

On some taxonomic changes in fossil Tipulomorpha (Diptera)

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Abstract. The following changes in the taxonomy of fossil Tipulomorpha are introduced. The genus *Triassochoristites* Hong and Guo, 2003 is transferred from the Mecoptera to the Diptera: Tipulomorpha: Archilimoniidae. This addition prompted us to present a new diagnosis for the Archilimoniidae. The genus *Ceuthoneura* Zhang, Zhang, Liu and Shangguan, 1986 is placed in the Limoniidae. New synonyms are: Zhangobiidae Evenhuis, 1994 is synonymized with Limoniidae, and the genus *Zhangobia* Evenhuis, 1994 is presented as a younger synonym of *Architipula* Handlirsch, 1906. The genus *Mesotrichocera* Hong and Wang, 1990 is synonymized with *Grimmenia* Krzemiński and Zessin, 1990. Due to preoccupations the following new names are introduced: *Cheilotrichia* (*Cheilotrichia*) *duplicata* Krzemiński, 2019, is renamed *Cheilotrichia* (*Cheilotrichia*) *wightensis* Oosterbroek and Krzemiński; *Dicranomyia* (*Dicranomyia*) *fasciata* Krzemiński, 2019 is renamed *Dicranomyia* (*Dicranomyia*) *britannica* Krzemiński & Oosterbroek. Two species of *Heli* (*H. hispanicus* and *H. turolensis*) are re-published due to missing obligatory registration in the ZooBank in original papers; *H. hispanicus* is described as *H. ibericus* Kania-Kłosok, Krzemiński and Arillo, sp. nov. due to preoccupied name. *Tipula* *oligocenica* Kania & Nel, 2013, is replaced by the new name *Tipula* (*Tipula*) *jarzembowskii* Kania & Nel.

Key words: *Architipula*, *Ceuthoneura*, *Cheilotrichia*, *Dicranomyia*, *Grimmenia*, *Heli*, *Mesotrichocera*, *Palaeolimnobia*, *Tipula*, *Triassochoristites*, *Zhangobia*.

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I. INTRODUCTION

During our work on the Catalogue of Fossil Tipulomorpha (Oosterbroek et al. 2026) several pre-occupations and misclassifications were discovered; also several descriptions of species without its obligatory registration in the ZooBank. This necessitated taxonomic corrections before these species are list-

ed in the CFC. The changes are presented below. In particular, the revision of *Triassochoristites*, Hong & Guo, 2003, stat. nov., and its including in the Archilimoniidae prompted us to redescription of this oldest family of the Tipulomorpha.

The nomenclature of wing venation follows that in Krzemiński and Krzemińska (2003), and is presented on Fig. 1G.

II. PALAEONTOLOGICAL SYSTEMATICS

Order **Diptera** Linnaeus, 1758

Infraorder **Tipulomorpha** Rohdendorf, 1961

Family **Archilimoniidae** Krzemiński & Krzemińska, 2003

Fig. 1 A-F

Type genus: *Archilimonia* Krzemiński & Krzemińska, 2003: 167, fig. 9. Age: lowermost Middle Triassic of France.

D i a g n o s i s. Archilimoniidae are discerned from remaining Tipulomorpha by unique combination of wing venation characters: Rs forked into R2+3 and R4+5; R2 positioned as crossvein r-r; discal cell present; four medial veins present; cross vein m-cu in fork of M3+4.

C o m p a r i s o n. Vein R4+5 is met also in *Psychotipa predicta* Shcherbakov, 1995, one of two species of the upper Middle Triassic family Psychotipidae Shcherbakov, 1995, but in this family the vein R2 is long and ends in wing margin (Fig. 1G) (Shcherbakov et al. 1995). In other Tipulomorpha the vein R4+5 is usually absent (except some Pediciidae) because Rs is forked into R2+3+4, and R5 leaves Rs independently, as a separate vein. This character of venation is discussed by Kopeć et al. (2020).

Description. Small Diptera, of body up to 5 mm long, wing length ca. 3 mm. Head shape best known in *Metarchilimonia* Blagoderov & Grimaldi, 2007 (in Blagoderov et al. 2007), in which rostrum is elongated, evenly narrowing to end, and a little longer than remainder of head in lateral view; eyes very large, occupying almost entire outline of head without rostrum. 16 antennomeres, with nine basalmost flagellomeres identifiable in *Archilimonia vogesiana* (Krzemiński & Krzemińska 2003: fig. 9C) and up to 14 in *Metarchilimonia krzeminskorum* Blagoderov & Grimaldi, 2007 and *M. solita*, Blagoderov & Grimaldi, 2007, both from USA (Blagoderov et al. 2007: fig. 8a-d). Flagellomeres are rounded, only a little longer than wide in *Archilimonia vogesiana*, in *Metarchilimonia solita* and *M. krzeminskorum* (however, more elongated in one specimen of the latter species; Blagoderov et al. 2007: fig. 8c).

Venation (Fig. 1 A-F): Sc not much longer than half wing length, ending about opposite fork of

Rs; sc-r positioned close to end of Sc; Rs relatively short, forked into R2+3 and R4+5; R4+5 short, only in *Triassochoristites* Hong & Guo, 2003, longer and maybe even not forked to the end (fork of R4+5 is not preserved); d cells of various sizes and shapes: in *Archilimonia* and *Triassochoristites* the d cell is pentagonal, with distal outline incised in its costal and anal margin due to m-m being shifted distad to connect M2 and M3, and M3 being strongly arched initially; in *Archilimonia* the d cell is largest, c. 1/3 of wing length, while in *Triassochoristites* it is c. 1/5 as long as wing. In *Mabelysia* Shcherbakov, 1995, and in *Metarchilimonia* shape of d cell is triangular (*Mabelysia*) or quadrangular (*Metarchilimonia*), and crossvein m-m connects M1+2 and M3, as it is in most Tipulomorpha; length of d cell is 1/6 as long as wing. Four medial veins present; A1 and A2 long.

Genus ***Triassochoristites*** Hong & Guo, 2003 **stat. nov.**

Triassochoristites Hong & Guo, 2003: Acta Zootax. Sin. 28: 716.

A monotypic genus from the Middle Triassic of China.

Type species. *Triassochoristites jinsuoguensis* Hong & Guo, 2003. China, Middle Triassic.

Triassochoristites jinsuoguensis Hong & Guo, 2003, **stat. nov.**

Fig. 1A-B

Triassochoristites jinsuoguensis Hong & Guo, 2003: Acta Zootax. Sin. 28: 718.

New diagnosis. Sc ending just behind fork of Rs into R2+3 and R4+5; Rs short, arched; d cell pentagonal, almost symmetrical along its long axis; cross vein m-m between M2 and M3; crossvein m-cu distal of fork of M3+4 into M3 i M4.

Description. Wings are well preserved, 5.0 mm long, 1.8 mm wide. Sc ending just behind fork of Rs into R2+3 and R4+5; Rs short, arched so that distal 2/3 of cell r is much narrower than proximal 1/3 in its widest point; crossvein sc-r positioned its two lengths before end of Sc and opposite fork of Rs; basal section of R2+3 strongly arched to costal margin; R4+5 longest in the family, but fork R4+5 into R4 and R5 is not preserved on both counterparts and entire length of this vein cannot be established (it is even not certain that R4+5 is forked); d cell pentagonal, almost symmetrical along its long axis, c. 1/5 as long as wing; cross vein m-m positioned

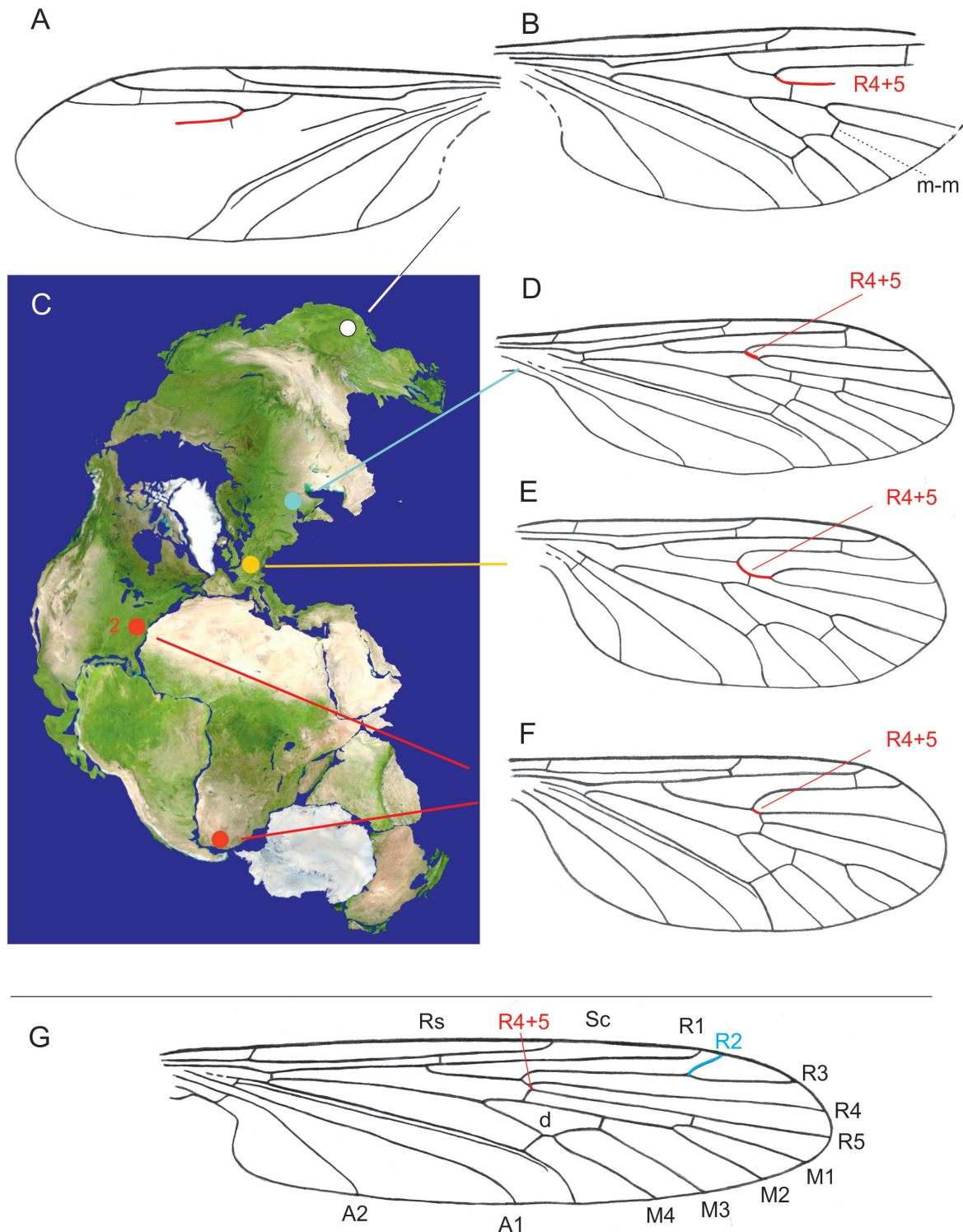


Fig. 1. Archilimoniidae (A-B, D-F), their distribution (C) and wing venation compared to Psychotipidae (G). A-B – *Triassochoristites jinsuoguensis* Hong & Guo, 2003, present reconstruction of a negative (A) and positive part (B), Middle Triassic, China. C – Triassic Pangea with localities of Archilimoniidae. D – *Mabelysia charlesi* Shcherbakov, 1995 (Shcherbakov et al. 1995: fig. 21), upper Middle Triassic, Kyrgyzstan; E – *Archilimonia vogesiana* Krzemiński & Krzemińska, 2003 (fig. 9B), lower Middle Triassic, Vosges Mts., France; F – *Metarchilimonia krzeminskorum* Blagoderov & Grimaldi, 2007 (Blagoderov et al. 2007: fig. 8c, d; present compilation is based on two wings), Upper Triassic, Virginia, USA. G. Psychotipidae: *Psychotipa predicta* Shcherbakov, 1995 (Shcherbakov et al. 1995: fig. 19, Kyrgyzstan, upper Middle Triassic). All wings are redrawn from original pictures cited here. Further explanations in text. Source of map (C): https://upload.wikimedia.org/wikipedia/commons/3/3a/Pangea_modern.png

between M2 and M3; crossvein m-cu distal of fork of M3+4 into M3 i M4; cell m4 parallel-sided, only very slightly constricted at end. A2 slightly wavy.

Remarks

Triassochoristites jinsuoguensis was described by Hong and Guo (2003) from the Tongchuan Formation, Shaanxi Province (China; Middle Triassic), in a new monotypic genus within the family Mesopanorpididae Tillyard, 1918, of the Mecoptera. Blagoderov et al. (2007: 3572) suggested that this species probably belongs to the family Vladipteridae within their concept and phylogeny of the infraorder Tipulomorpha. Vladipteridae is nowadays considered to belong to the Mecoptera, with the exception of the genus *Psychotipa* (Krzemiński and Krzemińska 2003). In the Systema Dipteriorum website (Evenhuis & Pape 2026) the Vladipteridae are given as “non Diptera”.

An erroneous interpretation of the venation by Hong and Guo resulted in recognition of this species as a mecopteran. Very good photographs of negative and positive parts of this specimen allowed us to reconstruct the venation (Fig. 1A-B) and to classify the species as a dipteron. Its venation resembles that of *Archilimonia* (Krzemiński and Krzemińska 2003; Fig. 1E, this paper), an oldest representative of the Archilimoniidae from the lowermost Middle Triassic of France (age of deposit: Gall and Grauvogel-Stamm 2005).

The Triassic family Archilimoniidae till now comprised three genera: *Archilimonia* (monotypic: *A. vogesiana* from Vosges Mts., lower Middle Triassic, France), *Mabelysia* Shcherbakov, 1995 (monotypic; *M. charlesi* Shcherbakov, 1995; Kyrgyzstan; upper Middle Triassic), *Metarchilimonia* Blagoderov & Grimaldi, 2007 (two species from USA, Upper Triassic: *M. krzeminskorum* Blagoderov & Grimaldi, 2007, and *M. solita* Blagoderov & Grimaldi, 2007). A third congener, *M. andersoni* Lukashevich, 2024, is based on the incomplete pupa and comes from South Africa, Upper Triassic. A recent addition of a fourth genus, *Triassochoristites*, from China evidences wide distribution of this oldest and most plesiomorphic family of the Tipulomorpha in various regions of the Triassic Pangea.

It is noteworthy to observe evolution of the d cell shape in the Archilimoniidae from the early Middle to the Upper Triassic (compare Fig. 1A-B, D-F). A far distal position of the crossvein m-m (between

M2 and M3) in eldest *Archilimonia* resulted in a large cell (1/3 of wing length), incised distally in an upper and lower (costal and anal) corners; this shape is repeated with the cell being smaller in *Triassochoristites*. In *Mabelysia* and *Metarchilimonia* the crossvein m-m is shifted proximad to connect M1+2 and M3 and the d cell acquires a shape common among other Tipulomorpha, including recent species.

Family Limoniidae Speiser, 1909

Syn. **Zhangobiidae** Evenhuis, 1994: 54, **syn. nov.**

Subfamily Architipulinae Handlirsch, 1906

Genus *Architipula* Handlirsch, 1906

Type species: *Architipula seebachiana* Handlirsch, 1906 [=seebachi (Geinitz, 1884)]. Lower Jurassic.

Syn. *Palaeolimnobia* Zhang, Zhang, Liu & Shangguan, 1986: 16; preocc. Bode 1953: 301.

Syn. *Zhangobia* Evenhuis, 1994: 54, **syn. nov.**

Architipula laiyangensis (Zhang, Zhang, Liu & Shangguan, 1986), **syn. nov.**

Syn. *Zhangobia laiyangensis* Evenhuis, 1994: 54.

Syn. *Palaeolimnobia laiyangensis* Zhang, Zhang, Liu & Shangguan, 1986: 16, 33.

Remarks

The generic name *Palaeolimnobia* appeared preoccupied by Bode (1953: 301) for a Jurassic genus of the Ptychopteridae from Braunschweig (Germany). Evenhuis (1994: 54) proposed the new names *Zhangobia* Evenhuis, 1994 and *Zhangobiidae* Evenhuis, 1994, in the Tipulomorpha.

The photographic documentation in Zhang et al. (1986: p. 39, pl 1, figs 1, 2) is of very poor quality. The analysis of an original drawing (p. 17, fig. 3b) allows us to consider *Palaeolimnobia* a junior synonym of *Architipula* Handlirsch, a speciose genus (43 species) from the Lower Jurassic to the Upper Cretaceous and mainly distributed in the West Palaearctic (32 species).

Genus *Ceuthoneura* Zhang, Zhang, Liu & Shangguan, 1986

Ceuthoneura Zhang, Zhang, Liu & Shangguan, 1986: 17, 34.

Type species: *Ceuthoneura dolichoptera* Zhang, Zhang, Liu & Shangguan, 1986: 19. Middle Jurassic of China. Monotypic.

Remarks

Zhang et al. (1986) described this genus and species in the Palaeolimnobiidae, along with *Palaeolimnobia laiyangensis*. The figures show only body and legs of the specimen, without any hints on wings. Its proclaimed similarity to *Palaeolimnobia*, the V-shaped thoracic suture, the long legs and small size indicate the family Limoniidae, but no further determination is possible. Therefore, the specimen shall be treated as a nomen dubium.

Genus ***Grimmenia*** Krzemiński & Zessin, 1990

Type species: *Architipula (Grimmenia) prima* Krzemiński & Zessin, 1990. Lower Jurassic, Germany.

Syn. *Mesotrichocera* Hong & Wang, 1990: 120; **syn. nov.**

[*Grimmenia* has a priority being published March, 1990, while *Mesotrichocera* was published October, 1990].

Grimmenia laiyangensis (Hong & Wang, 1990), **comb. nov.**

Syn. *Mesotrichocera laiyangensis* Hong & Wang 1990: 121, fig. 87.

Remarks

Hong and Wang (1990) described *Mesotrichocera laiyangensis* in the family Trichoceridae. Zhang J-F. (2006) challenged the position of this species in the Trichoceridae, but did not formally change it. The original drawing (Hong and Wang 1990: fig. 87) is of poor quality, apparently not based on a photograph, and with several errors in cubito-anal field. However, the following characters indicate the genus *Grimmenia* of the Limoniidae: a long R2+3+4, four medial veins, d cell wide, pentagonal, its anal (lower) margin straight, crossvein m-cu positioned in fork of M3+4. Therefore, with some hesitation, the genus *Mesotrichocera* is synonymized with *Grimmenia*, a genus known since the Lower Jurassic.

Subfamily **Limoniinae** Speiser, 1909

Genus: ***Helius*** Lepeletier & Serville, 1828

Type species *Limnobia longirostris* Meigen, 1818, by subsequent designation of Westwood (1840: 129), a recent species.

Helius ibericus Kania-Kłosok, Krzemiński & Arillo, **sp. nov.**

urn:lsid:zoobank.org:act:D38C89B4-126A-4DF8-9535-86A62061D2E9

Diagnosis. Rostrum only slightly longer than head; antennomeres 1-4 relatively massive and short, terminate just beyond head; first flagellomere twice larger than second; each flagellomere with two very long setae, approximately $4.5 \times$ longer than segments bearing them; palpus as long as rostrum; last palpomere approximately as long as second and third combined; penultimate palpomere very small and short, about $0.25 \times$ length of fourth palpomere.

Etymology. The new name alludes to the region where the holotype was found.

Material. Holotype No. MCNA 9946 (sex unidentified), Penacerrada, Álava, Spain, housed at the Museo de Ciencias Naturales de Álava, Vitoria, Spain.

Age and locality. The type specimen was found in amber from coal levels with abundant plant remains developed in delta plain areas which corresponds to the top of filling sequences of intertributary bays but it is also found in filling deposits of abandoned fluvial channels or crevasse splay, in the Utrillas Group (Barrón et al. 2015), Lower Cretaceous, upper Albain. The outcrop of Penacerrada I (Peñalver & Delclòs 2010) is located in the Basque-Cantabrian Basin, municipality of Moraza (Province of Burgos, Castilla y León Autonomous Community, northern Spain).

Description and a key to fossil congeners is in Kania-Kłosok et al. (2021) where the species was originally described as *Helius hispanicus* Kania-Kłosok, Krzemiński & Arillo. Due to an oversight, the article was not registered in the Official Register of Zoological Nomenclature (ZooBank) and thus is not published for the purposes of zoological nomenclature. In order to make the names available, a Code-compliant extract from that article is published here. The original name *Helius hispanicus* appeared preoccupied in this genus by Lackschewitz (1928) for a recent congeneric species from the West Palaearctic.

Helius turolensis Kania-Kłosok, Krzemiński & Arillo, **sp. nov.**

urn:lsid:zoobank.org:act:936DF832-DAFC-448B-B1E2-BC1A7C4924B1

Diagnosis. Rostrum only slightly longer than head; antennomeres 1-4 relatively slender and short,

terminates just beyond head; each flagellomere with two very elongate setae, approximately 6.7 x longer than length of segments bearing them; palpus longer than rostrum; last palpomere elongate, slender, longer than palpomeres 1-3 combined; third palpomere widened in basal part, about $0.3 \times$ length of fourth palpomere.

Etymology. The specific epithet is derived from Teruel, where the specimen was been found.

Material. Holotype No. SJ-10-54 (male), housed at the Fundación Conjunto Paleontológico de Teruel-Dinópolis (Teruel, Spain).

Age and locality. Amber from gray-black claystones in the Utrillas Group, Lower Cretaceous, upper Albian. The outcrop of San Just is located in the Maestrazgo Basin, municipality of Utrillas (Province of Teruel, Aragón Autonomous Community, eastern Spain).

Description is in [Kania-Kłosok et al. \(2021\)](#) where the species was originally described as *Helius turolensis* Kania-Kłosok, Krzemiński & Arillo. Due to an oversight, the article was not registered in the Official Register of Zoological Nomenclature (ZooBank) and thus is not published for the purposes of zoological nomenclature. In order to make the names available, a Code-compliant extract from that article is published here.

New replacement names

Subfamily *Chioneinae* Rondani, 1841

Cheilotrichia (Cheilotrichia) wightensis
Oosterbroek & Krzemiński, **nom. nov.**

[um:lsid:zoobank.org:act:A6F77CF4-42D7-4949-B2E0-AC8A86B7D3BD](https://doi.org/10.21203/rs.3.rs-1000000/v1)

Syn. *Cheilotrichia (Cheilotrichia) duplicata* Krzemiński, 2019, in: [Krzemiński et al. 2019](#): Earth and Env. Sci. Trans. Roy. Soc. Edinburgh 110: 507, fig. 21.

Etymology. The new species name is related to its locality, the Isle of Wight, Great Britain.

Age and locality. Upper Eocene, Isle of Wight, Great Britain.

Remark

The species name in this genus is preoccupied by the senior secondary homonym *Erioptera duplicata* Alexander, 1931, from Baltic amber, now in *Cheilotrichia*.

Subfamily *Limoniinae* Rondani, 1856

Dicranomyia (Dicranomyia) britannica
Krzemiński & Oosterbroek, **nom. nov.**

[um:lsid:zoobank.org:act:890380B8-4347-412D-83AA-3DFF35367E22](https://doi.org/10.21203/rs.3.rs-1000000/v1)

Syn. *Dicranomyia (Dicranomyia) fasciata* Krzemiński, 2019, in: [Krzemiński et al. 2019](#): Earth and Env. Sci. Trans. Roy. Soc. Edinburgh 110: 514; fig. 35.

Etymology. The new species name is related to Great Britain, the country of its locality.

Age and locality. Upper Eocene, Isle of Wight, Great Britain.

Remark

The species name in this genus is preoccupied by [Hutton \(1900\)](#) for a recent congeneric species in New Zealand.

Family *Tipulidae* Latreille, 1802

Tipula Linnaeus, 1758

Tipula (Tipula) jarzembowskii Kania-Kłosok & Nel,
nom. nov.

[um:lsid:zoobank.org:act:725152A5-7F26-4C16-AE40-D2B1C2D0A488](https://doi.org/10.21203/rs.3.rs-1000000/v1)

Syn. *Tipula (Tipula) oligocenica* Kania & Nel, 2013: Pol. J. Ent. 82: 330; fig. 2.

Etymology. The specific name is dedicated to the eminent paleontologist, Edmund A. Jarzembowski.

Age and locality. Upper Oligocene volcano-sedimentary paleolake of Bes-Konak, Türkiye.

Remark

Tipula oligocenica is preoccupied in this genus by [Savchenko \(1971: 57\)](#) as a new name for *Tipula maxima* Statz, 1934, because the latter name appeared earlier preoccupied by [Poda \(1761\)](#).

III. ACKNOWLEDGEMENTS

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IV. CONFLICT OF INTEREST

The authors declare no conflict of interest.

V. AUTHOR CONTRIBUTIONS

Research concept and design: WK, EK, PO. Writing the article: WK, EK, PO. Further assembly of data, Critical revision of the article and Final approval of article: all authors.

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