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## New species of Australian stoneflies (Insecta: Plecoptera)

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**Abstract:** Five species of Australian stoneflies are described as new. They are: *Austroheptura campbelli* n. sp., *Kirrama naumanni* n. sp., *Dinotoperla dalrymple* n. sp., *Austrocercoides kondu* n. sp., *Austrocercoides tunta* n. sp. The first satisfactory illustration of the male genitalia of *Dinotoperla spinosa* THEISCHINGER is given.

**Key words:** Plecoptera, new species (adults); Australia.

### Introduction

Since THEISCHINGER & CARDALE (1987) presented a survey of the Australian stonefly fauna, additional new taxa were described only by THEISCHINGER (1988). Considering all previously available and some of THEISCHINGER'S (1988) information, THEISCHINGER (1991) listed species numbers of the major groups in Australian Plecoptera. Including the rest of THEISCHINGER'S (1988) data and the descriptions in the present paper, these numbers can now be updated as follows: Plecoptera (202), Antartoperlaria (170), Eustheniidae (15), Austroperlidae (10), Gripopterygidae (145), Arctoperlaria (32), Notonemouridae (32).

### Acknowledgements

For handing over to me for study material from their own collections or collections in their care and for supportive information, I wish to thank the following people: Dr I.C. Campbell (East Caulfield), Ms J.C. Cardale and Dr I.D. Naumann (Canberra), Dr O.S. Flint jun. (Washington D.C., U.S.A.) and Dr H.B.N. Hynes (Waterloo, Canada).

### Material and methods

The material studied for this paper is now deposited in the Australian Museum in Sydney (AM), the Australian National Insect Collection in Canberra (ANIC), the Museum of Victoria (MV) and in the Smithsonian Institution in Washington D.C., U.S.A. (NMNH), as indicated.

The genitalia of specimens used for description and illustration have been cleared in KOH and are preserved in glycerol.

#### *Austroheptura campbelli* n. sp. (Figs 1, 2)

*Austroheptura nevoissi* ILLIES, Entomol. Tidskr. 90/1-2: 26 (1969) (in part).

*Austroheptura nevoissi* ILLIES; HYNES, Aust. J. Zool., Suppl. Ser. 29: 2 (1974) (in part).

*Austroheptura nevoissi* ILLIES; HYNES, Aust. Soc. Limnol. Spec. Publ. 2: 20 (1978) (in part).

*Austroheptura nevoissi* ILLIES; THEISCHINGER and CARDALE, CSIRO Aust. Div. Entomol. Tech. Pap. 26: 9 (1987) (in part).

*Austroheptura nevoissi* ILLIES; MICHAELIS and YULE, Zoological Catalogue of Australia 6: 145 (1988) (in part).

**Coloration:** Head dorsally black with a dark yellow mark lateral to each lateral ocellus, ventrally largely yellow; antennae and palps greyish-blackish brown. Thorax and abdomen with sclerotized areas largely blackish brown except for most of lateral margin of pronotum which is yellow; membranous areas largely pale yellow. Coxae yellow with black ventral mark; trochanters yellow; femora black with incomplete yellow basal ring covering 1/4 to 1/3 of their length; tibiae with base black, otherwise dark brown; tarsi greyish brown; claws yellowish grey. Wings with base conspicuously whitish yellow, otherwise blackish brown with yellow mottling.

**Dimensions:** Body, male 24-26 mm, female ca 31 mm; forewing, male 6,8-7,7 mm, female ca 9 mm.

**Genitalia:** Male (Fig. 1) with posterior sclerite of tergite 10 stout, conical, up-turned. Epiproct a long narrow obtuse cone as seen from dorsal aspect. Paraprocts with sclerotized area of lobe almost straight and not hooked, membranous portion with ventral hook only. Female with subgenital plate (Fig. 2) strongly concave posteriorly.

**Remarks:** *Austroheptura campbelli* n. sp. is based on the adults of what ILLIES (1969) and HYNES (1969, 1978) regarded as a brachypterous population of *Austroheptura nevoissi* ILLIES. However, there are not only differences in wing length and body- and wing pattern, but also marked and consistent differences in the structure of the male genitalia between *Austroheptura* from Mount Buller and *Austroheptura nevoissi* from elsewhere. Diagnostic characters of *A. campbelli*: both sexes brachypterous and with yellow pattern of wings and legs reduced as compared with *A. nevoissi* (no pale wing patch; tibiae not marked with yellow); male with posterior sclerite of tergite 10 stout, conical and up-turned, and with paraprocts lacking a posterior hook (and notch); female with subgenital plate strongly concave posteriorly. For comparison see illustrations of *A. nevoissi* ILLIES (Figs 3-5).

**Material examined:** Holotype ♂: Victoria, Mount Buller, 1455 m, small trickle, 17.11.1992, I. Campbell (ANIC). Paratypes: 1♂, 1♀, 3 larval exuviae, same data as holotype (MV).

**Distribution:** Victoria; known only from Mount Buller.

**Name:** This species is dedicated to Dr I.C. Campbell, collector of the type series.

***Kirrama naumanni* n. sp. (Figs 6-10)**

**Male**

**Coloration:** Head largely brown, a blackish brown patch each, adjacent and mesal to each lateral ocellus and adjacent and posterior to median ocellus; antennae and palps dark brown. Thorax yellowish- to greyish brown. Legs yellowish- to pale greyish brown, only apices of femora and tibiae, and tarsi somewhat darker. Wing venation brown; membrane hyaline, suffused with pale brown. Abdominal tergites 1-7 sclerotized and darkened (pale to dark brown) almost all over; tergite 8 heavily sclerotized anteriorly and laterally in form of an arch; tergite 9 similar to 8, but arch may be broken medially; sternites 1-6 and subgenital plate largely greyish yellow; sternites 7 and 8 greyish brown.

**Dimensions:** Body 5,7-6,1 mm; forewing 5,8-6,0 mm; cerci 4,2-4,5 mm.

**Genitalia** (Figs 6-10): Tergite 10 with anterior sclerites fused medially to central sclerite for a short distance only; central sclerite completely fused with lateral sclerites; posterior sclerite strongly bent, up-turned, with tip markedly

expanded. Epiproct moderately wide, deep, with rounded tip, armed anterodorsally with large sharp teeth along margins; a ventrally projecting, strongly bent, long and slender spine and a trapezoid keel along midline. Paraprocts moderately long, with apical half slightly and evenly curved dorsally and turned medially. Subgenital plate broad, with posterior margin evenly rounded to slightly bilobed.

**Female unknown.**

**Remarks:** Very similar to the only other congeneric species, *Kirrama abolos* THEISCHINGER (Fig. 11). Diagnostic characters: tip of posterior sclerite of tergite 10 strongly up-turned and expanded; epiproct with apex long and narrow, the teeth long and sharp, and with a single long and slender ventral spine. These specific characters extend the diagnosis of *Kirrama* as given by THEISCHINGER (1981). Two other gripopterygid species, *Dinotoperla spinosa* THEISCHINGER (Fig. 12) and *Illiesoperla tropica* THEISCHINGER, were found together with *Kirrama naumanni* n. sp. in the McIlwraith Range.

**Material examined:** Holotype ♂: Queensland, 13°44'S/143°20'E, 11 km W by N Bald Hill, McIlwraith Range, 500 m, search party campsite, at light, 26.6-13.7.1989, I.D. Naumann (ANIC). Paratype: 1♂, same data as holotype (ANIC).

**Distribution:** Queensland; known only from McIlwraith Range on Cape York Peninsula.

**Name:** This species is dedicated to Dr I.D. Naumann who collected the type material.

***Dinotoperla dalrymple* n. sp. (Figs 13-15)**

**Coloration.** Head largely yellowish- to pale brownish grey, a trapezoid brownish black patch between and adjacent to the ocelli; antennae dark greyish brown; palps greyish yellow to greyish brown. Thorax greyish yellow to blackish brown. Coxae yellowish- to pale greyish brown, meso- and metacoxa laterally black; trochanters pale greyish yellow; femora pale greyish brown with apex black; tibiae basally black, otherwise greyish brown, the metatibia markedly paler than pro- and mesotibia; tarsi and claws greyish- to blackish brown. Wing venation largely greyish brown, some distal crossveins greyish white; membrane hyaline, slightly suffused with pale brown all over; darker patches along pale crossveins. Abdomen largely yellow; male with sclerotized dorsal rods and arches, small ventral patches and terminalia greyish- to blackish brown; female with only the terminalia (including sub-

genital plate) greyish brown to black.

**Dimensions:** Body, male ca 7,5 mm; female ca 11 mm; forewing, male 8,1 mm, female 10,5 mm.

**Genitalia:** Male (Figs 13, 14) with central sclerite of tergite 10 produced posteriorly into a rounded cone. Epiproct large, basal 2/3 thick, apical 1/3 thin, curved ventrally and bearing apical spur. Paraprocts short, with base narrow; lobe slightly arched and with up-turned tip. Female subgenital plate (Fig. 15) rather narrow, widely rounded, possibly slightly bilobed, with narrow subtriangular sclerotized patch each side.

**Remarks:** Most similar to *Dinotoperla fasciata* KIMMINS. Diagnostic characters: male epiproct with apex thin and evenly curved; female subgenital plate rather narrow.

**Material examined:** Holotype ♂: Queensland, Dalrymple Creek, near Eungella, at light, 3.4.1993, G. Theischinger (AM). Paratype: 1♂, same data as holotype (AM).

**Distribution:** Queensland; known only from Dalrymple Creek near Eungella.

**Name:** From Dalrymple Creek, in north-eastern Queensland; to be treated as a noun in apposition.

### ***Austrocercoides kondu* n. sp. (Figs 18-20)**

*Austrocercoides bullata* (KIMMINS); ILLIES, Int. Revue ges. Hydrobiol. 60/2: 239 (1975) (in part).

*Austrocercoides bullata* (KIMMINS); THEISCHINGER & CARDALE, CSIRO Aust. Div. Entomol. Tech. Pap. 26: 39 (1987) (in part).

### **Male**

**Coloration:** Head dorsally blackish brown, ventrally somewhat paler; antennae and palps dark greyish- to blackish brown. Thorax greyish- to blackish brown. Coxae and trochanters blackish brown; femora basally greyish brown, passing into blackish more distally, only tip yellow; tibiae with basal 1/4 blackish brown, distal 1/2 greyish brown, greyish yellow in between; tarsi and claws greyish brown. Wing venation brown; membrane hyaline, suffused with pale brown, pterostigma area markedly darker than the rest. Abdomen pale to dark greyish brown; terminalia, from segment 9, largely blackish brown.

**Dimensions:** Body 5,0-6,0 mm; forewing 6,1-6,7 mm.

**Genitalia** (Figs 18-20): Tergite 9 markedly produced posteromedially. Epiproct with the two pairs of basal knobs very close together; hammer with "handle" long and straight and "head" apically rounded. Paraprocts with enlargement near tips.

**Female unknown.**

**Remarks:** This is the species partly referred to and illustrated by ILLIES (1975) and THEISCHINGER & CARDALE (1987) under *Austrocercoides bullata* (KIMMINS). Diagnostic characters: tergite 9 of male markedly produced posteromedially; basal knobs of epiproct very close together, hammer with "handle" long and straight and "head" short and rounded. For comparison see illustrations of *A. bullata* (KIMMINS) (Figs 16, 17). For sympatric existence with closely allied species see below, under *Austrocercoides tunta* n. sp.

**Material examined:** Holotype ♂: Tasmania, 41°51'S/146°03'E, 4 km S Mt Oakleigh (W.E.B.S.), closed forest, Malaise 3, 1.3-4.4.1990 (ANIC). Paratypes: Tasmania: 2♂♂, same data as holotype (ANIC); 1♂, type locality, 30.11.1990-8.1.1991, (ANIC); 1♂, type locality 11.2.-1.3.1990 (ANIC); 1♂, type locality, 4.4.-15.5.1990 (ANIC); 1♂, 41°51'S/146°03'E, 1 km S Pelion Hut, rainforest, Malaise 3, 5-10.2.1990, I.D. Naumann (ANIC); 1♂, 41°50'S/146°03'E, Pelion Hut, 3 km S Mt Oakleigh, closed forest (W.E.B.S.), Malaise 2, 11.2-1.3.1990 (ANIC).

**Distribution:** Tasmania.

**Name:** Kondu is an Australian Aboriginal word for "club"; it refers to the shape of the hammer of the epiproct; to be treated as a noun in apposition.

***Austrocercoides tunta* n. sp. (Figs 21-23)**

*Austrocercoides bullata* (KIMMINS); HYNES, Aquatic Insects 3: 156 (1981).

*Austrocercoides bullata* (KIMMINS); HYNES, Aust. Soc. Limnology, Spec. Publ. 8: 61,66 (1989).

**Coloration:** Head dorsally blackish brown, ventrally somewhat paler; antennae and palps dark greyish brown. Thorax greyish- to blackish brown. Coxae and trochanters yellowish grey; femora dark greyish yellow with incomplete greyish brown basal and subapical to apical rings; tibiae with the basal 1/4 blackish brown, apical 1/2 greyish brown, and markedly paler in between; tarsi and claws greyish brown. Wing venation brown; membrane hyaline, slightly suffused with pale brown. Abdomen yellowish grey to greyish brown; terminalia, from segment 9, largely dark to blackish brown.

**Dimensions:** Body, male 5,0-5,8 mm, female 6,2-6,5 mm; forewing, male 5,9-6,4 mm, female 7,6-7,7 mm.

**Genitalia:** Male (Figs 21-23) with tergite 9 slightly produced posteromedially. Epiproct with the two pairs of basal knobs close together, hammer with "handle" short and curved and "head" conical. Paraprocts with enlargement near tip. Female with ovipositor not extending beyond tips of cerci and with posterior margin of sternite 8 widely angulated (HYNES 1989: Figs 212, 213).

**Remarks:** This is the species referred to (?partly) and illustrated by HYNES (1981, 1989) under *Austrocercella bullata* (KIMMINS). Diagnostic characters: femora of both sexes banded; male with tergite 9 slightly produced posteromedially; basal knobs of epiproct close together, hammer with "handle" short and curved and with "head" conical. Indications of coexistence in the same stream of "*A. bullata*" (= *A. tunta*) and *A. zwicki* ILLIES, "a pair of closely allied species sharing a habitat on a temporal basis" seemed to excite HYNES (1981). In this paper, the coexistence of *A. tunta* n. sp. and *A. zwicki* ILLIES (perhaps largely on a temporal basis) near Mt Oakleigh is established. In addition, adults of *A. kondu* n. sp. and true *A. bullata* (KIMMINS) (Figs 16, 17), two species even more similar to each other and to *A. tunta* n. sp., than *A. tunta* is to *A. zwicki*, were collected in the same habitat.

**Material examined:** Holotype ♂: Tasmania, 41°51'S/146°03'E, 4 km S Mt Oakleigh (W.E.B.S.), closed forest, malaise 3, 1.3.-4.4.1990 (ANIC). Paratypes: Tasmania: 2♂♂, same data as holotype (ANIC); 2♀♀, type locality, 4.4-15.5.1990, (ANIC); 1♂, 2♀♀, near L. Lea, 15.4.1976, coll. Heaton, from I. Campbell (NMNH).

**Distribution:** Tasmania.

**Name:** *Tunta* is an Australian Aboriginal word for "spear"; it refers to the shape of the hammer of the epiproct; to be treated as a noun in apposition.

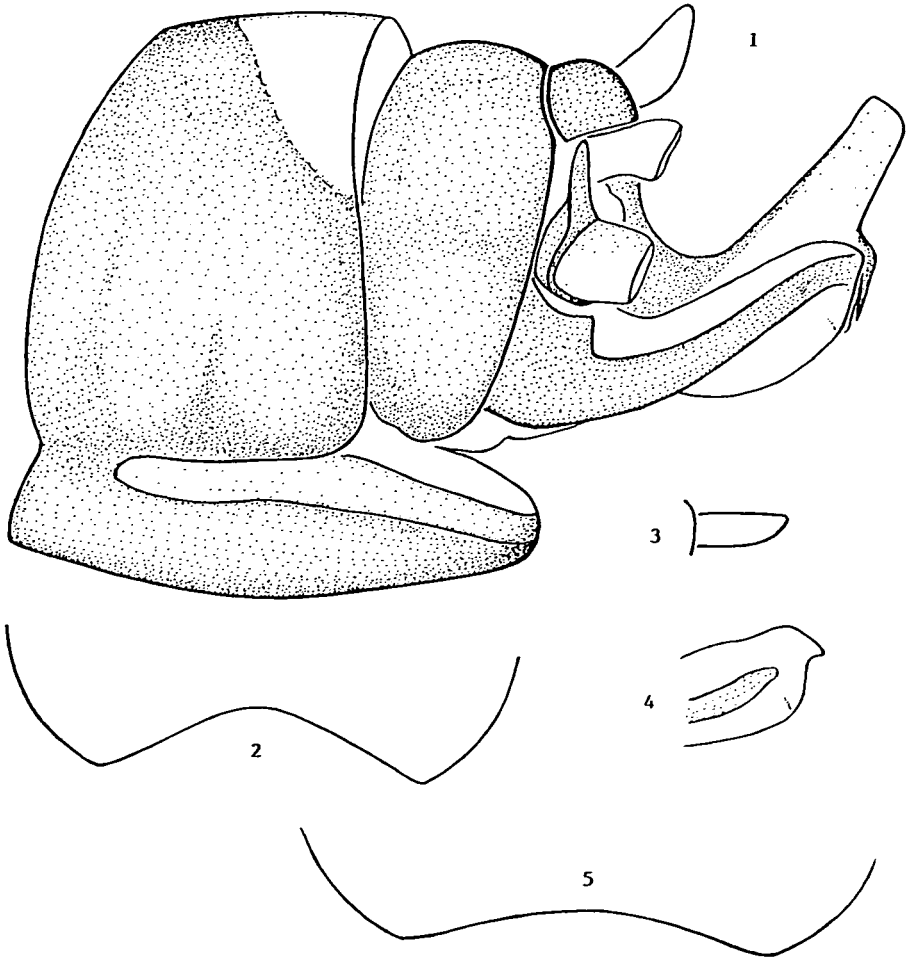
## References

- HYNES H.B.N. (1974): Comments on the taxonomy of Australian Austroperlidae and Gripopterygidae (Plecoptera). — Aust. J. Zool., Suppl. 29: 1-36.
- HYNES H.B.N. (1978): Annotated key to the stonefly nymphs (Plecoptera) of Victoria. — Australian Society for Limnology. Special Publication 2: 63 pp.
- HYNES H.B.N. (1981): Taxonomical notes on Australian Notonemouridae (Plecoptera) and a new species from Tasmania. — Aquatic Insects 3: 147-166.

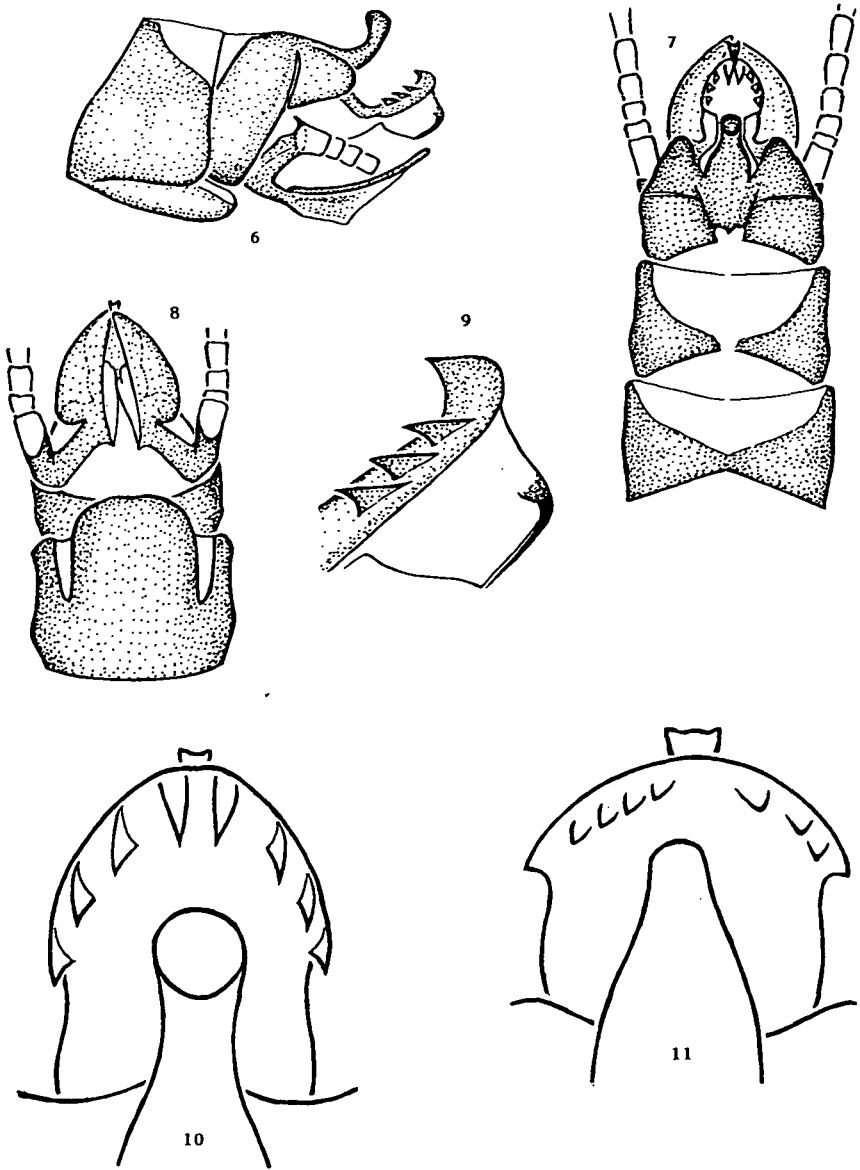
- HYNES H.B.N. (1989): Tasmanian Plecoptera. — Australian Society for Limnology. Special Publication 8: 81 pp.
- ILLIES J. (1969): Revision der Plecopterenfamilie Austroperlidae. — Entomol. Tidskr. 90: 19-51.
- ILLIES J. (1975): Notonemouridae of Australia (Plecoptera, Ins.). — Int. Rev. gesamten Hydrobiol. 60: 221-249.
- KIMMINS D.E. (1951): A revision of the Australian and Tasmanian Gripopterygidae and Nemouridae (Plecoptera). — Bull. Br. Mus. nat. Hist. 2: 45-93.
- MICHAELIS F.B. & YULE C. (1988): Plecoptera. pp. 133-176. In: HOUSTON, W.W.K. (ed.) Zoological Catalogue of Australia. Australian Government Publishing Service Canberra.
- THEISCHINGER G. (1981): New and little known stoneflies from Australia (Insecta: Plecoptera). — Aquatic Insects 3/2: 103-127.
- THEISCHINGER G. (1988): New and little known species of stoneflies from Australia (Insecta: Plecoptera). — Stapfia 17: 147-157.
- THEISCHINGER G. (1991): Plecoptera (Stoneflies). — In: I.D. NAUMANN & al. (Eds): The Insects of Australia. A textbook for students and research workers. Second edition: Vol.I.: 311-319. Melbourne University Press.
- THEISCHINGER G. & CARDALE J.C. (1987): An illustrated Guide to the Adults of the Australian Stoneflies (Plecoptera). — Division of Entomology Technical Paper No. 26, CSIRO, Australia. 83 pp.

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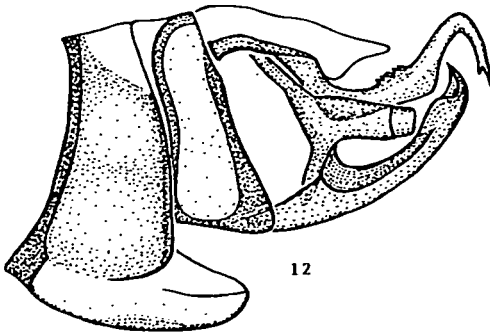




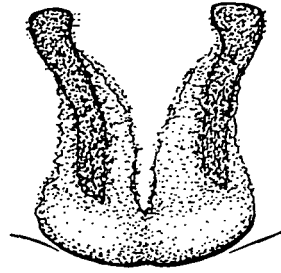
Figs 1, 2: *Austroheptura campbelli* n. sp. 1: male, genitalia, lateral; 2: female, posterior margin of subgenital plate. Figs 3-5: *Austroheptura nevoissi* ILLIES. 3: male, posterior sclerite of tergite 10, lateral; 4, male, tip of paraproct, lateral; 5: female, posterior margin of subgenital plate.



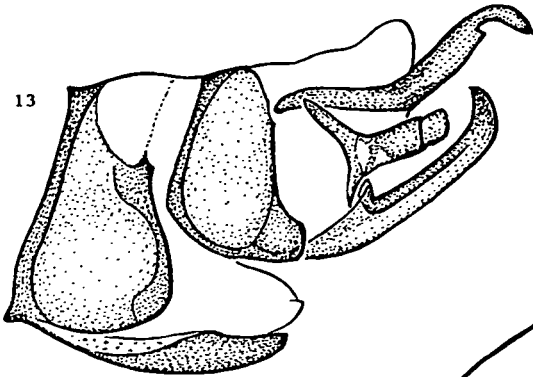
Figs 6-10: *Kirrama naumanni* n. sp., male. 6-8: genitalia: 6: lateral; 7: dorsal; 8: ventral; 9: epiproct, lateral; 10: posterior sclerite of tergite 10 and epiproct, dorsal. Fig. 11: *Kirrama abolos* THEISCHINGER, male, posterior sclerite of tergite 10 and epiproct, dorsal.



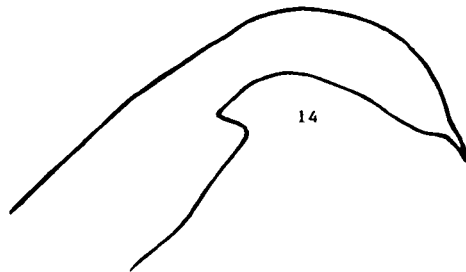
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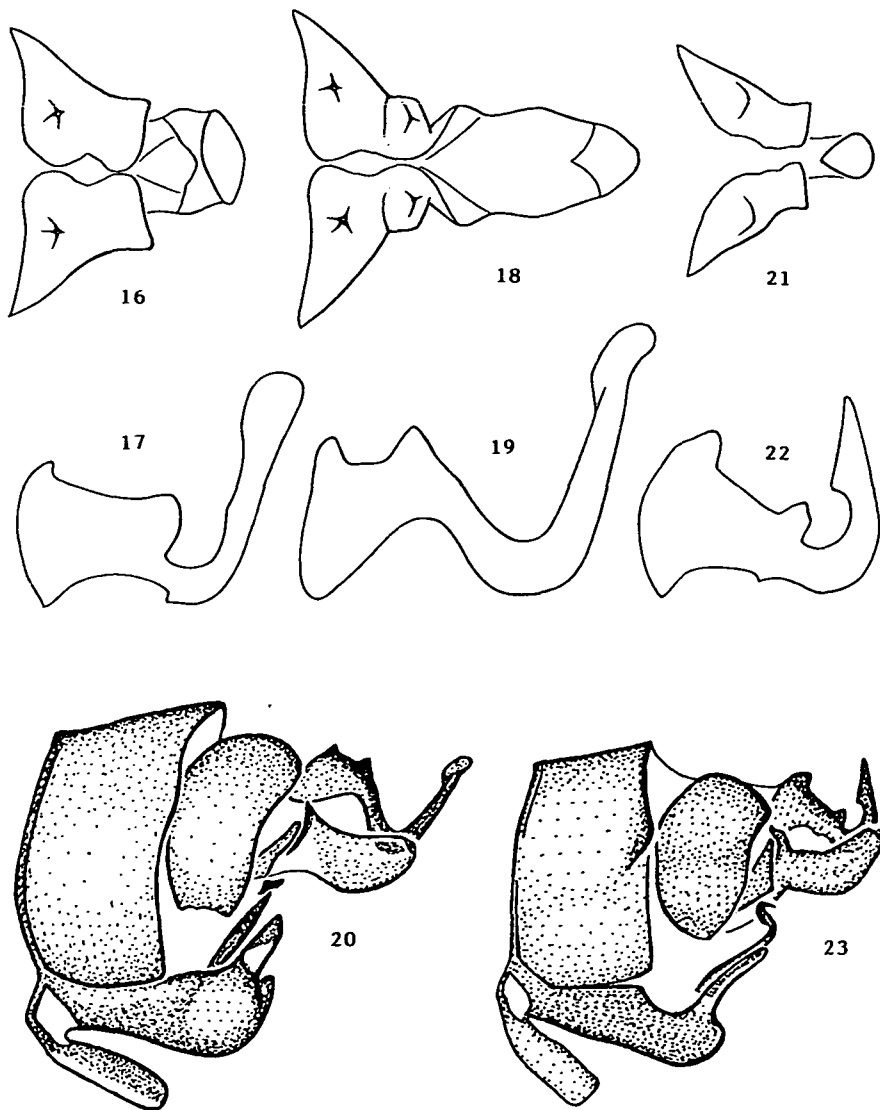


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Fig. 12: *Dinotoperla spinosa* THEISCHINGER, male, genitalia, lateral. Figs 13-15: *Dinotoperla dalrymple* n. sp. 13, 14: male: 13: genitalia, lateral; 14: tip of epiproct, lateral; 15: female, subgenital plate.



Figs 16, 17: *Austrocercoides bullata* (KIMMINS), male. 16: epiproct, dorsal; 17: epiproct, lateral. Figs 18-20: *Austrocercoides kondu* n. sp., male. 18: epiproct, dorsal; 19: epiproct, lateral; 20: genitalia, lateral. Figs 21-23: *Austrocercoides tunta* n. sp., male. 21: epiproct, dorsal; 22: epiproct lateral; 23: genitalia, lateral.