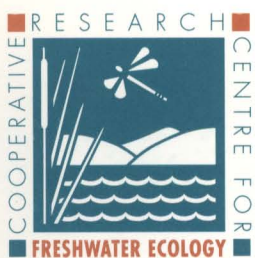
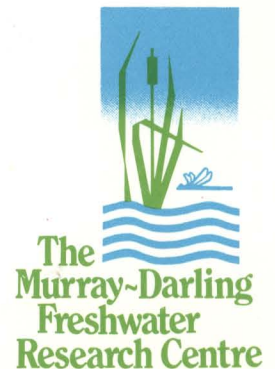


**PRELIMINARY GUIDE TO THE
IDENTIFICATION OF NYMPHS OF
AUSTRALIAN BAETID MAYFLIES
(INSECTA : EPHEMEROPTERA) FOUND IN
FLOWING WATERS**



Phillip J. Suter
Identification Guide No. 14



Presented at the Taxonomy Workshop held at
The Murray-Darling Freshwater Research Centre, Albury
18-20 February, 1997

Co-operative Research Centre for Freshwater Ecology
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Department of Environmental Management and Ecology, La Trobe University,
Albury/Wodonga Campus, Parkers Road, Wodonga, Victoria, 3690.

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Cover: Genus 2, species 3 (Baetidae)

Photograph by John H. Hawking, MDFRC/CRCFE

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INTRODUCTION

The Baetidae are a relatively small group of mayflies, with fewer than 10 described species from five genera. Of these described genera two, *Baetis* and *Pseudocloeon*, have had their taxonomic status altered through the work of Waltz and McCafferty. In 1987b Waltz and McCafferty examined the genus *Baetis* in the nymphal forms only and recognised that within the genus *Baetis* were a number of distinct lineages which each represented new genera or groups of genera. Since the taxonomy of the genus previously had been based on adults alone it was clear that the combination of the presence of a hind wing and paired intercalary veins on the forewing were insufficient to define the genus which included numerous non-related nymphs. On this basis they started to revise *Baetis* and recognised numerous new genera which previously were placed in *Baetis* on the basis of the adult characters. In 1985 and 1987a Waltz and McCafferty reviewed *Pseudocloeon* Klapálek and concluded that since only an adult was known from "Java" that it was impossible to determine what the nymph was like. They concluded that *Pseudocloeon* should only be used for the specimen described by Klapálek from Java. Waltz and McCafferty have continued to describe genera and species on the basis of nymphs alone and this revision of the nymphs of the Baetidae from flowing waters follows their work. Adults have not been reared and the following classification is based entirely on nymphal morphology.

The present study has extended the generic framework established by Dean and Suter (1996). Keys are provided to species for the Australian baetid nymphs from flowing waters, with the three still water genera *Cloeon*, *Centroptilum* and *Bungona* left for future study. These keys will encourage attempts to identify these nymphs to the species level, and increase our knowledge of these important aquatic insects. Recent work in local streams near Albury/Wodonga have shown distinctive habitat preferences of the 4 or 5 species which can be found in close association, but occupying distinct habitats. Keys are provided to six genera, both described and undescribed, a short diagnosis is presented for each, and then keys to identify the representative species are provided. Illustrations of characters are provided, and scale lines are all 0.1mm unless indicated otherwise. Twenty three species are included in the keys. However, additional undescribed genera and species may occur in Australia, and this should be borne in mind when using the keys.

In the preparation of the keys every attempt has been made to use characters which can be observed under dissecting microscopes working at a magnification up to approximately 60x using both direct and reflected light. This has been done to encourage the use of the keys by ecologists and to encourage aquatic biologists to be dissatisfied with merely a generic identification. However, in some instances it has been impossible to enable reliable identification without the need to dissect some mouthparts. The dissection of the labrum, mandibles or labium to verify identification should not be an impediment to the use of the keys. In some cases I have been able to view only one or two specimens, and so variation has not been taken into account. Also the key works best for mature specimens, but provided there is development of wingpads on the nymphs most of the characters will still work, and identification can be achieved.

Finally, the key needs testing, and this can only be done by its use. I encourage rigorous testing of the key and look forward to any comments which will improve its use.

Key to the Australian Baetid Mayflies
from Flowing Waters

1. Body dorso-ventrally flattened; head prognathous (Fig. 1); gills on segments 2-7; cerci and terminal filament lacking long setae on margins*Platybaetis* (only one species *Platybaetis spl* has been recorded from the Alligator Rivers Region in the Northern Territory. This species is very small reaching full maturity at under 3mm in body length).

Diagnosis: Body dorso-ventrally flattened; head prognathous; labrum very small compared with head capsule; mesothoracic wingpads absent; tarsal claws robust with 6-9 large teeth; gills single, plate-like on segments 2-7; caudal filaments not fringed, segments with whorls of short setae, terminal filament shorter than cerci with less than 10 segments.

Body (thorax) with oval to circular cross-section; head hypognathous; gills on abdominal segments 1-7; inner margins of cerci and both sides of terminal filaments fringed with setae2

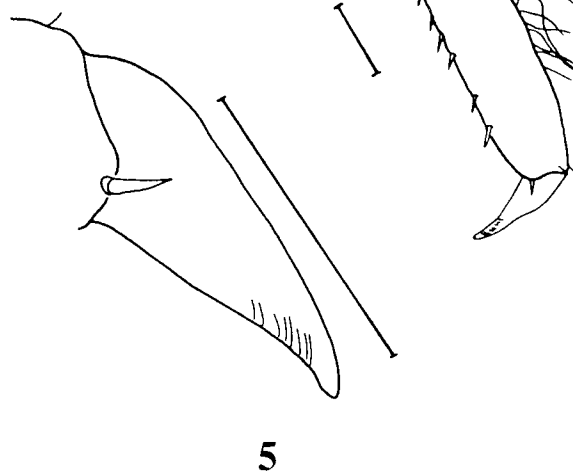
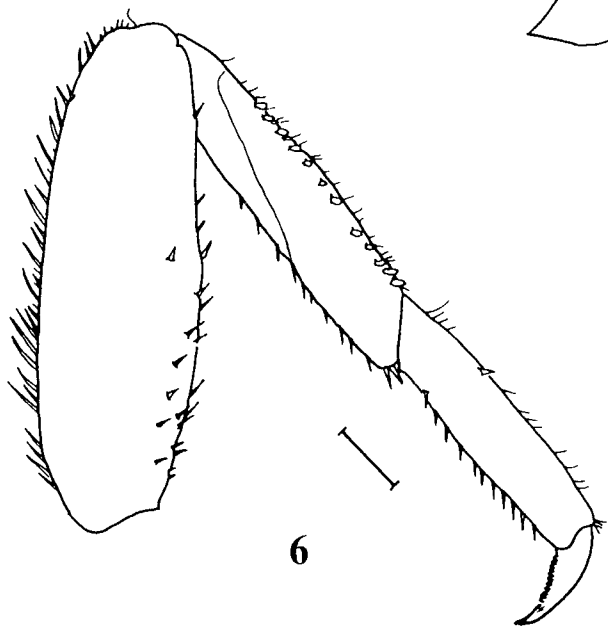
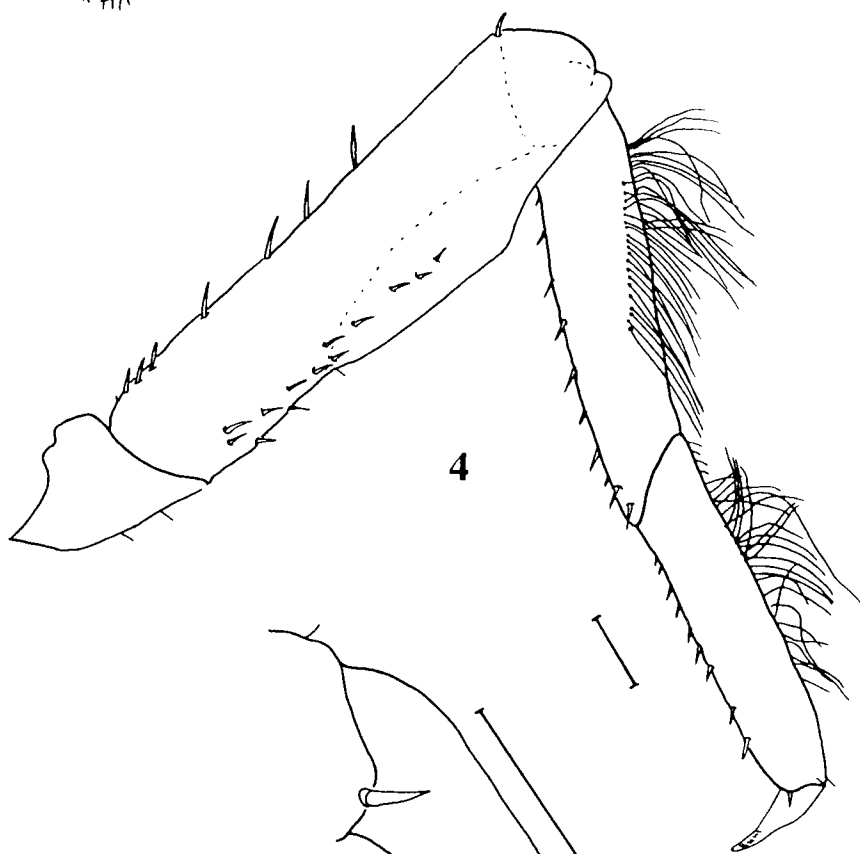
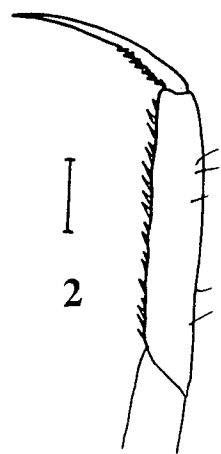
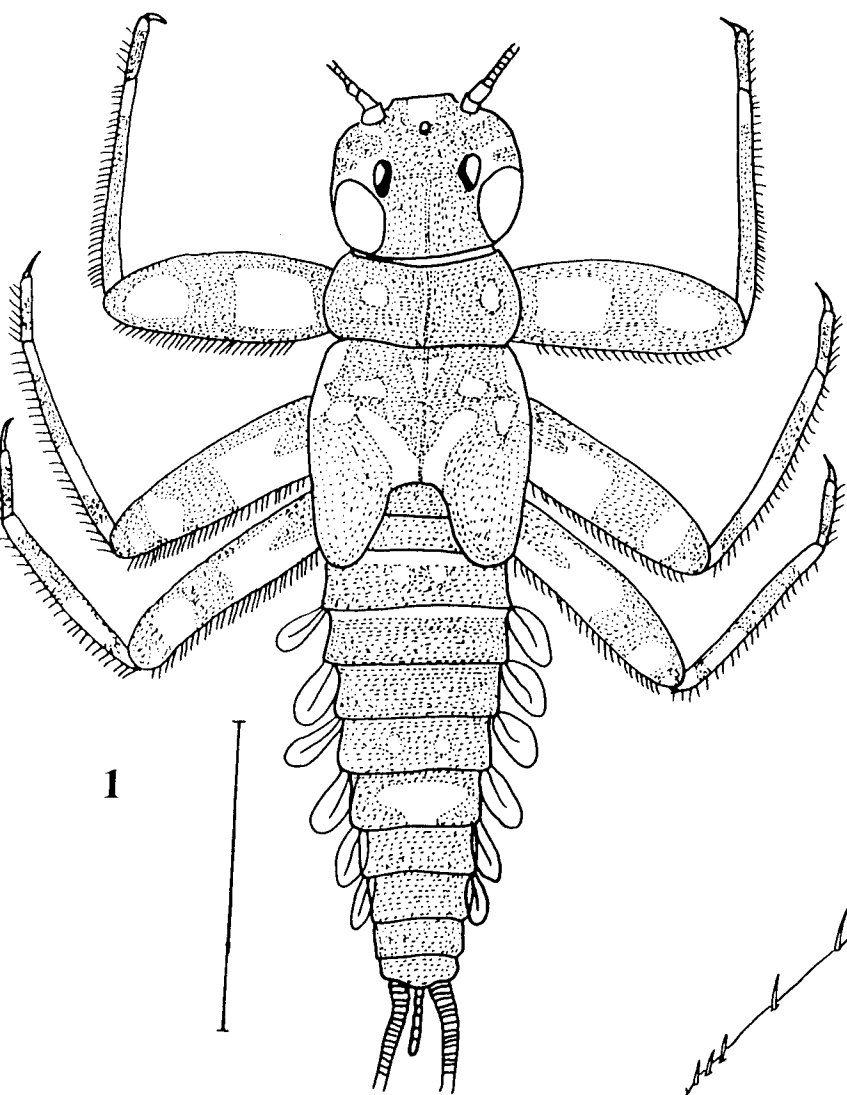
- 2 (1) Tarsal claws long and slender >1/3 length of tarsus (Fig. 2); claws lacking robust teeth but may possess two rows of fine denticle; postero-lateral margin of abdominal segments with numerous spines*Cloeon* and *Centroptilum* (not covered in this key.)

Tarsal claws short <1/3 length of tarsus (Fig 3); claws with one row of robust teeth or lacking robust teeth; postero-lateral margins of abdominal segments lacking spines3

- 3 (2) Tibiae of legs with an oblique line of long fine setae on basal 1/3, setal length approx 3/4 of tibial length; outer margin of tarsi with long fine setae (Fig. 4); tarsal claws short, lacking teeth (Fig. 5); outer margin of femora with few long setae, apex of femora with a pair of distinct sharp setae, tibia with blunt apical spine (Fig. 4)*Bungona* (not covered in this key)

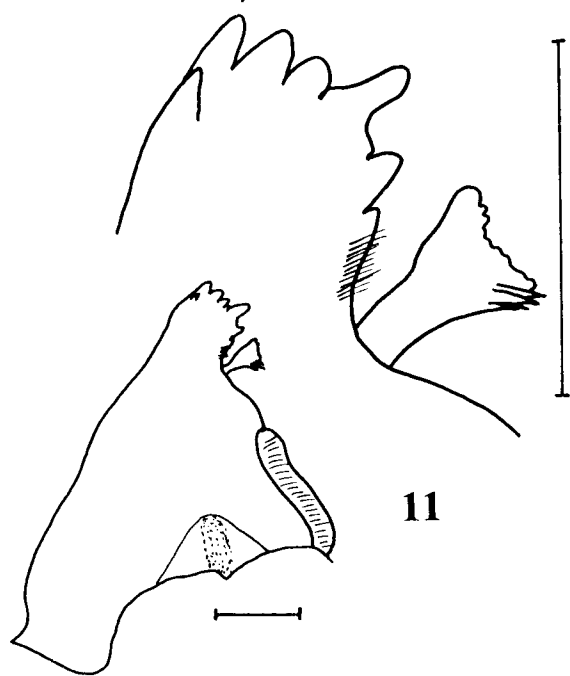
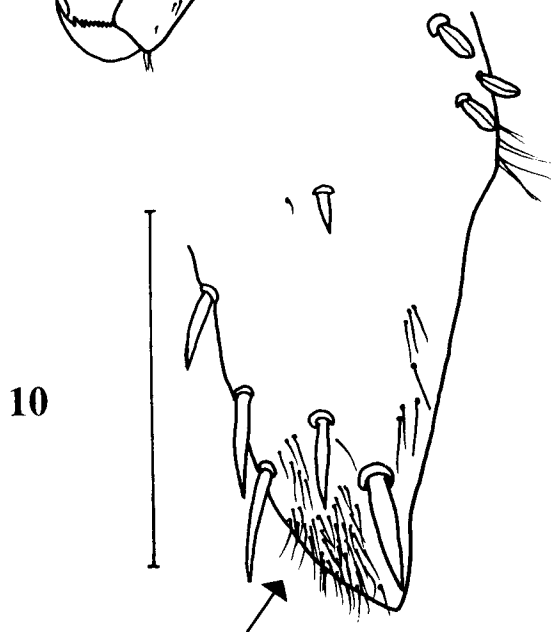
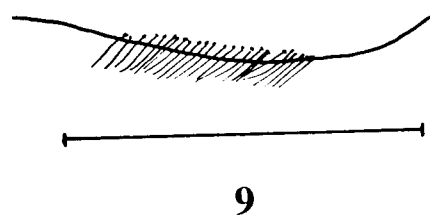
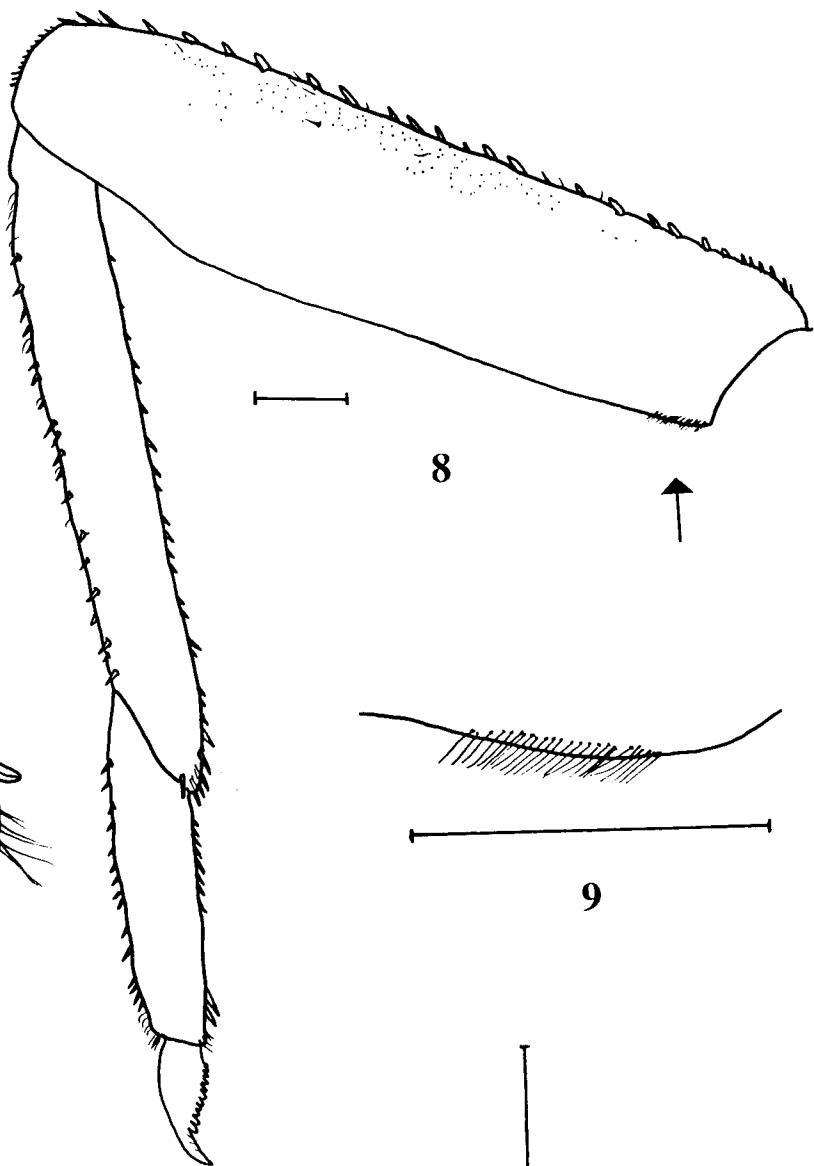
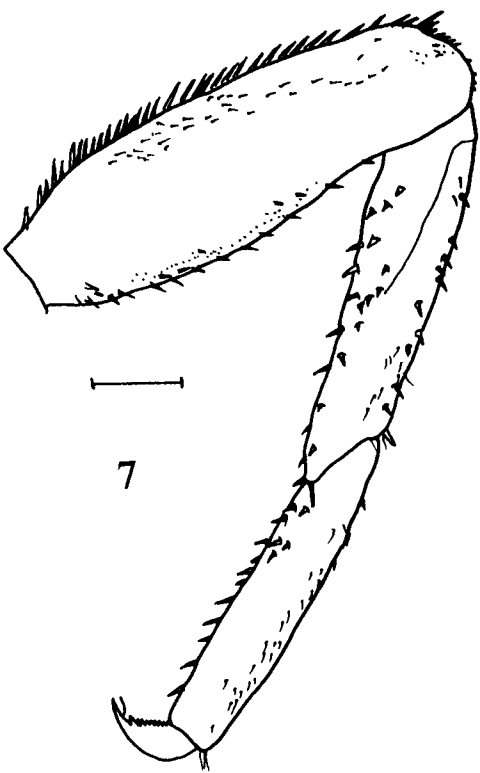
Tibiae of legs lacking long fine setal row; tarsi lacking long fine setae (Fig. 6); tarsal claws curved, with robust teeth4

Figure 1. *Platybaetis*, whole nymph, scale line = 1mm.
Figure 2. *Centroptilum*, tarsal claw.
Figure 3. **Baetidae Genus 1**, tarsal claw.
Figure 4. *Bungona*, foreleg.
Figure 5. *Bungona*, tarsal claw.
Figure 6. **Baetidae Genus 1 sp8**, leg.



- 4 (3) Length of tarsus sub-equal to tibial length (Fig. 7); caudal filaments not banded; prostheca of right mandible slender and bifid or robust and single6
- Length of tarsus much shorter than tibial length, approximately half to two thirds length (Fig. 8); caudal filaments banded or not banded5
- 5 (4) Terminal filament much shorter than cerci; ventral femoral patch present on fore femora (Fig. 9); inner angle of tibiae with a clump of fine hairs (Fig 10); prostheca of right mandible robust and broad apically; mandibles with toothed outer incisors (Fig. 11); hind wing pads absent**Baetidae Genus 3**20
- Terminal filament shorter than cerci, but not greatly so; ventral femoral patch absent; apex of tibiae lacking clump of fine hairs (Fig 12); prostheca of right mandible slender and usually bifid; mandibles with shearing outer incisors (Fig. 13); hind wing pads present**Baetidae Genus 5**23

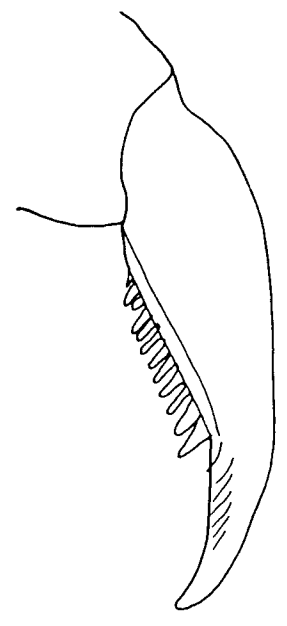
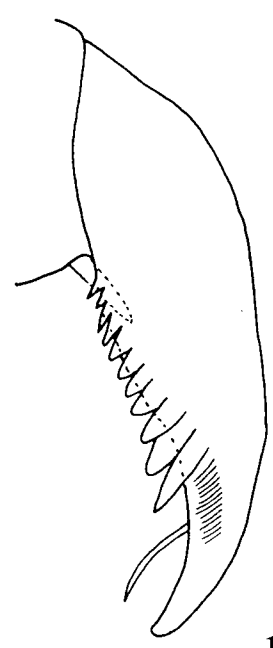
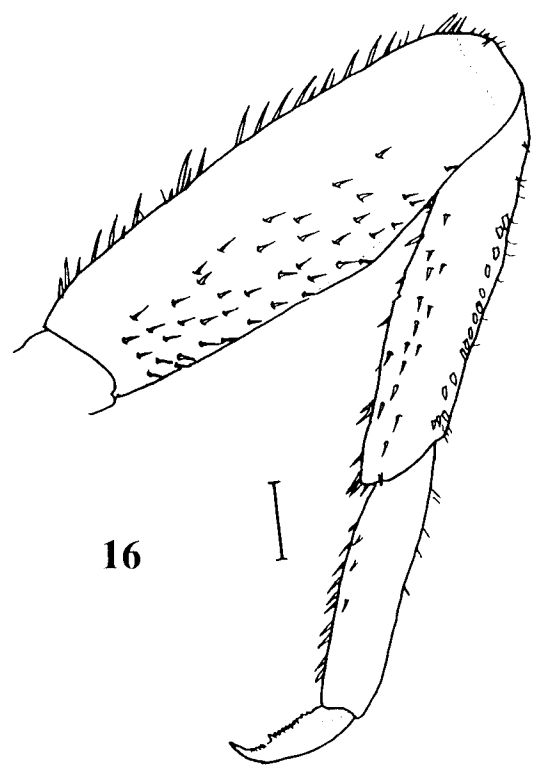
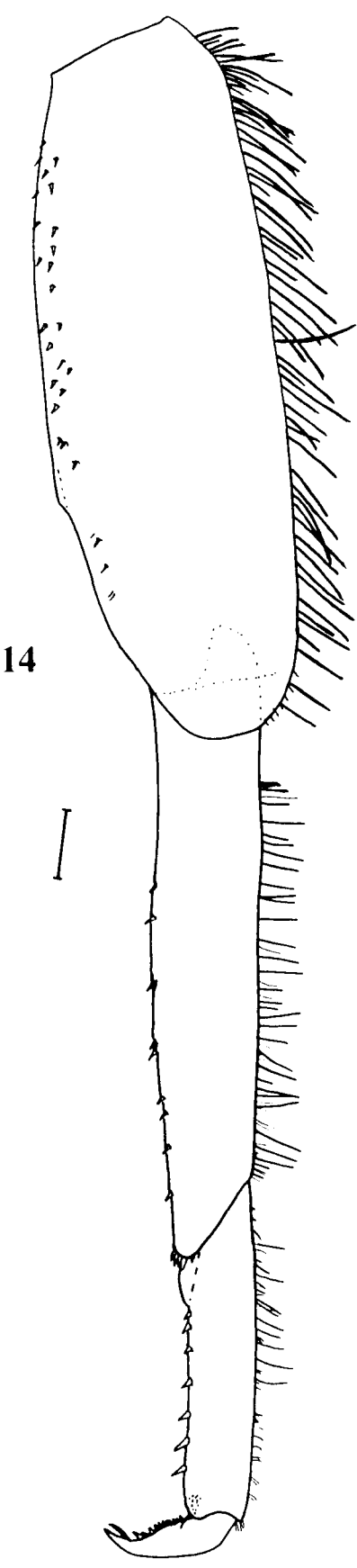
Figure 7. Genus 2 Armidale sp1, foreleg.
 Figure 8. Genus 3 sp4, foreleg with femoral patch highlighted.
 Figure 9. Genus 3 sp4, ventral femoral patch.
 Figure 10. Genus 3 sp4, inner angle of tibia.
 Figure 11. Genus 3 sp4, right mandible showing robust prostheca and toothed incisors.
 Figure 12. Genus 5 sp1, inner angle of tibia.
 Figure 13. Genus 5 sp1, right mandible showing bifid prostheca and "shearing" incisors.



6 (4) Fringe of long, blunt setae on at least the femora (Fig. 14), usually >30 but may be <10; tarsal claws with a subapical setule (Fig. 15)**Baetid Genus 2**
.....15

All leg segments lacking fringe of long blunt setae (Fig. 16) although may have fringe of long spine setae on femora and tibiae; tarsal claws lacking subapical setule (Fig. 17)7

Figure 14. **Baetidae Genus 2 MVsp3**, foreleg.
Figure 15. **Baetidae Genus 2 MVsp3**, tarsal claw.
Figure 16. **Baetidae Genus 1 sp8**, foreleg.
Figure 17. **Baetidae Genus 1 sp8**, tarsal claw.

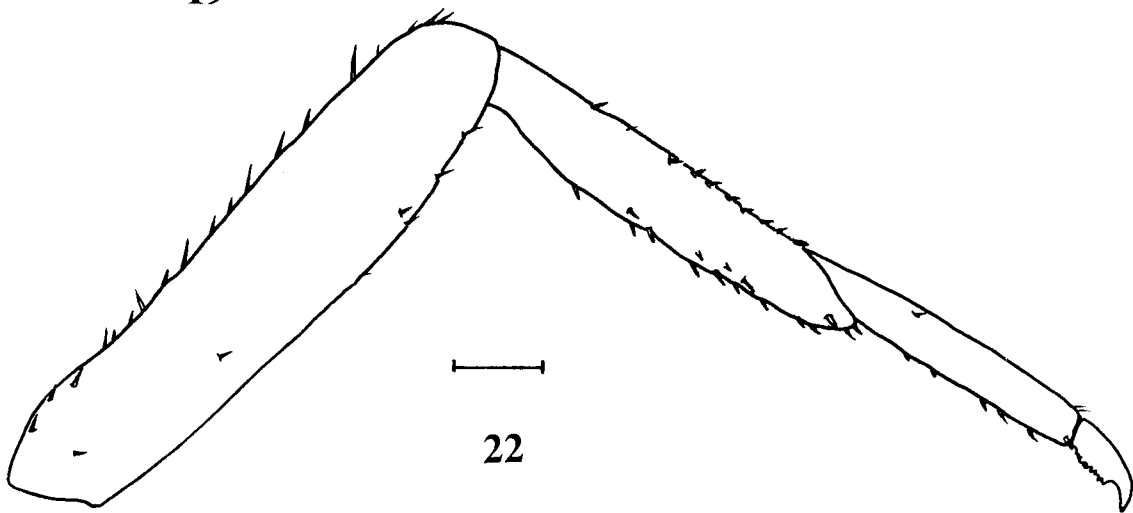
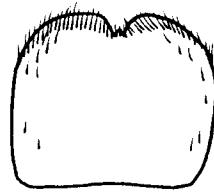
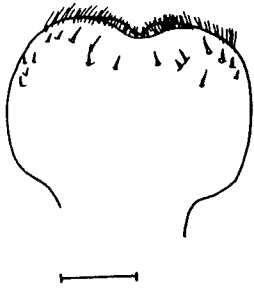
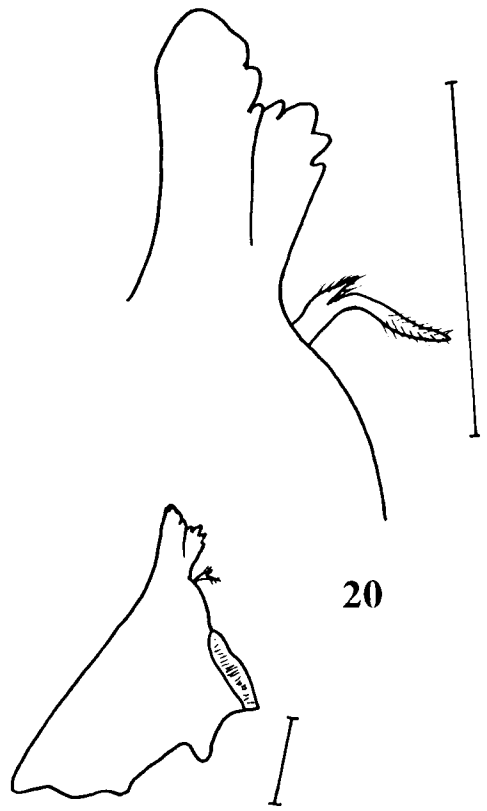


7 (6) Right mandible with distinct tubercle between incisors and molars, prostheca robust and single (Fig. 18); labrum wider than long (Fig. 19) ...**Baetid Genus 1**
8

Right mandible lacking tubercle between incisors and molar region, prostheca slender and bifid (Fig. 20), labrum oblong, longer than wide (Fig. 21)
**Baetid Genus 4**
 (Includes only one species from northern Queensland)

Diagnosis: Head hypognathous. Labrum almost square with a shallow median notch; incisors of mandibles fused, with a shearing surface; inner incisors without bristles; prostheca of right mandible slender and bifid; margin between incisors and molars smooth, tubercle absent; mesal margin of second segment of labial palp strongly developed. Thorax oval to circular in cross-section. Ventral femoral patch absent. Femora lacking fringe of long blunt setae. Tibiae without an oblique row of long fine setae; tarsi without long fine setae on outer margin; apex of tibiae without a clump of fine hairs. Tarsus of legs long equal length to tibiae; tarsal claws short less than half length of tarsus with obvious teeth; subapical bristle present or absent. Hind wing pads present. Gills single, plate-like, on abdominal segments 1-7. Three caudal filaments present; terminal filament shorter than cerci and fringed on lateral margins; cerci fringed on inner margin.

Figure 18. **Baetidae Genus 1 MVsp5**, right mandible with single robust prostheca and distinct tubercle highlighted.
 Figure 19. **Baetidae Genus 1 MVsp5**, labrum.
 Figure 20. **Baetidae Genus 4 sp1**, right mandible with bifid prostheca.
 Figure 21. **Baetidae Genus 4 sp1**, labrum.
 Figure 22. **Baetidae Genus 4 sp1**, foreleg.



Baetidae Genus 1

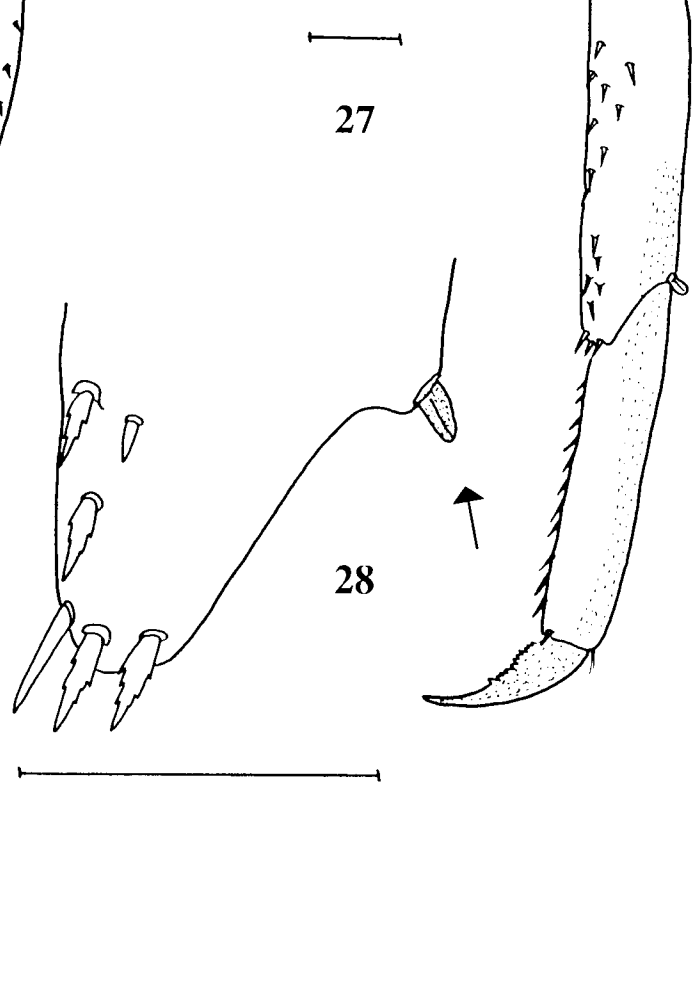
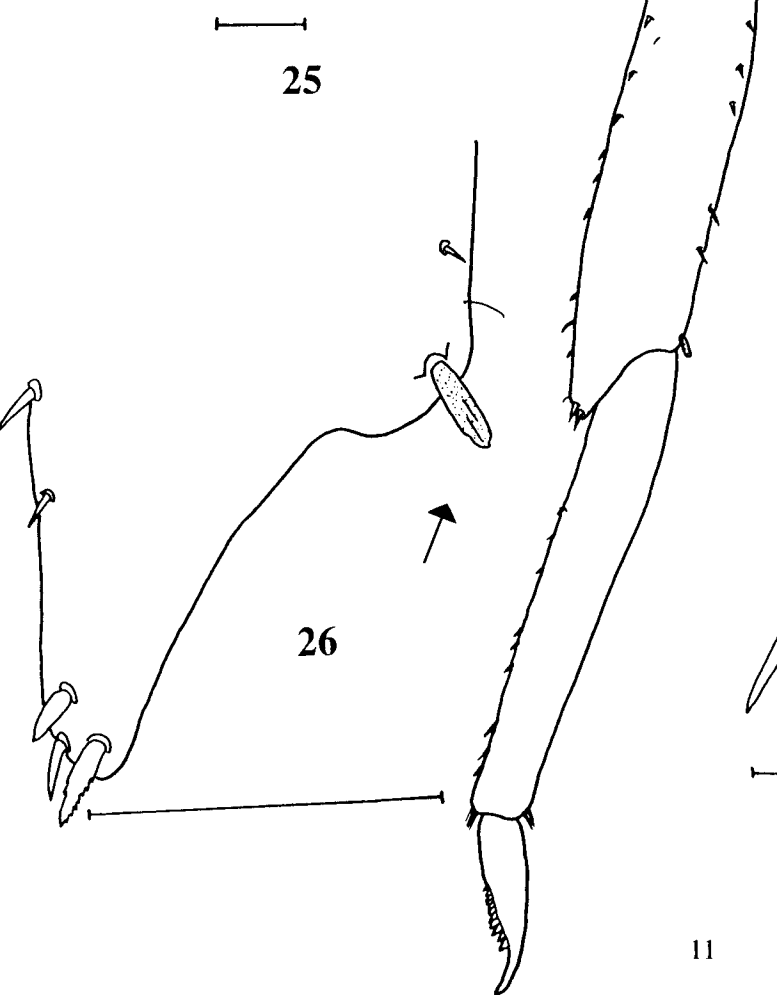
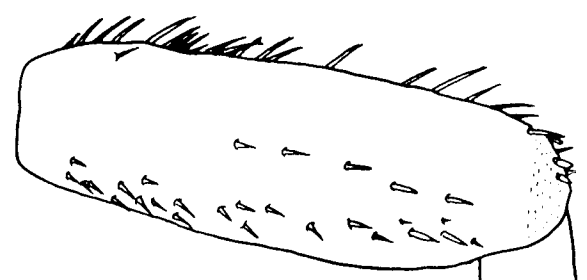
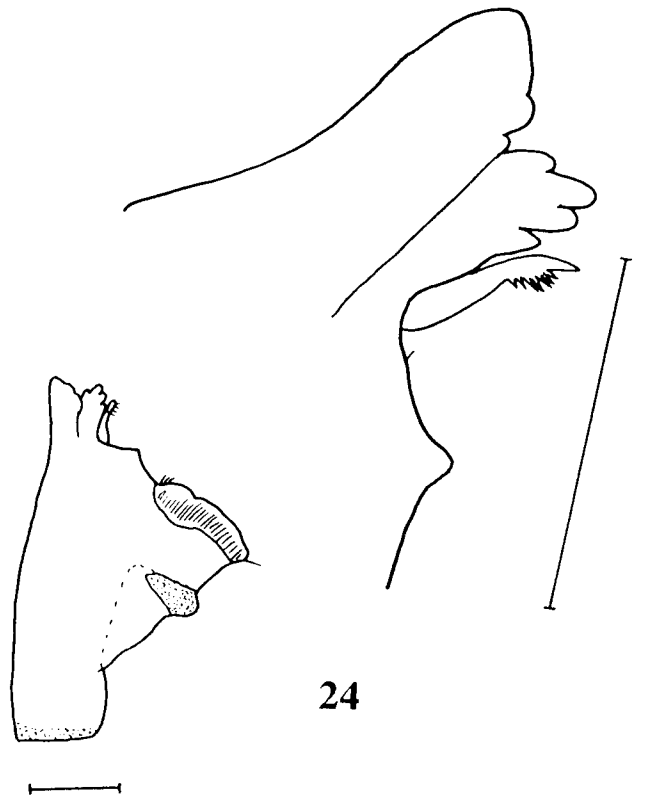
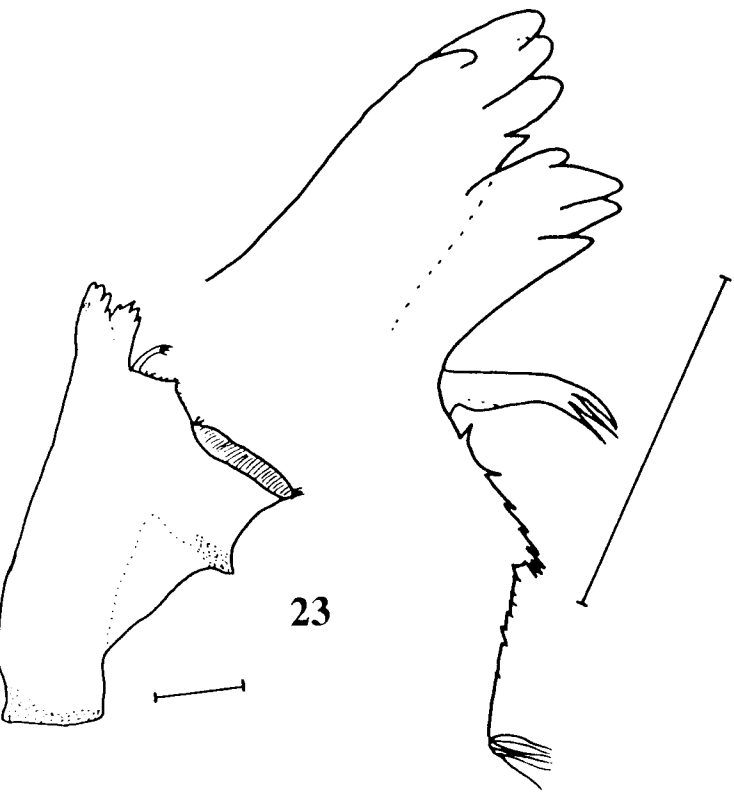
Diagnosis: Head hypognathous. Labrum ovoid with a shallow median notch; incisors of mandibles fused, with a shearing or toothed surface; inner incisors without bristles; prostheca of right mandible robust and single; margin between incisor and molars smooth, tubercle present; mesal margin of second segment of labial palp moderately developed. Thorax oval to circular in cross-section. Ventral femoral patch absent. Femora lacking fringe of long blunt setae. Tibiae without an oblique row of long fine setae; tarsi without long fine setae on outer margin; apex of tibiae without a clump of fine hairs. Tarsus of legs long sub-equal length to tibiae; tarsal claws short, less than half length of tarsus, with obvious teeth; subapical bristle absent. Hind wing pads present. Gills single plate-like, on abdominal segments 1-7. Three caudal filaments present; terminal filament shorter than cerci and fringed on lateral margins; cerci fringed on inner margin.

This genus has 8 species recognised, and occurs in all Australian states and territories. There are two distinct groups differentiated by the structure of the outer incisors of the mandibles. Two species have distinct toothed incisors whereas all the other species have a blunt "shearing" surface on the outer incisors.

- 8 (7) Outer incisors of mandibles with distinct teeth, margin between incisors and molars strongly serrated (Fig. 23)9
- Outer incisors of mandibles with a blunt, shearing surface (Fig. 24)10

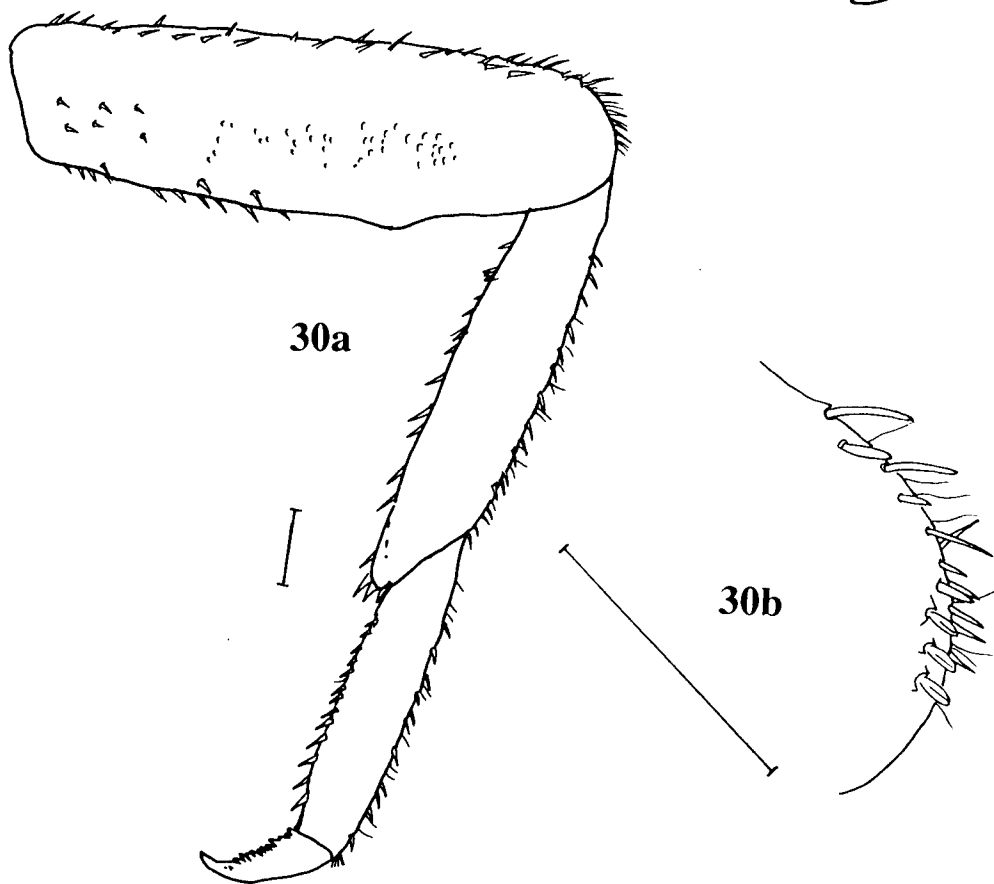
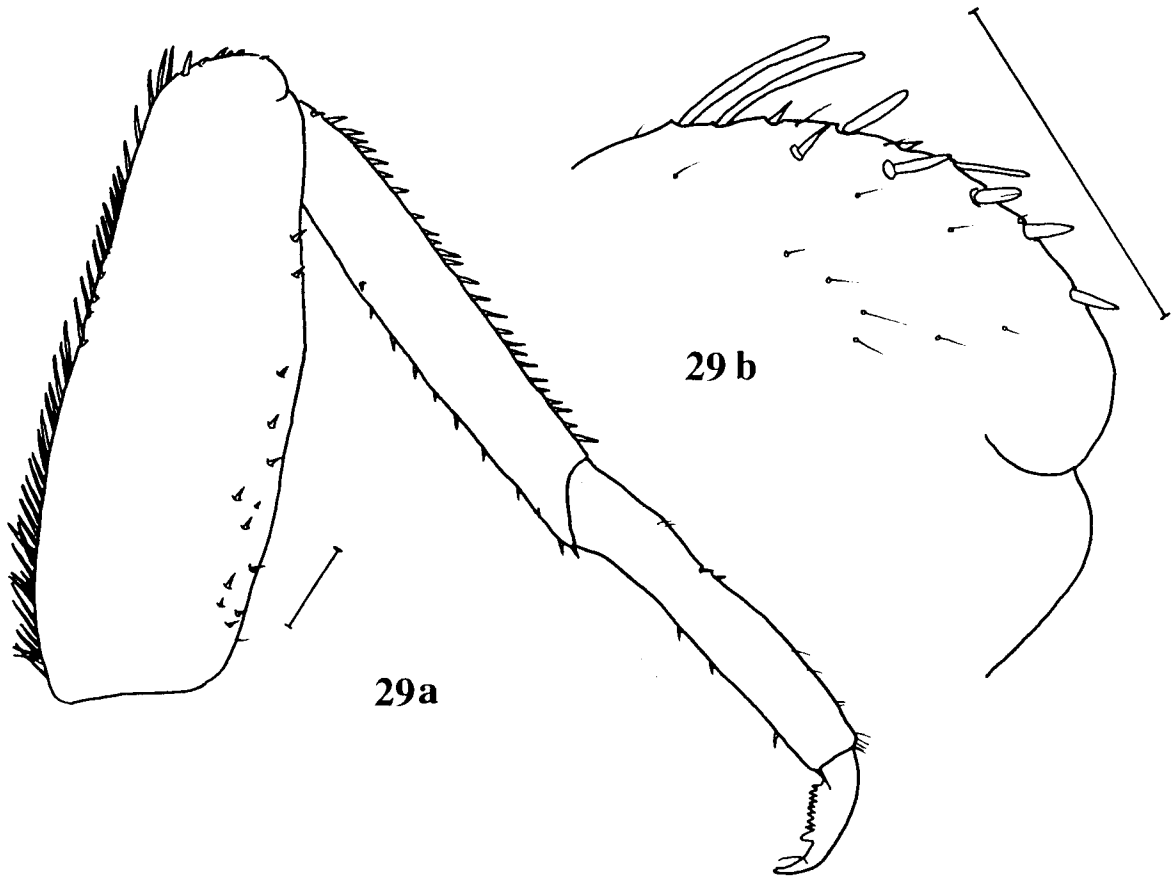
- 9 (8) Femur with few short spine setae on mesal margin (Fig. 25); apex of femur with short peg-like spines; tibiae with a single broad setule at apex (Fig. 26)**Genus 1 WA sp1**
(this species has only been found in north-western Western Australia)
- Femur with distinct long spine setae on the mesal margin (Fig. 27); apex of femur with globular setae; tibiae with a large globular setule at apex (Fig. 28)**Genus 1 SWB5N**
(this species has been recorded from New South Wales by the EPA)

Figure 23. **Baetidae Genus 1 WAsp1**, right mandible showing toothed outer incisors.
 Figure 24. **Baetidae Genus 1 MVsp4**, right mandible showing "shearing" outer incisors.
 Figure 25. **Baetidae Genus 1 WAsp1**, foreleg.
 Figure 26. **Baetidae Genus 1 WAsp1**, apex of tibiae showing apical setule.
 Figure 27. **Baetidae Genus 1 SWB5N**, foreleg.
 Figure 28. **Baetidae Genus 1 SWB5N**, apex of tibiae showing apical setule.



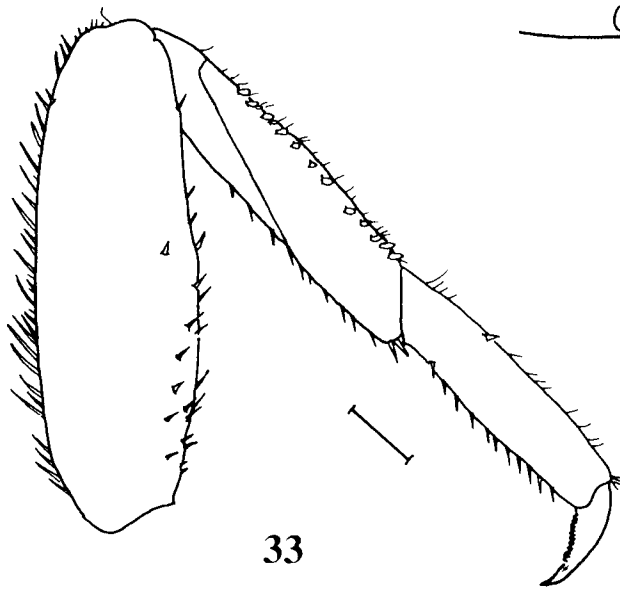
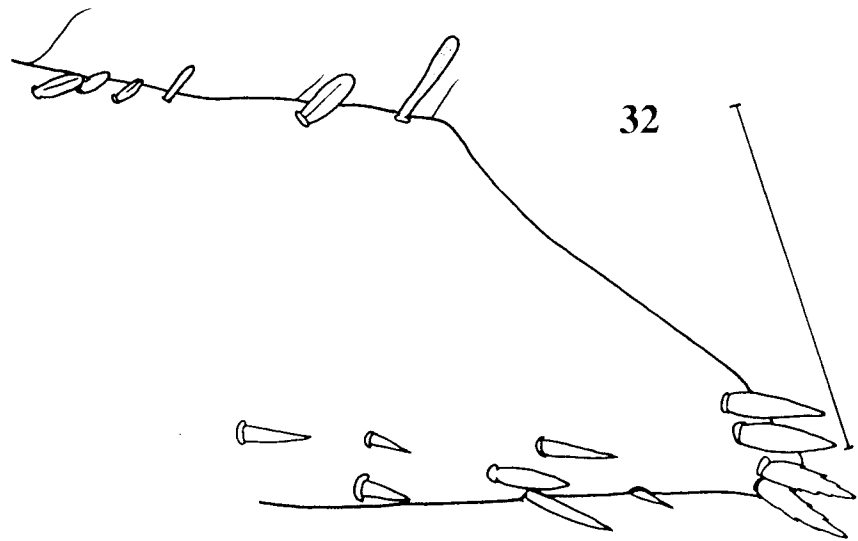
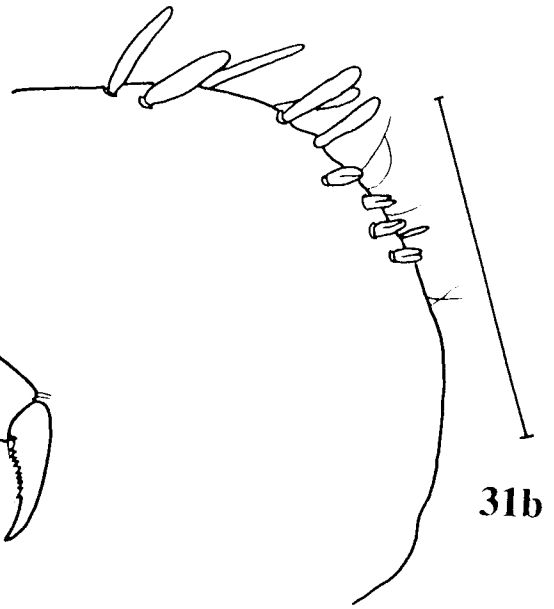
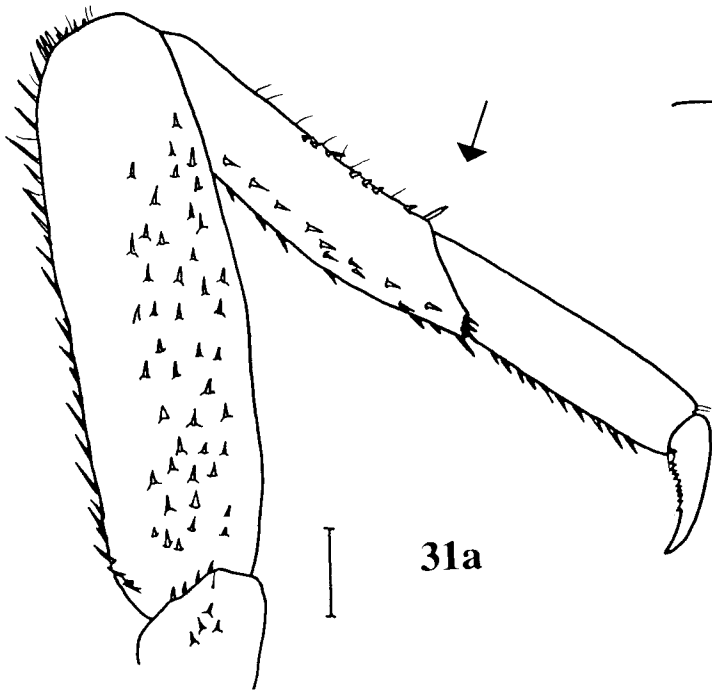
- 10 (8) Femora and tibiae with fringe of long spine setae (Fig. 29a) .**Genus 1 WA sp 2**
 (This species has only been recorded from north western Western Australia)
- Tibiae lacking distinct fringe of spine setae (Fig. 30a)11

Figure 29. **Baetidae Genus 1 WAsp2**, a) foreleg b) apex of femur.
 Figure 30. **Baetidae Genus 1 MVsp5**, a) foreleg b) apex of femur.



- 11 (10) Apex of tibiae with single, long and blunt setule, tibiae with short setae and fine hairs on outer margin (Figs. 31a and 32)**Genus 1 sp MVsp4**
 (This species has been recorded from eastern Australia from south Queensland, New South Wales, Victoria and Tasmania)
- Apex of tibiae lacking an obvious setule (Fig. 33)12

Figure 31. **Baetidae Genus 1 MVsp4**, a) foreleg b) apex of femur.
 Figure 32. **Baetidae Genus 1 MVsp4**, apex of tibia.
 Figure 33. **Baetidae Genus 1 sp8**, foreleg.



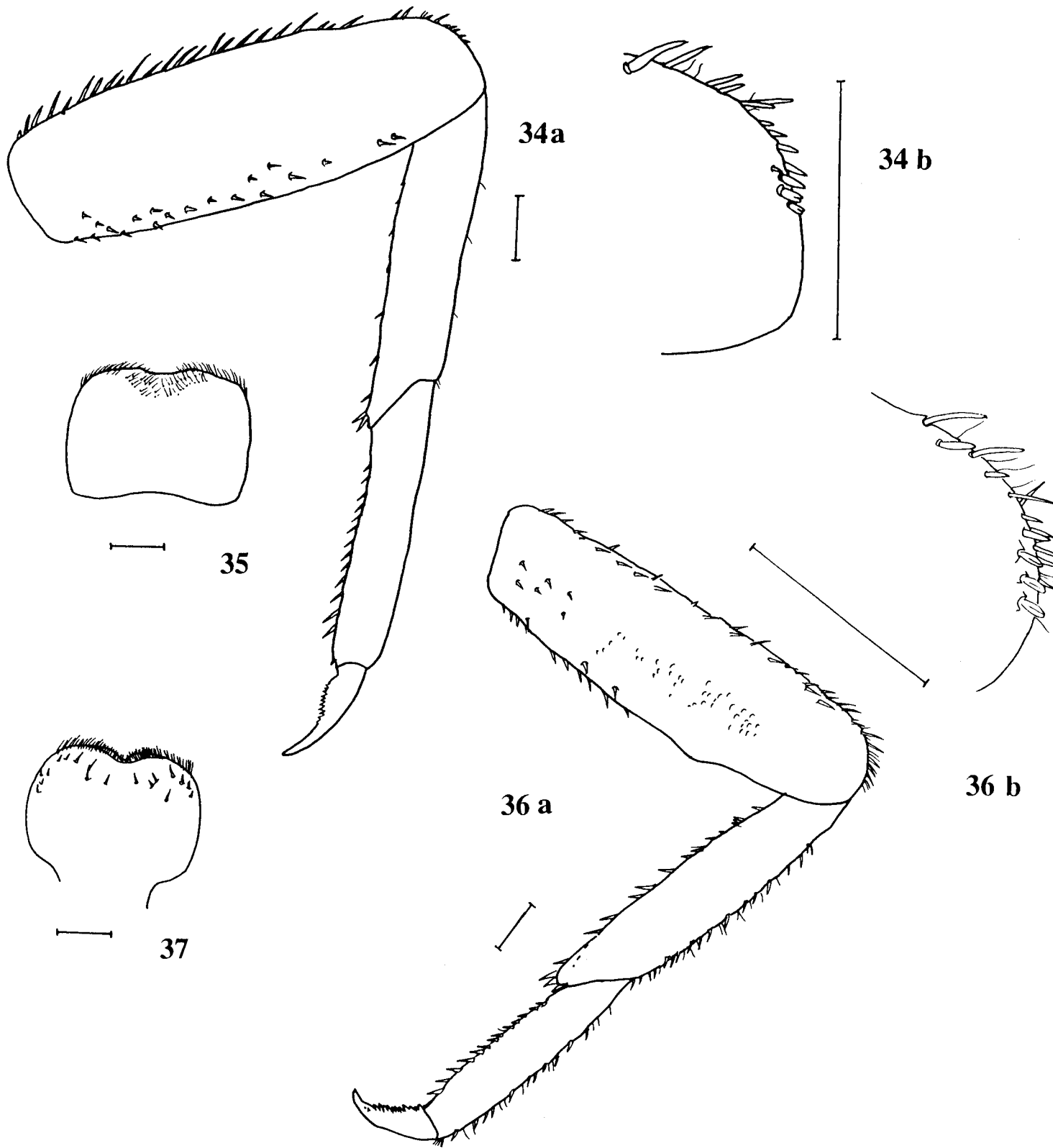
12 (11) Tibiae and tarsi lacking spines on outer margin, but with fine hairs present (Fig. 34a); labrum very hairy and lacking central concavity (Fig. 35)**Genus 1 sp7**
 (This species has been recorded from Victoria, New South Wales and southern Queensland. It is rare in collections, but may occur in the more ephemeral arid zone streams.)

Tibiae and tarsi with spines on outer margin (Fig. 36a), labrum with central concavity (Fig. 37)13

13 (12) Body without a distinct colour pattern, all abdominal segments similar in colour without strong contrasting segments; femora, tibiae and tarsi lined with spine setae (Fig. 36a)**Genus 1 MVsp5**
 (This species is widespread in south eastern Australia occurring in New South Wales, Victoria, South Australia and Tasmania. This species includes the following voucher species; MV sp 5, VicEPA sp 10 and VicEPA sp 12 and "*Baetis soror*" from SA. It is likely that one of the species described from the Armidale area by Harker in 1950 is this species. However, there are no types in the British Museum or Australian Museum to enable a comparison.)

Body pattern on abdominal segments with strongly contrasting dark and light segments (Fig. 38); femora with spine setae, but tibiae and tarsi lack spine setae (Fig. 39a)14

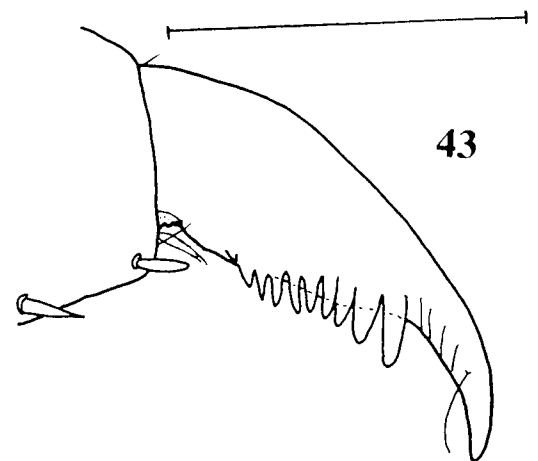
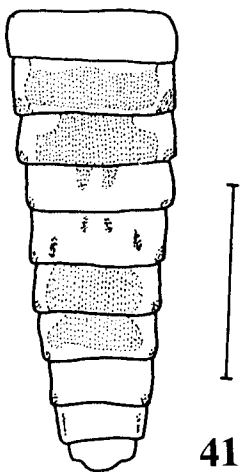
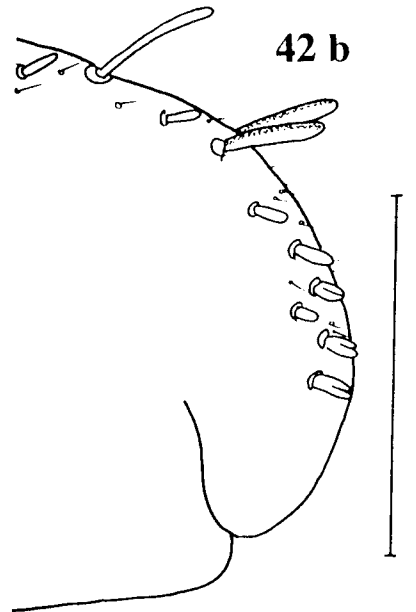
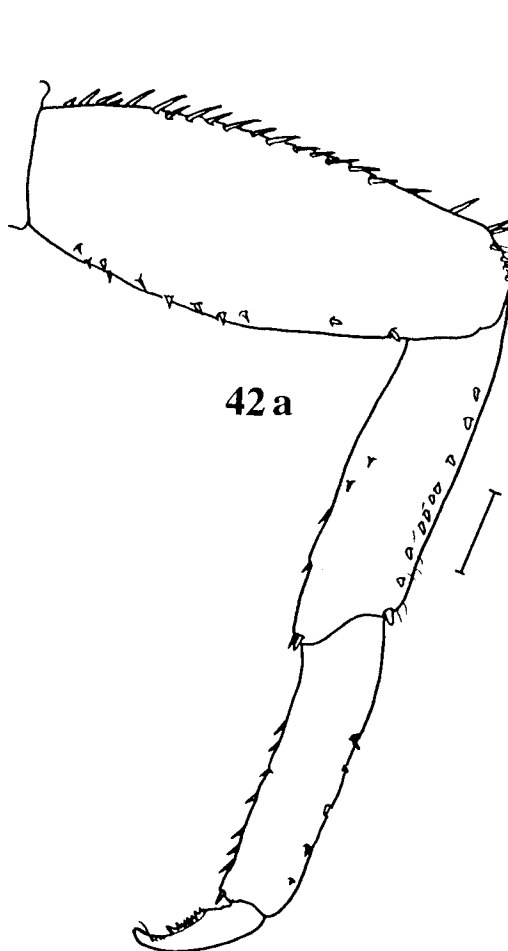
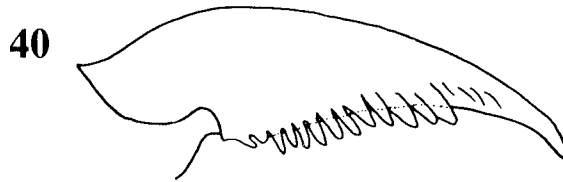
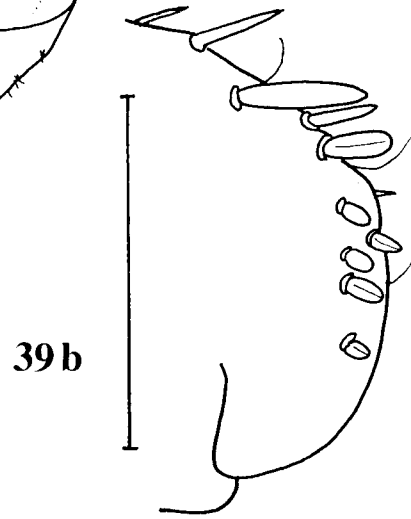
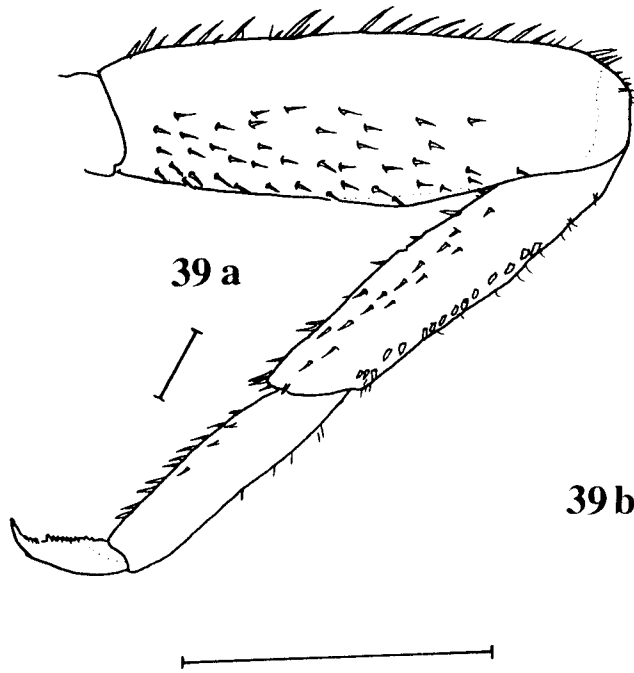
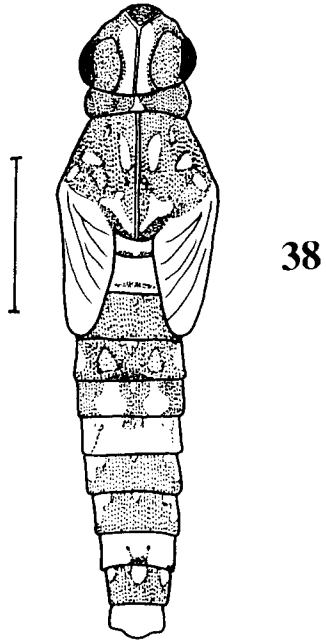
<p>Figure 34. Baetidae Genus 1 sp7, a) foreleg b) apex of femur. Figure 35. Baetidae Genus 1 sp7, labrum. Figure 36. Baetidae Genus 1 MVsp5, a) foreleg b) apex of femur. Figure 37. Baetidae Genus 1 MVsp5, labrum.</p>



14 (13) Body pattern on abdominal segments with segments 1, 5, 8 and 10 light, 2-4, 6, 7 and 9 dark, strongly contrasting the lighter segments (Fig. 38); mesal margin of femora with numerous spine setae (Fig 39a); apex of tarsal claw lacking a fine hair (Fig. 40) **Genus 1 sp 8**
 (This species is common in Tasmania and also occurs in Victoria and south eastern South Australia. Genus 1 sp8 includes VicEPA sp 8 and VicEPA sp 11 vouchers. It is a small species with a mature body length around 4mm, and is often ignored in field collections as a small example of some of the larger species).

Body pattern on abdominal segments 1, 4, 5 and 8-10 light, segments 2, 3, 6 and 7 dark strongly contrasting the lighter segments (Fig. 41); mesal margin of femora with few spine setae (Fig. 42a); apex of tarsal claw with a fine hair (Fig. 43) **Genus 1 ARR sp1**
 (his species has only been recorded from northern Australia in the Alligator Rivers Region of the Northern Territory. It is likely to be more widespread in the northern region of Australia).

<p>Figure 38. Baetidae Genus 1 sp8, dorsal body pattern, scale line = 1mm. Figure 39. Baetidae Genus 1 sp8, a) foreleg b) apex of femur. Figure 40. Baetidae Genus 1 sp8, tarsal claw. Figure 41. Baetidae Genus 1 ARRsp1, dorsal abdominal pattern, scale line = 1mm. Figure 42. Baetidae Genus 1 ARRsp1, a) foreleg b) apex of femur. Figure 43. Baetidae Genus 1 ARRsp1, tarsal claw.</p>



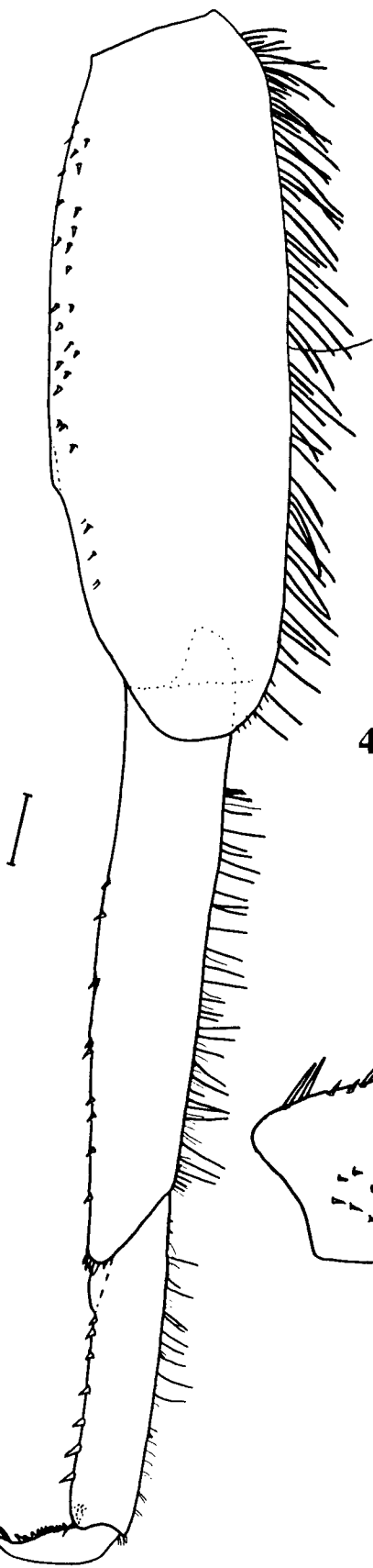
Baetidae Genus 2

Diagnosis: Head hypognathous. Labrum ovoid with a shallow median notch; incisors of mandibles fused, with a shearing surface; inner incisors without bristles; prosthema of right mandible slender and bifid; margin between incisors and molars serrated, tubercle absent; mesal margin of second segment of labial palp not developed. Thorax oval to circular in cross-section. Ventral femoral patch absent. Femora usually with dense fringe of long blunt setae. Tibiae without an oblique row of long fine setae; tarsi without long fine setae on outer margin; apex of tibiae without a clump of fine hairs. Tarsus of legs long equal length to tibiae; tarsal claws short less than half length of tarsus with obvious teeth; subapical bristle present, hind wing pads present. Gills single, plate-like, on abdominal segments 1-7. Three caudal filaments present; terminal filament shorter than cerci and fringed on lateral margins; cerci fringed on inner margin.

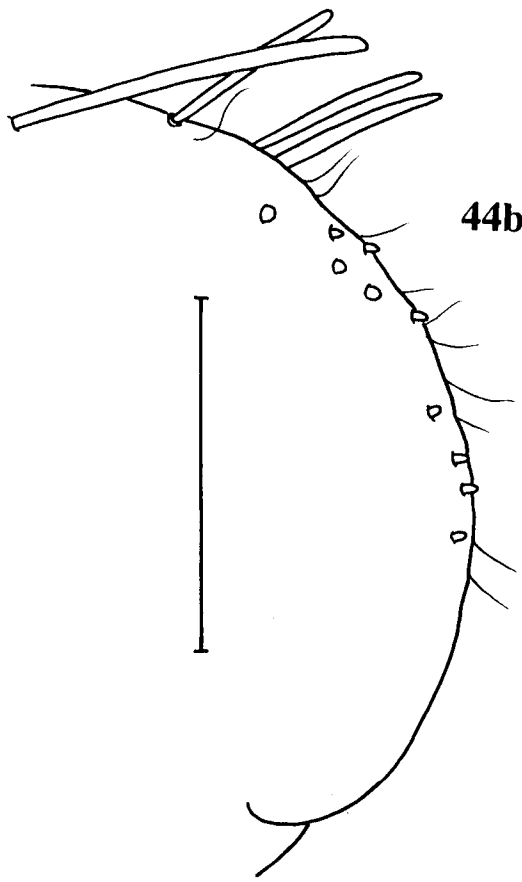
Six species are recognised in this genus, but it is probable that there are more as larger areas of country are examined. This genus has representatives mainly in south eastern Australia with South Australia the exception. It is likely that some species occur in Queensland.

- 15 (6) Fringe of long setae on femora, tibiae and tarsi (Fig. 44a)
 **Baetid Genus 2 MVsp3**
 (This species is one of the most common species in Victoria, Tasmania, New South Wales and has also been recorded in southern Queensland. The voucher species included in this species are "*Baetis*" MV sp3 and in NSW SWB1N).
- Fringe of long setae only on femora (Figs. 46a & 47a) 16
- 16 (15) Femora with <10 long blunt setae (Fig. 46a) **Baetid Genus 2 sp9**
 (This species is rare being recorded from the Gibbo River in the Upper Murray catchment in Victoria).
- Femora with >20 long blunt setae (Fig. 47a) 17

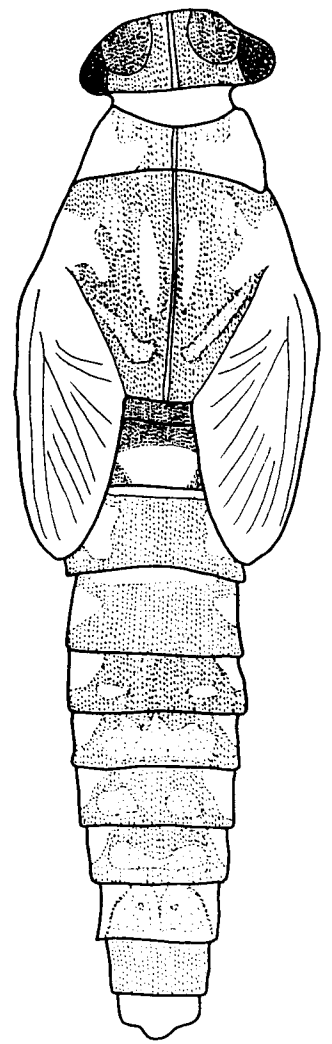
Figure 44. **Baetidae Genus 2 MVsp3**, a) foreleg b) apex of femur.
 Figure 45. **Baetidae Genus 2 MVsp3**, dorsal body pattern, scale line = 1mm.
 Figure 46. **Baetidae Genus 2 sp9**, a) foreleg b) apex of femur.



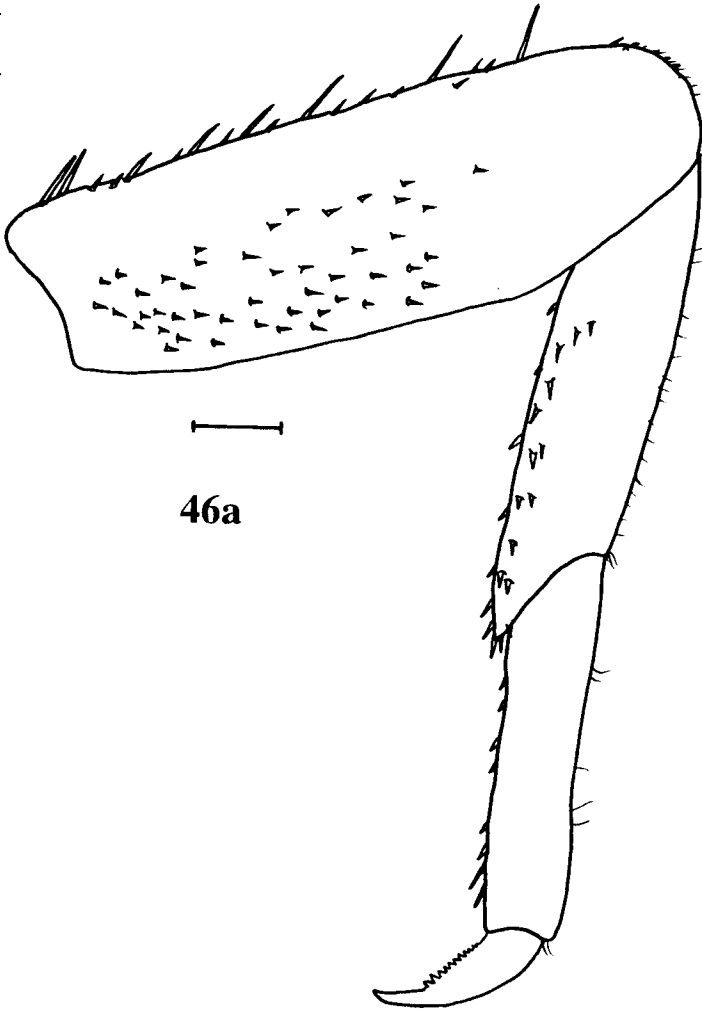
44a



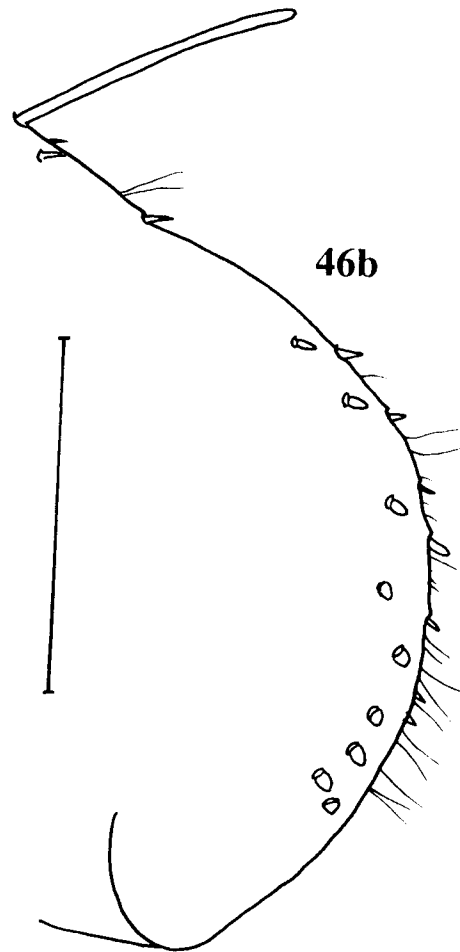
44b



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46a



46b

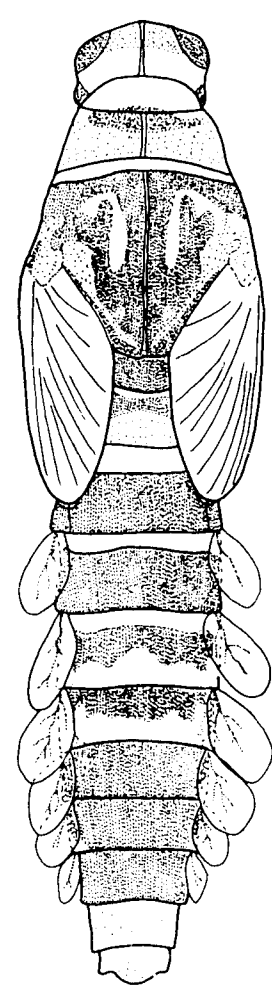
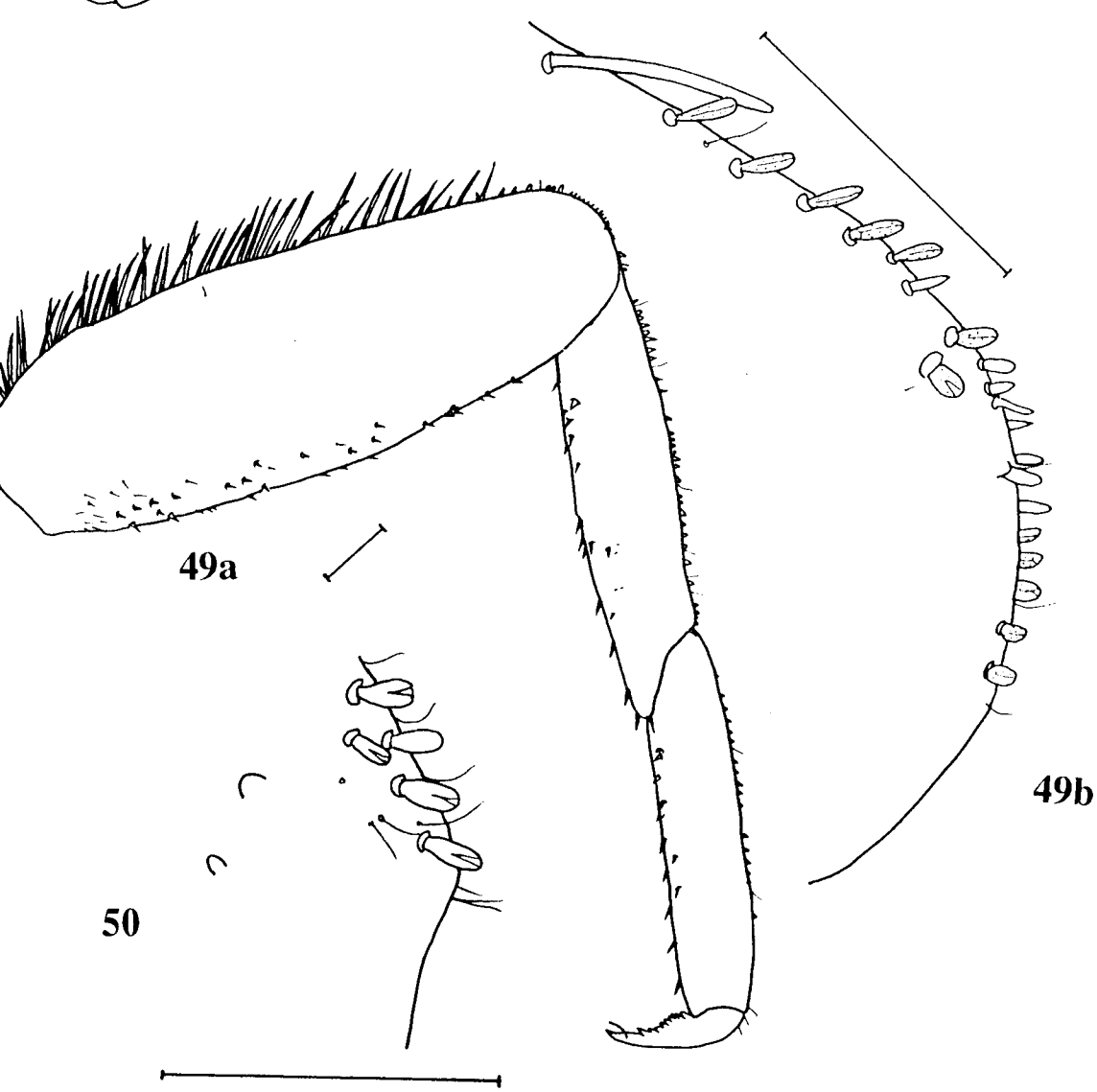
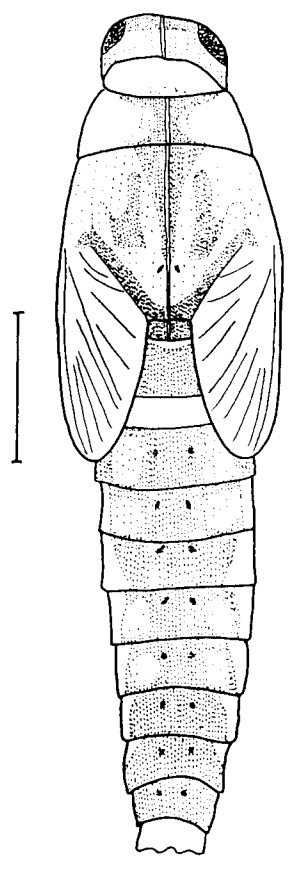
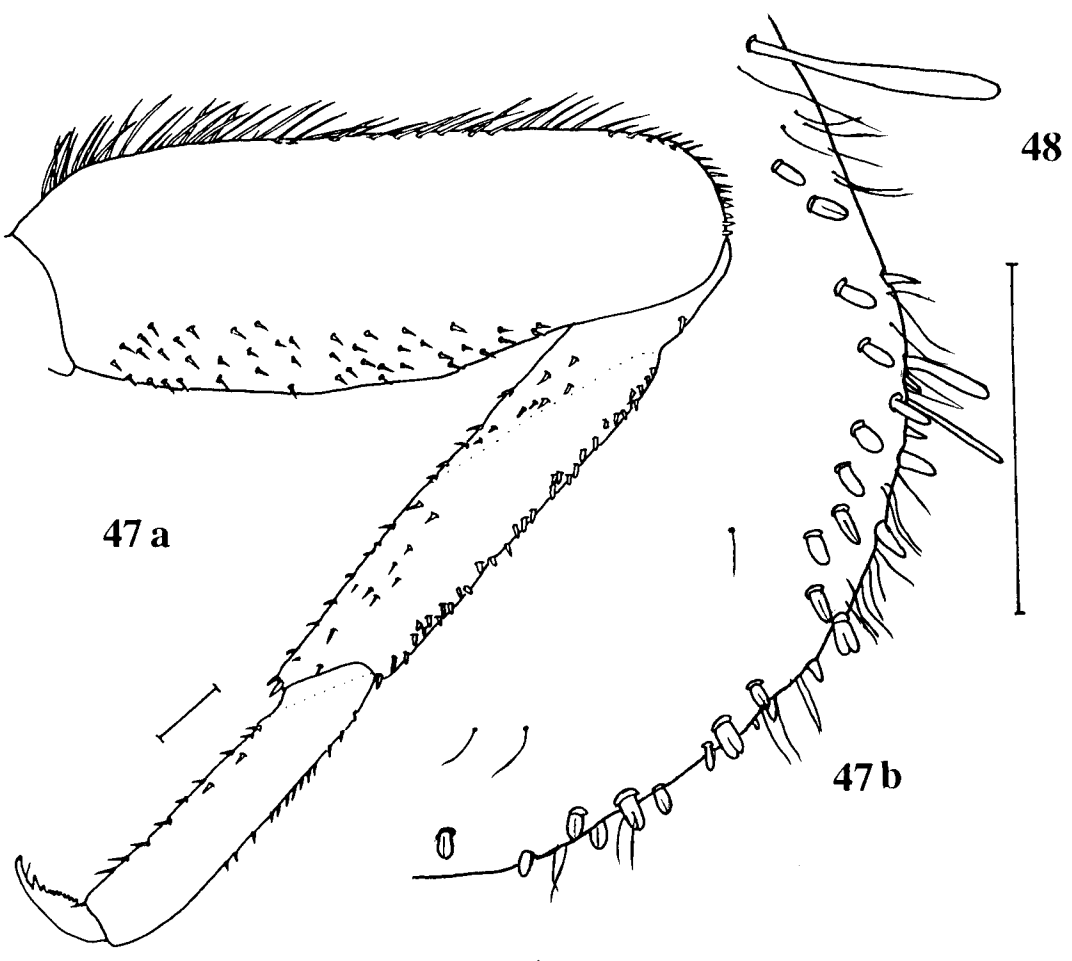
17 (16) Apex of femora with moderately long spine-like setae (Fig. 47b); abdomen without a distinct colour pattern, abdomen uniformly coloured (Fig. 48)
**Genus 2 sp MV1**
 (This species is found in south eastern Australia on the mainland in Victoria and New South Wales).

Apex of femora lacking long spine-like apical setae (Fig. 49b), but may possess short sub-globular setae (Fig. 52b) or a pair of subapical spine setae (Fig. 55); abdomen with distinct colour pattern with at least segments 6 and 7 dark forming a contrasting pattern (Fig. 51)18

18 (17) Femora lacking sub-apical setae, but with few spines on outer surface (Fig 49a and b); tibiae lacking apical setule (Fig. 50)**Genus 2 sp MV2**
 (This species is found in south eastern Australia on the mainland in Victoria, New South Wales and southern Queensland).

Femora with at least one long sub-apical blunt setule (Figs. 52b and 55); femora with dense spines on outer surface (Figs. 52a and 55); tibiae with a single apical blunt setule (Figs. 53 and 56)19

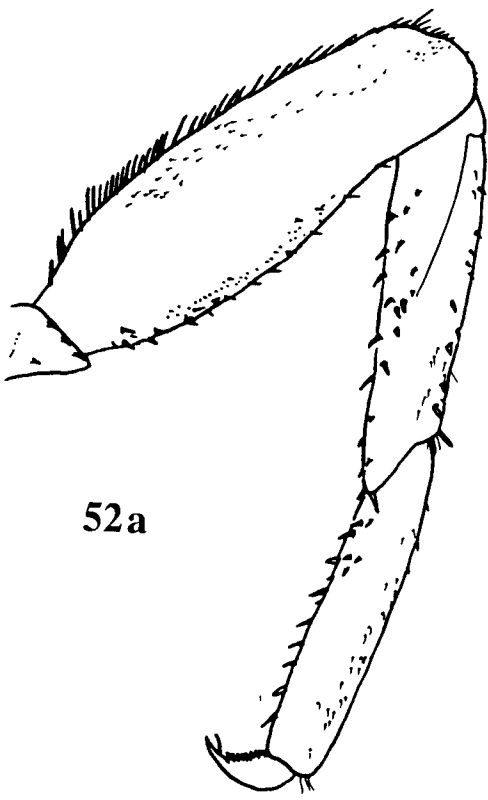
Figure 47. Baetidae Genus 2 MVsp1 , a) foreleg b) apex of femur.
Figure 48. Baetidae Genus 2 MVsp1 , dorsal body pattern, scale line = 1mm.
Figure 49. Baetidae Genus 2 MVsp2 , a) foreleg b) apex of femur.
Figure 50. Baetidae Genus 2 MVsp2 , apex of tibia.
Figure 51. Baetidae Genus 2 MVsp2 , dorsal body pattern, scale line = 1mm.



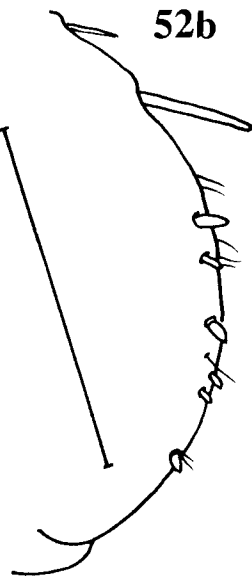
19 (18) Outer margin of tibiae and tarsi lacking fine hair setae (Fig. 52a); apex of tibiae with a long sharp setule (Fig. 53); prosthema of right mandible robust and single (Fig. 54)**Genus 2 Armidale sp1**
 (This species is probably the second of the two species described by Harker in 1950, but again no types exist. It has only been recorded from Northern New South Wales, but on examination of more extensive material it is likely to be recorded in a much wider distribution, probably including south eastern Queensland).

Outer margin of tibiae and tarsi with fine hair setae forming a conspicuous fringe (Fig. 55); apex of tibiae with a conspicuous long blunt setule (Fig 56); prosthema of right mandible bifid (Fig. 57)**Genus 2 sp MV6**
 (This species occurs in New South Wales, Victoria and Tasmania. It includes the voucher material MVsp6 and SWB2N).

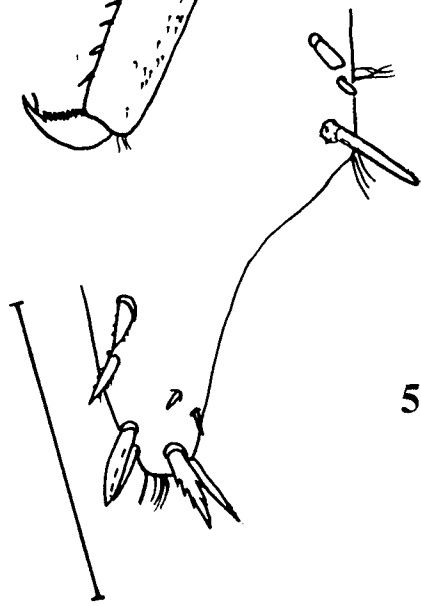
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| <p>Figure 52. Baetidae Genus 2 Armidale sp1, a) foreleg b) apex of femur.
 Figure 53. Baetidae Genus 2 Armidale sp1, apex of tibia.
 Figure 54. Baetidae Genus 2 Armidale sp1, right mandible with single prosthema highlighted.
 Figure 55. Baetidae Genus 2 MVsp6, foreleg.
 Figure 56. Baetidae Genus 2 MVsp6, apex of tibia.
 Figure 57. Baetidae Genus 2 MVsp6, right mandible with bifid prosthema highlighted.</p> |
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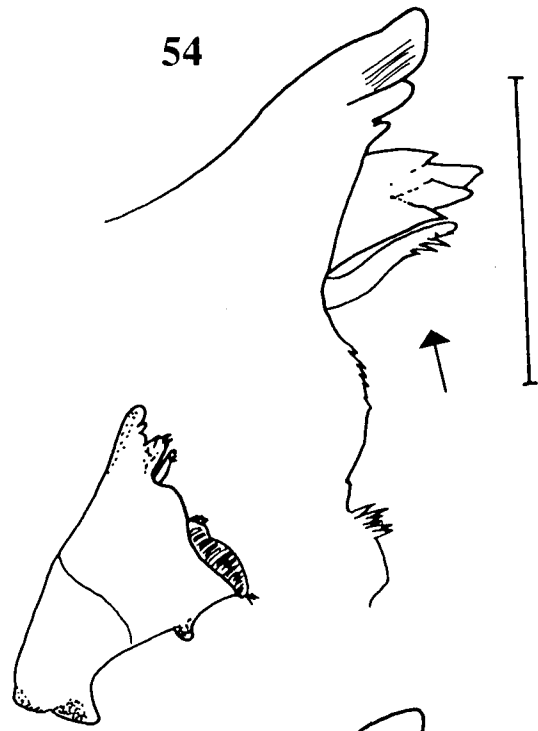
52a



52b



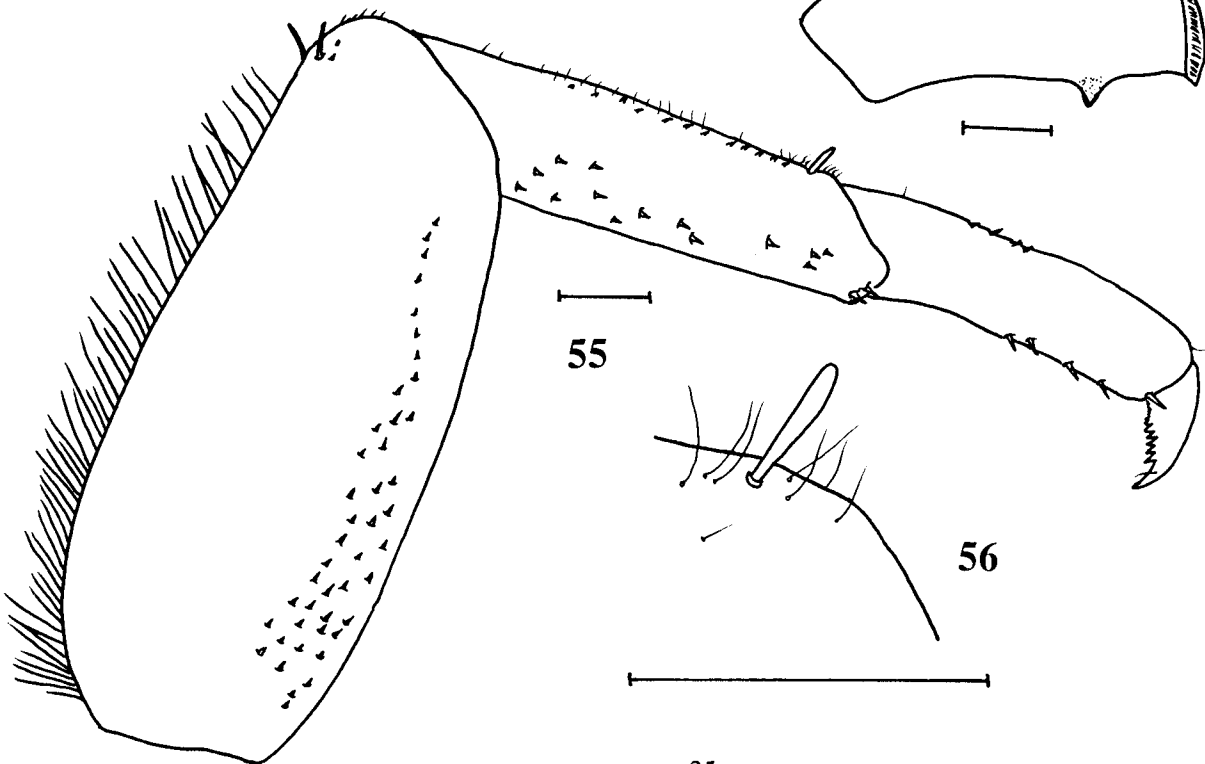
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54



57



55



56

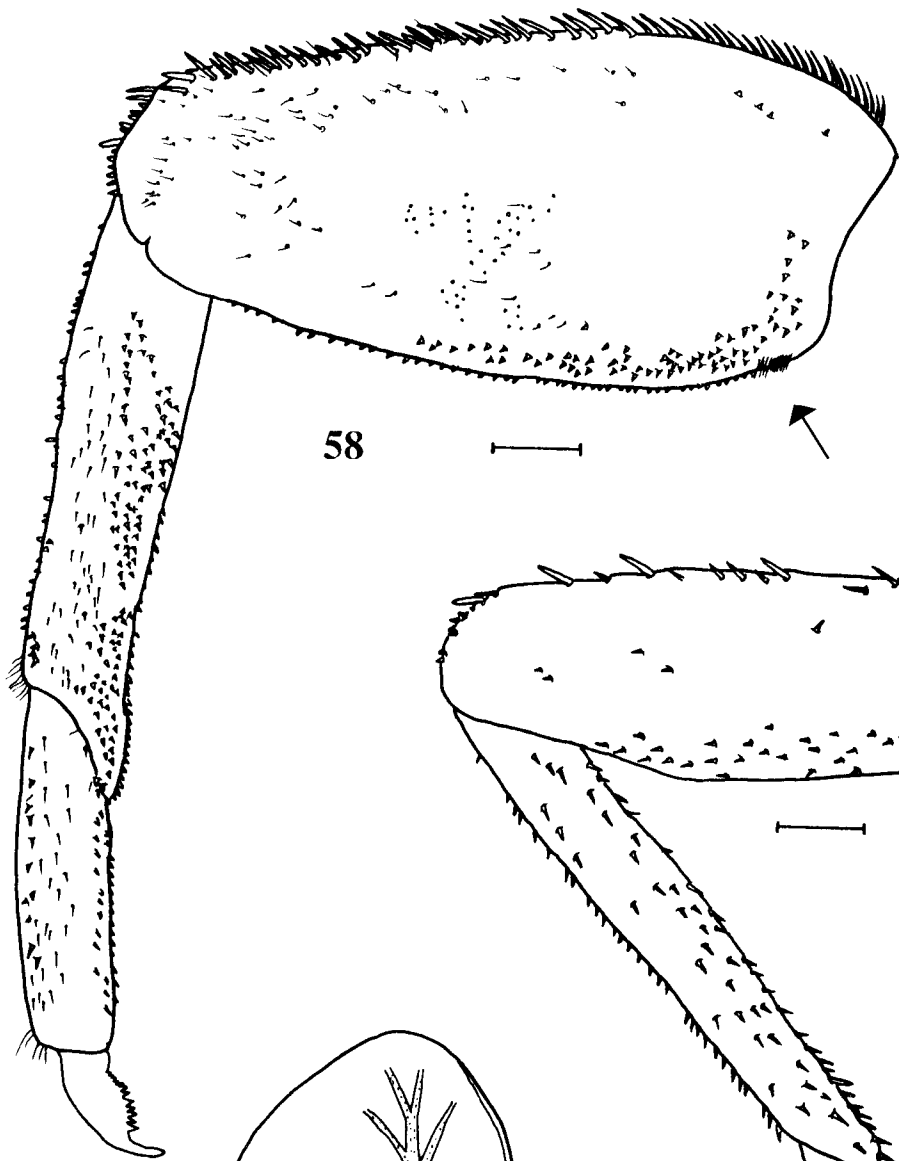
Baetidae Genus 3

Diagnosis: Head hypognathous. Labrum oval, with a shallow median notch; incisors of mandibles fused and toothed; inner incisors with bristles present; prostheca of right mandible broad and triangular; margin between incisors and molars serrated, tubercle absent; mesal margin of second segment of labial palp strongly developed. Thorax oval to circular in cross-section. Ventral femoral patch present. Tibiae without an oblique row of long fine setae; tarsi without long fine setae on outer margin; apex of tibiae with a clump of fine hairs. Tarsus of legs shorter (1/2-2/3 length) than tibiae; tarsal claws short less than half length of tarsus with obvious teeth; subapical bristle absent. Hind wing pads absent. Gills single, plate-like, on abdominal segments 1-7. Three caudal filaments present; terminal filament shorter than cerci and fringed on lateral margins; cerci fringed on inner margin.

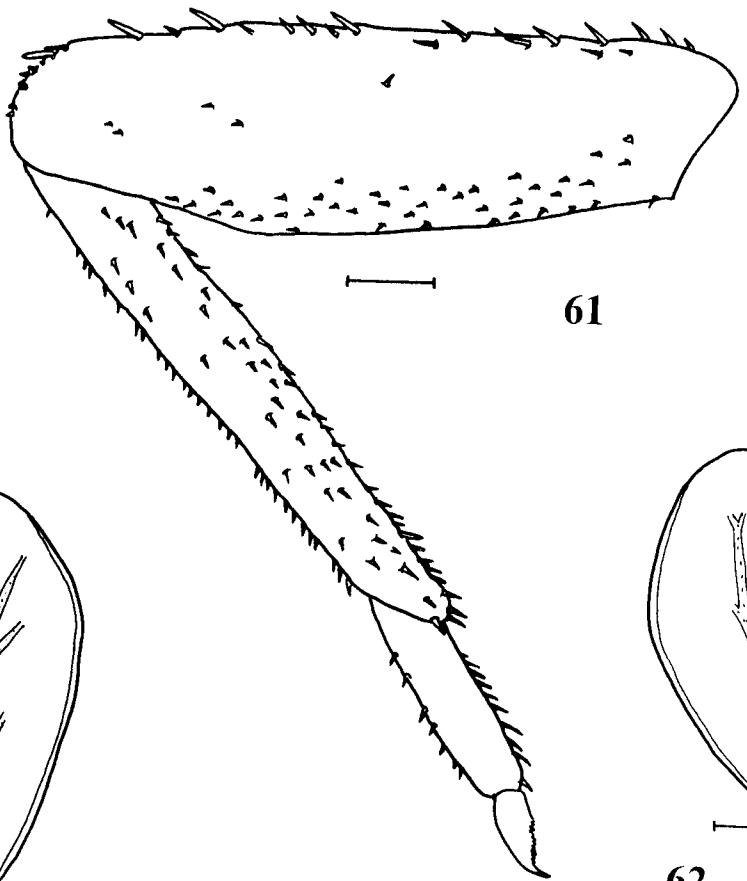
This genus previously would have been placed in the genus *Pseudocloeon* but following the revision of the genus *Baetis* by Waltz and McCafferty (1987b) it is considered that they now are representatives of an undescribed genus. There are five species recognised in this genus and all are found in northern Australia. One species does occur in northern New South Wales, but most are from Queensland and the Northern Territory.

- 20 (5) Femora broad, width almost half length (Fig. 58); outer margin of femora with >40 setae; gills large with dendritic trachea (Fig 59); femoral patch (villipore) present but reduced (Fig. 60)21
- Femora narrow, width less than one third length (Fig. 61); outer margin of femora with <30 setae; gills small with simple branched trachea (Fig. 62); femoral patch (villipore) present23

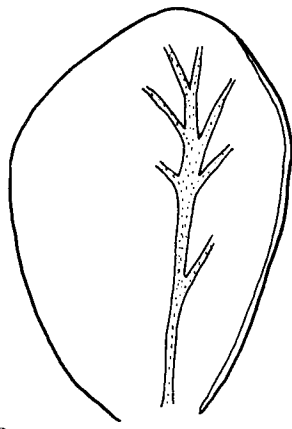
- Figure 58. **Genus 3 sp1**, foreleg with femoral patch highlighted.
 Figure 59. **Genus 3 sp1**, gill.
 Figure 60. **Genus 3 sp1**, femoral patch.
 Figure 61. **Genus 3 sp2**, foreleg.
 Figure 62. **Genus 3 sp2**, gill.



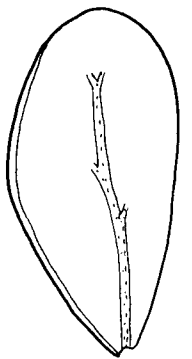
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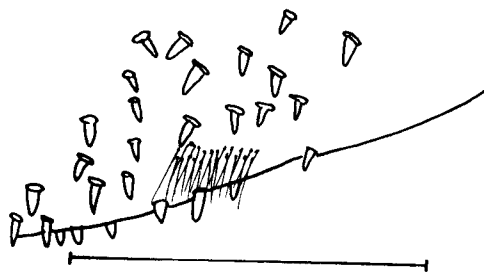


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21(20) Femora fringed with <50 long blunt setae (Fig. 63a); apex of femora with both blunt and spine setae (Fig. 63b); femoral patch reduced to less than five hairs; paraprocts with 15 large lateral spines, surface lacking scales (Fig. 64)

.....**Genus 3 sp 5**

(This species has only been found in the Harvey Range, Northern Queensland.)

Femora fringed with >60 long blunt setae (Fig. 58); apex of femora with short blunt setae and numerous hairs (Fig. 65); femoral patch distinct with numerous hairs; paraprocts with >15 large lateral spines, surface with scales (Fig. 66)

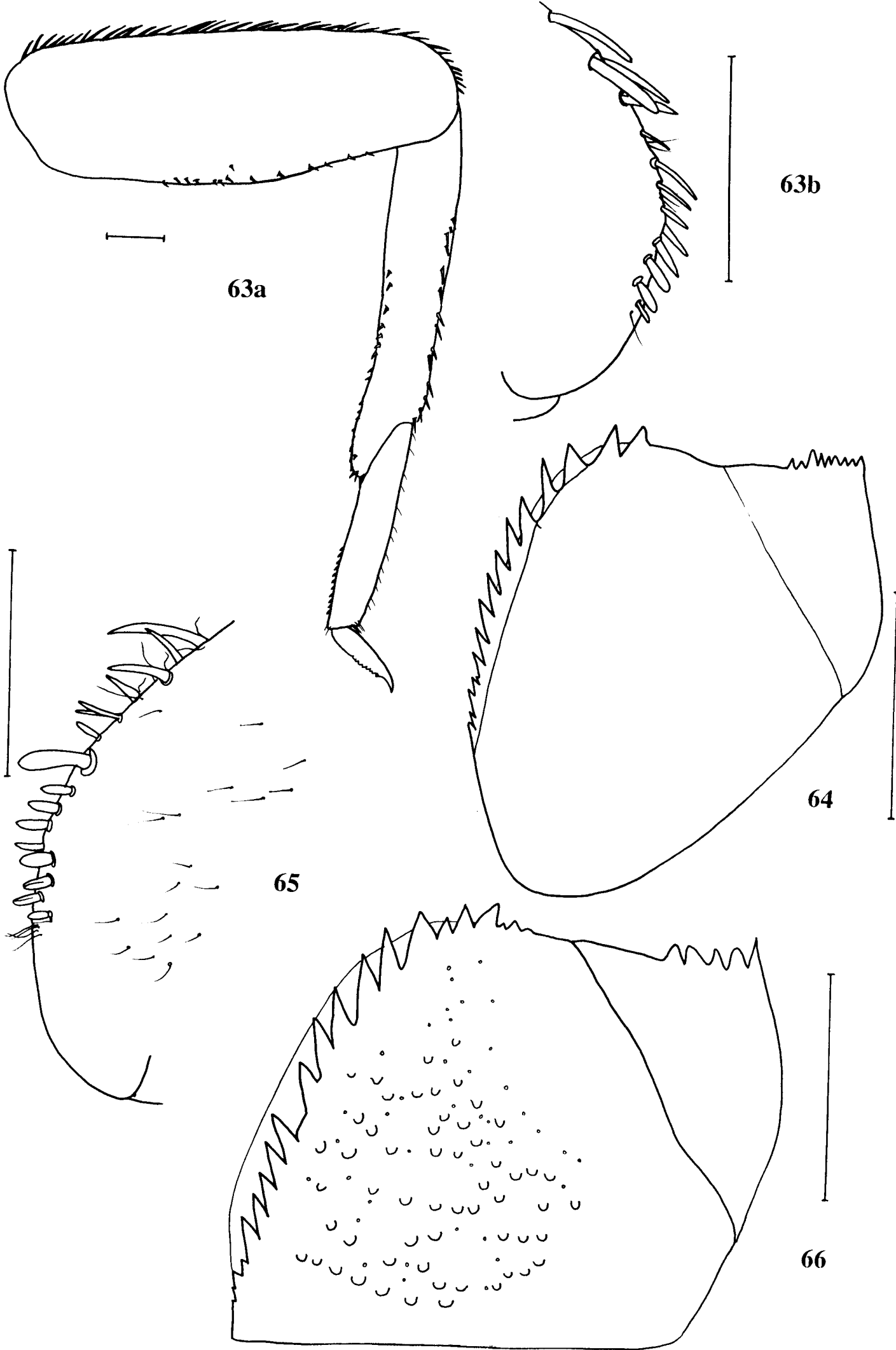
.....22

Figure 63. **Genus 3 sp5** a) foreleg b) apex of femur.

Figure 64. **Genus 3 sp5** paraproct.

Figure 65. **Genus 3 sp1** apex of femur.

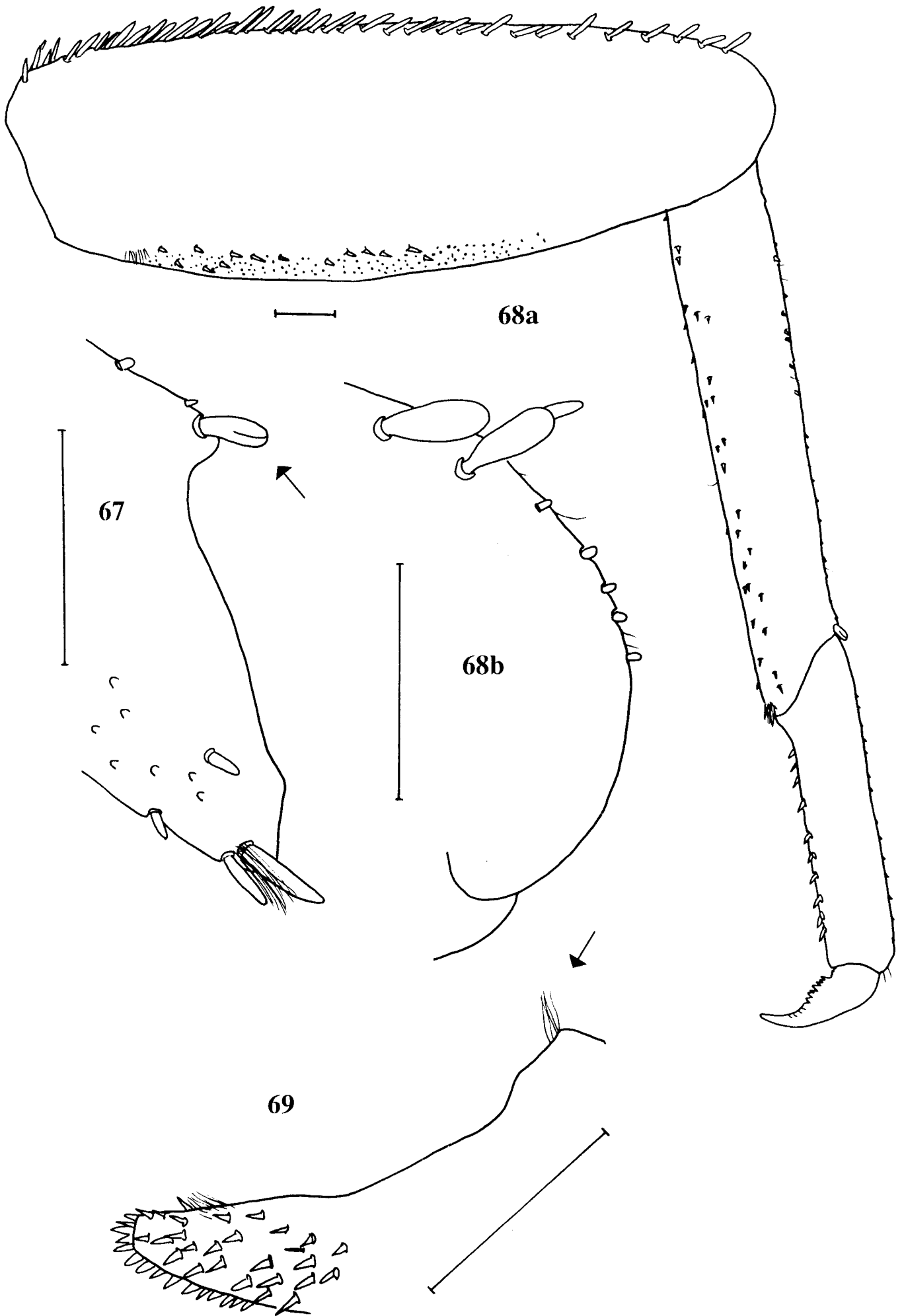
Figure 66. **Genus 3 sp1** paraproct.



22(21) Apex of tibiae with a broad setule (Fig 67) and lateral margin lined with small tubercles; femora with >40 blunt setae, dorsal margin of tibiae and tarsi lined with very short spine setae (Fig. 68a) **Genus 3 sp 3**
(This species has only been recorded from northern Queensland)

Apex of tibiae lacking an apical setule but with fine hairs (Fig. 69) and lateral margins lined with short spine setae; femora lined with >60 spine setae, dorsal margin of tarsus without spine setae (Fig. 58) **Genus 3 sp 1**
(This species has been recorded in northern Queensland and in the Northern Territory. It is recorded as ARR Genus C sp 1 by Suter, 1992)

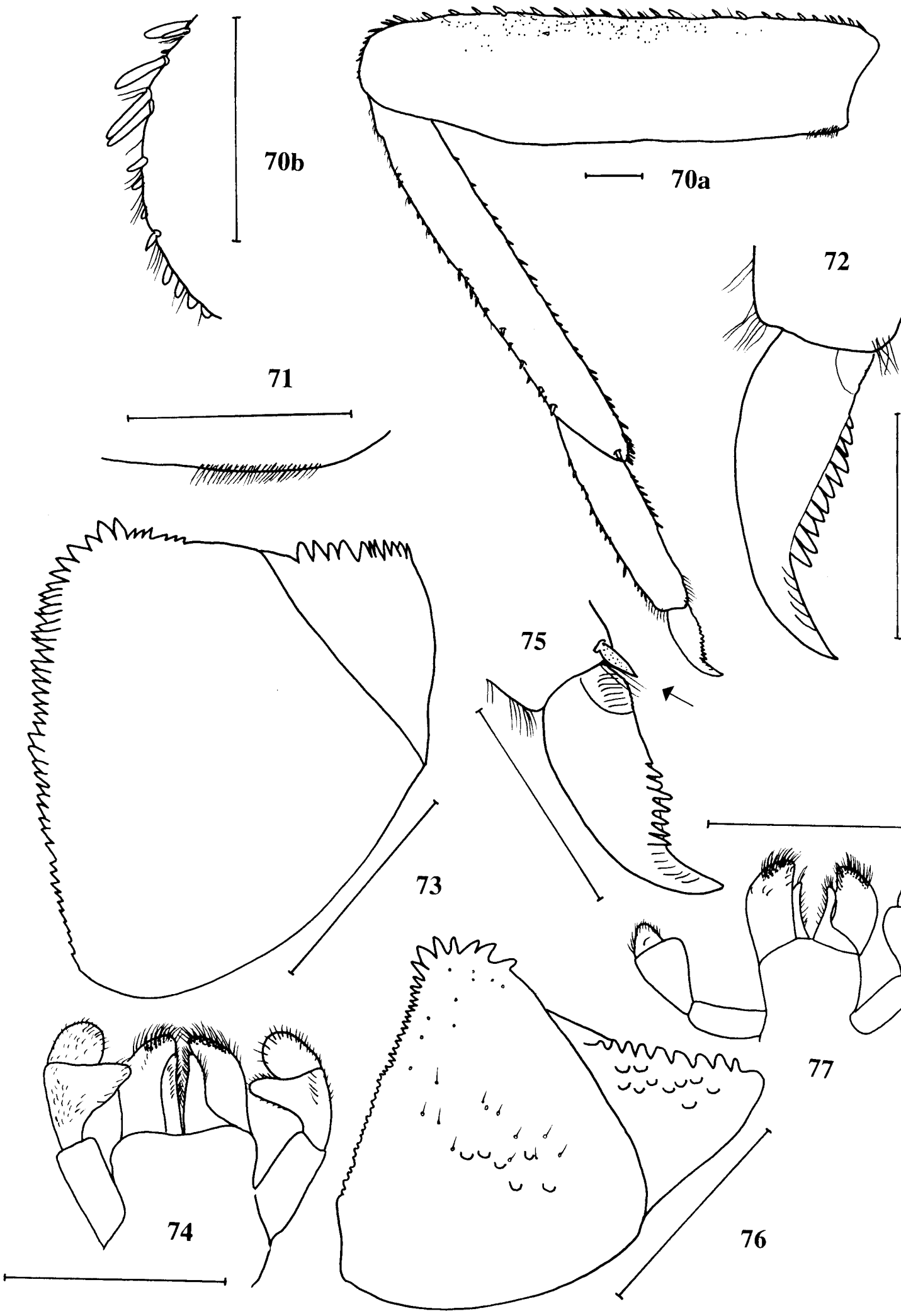
Figure 67. Genus 3 sp3. Apex of tibia. Figure 68. Genus 3 sp3. a) foreleg b) apex of femur. Figure 69. Genus 3 sp1. Apex of tibia.



23(20) Femora with distinct femoral patch (Figs. 70a & 71) femora and tibiae lacking spine setae on mesal margin (Fig 70a); apex of tarsus with fine hairs (Fig. 72); terminal filaments banded with basal segments light; paraprocts with >40 large mesal spines (Fig. 73); labial palpi with well developed lobe on the mesal margin of middle segment (Fig. 74)**Genus 3 sp 4**
 (This species has been recorded from the Northern Territory as ARR Genus B sp1 in Suter 1992, and also in Queensland and New South Wales. The EPA species SWB7N and SWB8N belong to this species)

Femora with indistinct femoral patch, may appear absent; femoral and tibiae with spine setae on mesal margins (Fig. 61); apex of tarsus with distinct spine setule (Fig. 75); terminal filaments banded with basal segments dark; paraprocts with 8-10 large apical spines and numerous small mesal spines (Fig. 76); labial palpi with weakly developed lobe on the mesal margin of middle segment (Fig. 77)**Genus 3 sp 2**
 (This species has only been recorded from the Northern Territory as ARR Genus C sp2 by Suter, 1992)

Figure 70.	Genus 3 sp4,	a) foreleg b) apex of femur.
Figure 71.	Genus 3 sp4,	femoral patch.
Figure 72.	Genus 3 sp4,	Apex of tarsus and tarsal claw.
Figure 73.	Genus 3 sp4,	paraproct.
Figure 74.	Genus 3 sp4,	labium showing labial palp.
Figure 75.	Genus 3 sp2,	Apex of tarsus and tarsal claw.
Figure 76.	Genus 3 sp2,	paraproct.
Figure 77.	Genus 3 sp2,	labium showing labial palp.



Baetidae Genus 5

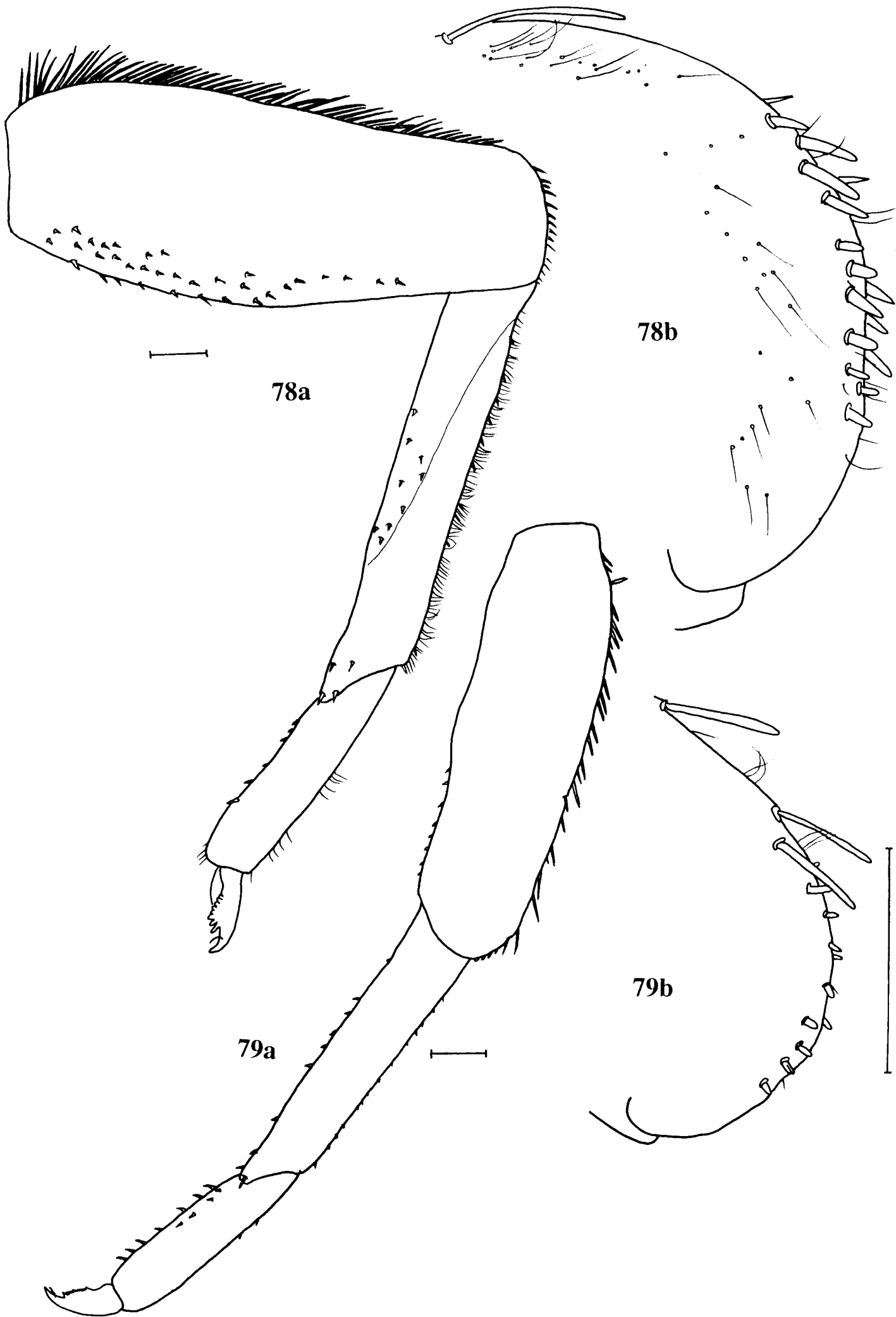
Diagnosis: Head hypognathous. Labrum oval with a shallow median notch; incisors of mandibles fused, with a shearing surface; inner incisors without bristles; prostheca of right mandible slender and bifid or single and robust; margin between incisors and molars smooth, tubercle absent; mesal margin of second segment of labial palp strongly developed. Thorax oval to circular in cross-section. Ventral femoral patch absent. Femora lacking fringe of long blunt setae. Tibiae without an oblique row of long fine setae; tarsi without long fine setae on outer margin; apex of tibiae without a clump of fine hairs. Tarsus of legs shorter (1/2 -2/3 length) than tibiae, tarsal claws short less than half length of tarsus with obvious teeth; subapical bristle present. Hind wing pads absent. Gills single, plate-like, on abdominal segments 1-7. Three caudal filaments present; terminal filament shorter than cerci and fringed on lateral margins; cerci fringed on inner margin.

Only two species have been recognised in this genus, both from the Conondale Ranges in south eastern Queensland. It is likely they are more widespread than this and with examination of more extensive material a better understanding of their distribution will be made.

23 (5) Femora fringed with >50 long setae (78a); tibiae and tarsi with a fringe of fine hairs and blunt setae**Genus 5 sp 2**

Femora lacking dense fringe of long setae, with 20-30 setae present (Fig. 79a); tibiae and tarsi lacking long fine hairs, but possess few short setae
.....**Genus 5 sp 1**

Figure 78. **Genus 5 sp2**, a) foreleg b) apex of femur.
Figure 79. **Genus 5 sp1**, a) foreleg b) apex of femur.



ACKNOWLEDGMENTS

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