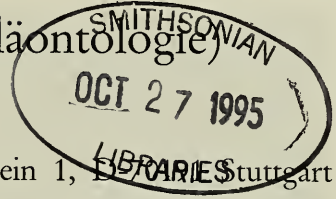


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## New Upper Jurassic Diptera (Limoniidae, Eoptychopteridae) from the Solnhofen Lithographic Limestone (Bavaria, Germany)

By Wieslaw Krzeminski, Kraków, and Jörg Ansoerge, Rostock

With 10 figures

### Summary

Two new Diptera are described from the Upper Jurassic Solnhofen Lithographic Limestone (Bavaria, Germany): *Crenoptychoptera bavarica* n. sp. (Eoptychopteridae) and *Tipunia intermedia* n. g. n. sp. (Limoniidae). *Tipunia* exhibits characters that are typical of both the Limoniidae and Tipulidae.

### Zusammenfassung

Aus den oberjurassischen Solnhofener Plattenkalken (Bayern, Deutschland) werden zwei neue Dipteren Spezies beschrieben: *Crenoptychoptera bavarica* n. sp. (Eoptychopteridae) und *Tipunia intermedia* (Limoniidae). *Tipunia* n. g. n. sp. besitzt typische Merkmale der Limoniidae und Tipulidae.

### 1. Introduction

The Upper Jurassic Solnhofen Lithographic Limestone (Bavaria, Germany) is well known not only for *Archaeopteryx* but also for its numerous fossil insects. Till now the representatives of the following orders have been found: Odonata, Ephemeroptera, Saltatoria, Blattodea, Homoptera, Heteroptera, Coleoptera, Neuroptera, Hymenoptera, Trichoptera and Diptera.

Diptera seem to be very rare, as up to now only one species has been described (*Prohirmoneura jurassica* HANDLIRSCH 1906, probably a representative of the Nemestrinidae (Brachycera): BEQUAERT & CARPENTER 1936, USSATCHOV 1968).

PONOMARENKO 1985 recorded a culicomorph midge in the collection of the Museum of Natural History, Vienna.

*Empidia wulpi* WEYENBERGH 1869, *Asilicus lithophilus* WEYENBERGH 1869 and *Tipularia teyleri* WEYENBERGH 1869 are very doubtful dipterans which need revision.

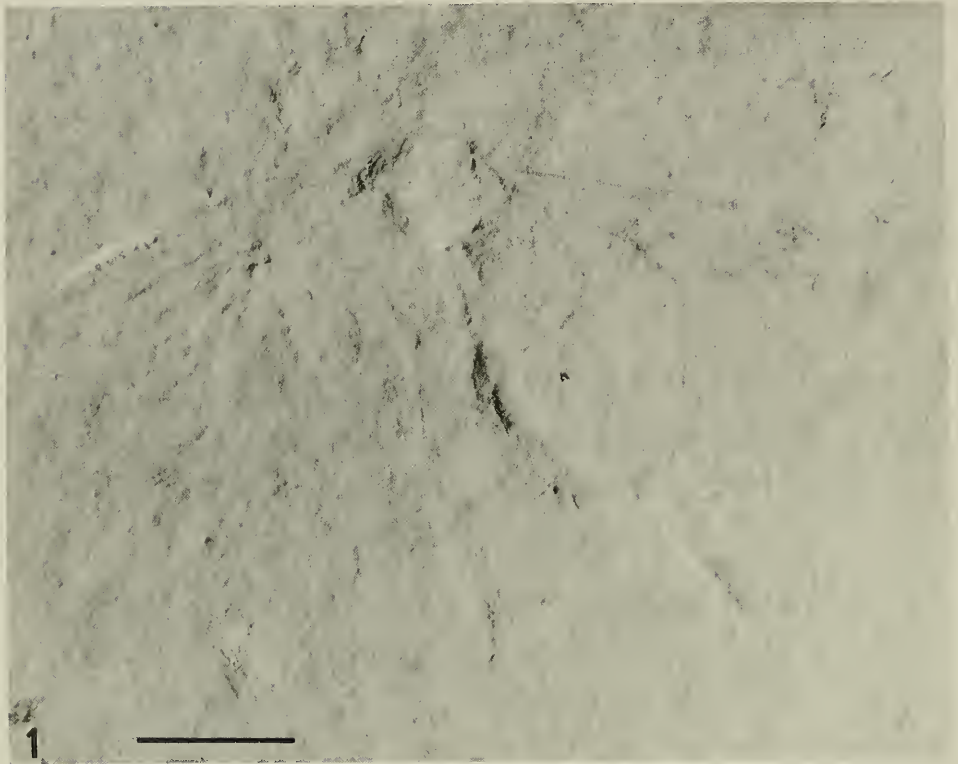


Fig. 1. *Crenoptychoptera bavarica* n. sp. (Eoptychopteridae), holotype (SMNS 62460) from the Lower Tithonian Solnhofen Lithographic Limestone. — Scale 5 mm.

The here described new dipterans from the Solnhofen Lithographic Limestone are comparatively large, and it seems that small dipteran species have simply been overlooked.

Recently a tipulomorph-like fly has been figured by FRICKHINGER 1994 (Fig. 354).

## 2. Description

Suborder Neoneura

Infraorder Ptychopteromorpha

Family Eoptychopteridae HANDLIERSCH 1906

Genus *Crenoptychoptera* KALUGINA 1985

*Crenoptychoptera bavarica* n. sp.

Figs. 1–2

Holotype: Complete specimen (SMNS 62460), housed in Staatliches Museum für Naturkunde, Stuttgart, Germany, coll. W. Ludwig 1992.

Locus typicus: Wegscheid, near Eichstätt (Bavaria).

Stratum typicum: Upper Jurassic Lithographic Limestone, Lower Tithonian (Hybonotum Zone).

Derivatio nominis: After the Latin name Bavaria for Bayern.

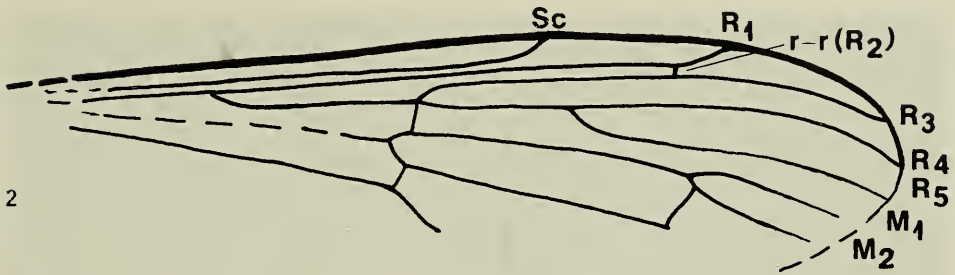


Fig. 2. *Crenoptychoptera bavarica* n. sp. (Eoptychopteridae), wing venation.

Diagnosis. — Sc ending just before  $R_{4+5}$ -fork; crossvein m-m almost straight.

Description. — Complete fly, legs (15 mm) longer than wings. Only the right wing is well preserved, but the anal part. Wing length ca. 11 mm. Sc ending just before fork of  $R_{4+5}$ .  $R_1$  long; crossvein r-r ( $R_2$ ) positioned ca. three times its length before  $R_1$  tip. Rs rather long (ca.  $\frac{1}{4}$  of wing length and about  $\frac{1}{4}$  longer than  $R_{4+5}$ ).  $R_3$  2.3 times as long as Rs.  $R_4$  2.3 times as long as  $R_{4+5}$ . Crossvein r-m at the fork of Rs. d-cell long and narrow, its shape being characteristic of the genus. Only three medial veins present.  $M_{1+2}$  almost twice as long as  $M_1$ . Crossvein m-m almost straight, only very slightly wavy. Terminal section of  $M_{3+4}$  invisible. Tip of Cu and anal veins not preserved.

Remarks. — Till now 3 species of the genus *Crenoptychoptera* have been described from the Jurassic and Lower Cretaceous of Asia (KALUGINA 1985, 1989). Only one specimen was found in Europe, in the Lower Jurassic of Dobbertin, Germany (ANSORGE, in preparation).

The species described here is larger than *C. antica* KALUGINA 1985 and *C. defossa* KALUGINA from the Middle Jurassic of Kubekowo (Siberia). *C. bavarica* has a shorter Sc than *C. gronskayae* KALUGINA 1989, which is almost of the same size.

Suborder Polyneura  
 Infraorder Tipulomorpha  
 Family Limoniidae HENDEL 1936  
 Subfamily Architipulinae HANDLIRSCH 1906

Genus *Tipunia* n. g.

Type species: *Tipunia intermedia* n. g. n. sp.

Derivatio nominis: A compound of *Tipula* (Fam. Tipulidae) and *Limonia* (Fam. Limoniidae).

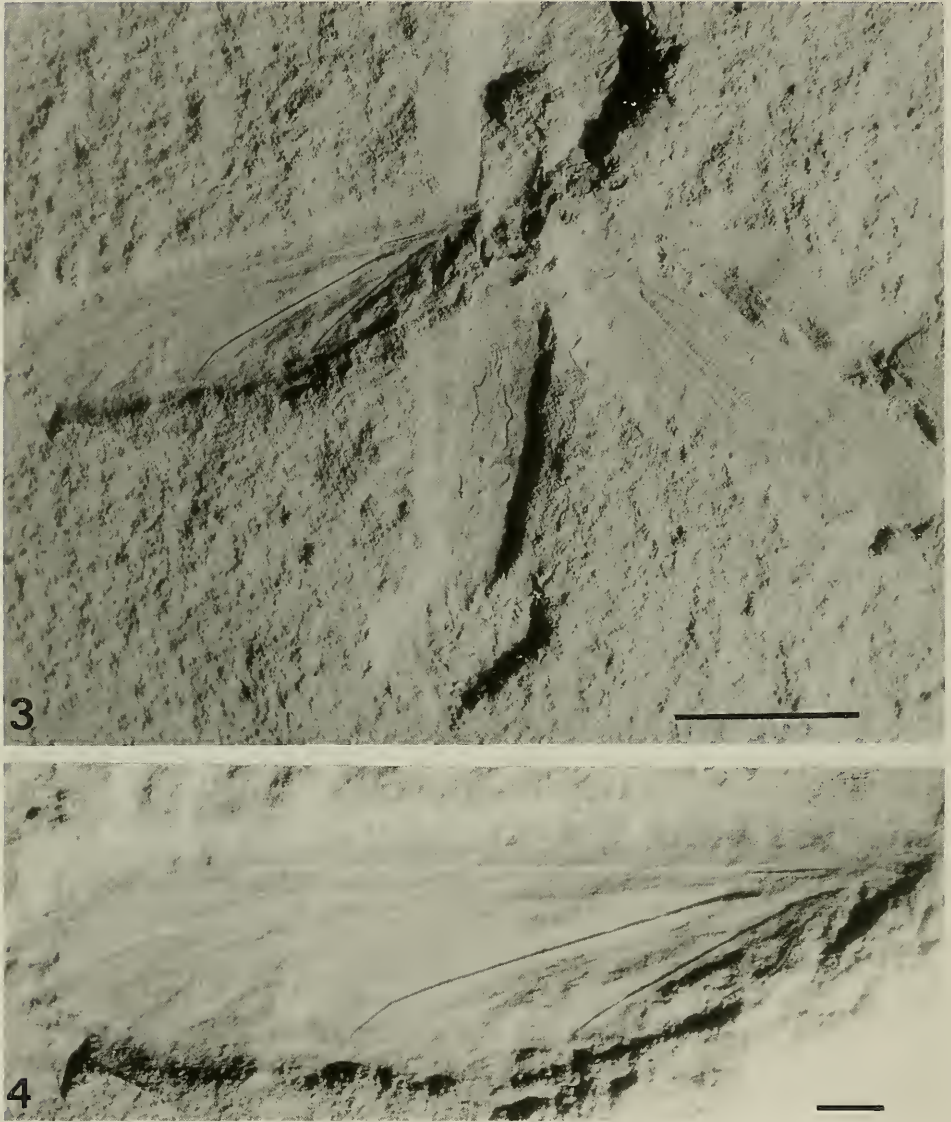
Diagnosis. — Sc terminating in C; distal part of d-cell widened, which is caused by extension of m-m; m-cu long and almost parallel to the wing margin.

*Tipunia intermedia* n. g. n. sp.

Figs. 3–8

Holotype: Complete female (SMNS 9633), housed in Staatliches Museum für Naturkunde, Stuttgart, Germany.

Locus typicus: Solnhofen.

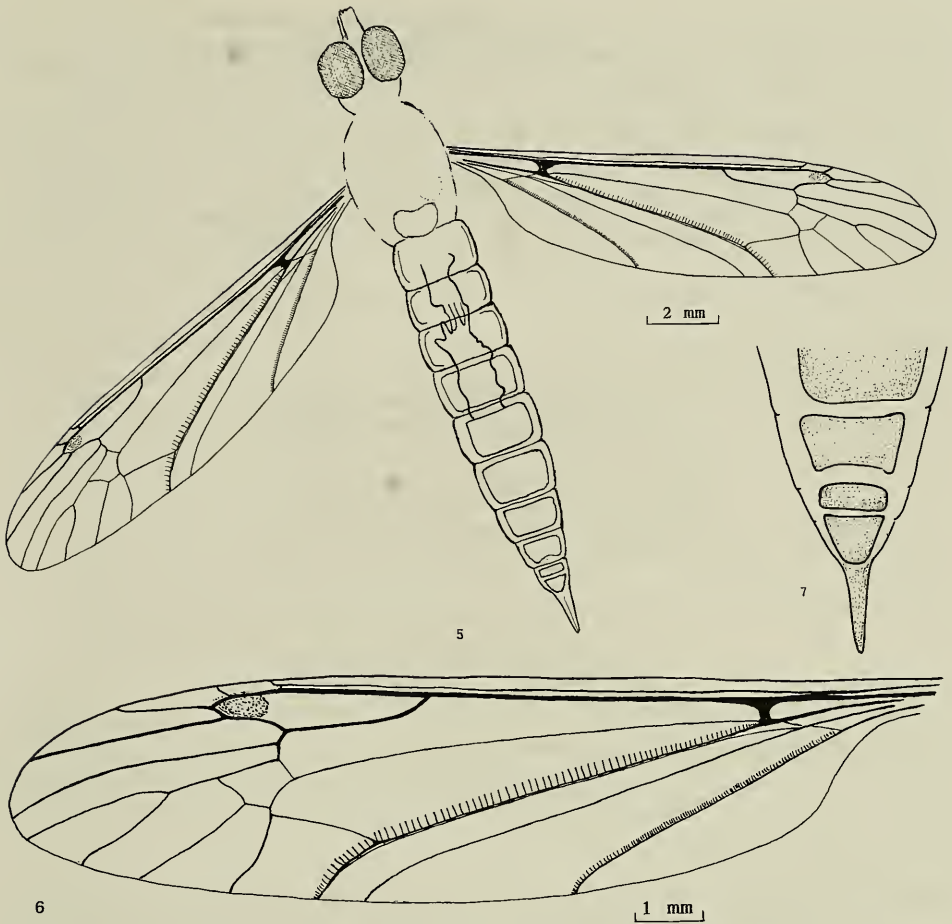


Figs. 3–4. *Tipunia intermedia* n. g. n. sp. (Limoniidae), holotype (SMNS 9633) from the Lower Tithonian Solnhofen Lithographic Limestone. – 3: General view, female; scale 5 mm. – 4: Left wing; scale 1 mm.

Stratum typicum: Upper Jurassic Lithographic Limestone, Lower Tithonian (Hybodontum Zone).

Derivatio nominis: After the intermediate position between Tipulidae and Limoniidae.

Diagnosis. – Crossvein sc-r at three times its length before the end of Sc. R<sub>4</sub> 2.5 times as long as R<sub>3</sub>. Crossvein m-m ca. 1/3 longer than the section of M<sub>3</sub> within the d-cell.

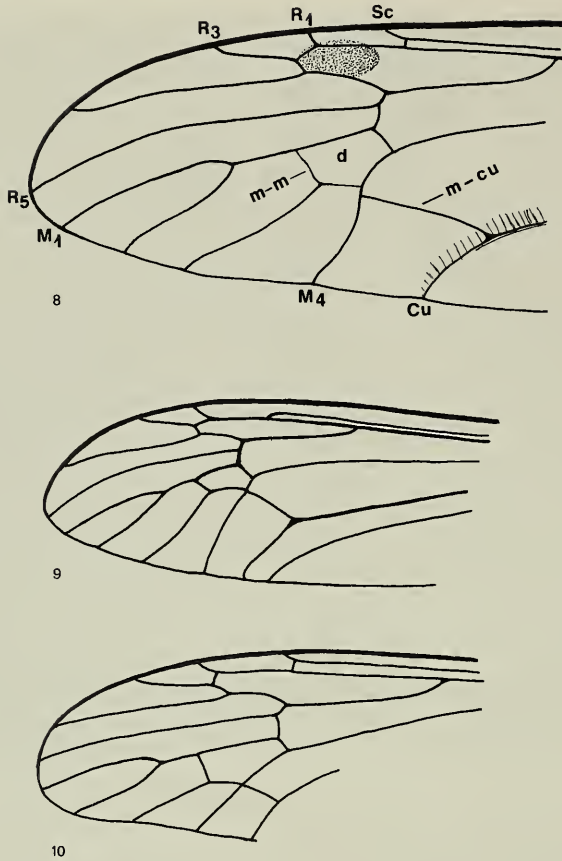


Figs. 5–7. *Tipunia intermedia* n. g. n. sp. (Limoniidae). – 5: General view. – 6: Wing venation. – 7: Ovipositor.

**Description.** – Body 18 mm long; head partially preserved, antennae and palpi invisible. Wings 13,2 mm long; Sc terminating in C opposite Rs-fork. Crossvein sc-r at three times its length before the end of Sc.  $R_1$  ending close to  $R_{3+4}$ -fork. Crossvein r-r ( $R_2$ ) short, almost parallel to costal wing margin.  $R_3$  2.5 times as long as  $R_2$ . Distal part of d-cell conspicuously widened, which is caused by extension of the crossvein m-m. m-m ca.  $\frac{1}{3}$  longer than the section of  $M_3$  within d-cell.  $M_4$  wavy. Crossvein m-cu extended, connecting  $M_4$  and Cu, positioned almost parallel to the wing margin. cu-cell very broad, short.  $A_2$  rather long, straight. Wing membrane along Cu wrinkled as in some larger Tipulidae and Limoniidae. Female terminalia: ovipositor short, visible in dorsal view.

### 3. Remarks on the systematic position of *Tipunia*

The new genus possesses features characteristic of both the Limoniidae (Sc terminating in the wing margin;  $R_3$  relatively long – Fig. 9) and the Tipulidae (r-r almost parallel to costal wing margin; cu-cell very broad – Fig. 10).



Figs. 8–10. Venation of the distal part of the wings of Tipulomorpha. – 8: *Tipunia intermedia* n. sp. (Limoniidae). – 9: *Architipula fragmentosa* (BODE) (Limoniidae: Architipulinae). – 10: *Tipula (Lunatipula) lunata* L. (Tipulidae).

Unfortunately, features of the head (tip of the rostrum, palpi and antennae) are unidentifiable. Furthermore the position of the ovipositor does not allow a reconstruction of its shape in lateral view. In this situation the fact that Sc terminates in the costa remains as a character that inclines us to place this genus in the family Limoniidae. The position of m-cu is characteristic of the subfamily Architipulinae.

Very probably, *Architipula austeni*, a species described by JARZEMBOWSKI (1991) from the Lower Cretaceous Weald Clay (Great Britain) belongs to this genus as well. This can be concluded from the photo in JARZEMBOWSKI (1991, Fig. 13a) and the author's remark that „Sc is directed to the anterior margin“. Beyond any doubt this species does not belong to *Architipula* HANDLIRSCH 1906.

Till now the oldest Limoniidae are known from the Upper Triassic (KRZEMINSKI 1992), and the Tipulidae from the beginning of the Upper Cretaceous (KRZEMINSKI 1992 a, b).

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