

A new genus and species of damsel-dragonfly from the Early Liassic of Germany (Odonata, Liassophlebiidae)

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Summary. – *Bavarophlebia schmeissneri*, new genus and species of Liassophlebiidae, is described from the Early Liassic of Germany. It represents the fourth accurate genus of this small family.

Résumé. – Un nouveau genre et nouvelle espèce de Libellule du Lias inférieur d'Allemagne (Odonata, Liassophlebiidae). *Bavarophlebia schmeissneri*, nouveau genre, nouvelle espèce de Liassophlebiidae, est décrit du Lias inférieur d'Allemagne. Il représente le quatrième genre de cette petite famille.

Key words. – Insecta, Odonata, Liassophlebiidae, n. gen., n. sp., Early Jurassic, Germany.

The Liassophlebiidae Tillyard, 1925, are a small family of damsel-dragonflies known by three genera from the Early Jurassic of Europe and Central Asia, with a fourth more dubious genus from China (TILLYARD, 1925; ZEUNER, 1962; HONG, 1983; NEL *et al.*, 1993; ANSORGE, 1996; BECHLY, 1996). It belongs to the clade Heterophlebioptera Bechly, 1996, sister group of the Stenophlebioptera Bechly, 1996 + Anisoptera (FLECK *et al.*, 2003). Other Heterophlebioptera also range between the Early and the Late Jurassic.

Mr Stefan Schmeißner recently discovered one very well preserved fore wing that corresponds to a liassophlebiid new genus and species in the sandpit Küfner (Early Liassic of Germany). Other damsel-dragonflies from the same outcrop belong to the clade Isophlebioptera Bechly, 1996 (NEL *et al.*, 2003). After VAN KONIJNENBURG-VAN CITTERT & SCHMEIßNER (1999), this outcrops corresponds to a fluvial possibly deltaic succession. The sandstone represents point bars of a meandering river system; enclosed clay lenses contain a very rich flora and insects. The clay lenses represent deposits of old watercourses like oxbow lakes.

The nomenclature of the dragonfly wing venation is based on the interpretations of RIEK & KUKALOVÁ-PECK (1984), amended by NEL *et al.* (1993) and BECHLY (1996).

Systematic palaeontology

Family **Liassophlebiidae** Tillyard, 1925

Genus ***Bavarophlebia*** n. gen.

Type species. – *Bavarophlebia schmeissneri* n. sp.

Etymology. – After Bavaria and 'phlebia' for wing.

Diagnosis. Based on forewing characters, wing of medium size; RP + MA, MA, MAb and CuA well aligned; a long and weakly zigzagged secondary longitudinal vein between MAa and MP, just distal of discoidal space; first branch of CuA long and well defined, between CuA and posterior wing margin; base of RP2 distinctly distal of subnodus.

Bavarophlebia schmeissneri n. sp. (fig. 1-2)

HOLOTYPE specimen G 753/02, coll. Stefan Schmeißner, Kulmbach, Germany.

Geological setting. Hettangian, Early Liassic (alpha 1 and alpha 2), Sandpit Küfner, south of Pechgraben, district of Kulmbach, Bavaria, Germany.

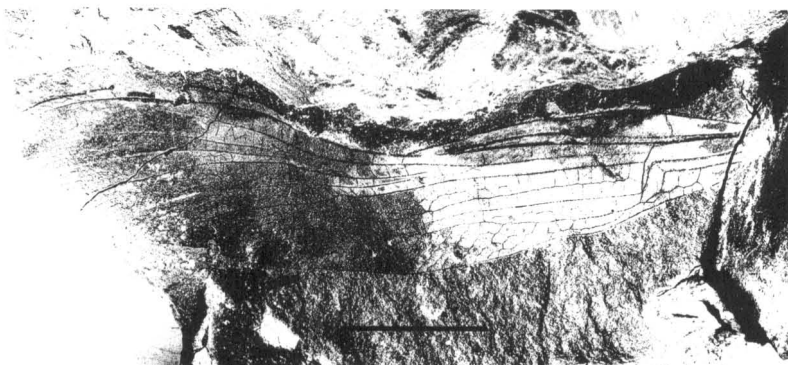


Fig. 1. – *Bavarophlebia schmeißneri* n. gen., n. sp., holotype specimen G 753/02, photography of forewing. Scale bar represents 10 mm.

Etymology. After Mr. Stefan Schmeißner, Kulmbach, Germany, who discovered the type specimen.

Diagnosis. That of the genus.

Description. – A nearly complete but partly deformed forewing, probably hyaline.

Forewing. circa 50.0 mm long, 12.0 mm wide; distance between base and arculus, 6.5 mm, between arculus and nodus, 18.0 mm, between nodus and pterostigma, 11.7 mm, between pterostigma and apex, 8.0 mm; pterostigma, 5.0 mm long, 0.8 mm wide; wing very shortly petiolate; 1-2 rows of cells between posterior wing margin and AA; AA nearly parallel to MP + CuA, making a very strong angle; median area free of cross-veins, no cross-vein in submedian area; a curved strong vein CuP separating submedian and subdiscoidal areas; subdiscoidal space free of cross-veins, large, elongate, broad and transverse, with its posterior margin convex; discoidal cell basally opened; RP + MA separated at nearly right angle from RA, straight; MAb very long, well aligned with RP + MA, basal part of MA, and distal free part of CuA; MP + CuA with a very pronounced curve below arculus; CuA separating from MP 8.0 mm from wing base and directed towards posterior wing margin for 0.8 mm; CuA distally fused with AA, CuA (+ AA) basally more or less parallel to posterior wing margin and distally delimitating a broad cubito-anal area with 6-7 rows of cells in its broadest part, CuA with a first posterior branch parallel to it and posterior wing margin; CuA distally zigzagged; area between CuA and MP with 1-2 rows of cells; distal of end of CuA, eight rows of cells in area between MP and posterior wing margin; MP nearly straight, MAa nearly straight, not vanishing distally; two rows of cells in postdiscoidal area just distal of discoidal space, 2.2 mm wide, as broad near posterior wing margin as near discoidal space; 14 rows of cells between MAa and MP near posterior wing margin; a longitudinal secondary vein between MAa and MP, parallel to MP, weakly zigzagged; Ax0 preserved at wing base; two very strong primary antenodal cross-veins, Ax1 5.0 mm basal of arculus and Ax2 5.0 mm distal of Ax1; Ax1 perpendicular to ScP and R + MA but Ax2 more oblique; no antenodal cross-veins of first row between C and ScP and one secondary antenodal cross-vein of second row between SCP and RA; five preserved postnodal cross-veins between C and RA; 11 postsubnodal cross-veins between RA and RP1 basal of pterostigma, not aligned with postnodals; six cross-veins in area between RA and RP, between arculus and nodus; base of RP3/4 1.2 mm distal of arculus, closer to nodus than to arculus; no cross-veins between MA and RP basal of RP3/4; base of IR2 2.0 mm distal of that of RP3/4; IR2 apparently branching on RP3/4; pterostigmal brace present, aligned with basal side of pterostigma but not very oblique; pterostigma with only one cross-veins below it; nodus not preserved but subnodus visible, not very oblique; four cross-veins in Bqr space between RP, IR2 and subnodus; base of RP2 three cells and 2.5 mm distal of subnodus; one oblique vein 'O' four cells distal of base of RP2; RP2 nearly straight; base of IR1 two cells distal of base of RP2; IR1 nearly straight, area between RP3/4 and IR2 with seven rows of cells in its distal preserved part; area between IR2 and RP2 with seven rows of cells in its distal part; area between RP2 and IR1 with five rows of cells in its distal preserved part; area between IR1 and RP1 with three rows of cells below pterostigma and only two rows in its distal preserved part.

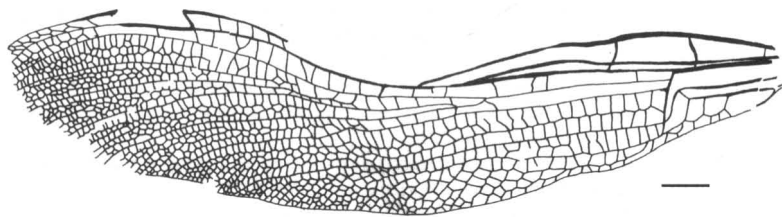


Fig. 2. – *Bavarophlebia schmeißneri* n. gen., n. sp., holotype specimen G 753/02, drawing of forewing, scale bar represents 4 mm.

Discussion. Although it is more difficult to attribute an isolated forewing than a hind wing of an Epiproctophora, *Bavarophlebia* n. gen. can be attributed to the Liassophlebiidae because of the following particular combination of characters : wing very large and broad, transverse subdiscoidal space, with a posterior margin convex (synapomorphy of the family) (NEL *et al.*, 1993 ; BECHLY, 1996) ; MP + CuA strongly curved below arculus ; AA with a very strong angle at same level ; broad postdiscoidal area with MAa well defined from its base to its apex ; absence of antenodal cross-veins between C and ScP ; free space between MA and RP basal of midfork ; opened discoidal space.

Bavarophlebia differs from *Liassophlebia* Tillyard, 1925 (Early Liassic of England) in its smaller size (50 mm long instead of 70 mm for *Liassophlebia*), RP + MA, MA, MAb and CuA well aligned and presence of a secondary longitudinal vein between MAa and MP, just distal of discoidal space. Nevertheless, they share the presence of a first posterior branch of CuA well parallel to main branch of CuA and posterior wing margin in cubital area (TILLYARD, 1925 : text-fig. 3).

Bavarophlebia differs from *Ferganophlebia* Pritykina, 1970 (Liassic of Fergana) and *Grimmenopteron* Ansoerge, 1996 (Late Liassic of Germany) in its distinctly broader post-discoidal area, presence of two rows of cells between MP and CuA, and its long first posterior branch of CuA (PRITYKINA, 1970 : fig. 10 ; ANSORGE, 1996 : fig. 7). The forewing of *Grimmenopteron* is also distinctly smaller than that of *Bavarophlebia* (23 mm long instead of 50 mm). Nevertheless, *Bavarophlebia* shares with these two genera the very well aligned veins RP + MA, MA, MAb, and CuA. *Bavarophlebia* also shares with *Grimmenopteron* its base of RP2 distal of subnodus, unlike in *Liassophlebia* (character unknown in *Ferganophlebia*). Lastly, *Bavarophlebia* differs from the very badly known *Paraliassophlebia* Hong, 1983 at least in the presence of two rows of cells in its postdiscoidal area (HONG, 1983). NEL *et al.* (1993) considered *Paraliassophlebia* as a "Anisozygoptera" *incertae sedis*.

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André NEL, Julian F. PETRULEVIČIUS, Giuseppe GENTILINI, Xavier MARTÍNEZ-DELCLÒS. – **Un nouvel Odonate du Miocène d'Italie (Odon.)**

Cette note brève a pour but de nommer formellement le taxon désigné "gen. et sp. A" dans NEL *et al.* (2005), ce qui n'a alors pas été possible, le type n'ayant pas encore été déposé dans un musée ; pour sa description détaillée, voir l'article susnommé.

Zygoptera, famille indéterminée

Genre *Italolestes* n. gen.

Diagnose : aile large, pétiole court ; base de RP2 dans une position distale ; présence d'une nervure "O" oblique ; bases de RP3/4 et IR2 au milieu entre l'arculus et le nodus ; cellules discoïdales allongées ; CuA courbée ; ptérostigma long, couvrant de nombreuses cellules ; pas de "pterostigmal brace" ; ScP ne traversant pas le nodus ; subnodus et transverse nodale Cr d'obliquité normale prononcée ; partie de CuA située distalement au nodus plus courte que la partie proximale ; IR1 non fortement courbée.

Étymologie. – D'après *Lestes* et Italie.

Italolestes stroppai n. sp.

HOLOTYPE : spécimen N 1734 de la coll. Gabrielle Stroppa, déposé au "Museo di Pesaro", Pesaro, Italie.

Diagnose : présence d'une bande sombre, située de quatre cellules basalement au ptérostigma jusqu'en son milieu, rejoignant le niveau de RP3/4.

Données géologiques : Messinien inférieur, Miocène supérieur, base de l'unité "Bituminous Marls", 10 m sous le niveau "Strato degli insetti". Monte Castellaro, Pesaro, Marches, Italie centrale.

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