyptichneumon* HABERMEHL, 1917, *Micrope* FOERSTER, [1869], and *Thyraeella* HOLMGREN, [1890], listed before in SIITAN and RASNITSYN; and proposed *Rhexidermus* FOERSTER, [1869], and *Proscus* HOLMGREN [1890], as subgenera of *Heterischnus* WESMAEL, 1859, and *Tycherus* FOERSTER, [1869], respectively. Later on DILLER (1985) described the genus *Raninia*. According to these publications, there exist 30 genera of Phaeogenini in the Western Palearctic.

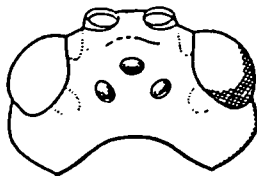
In this paper, we now consider *Gnathichneumon* AUBERT, 1958, as a subgenus of *Dicaelotus* WESMAEL, [1845], stat. nov. ; the subgenus *Proscus* HOLMGREN, [1890], syn. nov. of *Tycherus* FOERSTER, [1869]; and the subgenus *Rhexidermus* FOERSTER, [1869], syn. nov. of *Heterischnus* WESMAEL, 1859. *Gnathichneumon* AUBERT, 1958, shares its characters with *Dicaelotus* WESMAEL, [1845], except for the pattern of the mandibles; the subgenus *Proscus* HOLMGREN, [1890], belongs to the *elongatus*-Group (sensu DILLER 1981), the longitudinally carinated area between gastrocoeli at *Proscus* is not a character for a distinct subgenus; and the subgenus *Rhexidermus* FOERSTER, [1869], differs from *Heterischnus* WESMAEL, 1859, only by the length of antennae and the pattern of the ovipositor.

Key to subtribes

- 1(2) Mandible with one tooth 2
 - Mandible with two teeth 4
 2(3) Clypeus separated from the face by a deep groove. Flagellar segments slender and long. Notauli deeply indented and long. Scutellum high and arched. Ovipositor long and wide, extending beyond apex of the gaster *Heterischnina* (*Heterischnus* WESMAEL, 1859)
 3(2) Clypeus not separated from the face by a deep groove. Flagellar segments short and sturdy. Notauli hardly indented. Scutellum flat. Ovipositor short, hardly extending beyond apex of the gaster *Stenodontina* (*Stenodontus* BERTHOUMIEU, [1897])
 4(5) Last gastral tergite at hind edge concave, but distinctly marked only in females. Ovipositor very short and bent upwards. In the males, the thyridiae are big, placed far off the base of second tergite. Head almost cubic or a toothed clypeus *Notosemina*
 5(4) Last gastral tergite at hind edge not concave. Males with other characters 6
 6(7) Thyridiae clearly present, big and distinctly indented *Phaeogenina*
 7(6) Thyridiae absent, sometimes a very small impression at the position of the thyridiae or an impression at base of second tergite *Dicaelotina*

Notosemina

- 1(2) Clypeus without tooth. Frons dull, densely punctate. Head subquadrate and strongly incised posteriorly (Fig. 1). Vertex with two yellow spots in the male and red in the female. Thorax of the female with red colour *Notosemus* FOERSTER, [1869]
 2(1) Clypeus with a strong median apical tooth (Fig. 2). Frons shining, scarcely punctate. Temple small. Vertex without spots. Propodeum with a very small spiracles. Thorax of the female without red colour *Misetus* WESMAEL, [1845]



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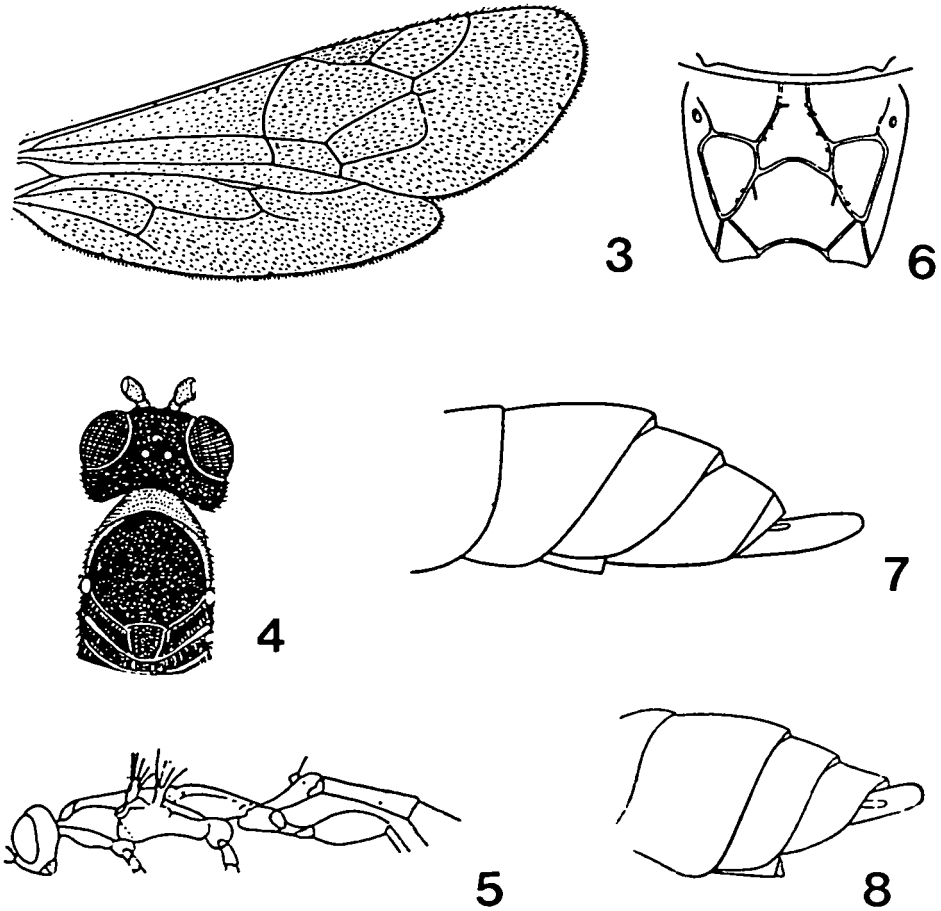
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Figs. 1-2: 1) *Notosemus bohemani* (WESMAEL), female: head, in dorsal view. 2) *Misetus oculatus* WESMAEL, female: clypeus, face and malar space.

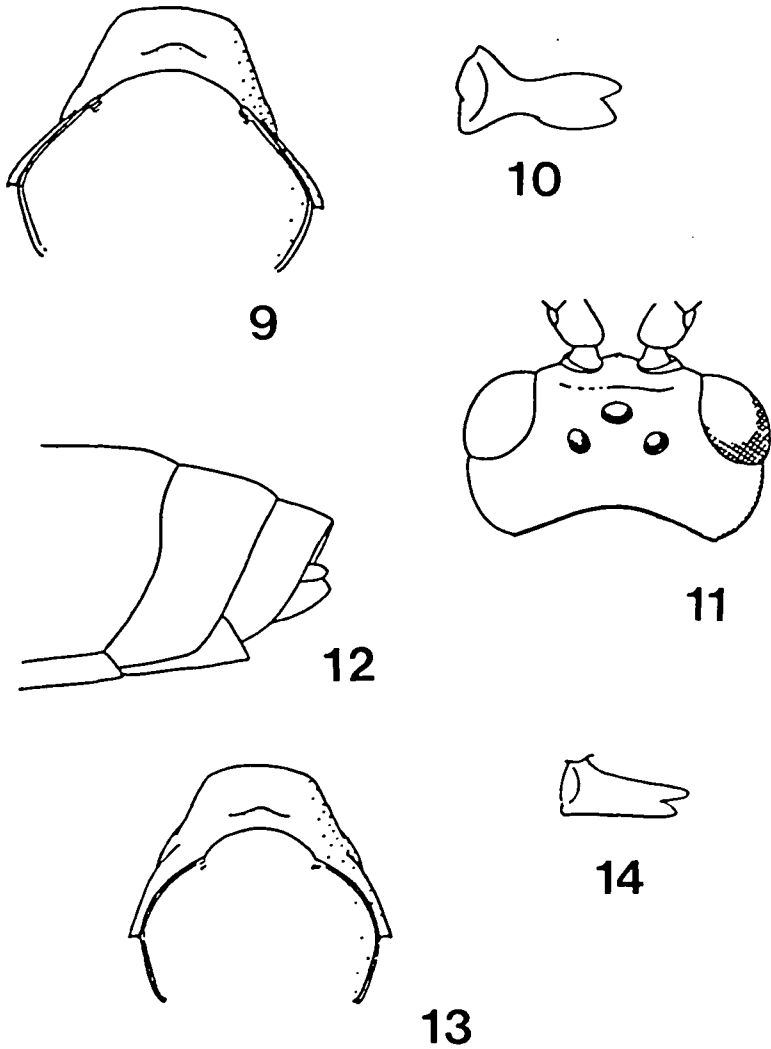
Dicaelotina

- 1(2) Vein 3_{rm} absent (Fig. 3). Gastrocoeli very short. Ovipositor as long as the postpetiolus. Head more or less enlarged, broader than the thorax (Fig. 4), and the distance between base of flagellum and genal carina is very wide. The apical edge of clypeus is concave *Dilleritomus* AUBERT, 1979
- 2(1) Vein 3_{rm} present 3
- 3(4) Propodeum without the area superomedia. Body shining, scarcely punctate. Tergite 2 with a pair of deep basal pits. Thyridiae absent. Thorax strongly dorsoventrally flattened. Scrobis frenalisis without groove separating it posteriorly from the propodeum. Female with the plane of the face nearly at right angles to the long axis of the eye (Fig. 5). Upper tooth of mandible clearly longer than the lower..... *Nematicrus* WESMAEL, [1845]
- 4(3) Propodeum with the area superomedia distinctly present. Body dull, coarsely punctate..... 5
- 5(6) Tergite 2 with a conspicuous transverse impression on the base of second tergite behind of postpetiolus, in males mostly distinct (thyridiae-like). Postpetiolus broad and densely punctate. Clypeus distinctly separated by a deep impression between supraclypeal area and clypeus..... *Baeosemus* FOERSTER, [1869]
- 6(5) Tergite 2 without conspicuous transverse impression on the base behind the postpetiolus 7
- 7(8) Area superomedia longitudinally shaped, heart shape or kidney shape, and receiving the costula behind the middle (Fig. 6). Mandibles long and broad, evenly tapered from the base to apex (*pumilus*-group), or mandibles very strongly tapered, the lower tooth weakly differentiated (*punctiventris*-group), or mandibles bent downwards; only in the female clypeus not separated by a groove from the supraclypeal area (*Dicaelotus* (*Gnathichneumon*)). Pronotum short. Hypopygium far or well removed from the apex of the ovipositor (Figs. 7, 8)..... *Dicaelotus* WESMAEL [1845].
- 8(7) Hypopygium reaching close to the apex of the ovipositor 9
- 9(10) Pronotal collar short (Fig. 9). Female with the hind margin of the mandible strongly excised towards the base (Fig. 10). Head of the male distinctly transverse (Fig. 11). Temples narrower, distinctly shorter than the breadth of an eye. Antennae of the male not narrowed towards the base. Genal carina meeting oral carina far from the mandible base. Apex of the gaster blunt (Fig. 12) *Colpognathus* WESMAEL, [1845]
- 10(9) Pronotal collar long (Fig. 13). Hypopygium not reaching close to the apex of the ovipositor. Female with the hind margin of the mandible not excised towards the base (Fig. 14). Head of the male enlarged or almost cubic. Antennae of the male narrowed towards the base. Apex of the gaster sharp (Fig. 15)..... 11
- 11(12) In the female, scapus twice as long as the flagellar segment 1 (Fig. 16). Thyridiae absent, but sometimes with a shallow transverse impression laterally at the position of them (Fig. 17). Head of the female somewhat prognathous (Fig. 18), clypeus and supraclypeal area very short. Head of the male enlarged. Area superomedia slender and long. Costula weak and before the middle of area superomedia *Eparces* FOERSTER, [1869]
- 12(11) In the female, scapus almost as long as the flagellar segment 1. Thyridiae absent, but sometimes with a transverse impression laterally at the position of them. Head

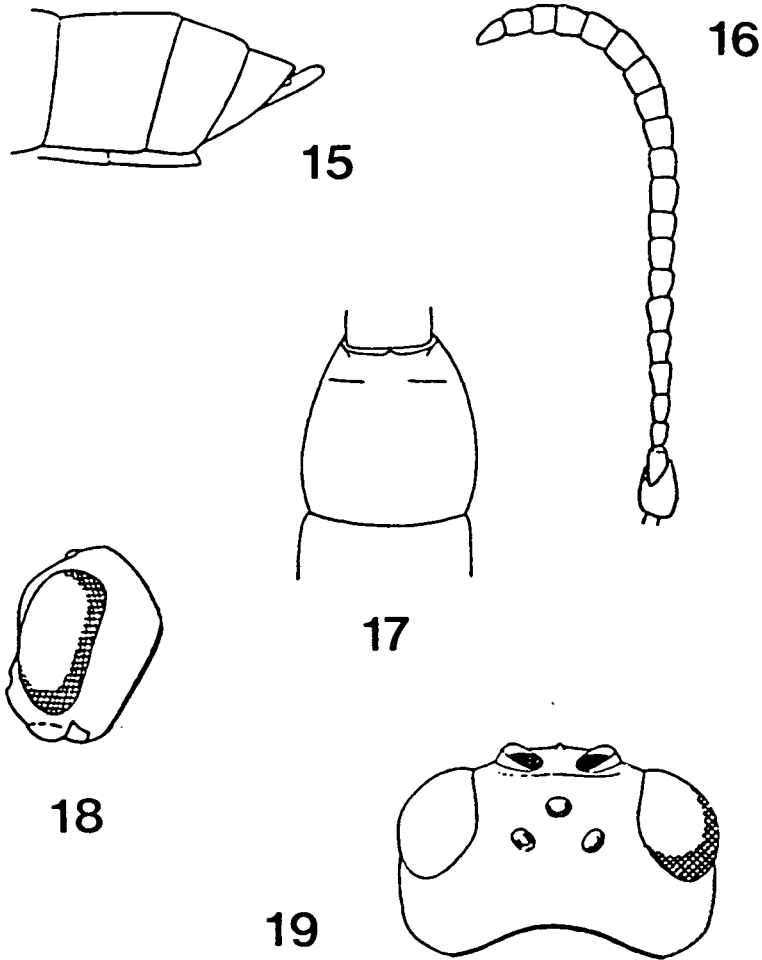
of the female not prognathous. Head of the male almost cubic, the temples at least as long as the breadth of an eye (Fig. 19)..... *Cenieterus* WESMAEL, [1845]



Figs. 3-8: 3) *Dilleritomus apertor* AUBERT, female: alar veinnation aspect. 4) *Dilleritomus apertor* AUBERT, female: head and pronotum, in dorsal view. 5) *Nematomicrus tenellus* WESMAEL, female: thorax and base of gaster, in lateral view. 6) *Dicaelotus pudibundus* (WESMAEL), female: propodeum, in dorsal view. 7) *Dicaelotus ruficoxatus* (GRAVENHORST), female: apex of gaster, in lateral view. 8) *Dicaelotus pumilus* (GRAVENHORST), female: apex of gaster, in lateral view.



Figs. 9-14: 9) *Colpognathus celerator* (GRAVENHORST), female: pronotum, in dorsal view. 10) *Colpognathus celerator* (GRAVENHORST), female: mandible. 11) *Colpognathus celerator* (GRAVENHORST), female: head, in dorsal view. 12) *Colpognathus celerator* (GRAVENHORST), female: apex of gaster, in lateral view. 13) *Centeterus confector* (GRAVENHORST), female: pronotum, in dorsal view. 14) *Centeterus confector* (GRAVENHORST), female: mandible.



Figs. 15-19: 15) *Centeterus confector* (GRAVENHORST), female: apex of gaster, in lateral view. 16) *Eparces grandiceps* THOMSON, female: flagellum. 17) *Eparces grandiceps* THOMSON, female: tergite 2. 18) *Eparces grandiceps* THOMSON, female: head, in lateral view. 19) *Centeterus confector* (GRAVENHORST), male: head, in dorsal view.

Phaeogenina

1(6)	Vein 3 _{rm} lost.....	2
2(5)	Propodeum sloping from the anterior margin of the area superomedia or from the base to the apex.....	3
3(4)	Thyridiae large. Propodeum sharply sloping from the anterior margin of the area superomedia to the apex. Mesopleurum in part rugose, otherwise much more coarsely punctate.	<i>Trachyarus</i> THOMSON, 1891
4(3)	Thyridiae small. Propodeum gradually sloping from the base to apex. Mesopleurum with fine distinct punctures, not rugose.....	<i>Hemichneumon</i> WESMAEL, 1857
5(2)	Propodeum not sloping. Radial cell of the frontal wing short and broad. Radial vein strongly curved (Fig. 20). Nervellus of the hind wing oppositus. Propodeum coriaceous and dull. Thyridiae present. Ovipositor raised.....	<i>Epitomus</i> FOERSTER, [1869]
6(1)	Vein 3 _{rm} present.....	7
7(12)	Clypeus with teeth apically.....	8
8(9)	Clypeus separated from the supraclypeal area by a narrow deep groove, its apical edge with two sharp teeth in the centre (Fig. 21). Propodeum sharply sloping from the base to the apex. Area superomedia transverse and short. Petiolar area with longitudinal hollows extending to the distal part. Female apex of gaster laterally flattened. Head enlarged, broader than the thorax. Ovipositor curved upwards, with broad valvae (Fig. 22).....	<i>Diaschisaspis</i> FOERSTER, [1869]
9(8)	Clypeus with two blunt teeth. Propodeum gradually sloping from the base to the apex. Area superomedia long and slender.....	10
10(11)	Thyridiae placed very far from the base of the tergite 2 (Fig. 23). Clypeus concave and impressed apically, above two blunt teeth (Fig. 24).....	<i>Paraethecerus</i> PERKINS, 1953
11(10)	Thyridiae placed at base of tergite 2. Apical edge of the clypeus straight, above two blunt teeth (Fig. 25). Mandibles and temples very broad.....	<i>Auberteterus</i> DILLER, 1981
12(7)	Clypeus without teeth apically.....	13
13(16)	Postpetiolus with strong and dense punctures, often polished.....	14
14(15)	Postpetiolus dorsally strongly intumescent (Fig. 26). Thorax long and dorsoventrally flattened, the propodeum about twice as long as the breadth of the petiolar area (Fig. 26), carinae of the propodeum mostly indistinct. Female with the face almost at right angle to the axis of the eye (Fig. 26).....	<i>Eriplatys</i> FOERSTER, [1869]
15(14)	Postpetiolus polished and with moderately dense, coarse, strong punctures. Thorax not flattened dorsoventrally (Fig. 27). Face of the female not inflexed (Fig. 27).....	<i>Herpestomus</i> WESMAEL, [1845]
16(13)	Postpetiolus often mat or striate, or its punctures smaller or not dense.....	17
17(18)	Apical edge of the clypeus with a large semicircular depression in the centre, without subapical ridge (Fig. 28). Genal carina not directly meeting the oral carina. Area superomedia weakly transverse, almost of kidney shape.....	<i>Oiorhinus</i> WESMAEL, [1845]

- 18(17) Clypeus different, sometimes with a centrally impressed or interrupted subapical ridge, but never with a semicircular depression. Genal carina meeting the oral carina directly at the base or distant from the base of the mandibles..... 19
- 19(20) Clypeus with a thin and straight apical margin. Area superomedia very small and long, about four times longer than the breadth of the apical carina (Fig. 29). Body slender. Flagella long and slender. Propodeum long, conspicuously produced apically. Base of tergite 2 depressed. Thyridiae far from base of tergite 2.....
..... *Oronotus* WESMAEL, [1845]
- 20(19) Clypeus different. Area superomedia not very small and long. Body stout and moderately slender..... 21
- 21(24) Clypeus not distinctly separated from the weakly differentiated supraclypeal area, or mostly with a vague impression between. Base of tergite 2 depressed..... 22
- 22(23) Apex of clypeus strongly concave with a distinct double margin, mostly polished, in the *collaris*-group more dull (Fig. 30). Clypeal fovea small. Flagella long in most species and with the flagellar segment 1 (postannellus) longer than segment 4
..... *Diadromus* WESMAEL, [1845]
- 23(22) Apex of clypeus with a vague impression and strongly roughened. Flagellar segment 1 (postanellus) hardly shorter than segment 2. Cheek deeply excavated in the adjacent mandibular area (Fig. 31)..... *Raninia* DILLER, 1985
- 24(21) Clypeus separated from the supraclypeal area, which is usually conspicuously differentiated by a sharp groove. Face and clypeus conspicuously short; if the clypeus is inflexed apically, at usual with an apical margin directed downwards and towards the lateral angles 25
- 25(30) Apex of clypeus impressed..... 26
- 26(29) Oral carina not strongly raised and excavated behind the base of the mandible. Gena not excavated. Clypeal foveae large (Fig. 32) 27
- 27(28) Apex of clypeus with a shallow impression, roughly polished. Face not convex. Flagellar segment 1 (postanellus) approximately as long as segment 2. Hind coxa unarmed.....
..... *Mevesia* HOLMGREN, [1890]
- 28(27) Apex of clypeus slightly impressed, sparsely punctuated and polished. Face convex (Fig.33). Flagellar segment 1 (postanellus) shorter than segment 2. Hind coxae of the female with ventral keels (Fig. 34)*Orotylus* HOLMGREN, [1890]
- 29(26) Oral carina strongly raised and excavated behind the base of the mandible (Fig. 36). Gena excavated, strongly in the male. Clypeal foveae smaller. Apex of clypeus strongly impressed, above it with a more or less distinct ridge which is strongly impressed or obliterated centrally (Fig. 35). Clypeus separated from the supraclypeal area by a sharp groove. Upper side of scapus more or less swollen at base and apex with profile of its upper margin somewhat concave (Fig. 37). Mandibles and temples not very widened. Hind coxa of the female sometimes with a small ventral tubercle or keel
..... *Aethecerus* WESMAEL, [1845]
- 30(25) Apex of clypeus not impressed or only shallow depressed and polished in the *osculator*-group of *Tycherus*, in this case hind coxa below with a carina..... 31
- 31(34) Apical edge of the clypeus thick. Gena excavated. Mandibles broad 32

- 32(33) Apical edge of the clypeus very thick, and coarsely punctate. In the female, the hind coxa with a ventral tooth beginning at the distal edge (Fig. 38).....
 *Phaeogenes* WESMAEL, [1845]
- 33(32) Apical edge of the clypeus thick and smooth or almost smooth, rarely punctate but not coarsely; in the *osculator*-group weakly concave. In the female, if present, the ventral tooth and/or keel begins at its internal area, never at the back-border of the hind coxa (Fig. 39).....
 *Tycherus* FOERSTER, [1869]
- 34(31) Apical edge of the clypeus thin and sharply rough. Gena not excavated. Mandibles narrowed and of concave profile on external part. In the female, the ventral tooth and/or keel beginning at the distal edge of hind coxa (Fig. 40).....
 *Dirophanes* FOERSTER, [1869]

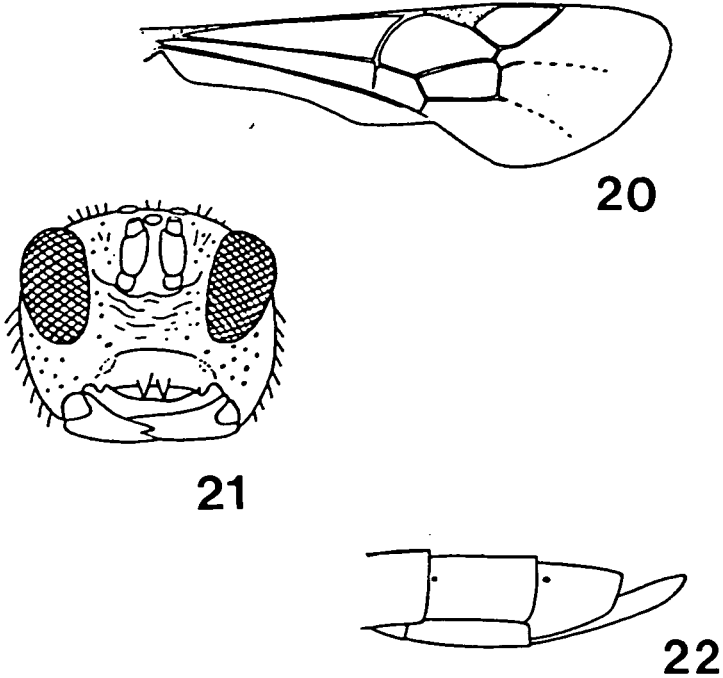
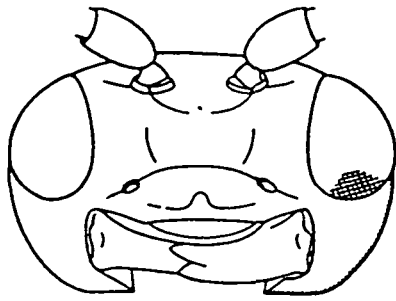
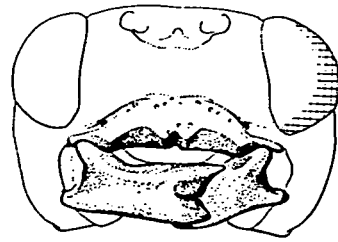


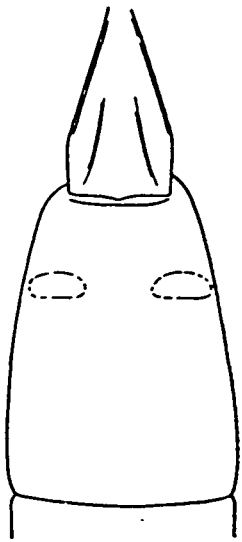
Fig 20-22: 20) *Epitomus infuscatus* (GRAVENHORST), male: frontal wing, aspect of veins. 21) *Diaschisaspis campoplegoides* HOLMGREN, female: head, in frontal view. 22) *Diaschisaspis campoplegoides* HOLMGREN, female: apex of gaster, in lateral view.



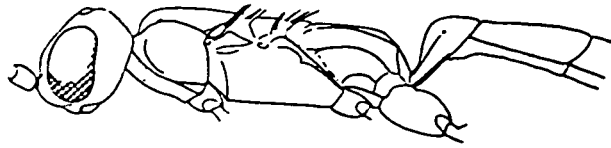
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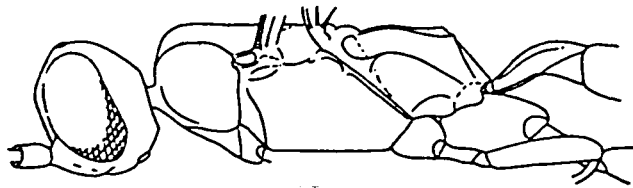
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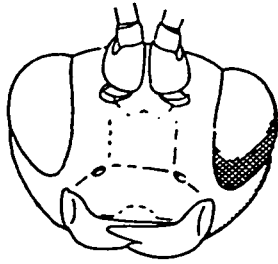


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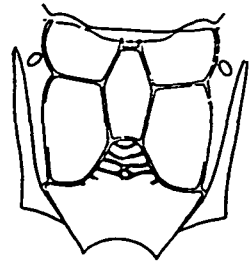


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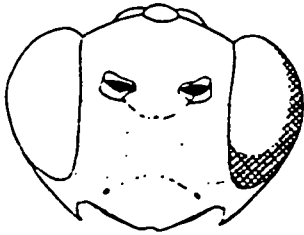
Figs. 23-27: 23) *Paraethecerus elongatus* PERKINS, female: tergites 1 and 2. 24) *Paraethecerus elongatus* PERKINS, female: head, frontal and ventral view. 25) *Auberteterus alternecoloratus* (CUSHMAN), female: head, frontal and ventral view. 26) *Eriplatys ardeicollis* (WESMAEL), female: thorax and base of gaster, in lateral view. 27) *Herpestomus wesmaeli* PERKINS, female: thorax and base of gaster, in lateral view.



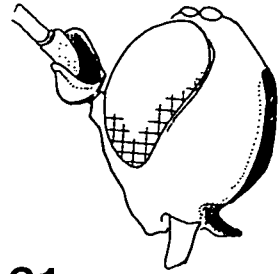
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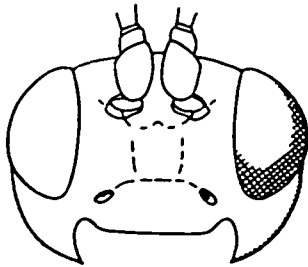
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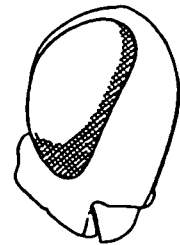
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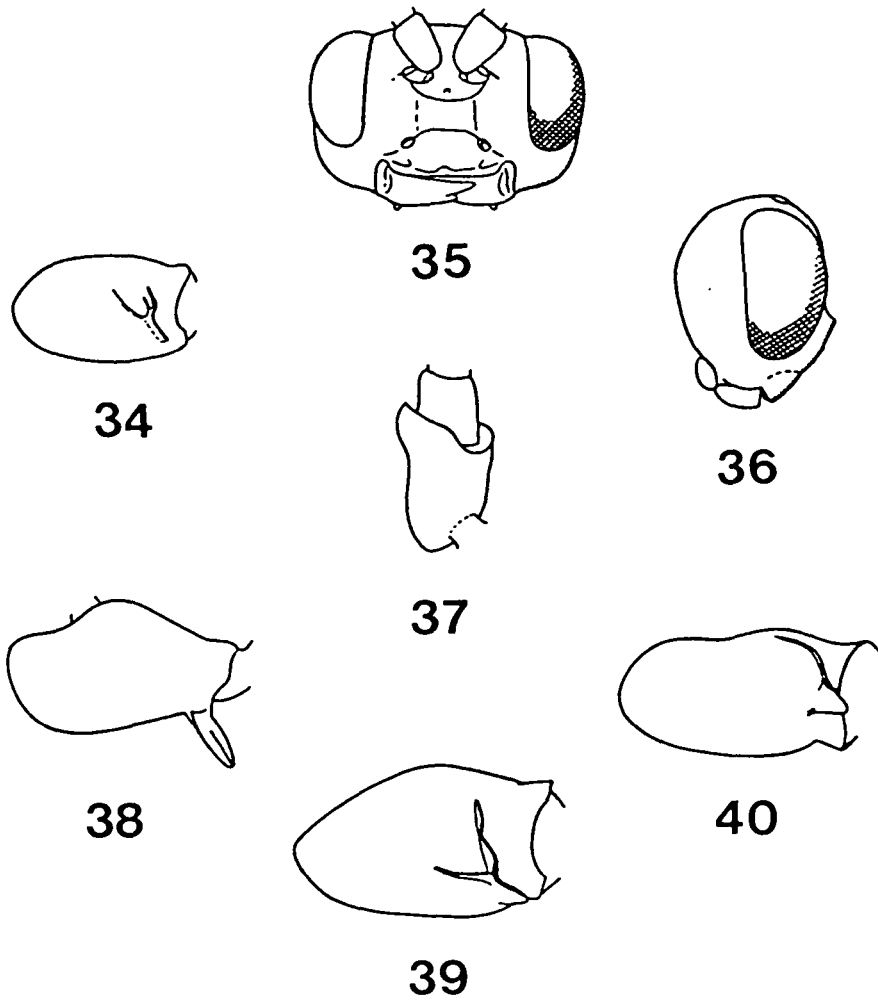


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Figs. 28-33: 28) *Oiorhinus pallipalpis* WESMAEL, female: head, in frontal view. 29) *Oronotus binotatus* (GRAVENHORST), female: propodeum, in dorsal view. 30) *Diadromus troglodytes* (GRAVENHORST), male: head, in frontal view. 31) *Raninia cavagenalis* DILLER, female: head, in lateral view. 32) *Mevesia gutata* PERKINS, female: head, in frontal view. 33) *Orotylus mitis* (WESMAEL), female: head, in lateral view.



Figs. 34-40: 34) *Orotylus mitis* (WESMAEL), female: hind coxa, in ventral view. 35) *Aethecerus nitidus* WESMAEL, female: head, in frontal view. 36) *Aethecerus nitidus* WESMAEL, female: head, in lateral view showing the hypostomal carina. 37) *Aethecerus nitidus* WESMAEL, male: scapus. 38) *Phaeogenes semivulpinus* (GRAVENHORST), female: hind coxa, in ventral view. 39) *Tycherus ophthalmicus ophthalmicus* (WESMAEL), female: hind coxa, in ventral view. 40) *Dirophanes invisior* (THUNBERG), female: hind coxa, in ventral view.

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Authors' addresses:

Jesús SELFA.

Departament de Biologia Animal (Entomologia).

Universitat de València.

Dr. Moliner, 50.

E-46100 Burjassot. València.

Spain

Erich DILLER

Zoologische Staatssammlung.

Münchhausenstraße, 21.

D-81247 München.

Germany

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Max Kühbandner, Marsstraße 8, D-85609 Aschheim;
Wolfgang Schacht, Scherrerstraße 8, D-82296 Schöngeising;
Erika Schamhop, Wemer-Friedmann-Bogen 10, D-80993 München;
Thomas Witt, Tengstraße 33, D-80796 München 40;
Postadresse: Entomofauna, Münchhausenstraße 21, D-81247 München; Tel. 089/8107-0, Fax -300.