

## TRICHOPTERA FROM THE HIGH MOUNTAIN LAKES PINDE AND AUNDE, NEW GUINEA

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*Abstract* : Two new species of Trichoptera from New Guinea are described and additional information about a 3rd species is given. A discussion on the zoogeographical significance of these and other known species from this region is included.

*Introduction* : During my expedition to Australia I had the opportunity of a short stay at Lakes Pinde and Aunde (field station of the School of South Pacific Studies, Canberra University) on Mt. Wilhelm in the Eastern Highlands of New Guinea. These lakes are of great limnological and zoogeographical interest as they form the Notogaic limnic biotopes of highest elevation (3,680 m and 3,600 m respectively). Cool adapted forms of benthic origin were to be expected and it was hoped to find amongst them some indication as to the zoogeographic relation of this high mountain fauna to the neighboring continents. A general report about the limnic conditions and the fauna will be given in a special study.

From 29 September to 5 October 1966, I collected limnic insects in Lake Pinde and Lake Aunde and their tributaries and outlets. Trichoptera made up the largest percentage of insects obtained. Former studies on the Trichoptera of New Guinea are those of Ulmer (1939), Kimmins (1962, - Cheesman Expedition) and Korboot (1964, 1966).

*Acknowledgments* : I am indebted to the authorities of the School of South Pacific Studies, University of Canberra, Australian Capital Terr., for the invitation to use the accommodation at the field station at Lakes Pinde and Aunde and also to Mr and Mrs Keith Wade, residents at this station. Furthermore I have to thank Mr Max Orken, Land Commissioner of the Australian Government at Goroka, Eastern Highlands, for much valuable help with collecting and transportation facilities. Special thanks are due to Mr Noel N. Drummond, an official of the Australian Government Ministry for the Administration of the Territory of Papua, New Guinea, Sydney, whose assistance enabled me to reach the collecting places and who put many official facilities at my disposal. The drawings were executed by Dr and Mrs Jan Sykora to whom I extend my thanks.

### POLYCENTROPODIDAE

***Polycentropus drummondi*** Illies, new species

Length of forewing in ♂ : 6.5 mm; in ♀ : 6.5 mm.

*Morphology* : Head piceous with black hairs. Antennae stout, piceous with brown pubescence. Palpi brown. Thorax brown with dark hairs except for pronotum which bears light hairs.

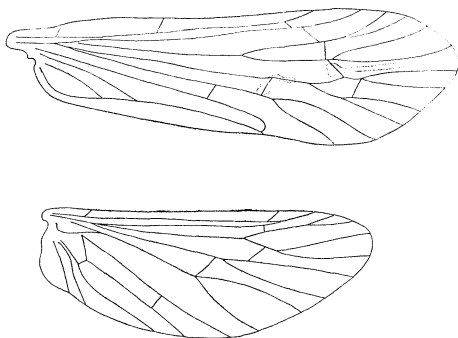


Fig. 1. *Polycentropus drummondi*  
n. sp. ♂ wings.

Legs and abdomen brown. Wings fuscous with dark pubescence; immaculate apart from 2 white spots in forewing - one around the r-m crossvein and from there extending to the margin, another around the m-cu crossvein. (fig. 1).

♂ *Genitalia*: (fig. 2) 9 segment dorsally forms a quadrangular cover with a slight insinuation at hind margin; 10 segment partially hidden under 9th except for the deeply incised apex. Cercus with short basal joint and long finger-like medially bent process (2nd joint). Aedeagus cylindrical, claspers stout at base, tapering gradually to a triangular apex, upper branch longer, and in side view, bent ventrally.

♀ *Genitalia*: (fig. 3) 8 segment forming a lightly sclerotized suboval subgenital plate which is shorter than the lateral gonapophyses. 9th segment partially sunk within the 8th, lateral gonapophyses completely covered under subgenital plate. 10th segment with the 3 pairs of processes which are usual in the genus.

*Holotype* ♂, Shore of Lake Aunde, 2. X. 1966, Illies. Allotopotype ♀, same data as type. Both specimens are deposited in the Coll. of the Entomology Dept.; C. S. I. R. O., Canberra, A. C. T.

*Affinities*: This species differs from all other Papuan species of the genus in the ex-

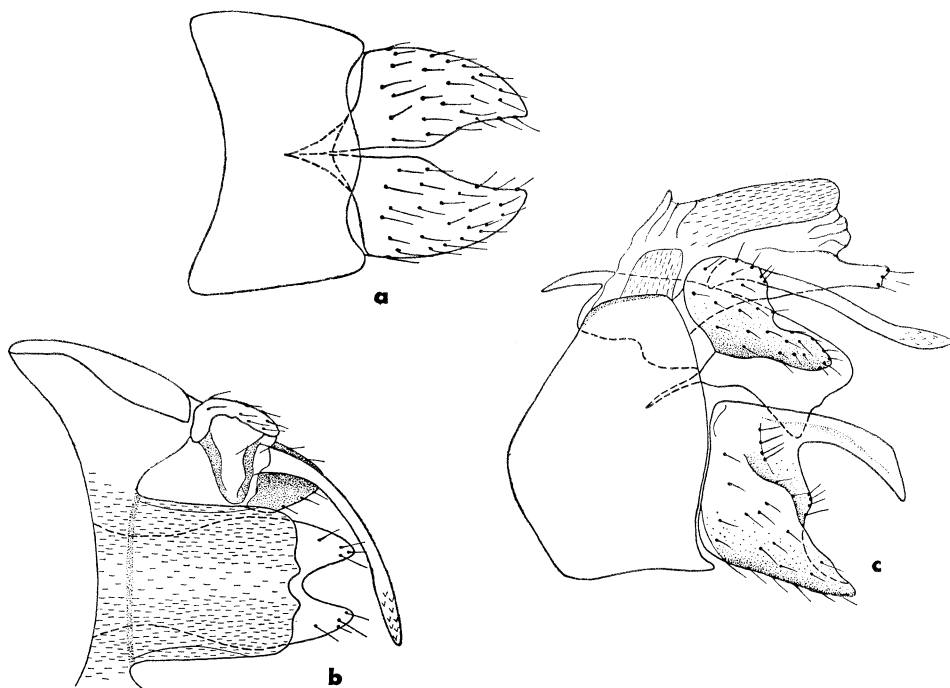


Fig. 2. *Polycentropus drummondi* n. sp. ♂ genitali: a, ventral; b, dorsal; c, lateral.

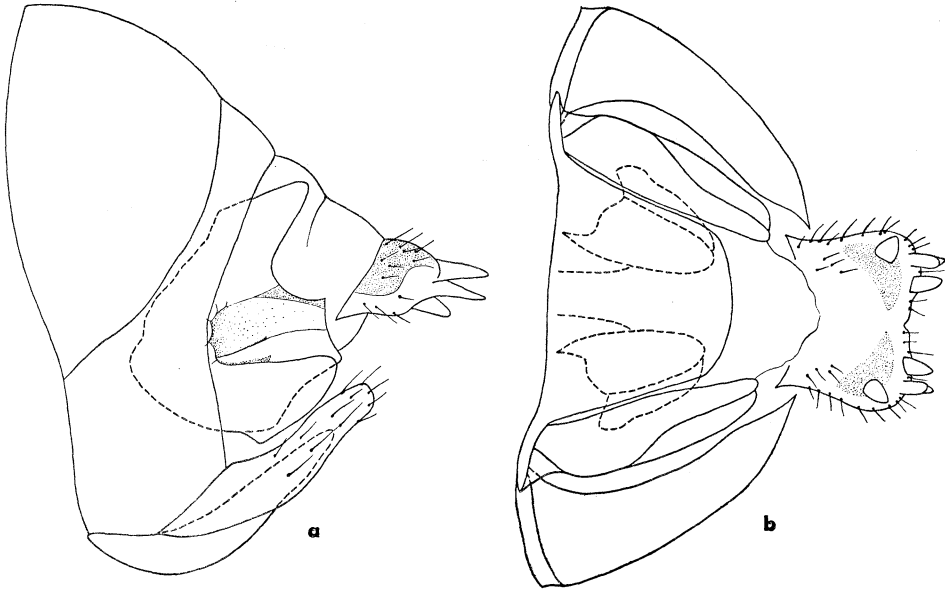


Fig. 3. *Polycentropus drummondi* n. s. ♀ genitalia: a, lateral; b, ventral.

tremely long processes at the base of the ♂ cerci.

#### HYDROPSYCHIDAE

##### *Abacaria orkeni* Illies, new species

Length of forewing: ♂, 6.5-7.0mm; ♀, 7.5-8.0 mm.

*Morphology*: Head, thorax and legs fuscous or pale brown (all specimens studied were recently emerged so that the mature coloration may be even darker). Hairs brown. Wings (Fig. 4) pale with uniform dark pubescence.

♂ *Genitalia*: (fig. 5) 9th segment rounded in side view, 10th segment rather long and protruded forming 2 lobes in dorsal view. Aedeagus cylindrical, slightly constricted before apex; apical lobes sub-triangular in side view, semi-circular in dorsal view. (Lobes shorter than terminal segments of claspers.) Claspers long, sinuate in side view; terminal joint long and finger-like.

♀ *Genitalia*: (fig. 6) The figure shows all details. Special emphasis is given to the situation and orientation of the clasper grooves.

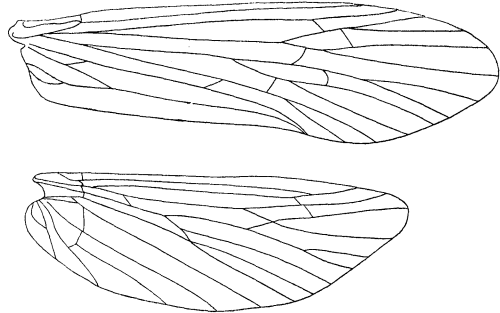


Fig. 4. *Abacaria orkeni* n. sp. ♂ wings.

Holotype ♂, Outlet of Lake Aunde, 3. X. 1966, Illies. Allotopotype ♀, same data. Both specimens are deposited in the Coll. Ent. Dept. of C. S. I. R. O., Canberra, A.C.T. Additional

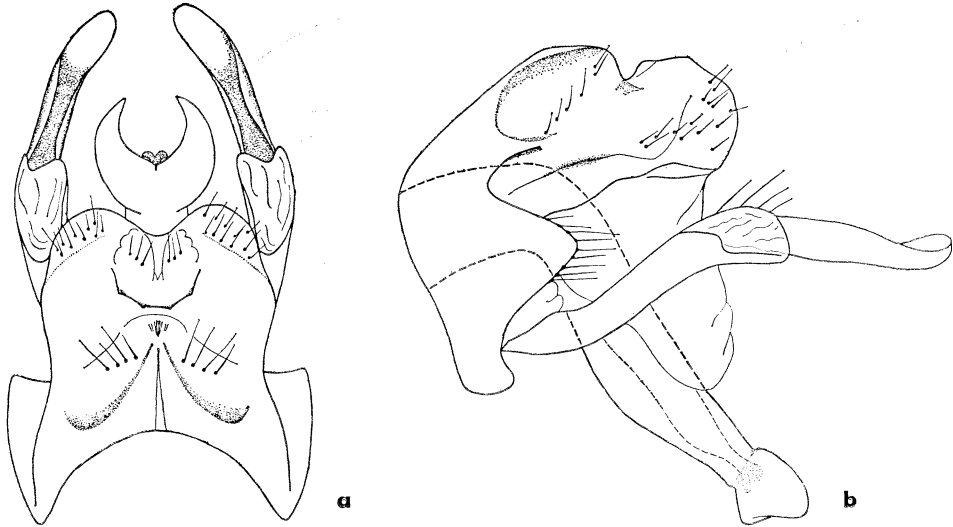


Fig. 5. *Abacaria orkeni* n. s. ♂ genitalia: a, dorsal; b, lateral.

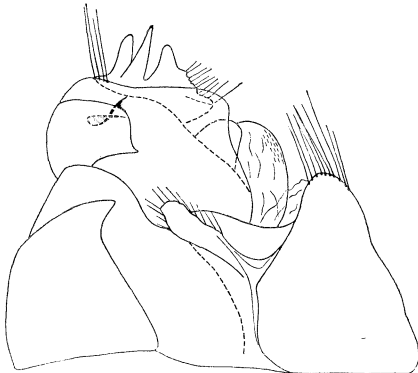


Fig. 6. *Abacaria orkeni* n. sp. ♀ genitalia, lateral.

material: 10 ♂♂ and 22 ♀♀ in Coll. mea, of which one couple is given to Bishop Museum, Hawaii.

*Affinities*: As in the other Papuan species (*A. subfusca* Kimmins), the wings are uniform and unmarked; as well as by its greater size the ♂ of the new species differs from it by the length of the terminal segment of the claspers and other details of the genitalia.

#### LEPTOCERIDAE

#### *Symphitoneuria ampla* Korboot 1964

The original description of this species is rather brief and the drawings are small and give little information. Therefore I find it necessary to redescribe it. This species seems to be the most abundant caddis-fly in the Pinde and Aunde lakes.

The original series, of which the holotype was selected, was taken at "Mt. Wilhelm, 11,300 ft., 3. ix. 1959" 1 ♂ by A. M. Rapson and 4 ♀♀ by J. H. Barrett (Korboot 1964: 49). I collected 2 ♂♂ and 44 ♀♀ (3. X. 1966) on the shore of Lake Aunde, mainly at the lights of the field station, where this species was reported by the local residents to be very abundant throughout the year. The description by Korboot (1964) covers all important items of the species, but new drawings of the wings and genitalia are given here.

*Wings*: (fig. 7,8) In the ♂ the coalescence of Rs and M is obvious and forms a thick, heavily

sclerotized band which sends 2 veins directly to the apex, and 3 veins downwards and returning basally for a short distance before they, too, run towards the apex. In the ♀ the general shape of the wing is much narrower than in Korboot's drawing; the hind fringe of the forewing especially, is constricted at the point where Cu and A reach the margin. The anal fan in the hindwing too shows another form than is suggested by Fig. 28 of Korboot.

♂ *Genitalia*: (fig. 9, 10) 9th tergite with convex apical margin under which the 2 acute triangular processes of the 10th segment reach 1/2 the length of cerci. Under the cerci the 10th segment is tapered caudally to form a broad covering plate, its apex deeply excised to give 2 triangular lobes. Aedeagus much shorter than cover plate of 10th segment, apex dividing into a fan of 5 lobes which, in their center, carry a triangular plate (fig. 10a). Claspers a little longer than aedeagus, 3-branched in side view—a basal branch similar to cerci in size, shape and pubescence; a medial branch acute, straight, as long as penis cover of 10th segment; upper branch ending in 2 hairy lobes of which the outer carries a long downwardly directed needle.

♀ *Genitalia*: (fig. 11) Gonapophyses of 9th and 10th segments of equal length and triangular in shape 10th segment with usual double set of processes.

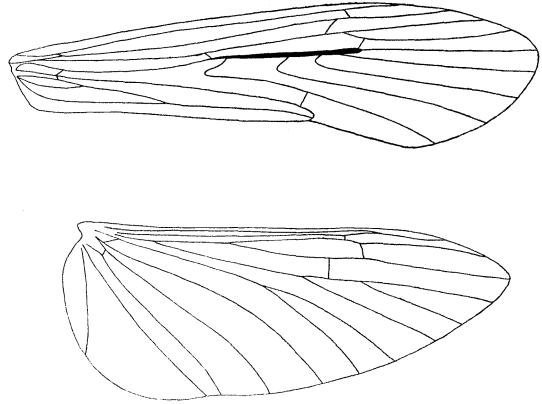


Fig. 7. *Symphitoneuria ampla* Korboot ♂ wings.

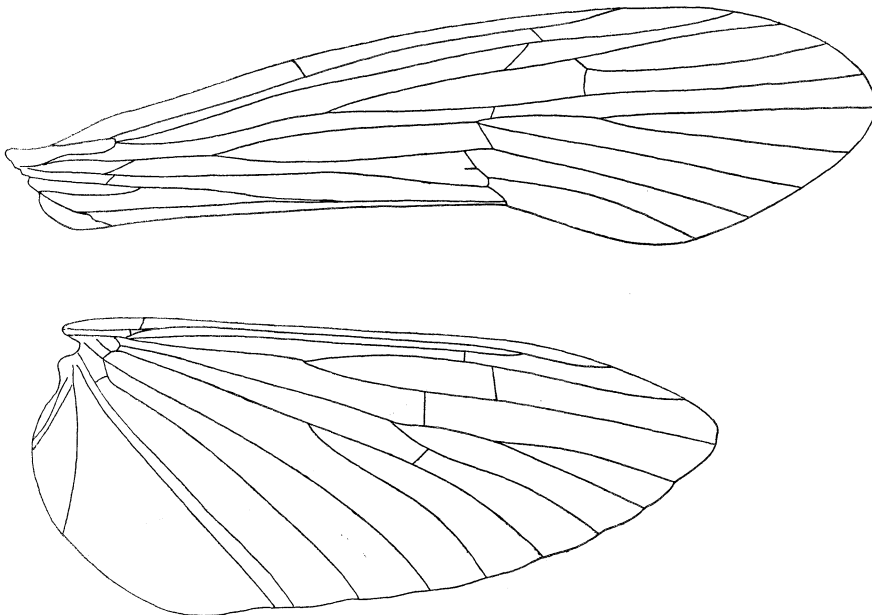


Fig. 8. *Symphitoneuria ampla* Korboot ♀ wings.

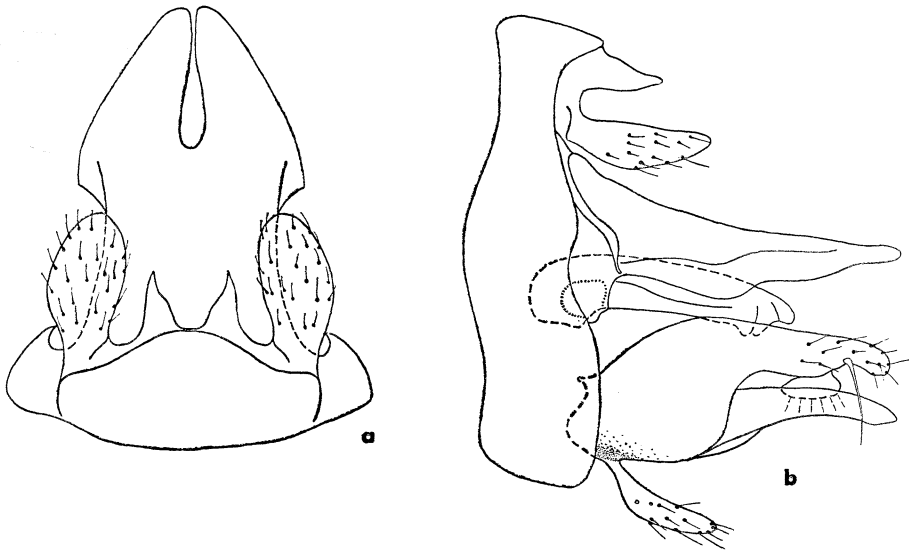


Fig. 9. *Symphitoneuria ampla* Korboot ♂ genitalia: a, dorsal; b, lateral,

*Zoogeographical significance:* Of the 3 species mentioned, *P. drummondi* nov. spec. belongs to a genus of wide distribution: *Polycentropus* species occur in all continents except Australia (!), most of them in the Palearctic. The number of New Guinean species of *Polycentropus* with *drummondi* nov. spec. now amounts to 10. *A. orkeni* nov. spec. is the 2nd New Guinean species of the genus *Abacaria* Mosely, which was originally erected for 2 Fijian species of the *Hydropsychodes*-complex. A faunal relation between the Papuan and East Melanesian zoogeographical subdistrict is, therefore evident. In the Leptoceridae,

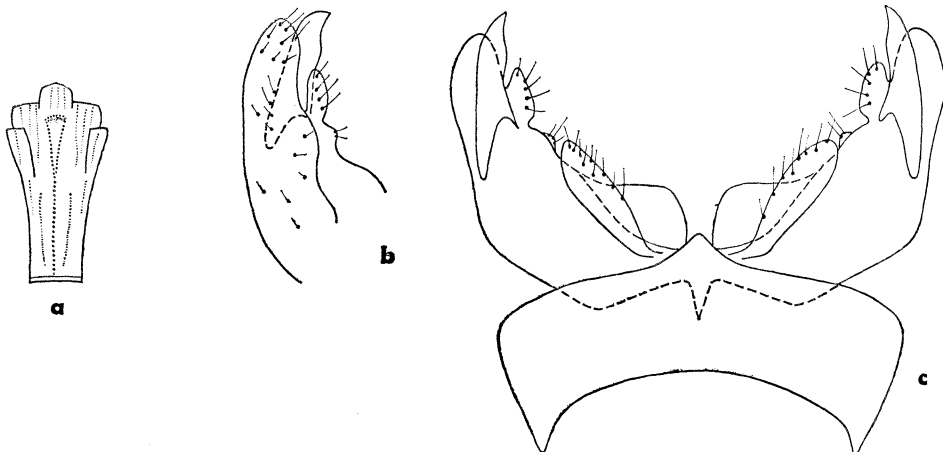


Fig. 10. *Symphitoneuria ampla* Korboot ♂ genitalia: a, aedeagus, ventral; b, upper branch of clasper, dorsal; c, ventral.

*Symphitoneuria* Ulmer is a genus of exclusive Australian and New Guinean distribution.

Two more species of Trichoptera are known from the lakes of Mt. Wilhelm. The leptocerid, *Oecetis arcipennis* Kimmins, was found in fair numbers by me (3. X. 1966, Pinde, Aunde) and the psychomid, *Austreconomina kenampi* Korboot, was reported from "Mt. Wilhelm, 11,300 ft., 3. ix. 1959, leg. J. H. Barrett" by Korboot. The zoogeographical significance of these additional species is rather remote because *Oecetis* is a cosmopolitan genus and *Austreconomina* Korboot is monospecific, split from the Australian genus *Ecnomina* Kimmins.

In summarizing all records about the 5 known species of Trichoptera from the fauna of the high mountain lakes Pinde and Aunde, this fraction of the aquatic fauna shows almost equal relations to the Palearctic and to the Notogaea. As our present knowledge of Papuan species of this group is rather elementary, the fact of 4 "endemic" species in the lake area is of little or no significance as far as the degree of isolation is concerned; they must all at least be expected from the entire Highland area. As they do not represent a cool-adapted group, in spite of the extremely high elevation of the area, an alpine fauna at the lakes is obviously lacking. This result of our study agrees with former observations by Gressitt (1961), who previously stated this peculiar lack of alpine forms in the terrestrial fauna of the New Guinean Highlands. The surrounding tropical lowland obviously forms an effective barrier against the colonization by montane forms from distant high mountain areas.

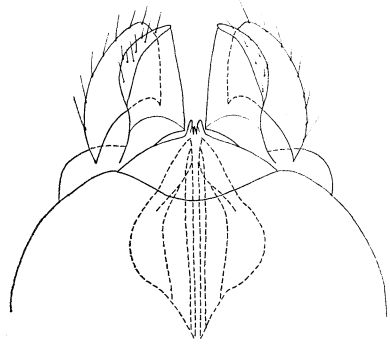


Fig. 11. *Symphitoneuria ampla* Korboot ♀ genitalia, ventral.

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