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Mixotrephes (*Thermotrephes*) *punctatus* sp.n. (Insecta: Heteroptera: Helotrephidae) from India

M. Papáček* & H. Zettel**

Abstract

Mixotrephes (*Thermotrephes*) *punctatus* sp.n. (Helotrephidae: Helotrephinae: Limnotrephini) from Meghalaya, northeastern India, is described and illustrated. The new species is most closely related to *M. thermophilus* (PAPÁČEK & KOVAC, 2001) from Myanmar and Thailand.

Key words: Helotrephidae, Limnotrephini, *Mixotrephes*, *Thermotrephes*, new species, India.

Zusammenfassung

Mixotrephes (*Thermotrephes*) *punctatus* sp.n. (Helotrephidae: Helotrephinae: Limnotrephini) aus dem nordöstlichen Indien (Meghalaya) wird beschrieben und abgebildet. Die neue Art ist mit *M. thermophilus* (PAPÁČEK & KOVAC, 2001) aus Myanmar und Thailand am nächsten verwandt.

Introduction

The water bug genus *Mixotrephes* was originally described for *M. hoberlandti* PAPÁČEK, ŠTYS & TONNER, 1989, a species from Afghanistan and Iran (PAPÁČEK et al. 1989), and later revised by PAPÁČEK & ZETTEL (2003). More recently, PAPÁČEK & ZETTEL (2006) provided a subgeneric classification and established the subgenus *Thermotrephes* for two species, *M.* (*T.*) *thermophilus* (PAPÁČEK & KOVAC, 2001) (type species) from Myanmar and Thailand and *M.* (*T.*) *freitagi* PAPÁČEK & ZETTEL, 2006 from Nepal. In this study a third species of *Thermotrephes* is added from northeastern India. Terminology and methods follow PAPÁČEK & ZETTEL (2003). The digital photograph was taken with a Leica DFC490 camera attached to a Leica MZ16 binocular microscope with the help of Image Manager IM50 and processed with Auto-Montage Pro and Adobe Photoshop 7.0 programmes.

Mixotrephes (*Thermotrephes*) *punctatus* sp.n. (Figs. 1 - 8)

Type material: Holotype (hindwing-brachypterous male) and paratypes (8 hindwing-brachypterous males, 20 hindwing-brachypterous females, 1 hindwing-macropterous male, 4 hindwing-macropterous females), labelled "NE INDIA, MEGHALAYA\ SW of CHERRAPUNJEE\ 25°13'-14' N 91°40' E,\ 5.-24.v.2005, 900 m,\ P Pacholatko leg."; holotype and paratypes in the Natural History Museum Vienna, Austria, four hindwing-brachypterous paratypes in the University of South Bohemia, Coll. Miroslav Papáček, České Budejovice, Czech Republic.

* Prof. Dr. Miroslav Papáček, University of South Bohemia, Pedagogical Faculty, Jeronýmova 10, CZ-371 15 České Budějovice, Czech Republic – papacek@pf.jcu.cz

Dr. Herbert Zettel, Natural History Museum Vienna, International Research Institute of Entomology, Burgring 7, A-1010 Vienna, Austria – herbert.zettel@nhm-wien.ac.at

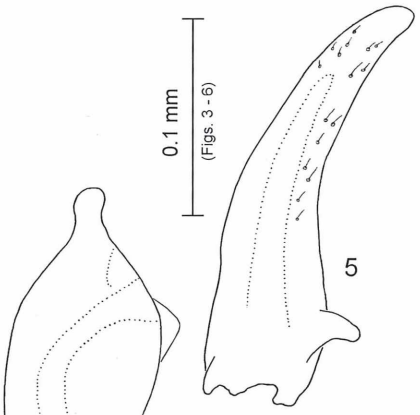
Description: Size: One of the smallest helotrephids known. Body length of hindwing-brachypterous male 1.04 - 1.11 mm (holotype 1.09 mm), of hindwing-brachypterous female 1.09 - 1.17 mm, of hindwing-macropterous male 1.03 mm, of hindwing-macropterous female 1.12 - 1.17 mm. Maximum body width (= pronotum width) of hindwing-brachypterous male 0.68 - 0.73 mm (holotype 0.70 mm), of hindwing-brachypterous female 0.71 - 0.76 mm, of hindwing-macropterous male 0.75 mm, of hindwing-macropterous female 0.87 - 0.89 mm. Eye index (= minimum eye distance maximum eye width) of hindwing-brachypterous male 2.8 - 3.0 (holotype 2.9), of hindwing-brachypterous female 2.7 - 3.0, of hindwing-macropterous male 2.6, of hindwing-macropterous female 2.5 - 2.6.

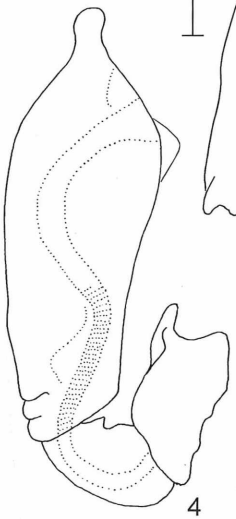
Colour: Dorsum (Fig. 1) almost uniformly light to medium brown, mesoscutellum and hemelytra somewhat darker than cephalonotum; hemelytra with very indistinct speckled dark brown pattern. Ventral side of head and thorax mostly yellowish brown, of abdomen dark brown. Legs dark yellow.

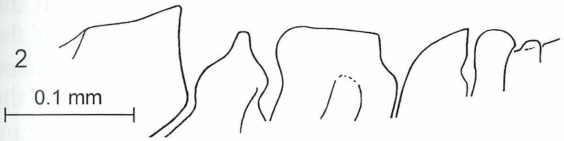
Structural characteristics of hindwing-brachypterous morph: All parts of dorsum shining; cuticular punctures with long, fine setae. Cephalonotum with sparse, small punctures over entire surface. On mesoscutellum, punctures also sparse, but larger. Hemielytron with large, deep punctures, these partly closely set (distance smaller than diameter) or even confluent. W-shaped cephalonotal suture distinct. Rostrum short, almost reaching level of posteroventral corner of prosternal carina; segment 4 ca. 1.3 times as long as segment 3. Forewing without claval and embolar sutures. Hindwing (only 1 male, 2 females dissected) brachypterous, membraneous, folded to narrow, stick-shaped structure, variable in length and reaching approximately level of abdominal segments 5 - 7. Midventral carinae (Fig. 2): Prosternal carina with slightly acute posteroventral corner; mesosternal carina short and acute; metasternal carina with approximately rectangular posteroventral corner; carinae of abdominal sterna 2 - 4 of normal shape, directed caudad, acute, continuously decreasing in size from 2 to 4. Sternum 5 without carina.

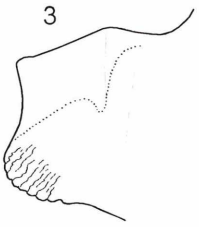
Structural characteristics of hindwing-macropterous morph: Similar to brachypterous morph, but proportionally broader and more highly domed. Eyes larger (see eye indices above). Cephalonotum with small, low tubercle close to posterior corner indicating insertion of hindwing beneath. Forewing with claval and embolar sutures. Hindwing (1 female dissected) of pleoid type, with extended vanal lobe, very large in comparison with body size (approximately 1.2 - 1.25 times as long and 1.0 times as wide as body length).

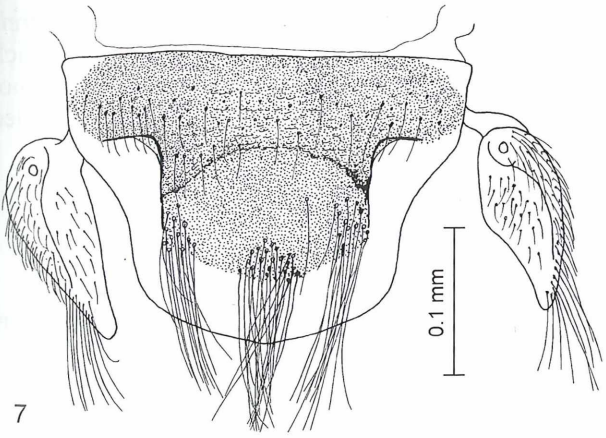
Genitalia of male: Spur-like process of pygophore (Fig. 3) simple, quadrangular, its posterior tubercle-shaped part posteroapically with very minute, rugose ridges and with nearly imperceptible marginal serration. Aedeagus (Fig. 4): phallosoma robust, stout, cylindrical, peg-shaped, distally broader than proximally, apically with rounded, upright, peg-shaped tip; phallobase large; ductus ejaculatorius simple, without distinct bulbose ejaculatory reservoir. Left paramere (Fig. 5) only slightly tapering towards apex and curved anteriad, with anterobasal protuberance and with broadly rounded apex. Right paramere (Fig. 6) of similar shape as left paramere, but only two-thirds as long as that, with rounded apex prominently pointing anteriad.

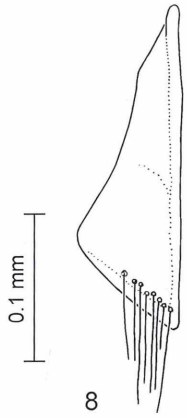












Figs. 1 - 8: *Mixotrephes* (*Thermotrephes*) *punctatus* sp.n. (1 - 6: male; 7, 8: female). (1) Habitus of hindwing-brachypterous male (holotype); (2) lateral view of midventral carinae (venter turned upward); (3) spur-like process of pygophore; (4) aedeagus; (5) left paramere; (6) right paramere; (7) subgenital plate and ventral laterotergites 7; (8) first right valvula.

Terminalia of female: Subgenital plate (= abdominal sternum 7; Fig. 7) completely symmetrical (even under high magnification), wider than long, with broad, squared posteromedial lobe; posterior margin of lobe with obtuse angle medially. Ventral surface of subgenital plate with pair of strongly sclerotized and pigmented, obviously rectangularly inflexed ridges (in situ, limiting mesal edges of ventral laterotergites 7), and with shallow depression in medial part of posteromedial lobe. Base of plate with tuberculate microsculpture and stout setae, pilosity of posterior lobe consisting of paired groups of long hairs laterally (located near impressions for laterotergites 7) and one group posteromedially. Ovipositor symmetrical. First valvula (Fig. 8) long, subtriangular, with row of long bristles near posteromesal margin.

Comparative notes: The structures of the genitalia of the male and of the abdominal sternum 7 of the female, and several other characteristics clearly place *Mixotrephes punctatus* sp.n. in the subgenus *Thermotrephes*, which hitherto has contained *M. freitagi* from Nepal and *M thermophilus* from Myanmar and Thailand. Only the absence of a pigmentation pattern on the female's subgenital plate does not fully fit the diagnosis of *Thermotrephes* (see PAPÁČEK & ZETTEL 2006). Comparing the genital structures of these three species, *Mixotrephes punctatus* sp.n. is more similar to *M. thermophilus* than to *M. freitagi.*

The male of *M. punctatus* sp.n. differs from *M. freitagi* by the short tip of the aedeagus, the reduction of the ejaculatory bulb and the long phallobase, by the evenly curved anterior margin of the left paramere, and by the less prominent posterobasal part of the right paramere. It differs from *M. thermophilus* by the broader proximal part of the aedeagus and its relatively shorter and more robust tip. Finally, it can be distinguished from both species in the broadly rounded apex and the anterobasal protuberance of the left paramere, the more prominent apex of the right paramere, and the simple, quadrangular spur-like process of the pygophore.

The female of *M. punctatus* sp.n. differs in the subgenital plate, distinctly from *M. freitagi* with its elongate plate, and slightly in its proportions from *M. thermophilus* which has a similarly broad and short plate. The subgenital plate of *M punctatus* sp.n. does not express a distinct pattern of dark pigmentation which is very characteristically extended posteriad into two lobes in both other species.

Externally, the two sibling species, *M. thermophilus* and *M. punctatus* sp.n., can be easily distinguished by colour, size, and density and size of the puncturation of dorsum.

Distribution: Only known from the type locality in Meghalaya, northeastern India.

Etymology: The specific epithet *punctatus*, a Latin adjective meaning punctured, refers to the coarse puncturation of the hemelytra of the new species.

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