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ILLUSTRATED KEYS TO GENERA OF THE MALE WASPS IN THE SUBFAMILY THYNNINAE (HYMENOPTERA: TIPHIIDAE)

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Abstract.—Extensively illustrated keys to the genera of the tiphiid subfamily Thynninae are provided for males, with separate keys for Australasian and South American taxa, and a table is included giving generic composition and synonymies in the Thynninae over the past century.

Key Words: Tiphiidae, Thynninae, generic keys

The tiphiid subfamily Thynninae has never been any easy group to study. Changes in the taxonomy in the past century have made identification of genera nearly impossible. There are no up-to-date keys, and a number of recently described genera are so poorly characterized that generic identification is impossible without identified specimens on hand. There have been many changes in the taxonomy of the subfamily since Turner (1910) published the most recent key to the genera in the Genera Insectorum. The number of described genera has increased from 53 as of Turner (1910) to 71 today (Table 1). Numerous changes in the status of the genera have also taken place. The genus *Diamma* Westwood was placed in a separate subfamily (Kimsey 1991). Eight genera have been synonymized and a ninth, *Glyptometopa* Ashmead, was found to belong to a different subfamily, the Brachycistidinae, by Mickel and Krombein (1942). Seventeen new genera have been described since 1910. Finally, the subfamily Thynninae has been rearranged and the tribal classification has also changed in the last century.

To further confuse matters male female associations are incomplete and females are unknown for some genera. This is exacerbated by the frequency of miscoupling. Thynnine females are wingless, antlike and largely subterranean. Males are winged, fossorial and very different looking than the females. Pairs fly in copula and are frequently collected in tandem. Sadly, although this should give us clear sex associations, male-female pairs are, on occasion, miscoupled (Brown 1993)—pairs consisting of two different species, genera or even tribes have been observed. Personal observations suggest that this rate of miscoupling may be as frequent as 10% of the pairs observed. Therefore species and generic characterization of females cannot be done reliably unless multiple pairs have been collected of a particular species. Thus, the taxonomy of this group is based on male features. While this is not an optimal situation it will be some time before females are sufficiently well known to be included in generic keys.

Because of these major taxonomic changes it seems appropriate and necessary to produce illustrated keys to the genera of Australia and South America to facilitate biological and systematic research in this group. The genera in the two continental

Table 1. Changes in the generic and tribal taxonomy of the tiphiid subfamily Thynninae in the past century.

Tribe/Subfamily	Turner (1910)[1]	Tribe/Subfamily	Year 2003[2]
Thynninae		Diamminae	
Diammini	1. *Diamma* Westwood	Thynninae	1. *Diamma* Westwood
Rhagigasterini	2. *Aelurus* Klug	Rhagigasterini	2. *Aelurus* Klug
	3. *Dimorphothynnus* Turner		3. *Dimorphothynnus* Turner
	4. *Eirone* Westwood		4. *Eirone* Westwood
	5. *Rhagigaster* Guérin Méneville		4a. *Rhagigaster* Guérin Méneville
Thynnini	6. *Acanthothynnus* Turner	Thynnini	5. *Acanthothynnus* Turner
	7. *Aeolothynnus* Ashmead		6. *Aeolothynnus* Ashmead
	8. *Agriomyia* Guérin Méneville		7. *Agriomyia* Guérin Méneville
	9. *Amblysoma* Westwood		8. *Ariphron* Erichson
	10. *Ammodromus* Guérin Méneville		9. *Arthrothynnus* Brown
	11. *Anodontyra* Westwood		
	12. *Ariphron* Erichson		10. *Aspidothynnus* Turner (= *Tmesothynnus* Turner)
			11. *Beithynnus* Kimsey
	13. *Aspidothynnus* Turner (= *Tmesothynnus*)		12. *Belothynnus* Turner
	14. *Asthenothynnus* Turner (= *Iswaroides*)		13. *Bifidothynnus* Brown
	15. *Aulacothynnus* Turner (= *Neozeleboria*)		14. *Campylothynnus* Turner
	16. *Belothynnus* Turner		15. *Catocheilus* Guérin Méneville
			16. *Chilothynnus* Brown
	17. *Campylothynnus* Turner		17. *Dythynnus* Kimsey
	18. *Catocheilus* Guérin Méneville		
	19. *Chrysothynnus* Turner		18. *Doratithynnus* Turner
	20. *Dolichothynnus* Turner		19. *Elidothynnus* Turner
	21. *Doratithynnus* Turner		20. *Encopothynnus* Turner
	22. *Elaphroptera* Guérin Méneville		21. *Epacitiothynnus* Turner
	23. *Elidothynnus* Turner		22. *Guerinius* Ashmead
	24. *Epactiothynnus* Turner		23. *Gymnothynnus* Turner
	25. *Eucyrtothynnus* Turner		24. *Hathynnus* Kimsey
	26. *Glaphrothynnus* Turner (= *Zeleboria*)		25. *Iswaroides* Ashmead
	27. *Glyptometopa* Ashmead (= Brachycistidinae)		26. *Leiothynnus* Turner
	28. *Guerinius* Ashmead		27. *Leptothynnus* Turner
	29. *Gymnothynnus* Turner		28. *Lestricothynnus* Turner
	30. *Hemithynnus* Ashmead (= *Catocheilus*)		29. *Lophocheilus* Guérin Méneville
	31. *Iswaroides* Ashmead		30. *Macrothynnus* Turner
	32. *Leiothynnus* Turner		31. *Megalothynnus* Turner
	33. *Leptothynnus* Turner		32. *Neozeleboria* Rohwer
	34. *Lestricothynnus* Turner		33. *Oncorhinothynnus* Shuckard
	35. *Lophocheilus* Guérin Méneville		34. *Pentazeleboria* Brown
	36. *Macrothynnus* Turner		35. *Phymatothynnus* Turner
	37. *Megalothynnus* Turner		36. *Pogonothynnus* Turner
	38. *Oncorhinothynnus* Shuckard		37. *Psammothynnus* Ashmead
	39. *Ornepetes* Guérin Méneville		38. *Tachynoides* Kimsey
	40. *Parelaphroptera* Turner		39. *Tachynomia* Guérin Méneville
	41. *Phymatothynnus* Turner		40. *Tachyphron* Brown (= *Takyomyia* Kimsey)
	42. *Pogonothynnus* Turner		41. *Thynnoides* Guérin Méneville
	43. *Psammothynnus* Ashmead		42. *Thynnus* Fabricius

Table 1. Continued.

Tribe/Subfamily	Turner (1910)[1]	Tribe/Subfamily	Year 2003[2]
	44. *Pseudelaphroptera* Ashmead		43. *Zaspilothynnus* Ashmead
	45. *Scotaena* Klug		
	46. *Spilothynnus* Ashmead		44. *Zeleboria* Saussure
			45. *Zythynnus* Kimsey
	47. *Tachynomia* Guérin Méneville	Elaphropterini	46. *Amblysoma* Westwood[3]
	48. *Tachynothynnus* Turner (= *Guerinius*)		47. *Ammodromus* Guérin Méneville
	49. *Thynnoides* Guérin Méneville		48. *Argenthynnus* Genise
	50. *Thynnus* Faricius		
	51. *Tmesothynnus* Turner		49. *Atopothynnus* Kimsey
			50. *Brethynnus* Genise
	52. *Zaspilothynnus* Ashmead		51. *Chrysothynnus* Turner
	53. *Zeleboria* Saussure		52. *Dolichothynnus* Turner
			53. *Elaphroptera* Guérin Méneville
			54. *Eucyrotothynnus* Turner
			55. *Merithynnus* Kimsey
			56. *Mesothynnus* Kimsey
			57. *Spilothynnus* Ashmead
			58. *Telephoromyia* Guérin Méneville
			59. *Upa* Kimsey
			60. *Zeena* Kimsey
		Scotaenini	61. *Anodontyra* Westwood
			62. *Glottynnus* Genise
			63. *Ornepetes* Guérin Méneville
			64. *Parelaphroptera* Turner
			65. *Pseudelaphroptera* Ashmead
			66. *rostrynnus* Genise
			67. *Scotaena* Klug

[1] Names followed by parentheses in the 1910 column are synonyms, and the currently accepted valid name for the genus is given in parentheses.

[2] Names in parentheses in the 2003 column are recently synonymized junior synonyms.

[3] The genus is unknown and the type species is apparently lost.

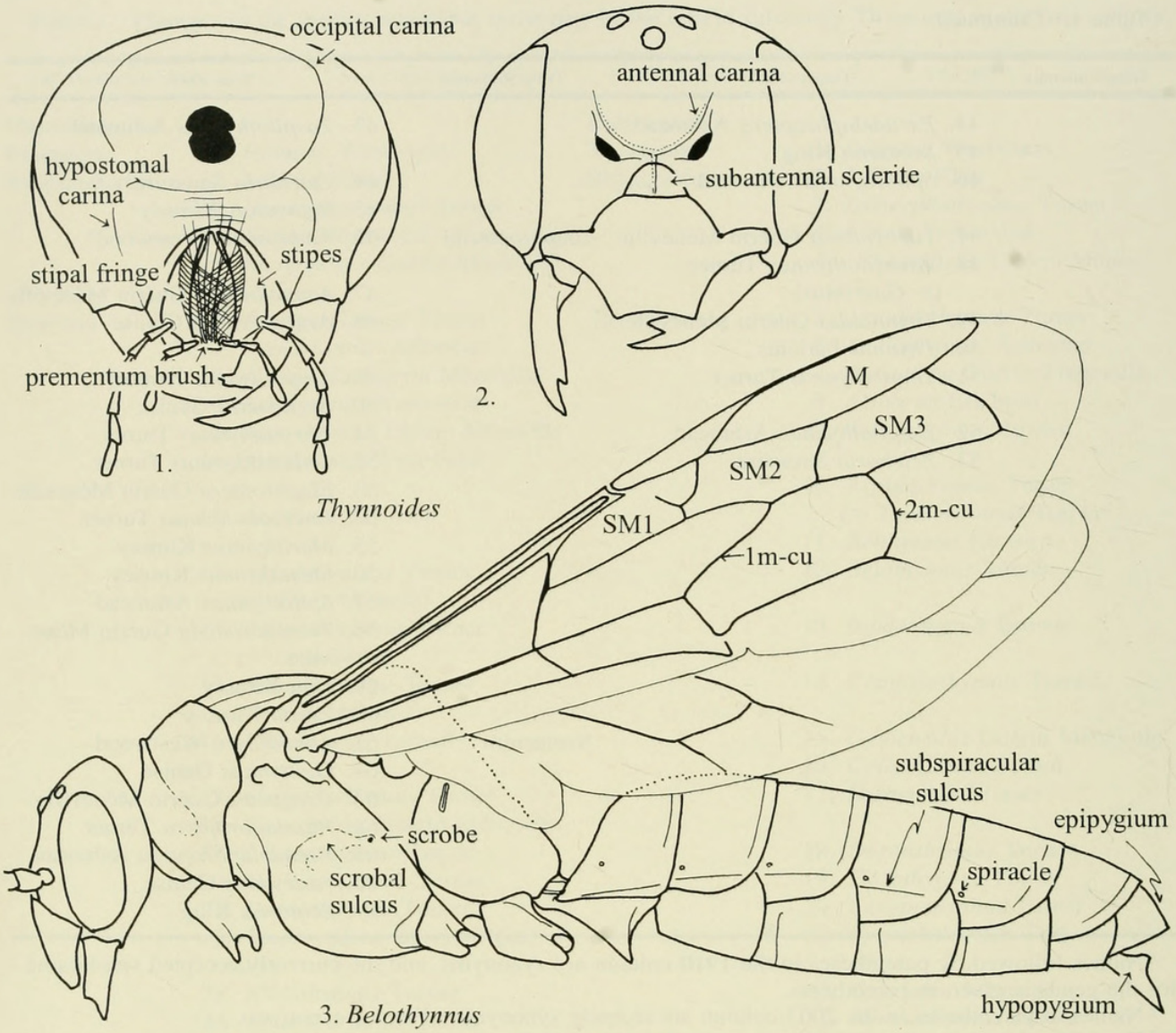
regions are keyed separately to simplify the identification process.

There are several features of these keys that should be explained. I have tried not to use difficult to observe characteristics, such as genitalia. However, there is no way to avoid some of these. Characteristics of the underside of the head and the tongue are critical features to distinguish a number of genera. In most specimens it is possible to see enough of the underside of the head to determine the shape and extent of the hypostomal plate, positions of the occipital and hypostomal carinae, and setation of the stipes and prementum. If not, in some cases it will be necessary to relax the specimen and tilt the head up to see the underside. Critical features on the underside of the head are illustrated in Fig. 1. Other structures important in identifying thynnine genera are illustrated in Figs. 2–3.

Key to Males of the Australasian Genera of Thynninae

1 Hypopygium apically evenly curved and apical margin spinose or apicomedially with long curved apicomedial spine (unciform) (Figs. 6–11); hindcoxal cavities continuous with petiolar socket, not enclosed by extension of metasternal and metapleural lobes (Fig. 5); metasomal sternum I basally with single longitudinal ridge or carina (Rhagigasterini) 2

– Hypopygium apically dentate, lobate, or narrowly rounded without marginal spines and not apicomedially unciform or spinose (as in Figs. 45–62); hindcoxal cavities enclosed, separated from petiolar socket by extension of metasternal and metapleural lobes (Fig. 4);



Figs. 1–3. 1, Diagram of underside of head. 2, Front view of face. 3, Side view of body with legs and antennae removed. Species illustrated: 1, 2, *unifasciatus* (Smith); 3, *fuscocostalis* Turner. Abbreviations used include: M = marginal cell, SM1 etc. = submarginal cells, 1m-cu = first marginal-cubital crossvein, 2m-cu = second marginal-cubital crossvein.

metasomal sternum I basally without longitudinal ridge or carina 4

2 Hypopygium evenly rounded and unmodified, or with narrow platform margined with stout broad setae (Fig. 8); metasomal tergum VII evenly rounded, or slightly indented apicomedially, otherwise unmodified . . . . . *Eirone* Westwood

– Hypopygium unciform without stout broad setae (as in Figs. 6–7); metasomal tergum VII broad and shovellike or narrowed and sublaterally carinate (as in Figs. 6–7, 9, 11) 3

3 Metasomal tergum VII broadly rounded apically, and hoodlike or shovellike, with lateral carina (Figs. 6, 10); apical sternum with broad dorsal platform above elongate curved apical spine (uncus) (Figs. 6, 9) . . . . . *Dimorphothynnus* Turner

– Metasomal tergum VII strongly narrowed or almost trilobate apically, often with accompanying sublateral carinae (Figs. 7, 11); hypopygium with dorsal tooth or narrow rim above uncus (Figs. 7, 11) . . . . . *Rhagigaster* Guérin Méneville

4 Metasomal sternum VI with small, acute lateral tooth (as in Figs. 20, 32) 5

– Metasomal sternum VI simple, laterally without tooth 11

5 Metasomal sternum V with small, acute lateral tooth or elongate prong (Fig. 32) 6

– Metasomal sternum V simple, without lateral tooth or large prong 8

6 Mesopleuron evenly convex, without scrobal groove and scrobe obsolescent (Fig. 20); metasoma appearing flattened on top, terga flat to concave dorsally; terga II–VI or III–VI terminating in apicolateral tooth (Fig. 20) . . . . . *Encopothynnus* Turner

– Mesopleuron flattened or depressed medially with clearly indicated transverse scrobal groove and scrobe (as in Fig. 3); metasoma cylindrical in cross-section, terga evenly convex dorsally, apicolateral angle unmodified or may be broadly expanded and shelflike, not toothlike (as in Fig. 32) 7

7 Face flattened in profile; hypopygium narrowly tridentate or ligulate apically, often with submedial angle or tooth on lateral margin (Fig. 50) . . . . . *Doratithynnus* Turner

– Face protuberant in profile: clypeus and frons convex in profile (Fig. 22); hypopygium apically strongly tridentate or trilobate, without lateral angle or tooth on lateral margin (as in Fig. 52) . . . . . *Acanthothynnus* Turner

8 Metasomal tergum VII flattened medially, without elevated medial platform and with subapical transverse ridge (Fig. 39) . . . . . *Iswaroides* Ashmead

– Metasomal tergum VII with elevated medial area above and often overhanging smooth apical lip, without subapical transverse ridge (as in Figs. 42–43) 9

9 Mesopleuron evenly convex, without scrobal groove; metanotum strongly overhanging flat posterior surface of propodeum (Fig. 13); subantennal sclerite obscured by strongly elevated and often broad, flat platform between antennal sockets (Fig. 23); apical flagellomeres cylindrical (Fig. 29) . . *Thynnus* Fabricius

– Mesopleuron flattened or depressed medially, with well-developed scrobal groove; metanotum not overhanging propodeum and posterior surface of propodeum convex to somewhat flattened (as in Fig. 20); subantennal sclerite narrow and medially ridged between antennal sockets (as in Fig. 25); apical flagellomeres lobulate (as in Fig. 30) 10

10 Mandible relatively straight and outer surface flat without longitudinal grooves (Fig. 14); propodeum usually flat from metanotum to petiolar socket; gena usually with low carina or ridge parallel with posterior eye margin . . . . . *Zaspilothynnus* Turner

– Mandible curved to relatively straight but outer surface convex, with one or more longitudinal grooves (Fig. 15); propodeum convex from metanotum to petiolar socket; gena evenly rounded without carina or ridge parallel with posterior eye margin . . *Leptothynnus* Turner

11 Epipygium somewhat or strongly elevated above large smooth and usually transparent apical lip, elevated area differently sculptured, usually densely transversely ridged or ridging U-shaped (as in Fig. 42); subantennal sclerite strongly elevated, often with longitudinal medial ridge, and usually planar with clypeus (as in Figs. 23, 25) 12

– Epipygium not elevated above large apical lip, either smooth or coarsely punctate, with at most only one subapical transverse ridge (as in Figs. 37, 39–41); subantennal sclerite depressed below level of clypeus and usually not elevated or medially ridged 23

12 Hypopygium deeply emarginate medially with long spine or prong on either side of emargination, appearing bidentate (as in Figs. 47, 55) . . 13

– Hypopygium tridentate or trilobate, with medial lobe produced the furthest (as in Figs. 44, 46, 48–50) 14

13 Epipygium with elevated triangular platform submedially, with narrow translucent lip; maxilla evenly covered with sparse short setae, without marginal row of long setae; facial convexity most extreme in upper third of clypeus; forewing with first m-cu crossvein received by second submarginal cell and second m-cu received by third submarginal cell (as in Fig. 28) . . . . . *Oncorhinothynnus* Shuckard

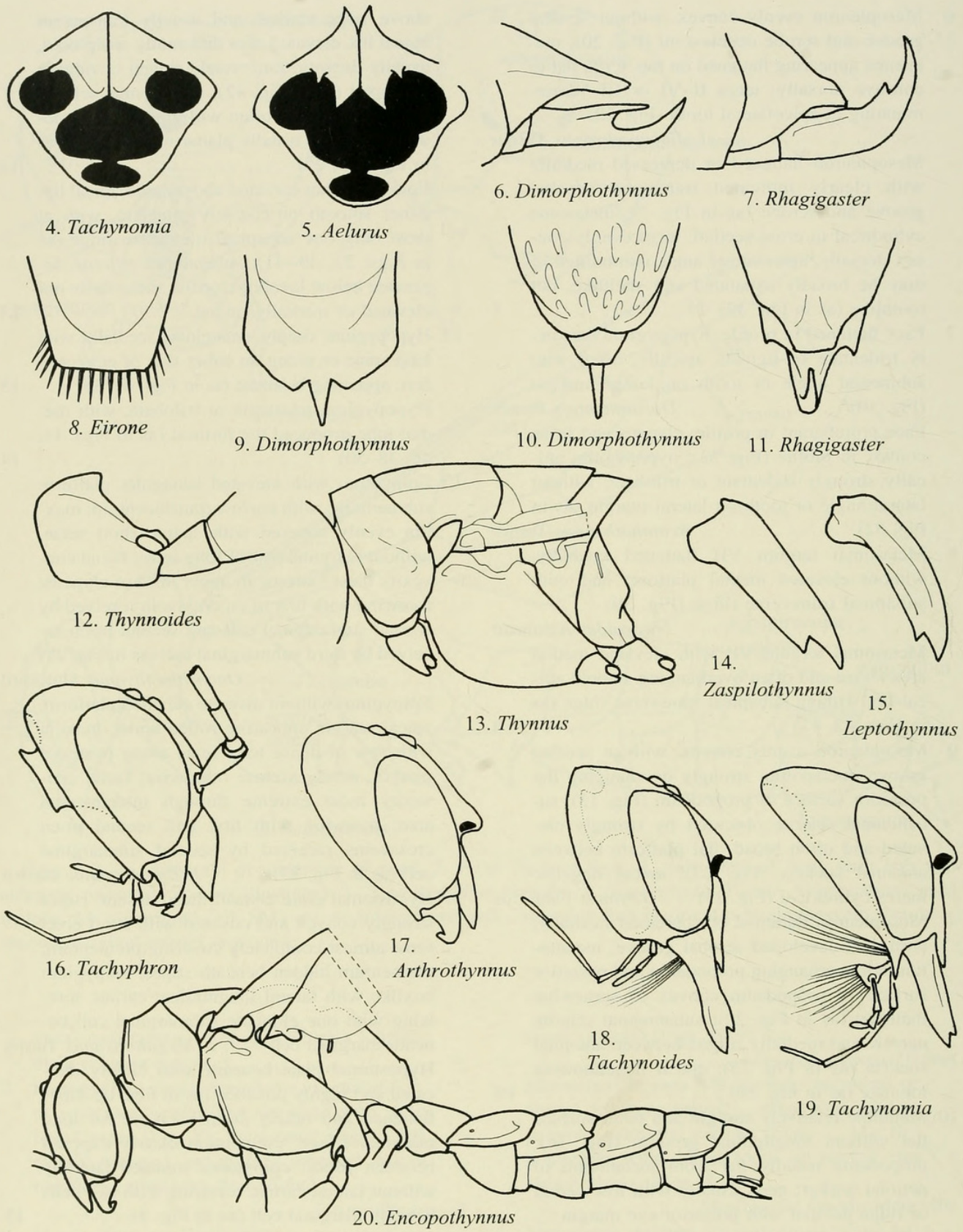
– Epipygium without discrete elevated platform, apical margin appearing rolled under, maxilla with row of dense long setae along posterior margin, nearly asetose otherwise; facial convexity most extreme through interantennal area; forewing with first and second m-cu crossveins received by second submarginal cell (as in Fig. 27) . . . . . *Bifidothynnus* Brown

14 Hypostomal plate beneath head absent; stipes strongly convex and covered with short erect setae almost completely covering prementum; prementum hidden beneath stipes; epipygium boxlike with lateral longitudinal carina; forewing with one elongate submarginal cell beneath marginal cell . . . . *Megalothynnus* Turner

– Hypostomal plate beneath head clearly indicated and highly polished (as in Fig. 1); stipes flattened and nearly asetose except for long marginal fringe; prementum clearly exposed between stipes; epipygium rounded laterally without lateral carina; forewing with two cells beneath marginal cell (as in Fig. 3) 15

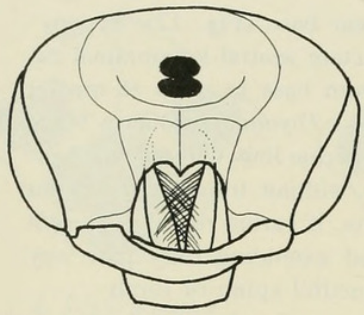
15 Metasomal sternum I produced into acute, long ventrally projecting lobe (Fig. 3); scutellum medially depressed, often appearing somewhat bituberculate . . . *Belothynnus* Turner

– Metasomal sternum I flattened or ventrally angulate, but without long, ventrally projecting lobe (as in Fig. 34); scutellum evenly convex 16

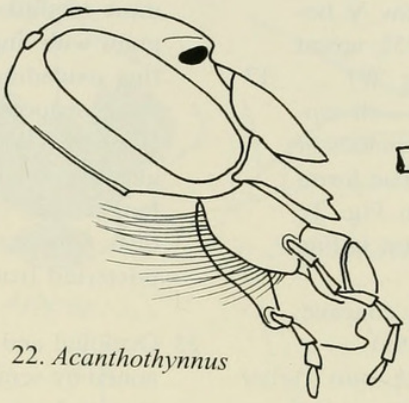


Figs. 4–20. 4–5, Ventral view of metathorax + propodeum, with petiole and hindlegs removed. 6, 7, Side view of epipygium and hypopygium. 8, 9, Dorsal View of hypopygium. 10, 11, Dorsal view of epipygium and hypopygium. 12, Side view of hindcoxa and trochanter. 13, Side view of thorax, with legs and wings removed. 14–15, Outer view of mandible. 16–19, Side view of head, with antenna partly to entirely removed. 20, Side view of body with legs and wings removed. Species illustrated: 4, *abdominalis* (Guérin Méneville); 5, *nigrofasciatus* (Smith); 6, *obtusus* Smith; 7, *lyelli* Turner; 8, *transversus* Brown; 9, *obtusus*; 10, *lecheri* (Dalla Torre); 11, *lyelli*; 12, *gracilis* (Westwood); 13, *ventralis* Smith; 14. *fenestrus* (Smith); 15, *purpureipennis* (Westwood); 16, *evelinae* (Turner); 17, *mulleri* (Dalla Torre); 18, *huntianus* Brown; 19, *abdominalis* Guérin Méneville); 20, *neoatrifacies* Brown.

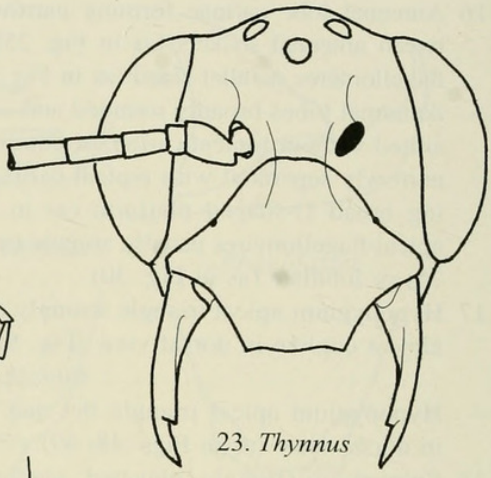
16 Antennal lobe carinae forming narrow V between antennal sockets (as in Fig. 25); apical flagellomeres parallel-sided (as in Fig. 29) . . 17
– Antennal lobes broadly rounded and well-separated without topical carina, or continuous or narrowly separated with topical carinae forming broad U-shaped platform (as in Fig. 2); apical flagellomeres usually arcuate (as in Fig. 75) or lobulate (as in Fig. 30) 19
17 Hypopygium apical triangle strongly concave, almost cuplike in dorsal view (Fig. 51) . . . . . *Elidothynnus* Turner
– Hypopygium apical triangle flat and carinate in dorsal view (as in Figs. 48–49) 18
18 Epipygium strongly elevated medially and shelflike, overhanging broad polished posterior declivity (as in Fig. 42); propodeum strongly flattened between metanotum and petiolar socket in lateral view; metasomal sternum I strongly angulate medially . . . *Guerinius* Ashmead
– Epipygium only slightly elevated adjacent to posterior transparent lip, without elevated middle; propodeum convex, at least dorsally between metanotum and petiolar socket in lateral view; metasomal sternum I flattened or rounded medially . . . . . *Campylothynnus* Turner
19 Prementum with discrete row of long apical setae, setae as long or longer than prementum (as in Fig. 1); stipes without fringe of long marginal setae; subantennal sclerite with medial longitudinal ridge or carina obsolescent . . . . . *Lophocheilus* Guérin Méneville
– Prementum without long apical setae; stipes with dense fringe of long marginal setae (as in Fig. 1); subantennal sclerite usually medially carinate (weak in *Catocheilus*) 20
20 Metasomal sternum I gently convex or nearly flat; antennal lobes rounded, topical carina weakly indicated and not joining medially to make U-shaped structure . . . . . *Catocheilus* Guérin Méneville
– Metasomal sternum I strongly angled or convex ventrally, particularly near posterior margin, often nearly forming right angle posteriorly in side view; antennal lobes undeveloped or angulate, with well-developed topical carina, carinae often merged forming broad U-shaped platform (as in Fig. 2) 21
21 Epipygium with lip posterior to elevated medial surface coarsely cross-ridged and translucent to opaque (Fig. 43); hypopygium with lateral lobes obtuse or broadly rounded . . . . *Macrothynnus* Turner
– Epipygium with lip posterior to elevated medial surface smooth and nearly transparent; hypopygium with lateral lobes clearly defined and acute (as in Fig. 48) 22
22 Hindcoxal dorsal carina strongly angled, almost toothlike near base (Fig. 12); hypopygium with impunctate ventral longitudinal carina extending from base to apex of medial spine or tooth . . . *Thynnoides* Guérin Méneville
– Hindcoxal dorsal carina low, without basal angle; hypopygium without impunctate ventral longitudinal carina, if carina or ridge present then punctate and extending only part way posteriad from medial spine or tooth . . . . *Lestricothynnus* Turner
23 Occipital and hypostomal carinae widely separated by semitransparent genal plate covering tongue base (Fig. 21); epipygium with flat smooth wedge-shaped or subovoid apicomedial area; hypopygium often quadrilobate (Fig. 60) . . . . . *Zeleboria* Saussure
– Occipital and hypostomal carinae touching to broadly separated, but without semitransparent expansion covering most of tongue base; epipygium variable, usually without flat, smooth apicomedial area; hypopygium with 1 or 3 apical teeth or spines, or ligulate (as in Figs. 45–46, 50, 53) 24
24 Prementum with long apical setae, setae as long or longer than prementum (as in Fig. 1); occipital and hypostomal carinae broadly separated; hypopygium ventrally with distinctive parallel-sided or crescentic medial indentation (Fig. 45) . . . . . *Aeolothynnus* Ashmead
– Prementum without long apical setae, setae if present shorter than width of prementum; occipital and hypostomal carinae touching to broadly separated medially; hypopygium ventrally without medial indentation 25
25 Epipygium with discrete transverse subapical welt or ridge extending all or part way across epipygium, with narrow transparent apical rim (as in Figs. 37, 39), or epipygium with apical margin thickened and appearing rolled under (as in Fig. 41) 26
– Epipygium without subapical welt or ridge, gradually tapering to translucent rim or flattened apicomedial area (as in Figs. 40, 44) . . 29
26 Stipes without discrete marginal fringe of long setae; flagellomeres V–XI with (as in Figs. 29–30) or without tyloids . . . . . *Tmesothynnus* Turner
– Stipes with well-developed marginal fringe of long setae; flagellomeres V–XI without tyloids (as in Fig. 33) 27
27 Hypopygium strongly apically bidentate (similar to Fig. 55); epipygium with polished medial knob and without transverse subapical ridge or welt, appearing rolled under apically, without thin transparent apical rim (Fig. 41); metasomal terga III–V without subspiracular sulcus . . . . . *Psammothynnus* Turner
– Hypopygium strongly tridentate (as in Figs. 44, 52); epipygium without polished medial



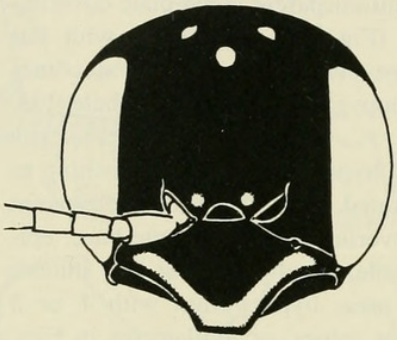
21. *Zeleboria*



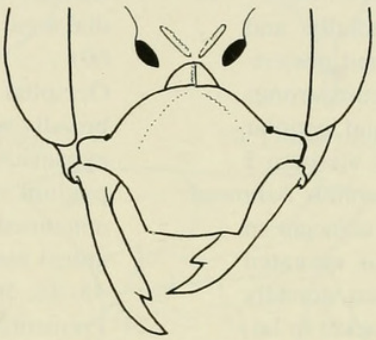
22. *Acanthothynnus*



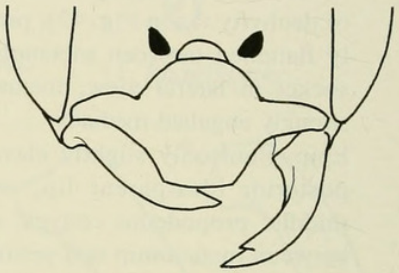
23. *Thynnus*



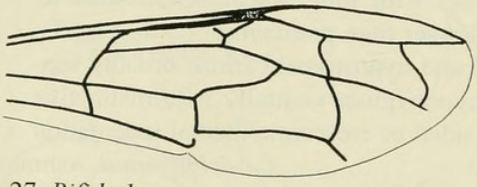
24. *Encopothynnus*



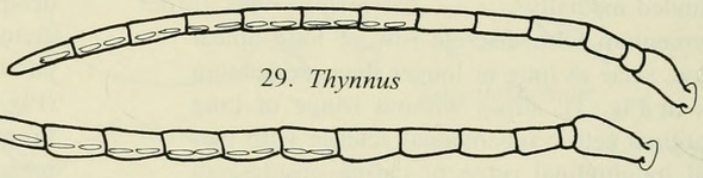
25. *Guerinius*



26. *Hathynnus*

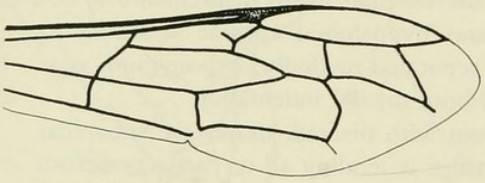


27. *Bifidothynnus*

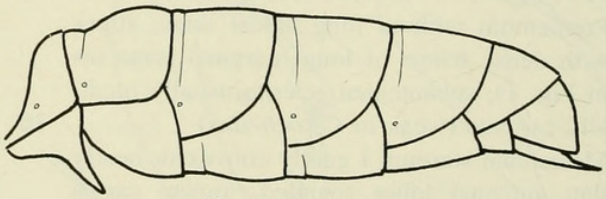


29. *Thynnus*

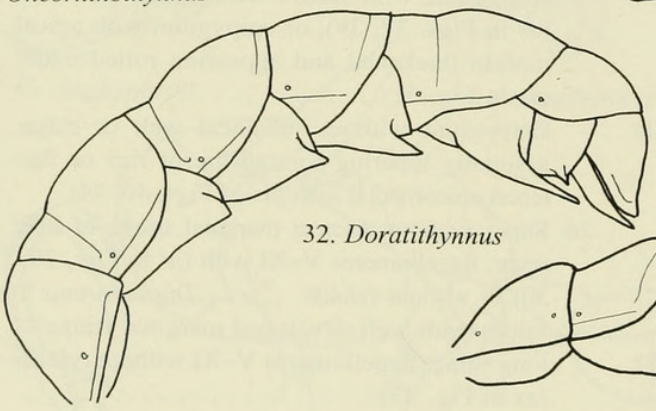
30. *Elidothynnus*



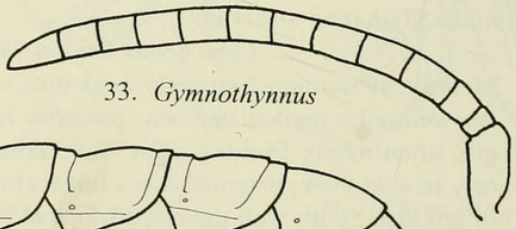
28. *Oncorhinothynnus*



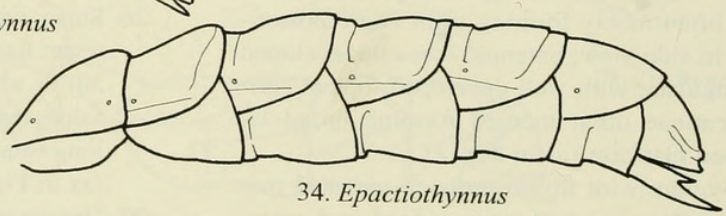
31. *Agriomyia*



32. *Doratithynnus*

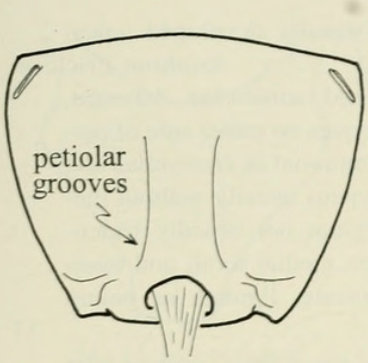


33. *Gymnothynnus*



34. *Epactiothynnus*

Figs. 21–34. 21, Ventral view of head. 22, Side view of head, antennae removed. 23–26, Front view of face, with one or both antennae removed. 27, 28, Forewing. 29, 30, 33, Antennae. 31, 32, 34, Side view of metasoma. Species illustrated: 21, *flavescens* (Smith); 22, *sannae* (Turner); 23, *ventralis* Smith; 24, *atrifacies* Turner; 25, *picipes* (Westwood); 26, *pygmaeus* (Turner); 27, *wubiniensis* Brown; 28, *xanthorrhoei* (Smith); 29, *ventralis*, 30; *melleus* (Westwood); 31, *albopictus* (Smith); 32, *doddi* (Turner); 33, *gilberti* (Turner); 34, *abductor* (Smith).



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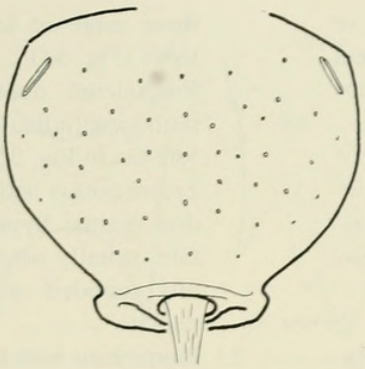
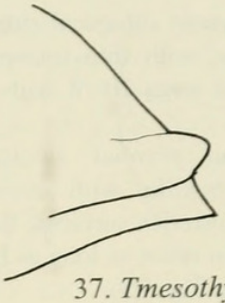


36. *Ariphron*



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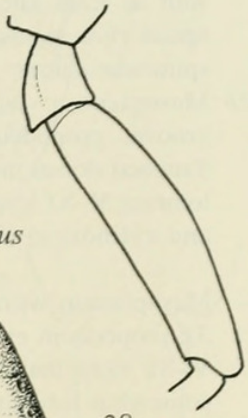

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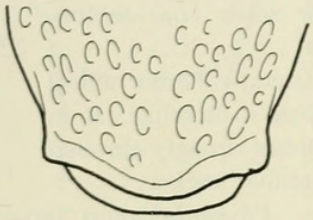
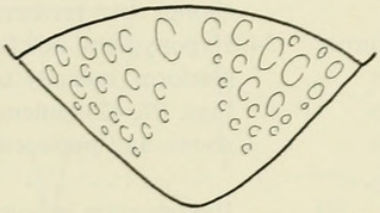
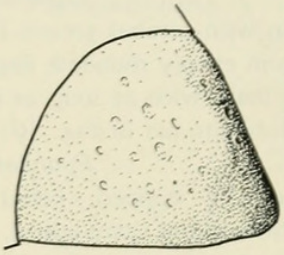


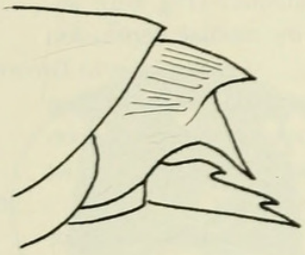
39. *Iswaroides*



40. *Zythynnus*



41 *Psammothynnus*



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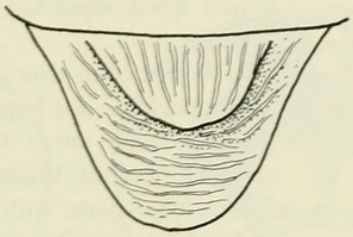
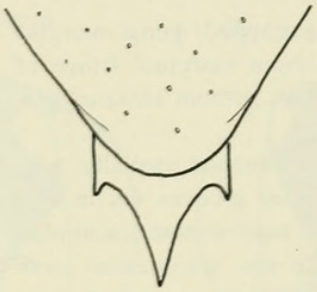


43. *Macrothynnus*



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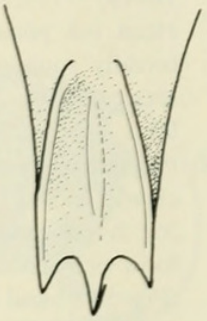
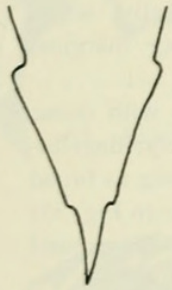
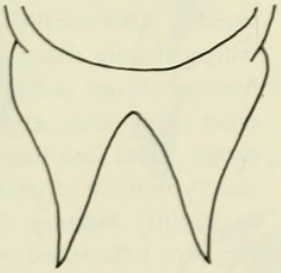


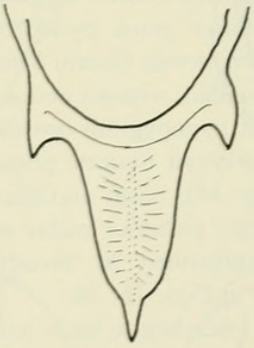
45. *Aeolothynnus*



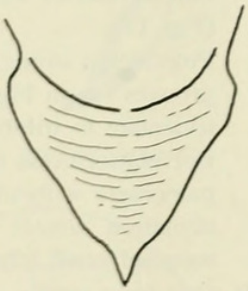
46. *Beithynnus*



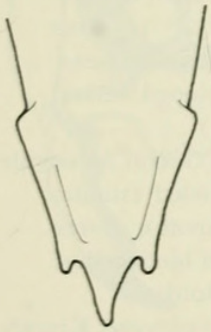
47. *Bifidothynnus*



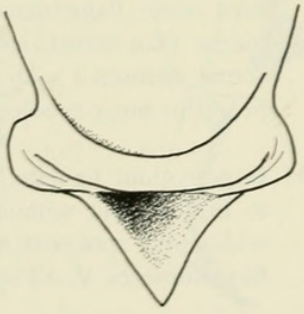
48. *Campylothynnus*



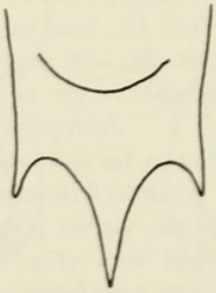
49. *Catocheilus*



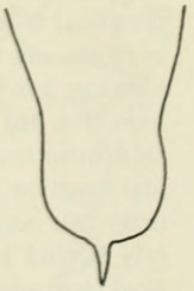
50. *Doratithynnus*



51. *Elidothynnus*



52. *Iswaroides*



53. *Leiothynnus*

Figs. 35–53. 35, 36, Posterior view of propodeum. 37, Side view of epipygium. 38, Side view of trochanters and femur. 39–40, 43, Dorsal view of epipygium. 41, Oblique view of epipygium. 42, Side view of metasomal apex. 44, Dorsal view of epipygium and hypopygium. 45, Ventral view of hypopygium. 46–53, Dorsal view of hypopygium. Species illustrated: 35, *illidgeri* Turner; 36, *rigidulus* Turner; 37, *zelebori* (Saussure); 38, *amplus* Kimsey; 39, *koebelei* Ashmead, 40; *vespoides* Kimsey; 41, *depressus* (Westwood); 42, *ventralis*; 43, *simillimus* (Smith); 44, *blandulus* Turner; 45, *multiguttatus* Ashmead; 46, *solaris* Kimsey, 47; *wubiniensis* Brown, 48; *flavopictus* (Smith); 49, *klugi* Guérin Méneville; 50, *doddi* (Turner); 51, *melleus* (Westwood); 52, *koebelei* Ashmead; 53, *mackayensis* (Turner).

knob and with transverse subapical ridge or welt at least laterally, with thin transparent apical rim; metasomal terga III–V with subspiracular sulcus 28

28 Mesopleuron without scrobal sulcus or groove; propodeum boxlike with distinctly flattened dorsal and posterior surfaces; flagellomeres V–XI less than twice as long as broad and cylindrical (as in Fig. 33) . . . . . *Gymnothynnus* Turner

– Mesopleuron with scrobal groove (as in Fig. 3); propodeum evenly rounded; flagellomeres V–XI more than twice as long as broad and somewhat lobulate (as in Fig. 30) . . . . . *Epactiothynnus* Turner

29 Head posteriorly cupped, genal margins strongly narrowed and sharp-edged, with marginal fringe of long setae; occipital foramen with elevated necklike collar (as in Figs. 16, 18–19) 30

– Head not posteriorly cupped, genal margins broadly rounded, without marginal fringe of setae; occipital foramen without elevated collar 32

30 Propodeum somewhat flattened medially, with clearly indicated petiolar grooves (as in Fig. 35); hypopygium with multidentate apical platform or rounded with one apicomedial tooth (Fig. 58); basal maxillary palpomere with elongate fringe (Fig. 19); posterior malar articulation subtended by toothlike genal projection (Fig. 19) . . . . . *Tachynomia* Guérin Méneville

– Propodeum strongly rounded, without petiolar grooves (as in Fig. 36); hypopygium broadly tridentate to trilobate, without discrete posterior platform (as in Fig. 44); basal maxillary palpomere without fringe; posterior malar articulation simple or subtended by broadly rounded genal lobe (as in Figs. 16, 18) . . . 31

31 Oral fossa narrow, only extending to inner base of mandible; maxillary brush absent (Fig. 16); occipital collar usually protruding posteriorly behind head in lateral view (Fig. 16); head narrow in profile, not large and cuboidal, with gena behind eye less than half as wide as eye in side view (Fig. 16) . . . . . *Tachyphron* Brown

– Oral fossa wide, extending as far as mandibular insertion; maxillary brush well developed (Fig. 18); occipital collar not visible posteriorly behind head in lateral view (Fig. 18); head large and cuboidal, with gena behind eye more than half as wide as eye in side view (Fig. 18) . . . . . *Tachynoides* Kimsey

32 Propodeum evenly convex, without longitudinal grooves on either side of petiole (Fig. 36) and clypeus with medial carina; epipygium thin, evenly rounded and unmodified (Fig. 44); hypopygium broadly tridentate, with three more or less equally developed apical teeth (Fig. 44) . . . . . *Ariphron* Erichson

– Propodeum ovoid and somewhat flattened, with longitudinal grooves on either side of petiole (as in Fig. 35) (minimal in *Dythynnus* and *Leiothynnus*) and clypeus usually without medial carina; hypopygium not broadly tridentate, usually with one medial tooth and laterally rounded or truncate, ligulate or pentadentate 33

33 Prementum with long apical setae, setae as long or longer than prementum (as in Fig. 1) 34

– Prementum asetose or setae considerably shorter than prementum 35

34 Hypopygium notched laterally before apical platform, apically trilobate to hooflike (as in Figs. 57, 62); antennal lobes strongly elevated above and between antennal sockets . . . . *Phymatothynnus* Turner

– Hypopygium unnotched laterally before apical platform, apically pentadentate (Fig. 56); antennal lobes separated by medial depression . . . . . *Pentazeleboria* Brown

35 Hypostomal plate with each side narrower than stipes; occipital and hypostomal carinae convergent medially; stipes nearly asetose, without marginal or apical fringes of hair 36

– Hypostomal plate with each side as wide or wider than stipes (as in Fig. 1); occipital and hypostomal carinae widely to narrowly (*Beithynnus* species) separated medially; stipes usually with well-developed long marginal fringe of long setae 37

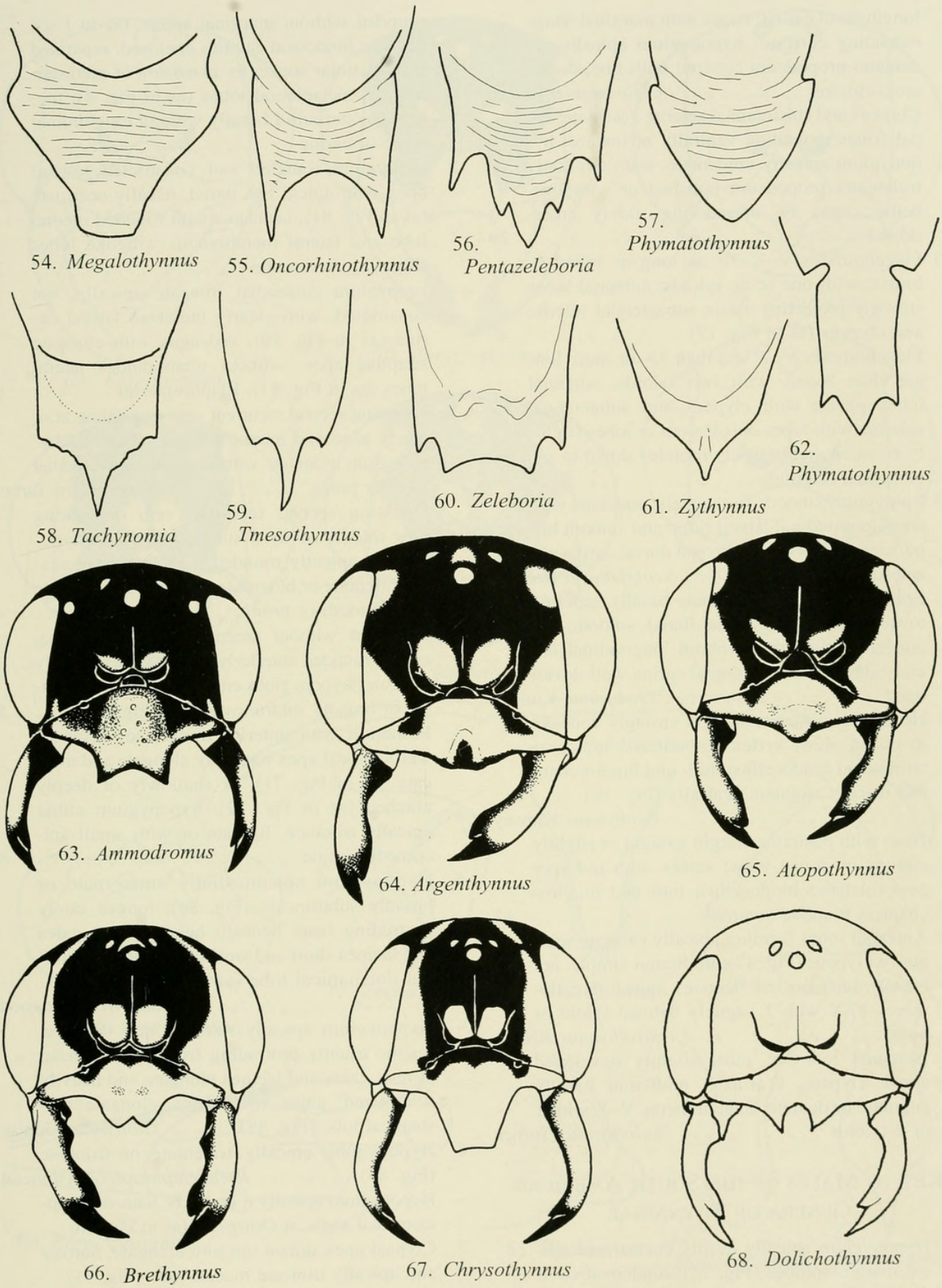
36 Metasoma not polished, covered with dense erect short setae, appearing velvety; flagellomeres V–XI less than twice as long as broad and cylindrical in cross-section (as in Fig. 33) or slightly bulging on one side; metasomal sternum I flattened or gently convex . . . . *Zythynnus* Kimsey

– Metasoma polished with sparse short decumbent setae; flagellomeres V–XI 2× or more longer than broad, somewhat arcuate; metasomal sternum I with well-developed ventral prong in most species (Fig. 31) . . . . . *Agriomyia* Guérin Méneville

37 Hypopygium ligulate, apex rounded (similar to Fig. 53, but without apical tooth); vertex without red spot posterolaterad of hindocellus; flagellomeres V–XI without tyloids . . . . . *Hathynnus* Kimsey

– Hypopygium apically dentate, with acute medial tooth and sometimes lateral tooth as well (appearing tridentate) (as in Figs. 46, 53); vertex usually with red spot posterolaterad hindocellus; flagellomeres V–XI usually with one or two tyloids 38

38 Clypeus and subantennal sclerite with medial



Figs. 54–68. 54–62, Dorsal view of hypopygium. 63–68, Front view of face, with antennae removed. Species illustrated: 54, *friederichi* (Dalla Torre); 55, *xanthospilus* (Shuckard); 56, *agnata* Brown; 57, *atratus* (Cameron); 58, *abdominalis* (Guérin Méneville); 59, *zelebori* (Saussure); 60, *xanthorrhoei* (Smith); 61, *vespoides* Kimsey; 62, *monilicorns* (Smith); 63, *frontalis* Guérin Méneville; 64, *impressus* (Bréthes); 65, *uiiidens* Kimsey; 66, *infernus* (Turner); 67. *inca* (Turner); 68, *pastoris* (Dalla Torre).

longitudinal carina; stipes with marginal fringe extending outward; hypopygium apically tridentate; propodeum covered with fine, dense, cross-ridging . . . . . *Chilothynnus* Brown

– Clypeus and subantennal sclerite ecarinate; stipal fringe extending ventrally or inward; hypopygium apically unidentate, less commonly tridentate; propodeum polished or with fine, dense rugae or shagreening, rarely cross-ridged 39

39 Flagellomeres V–X 3× as long as broad or longer, with one or no tyloids; antennal lobes strongly projecting above subantennal sclerite and clypeus (as in Fig. 17) 40

– Flagellomeres V–X less than 3× or more longer than broad, with two tyloids; antennal lobes planar with clypeus and subantennal sclerite, with lobes obsolescent or lobes slightly elevated and obtusely rounded down to subantennal sclerite 41

40 Epipygium smooth to coarsely punctate with short longitudinal lateral ridge and smooth impunctate apical lip; hindcoxal dorsal carina obsolescent . . . . . *Neozeleboria* Rohwer

– Epipygium coarsely punctate basally, tapering toward apex to somewhat flared, smooth, impunctate apical rim, without longitudinal lateral ridge; hindcoxal dorsal carina well-developed . . . . . *Dythynnus* Kimsey

41 Head with posterior margin strongly concave in dorsal view; vertex without red spot posterolaterad hindocellus; mid- and hindtrochanters usually angulate ventrally (Fig. 38) . . . . . *Beithynnus* Kimsey

– Head with posterior margin straight or slightly convex in dorsal view; vertex with red spot posterolaterad hindocellus; mid and hindtrochanters rounded ventrally 42

42 Antennal lobes forming apically carinate shelf above clypeus (Fig. 17); midfemur simple, not basally angulate or dentate; apical flagellomeres V–X with 1 vaguely defined tyloid or none . . . . . *Arthrothynnus* Brown

– Antennal lobes at most slightly developed above clypeus, ecarinate; midfemur basally angulate or dentate; flagellomeres V–X with 1 or 2 tyloids . . . . . *Leiothynnus* Turner

Key to Males of the South American Genera of Thynninae

1 Hypopygium apically evenly curved and apical margin spinose (Fig. 78); hindcoxal cavities continuous with petiolar socket, not enclosed by extension of metasternal and metapleural lobes (Fig. 5); metasomal sternum I basally with longitudinal ridge or carina (Rhagigasterini) . . . . . *Aelurus* Klug

– Hypopygium apically dentate or narrowly rounded without marginal spines (as in Figs. 82, 83); hindcoxal cavities enclosed, separated from petiolar socket by extension of metasternal and metapleural lobes (as in Fig. 4); metasomal sternum I basally without longitudinal ridge or carina 2

2 Epipygium rounded and constricted toward apex with apical rim flared, usually ecarinate (as in Fig. 81); aedeagus with rounded medial lobe and lateral membranous winglike lobes (Fig. 92); Scotaenini 3

– Epipygium somewhat truncate apically, not constricted, with clearly indicated lateral carina (as in Fig. 79); aedeagus with elongate straplike apex, without membranous lateral lobes (as in Fig. 91); Elaphropterini 9

3 Forewing second recurrent vein originating at or nearly at second transcubital vein (Fig. 80); hypopygium tridentate with elongate, acute medial tooth or prong . . . . . *Parelaphroptera* Turner

– Forewing second recurrent vein originating near middle of third submarginal cell; hypopygium apically rounded, angulate, unidentate, tridentate or bidentate, but without elongate medial tooth or prong 4

4 Pronotum without anterior transverse carina, evenly rounded anteriorly; clypeal apex broadly truncate; hypopygium either medially emarginate or broadly subtruncate (as in Fig. 84) . . . 5

– Pronotum with anterior transverse carina or welt; clypeal apex narrowly elongate and truncate (as in Fig. 71), or shallowly or deeply notched (as in Fig. 72); hypopygium either apically trilobate, ligulate or with small apicomedial angle 6

5 Hypopygium apicomedially emarginate or broadly subtruncate (Fig. 84); tongue rarely protruding from beneath head at rest; galea and lacinea short and weakly sclerotized, without dorsoapical lobe (as in Fig. 90) . . . . . *Anodontyra* Westwood

– Hypopygium apically rounded and hooflike; tongue usually protruding from beneath head at rest; galea and lacinea elongate and heavily sclerotized, galea with sharp, elongate dorsoapical lobe (Fig. 88) . . . . . *Glottynnus* Genise

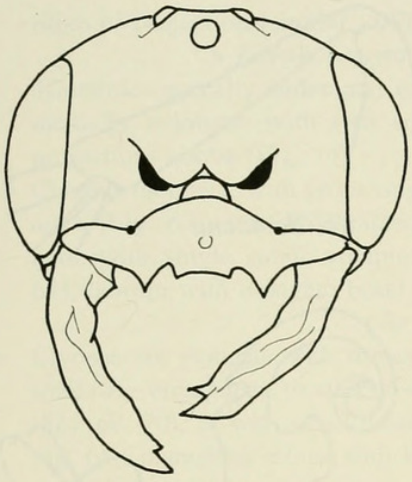
6 Hypopygium apically tridentate or trilobate (Fig. 85) . . . . . *Pseudelaphroptera* Ashmead

– Hypopygium apically rounded or with small apicomedial angle in *Ornepetes* (as in Fig. 86) . . 7

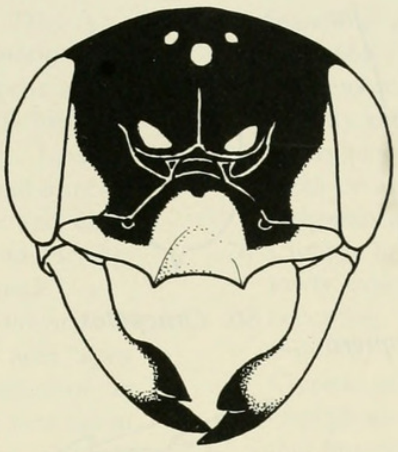
7 Clypeal apex drawn out into elongate, narrow and apically truncate medial lobe (Fig. 71) . . . . . *Rostrynnus* Genise

– Clypeal apex not drawn out into narrow truncation, short and apicomedially broadly truncate or medially notched (as in Fig. 72) 8

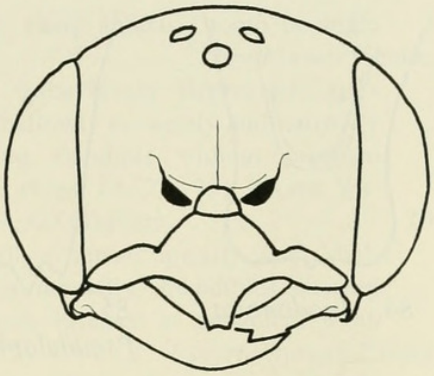
8 Hypopygium with small apicomedial angle or tooth (Fig. 86); hindtibia without distinct row



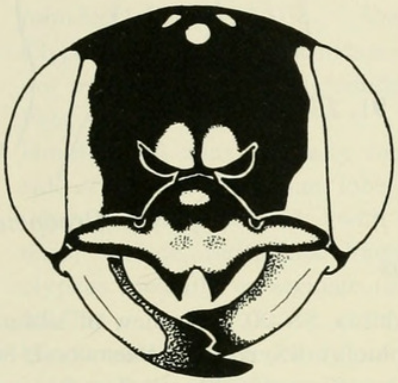
69. *Elaphroptera*



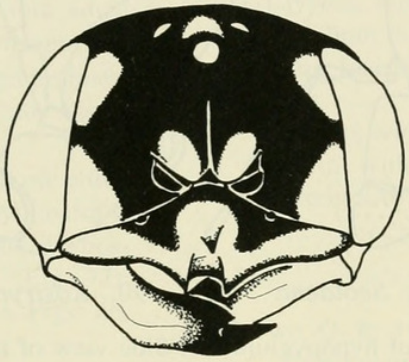
70. *Eucyrtothynnus*



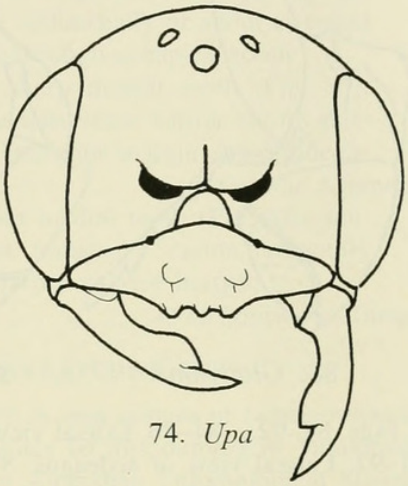
71. *Rostrynnus*



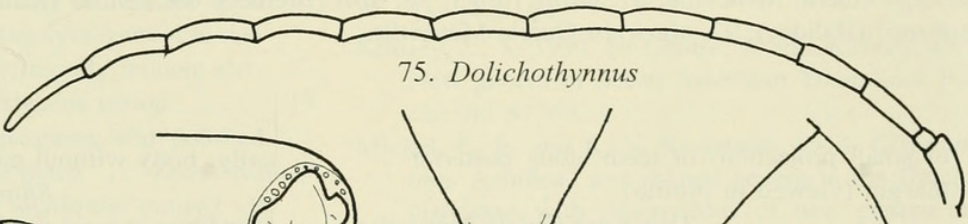
72. *Scotaena*



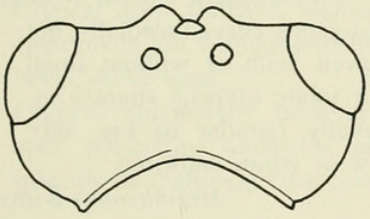
73. *Spilothynnus*



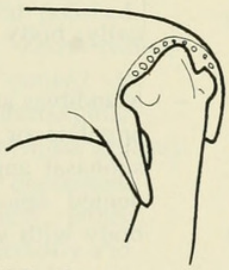
74. *Upa*



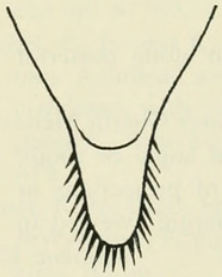
75. *Dolichothynnus*



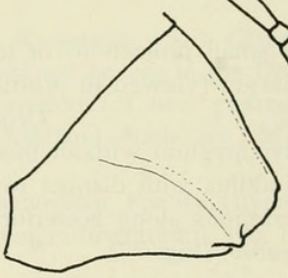
76. *Ammodromus*



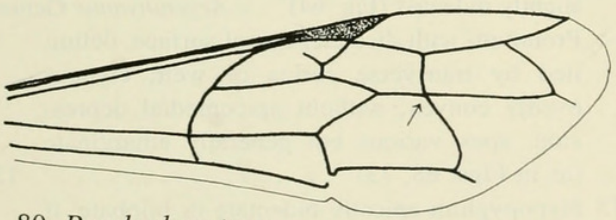
77. *Zeena*



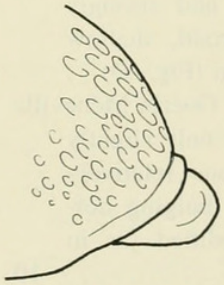
78. *Aelurus*



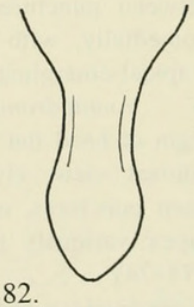
79. *Dolichothynnus*



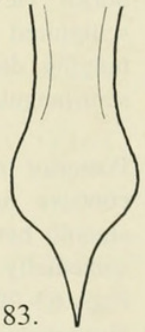
80. *Parelaphroptera*



81. *Rostrynnus*

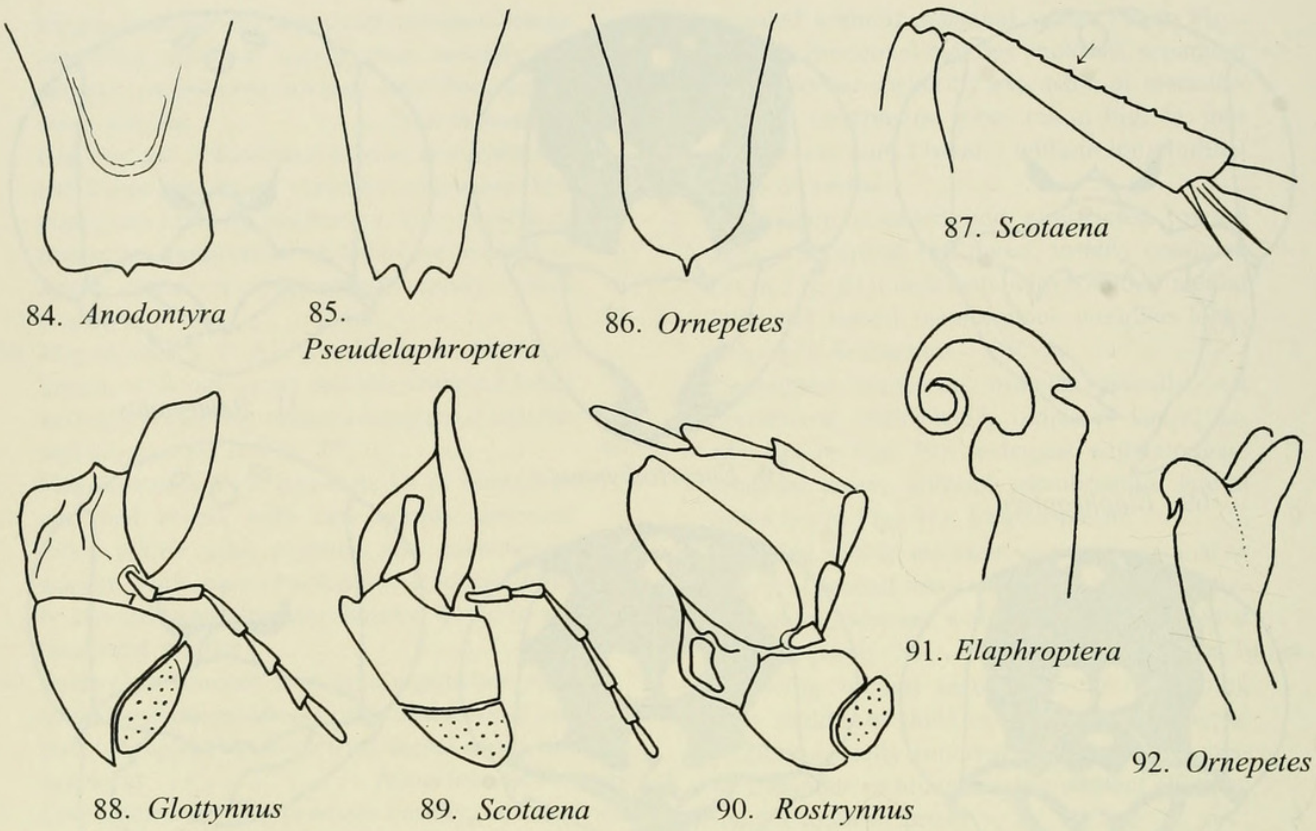


82. *Dolichothynnus*



83. *Mesothynnus*

Figs. 69–83. 69–74, Front view of face, with antennae removed. 75, Antenna. 76, Dorsal view of head. 77, Oblique view of hindfemorotibial joint. 78, Dorsal view of hypopygium. 79, Oblique view of epipygium. 80, Forewing. 81, Side view of epipygium and hypopygium. 82–83, Dorsal view of hypopygium. Species illustrated: 69, *vulpina* (Klug); 70, unidentified species; 71, *tarsatus* (Klug); 72, *polistoides* Turner; 73, *laetus* (Klug); 74, *impressiceps* (Turner); 75, *pastoris* (Dalla Torre); 76, *frontalis* Guérin Méneville, 77; *aethiops* (Klug), 78; *nigrofasciatus* (Smith); 79, *pastoris* (Dalla Torre); 80, *santacruciana* (Brethes); 81, *tarsatus* (Klug); 82, *pastoris* (Dalla Torre); 83, *gratiosus* (Smith).



Figs. 84–92. 84–86, Dorsal view of hypopygium. 87, Side view of hindtibia. 88–90, Side view of labium. 91–92, Lateral view of aedeagus. Species illustrated: 84, *quadrizonata* (Spinola); 85, *tricolor* Westwood; 86, *nigriceps* Guérin Méneville; 87, *horni* Turner; 88, *lara* (Brethes), 89; *genisei* (Kimsey); 90, *tricolor*; 91, *scoliaeformis* (Haliday); 92, *nigriceps* Guérin Méneville.

of small projections or teeth along posterior margin (viewed in profile) . . . . . *Ornepetes* Guérin Méneville

– Hypopygium without medial angle or tooth; hindtibia with distinct row of projections or serrations along posterior margin (viewed in profile) (Fig. 87) . . . . . *Scotaena* Klug

9 Posterior margin of head strongly concave in dorsal view (Fig. 76); clypeus irregularly sculptured between punctures, and strongly bulging dorsomedially, with broad, shallow subtriangular apical emargination (Fig. 63) . . . . . *Ammodromus* Guérin Méneville

– Posterior margin of head flat or only slightly concave in dorsal view; clypeus relatively smooth between punctures, not bulging dorsomedially, apex variously modified (as in Figs. 63–70, 73–74) 10

10 Hypopygium apex trilobate, tridentate or sharply triangular or unidentate (as in Fig. 83) 11

– Hypopygium apex rounded (as in Fig. 82), truncate or bilobate 12

11 Mandibles distinctly bent and angulate medially, somewhat elbowed, usually with small subbasal tooth or angle (Fig. 69); clypeus broadly, but usually, shallowly emarginate apically; body without pale markings . . . . . *Elaphroptera* Guérin Méneville

– Mandibles at most gently curved medially, not angulate or elbowed, with or without small subbasal angle or tooth; clypeus slightly indented apicomedially (similar to Fig. 66); body with yellow or white markings . . . . . *Mesothynnus* Kimsey

12 Pronotum without discrete, delimited dorsal surface; clypeus bulging somewhat around apicomedial depression, apex narrow and at most slightly indented (Fig. 64) . . *Argenthynnus* Genise

– Pronotum with discrete, dorsal surface, delimited by transverse carina or welt; clypeus evenly convex, without apicomedial depression, apex various but generally emarginate (as in Figs. 68, 73) 13

13 Hypopygium apically bidentate or bilobate, if apparently rounded apically then mandibles tridentate 14

– Hypopygium apically rounded, unidentate or truncate (as in Fig. 82), and mandibles always bidentate (as in Figs. 67–68) 16

14 Mandibles apically tridentate; clypeus apicomedially emarginate, with polished bevel above emargination, usually overhung by

ridge or projection (similar to Fig. 73) . . . . . *Telephoromyia* Guérin Méneville

– Mandibles apically bidentate; clypeus apicomedially trilobate, with two small lobes or projections above (Fig. 74) . . . . . *Upa* Kimsey

15 Clypeus elongate, with projecting and truncate apex (Fig. 67); mandibles slender and elongate, with single small subapical tooth (Fig. 67); labrum with elongate basal "neck" . . . . . *Chrysothynnus* Turner

– Clypeus not elongate with truncate apex, apex shallowly emarginate to deeply notched (as in Figs. 68, 70), or with small medial lobe (as in Fig. 65); mandibles robust with large subapical tooth; labrum without long basal "neck" . . . 16

16 Clypeus projecting apicomedially into small rounded lobe (Fig. 65) . . . *Atopothynnus* Kimsey

– Clypeus apicomedially truncate or emarginate, not produced into small rounded lobe (as in Figs. 66, 68, 70, 73) 17

17 Hindfemoral apex ventrally lobate on either side of femoral-tibial joint, lobes asymmetrical when viewed posteriorly, with flattened posterior surface, inner lobe longest (Fig. 77); clypeus medially emarginate (as in Figs. 66, 68, 73) 18

– Hindfemoral apex generally not expanded into obvious lobes on either side of femoral-tibial joint, or if lobate then lobes symmetrical in size when viewed posteriorly, usually without flattened posterior surface; clypeus various 19

18 Clypeal apex medially emarginate, with polished subtriangular bevel above notch . . *Zeena* Kimsey

– Clypeal apex truncate, shallowly convex or emarginate but without polished subtriangular bevel above apex . . . . . *Merithynnus* Kimsey

19 Clypeus subapically transversely depressed, apex projecting somewhat anteriorly, either truncate or shallowly emarginate medially and mandible with sharp subbasal tooth or angle (Fig. 66) . . . . . *Brethynnus* Genise

– Clypeus not transversely depressed, apex broadly and shallowly or deeply and narrowly emarginate and mandible without subbasal tooth or angle (Figs. 68, 70, 73), except *Spilothynnus exsectus* (Turner). 20

20 Clypeus broadly truncate apically, very shallowly concave medially, mandibles slender, becoming much broader at subapical tooth (Fig. 70) . . . . . *Eucyrtothynnus* Turner

– Clypeus narrow apically, shallowly or deeply emarginate (as in Figs. 68, 73); mandibles either broadened submedially or about as broad submedially as through subapical tooth . . . 21

21 Clypeus with sharp medial tooth (Fig. 73); scutellum with transverse carina before posterior margin, posterior margin sharply declivous . . . . . *Spilothynnus* Ashmead

– Clypeus without medial tooth (Fig. 68); scutellum without transverse carina, smoothly flattened to sharp posterior margin . . . . . *Dolichothynnus* Turner

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