

THE FAMILY PSYCHOMYIIDAE (TRICHOPTERA) RE-ESTABLISHED IN AUSTRALIA

BY ARTURS NEBOISS

Department of Entomology, Museum of Victoria, 71 Victoria Crescent,
Abbotsford 3067, Victoria, Australia

Abstract

Neboiss, A., 1990. The family Psychomyiidae (Trichoptera) re-established in Australia. *Memoirs of the Museum of Victoria* 51(1): 83–86.

The family Psychomyiidae is re-established in the Australian Trichoptera fauna represented by *Tinodes radona* sp. nov. from Kakadu National Park, NT, and a north-eastern Queensland species tentatively referred to the New Zealand genus *Zelandoptila*, *Z. yuccabina* sp. nov.

Introduction

The family Psychomyiidae s.l. was first recorded from Australia by Mosely and Kimmins (1953) who reported the genera *Ecnomus* and *Ecnomina*. Subsequently, Riek (1970) incorporated all polycentropodids, stenopsychids and ecnomids in Psychomyiidae. This was changed when Neboiss (1977) following proposals of Ulmer (1951), Lepneva (1956) and Schmid (1969), recognized these three groups as separate families and removed Psychomyiidae from the Australian Trichoptera. Recent discovery of a member of the genus *Tinodes* in Northern Australia re-establishes the family firmly on the Australian continent and comes as no surprise as the genus *Tinodes* is already known from New Guinea (Kimmins, 1962). Another species from north-eastern Queensland is tentatively referred to the New Zealand genus *Zelandoptila* although it conflicts in several respects with the generic definition.

The following abbreviations are used for the institutions where specimens are deposited: ANIC, Australian National Insect Collection, Canberra; NMV, Museum of Victoria, Melbourne.

Psychomyiidae Curtis

Psychomidae Curtis, 1835: 561 (text).

Diagnosis. (Modified after Wiggins, 1982) Ocelli absent. Maxillary palpi 5-segmented in both sexes (6-segmented in Padunellinae, not known from Australia); segment 1 short, segment 2 about as long as or longer than segment 1, segment 3 as long as segment 2 or segments 1 and 2 together, never inserted before the apex of segment 2, segment 4 as long as or shorter than segment 3, segment 5 about as long as segments 3

and 4 together, annulate, flexible. Antennae moderately robust, not exceeding the length of fore wing, scape shorter than head, only slightly thicker than following segments. Mesoscutum with pair of ovoid warts, scutellum with setal warts either separate or fused. In some genera females with mid-legs dilated. Claws normal. Spurs 2:4:4 (some genera may be 1:2:4 or 1:4:4).

Wings slender, rounded or tapered apically. Fore wings fork 1 absent, discoidal cell short, median cell usually closed, thyridial cell very small, situated close to wing base and more or less separated from the base of median cell. Hind wing narrow, lanceolate, costal margin more or less produced anteriorly at middle, fork 1 absent, forks 2, 3 and 5 usually present, fork 3 sometimes absent, discoidal cell open.

Tinodes Curtis

Tinodes Curtis, 1834: 216.

Type species. *Tinodes lurida* Curtis, 1834 (= *Phryganea waeneri* Linnaeus, 1758 (by monotypy)).

Diagnosis. Maxillary palpi with segment 3 about as long as segment 2, segment 4 shorter than segment 3. Mid-legs of females not dilated. Spurs 2:4:4.

Fore wings moderately slender, rounded apically, discoidal cell relatively broad, apical forks 2, 3, 4 and 5 present, fork 2 sessile, forks 3 and 4 with footstalk, median cell open in Australian and New Guinea species (closed in European species), thyridial cell small, distinctly separated from base of median cell (fork). Hind wing rather narrow, costal margin at apical half slightly concave, projection at middle small, R1 connected to R2 by cross-vein, fork 3 present,

sessile, 2 anal veins run separately along their entire length.

Male genitalia with inferior appendages robust; in females abdomen ends in more or less extended ovipositor.

***Tinodes radona* sp. nov.**

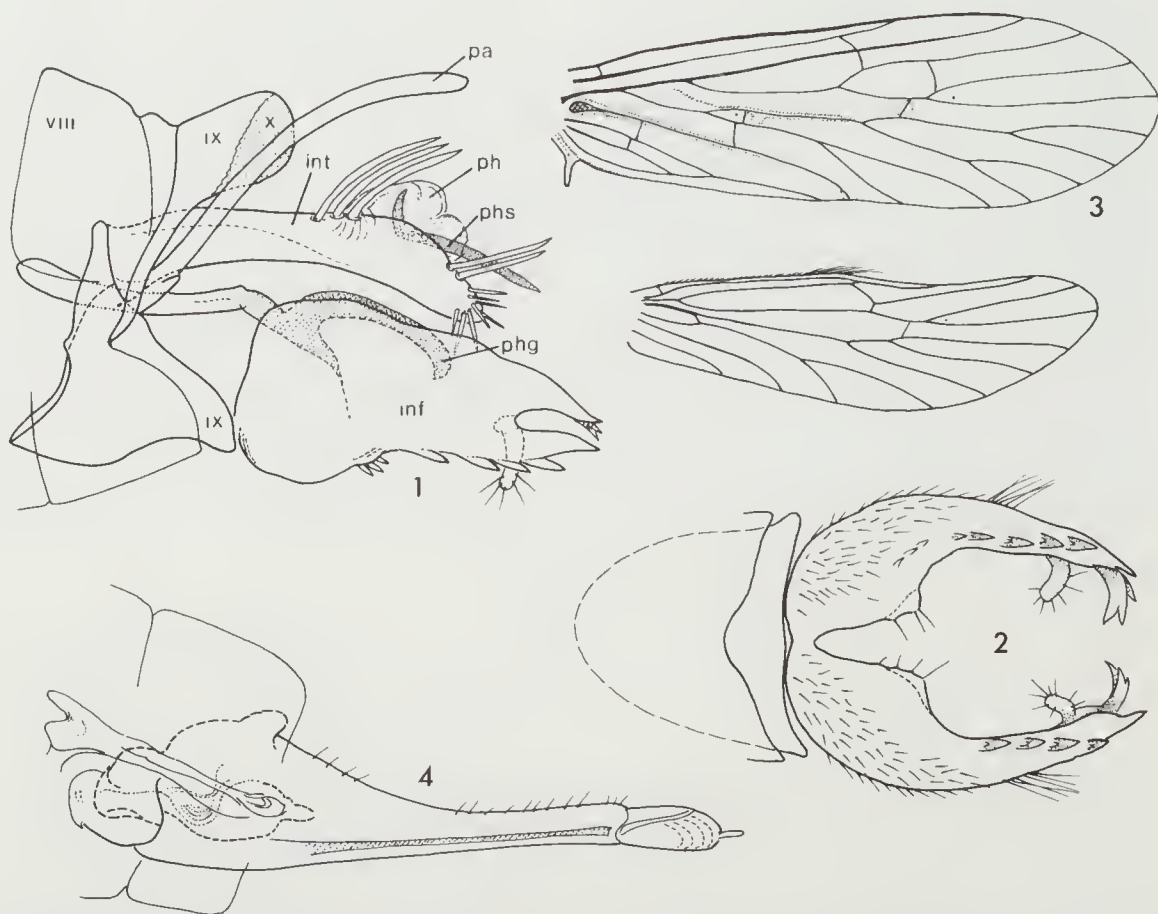
Figures 1–4

Type material. Holotype ♂, Northern Territory, Radon Springs, 12°45'S, 132°55'E, light trap, 13 Apr 1989, A. Wells and P. Suter (NMV T-10484).

Paratypes: 1♂ 1♀, collected with holotype (genitalia prep. PT-1814♂, PT-1815♀ figured) (NMV T-10485, T-10486); 1♂, North Queensland, Gordon Creek, Iron Range, 2 Jun 1975, M.S. Moulds (NMV T-10487); 16♂ 2♀, 3–13 km ENE of Mt Tozer, 12°43'S, 143°18'E, MV-light, 28 Jun–13 Jul 1986, J.C. Cardale et al. (ANIC; NMV).

Other material examined: 1♂, North Queensland, 1 km SE of Mt Cook, Cooktown, 13 Oct 1980, J.C. Cardale (ANIC).

Description. Adults preserved in alcohol, general colour including legs and antennae yellowish to greyish brown. Male genitalia: tergite 9 with long and narrow ventrolateral extensions, segment 10 membranous and vestigial, sternite 9 strongly sclerotised, ventral margin extended distally. Preanal appendages long, slightly curved, inserted together with end of ventrolateral extension of tergite 9, a small lateral tubercle near base. Intermediate appendages strongly developed, attached to upper section of sternite 9, lateral sclerites flattened, extended distally, armed mid-dorsally with 3 long, slightly curved spiny setae and apically with several long and a group of shorter spiny setae. Inferior appen-



Figures 1–4. *Tinodes radona* sp. nov. 1, male paratype T-10485, genitalia lateral; inf, inferior appendages; int, intermediate appendages; pa, preanal appendages; ph, phallus; phg, phallie guide; phs, phallie sclerite. 2, male genitalia ventral. 3, male wing venation. 4, end segments of female abdomen paratype T-10486.

dages robust, broad, fused mesoventrally near base, terminating with 2 apically pointed branches, ventral margin with several short, pointed teeth, ventrally directed, digitiform process arises from mesal surface at base of apical branches. Phallic structure membranous, situated between and above intermediate appendages, phallic sclerite flattened dorsoventrally, situated near apex.

Female: abdominal segment 8 composed of distinct tergite and sternite, segment 9 elongate, tapering distally, segment 10 short, rounded apically, terminating with pair of small cerci.

Length of fore wing: ♂ 3.1–3.4 mm, ♀ 3.6–3.8 mm.

Distribution. Northern Australia (Arnhem Land and Cape York Peninsula).

Etymology. The name refers to the type locality, Radon Springs, Kakadu National Park.

Remarks. Male genitalia resemble those of *Tinodes aberrans* Kimmins of New Guinea but may be distinguished by row of strong, acute teeth along the ventral margin of inferior appendages.

Zelandoptila Tillyard

Zelandoptila Tillyard, 1924: 300.

Type species. *Zelandoptila moselyi* Tillyard (by monotypy).

Diagnosis. Head wider than long. Maxillary palpi with segment 1 short, about as long as wide, segment 2 about as long as segment 1, segment 3 and 4 slender, each about as long as segments 1 and 2 together, segment 5 annulate, flexible. Scutellum with setal warts apparently fused. Spurs 2:4:4 (Australian species) or 1:2:4 (New Zealand species).

Wings slender, narrowly rounded apically. Fore wing with discoidal cell and apical forks 2 and 3 present, median cell open, thyridial cell basal to medial fork, or at most, just touching. Hind wing with costal margin slightly produced anteriorly at middle, Sc extends beyond middle without cross-vein to R, discoidal cell open, forks 2, 3 and 5 present, anal area narrow.

Remarks. Irrespective of some deviation from the generic characters described for the New Zealand genus, the general characteristics of both insects are so similar that a separate generic placement for the Australian species is not warranted.

Tillyard (1924) proposed the genus *Zelandoptila* for species *moselyi* in the family Hydroptil-

idac, commenting that "... this remarkable genus has no near relatives in any part of the world, and must be considered as a very primitive Hydroptilid type." In 1956 McFarlane described *Zelomyia trulla* in the Psychomyiidae, but later (McFarlane, 1964) recognized this as a synonym of Tillyard's *Zelandoptila moselyi* in the Hydroptilidae. McFarlane (1964) examined Tillyard's unique type specimen, a female, and noted that both wings were incorrectly figured, they actually agree with figures given for *Zelomyia trulla*. The absence of cross-veins is particularly noticeable in Tillyard's figures. Further amendments were suggested and new drawings of wing venation were prepared which differed from the previously published versions (McFarlane, in litt. 1976). It is still not clear whether the fore wing median and thyridial cells and fork 5 are present. Tillyard (1924) gave tibial spurs as "apparently 1, 2, 4" but the formula was not verified by McFarlane (1956, 1964).

The Australian species agree in most characters with the combined descriptions given by Tillyard (1924) and McFarlane (1956). The main discrepancies, however, are the closed thyridial cell, absence of fork 5 in fore wing and the spurs 2:4:4 as in typical psychomyiids.

Zelandoptila yuccabina sp. nov.

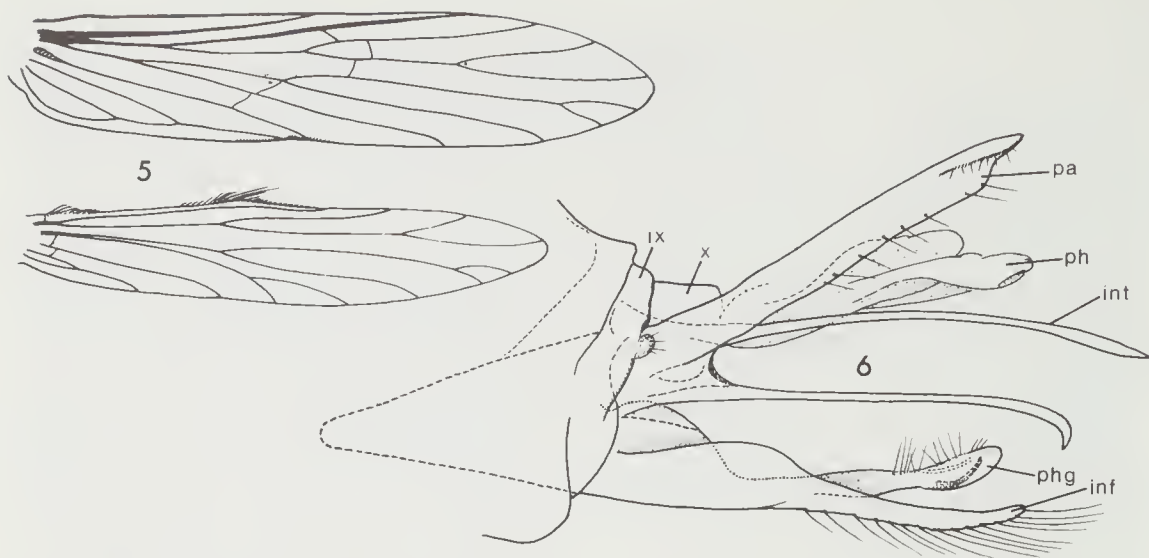
Figures 5, 6

Type material. Holotype ♂, NE Queensland, Yuccabine Creek, Kirrama State Forest, 18°12'S, 145°54'E, Feb 1986, R. Pearson and L. Benson (genitalia prep. PT-1587 figured) (NMV T-10488).

Description. Adult preserved in alcohol, general colour pale yellowish-brown. Male genitalia: segment 9 short, segment 10 membranous, in dorsal view triangular with small apicomeral incision. Preanal appendages long, subparallel, apex with partial twist forming short mesal ridge, a short rounded tubercle basolaterally, ventromesal margins of both sides fused, extended distally into a long, apically hooked process. Intermediate appendages slender, gradually curved, distally slightly dilated before tapering to acute apex. Phallus almost as long as preanal appendages, semimembranous, apex rounded. Inferior appendages fused mesally to form elongate, distally tapered and apically bluntly rounded plate, phallic guide arises from the mesal surface, flattened dorsoventrally, apex turned upwards, deeply incised apically, with two internal chitinous spines.

Female unknown.

Length of fore wing: ♂ 2.4 mm.



Figures 5, 6. *Zelandoptila yuccabina* sp. nov., holotype T-10488. 5, male wing venation. 6, male genitalia lateral.

Distribution. NE Queensland.

Etymology. The species name refers to the type locality Yuccabine Creek, NE Queensland.

Acknowledgments

The author is indebted to Dr R. Pearson, Zoology Department, James Cook University, Townsville and Dr A. Wells, Department of Zoology, University of Adelaide, for the privilege of examining and describing material they collected in North Queensland and Northern Territory respectively.

References

- Curtis, J., 1834. Descriptions of some hitherto non-descript British species of mayflies of anglers. *Philosophical Magazine and Journal of Science* 4: 120–125; 212–218.
- Curtis, J., 1835. *British Entomology* 12: plates 530–577.
- Kimmins, D.E., 1962. Miss L. E. Cheesman's expeditions to New Guinea. Trichoptera. *Bulletin of the British Museum (Natural History), Entomology* 11: 99–187.
- Lepneva, S.G., 1956. Morphological relationships of the subfamilies Psychomyiinae, Ecnominac and Polycentropinae (Trichoptera, Annulipalpia) in preimaginal stages. *Revue d'Entomologie de l'USSR* 35: 8–27. [In Russian]
- McFarlane, A.G., 1956. Additions to the New Zealand Trichoptera (Part 3). *Records of the Canterbury Museum* 7: 29–41.
- McFarlane, A.G., 1964. A new endemic subfamily, and other additions and emendations to the Trichoptera of New Zealand (Part 5). *Records of the Canterbury Museum* 8: 55–79.
- Mosely, M.E. and Kimmins, D.E., 1953. *The Trichoptera (caddis-flies) of Australia and New Zealand*. British Museum (Natural History): London. 550 pp.
- Neboiss, A., 1977. A taxonomic and zoogeographic study of Tasmanian caddis-flies (Insecta: Trichoptera). *Memoirs of the National Museum of Victoria* 38: 1–208.
- Riek, E.F., 1970. Trichoptera. Chapter 35, pp. 741–764 in Mackerras, I.M. (ed.) *The Insects of Australia*. Melbourne University Press: Melbourne.
- Schmid, F., 1969. La famille des Stenopsychides (Trichoptera). *Canadian Entomologist* 101: 187–224.
- Tillyard, R.J., 1924. Studies of New Zealand Trichoptera or caddisflies: No. 2. Descriptions of new genera and species. *Transactions of the New Zealand Institute* 55: 285–314.
- Ulmer, G., 1951. Köcherfliegen (Trichopteren) von den Sunda-Inseln (Teil 1). *Archiv für Hydrobiologie Supplement* 19: 1–528.
- Wiggins, G.B., 1982. Trichoptera. Pp. 599–612 in Parker, S.P. (ed.) *Synopsis and classification of living organisms*. McGraw-Hill: New York. Vol. 2.