Sivec, I. & B.P. Stark 2009. *Tominemoura*, a new stonefly genus from Sabah, East Malaysia (Plecoptera: Nemouridae). *Illiesia*, 5(20):199-203. Available online: http://www2.pms-lj.si/illiesia/Illiesia05-20.pdf

TOMINEMOURA, A NEW STONEFLY GENUS FROM SABAH, EAST MALAYSIA (PLECOPTERA: NEMOURIDAE)

Ignac Sivec[1] and Bill P. Stark[2]

[1] Slovenian Museum of Natural History, Prešernova 20, P.O. Box 290, SLO-1001 Ljubljana, Slovenia
E-mail: isivec@pms-lj.si

[2] Box 4045, Department of Biology, Mississippi College, Clinton, Mississippi, U.S.A. 39058
E-mail: stark@mc.edu

ABSTRACT

Tominemoura gen. nov., is proposed for a new nemourid species, *T. trilari* found at high elevations on Mt. Kinabalu, Sabah, Malaysia, and assigned to the subfamily Amphinemurinae. The new genus is readily distinguished from others by a unique gill arrangement and by male epiproct and paraproct structure.

Keywords: *Tominemoura*, Plecoptera, Nemouridae, New Genus, New Species, East Malaysia, Sabah

INTRODUCTION

Baumann (1975) revised the world Nemouridae and recognized 17 genera placed in two subfamilies, Amphinemurinae and Nemourinae. Recently, Shimizu and Sivec (2001) proposed *Sphaeronemoura* for a group of Asian nemourids with inflated nymphal cercal segments "...which increase in diameter from the base to the terminal segments", and Baumann & Fiala (2001) recognized *Nanonemoura* as a new genus for an unusual micropterous species known from the Columbia River Gorge, Oregon (USA). The addition of *Sphaeronemoura* brings the number of Asian nemourid genera to seven. In this study we propose a new genus for another unusual nemourid species found in small streams above 3000 meters on Mt. Kinabalu, Sabah, East Malaysia. Specimens are deposited in the Slovenian Museum of Natural History, Ljubljana (PMSL).

RESULTS AND DISCUSSION

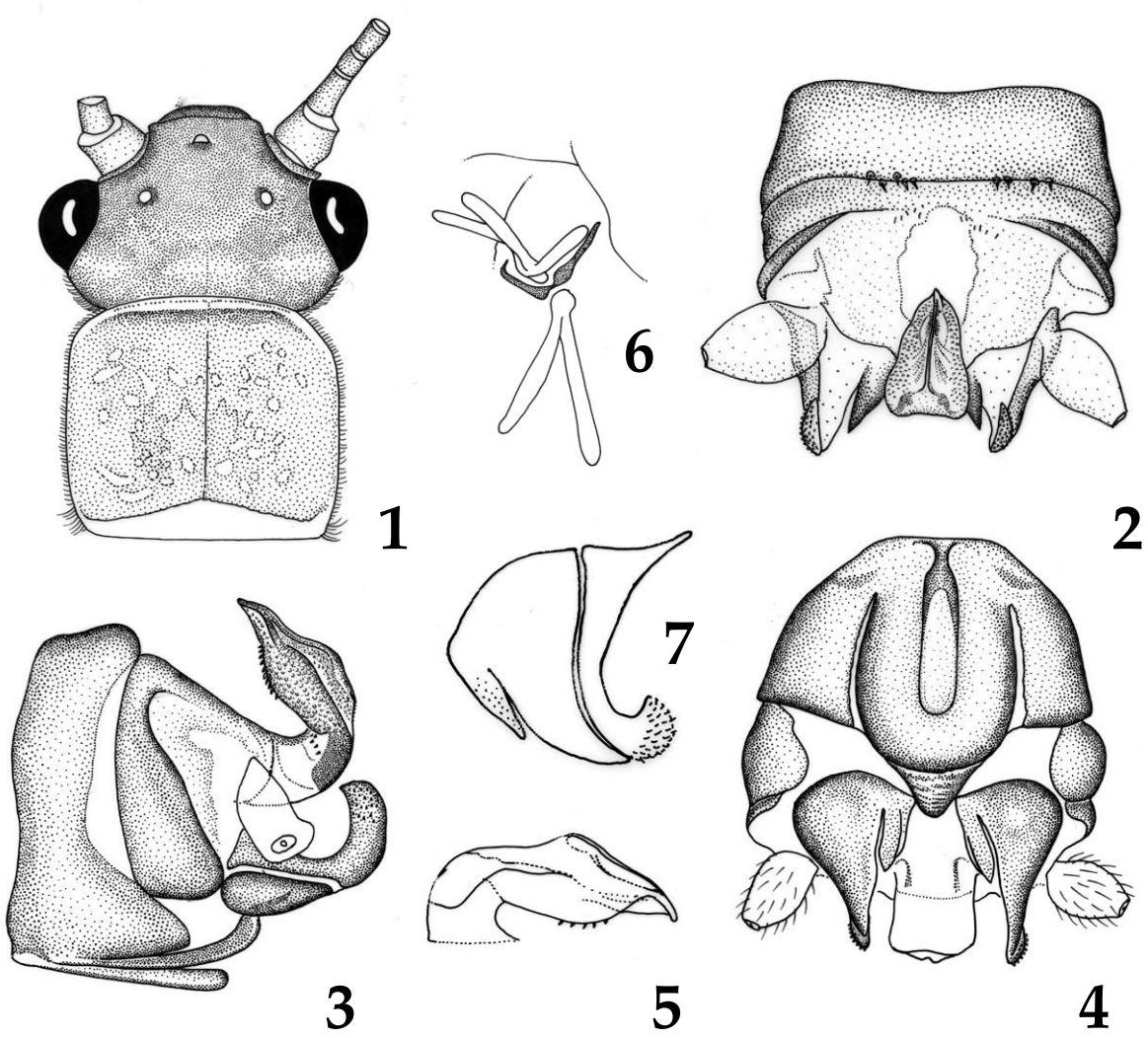
Tominemoura, gen. nov.

Type species. *Tominemoura trilari*, sp. nov., by monotypy.

Adult habitus. General dorsal color brown. Head almost entirely dark brown, pronotum brown but with pale areas along lateral and posterior margins (Fig. 1). Legs banded; hind legs with dark coxa and trochanter; femora with narrow basal and wider median and apical brown bands separated by a wide sub-basal and narrow subapical yellow band. Wing membrane pale brown, veins dark brown.

Gills. Four slender cervical gills present (Fig. 6); outer gills 3-branched, inner gills 2-branched; all gill rami subequal in length and with common origin on respective inner or outer gill trunk.

Male. Most of dorsal epiproct sclerite membranous but covered with rows of tiny scale-like, triangular spines (Figs. 2-3). Ventral epiproct sclerite large basally, curved upward as a pair of narrow straps dividing dorsal sclerite and extending around epiproct apex (Figs. 2, 3, 5); center of ventral sclerite membranous and armed with a triangular patch of stout, backward directed spines visible in lateral aspect (Fig. 5). Paraprocts with three lobes; outer lobe dorsad to mesal lobe in caudoventral aspect (Fig. 4), hooked and armed with an apical patch of spines (Fig. 7). Mesal lobe broad at base and strongly narrowed to tips (Figs. 4, 7); inner lobes narrow, weakly sclerotized, much shorter than outer and middle lobes, and without



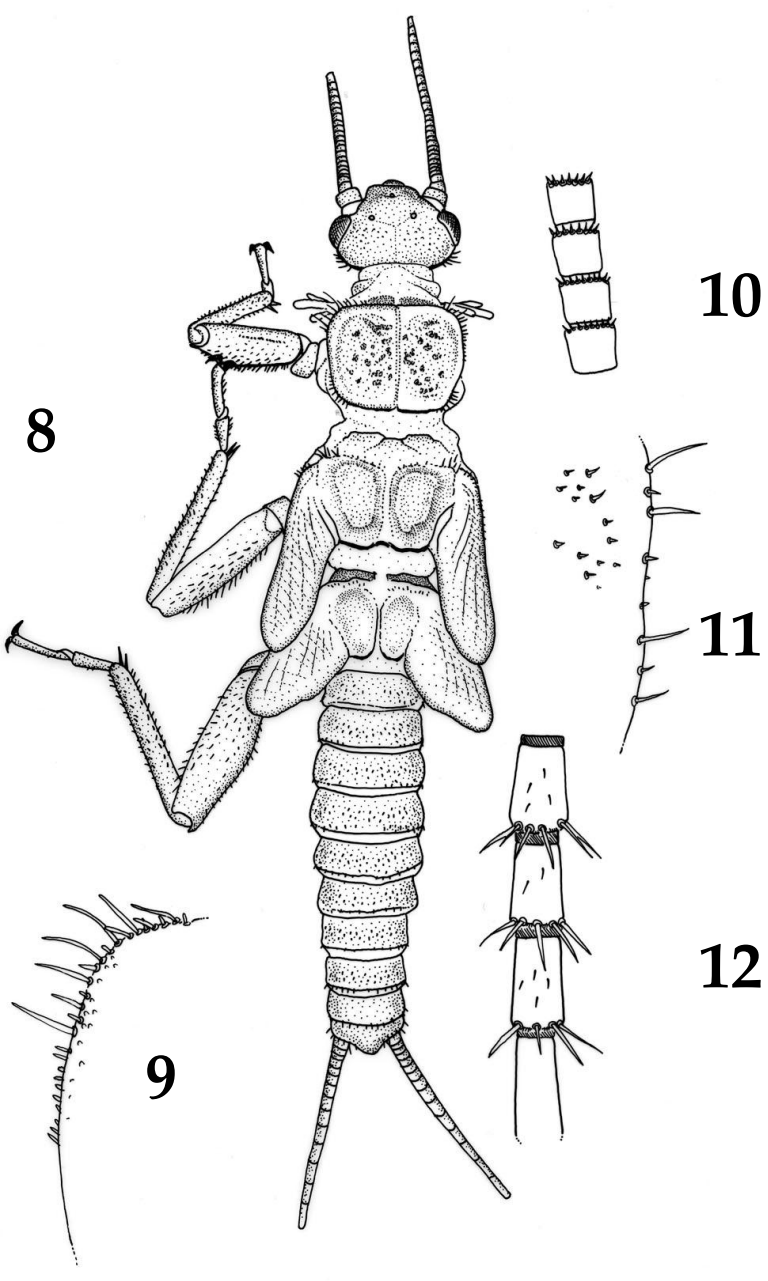
Figs. 1-6. *Tominemoura trilari* structures. 1. Adult head and pronotum, 2. Male genitalia, dorsal, 3. Male genitalia, lateral, 4. Male genitalia, ventral, 5. Epiproct, lateral. 6. Larval gills showing three outer rami (above) and two inner rami (below), 7. Male paraproct, oblique lateral aspect.

spines. Hypoproct strongly tapered to a broadly triangular process (Fig. 4) which terminates in a slender upturned filament-like structure not shown in figures; vesicle very long and with parallel margins beyond base (Fig. 4). Cerci a single weakly sclerotized and somewhat barrel-shaped segment (Figs. 2-4).

Female. Known from two pharate larvae. Sternum 8 bears a deep mesal notch and sternum 7 has a mesal plate covering at least the base of sternum 8 (Fig. 15).

Larva. General color pale brown with irregular brown occipital maculations (Fig. 8); mesonotum and metanotum with pale mesobasal spots. Marginal pronotal bristles long around anterolateral angles, short laterally but with a few longer ones at posterior angles (Fig. 9); bristles becoming obsolete near median suture along both margins. Mouthparts of typical nemourid type but laciniae terminating in a vertical truncate blade like structure armed along ventroapical margin with several rounded teeth, subequal in size (Figs. 13-14). Apical maxillary palpal segment bearing a small nipple. Gills as described above (Fig. 6).

Diagnosis. Adults and larvae are distinguished from other Nemouridae by their unique gill structure

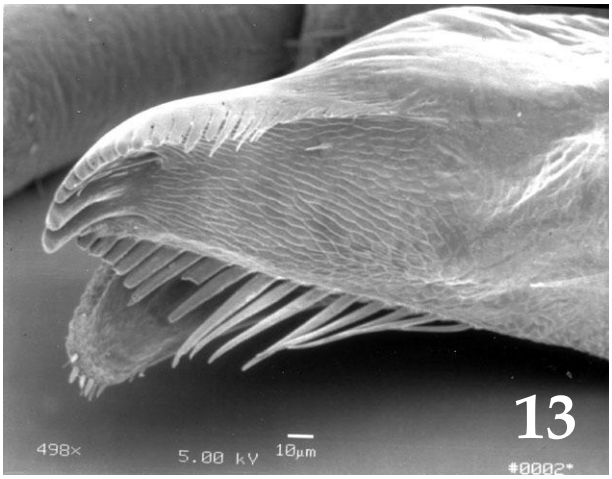


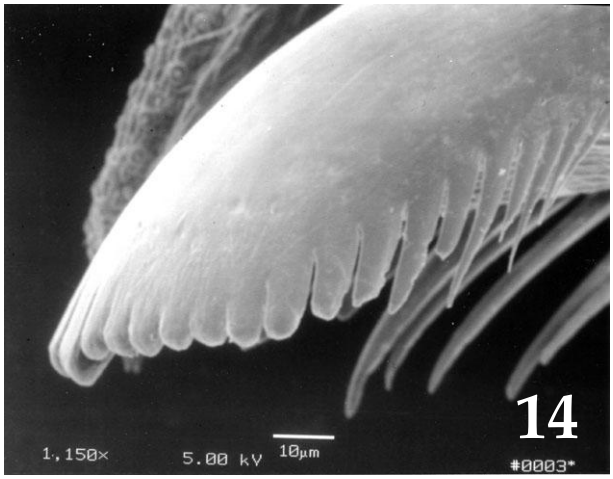
Figs. 8-12. *Tominemoura trilari* larval structures. 8. Habitus, 9. Margin of pronotum, 10. Antennal segments, 11. Abdominal tergum, 12. Cercal Segments.

which is most similar to *Nanonemoura* among known genera (Baumann & Fiala 2001). However, in *Tominemoura* the respective inner and outer gill rami arise from a common trunk rather than from an elongate major ramus. The gill structure and the 3-lobed paraprocts of *Tominemoura* suggest it should be placed in subfamily Amphinemurinae (Baumann 1975) where its nearest relative may be *Amphinemura*.

Distribution. Known from Mt. Kinabalu at sites above 3000 meters.

Etymology. The prefix "*Tomi*" honors our colleague Dr. Tomi Trilar, from the Slovenian Museum of Natural History who provided the first specimens of this interesting stonefly.





Figs. 13-14. *Tominemoura trilari* SEM micrographs of larval mouthparts. 13. Lacinia, 14. Apex of lacinia.

***Tominemoura trilari*, sp. n.**

(Figs. 1-15)

Material examined. Types. Holotype ♂ and 1♂ paratype from Malaysia, Sabah, Mt. Kinabalu, 3200 m, Gunting Lagadan, 1 July 1996, T. Trilar (PMSL). Additional paratype: Malaysia, Sabah, Sayat-Sayat Hut, Mt. Kinabalu, 3850 m, 30 June 1996, T. Trilar, 1♂ (PMSL). Other material: Malaysia, Sabah, Kinabalu National Park, Laban Rata, 3280 m, 15-16 April 1999, I. Sivec, 59 larvae including 2 pharate females and 1 pharate male.

Adult habitus. See generic description above.

Male. Forewing length 7-8 mm. Epiproct largely membranous dorsolaterally but with minute scale-like spines imbedded in membrane (Figs. 2-3); sclerites well developed around base and as a narrow pair of straps between bulbous epiproct dorsal sclerites, extending from midlength, and downturned around epiproct apex. Venter of epiproct armed with a patch of stout backward directed spines, visible in lateral aspect (Fig. 3). Paraprocts relatively bare but outer paraproct lobe appearing stout, curved forward and armed with a patch of short, stout spines on outer surface near apex (Figs. 2-4, 7).

Female. Known from pharate larvae. See generic description above.

Larva. Preemergent body length 7-10 mm. General color pale brown. Gills (Fig. 6) bracket cervical sclerite, three outer rami arising from a common short trunk, inner gill furcation near base of trunk; lacinial structures as described above (Figs. 13-14). Pronotal setal fringe as shown in Fig. 9; antennal setal pattern as shown in Fig. 10. Abdominal terga with sparse posterior marginal bristle row; intercalary surface with sparse patches of short bristles (Fig. 11). Cercal segments armed with apical whorls of bristles (Fig. 12); longest bristles in whorls generally one third to half as long as next segment;

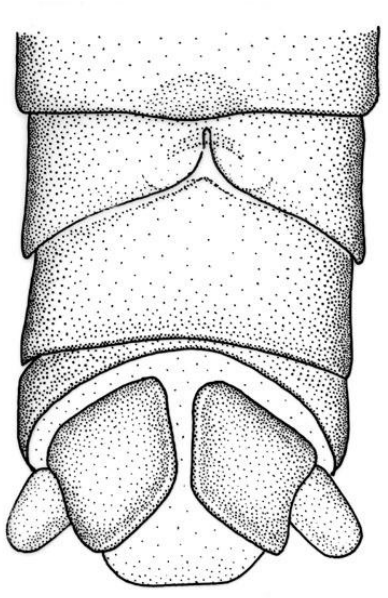


Fig. 15. *Tominemoura trilari* female terminalia prepared from pharate larval specimen.

long apical segments with additional short fine bristles near midlength of segments. Fine fringe setae absent from legs and cerci.

Etymology. The patronym honors our colleague Dr. Tomi Trilar, collector of the type series.

Diagnosis. See generic diagnosis above.

Comments. The larval specimens, collected from the same stream and general elevation and only a short distance from the two sites where adult males were collected on Mt. Kinabalu, share the same unusual gill structure and very likely represent the same species as the male specimens. Fig. 15 shows the female terminalia prepared from pharate larval specimens which are not fully expanded.

ACKNOWLEDGMENTS

We thank our colleague, Dr. Tomi Trilar for providing adult male specimens of this species.

REFERENCES

Baumann, R.W. 1975. Revision of the stonefly family Nemouridae (Plecoptera): A study of the world fauna at the generic level. Smithsonian Contributions to Zoology, 211:1-74.

Baumann, R.W. & G.R. Fiala. 2001. *Nanonemoura*, a new stonefly genus from the Columbia River Gorge, Oregon (Plecoptera: Nemouridae). Western North American Naturalist, 61:403-408.

Shimizu, T. & I. Sivec. 2001. *Sphaeronemoura*, a new genus of the Amphinemurinae (Nemouridae, Plecoptera) from Asia. Pp. 393-399. *In* E. Dominguez [ed.]. Trends in research in Ephemeroptera and Plecoptera. Kluwer Academic/Plenum Pub. New York. 478 pp.

Received 11 December 2009, Accepted 17 December 2009, Published 30 December 2009