

Key to the Genera of Male Adult Mayflies of Australia



PJ Suter and J. Webb

TRIN Taxonomy Research and Information Network

La trobe University

Department of Environmental Management and Ecology

Albury-Wodonga

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Key to the Genera of Male Adult Mayflies of Australia

- 1a Hind wings large, length greater than 1/3 forewing length (Fig. 1) .. 2
- 1b Hind wings small, length less than 1/3 forewing length or absent
(Fig. 2) 5

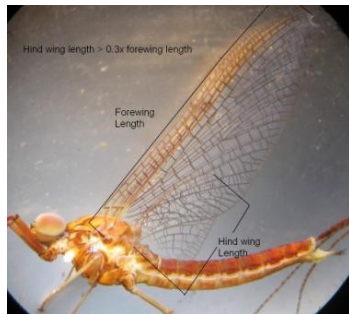


Fig 1. *Coloburiscoides* wings



Fig 2 *Jappa* wings

- 2a (1) Tarsal claws of all legs similar, sharp (Fig. 3); three well developed tail filaments in males and females; forceps four segmented
.....Nesameletidae..... *Ameletoides*
- 2b Tarsal claws of mid and hind legs dissimilar, one sharp and hooked, one blunt, pad-like (Fig 4) or pad like only (Fig 10); terminal filament reduced, vestigial or absent; forceps three or four segmented
..... 3

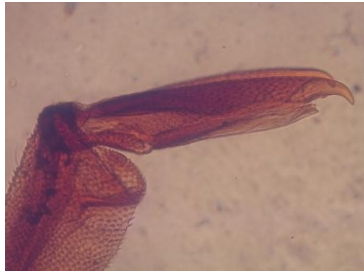


Fig 3. Tarsal claws similar



Fig 4. Tarsal claws dissimilar

3a (2) Forceps four segmented (Fig. 5); only two caudal filaments (Fig 7) ...
Ameletopsidae..... *Mirawara*

3b Forceps three or four segmented (Fig. 6); three caudal filaments but
 terminal filament reduced/vestigial (Fig 8) 4



Fig 5. Forceps of *Mirawara*

Fig 6. Forceps of *Tasmanophlebia*

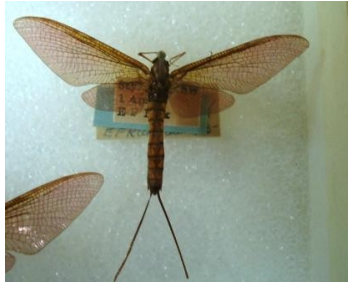


Fig 7. *Mirawara* caudal filaments

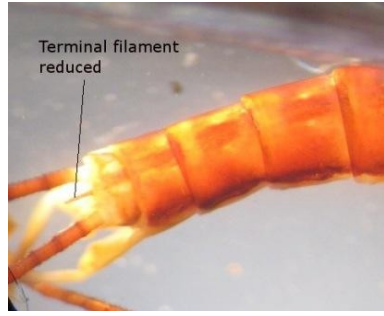


Fig 8. *Coloburiscoides* caudal filaments

4a (3) Fore tarsus with dissimilar claws, one hooked, one blunt (Fig. 9)
Oniscigastridae..... *Tasmanophlebia*

4b Fore tarsal of males with pad-like “claws”, no hooked claw (Fig 10) ...
Coloburiscidae..... *Coloburiscoides*



Fig 9. Tarsal claws of *Tasmanophlebia*



Fig 10. Tarsal claws of *Coloburiscoides*

5a (1) Forewings with few cross veins; CuP of forewing not strongly curved (Fig 11); hind wing present or absent, if present then with few veins and cross veins (Fig 13) 6

5b Forewings with complete venation and numerous cross veins; CuP of forewing strongly curved (Fig. 12); hind wing present usually with complete venation (Fig. 14) 15

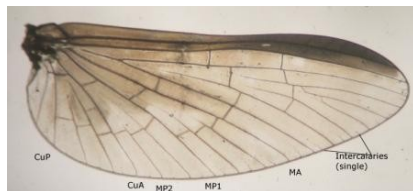


Fig 11. Forewing of *Centroptilum*

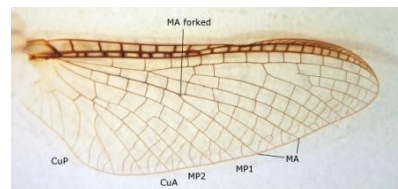


Fig 12. Forewing of *Atalophlebia*



Fig 13. Hindwing of *Offadens*



Fig 14. Hindwing of *Coloburiscoides*

6a (5) Forewings with marginal intercalaries between main veins (Fig. 15); pterostigma with cross veins present; hind wings present or absent; ...
.....Baetidae..... 10

- 6b** Forewings lacking marginal intercalaries between main veins (Fig. 16);
 pterostigma lacking cross veins..... 7

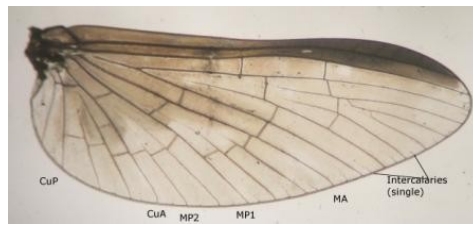


Fig 15 Forewing of *Centropilum*

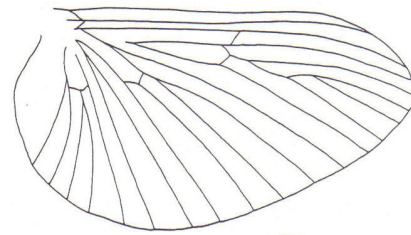


Fig 16. Wing of *Tasmanocoenis*

- 7a (6)** Hind wing absent; forewing with MA forked (Fig. 17) Caenidae .. 8

- 7b** Hind wing present; hind wing with MA not forked (Fig. 18)

.....Prosopistomatidae..... *Prosopistoma*

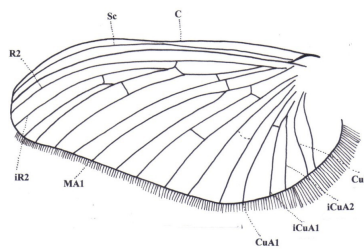
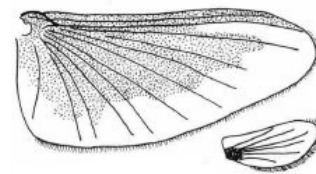


Fig 17. Forewing of *Irpacaenis* with forked MA.



Six longitudinal veins in hindwing

Fig 18. Wings of *Prosopistoma*
 Modified after Campbell and Hubbard (1998)

- 8a (7)** Claspers weakly sclerotised, broad and straight, with terminal hook
 (Fig. 19); styliiger plate and associated sclerites weakly sclerotised;
 abdominal segments lacking lateral projections *Irpacaenis*

- 8b** Claspers strongly sclerotised, narrow, curved to straight, lacking
 terminal hook (Fig. 20); abdominal segments with or without lateral
 projections; 9

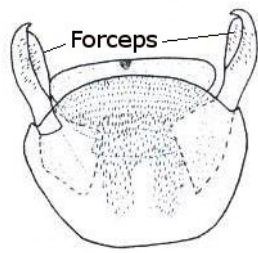


Fig 19. Genitalia of *Irpacaenis*

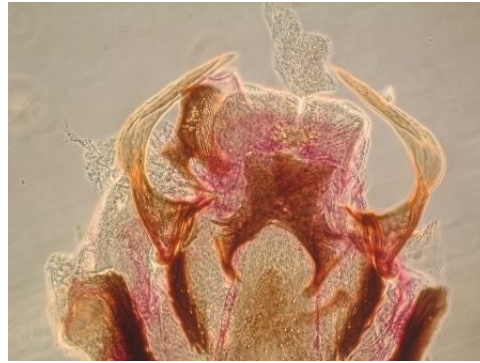


Fig 20. Genitalia of *Tasmanocoenis*

- 9a (8) Abdominal segments lacking lateral projections (Fig. 21)
*Tasmanocoenis*
- 9b Abdominal segments with lateral projections (Fig. 22)
*Wundacaenis*



Fig 21. Dorsal view of imago of



Fig 22. Dorsal view of imago of

Tasmanocoenis. Modified after Suter (1986).

Wundacaenis. Modified after Suter (1999)

- 10a (6) Hind wing present..... 11
- 10b Hind wing absent..... 12

- 11a (10) Forewings with single intercalaries between main veins (Fig. 23)
*Centroptilum/Offadens*
- 11b Forewings with paired intercalaries between main veins (Fig. 24)
*Offadens/Centroptilum*

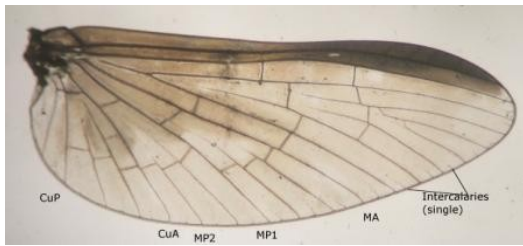


Fig 23. *Centroptilum* forewing with single Intercalaries

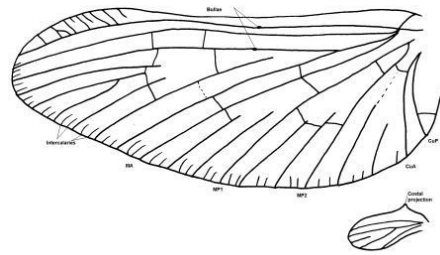


Fig 24. Forewing of *Offadens* with paired intercalaries. Modified after Suter (1986)

- 12a (10) Forewings with paired intercalaries between main veins (Fig. 24) .. 13
- 12b Forewings with single intercalaries between main veins (Fig. 25)
*Cloeon*

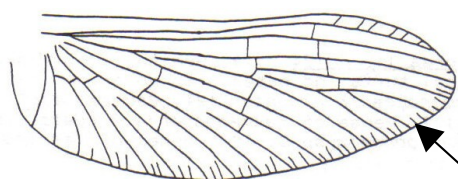


Fig 24. *Pseudocloeon* forewing with

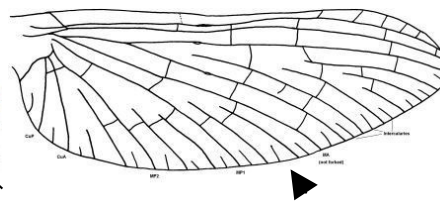
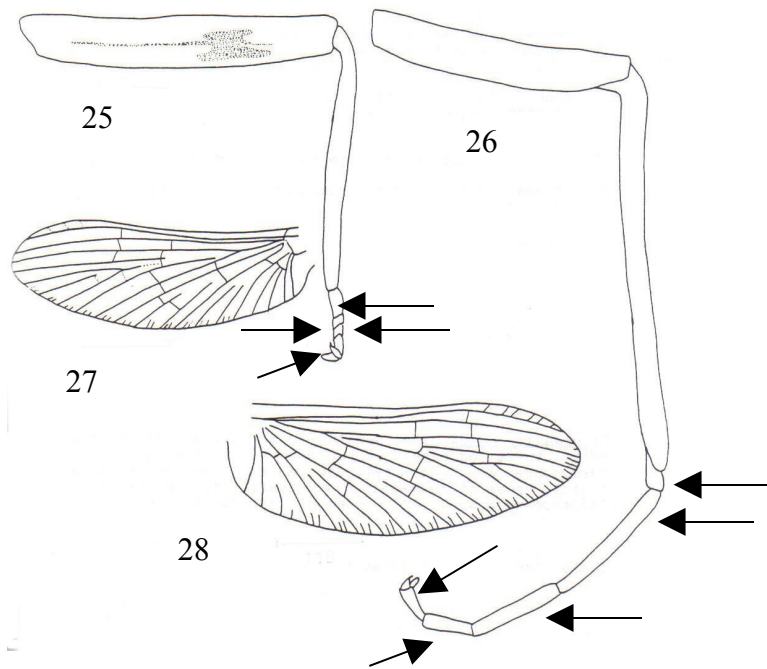


Fig 25. *Cloeon* forewing with

paired intercalaries. Modified after Suter (1992)

with single intercalaries. Modified after Suter (2000).

- 13a** (12) Forelegs with four tarsal segments (Fig. 25); femora of forelegs longer than tibiae; forewing as in Fig. 27 *Platybaetis*
- 13b** Forelegs with five tarsal segments (Fig. 26); femora of foreleg shorter than tibiae; forewing as in Fig. 28 15



Figures 25-28. *Platybaetis* foreleg (25) and forewing (27); *Pseudocloeon* foreleg (26) and forewing (28) with tarsal segments arrowed. Modified after Suter (1992).

- 14a** (13) Turbinate eyes cylindrical and uniform in width, projecting well above head (Fig. 29) *Bungona*
- 14b** Turbinate eyes narrow at base and broad apically (Fig. 30)
..... *Pseudocloeon*

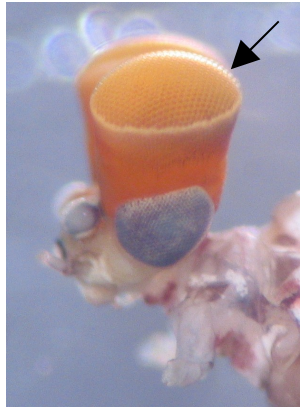


Fig 29. Head and eyes of *Bungona*



Fig 30 Head and eyes of *Pseudocloeon*.

15a (5) Intercalaries of forewing free and single (Fig. 31) Austremerellidae ..
 *Austremerella*

15b Intercalaries of forewing not free, attached to main veins (Fig. 32)
Leptophlebiidae..... 16

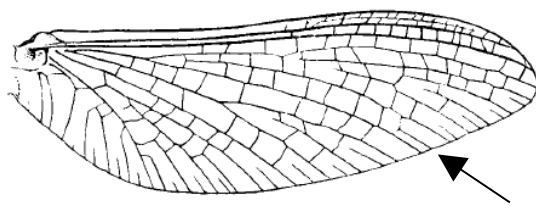


Fig 31 Forewing of *Austremerella*
 Intercalaries free. Modified after Riek (1963)

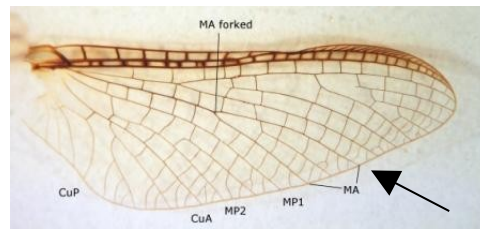


Fig 32. Forewing of *Atalophlebia*
 intercalaries not free, attached to main veins

16a (15) Fore tarsal claws similar, slender and hooked (Fig. 33) 17

16b Fore tarsal claws dissimilar, one slender and hooked, one blunt, pad-
 like (Fig. 34) 27

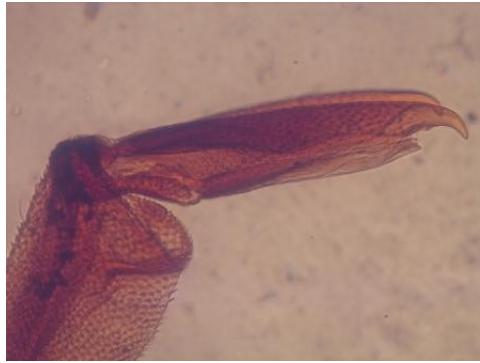


Fig 33. Tarsal claws similar



Fig 34. Tarsal claws dissimilar

17a (16) Forewing with spots (Fig 35) *Marmenuera*

17b Forewing hyaline lacking spots (Fig 36) 18

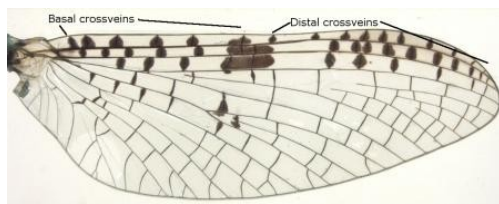


Fig 35. Forewing of *Marmenuera*.

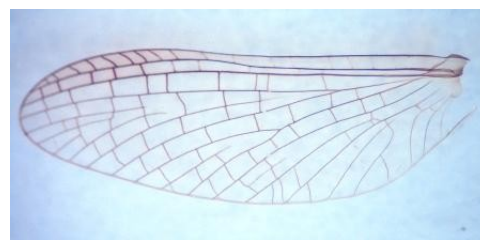


Fig 36. Forewing of *Nousia*.

18a (17) Hind wing small (0.1-0.15x forewing length) (Fig. 37), with large costal projection, MP of hind wing lacking intercalary (Fig. 39); penes fused in basal half, with apical sclerotised curved spines
 *Nyungara*

18b Hind wing larger ($>0.15x$ forewing length) (Fig. 38), lacking costal projection, MP of hind wind with or without intercalary (Fig. 40); penes separate or fused, with or without sclerotised structures
 19

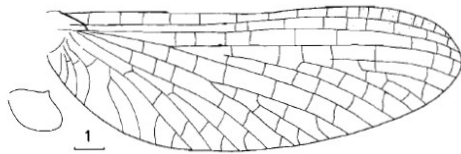


Fig 37. Fore and hind wing of *Nyungara* modified after Dean (1987)



Fig 38. Fore and hind wing of *Jappa*

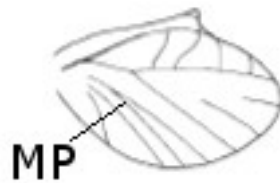


Fig 39 Hind wing of *Nyungara* MP without intercalary - modified after Dean (1987)

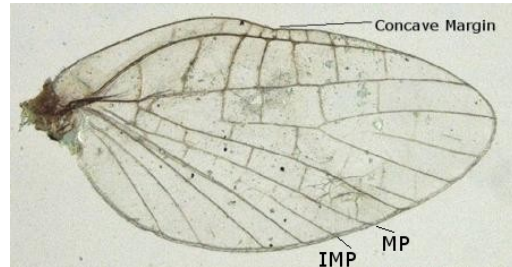


Fig 40. Hind wing of *Loamaggalangta*

19a (18) Forewing appear to lack costal crossveins basal to bullae (they may be present but very faint), ICu1 and ICu2 parallel at wing margins (Fig. 41); costal margin of hindwing convex, with 2-4 costal crossveins, and 3-4 subcostal crossveins; penes fused in basal third (Fig. 43)
 *Thraulophlebia* and *Koornonga*

19b Forewing with obvious costal cross veins basal to bullae, ICu1 and ICu2 divergent to almost parallel at wing margin (Fig. 42); costal margin of hind wing concave or convex, with $>$ four costal and

No basal cross veins

subcostal crossveins; penes separate or fused over more than half length (Fig. 44 and 45) 20

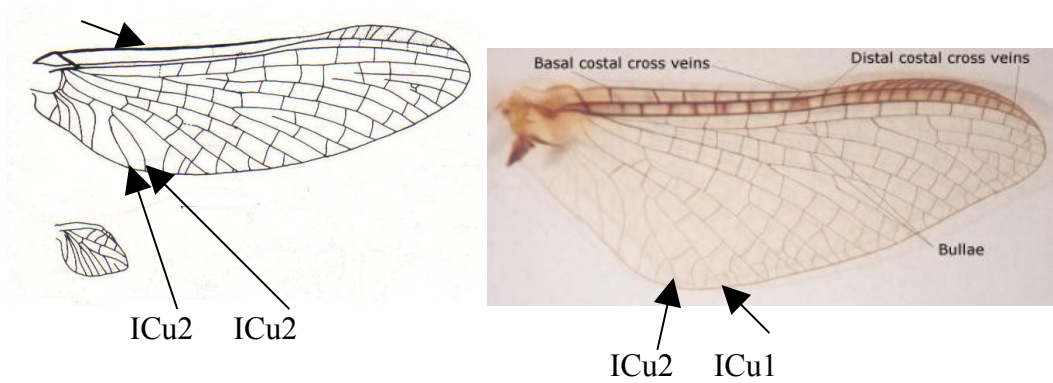


Fig 41. Fore and hind wing of *Koornonga*. Fig 42. Forewing of *Atalophlebia*.
Modified after Suter (1986).



Fig 43. Genitalia of *Koornonga*
Penes fused basal third.
Modified after Suter (1986).

Fig 44. Genitalia of *Atalophlebia*
Penes fused over whole length

Fig 45. Genitalia of *Jappa*.
Separate penes.

- 20a (19) Costal margin of hind wing concave near mid length (Fig. 46) 21
- 20b Costal margin of hind wing convex with raised costal projection in basal half (Fig. 47) 24

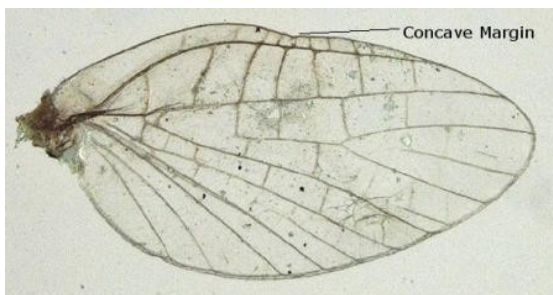


Fig 46. *Loamaggalanga* hindwing.



Fig 47. *Manggabora* hindwing.

- 21a (20) Pterostigma of forewing translucent not pigmented, ICu1 and ICu2 parallel or converging at wing margin, ICu1 attached to CuA-CuP cross vein (Fig. 48); penes slender, fused along whole length with minute spines over apical surface

Loamaggalanga

- 21b Pterostigma of forewing translucent or pigmented, ICu1 and ICu2 divergent at wing margin, ICu1 attached by crossvein to CuA (Fig. 49); penes robust, fused or separate 22

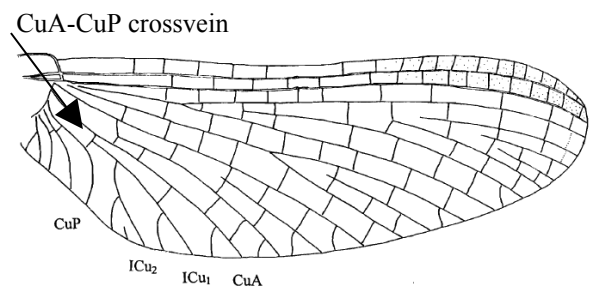
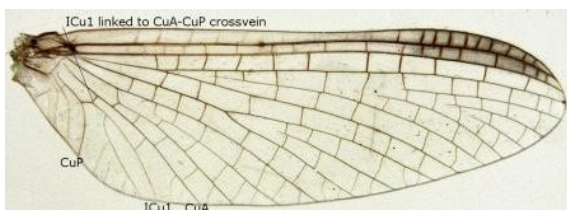


Fig 48. *Loamaggalangta* forewing

Fig 49. Forewing of *Kaninga* modified after Dean (2000)

- 22a (21)** Pterostigma of forewing tinged with brown, ICu1 not linked to CuP by cross vein (Fig. 50); penes separate over whole length, with sclerotised processes *Garinjuga*
- 22b** Pterostigma of forewing translucent, tinged with white, ICu1 linked to CuA and CuP by crossveins (Fig. 51); penes fused over at least half length, lacking sclerotised processes 23

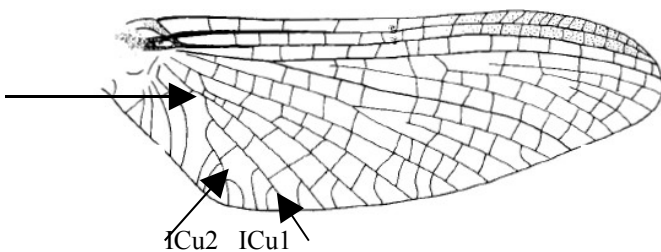


Fig 50. Forewing of *Garinjuga* with divergent ICu1 and ICu2, ICu1 not attached to CuA-CuP crossvein indicated.

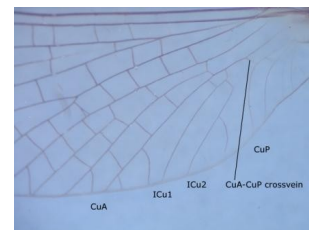


Fig 51. ICu1 and ICu2 parallel, ICu1 attached to CuA-CuP crossvein

- 23a (22)** Pterostigma of forewing with >20 complex (anastomosed) crossveins (Fig. 52); penes with angular apical lobes and minute spines over apical half *Bibulmena*
- 23b** Pterostigma of forewing with <15 simple crossveins (Fig. 53); penes with fleshy lobes, lacking minute spines and not angular at apex *Kaninga*



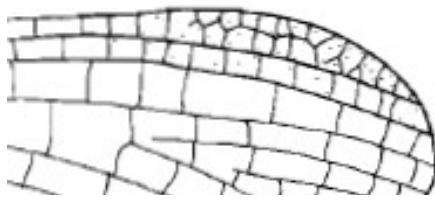


Fig 52. Anastomosed crossveins in pterostigma of *Bibulmena* indicated (modified after Dean 1987).

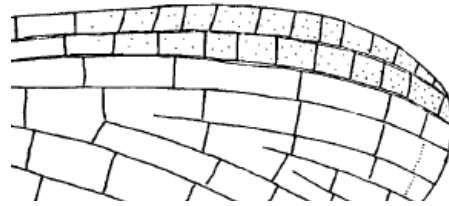


Fig. 53. Simple crossveins in pterostigma of *Kaninga* (modified after Dean 2000).

24a (20) Penes with obvious apical sclerotised spines (Fig. 54); tarsal claws with only one opposing flange *Atalomicria*

24b Penes lacking obvious apical spines (Fig. 55); tarsal claws each with opposing flange 25



Fig 54. *Atalomicria* genitalia lateral view. with spines

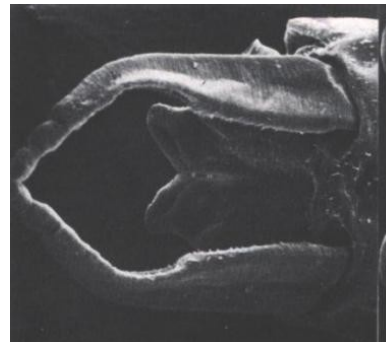


Fig 55. Penes of *Atalophlebia* ventral view. lacking spines

25a (24) Pterostigma of forewing with complex (anastomosed) or simple crossveins, costal and subcostal crossveins pigmented, usually >17 costal crossveins distal of bullae (Fig. 56) *Atalophlebia*

- 25b** Pterostigma of forewing with simple crossveins, costal and subcostal crossveins not pigmented, usually <15 costal crossveins distal of bullae (Fig. 57) 26

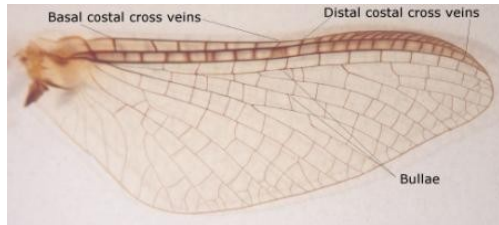


Fig 56. Forewing of *Atalophlebia*

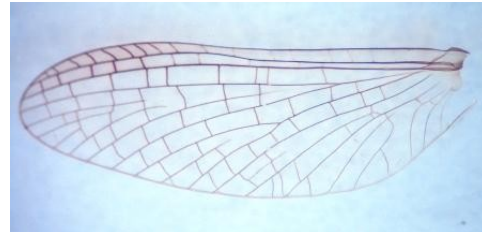


Fig 57. Forewing of *Nousia*.

- 26a (25)** Hind wing with > six costal and subcostal crossveins, MP forked with intercalary (Fig. 58); forewing with ICu1 linked to CuA, ICu1 and ICu2 divergent at wing margin (Fig. 58); penes fused over whole length (Fig. 59)..... *Kalbaybaria*
- 26b** Hind wing with < four costal and subcostal crossveins, MP forked without intercalary (Fig. 60); forewing with ICu1 linked to CuA by crossvein, ICu1 and ICu2 parallel at wing margin (Fig 61); penes fused 0.6x length, but may appear fused over whole length
 *Nousia*

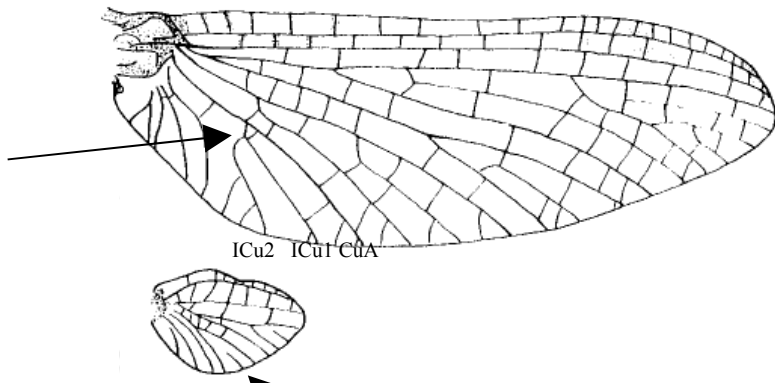


Fig 58. Fore and hind wing of *Kalbaybaria* with forked MP indicated and ICu1 linked to CuA indicated modified after Campbell (1993).

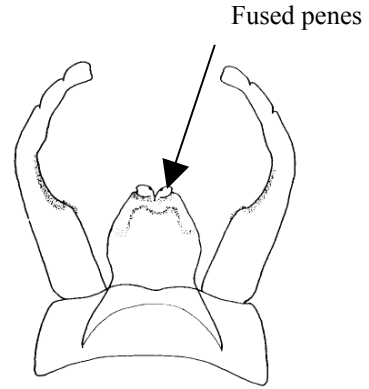
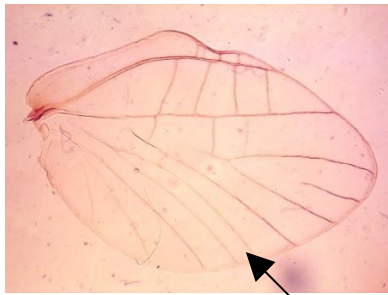
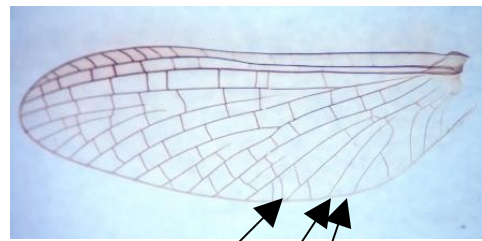


Fig 59. Genitalia of *Kalbaybaria* with fused penes modified after Campbell (1993).



MP

Fig 60. Hindwing of *Nousia*



CuA ICu1 ICu2

Fig 61. Forewing of *Nousia*.

- 27a (16) Hind wind with large costal projection, venation reduced with only one costal and subcostal crossvein (Fig. 62) *Thraulus*
- 27b Hind wing lacking large costal projection and with > four costal and > five subcostal crossveins (Fig. 63) 28

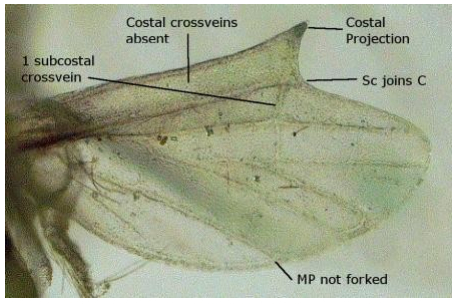


Fig 62. Hindwing of *Thraulius*.

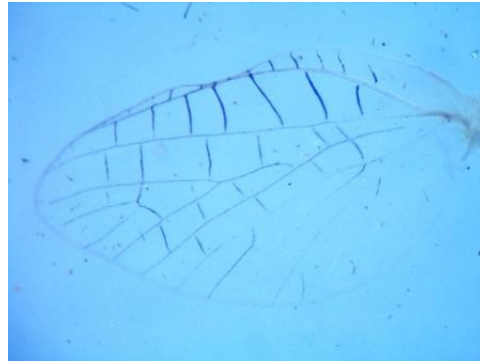


Fig 63. Hindwing of *Jappa*.

28a (27) Penes fused over part of length, greater than half length (Fig. 64)

..... 29

28b Penes separate over greater than half length (Fig. 65) 31



Fig 64. Genitalia of *Manggabora* ventral view.



Fig 65. Genitalia of *Jappa* ventral view.

- 29a (28)** Costal space of forewing basal to bullae lacking crossveins, if present very weakly developed and difficult to see, distally with <10 crossveins (Fig. 66); MP of hind wing lacking an intercalary (Fig. 68).....30
- 29b** Costal space of forewing basal to bullae with six to eight crossveins, distally with > 10 crossveins (Fig. 67); MP of hind wing with an intercalary (Fig. 69); penes lacking a ventral projection
-*Austrophlebioides*

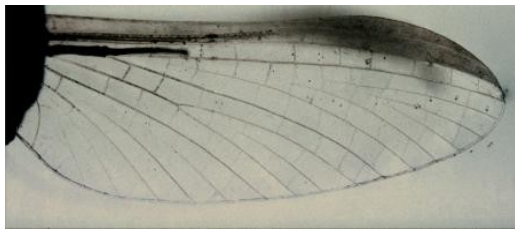


Fig 66. Forewing of *Manggabora* lacking basal costal crossveins.

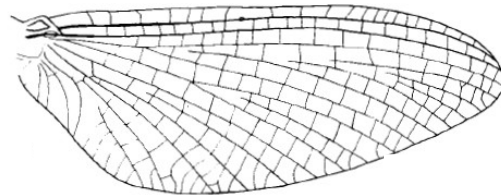


Fig 67. Forewing of *Austrophlebioides* with basal costal crossveins (modified after Campbell and Suter (1986).

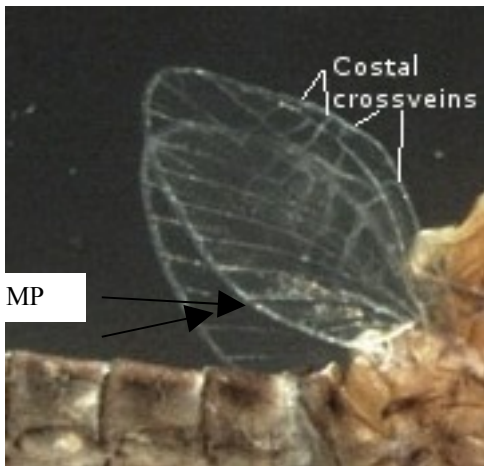


Fig 68. Hindwings of *Manggabora* with MP lacking intercalary indicated.

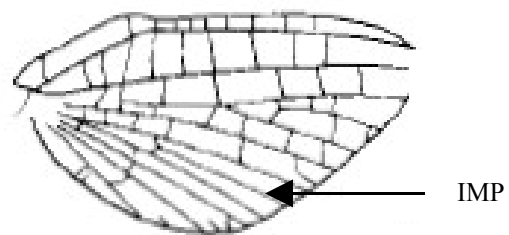


Fig 69. Hindwing of *Austrophlebioides* with an intercalary in MP. Modified after Campbell and Suter (1988).

- 30a (29)** Penes with sharp apical spines and lacking ventral projection; styliger plate deeply cleft *Riekophlebia*
- 30b** Penes with ventral projection (Fig. 70); styliger plate not deeply cleft *Manggabora*



Fig 70. Lateral view of penes of *Manggabora*.

- 31a (28)** Penes with spines at base or apex (Fig. 71) *Tillyardophlebia*
- 31b** Penes lacking spines (Fig. 72) 32

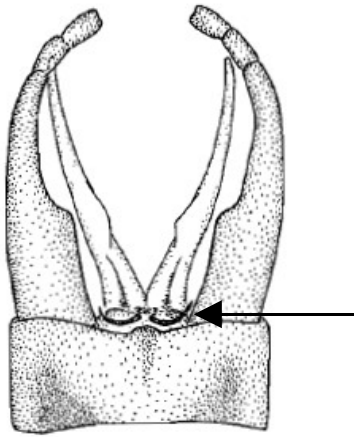


Fig 71. Ventral view of genitalia of *Tillyardophlebia* with spines indicated modified after Dean (1997).



Fig 72. Ventral view of genitalia of *Jappa*.

- 32a** (31) Costal space of forewing basal to bullae lacking crossveins, if present very weakly developed and difficult to see (Fig. 73); apex of penes hooked *Neboissophlebia*
- 32b** Costal space of forewing basal to bullae with six to eight crossveins (Fig. 74); penes simple or with a small ventral knob only
 33

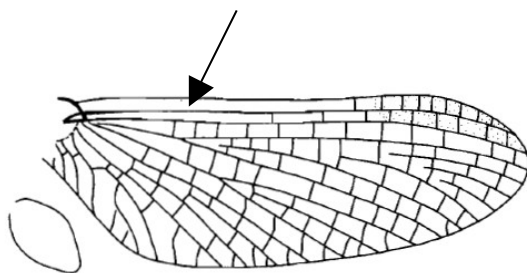


Fig 73. Forewing of *Neboissophlebia* modified after Dean (1988) showing absence of basal costal crossveins.

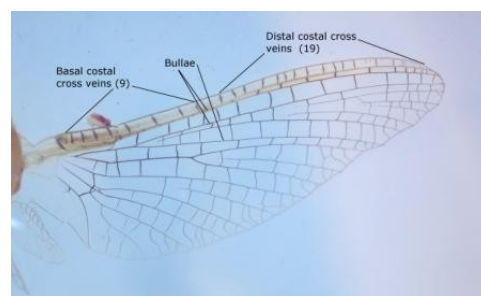


Fig 74. Forewing of *Jappa*.

- 33a (32) MP of hind wing forked with intercalary present (Fig. 75); penes with ventral medial knob *Kirrara*
- 33b MP of hind wing if forked lacking an intercalary (Fig. 76); penes simple lacking ventral projections 34

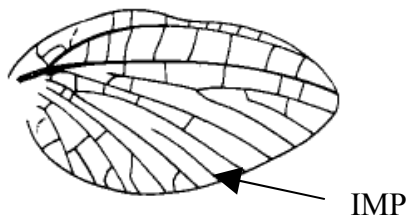


Fig 75. Hind wing of *Kirrara* with Intercalary indicated Modified after Campbell and Peters (1986).

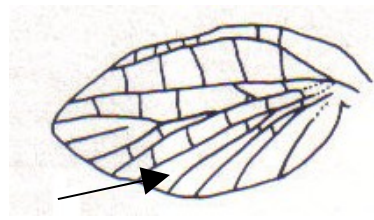


Fig 76. Hindwing of *Ulmerophlebia* lack of intercalary (IMP) indicated Modified after Suter (1986).

- 34a (33) Sc of hind wing joins costal margin at 0.75 wing length (Fig. 77); penes short and separate (Fig. 78) *Ulmerophlebia*
- 34b Sc of hind wing joins costal margin at >0.8 wing length (Fig. 79); penes long and separate (Fig. 80) *Jappa*

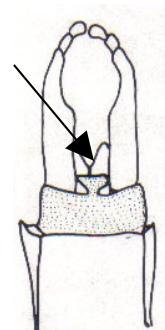
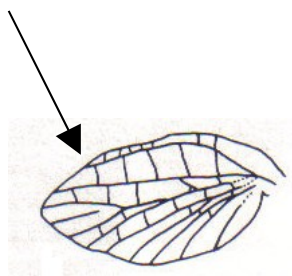


Fig 77. Hind wing of *Ulmerophlebia* with Sc joining costal margin shown.
(Modified after Suter 1986).

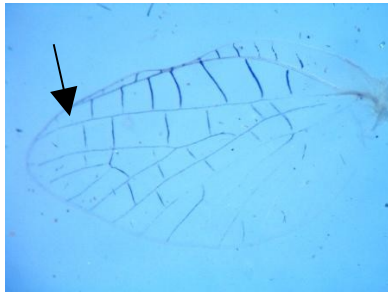


Fig 78. Genitalia of *Ulmerophlebia*.
(Modified after Suter 1986)



Fig 79. Hind wing of
Jappa with Sc joining costal
margin shown

Fig 82. Genitalia of *Jappa*

References