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Description of *Tinodes multidentatus* sp. n. (Trichoptera, Psychomyiidae) from the Kei Islands (Southeast Asia, Indonesia)

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(with 10 figures)

Abstract

Tinodes multidentatus sp. n. (Trichoptera, Psychomyiidae) from the Kei Islands (Southeast Asia, Indonesia) is described and illustrated. The new species is characterised by seven strong spines on each male inferior appendage and a row of three strong, prominent and equally sized subapical spines on each male paramer.

Key words: Trichoptera, caddisflies, Psychomyiidae, *Tinodes multidentatus* sp. n., Kei Islands, Asia.

Introduction

The genus *Tinodes* was established by Curtis (1834). With about 200 described species it is a highly diverse taxon within the caddisfly family Psychomyiidae. The distribution area of the genus *Tinodes* includes the Western Nearctic, the Palearctic, Orientalis and parts of the Afrotropis and is centered in the Orientalis (Holzenthal *et al.* 2007).

Over the last years many new *Tinodes* species have been described especially from the Orientalis (e. g. Malicky 1995, 1998, 2009, Malicky & Chantaramongkol 1993), indicating a high diversity of the genus *Tinodes* in



Figs 1-2. *Tinodes multidentatus* sp. n., habitus: **1.** dorsal, holotype, ♂ (ZMH-MK-20101214-001); **2.** lateral, ♀ (ZMH-MK-20101214-002) (Scale bar = 1 mm).

this region. Caddisfly records from the Kei Islands (Southeast Asia, eastern Indonesian Archipelago) are rare. Only Ulmer (1951) reported about three Trichoptera species. Two of these species, *Triaenodes insulana* Ulmer, 1951 and *Lepidostoma daabanum* (Ulmer, 1951), were described from material collected on the Kei Islands (*Locus typicus*: "Gunung Daab"). From the same location another previously undescribed species, *Tinodes multidentatus* sp. n., was found in the Collection G. Ulmer at the Zoologisches Museum Hamburg and will be described and figured herein.

Material and methods

The examination procedure of the male genitalia follows Aspöck (1971) and Malicky (2010). Specimens were examined with a Leica M 165C stereo microscope or with a Zeiss Standard 14 light microscope with a drawing tube. Photos and measurements were made with a Keyence VHX-500F digital microscope. Subsequently, photos were composed using Helicon Focus 5.1 and Microsoft Image Composite Editor 1.3.5.

Abbreviations used are: *C* - costa, *Sc* - subcosta, *R1-5* - radius 1-5, *M1-4* - media 1-4, *Cu1-2* - cubitus 1-2, *A1-2* - annale 1-2, *Dc* - discoidal cell, *II-V* - fork 2-5, *tIX* - tergite IX, *sIX* - sternite IX, *sa* - superior appendages, *ia* - inferior appendages, *pha* - phallic apparatus, *pa* - paramers, *iba* - internal basal appendages, *ZMH* - Zoologisches Museum Hamburg.

Taxonomic account

Family Psychomyiidae Curtis, 1835 [Br. Ent. 4: pl. 561 text]

Genus *Tinodes* Curtis, 1834 [Phil. Mag. 4: 216]

Tinodes multidentatus sp. n.

(Figs 1-10)

TYPE MATERIAL: Holotype ♂: "Kei Eil., Gn. Daab" [Indonesia, Maluku province, Kei Islands, Kei Besar, Gn. (= Gunung (Indonesian) - mountain) Daab; S 05°34'; E 133°03' (S 5.5667°; E 133.0500°)], "1922, H. C. Siebers" [leg.]. The specimen is deposited at the Zoologisches Museum Hamburg ("ZMH-MK-20101214-001", "Eing.-Nr. Coll. Ulmer 6-63").

ADDITIONAL MATERIAL: 6 ♀: same data as holotype ("ZMH-MK-20101214-002 - ZMH-MK-20101214-007", "Eing.-Nr. Coll. Ulmer 6-63").

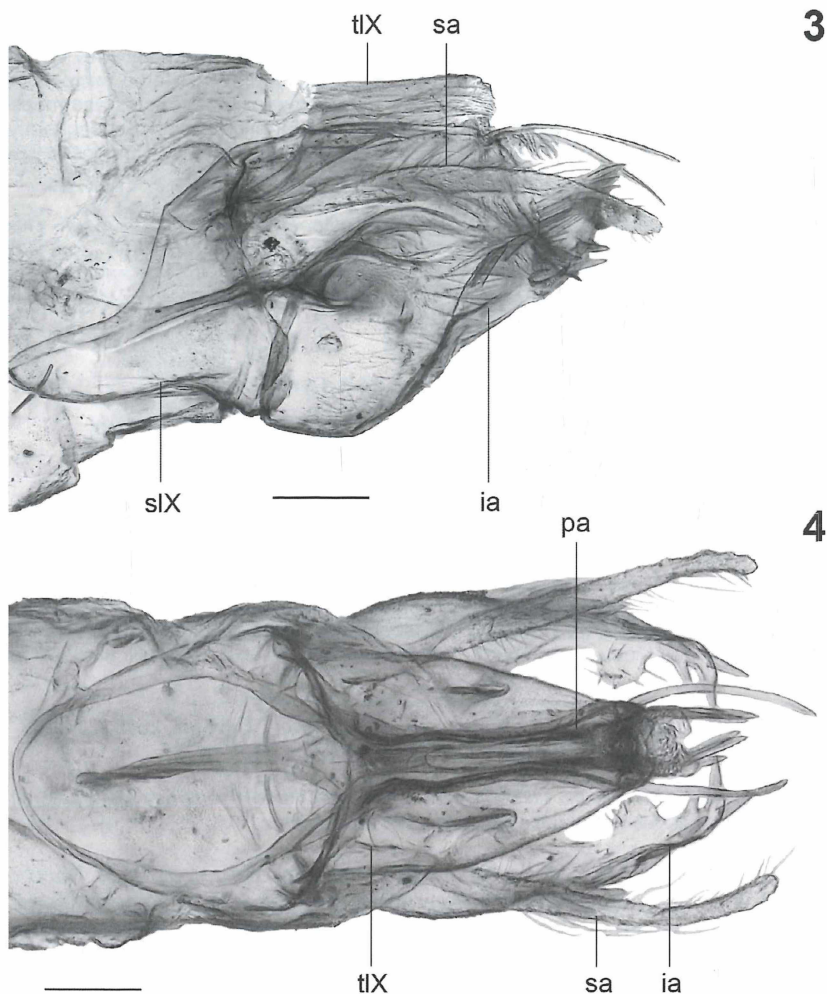
ETYMOLOGY: The specific epithet refers to the high number of strong spines on the inferior appendages in the male genitalia (see Figs 7, 8).

DIAGNOSIS: *T. multidentatus* sp. n. differs from all other species of *Tinodes* by the following characters of the paramers and the inferior appendages in the male genitalia: (1) inferior appendages with seven equal sized strong spines on each side, (2) each paramer with a row of three strong, prominent and equally sized spines subapically.

DESCRIPTION: Based on male holotype.

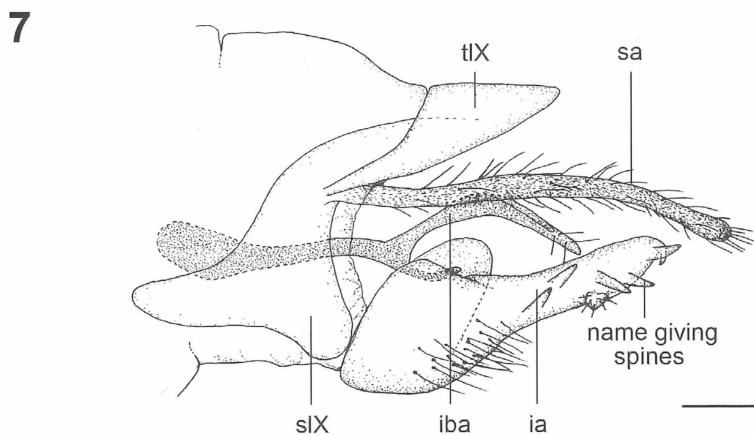
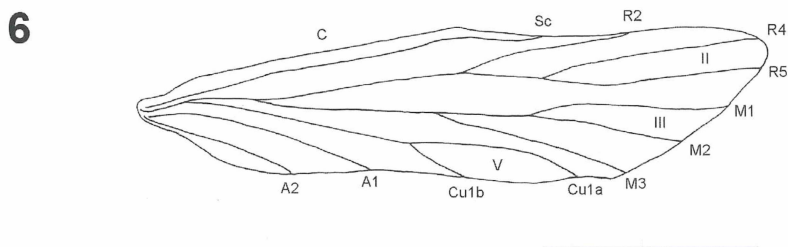
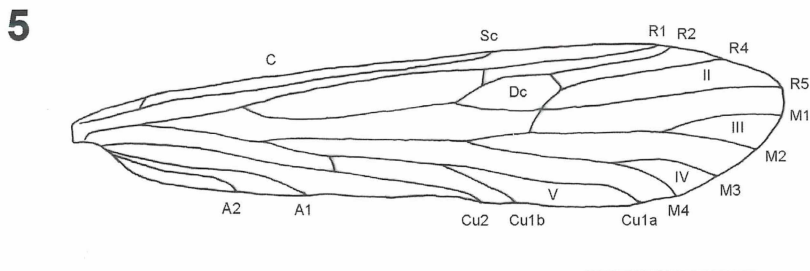
GENERAL FEATURES: Total body length 2.5 mm, length of forewing 3.2 mm. Antenna as long as forewing (Fig. 1). Ocelli absent. Spurs 2.4.4 (both sexes). Maxillary palpus five-segmented in both sexes, last segment remarkably longer than the preceding ones.

COLORATION: Head and thorax brown, antenna pale yellow-brown, legs generally pale brown, femora dark brown, spurs light brown, maxillary palpus pale yellow-brown. Wings hyaline (Figs 1, 2).



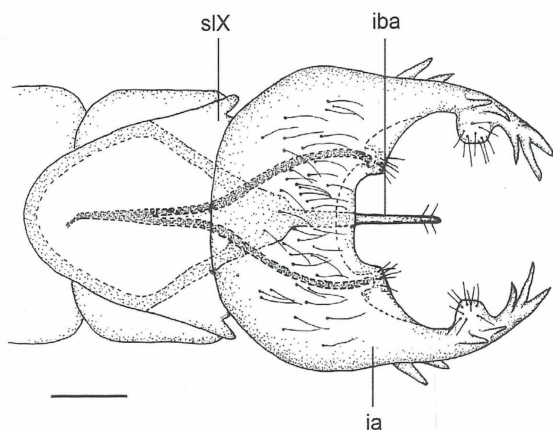
Figs 3-4. *Tinodes multidentatus* sp. n., holotype, ♂, genital apparatus: 3. lateral; 4. dorsal (Explanations in text, scale bar = 0.1 mm).

MORPHOLOGY: Wing venation. Forewing: fork I absent; discoidal cell present, median cell missing (Fig. 5). Hindwing: forks I, IV absent; discoidal cell absent (Fig. 6).

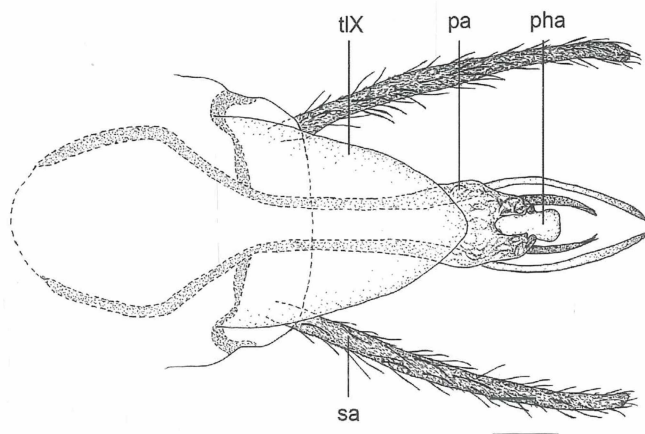


Figs 5-7. *Tinodes multidentatus* sp. n., wing venation and male genitalia: **5.** forewing; **6.** hindwing, ♀ (ZMH-MK-20101214-002); **7.** male genitalia, lateral, holotype (ZMH-MK-20101214-001) (Explanations in text, scale bar = 0.1 mm).

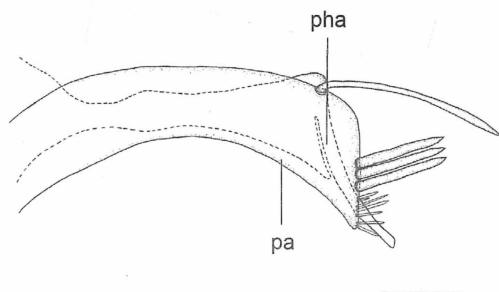
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9



10



Figs 8-10. *Tinodes multidentatus* sp. n., male genitalia, holotype: **8.** ventral (superior appendages and paramers not shown); **9.** dorsal (inferior appendages not shown); **10.** phallic apparatus, lateral (Explanations in text, scale bar = 0.1 mm).

Antenna: First antennal segment broad, second segment slender and nearly half as long as first one. Third antennal segment almost as long as first and second segment combined. All other antennal segments similar to third segment (Figs 1, 2).

Setal warts: Occipital and vertexal ocellar compact setal warts present. Antennal setal warts are fused and form one broad central wart anteriorly. Occipital warts enlarged and ellipsoid. All cephalic warts including the pronotal warts bright yellow-brown. Mesonotal sclerites enlarged, nearly quadratic, dark brown. Scutellar setal warts spherical and light yellow-brown (terminology after Oláh & Johanson 2007).

Male genitalia: Tergum IX (*tlX*) tongue shaped in dorsal view, slightly rounded at the apex and with convex sides (Figs 4, 9); triangular in lateral view, dorsal margin of triangle comparatively long (Fig. 7). Sternum IX (*sIX*) well developed and broad in ventral view (Fig. 8); in lateral view almost triangular with concave margins (Fig. 7). Superior appendages (*sa*) (= preanal appendages in Schmid (1998)) slender, rod-like and slightly rounded at the apex, bearing several setae and protruding the paramers (*pa*, Fig. 9) (= intermediate appendages in Schmid (1998)); distal end slightly curved mediad (in dorsal view, Fig. 4). Paramers well pointed terminally, bearing several apical setae, these differ in thickness and length, terminal setae short, subterminal three stronger ones, another strong seta more basally on the dorsal margin of each paramer (in lateral view, Fig. 10). Phallic apparatus (*pha*) covered by segment IX in dorsal view (Figs 4, 9); in lateral view phallus appears as a long, slender tube (Fig. 10). Internal basal appendages (*iba*) (= phallic apparatus guide in Schmid (1998)) with u-shaped median cleft, ending in a long slender process on each side (Fig. 8). Inferior appendages (*ia*) in ventral view slightly curved medially, bearing seven evenly distributed and equally sized spines on the outer side and on the apex; on inner margin, approximately half distance between gonopods apex and base of 9th sternum, inferior appendages exhibit a broad, prominent lobe; lobe covered by several hairs (Fig. 8).

Remarks

T. multidentatus sp. n. is similar in paramer and gonopod structure to the species shown on pages 144 and 145 in Malicky (2010). The similarity between *T. multidentatus* and *T. dependens* was already recognized by Ulmer himself in a handwritten label: "nicht beschr., *Tinodes* n. sp., nahe *dependens*, 1 ♂, 7 ♀♀" [engl.: "not described, *Tinodes* n. sp., near *dependens*, 1 ♂, 7 ♀♀"]; in fact, there are only 6 ♀, one female specimen clearly belongs to another species].

The female genitalia show characters which are typical for the genus *Tinodes*, but no diagnostic features were found for *T. multidentatus* sp. n. Presently, there are no reliable diagnostic characters known to separate *Tinodes* females.

This record of *T. multidentatus* sp. n. is the first for the genus *Tinodes* from the Kei Islands. An endemic status of *T. multidentatus* sp. n. on the Kei

Islands is at least possible. However, the knowledge of the caddisfly fauna of the eastern Indonesian Archipelago is sparse. Further intensive collecting is necessary to establish species inventories and distribution of species.

Zusammenfassung

Tinodes multidentatus sp. n. (Trichoptera, Psychomyiidae) von den Kei-Inseln (Südostasien, Indonesien) wird beschrieben und dargestellt. Diese neue Art zeichnet sich durch den Besitz von sieben Dornen auf jedem unteren Genitalanhang des Männchens und durch eine Reihe von drei auffälligen und gleich großen subapikalen Dornen auf jeder Paramere des Männchens aus.

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