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The Limoniinae (Diptera: Tipulidae) of Australia VIII. Preliminary key to the genus-group taxa

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Abstract: The genus-group taxa of the Australian Limoniinae are keyed, with relevant characters illustrated.

Introduction

Until now, a key to the genera and subgenera of the Australian Limoniinae has not been available. Therefore, since starting to study this group of crane flies in 1988, I have been asked repeatedly by Australian biologists and by overseas tipulid specialists to provide such a key.

After having revised several genera and having sorted most of the Australian Limoniinae available in collections, I am now in a position to present a preliminary key to the genus-group taxa. I am particularly glad about the timing of the key's appearance, as it is coincident with a forthcoming project on the larvae of the Australian Tipulidae. Apart from filling a gap, the preliminary key below should facilitate this and other projects in their infant stages and will possibly benefit from them later.

It should be noted again that besides the one-family concept of Tipulidae which was followed throughout his career by Alexander, which was recently seconded by BYERS (1992) and which is followed in this paper, an alternative multi-family system of crane flies is presently being used and has been used for some time by tipulid workers, particularly in Europe. According to this system which was very well laid out by STARÝ (1992), the genus-group taxa included in the key below belong in two families other than Tipulidae [*Tricyphona* (*Tricyphona*) in Pediciidae; remaining taxa in Limoniidae]. The groups hitherto ranked as tribes in "The Limoniinae (Diptera: Tipulidae) of Australia" were accordingly given the rank of subfamilies in the alternative system.

Thus, including some nomenclatorial updating, Limoniini became Limoniinae, Hexatomini became Limnophilinae, and Eriopterini became Chioneinae.

The arrangement of the genus-group taxa in the key below also follows more or less the classification of Alexander which is based largely on characters of the wing venation. Some of the now available and more modern systems differ from Alexander mainly in the classification of the group regarded in the present key as genus *Limonia* MEIGEN. The *Limonia* subgenera *Atypophthalmus* BRUNETTI, *Dapanoptera* WESTWOOD, *Dicranomyia* STEPHENS, *Discobola* OSTEN SACKEN, *Geranomyia* HALIDAY, *Libnotes* WESTWOOD, *Limonia* s. str., *Rhipidia* MEIGEN and *Thrypticomyia* SKUSE are now mostly regarded as genera, with genus *Dicranomyia* including amongst others the subgenera *Dicranomyia* s. str., *Goniodineura* WULP, *Idioglochina* ALEXANDER, *Nealexandriaria* ALEXANDER and *Pseudoglochina* ALEXANDER (*Cygnomyia* THEISCHINGER, *Nesciomyia* THEISCHINGER and *Pandamyia* THEISCHINGER would most probably also belong here) and with genus *Libnotes* including amongst others *Libnotes* s. str., *Metalibnotes* ALEXANDER, *Neolibnotes* ALEXANDER and *Paralibnotes* ALEXANDER. *Trimicra* OSTEN SACKEN, considered as a subgenus of *Erioptera* MEIGEN by some (e. g. ALEXANDER & BYERS 1981) and as a subgenus of *Symplecta* MEIGEN by others (e. g. SAVTSCHENKO 1982) is treated in this paper as a distinct genus.

Methods

Original citations and bibliography of names are not given. They can be found in OOSTERBROEK (1989) and in THEISCHINGER (1992, 1993, 1994b, 1995b).

The descriptive terminology largely follows ALEXANDER and BYERS (1981), however, without using subscript numerals for divisions of veins.

Under each taxon of the genus-group the number of described species is given, followed by the general distribution of the group in Australia. In this context it should be noted that only a few genera have been revised and updated recently (THEISCHINGER 1992, 1993, 1994a, 1994b, 1996a, 1996b).

Users of this key should be aware that in some cases the key may work only for the known Australian members of the generic units involved.

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Key to genera and subgenera (adults only)

[Both sexes of one species of *Gynoplistia* (*Xenolimnophila*) (body 15 mm or longer, antennae simple), the female of one species of *Gynoplistia* (*Gynoplistia*) (body markedly shorter than 15 mm, antennae pectinate) and at least the females (males possibly; unknown) of two species of *Molophilus* (body length ca 3 mm) are known to be brachypterous; they are not included in the key.]

1. Eyes hairy, with short hairs between ommatidia (Fig. 1); Sc1 very long, exceeding fork of Rs; Sc2 basal to origin of Rs (Fig. 2) ..... *Tricyphona* (*Tricyphona* ZETTERSTEDT) 2 species; south-eastern, south-western

\- Eyes glabrous (Fig. 3); Sc1 short or of moderate length (Fig. 4); when Sc1 longer, Sc2 usually situated distal to origin of Rs (Fig. 5); when Sc2 situated basal to origin of Rs, Sc1 not exceeding fork of Rs (Fig. 6) 2

2 (1). R1, R1+2, R2+3 and R3 forming X-shaped vein crossing; R2 very short; dm hexagonal and proximally pointed (Fig. 5) ..... *Lechria* SKUSE 3 species; eastern

\- No such vein crossing formed; dm not hexagonal and not proximally pointed (Fig. 6) 3

3 (2). Vein r-m more or less in direct alignment with Rs; CuA2 distally fused with A1 (Fig. 7) ..... *Trentepohlia* BIGOT, 4

\- Vein r-m not in alignment with Rs; CuA2 not fused with A1 (Fig. 6) 5

4 (3). M with two branches (Fig. 7) ..... *Trentepohlia* (*Trentepohlia* BIGOT) 4 species; northern, eastern

\- M with three branches (Fig. 8) ..... *Trentepohlia* (*Mongoma* WESTWOOD) 3 species; north-eastern

5(3). Front of head extended into long, slender rostrum, half body length or more (Figs 9a, b) 6

- Front of head not or only moderately produced (Figs 10a-d) 8

6 (5). Setae on legs simple (Fig. 11); origin of Rs before Sc2 (Fig. 12) ..... *Elephantomyia* (*Elephantomyodes* ALEXANDER)
2 species; eastern

- Setae on legs bifid (Fig. 13); origin of Rs beyond Sc2 (Figs 6, 14) ..... *Toxorhina* LOEW, 7

7 (6). Rs with two branches; M with two branches; discal cell (dm) closed (Fig. 6) ..... *Toxorhina* (*Ceratocheilus* WESCHE)
5 species; eastern, south-western

- Rs unbranched; M unbranched or with two branches; discal cell open (Fig. 14) .... *Toxorhina* (*Eutoxorhina* ALEXANDER)
1 species; north-eastern

8 (5). Two or three branches of R reaching the margin (Fig. 4) 9

- Four branches of R reaching the margin (Fig. 15) 38

9 (8). Antennae 14 segmented ..... *Limonia* MEIGEN, 10

- Antennae 15 or 16 segmented 28

10 (9). M unbranched (Fig. 4) ..... *Limonia* (*Nealexandriaria* ALEXANDER)
2 species; northern

- M with two branches (Fig. 16) 11

11 (10). Mouthparts, especially labella, elongate, usually about equal in length to combined head and thorax (Fig. 10a) ..... *Limonia* (*Geranomyia* HALIDAY)
24 species; eastern

- Mouthparts shorter than remainder of head (Fig.10b) 12

12 (11). Supernumerary crossveins in cells R3, R4+5 or A1 (Figs 16-18) 13

- No supernumerary crossveins (Fig. 19) 15

13 (12). Flagellomeres of male antennae produced into two lobes of different length (Fig. 20); supernumerary crossvein in cell R3 (Fig. 16) ..... *Limonia* (*Pandamyia* THEISCHINGER)
2 species; north-eastern

- Flagellomeres of antennae not produced (Fig. 21); supernumerary crossveins in cells R4+5 or A1 (Figs 17, 18) 14

14 (13). Supernumerary crossvein in cell R4+5 (Fig. 17) ..... *Limonia* (*Dapanoptera* WESTWOOD)
3 species; eastern (mainly north-eastern)

- Supernumerary crossvein in cell A1 (Fig. 18) ..... *Limonia* (*Discobola* OSTEN SACKEN)
1 species; south-eastern

15 (12). Flagellomeres of antennae of both sexes produced into substantial lobes [male, 2 long slender lobes (Fig. 22); female, 1 short stout lobe (Fig. 23)]... 16

- Flagellomeres of antennae not produced..... 17

16 (15). Sc ending well before origin of Rs (Fig. 19)..... *Limonia* (*Idioglochina* ALEXANDER)
2 species; northern, north-eastern

- Sc ending very close to origin of Rs (Fig. 24) .....*Limonia* (*Rhipidia* MEIGEN)
2 species; south-eastern

17 (15). Vein CuP lacking (Fig. 25) .....*Limonia* (*Thrypticomyia* SKUSE)
5 species; eastern

- Vein CuP present (Fig. 26)..... 18

18 (17). Some branches of Rs and M strongly deflected backward near wing apex (Figs 26, 27) 19

- Branches of Rs and M not strongly deflected backward near wing apex (Figs 28-32)..... 20

19 (18). Sc1 ending some distance beyond fork of Rs; Rs three times as long as r-m or longer (Fig. 26) ..... *Limonia* (*Libnotes* WESTWOOD)
5 species; eastern

- Sc1 ending from about opposite to origin of Rs to just beyond fork of Rs; Rs twice as long as r-m or shorter (Fig. 27) ..... *Limonia* (*Neolibnotes* ALEXANDER)
2 species; north-eastern

20 (18). Male hypopygium with one pair of gonostyli (g) (Figs 33-35)..... 21

- Male hypopygium with two pairs of gonostyli (dg, vg) (Figs 36-40)..... 23

21 (20). Male hypopygium with meso-ventral lobe (mvl) of gonocoxite markedly longer than gonostylus (g) (Fig. 33)..... *Limonia* (*Metalibnotes* ALEXANDER)
1 species; eastern

- Male hypopygium with meso-ventral lobe (mvl) of gonocoxite markedly shorter than gonostylus (g) (Figs 34, 35) 22

22 (21). Male hypopygium with aedeagus (ae) appearing markedly longer than width of tergum 9 (Fig. 34) .....*Limonia* (*Paralibnotes* ALEXANDER)
1 species; eastern

- Male hypopygium with aedeagus (ae) appearing shorter than width of tergum 9 (Fig. 35) ..... *Limonia* (*Limonia* MEIGEN)
5 species; eastern

23 (20). Wings strongly narrowed and petiolate at base; cell A2 very small (Figs 28-30) 24

- Wings not particularly narrow or petiolate at base; cell A2 of moderate size (Figs 31, 32) 26

24 (23). Sc ending close to origin of Rs; discal cell open (Fig. 28) ..... *Limonia* (*Pseudoglochina* ALEXANDER)
1 species; eastern (mainly north-eastern)

- Sc ending some distance beyond origin of Rs; discal cell (dm) closed (Figs 29, 30) 25

25 (24). Wing with anal angle (aa) detectable (Fig. 29); male hypopygium with ventral gonostylus (vg) simple (Fig. 36) ..... *Limonia* (*Nesciomyia* THEISCHINGER)
1 species; north-eastern

- Wing without anal angle (Fig. 30); male hypopygium with ventral gonostylus (vg) differentiated into base and rostral prolongation (Fig. 37) ..... *Limonia* (*Cygnomyia* THEISCHINGER)
1 species; north-eastern

26 (23). Male without any spines on rostral prolongation of ventral gonostylus (vg); proctiger (pr) forming several separate lobes (Fig. 38) ..... *Limonia* (*Atypophthalmus* BRUNETTI)
2 species; eastern

- Male with rostral prolongation of ventral gonostylus (vg) armed with at least one spine; proctiger (pr) not strongly modified (Figs 39, 40) 27

27 (26). Sc usually ending before fork of Rs, and Sc1 not particularly long (Fig. 31); male usually with two, more rarely with one or several spines on rostral prolongation of ventral gonostylus (vg) (Fig. 39) ..... *Limonia* (*Dicranomyia* STEPHENS)
66 species; northern, southern, eastern, western

- Sc ending beyond fork of Rs, and Sc1 long (Fig. 32); male with one thick and one rather weakly developed spine on rostral prolongation of ventral gonostylus (vg) (Fig. 40) ..... *Limonia* (*Goniodineura* WULP)
1 species; north-eastern

28 (9). Discal cell open (Figs 41-44) 29

- Discal cell (dm) closed (Fig. 45) 32

29 (28). Sc2 not evident; anal angle (aa) prominent (Fig. 41) ..... *Antocha* (*Orimargula* MIK)
2 species; eastern

- Sc2 clearly evident; anal angle (aa) wide or widely rounded (Figs 42-44) 30

30 (29). Rs aligned with R2+3; bscu well before fork of M (Fig. 42) ..... *Orimarga* (*Orimarga* OSTEN-SACKEN)
3 species; eastern (mainly south-eastern)

- Rs aligned with R4+5; bscu close to or beyond fork of M (Figs 43, 44) 31

31 (30). Arculus (arc) before 1/5 wing length; M3 absent (Fig. 43) ..... *Collessophila* THEISCHINGER
1 species; north-eastern

- Arculus (arc) beyond 1/5 wing length; M3 branching from a basal fusion with CuA1 (Fig. 44) ..... *Tonnoiromyia* ALEXANDER
3 species; south-eastern

32 (28). Front of head produced, with rostrum from about as long as remainder of head to four times as long as remainder of head (Figs 10c, d); R2 absent (Fig. 45) ..... *Helius* LEPELETIER & SERVILLE, 33

- Front of head not produced, rostrum shorter than remainder of head; R2 absent (Fig. 46) or present (Figs 47, 48). 36

33 (32). R4+5 and M1+2 partly fused, thus crossvein r-m absent (Fig. 49); male hypopygium with only one pair of gonostyli (g) (Fig. 50) ..... *Helius* (*Mammuthonasus* THEISCHINGER)
1 species; northern

- R4+5 and M1+2 not fused, crossvein r-m present (Fig. 45); male hypopygium with two pairs of gonostyli (dg, vg) (Fig. 51) 34

34 (33). Crossvein r-m connecting R4+5 and M1+2 (Fig. 45) ..... *Helius* (*Helius* LEPELETIER & SERVILLE)
8 species; northern, southern, eastern, western

- Crossvein r-m connecting Rs and M1+2 (Figs 52, 53) 35

35 (34). Crossvein bscu before fork of M (Fig. 52) ..... *Helius* (*Rhampholimnobia* ALEXANDER)
1 species; north-eastern

- Crossvein bscu beyond fork of M (Fig. 53) .... *Helius* (*Eurhamphidia* ALEXANDER)
  2 species; eastern (mainly south-eastern), south-western

36 (32). Anterior branch of Rs ending well beyond 2/3 wing length (Fig. 46) .... *Gonomyia* (*Leiponeura* SKUSE)
  24 species; throughout Australia

- Anterior branch of Rs ending well before 2/3 wing length (Figs 47, 48) 37

37 (36). Rs with two branches (Fig. 47) .....*Styringomyia* LOEW
  3 species; north-eastern

- Rs with three branches (Fig. 48)..... *Teucholabis* (*Teucholabis* OSTEN-SACKEN)
  2 species; south-eastern

38 (8). Sc1 lacking or virtually so (Fig. 15), or Sc2 much more strongly developed than Sc1 (Fig. 54) 39

- Sc1 clearly present and not much less strongly developed than Sc2 (Fig. 55)....40

39 (38). Tibial spurs present (Fig. 56); R2+3 markedly longer than R2 (Fig. 15) .... *Gynoplistia* (*Cerozodia* MACQUART)
  1 species; south-western

- No tibial spurs (Fig. 57); R2+3 shorter than or subequal in length to R2 (Fig. 54)..... *Tipulimnoea* THEISCHINGER
  1 species; south-eastern

40 (38). Antennae with fewer than 10 segments..... *Hexatoma* (*Eriocera* MACQUART)
  4 species; eastern

- Antennae with more than 10 segments 41

41 (40). R2 absent and R3+4 longer than or subequal in length to R4 (Figs 55, 58-60) 42

- R2 present (Fig. 61); when, exceptionally, R2 absent or not detectable, R3+4 markedly shorter than R4 (Fig. 62) 46

42 (41). Discal cell open; Sc1 ending close to origin of Rs (Fig. 55)..... .....*Idiocera* (*Idiocera* DALE)
  1 species; northern, north-western

- Discal cell (dm) closed; Sc1 ending well beyond origin of Rs (Figs 58-60) ...43

43 (42). R4 ending close to wing apex (Fig. 58) ..... *Horistomyia* ALEXANDER
  4 species; south-eastern, south-western

- R4 ending well before wing apex (Figs 59, 60) 44

44 (43). Basal section of R5 aligned more closely with Rs than with r-m (Fig. 59) ..... *Atarba* (*Ischnothrix* BIGOT)
13 species; eastern, south-western

- Basal section of R5 aligned more closely with r-m than with Rs (Fig. 60) ..... *Rhabdomastix* SKUSE, 45

45 (44). Male antennae nearly as long as body or longer ..... *Rhabdomastix* (*Rhabdomastix* SKUSE)
2 species; south-eastern

- Male antennae much shorter than body ..... *Rhabdomastix* (*Sacandaga* ALEXANDER)
2 species; south-eastern

46 (41). Series of crossveins (usually more than 6) between C and Sc (Fig. 61) ..... *Conosia* WULP
1 species; throughout Australia

- No series of crossveins (usually 1-3) between C and Sc (Fig. 63) 47

47 (46). Tibial spurs present 48

- Tibial spurs absent 59

48 (47). Rostrum as long as or longer than remainder of head (Figs 64, 65) 49

- Rostrum markedly shorter than remainder of head 50

49 (48). Rostrum about as long as remainder of head (Fig. 64); basal flagellomeres with lower surface protuberant; R2+3 subequal in length to R2; R2+3+4 much longer than basal section of R5 (Fig. 63) ..... *Bergrothomyia* ALEXANDER
3 species; south-eastern

- Rostrum about twice as long as remainder of head (Fig. 65); flagellomeres not protuberant; R2+3 several times as long as R2; R2+3+4 and basal section of R5 subequal in length (Fig. 66) ..... *Tonnoirella* ALEXANDER
1 species; south-eastern

50 (48). Cell C usually with 1-3 supernumerary crossveins (Fig. 67) ..... *Epiphragma* (*Epiphragma* OSTEN SACKEN)
6 species; eastern

- Cell C without supernumerary crossvein(s) (Fig. 68) 51

51 (50). Rs curved step-like at about midlength; bscu situated in line with distal end of discal cell (dm) (Fig. 68) ..... *Skuseomyia* ALEXANDER
1 species; eastern

- Rs not curved step-like; bscu usually situated well before distal end of discal cell (dm) (Fig. 69) 52

52 (51). Antennae with basal flagellomeres bearing verticillar hairs that are markedly longer than the flagellomeres; squama with macrotrichia (Fig. 70); R2 well before fork of R3+4 (Fig. 72) ..... *Pilaria* SINTENIS
1 species; north-eastern

- Verticillar hairs of basal flagellomeres not markedly longer than flagellomeres; squama without macrotrichia (Fig. 71); R2 generally well beyond fork of R2+3+4 (Fig. 73) or, exceptionally, not detectable (Fig. 62) 53

53 (52). Crossvein r-m about level with first fork of Rs and about as long as or longer than basal section of R5 (Fig. 69), or, r-m distal to first fork of Rs and distal section of M1+2 longer than cell M1 (Fig. 73) 54

- Crossvein r-m well beyond first fork of Rs, and usually markedly shorter than basal section of R5 (Fig. 74), or, r-m about level with first fork of Rs and distal section of M1+2 shorter than cell M1 (Fig. 75) 55

54 (53). Antennae with flagellomeres protuberant ventrally (Fig. 76) ..... *Diemenomyia* ALEXANDER
2 species; south-eastern

- Antennae with flagellomeres not protuberant ventrally ..... *Limnophila* MACQUART
68 species; eastern

55 (53). Antennae filiform, exceptionally moniliform (flagellomeres not produced into lobes); anterior arculus absent; A2 almost straight (Fig. 77) 56

- Antennae mostly pectinate (flagellomeres produced into lobes), or, rarely, filiform or moniliform; anterior arculus (anta) preserved; A2 generally sinuous (Fig. 74) 57

56 (55). R1+2 more than half as long as R3 (Fig. 77); male hypopygium with dorsal lobe (dl) and medial process of tergum 9 (t9), and gonocoxites (ge) produced posteromedially (Fig. 78) ..... *Leolimnophila* THEISCHINGER
2 species; eastern (mainly south-eastern)

- R1+2 less than half as long as R3 (Fig. 79); male hypopygium without dorsal lobe or posteromedial process of tergum 9 (t9), and gonocoxites (ge) not produced posteromedially (Fig. 80) ..... *Austrolimnophila* (*Austrolimnophila* ALEXANDER)
10 species; eastern

57 (55). R1+2 strongly curved and considerably longer than R2 (Fig.74); male hypopygium with segment 9 (s9) broadly open ventrally (apparently not sclerotized) (Fig. 81) ..... *Paralimnophila* (*Paralimnophila* ALEXANDER) 59 species; northern, eastern, south-western

- R1+2 rather straight and usually about as long as R2 (Fig. 82); male hypopygium with segment 9 (s9) broadly sclerotized ventrally (closed) (Fig. 83)..... *Gynoplistia* MACQUART (in part), 58

58 (57). Antennae generally pectinate or ventrally protuberant (Fig. 84), or if not (females of a few species), body shorter than 14 mm; male hypopygium (Fig. 83): segment 9 (s9) without strongly sclerotized X-shaped support along ventral midline..... *Gynoplistia* (*Gynoplistia* MACQUART) 96 species; northern, eastern, south-western

- Antennae never pectinate or ventrally protuberant (Fig. 85); body length of females at least 15 mm; male hypopygium (Fig. 86): segment 9 (s9) with small posterior lobes (vl) and with strongly sclerotized X-shaped inner support (xs) along ventral midline .... *Gynoplistia* (*Xenolimnophila* ALEXANDER) 5 species; eastern

59 (47). Sc2 beyond first fork of Rs (Fig. 87); size larger (wing length >10 mm) .... *Sigmatomera* (*Austrolimnobia* ALEXANDER) 3 species; eastern

- Sc2 absent or before first fork of Rs (Figs 88, 89); size small (wing length <10 mm) 60

60 (59). Middle and hind coxae (c2, c3) approximated, mesothoracic meron (m) not larger than mesocoxa (Fig. 90)..... *Gymnastes* (*Paragymnastes* ALEXANDER) 7 species; northern, eastern

- Middle and hind coxae (c2, c3) more widely separated, meron (m) large, more extensive than mesocoxa (Fig. 91)..... 61

61 (60). Rs ending in cell R3, with veins R2+3 and R4+5 distinct (Fig. 88), or Rs in direct alignment with vein R4 (Fig. 92) 62

- Rs ending in cell R4 (Fig. 93), or in direct alignment with R5 (Fig. 94)..... 68

62 (61). Rs ending in cell R3; cell A2 generally almost as long as and wider than cell A1 (Fig. 88) ..... *Molophilus* CURTIS, 63

- Rs in direct alignment with R4; cell A2 much shorter and narrower than cell A1 (Fig. 92) ..... *Tasiocera* (*Tasiocera* SKUSE) 24 species; eastern; south-western

63 (62). Male hypopygium (Fig. 95): inner gonostylus (ig) with two separate branches..... *Molophilus* (*Austromolophilus* THEISCHINGER) 57 species; eastern

- Male hypopygium (Figs 96-101): inner gonostylus (ig) unbranched 64

64 (63). Male hypopygium (Fig. 96): dorsal lobe of gonocoxite (ge) with bristle-bearing dorsal appendage (da)...*Molophilus* (*Diplomolophilus* THEISCHINGER) 2 species; south-eastern

- Male hypopygium (Figs 97-101): dorsal lobe of gonocoxite (ge) without dorsal appendage 65

65 (64). Male hypopygium (Fig. 97): parameres (p) forming lyriform fork; mesodorsal apodeme (ma) of gonocoxites reaching anteriorly well beyond base of tergum 9 (t9) ..... *Molophilus* (*Lyriomolophilus* THEISCHINGER) 13 species; eastern

- Male hypopygium (Figs 98-101): parameres (p) not lyriform; mesodorsal apodeme (ma) of gonocoxites not reaching base of tergum 9 (t9).....66

66 (65). Male hypopygium (Fig. 98): a U-shaped notch between mesal and ventral lobes of gonocoxite; outer gonostylus (og) extremely small and situated at considerable distance from base of inner gonostylus (ig)..... ..... *Molophilus* (*Onychomolophilus* THEISCHINGER) 3 species; south-eastern

- Male hypopygium (Figs 99-101): no U-shaped notch between mesal and ventral lobes of gonocoxite; outer gonostylus (og) generally much larger and usually originating not far from base of inner gonostylus (ig).....67

67 (66). Male hypopygium (Fig. 99): parameres (p) completely separate, each connected to base of mesal face of gonocoxites (ge)..... .....*Molophilus* (*Superbomolophilus* THEISCHINGER) 9 species; eastern

- Male hypopygium: parameres (p) not completely separate and not connected to mesal face of gonocoxites (ge) (Fig. 100), or fused at least half their length (Fig. 101).....*Molophilus* (*Molophilus* CURTIS) ca 202 species; northern, eastern, southern, south-western

68 (61). M3 and CuA1 not fused (Fig. 93) .....*Amphineurus* (*Amphineurus* SKUSE) 15 species; eastern, south-western

- M3 and CuA1 fused for some distance (Fig. 94) 69

69 (68). Rs in direct alignment with R5 (Fig. 94).....*Baeoura* ALEXANDER 4 species; eastern

- Rs ending in cell R4 (Fig. 89) 70

70 (69). R2 originating from R2+3+4 (Fig. 89) ..... *Cheilotrichia* ROSSI, 71

- R2 originating from R2+3 (Figs 102, 103) 72

71 (70). Wing with discal cell (dm) closed (Fig. 89) ..... *Cheilotrichia* (*Cheilotrichia* ROSSI)
1 species; eastern (mainly north-eastern)

- Wing with discal cell open (Fig. 104) ..... *Cheilotrichia* (*Empeda* OSTEN SACKEN)
1 species; north-eastern

72 (71). Rs and R5 subequal in length; discal cell (dm) closed (Fig. 102) ..... *Trimicra* OSTEN SACKEN
1 species; throughout Australia (in moist habitats)

- Rs much shorter than R5; discal cell open (Fig. 103) ..... *Erioptera* MEIGEN, 73

73 (72). Male hypopygium with parameres (p) completely fused medially; ventral lobe of gonocoxites (ge) long, sausage-shaped (Fig. 105) ..... *Erioptera* (*Alcheringa* THEISCHINGER)
1 species; south-eastern

- Male hypopygium with parameres (p) distinctly separated; ventral lobe of gonocoxites (ge) not prominent (Figs 106, 107) 74

74 (73). Antennae with basal flagellomere distinctly expanded (Fig. 108); male hypopygium with apex of outer gonostylus (og) spinulate, and with inner gonostylus (ig) unforked, distinctly bent and pointed (Fig. 106) ..... *Erioptera* (*Meterioptera* ALEXANDER)
3 species; eastern

- Antennae with basal flagellomere not expanded (Fig. 109); male hypopygium with apex of outer gonostylus (og) not spinulate, and with inner gonostylus (ig) either unforked, not distinctly bent and not pointed, or forked (Fig. 107) ..... *Erioptera* (*Erioptera* MEIGEN)
9 species; northern, eastern.

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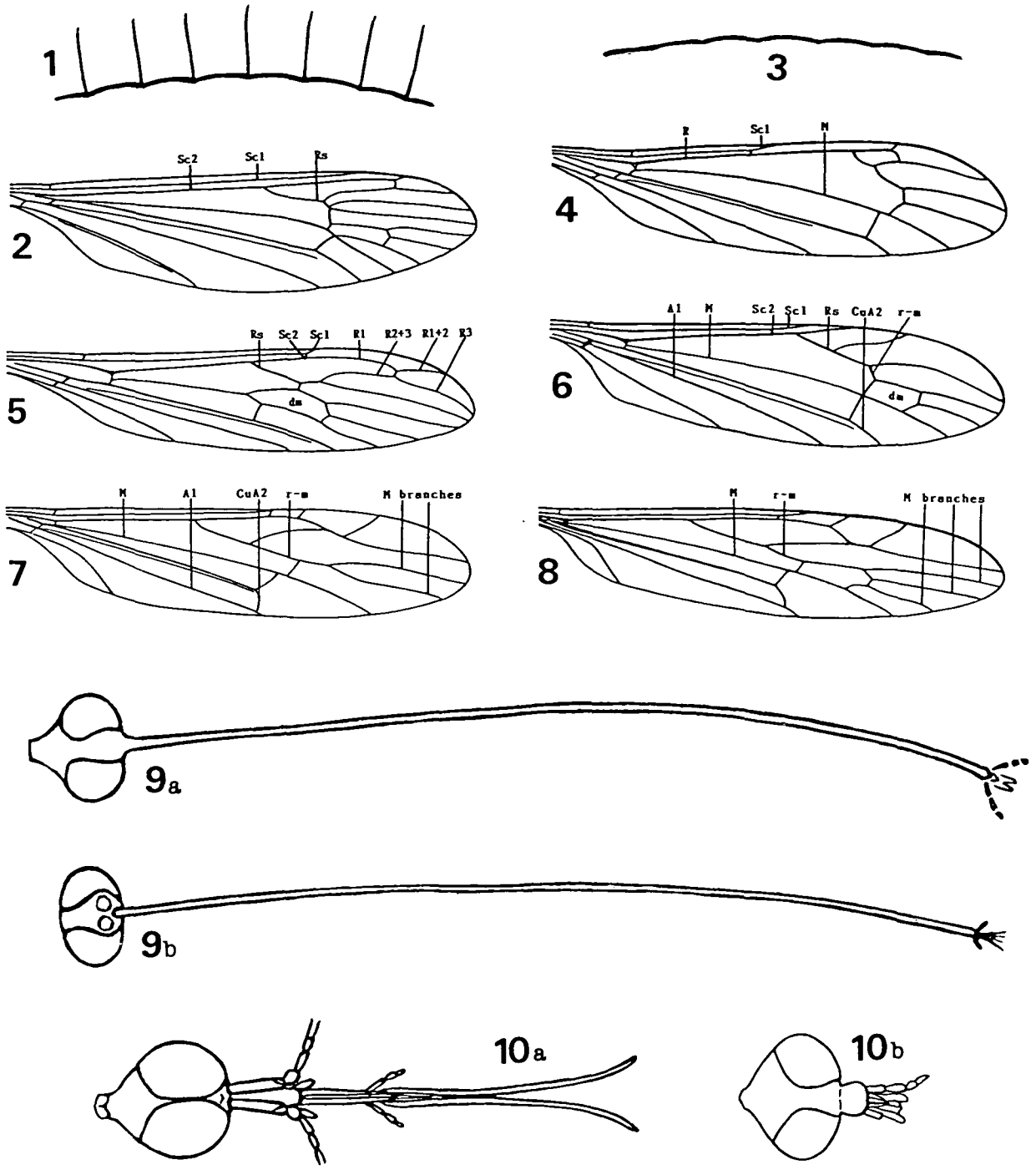


Figs 1, 2: *Tricyphona* (*Tricyphona*) sp.: 1: portion of eye, in profile; - 2: wing venation. Fig. 3: *Lechria* sp., portion of eye, in profile. Fig. 4: *Limonia* (*Nealexandriaria*) sp., wing venation. Figs 5-8: wing venation of: 5: *Lechria* sp.; - 6: *Toxorhina* (*Ceratocheilus*) sp.; 7, 8: *Trentepohlia* spp.: 7: *T.* (*Trentepohlia*); - 8: *T.* (*Mongoma*). Figs 9a-10b: head including rostrum, dorsal aspect, of: 9a: *Elephantomyia* (*Elephantomyodes*) sp.; - 9b: *Toxorhina* (*Ceratocheilus*) sp.; - 10: *Limonia* spp: a, *L.* (*Geranomyia*); b, *L.* (*Dicranomyia*).

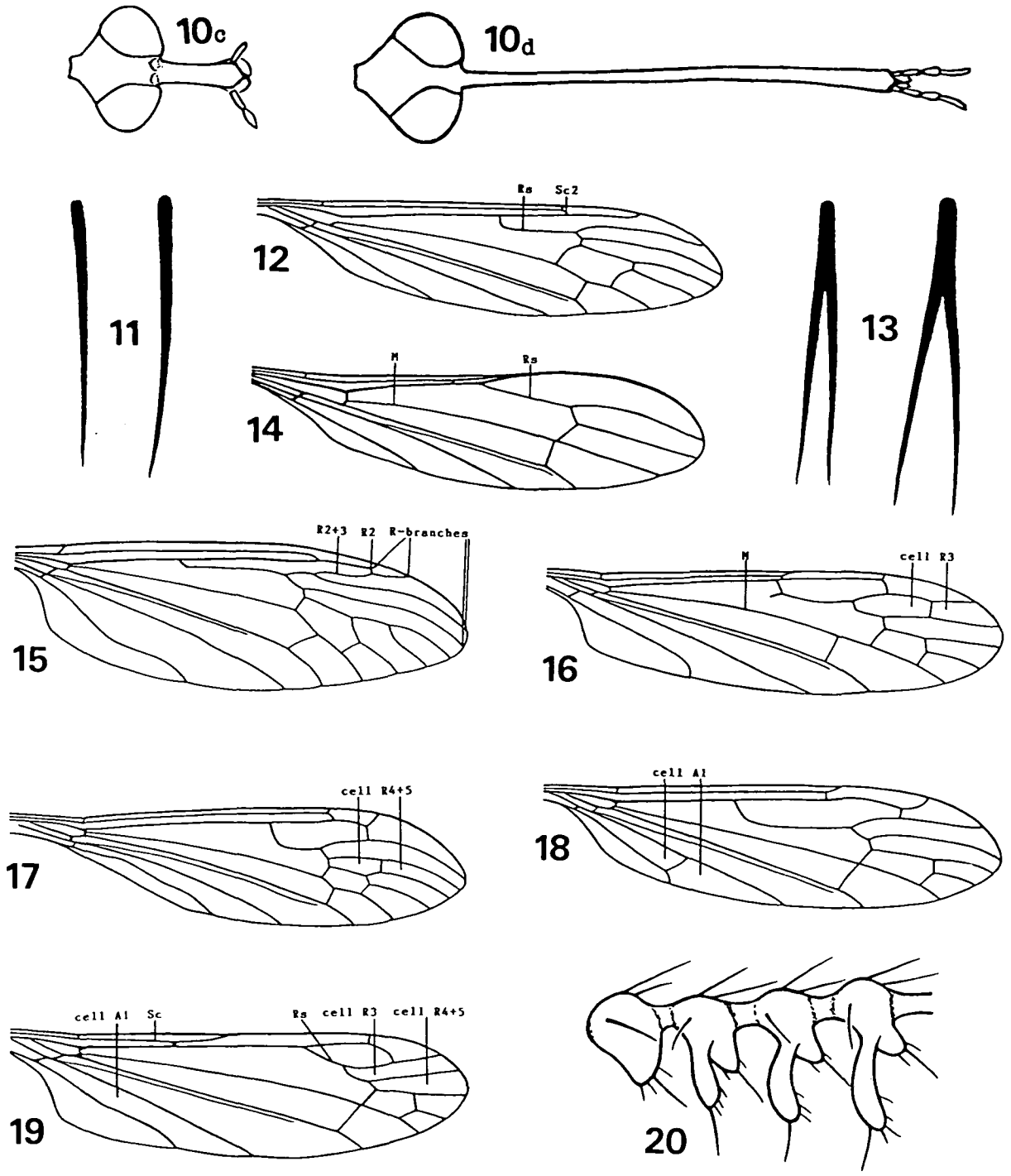
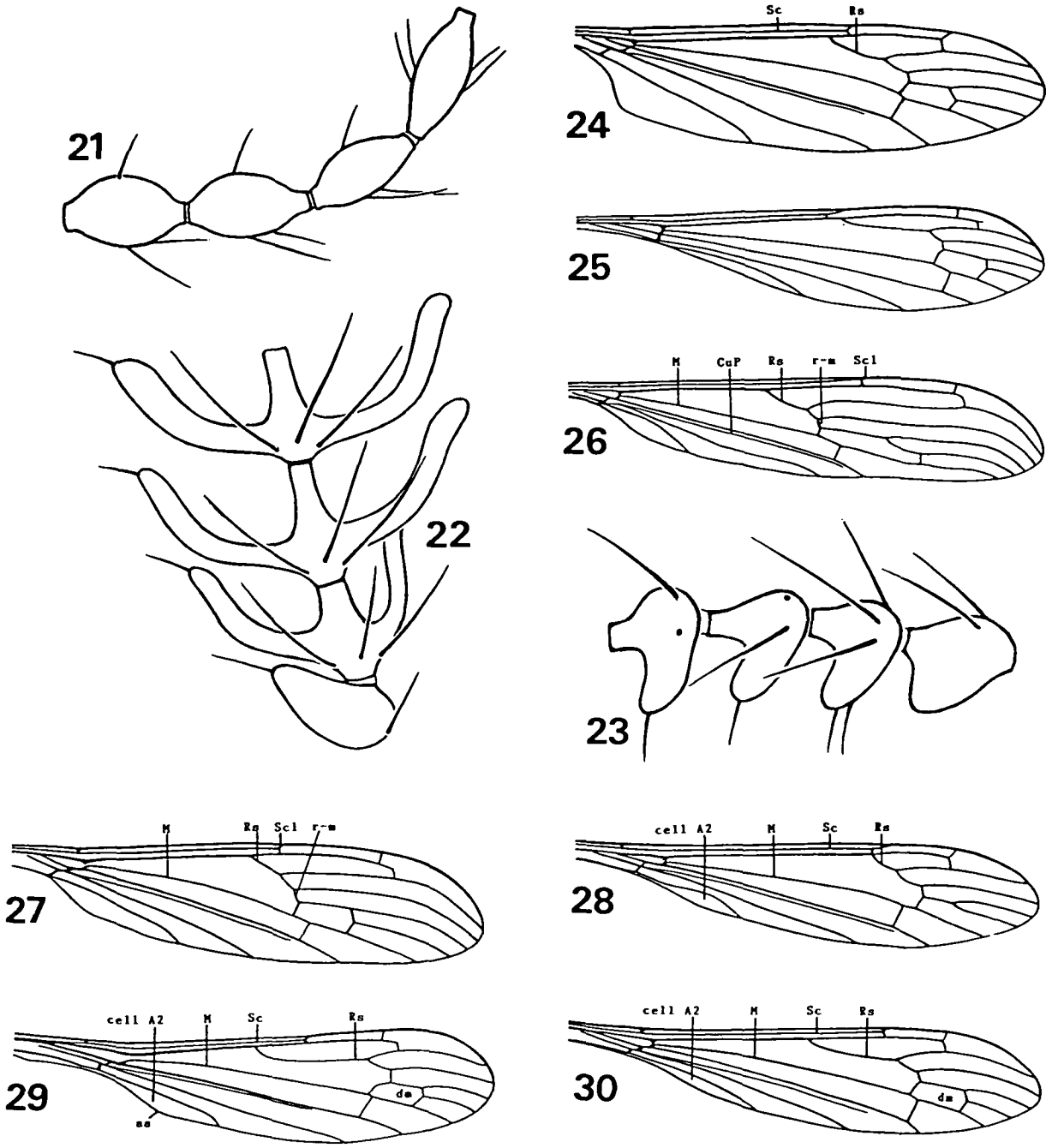
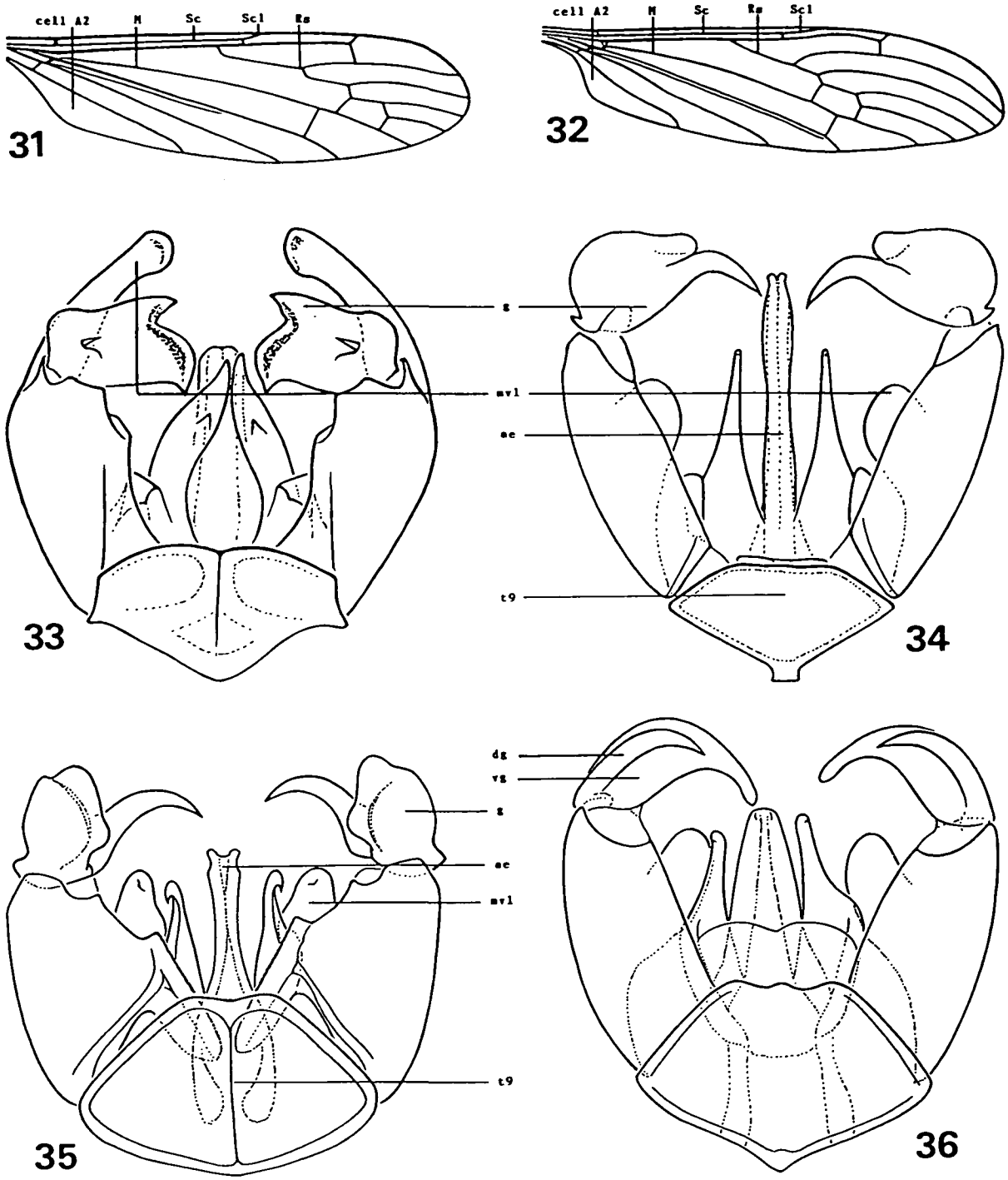


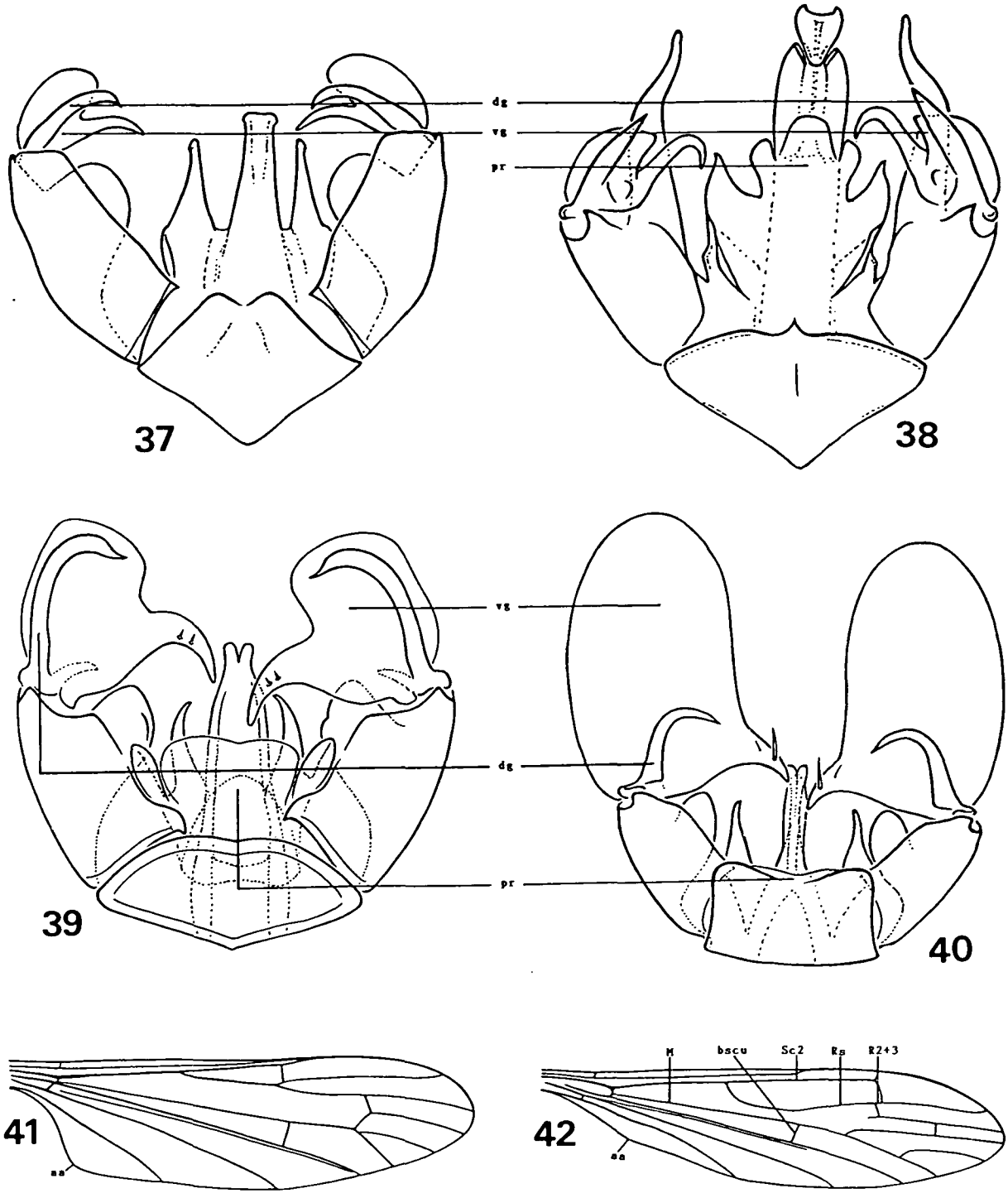
Fig.10: *Helius* spp., head including rostrum, dorsal aspect: c, *H.* (*Eurhamphidia*); - d, *H.* (*Mammuthonasus*). Figs 11, 12: *Elephantomyia* (*Elephantomyodes*) sp.: 11: setae of legs; - 12: wing venation. Figs 13, 14: *Toxorhina* spp.: 13: *T.* (*Ceratocheilus*), setae of legs; - 14: *T.* (*Eutoxorhina*), wing venation. Fig. 15: *Gynoplistia* (*Cerozodia*) sp., wing venation. Figs 16-20: *Limonia* spp.: 16-19: wing venation: 16: *L.* (*Pandamyia*); - 17: *L.* (*Dapanoptera*); - 18: *L.* (*Discobola*); - 19: *L.* (*Idioglochina*); - 20: *L.* (*Pandamyia*), basal flagellomeres of male antenna.



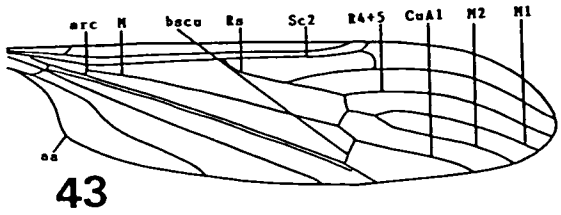
Figs 21-23: *Limonia* spp., basal flagellomeres of antenna: 21: *L.* (*Discobola*), male; - 22, 23: *L.* (*Rhipidia*): 22: male; - 23: female. Figs 24-30: *Limonia* spp., wing venation: 24: *L.* (*Rhipidia*); - 25: *L.* (*Thryptocomyia*); - 26: *L.* (*Libnotes*); - 27: *L.* (*Neolibnotes*); - 28: *L.* (*Pseudoglochina*); - 29: *L.* (*Nesciomyia*); - 30: *L.* (*Cygnomyia*).



Figs 31, 32: *Limonia* spp., wing venation: 31: *L.* (*Dicranomyia*); - 32: *L.* (*Goniodineura*). Figs 33-36: *Limonia* spp., male hypopygium, dorsal aspect: 33: *L.* (*Metalibnotes*); - 34: *L.* (*Paralibnotes*); - 35: *L.* (*Limonia*); - 36: *L.* (*Nesciomyia*). Abbreviations: ae = aedeagus: dg = dorsal gonostylus; g = gonostylus; mvl = meso-ventral lobe of gonocoxite; t9 = tergite 9; vg = ventral gonostylus.



Figs 37-40: *Limonia* spp., male hypopygium, dorsal aspect: 37: *L.* (*Cygnomyia*); - 38: *L.* (*Atypophthalmus*); - 39: *L.* (*Dicranomyia*); - 40: *L.* (*Goniodineura*). Figs 41, 42: wing venation of: 41: *Antocha* (*Orimargula*) sp.; - 42: *Orimarga* (*Orimarga*) sp. Abbreviations: dg = dorsal gonostylus; pr = proctiger; vg = ventral gonostylus.



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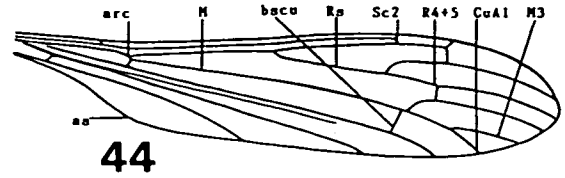

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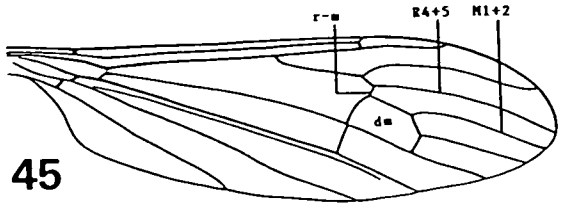

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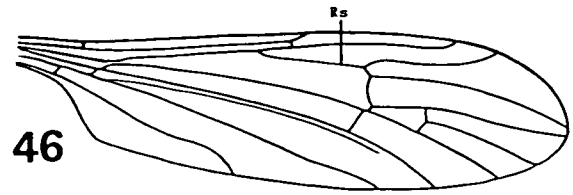

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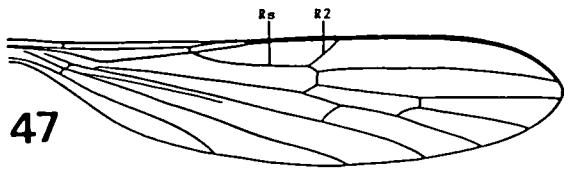

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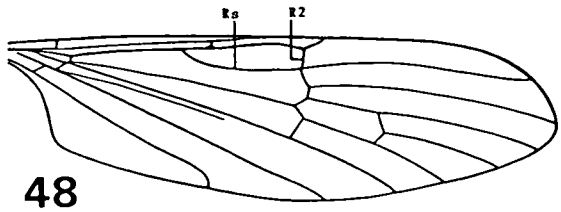

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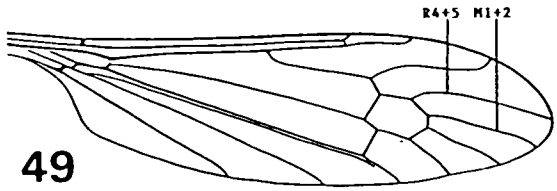

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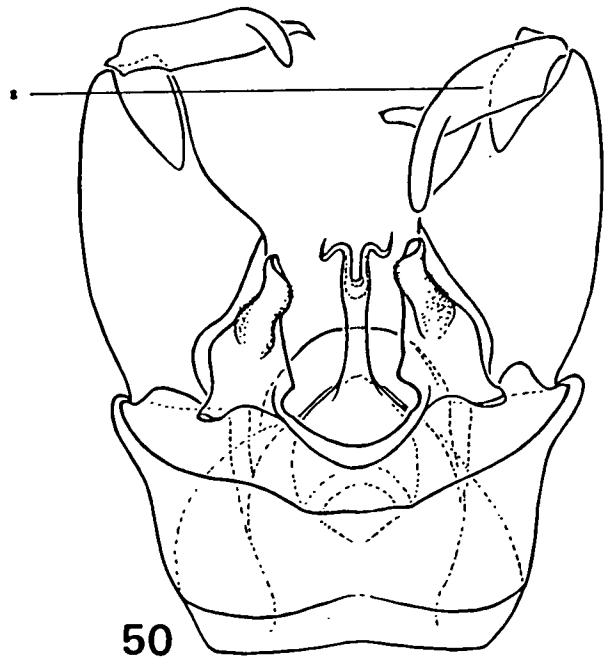

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Figs 43-49: wing venation of: 43: *Collessophila* sp.; - 44: *Tonnoiromyia* sp.; - 45: *Helius* (*Helius*) sp.; - 46: *Gonomyia* (*Leiponeura*) sp.; - 47: *Styringomyia* sp.; - 48: *Teucholabis* (*Teucholabis*) sp.; - 49: *Helius* (*Mammuthonasus*) sp. Fig. 50: *Helius* (*Mammuthonasus*) sp., male hypopygium, dorsal aspect. Abbreviation: g = gonostylus.

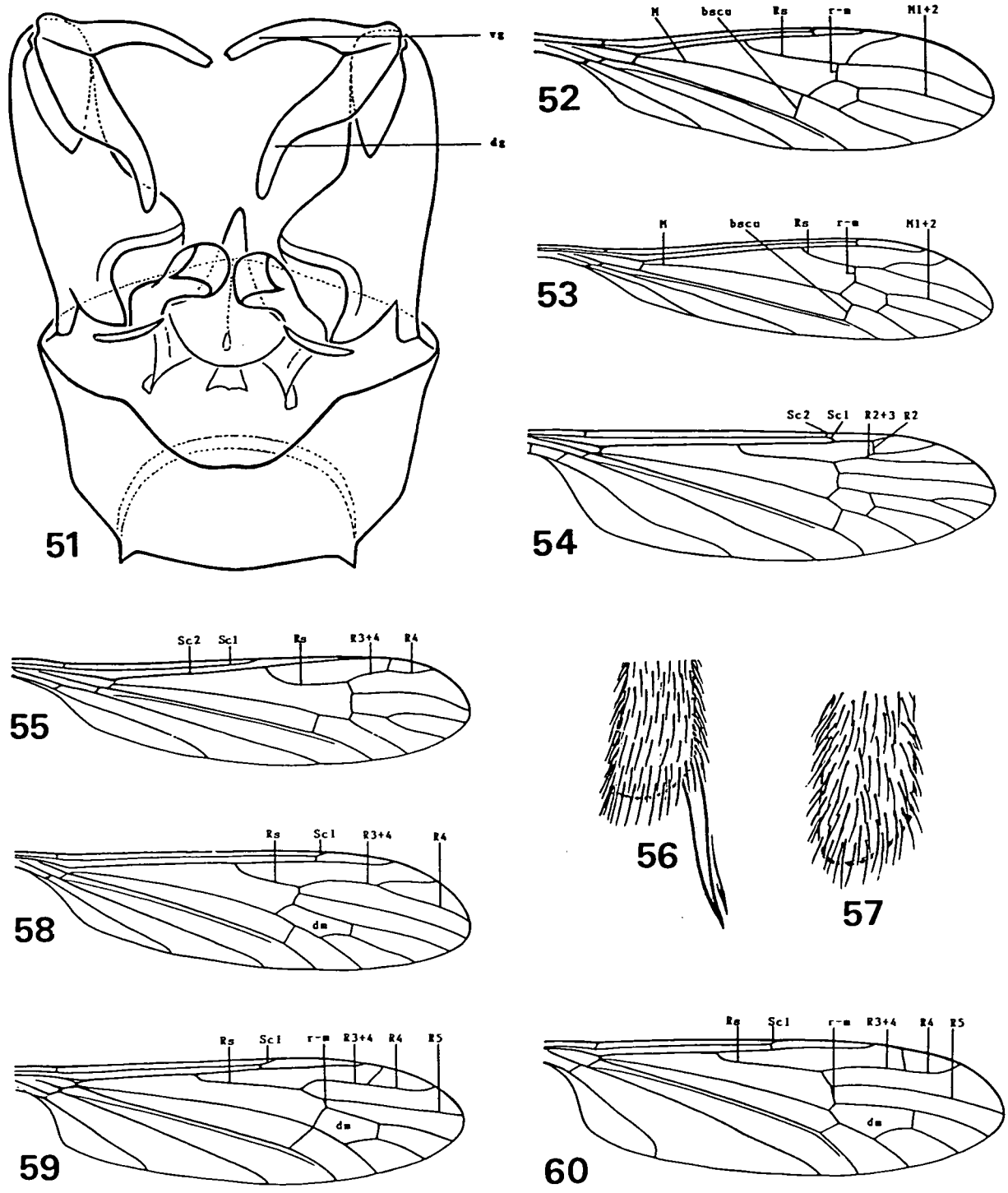
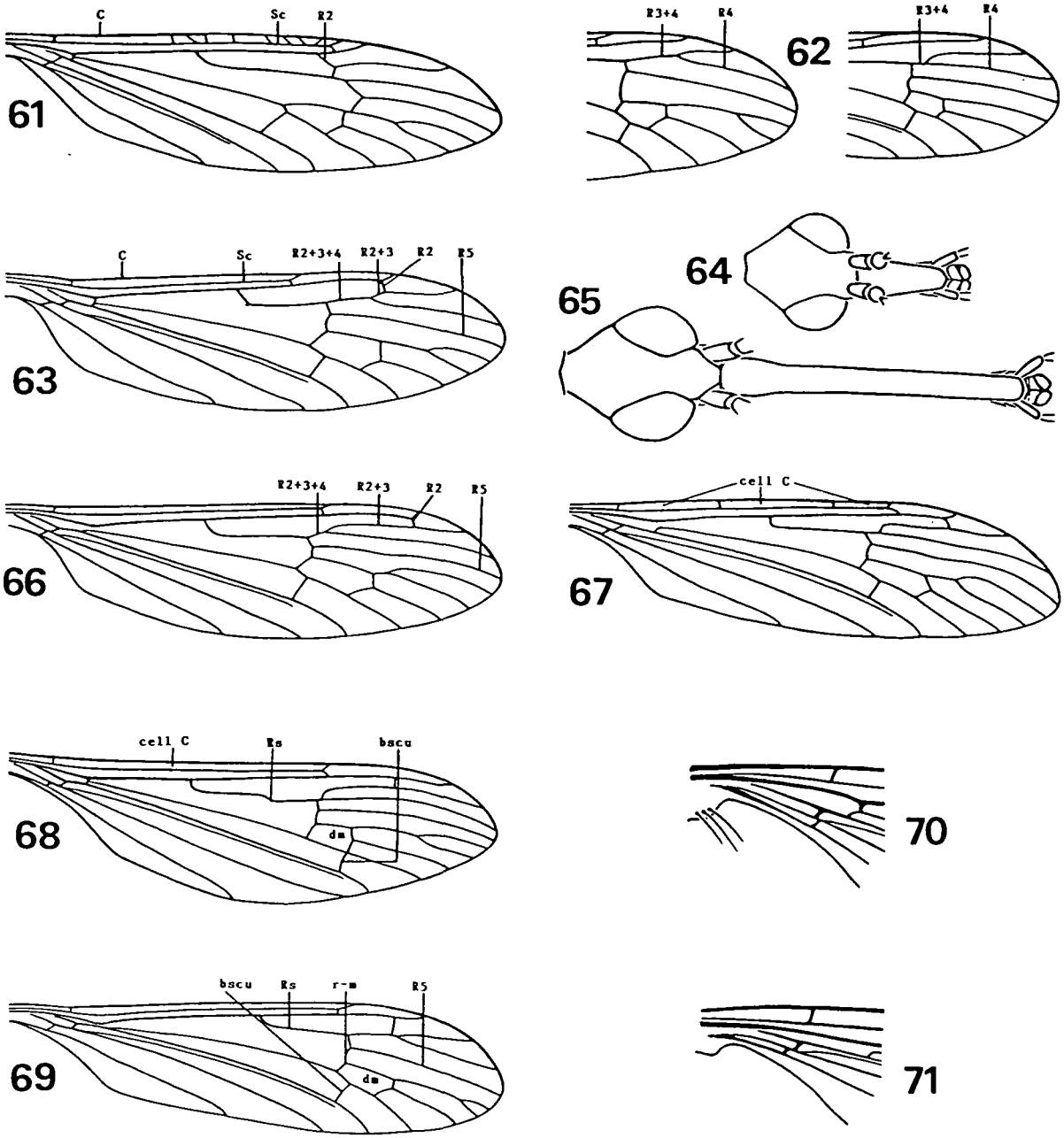
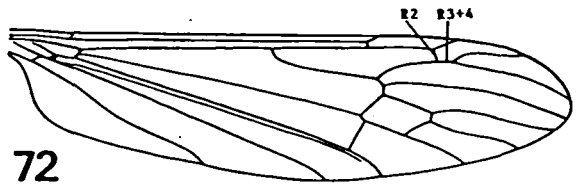


Fig. 51: *Helius* (*Helius*) sp., male hypopygium, dorsal aspect. Figs 52-55: wing venation of: 52, 53: *Helius* spp.: 52: *H.* (*Rhampholimnobia*); - 53: *H.* (*Eurhamphidia*); - 54: *Tipulimnoea* sp.; - 55: *Idiocera* (*Idiocera*) sp. Figs 56, 57: apex of mesotibia of: 56: *Gynoplistia* (*Gynoplistia*) sp.; - 57: *Tipulimnoea* sp. Figs 58-60: wing venation of: 58: *Horistomyia* sp.; - 59: *Atarba* (*Ischnothrix*) sp.; 60: *Rhabdiomastix* (*Sacandaga*) sp. Abbreviations: dg = dorsal gonostylus; vg = ventral gonostylus.



Figs 61-63: wing venation of: 61: *Conosia* sp.; - 62: *Limnophila* (*Limnophila*) sp.; 63: *Bergrothomyia* sp. Figs 64, 65: head including rostrum, dorsal aspect, of: 64: *Bergrothomyia* sp.; - 65: *Tonnoirella* sp. Figs 66-69: wing venation of: 66: *Tonnoirella* sp.; - 67: *Epiphragma* (*Epiphragma*) sp.; - 68: *Skuseomyia* sp.; - 69: *Diemenomyia* sp. Figs 70, 71: wing base of: 70: *Pilaria* sp.; - 71: *Austrolimnophila* (*Austrolimnophila*) sp.



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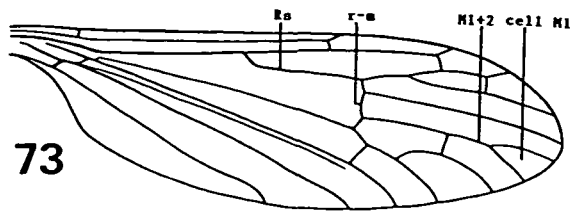

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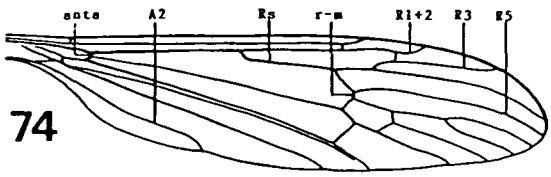

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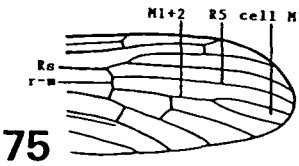

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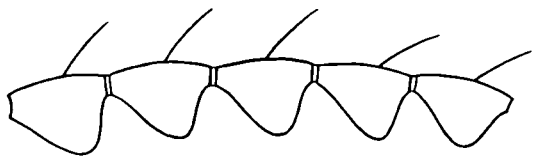

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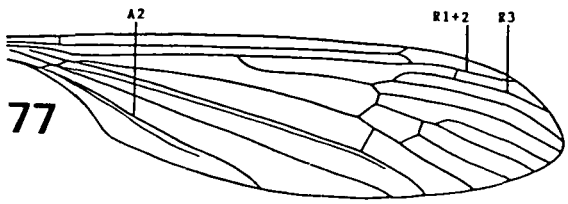

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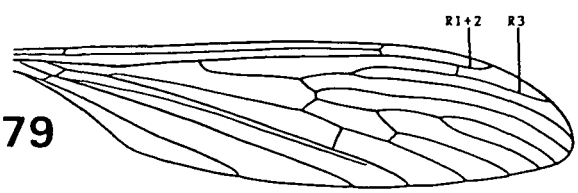

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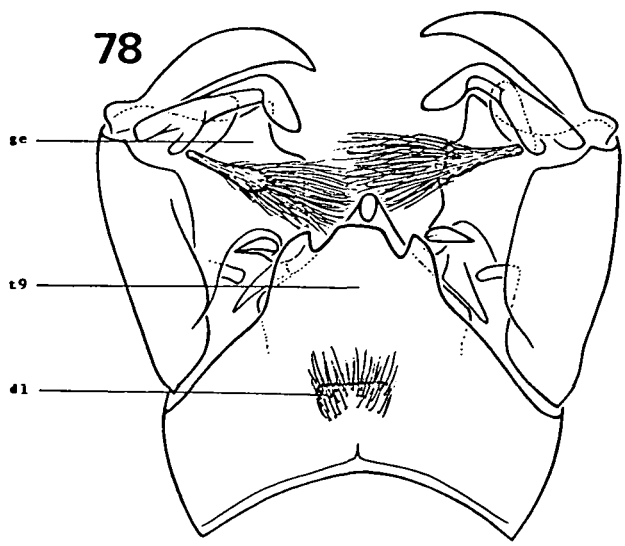
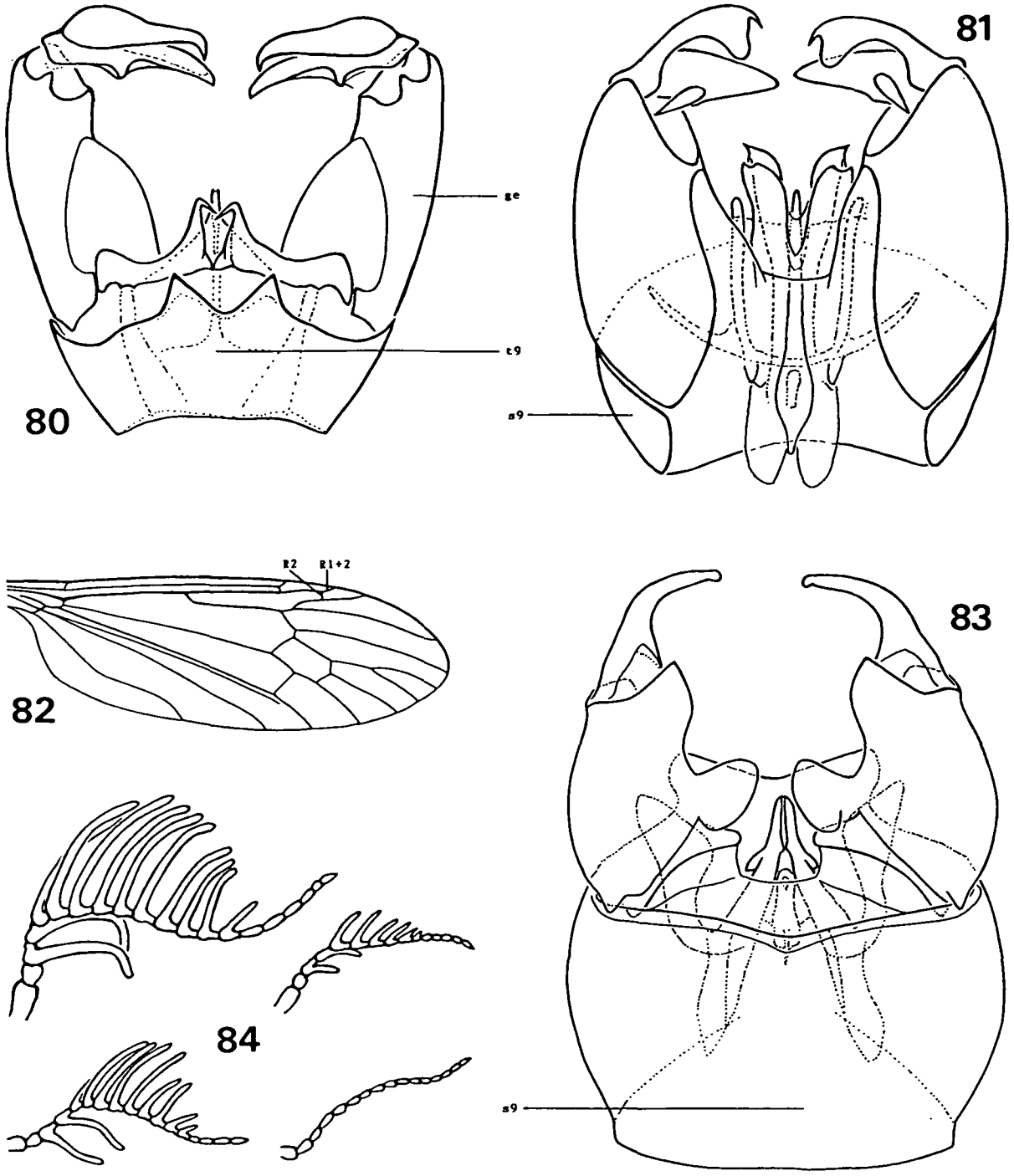
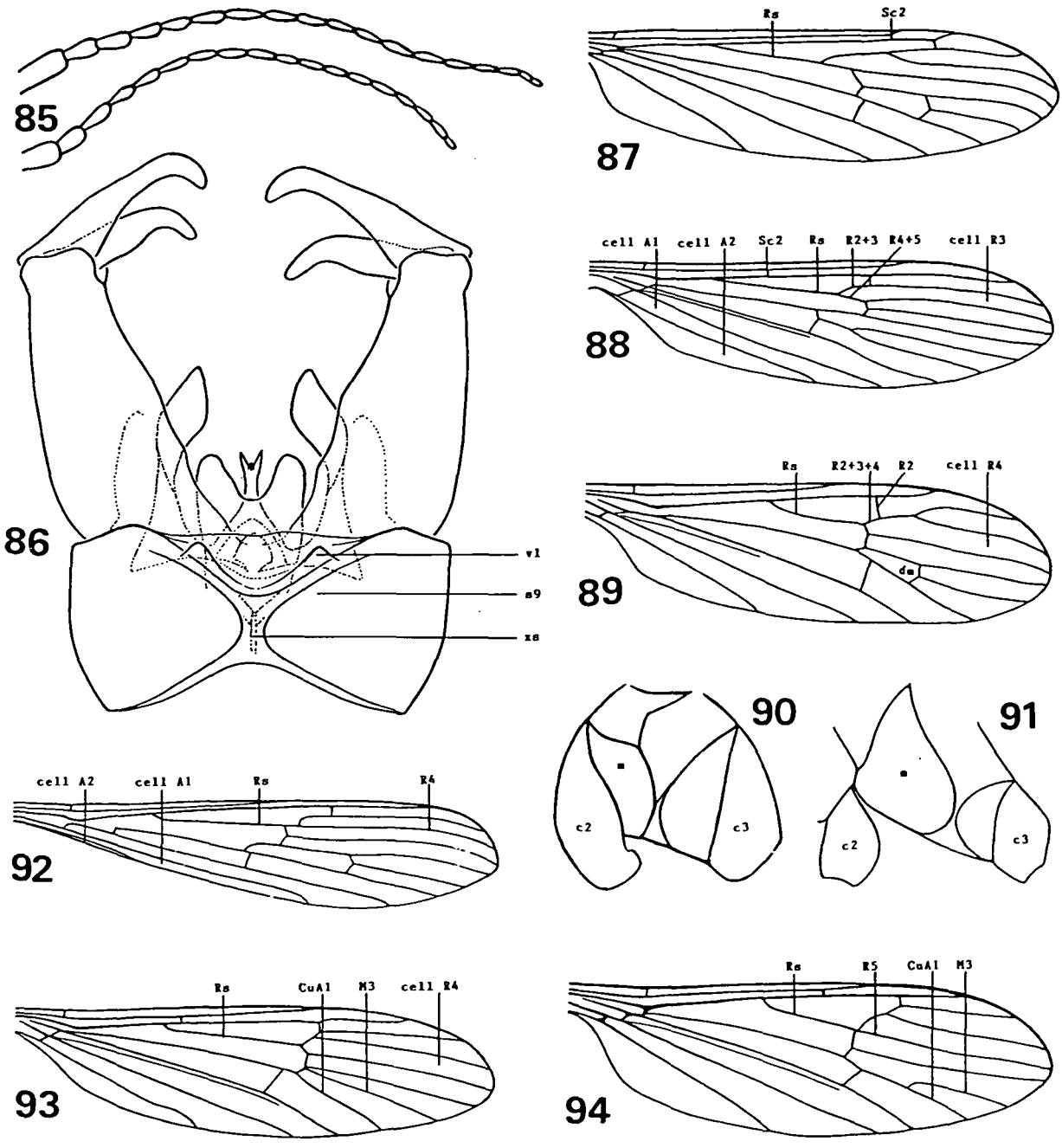


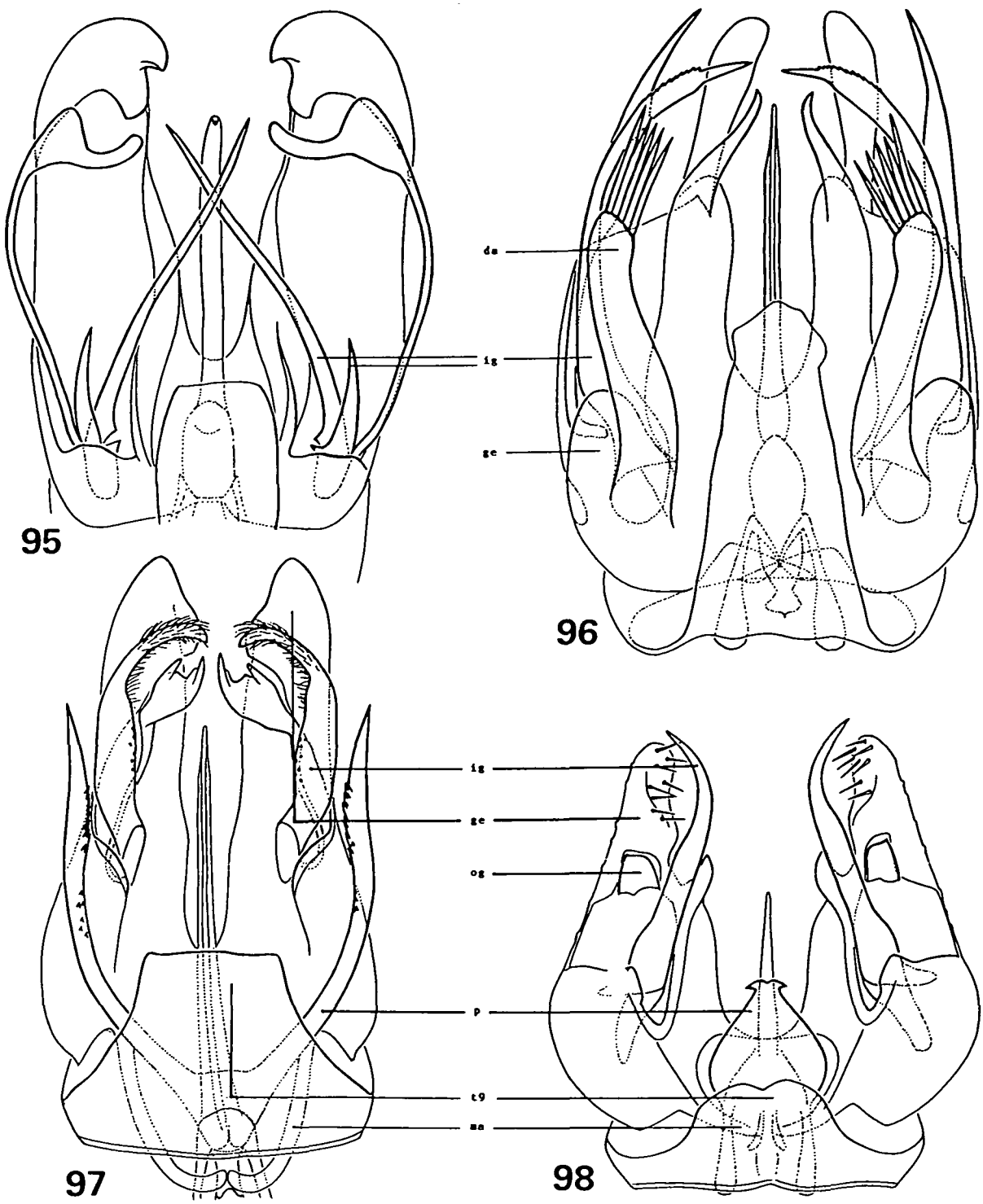
Figs 72-75: wing venation of: 72: *Pilaria* sp.; - 73: *Limnophila* (*Limnophila*) sp.; - 74: *Paralimnophila* (*Paralimnophila*) sp.; - 75: *Austrolimnophila* (*Austrolimnophila*) sp. Fig. 76: *Diemenomyia* sp., basal flagellomeres of male antenna. Figs 77, 78: *Leolimnophila* sp.: 77: wing venation; - 78: male hypopygium, dorsal aspect. Fig. 79: *Austrolimnophila* (*Austrolimnophila*) sp., wing venation. Abbreviations: ge = gonocoxite; t9 = tergum 9.



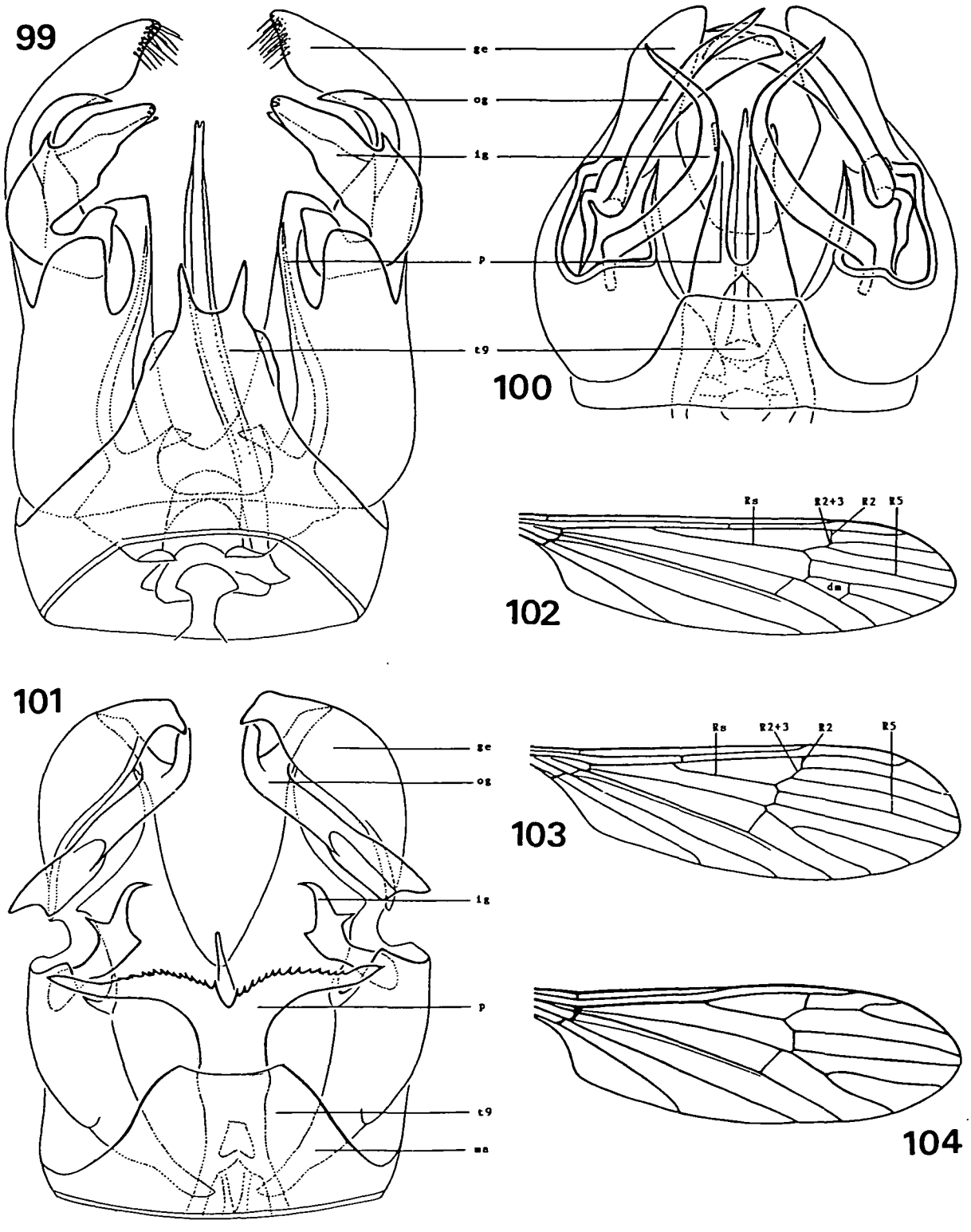
Figs 80, 81: male hypopygium of: 80: *Austrolimnophila* (*Austrolimnophila*) sp., dorsal aspect; - 81: *Paralimnophila* (*Paralimnophila*) sp., ventral aspect. Fig. 82: *Gynoplistia* (*Gynoplistia*) sp., wing venation. Figs 83, 84: *Gynoplistia* (*Gynoplistia*) spp.: 83: male hypopygium, ventral aspect.; - 84: male and female antennae. Abbreviations: ge = gonocoxite; s9 = segment 9; t9 = tergum 9.



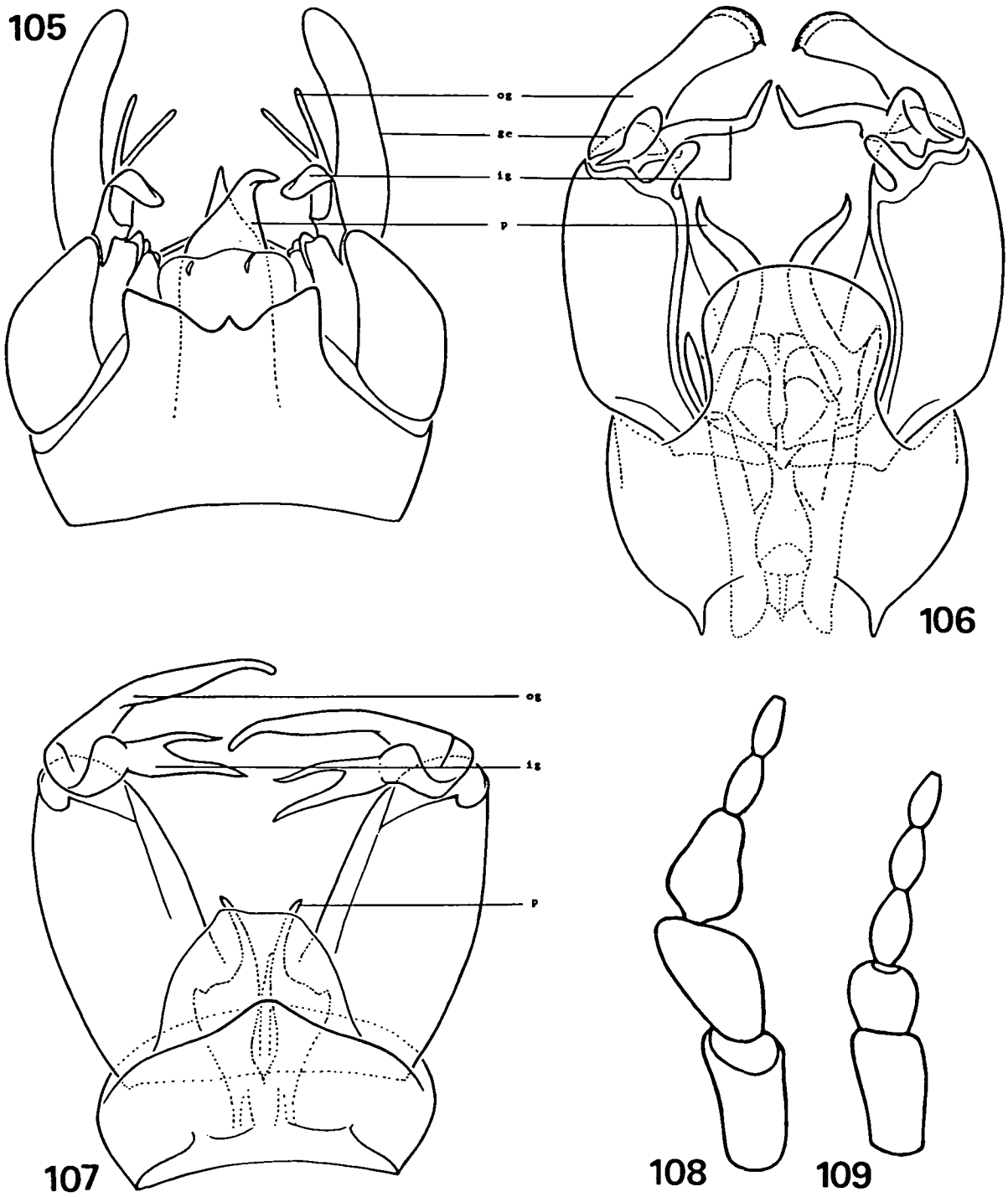
Figs 85, 86: *Gynoplistia* (*Xenolimnophila*) sp.: 85: male and female antennae; 86: male hypopygium, ventral aspect. Figs 87-89: wing venation of: 87: *Sigmatomera* (*Austrolimnobia*) sp.; - 88: *Molophilus* (*Molophilus*) sp.; - 89: *Cheilotrichia* (*Cheilotrichia*) sp. Figs 90, 91: part of thorax, lateral aspect, of: 90: *Gymnastes* (*Paragymnastes*) sp.; - 91: *Molophilus* (*Molophilus*) sp. Figs 92-94: wing venation of: 92: *Tasiocera* (*Tasiocera*) sp.; - 93: *Amphineurus* (*Amphineurus*) sp.; - 94: *Baeoura* sp. Abbreviations: c2 = middle coxa; c3 = hind coxa; m = meron; s9 = segment 9; vl = ventral lobe; xs = x-shaped support.



Figs 95-98: *Molophilus* spp., male hypopygium, dorsal aspect: 95: *M.* (*Austromolophilus*); - 96: *M.* (*Diplomolophilus*); - 97: *M.* (*Lyriomolophilus*); - 98: *M.* (*Onychomolophilus*). Abbreviations: ad = dorsal appendage of dorsal lobe of gonoxite; ge = gonocoxite; ig = inner gonostylus; ma = mesodorsal apodeme of gonocoxite; og = outer gonostylus; p = parameres; t9 = tergum 9.



Figs 99-101: *Molophilus* spp., male hypopygium, dorsal aspect: 99: *M.* (*Superbomolophilus*); - 100: 101: *M.* (*Molophilus*). Figs 102-104: wing venation of: 102: *Trimicra* sp.; - 103: *Erioptera* (*Alcheringa*) sp.; - 104: *Cheilotrichia* (*Empeda*) sp. Abbreviations: ge = gonocoxite; ig = inner gonostylus; og = outer gonostylus; p = parameres; t9 = tergum 9.



Figs 105-109: *Erioptera* spp.: 105-107: male hypopygium, dorsal aspect: 105: *E.* (*Alcheringa*); - 106: *E.* (*Meterioptera*); - 107: *E.* (*Erioptera*); 108, 109: base of antenna: 108: *E.* (*Meterioptera*); - 109: *E.* (*Erioptera*). Abbreviations: ig = inner gonostylus; og = outer gonostylus; p = parameres.