Compsoneuria (Siamoneuria) kovaci subg. n., sp. n., a new mayfly from northern Thailand
(Insecta, Ephemeroptera, Heptageniidae)

DIETRICH BRAASCH

Abstract

Compsoneuria (Siamoneuria) kovaci subg. n., sp. n. is described from a male collected at light and a larva at the bank of the small river Nam Lang in northern Thailand. Holotype male deposited in SMF (Senckenberg-Museum, Frankfurt am Main), SMF-Eph. 125. The assignment to the genus Compsoneuria Eaton 1881 is discussed. A list of other genera of Heptageniidae and families of Ephemeroptera collected at the same location is given. The genus Trichogenia Braasch & Soldan 1988 is recorded from Thailand for the first time.

Key words: New taxa, new records, Trichogenia maxillaris, Oriental region.

Introduction

The Heptageniidae fauna of Southeast Asia is poorly known. So far, the following genera have been recorded from Thailand: Thalerosphyrus Eaton 1881 (Polhemus & Polhemus 1988, Sites et al. 2001), Afronurus Lestage 1924 (Ueno 1961, Sites et al. 2001), Cinygmina Kimmins 1937, Compsoneuria Eaton 1881, Dacnogenia Eaton 1881, Ecdyonurus Eaton 1868 and Rhithrogena. The described in the present paper differs distinctly from other Oriental heptageniid seen by the author and is tentatively placed as subgenus in the genus Compsoneuria according to the concept of Wang & McCafferty (2004) in outlining the Heptageniidae tribes and in comparison with the generic scope in Kluge (2004). Records of the genus

Author’s address:
Dipl.-Biol. Dietrich Braasch, Kantstrasse 5, D-14471 Potsdam, Germany; h.braasch@t-online.de
Compsonuria so far concern different Asian countries of the Oriental region, i.e. tropical area of Southeast Asia (Ulmer 1939: Borneo, Java, Sumatra; Braasch & Soldan 1986b: peninsular Malaysia; 1986c: Sumatra; Braasch 1990: Thailand; 2005: Sulawesi, in coll. Museum für Naturkunde Berlin; Braasch & Freitag in prep.: Philippines, Palawan). Besides, there exists a disjunct Afrotropical species group of Compsonuria including Madagascar (Sartori & Eloyard 1996, McCallferty 2003). The larvae of Compsonuria are inhabitants of lower reaches of flowing waters.

Systematic account

Genus Compsonuria Eaton 1881

(Type species: Compsonuria spectabilis Eaton 1881 by original designation.)

The concept of the genus Compsonuria here is understood in the sense of Braasch & Soldan (1986b) encompassing Compsonuriella Ulmer 1939 as synonym. The main characters of the ♂ adults are: eyes contiguous; ♀♂ with richly differentiated dorsal and lateral abdominal pattern; dorsal faces of femora with many small spots (stippled); fore wings with thickened cross veins shaded; subcosta and radius I have a sinuous course in the outer ½ of the wing (Gillies 1983: 22, fig. 1); fore tarsal segment I is long, usually over ½ of segment II (exception is C. spectabilis Eaton 1881 with less than ⅔); penes are stout, apically and medially provided with a tiny hook at inner penis lobe corner and discal spines ventrally, titillators strongly curved. African spp. and 2 undescribed southeast Asian spp. of the genus with more slender penes (Gillies 1983, Braasch & Soldan 1986c, Braasch & Freitag in prep.).

Larvae of Compsonuria are characterized as follows: glossae are elongate and pointed (Braasch & Soldan 1986b: 44, fig. 14.2); gills distally obtusely pointed, in several species sharply pointed (Braasch & Soldan 1986b, Gillies 1983, Sartori & Eloyard 1986); femora are strikingly stippled (Braasch & Soldan 1986b: 45, fig. 14.7); supracoxal spurs are sharply pointed (Gillies 1983: 23, fig 2); caudal filaments ringed.

Subgenus Siamoneuria subg. n.

(Type species: Compsonuria (Siamoneuria) kovaci, n. sp.; gender feminine.)

Derivation nominis: The subgenus name refers to former name Siam of the new species' patria in combination with Greek vespiov (vein; feminine), like in Compsonuria.

♂ adults: eyes contiguous as in Compsonuria; dorsal pattern in southeast Asian genera of Heptageniidae unique (Fig. 1); dorsal face of femora not stippled (Fig. 3) in contrast to Compsonuria; fore wings similar as in Compsonuria (Fig. 2), with sinuous course but less expressed; fore tarsal segment short, almost as in C. spectabilis; penis slender (Fig. 5), similar to penis type of African Compsonuria and some Southeast Asian representatives but lacking hooked corner and discal spines (Braasch & Soldan 1986b: 43, figs. 1, 3, 5), latero-dorsal spines present (Fig. 7) in accordance with Compsonuria; titillators contiguous, attenuate, different from Compsonuria. Caudal filaments ringed like in Compsonuria.

Larva: glossae sessile and not pointed (Fig. 11) unlike those of Compsonuria: gills I–V bluntly pointed, but III–IV somewhat lobate (Figs. 13–14), V–VI with curved acute elongation (Fig. 15–16), VII narrowly lanceolate (Fig. 17), gill set of Compsonuria different, without lobation, hooks and broader 7th gill; femora not stippled (Fig. 18); supracoxal spurs are short and distally rounded unlike in Compsonuria. Cerci probably with ringlets corresponding to Compsonuria but in described larva not visible; paracercus is half width of cerci (Fig. 20) and conspicuously shorter, in Compsonuria of same width.

One species known:

Compsonuria (Siamoneuria) kovaci sp. n.

Figs. 1–21

Holotype ♂: North Thailand, Mae Hong Son Province, Pangmapa/Soppong, bank of Nam Lang river, 19°34.447'N, 98°18.727'E, altitude 605 m, 18. VII. 2004, at light in the evening, leg. D. Kovac, in 70% alcohol. Type deposition: holotype in Senckenberg-Museum, Frankfurt am Main (SMF-Eph. 125).


Derivatio nominis: The name is given in honour of the collector of the species, Dr. Damir Kovac, Frankfurt am Main. It is a noun in apposition.

Diagnosis: The species of the genus Asiourmetus are easily distinguishable from the species described here by possessing a ton-like copulatory organ (Braasch 2005). Adults of Atopopus Eaton 1881 are characterised by tinged fore- and hindwings (Braasch 2005, Wang & Mccafferty 1995). Cinygmina ♂ ♂ differ from the new species by having untinged wings and laterally expanded, often antler-shaped penes with poorly developed titillators lacking distinct sclerites on their lobular parts and ♂ ♂ of Thalerosphyrus in having rounded, weakly sclerotised penis globes. ♂ ♂ of Afronurus can be differenti-
ated by stout, vertically structured, apically subdivided penes without titillators. *Parafronurus* *Zhou & Braasch* 2003 possesses titillators, but the penis type resembles *Afronurus*. The titillators of the new species are attenuate and not thick and spindle-shaped as in *Nixe*. Affiliation to *Ecdyonurus* can be excluded by penial structures with hammer-like apical lobes and with highly developed lateral and marginal sclerites (*Bauernfeind & Humpesch* 2001, *Kluge* 2004). ♂♂ of *Electrogena* *Zurwerra & Tomka* 1985 are characterized by penes lobes of teardrop shape or subtruncate and lacking distal sclerotisation (*Kluge* 2004, *Wang & McCafferty* 2004).

The species so far listed under *Rhithrogeniella* from Thailand must be assigned to *Nixe* in accordance with *McCafferty* (2004: 5), because “a distally extended apical lobe of the penes lobes is generally not developed in *Nixe*” and “a poor development of dorsal penes sclerites” is characteristic for this genus.

**Description ♂ (holotype):** Eyes dark grey, contiguous; prothorax characteristically marked (Fig. 4); thorax mostly brown, with some longitudinal light stripes; black markings on terga V–X, distally blackish margined (Fig. 1); sterna light with exception of I having a broad black cross band widened in the middle, and VII and VIII with 2 parallel black stripes (Fig. 6). Femur of fore leg 1.9, tibia 2.7 and tarsus 3.4 mm; segments of tarsus 0.4, 1.1, 1.0, 0.6 and 0.3 mm; femur of hind leg 2.0, tibia 1.83, tarsus 1.12 mm, tarsal segments 0.13, 0.15, 0.15, 0.11 and 0.22 mm long. Forelegs with indistinct black-brownish markings on distal femur (Fig. 3), black coloration at proximal and distal ends of tibia; ends of tarsal joints slightly darkened.

Forewings oval, transparent, costa rather straight, in the middle somewhat depressed; costal field with 12 thickened, short, straight, brownish cross veins; other longitudinal vein fields (C, SC, RA) provided with
strengthened cross veins too, veins of third field longer and less thickened; cross veins in lower half of fore wing creating a fine thin network; apparent cross bars as in species of *Compsoneuria* not evident. Subcosta and radius 1 in last third follow a slightly sinuous course. Fig. 2 shows the conspicuous black mark within the costal bridge of fore wing. Hindwings completely transparent, with blunt angled projection, veins not tinged.

Genital segment (Fig. 5) with relatively short colourless forcipes, curved inwards, brownish stylinger...
at both sides somewhat elevated; penis (Figs. 7, 8) with almost hammerlike head, apical marginal sclerites of penes lacking, lateral sclerites present and strongly expanded medially; titillators slender, not spindle-shaped, attenuated.

Length of body 7 mm, forewing 7.8 mm, hindwing 5.7 mm, cerci 9.5 mm (end broken off).

Larva, nearly mature: head subrectangular (Fig. 9), width 1.9 mm, length 1.2 mm, faintly brownish without conspicuous markings, ocelli got lost, antennae 1.7 mm, margin of anterior head plain, unthickened; mouthparts: labrum (Fig. 10) 0.8 mm; mandibles, maxillae and hypopharynx got lost, as checked before corresponding with Ecdyonurinae; glossae stout (Fig. 11) apically rounded. Abdomen dorsally marked as in imago male (Fig. 1), ventrally without any strikes. Femora (Fig. 18) with 3 not sharply expressed cross bands, tibia only with proximal band (Fig. 18), yellowish, tarsus brownish; fore femur 1.96 mm, tibia 1.71 mm and tarsus 0.62 mm, femur bristles spatulate (Fig. 19), supra-coxal spurs rounded, claws with 4 denticles. Gill I–VI with good evolved filamentous tuft; gill I banana-like (Fig. 12), II–V roundish triangular, III–IV apically with emargination (Figs. 13–14), V–VI distally with curved hook (Figs. 15–16) and VII narrowly lanceolate (Fig. 17) without tuft. Caudal filaments (Fig. 20) whitish, with whorls of few small spines lacking setae (Fig. 21), paracercus ½ width of cercus. Length: body 5.9 mm, cerci 8.7 mm, paracercus 6.0 mm.

Habitat and biological notes: The Nam Lang river was about 15 m wide and 0.5–2 m deep at the collecting site in June 2004. Rocks, boulders, stones of different sizes, gravel and sand, floating roots, anchored trees and plants along the banks provided a wide range of different microhabitats. The larva of the new subgenus the heptageniid fauna were species of Cinygmina (2 spp.), Arionurus (1 sp.), Compsonura (2 spp.), Epeorus (2 spp.), Nixe (sub nom. Rhithrogenella) (1 sp.), Notacanthurus (1 sp.), Rhithrogena (1 sp.), Thalerosphyrus (1 sp.) and Trichogenia Braasch & Soldan 1988. The genus Trichogenia (T. maxillaris Braasch & Soldan 1988: larva) is a new record for Thailand.

Other families of Ephemeroptera recorded from the same location at different times of the year belong to Baetidae (> 20 spp.), Caenidae (5 spp.), Ephemerellidae (5 spp.), Ephemeridae (2 spp.), Isonychiidae (1 sp.), Lepothlebiidae (5 spp.), Neopephemeraeidae (3 spp.), Polymitarcyidae (1 sp.), Potamanthidae (3 spp.), Prospistomatidae (1 sp.) and Tricyrithidae (1 sp.).

Discussion: The genus Ecdyonurus is usually characterised by European workers by having paranota in the larval stage and hammer-like penes with lateral and apical marginal sclerites in the (Bauernfeind & Humpesch 2001, Kluge 2004, Studemann et al. 1993). Wang & McCafferty (2004) have proposed a broader definition of this genus on account of their cladistic analysis of the Heptageniidae, thus including larvae of different shapes (flanged or rectangular pronota, etc.) or retaining penis bulps with spined or unspined, rounded or angular heads. The new species approaches this definition to a certain extent containing both plesiomorphic and apomorphic characters. The described adult with its medial depression of the mesothoracic furcasternum parallel-sided (apomorphic condition) belongs to Ecdyonurinae Ulmer 1920. However, the accessory larva with caudal filaments and lateral setae reduced excludes it from the tribe Ecdyonurinae Ulmer 1920 (genera Ecdyonurus, Nixe).

Likewise cannot be referred to tribe Leucoceratini Wang & McCafferty 2004 by their penes with dorsolateral spines well developed and strongly developed medially. Regarding the preceding exclusions, the adult keys out by its plesiomorphic feature of fore tarsal segment I less than one-half of segment to the tribe Atopopini Wang & McCafferty 2004, including the genera Afnonurus, Arionurus, Atopopus and Thalerosphyrus. Already in the diagnosis (see above) all foregoing genera have been ruled out to match the species described here. Species of the tribe Notacanthurini Wang & McCafferty 2004 have larvae with maxillary palp segment I lacking setae on inner margin, whereas Compsonuria (Siamoneuria) kovaci sp. n. does show this (as a plesiomorphic feature). It is not quite clear whether adaptations of the new species (and subgenus) to a currently reduced niche have triggered some features deviating from Compsonuria. The antennae are long, the gill set and the remarkable width and length reduction of the paracercus are most striking to suggest any apomorphies relevant for moving in dense substrate; also the femora are relatively slim, not enlarged for reason of withstand stronger current, provided with rather long hairs. In evolutionary respect the penes could have undergone a reduction of discal spines. Further studies are needed to comprise possible affinities to other unclear species, for example the Hong Kong "Heptagenia gn" (see Hsu 1936). Notacanthurus Tshernova 1972 larvae have a longitudinal median ridge on terga mostly with a posterior spine (Braasch 1986, Kluge 2004).
References


Received: 29. iv. 2005, 23. iii. 2006; accepted: 27. iii. 2006.