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NEW AND LITTLE KNOWN SPECIES OF STONEFLIES FROM AUSTRALIA

(INSECTA: PLECOPTERA)

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A b s t r a c t : Seven new species of Australian stoneflies, *Austropentura hynesorum*, *Leptoperla longicauda*, *L. membranosa*, *L. thompsoni*, *Dinotoperla inermis*, *D. subserricauda* and *Kimminosperla nevoissi*, and the hitherto unknown female of *Leptoperla rubiconis* THEISCHINGER are described.

Introduction

On the occasion of the first "International Conference on Plecoptera" in Australia, THEISCHINGER & CARDALE (1987) presented a survey of the Australian stonefly fauna. They diagnosed all species available in collections up to 1985 but did not formally introduce and name previously undescribed species. Recently collected material includes two additional new species and, together with some more study, helped to clarify the status of some of the unnamed species listed by THEISCHINGER & CARDALE (1987). The results are treated in detail in this paper.

Acknowledgments

I wish to thank Ms J.C. Cardale (Canberra), Dr G. Monteith and Mr G. Thompson (Brisbane), Dr A. Neboiss (Melbourne) and Dr C.N. Smithers (Sydney) for the loan of material in their care, and Prof. Dr H.B.N. Hynes (Waterloo, Canada) for supplying unpublished information.

Material and Methods

Material for this study was made available from the Australian Museum (AM) in Sydney, from the Australian National Insect Collection (ANIC) in Canberra, from the Museum of Victoria (MV) in Melbourne and from the Queensland Museum (QM) in Brisbane and is now lodged in the collections of these institutes as indicated below. The genitalia of specimens used for descriptions and illustrations have been cleared in KOH and are preserved in glycerol.

***Austropentura hynesorum* spec.nov.** (Figs 1, 2)

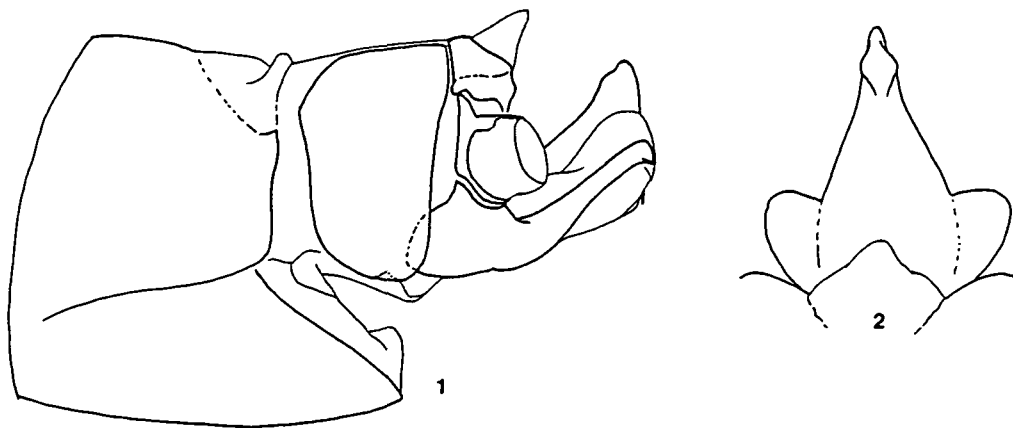
Austropentura sp., HYNES in print.

Austropentura sp., THEISCHINGER & CARDALE 1987: 10.

D e s c r i p t i o n (♂). Colouration: head, thorax and abdomen largely dull reddish to greyish brown; two spots lateral to lateral ocellus and mouthparts pale to dull yellow; coxae and trochanters pale yellow, remainder of legs greyish to blackish brown with pale yellow marks on femora and tibiae; forewing grey with some darker grey mottling which is absent from a large spot in the medio-cubital area.

Pronotum: corners not produced.

Wings: apparently of normal length.



Figs 1, 2. *Austropentura hynesorum* spec.nov., ♂: 1, genitalia, lateral; 2, epiproct, dorsal.

Genitalia: posterior sclerite of tergite 10 short, stout, conical; epiproct a stout cone with almost semicircular basolateral lobes and blunt tip; paraprocts with sclerotized portion ending in a hook-shaped structure as seen from lateral aspect.

Dimensions: body 22,5 mm, forewing 20,0 mm.

Material examined. Holotype ♂: Tasmania, 41°23'S/147°25'E, Mt Barrow, 11 km E by N Nunamara, 7.2.1983, at light, J.C. Cardale (ANIC).

Distribution. Tasmania.

Remarks. HYNES (in print) whose completed manuscript was sitting with potential publishers for considerable time, recorded larvae and two adults of *A. hynesorum* under *Austropentura* sp. He illustrated and diagnosed the larvae for a key to the Tasmanian stoneflies as typical *Austropentura* with 5 beaded gill filaments and gave the length for the last instar with 16-18 mm. He also keyed out the adults by eidonomic and genitalic characters. THEISCHINGER & CARDALE (1987) described and figured the male genitalia (p. 10; Figs 79, 80).

Name. This species is dedicated to Dr M. and Prof. Dr H.B.N. Hynes in recognition of their pioneer work on the Australian stoneflies.

Leptoperla longicauda spec. nov. (Figs 3-6)

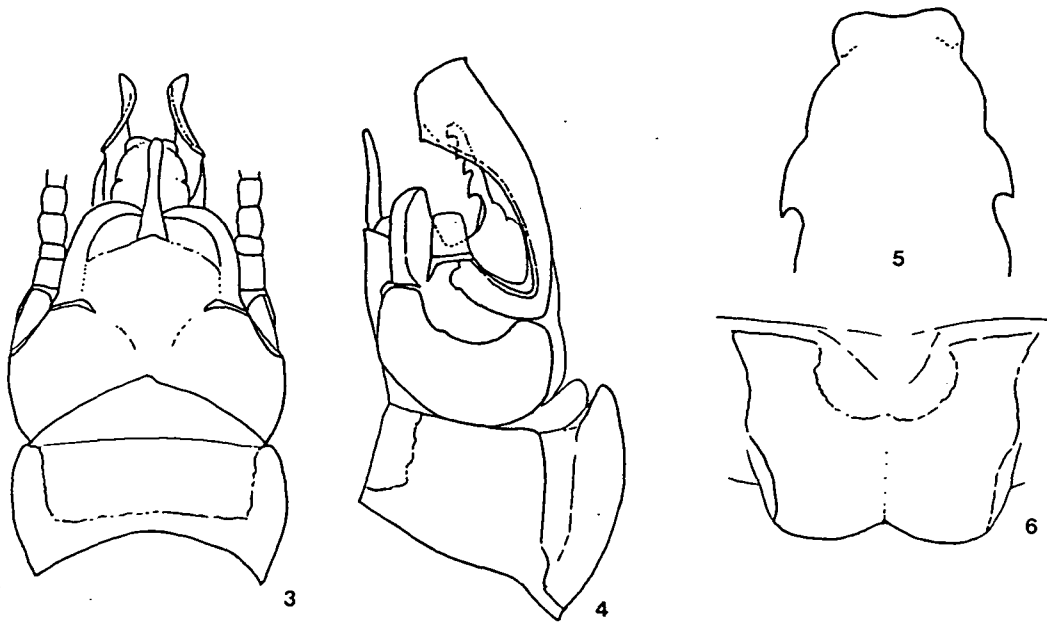
Leptoperla sp. near *kimminsi*, THEISCHINGER & CARDALE 1987: 16.

Description. Colouration: sclerotized portions largely yellowish to greyish brown, membranous portions greyish yellow; apex of femora and base of tibiae markedly darker than remainder of legs; wing membrane largely suffused with grey but whitish hyaline along veins, particularly the distal crossveins, which appear white.

Male genitalia: anterior sclerites of tergite 10 not much and not narrowly produced posterolaterally; posterior sclerite very long and thin; paraprocts with posteroventral corner produced ventrally; epiproct with toothed portion only slightly set off from base.

Female genitalia: subgenital plate slightly bilobed, extensively sclerotized; sides of tergite 8 not produced posteriorly.

Dimensions: body, male 6,0-8,0 mm, female 7,0-9,0 mm; forewing, male 7,0-8,5 mm, female 6,0-8,5 mm; antennae, male and female 8,0-10,0 mm; cerci, male and female 5,5-7,0 mm.



Figs 3-6. *Leptoperla longicauda* spec.nov.: 3,4, male genitalia: 3, dorsal; 4, lateral; 5, epiproct, ventral; 6, female subgenital plate, ventral.

M a t e r i a l e x a m i n e d . Holotype ♂: New South Wales, Mount Kosciusko, Perisher Creek, 1600 m, 26.2.1987, G. Theischinger (ANIC). Paratypes: New South Wales: 2 ♀, same data as holotype (ANIC); 2 ♂, Alpine Ck, Kiandra, 29.1.1970, E.F. Riek (ANIC); 2 ♂, Thredbo River, 5.9.1986, G. Theischinger; 3 ♀, Bendora, A.C.T., 14.12.1960, D.H. Colless; 1 ♂, Mt Gingers, A.C.T., 12.12.1956, E.F. Riek; 1 ♀, same locality, 27.10.1966, 5 ♀, same locality, 11.1.1967, 2 ♂, same locality, 6.2.1947, E.F. Riek (all ANIC).

Distribution. New South Wales.

Remarks. THEISCHINGER & CARDALE (1987) presented both sexes of *L. longicauda* under "*Leptoperla* sp.near *kimminsi*" (p. 16; Figs 167-169, 183). Since then material of the certainly closely allied *L. kimminsi* MCLELLAN and *L. longicauda* has become available from several more localities. The two species show little geographical variability of populations and can be distinguished from each other without difficulties. It appears that *L. longicauda* is perhaps closer to *L. bifida* MCLELLAN or *L. kalliste* HYNES and *L. albicincta* THEISCHINGER than to *L. kimminsi*.

Name. The specific name is a combination of the Latin words longus (=long) and cauda (=tail), referring to the long posterior sclerite of tergite 10 in the male of this species.

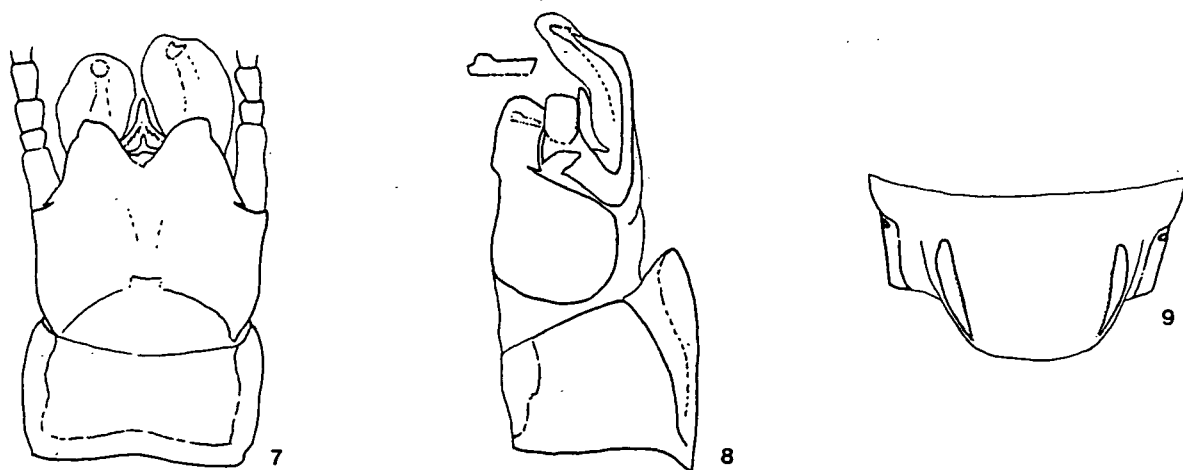
Leptoperla membranosa spec.nov. (Figs 7-9)

Leptoperla sp. near *tasmanica*, THEISCHINGER & CARDALE 1987: 18.

Description. Colouration: head and thorax yellowish to blackish brown; wings suffused with pale yellowish brown, the distal crossveins appearing white; abdomen largely greyish yellow with sclerotized areas yellowish to blackish brown.

Male genitalia: lateral sclerites of tergite 10 long, apically rounded and slightly angulated on outer side; posterior sclerite a high narrow structure with posteroventral corner pointed and dorsal portion enlarged posteriorly; epiproct subtriangular with small dorsal teeth and narrow tip; lobe of paraprocts long, posterior portion bent dorsally and slightly hooked apically, sclerotized portions largely hidden under a bulging membranous portion.

Female genitalia: subgenital plate wide, with posterior margin rounded; a narrow, dark, sclerotized patch along each lateral margin.



Figs 7-9. *Leptoperla membranosa* spec.nov.: 7,8, male genitalia: 7, dorsal; 8, lateral; 9, female segment 8, ventral.

Dimensions: body, male 6,5-7,5 mm, female 8,5 mm; forewing, male 6,5-7,0 mm, female 8,0 mm; antennae, male 7,0-7,5 mm, female 8,5 mm; cerci, male 6,0-6,5 mm, female 6,5 mm.

Material examined. Holotype ♂: New South Wales, Mt Kosciuszko, Wilsons Valley, March 1962, J.W. and F. Evans (AM). Paratypes: 2 ♂, 1 ♀, same data as holotype (AM).

Distribution. New South Wales.

Remarks. THEISCHINGER & CARDALE (1987) presented both sexes of *L. membranosa* under "*Leptoperla* sp. near *tasmanica*" (p. 18; Figs 154, 155, 191). Series of the closely allied *L. tasmanica* KIMMINS have been collected since from several localities. This material gave evidence of very insignificant variability of *L. tasmanica* populations from north-eastern New South Wales to South Australia and strongly suggested specific status for *L. membranosa*.

Name. The specific name is from the Latin adjective *membranosus* (=membranous), referring to the bulging membranous portion of the male paraprocts in this species.

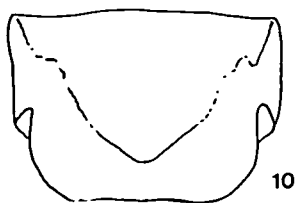
***Leptoperla rubiconis* THEISCHINGER (Fig. 10)**

Leptoperla rubiconis THEISCHINGER 1984: 98.

Leptoperla sp. THEISCHINGER & CARDALE 1987: 18.

Primary type. Holotype ♂: Victoria, Rubicon, 29.3.1957, A. Neboiss (MV).

D e s c r i p t i o n (♀). Colouration: head and thorax yellowish to dark greyish brown; legs yellowish to pale greyish brown with markedly darker basal ring on tibiae; wings with yellowish grey venation, membrane largely suffused with grey but whitish hyaline along most veins, and all distal crossveins appearing white; abdomen largely greyish yellow, sclerotized portions yellowish to greyish brown.



Leptoperla rubiconis
THEISCHINGER, female segment 8, ventral.

Genitalia: subgenital plate very wide, with posterior margin mostly almost straight, sclerotized along posterior and lateral margins.

Dimensions: body 6,5-8,5 mm, forewing 8,0-10,0 mm, antennae 8,0-9,5 mm, cerci 6,0-7,5 mm.

M a t e r i a l e x a m i n e d. Holotype; 25 ♂, 7 ♀, New South Wales, Mount Kosciusko, Perisher CK, 1600 m, 26.2.1987, G. Theischinger (ANIC).

Distribution. Victoria, New South Wales.

Remarks. *L. rubiconis* was described after a single male from Rubicon in Victoria (THEISCHINGER 1984). A long series of quite typical males, toge-

ther with a number of apparently conspecific females, was collected recently on Mt Kosciusko in New South Wales. From this material it became evident that THEISCHINGER & CARDALE (1987) had also presented the female of *L. rubiconis* under *Leptoperla* sp. (p. 18; Fig. 195).

***Leptoperla thompsoni* spec.nov. (Figs 11,12)**

D e s c r i p t i o n (♂). Colouration: head and thorax yellowish to reddish or greyish brown; legs largely yellowish to greyish brown, with knees markedly darker; wings suffused with greyish brown, the distal cross-veins appearing white; abdomen pale yellow with sclerotized portions yellowish to blackish brown.

Genitalia: anterior sclerites of tergite 10 slightly produced posterolaterally, lateral sclerites evenly rounded posteriorly, posterior sclerite small, thumb-shaped; epiproct with well developed slender apical hook, long narrow "neck" and toothed lateral lobes; lobe of paraprocts arched dorsally, ending in a huge apical hook which is directed anteroventrally.

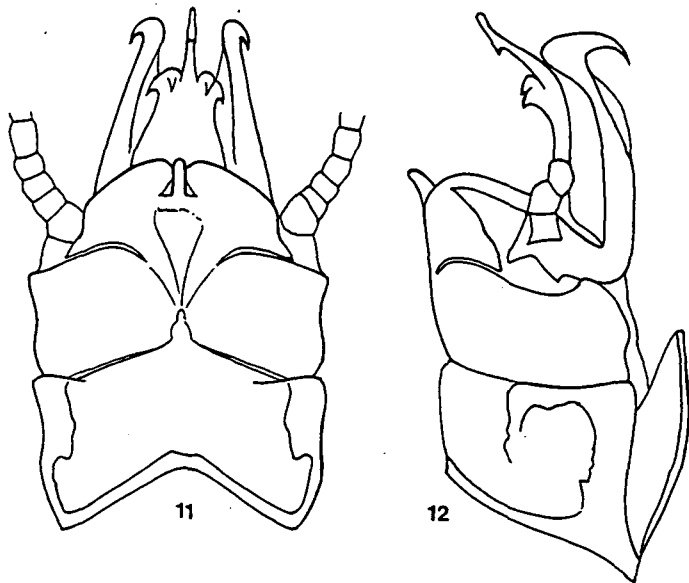
Dimensions: body 9,0 mm,

forewing 8,8 mm, antennae 8,5 mm, cerci 5,5 mm.

Distribution. Queensland.

M a t e r i a l e x a m i n e d . Holotype ♂: Queensland, Upper Boulder CK, via Tully, 900 m, 26.10.1983, Monteith, Yeates and Thompson (QM).

Name. This species is dedicated to Mr G. Thompson, one of its collectors.



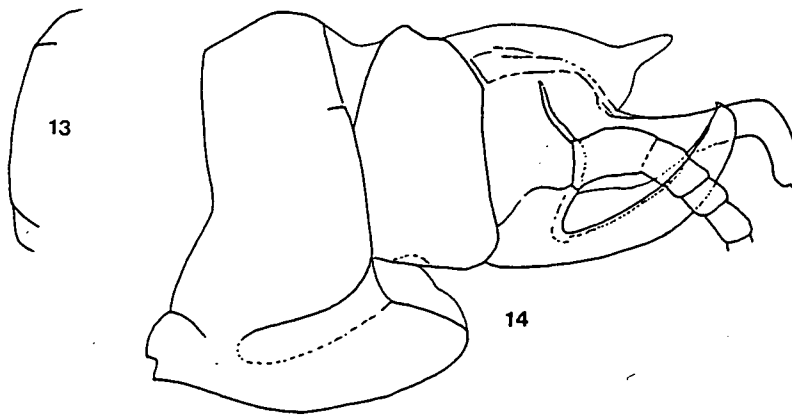
Figs 11, 12. *Leptoperla thompsoni* spec.nov.; male genitalia: 11, dorsal; 12 lateral.

***Dinotoperla inermis* spec.nov.** (Figs 13, 14)

Dinotoperla sp. near *christinae* THEISCHINGER & CARDALE 1987: 27.

D e s c r i p t i o n . Colouration: largely greyish yellow to pale reddish brown (alcohol preservation, young individuals) with membranous portions of abdomen whitish yellow; apex of femora and base of tibiae greyish brown.

Male genitalia: central sclerite of tergite 10 produced posteriorly, the membranous cone ending in a narrow tip; epiproct with distal third bent or bowed ventrally and bearing a small apical spur; paraprocts with long base and moderately long and wide lobe.



Female genitalia: subgenital plate widely and distinctly bilobed.

Dimensions: body, male 8,0-10,0 mm, female 8,5-10,0 mm; forewing, male 8,5-10,5 mm, female 10,0-12,5 mm; antennae, male and female 9,0-11,5 mm.

Figs 13,14. *Dinotoperla inermis* spec.nov.: 13, left side of pronotum; 14, male genitalia, lateral.

M a t e r i a l e x a m i n e d .: Holotype ♂: New South Wales, Warrumbungle Range, 7.10.1983, G. Theischinger (ANIC). Paratypes: 4 ♂, 15 ♀, 3 larvae, same data as holotype (ANIC).

Distribution. New South Wales.

Remarks. THEISCHINGER & CARDALE (1987) presented both sexes of *D. inermis* under "*Dinotoperla* sp. near *christinae*". Beyond the differences from *D. christinae* MCLELLAN in the male genitalia, the corners of the prothorax are not produced in *D. inermis*, and its larvae do not show any sign of prothoracic processes so typical for *D. christinae*.

Name. The specific name is from the Latin adjective *inermis* (=unarmed), referring to the smooth outlines of the prothorax in this species as opposed to its close ally *D. christinae*.

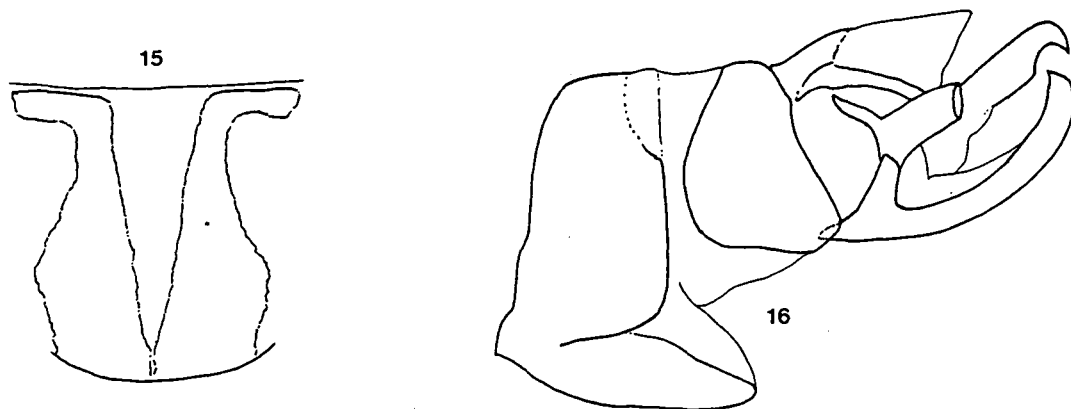
Dinotoperla subserricauda spec.nov. (Figs 15, 16)

Dinotoperla sp. near *serricauda* THEISCHINGER & CARDALE 1987: 30.

D e s c r i p t i o n . Colouration: sclerotized portions yellowish to dark reddish and greyish brown; tibiae basally markedly darker than remainder of legs; membranous portions pale greyish yellow.

Male genitalia: epiproct moderately high and with gap between apical ventral spur and basal ventral bulge of considerable width; base of paraprocts moderately wide.

Female genitalia: subgenital plate rather narrow with sclerotized lateral patches basally strongly angulated.



Figs 15,16. *Dinotoperla subserricauda* spec.nov.: 15, female subgenital plate, ventral; 16, male genitalia, lateral.

Dimensions: body, male 9,0-11,0 mm, female 10,0-12,0 mm; forewing, male 9,0-10,0 mm, female 10,0-12,0 mm; antennae, male and female 8,5-10,5 mm.

M a t e r i a l e x a m i n e d . Holotype ♂: New South Wales, Kiandra, 20.12.1966, E.F. Riek (ANIC). Paratypes: 3 ♂, 24 ♀, same data as holotype (ANIC); 20 ♂, 30 ♀, New South Wales, Barrington Tops, Polblue Creek (near swamp), 22.-23.10.1984, G. Theischinger (ANIC).

Distribution. New South Wales, ?Queensland.

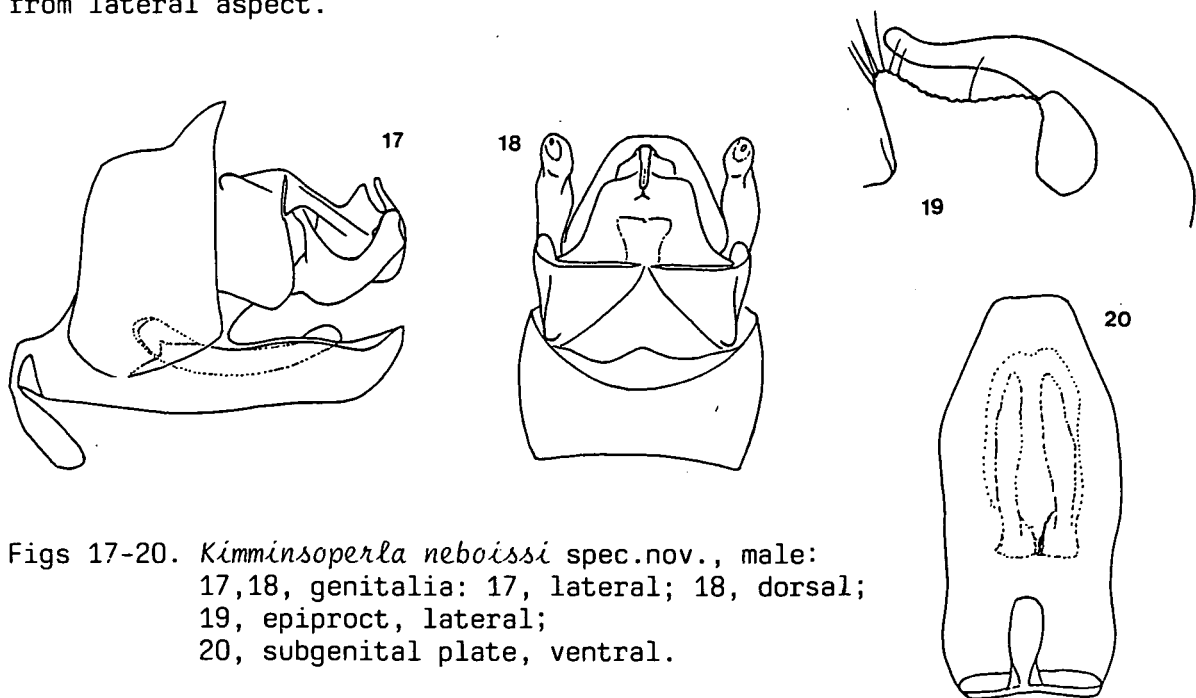
Remarks. THEISCHINGER & CARDALE (1987) presented both sexes of *D. subserricauda* under "*D. sp. near serricauda*". Up to recently it appeared that *D. serricauda* and *D. subserricauda* are geographical vicariants. However, as there are now both forms available from the same areas near Mt Kosciusko, they are regarded as specifically distinct.

Name. Sub (Latin: under) combined with *serricauda* should indicate that *D. subserricauda* is a very close ally of *D. serricauda* KIMMINS.

Kimminsoperla nevoissi spec.nov. (Figs 17-20)

Description (♂). Colouration: head and thorax largely greyish to blackish brown, a yellow mark between ocelli; legs dull brownish yellow to dark greyish brown, with femora and tibiae darker basally and apically than in between; abdomen greyish to reddish brown.

Genitalia: tergite 9 produced posteromedially in a high subtriangular process; subgenital plate with posterior portion about as wide as base, only distal third slightly tapered, apex truncate; a high medial longitudinal ridge anterior to the base of the narrow curved epiproct; paraprocts without destruction of the type specimen not clearly detectable, about half as long as subgenital plate; cerci long, curved, plumply foot-shaped as seen from lateral aspect.



Figs 17-20. *Kimminsoperla nevoissi* spec.nov., male:
17,18, genitalia: 17, lateral; 18, dorsal;
19, epiproct, lateral;
20, subgenital plate, ventral.

Dimensions: body 5,0 mm, forewing 3,8 mm, antennae 4,5 mm.

Material examined. Holotype ♂: Tasmania, below Maxwell Ridge, tributary of Picton River above Reservoir Lakes, 43°29'S/146°44'E, alt. 800 m, 15.2.1988, A. Neboiss (MV).

Distribution. Tasmania.

Remarks. *K. nevoissi* is the only *Kimminsoperla* which is apparently slightly brachypterous; the species is closely related to *K. biloba* ILLIES.

Name. This species is dedicated to Dr A. Neboiss who discovered and collected it.

Zusammenfassung

Sieben neue Arten australischer Steinfliegen, *Austropentura hynesorum*, *Leptoperla longicauda*, *L. membranosa*, *L. thompsoni*, *Dinotoperla inermis*, *D. subserricauda* und *Kimminsooperla nevoissi*, und das bisher unbekannte Weibchen von *Leptoperla rubiconis* THEISCHINGER werden beschrieben.

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