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Fieber's original drawings and their corresponding types for the family Issidae (Hemiptera, Fulgoromorpha) in the Muséum national d'Histoire naturelle of Paris, France

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Abstract

Lectotypes are designated for 10 species described by Fieber, deposited in MNHN, Paris: *Issus climacus* Fieber, 1876, *I. frontalis* Fieber, 1876, *I. truncatus* Fieber, 1876, *I. fissala* Fieber, 1876, *Hysteropterum angulare* Fieber, 1877, *H. melanophleps* Fieber, 1877, *H. fuscovenosum* Fieber, 1877, *H. striolatum* Fieber, 1877, *H. impressum* Fieber, 1877, *Mycterodus sulcatus* Fieber, 1876. *Iberanum nuragicum* Gnezdilov & Mazzoni, 2003 is placed in synonymy under *Hysteropterum fuscovenosum* Fieber, 1877 and *Issus novaki* Dlabola 1959 under *Issus frontalis* Fieber, 1876. A new genus *Thabenula* is erected for *Mycterodus sulcatus* Fieber, 1876. Six new generic combinations are proposed: *Hysteropterum melanophleps* Fieber, 1877 is transferred to the genus *Tingissus* Gnezdilov, 2003, *Hysteropterum fuscovenosum* Fieber, 1877 to the genus *Thabenyleps* Fieber, 1877 to the genus *Tshurtshurnella* Kusnezov, 1927 and *Issus fissala* Fieber, 1876 to the genus *Thabena* Stål, 1866. Fourteen species described by Fieber are illustrated with his original drawings.

Key words: Taxonomy, nomenclature, type designation, new genus, new combination, synonymy

Introduction

During our study of the issid collection of the Muséum National d'Histoire Naturelle (Paris, France) the type specimens for ten of F.X. Fieber's species were recognised within Puton's and Noualhier-Lethierry's collections. The identification of Fieber's types became possible after comparison of the specimens with the original Fieber's descriptions and drawings that were recently rediscovered in the Paris entomological library.

F.X. Fieber (1807–1872) published 18 papers on Auchenorrhyncha between 1844 and 1885 (Metcalf, 1942). In these he described 20 issid species, 17 of which are considered valid, in two papers (translated from German to French by Ferdinand Reiber) published after Fieber's death (Fieber, 1876, 1877). All of Fieber's publications concerned the European fauna. However, after examination of the type specimens of *Issus fissala* Fieber, 1876 and *Mycterodus sulcatus* Fieber, 1876 it was clear that these species belong to the Oriental fauna. It is still an open question how this material came to Fieber and why these two species were recorded from Europe.

Redefinition of Fieber's species was started by Dlabola who figured (Dlabola, 1980, figs 200–207) and accordingly validated the male lectotype for *Hysteropterum suturale* Fieber, 1877 (as *Bubastia suturale*) designated in NMW. Gnezdilov (2003) has recognised the holotype by monotypy for *Hysteropterum nervosum* Fieber, 1877 (as *Kervillea nervosa*) which was described based on a female from Southern Europe within Ullrich's Collection in NMW. Recently Holzinger, Kammerlander & Nickel (2003) designated the lectotype for *Hysteropterum bilobum* Fieber, 1877 (as *Agalmatium bilobum*) in PC.

Kerzhner & Matocq (1994) discovered that Fieber's specimens of Heteroptera in Puton's and Noualhier's collections are usually labelled by a green square. It is important to note that it is not always the case: some types may have different labels and specimens with such green square labels are not necessarily Fieber's types. This indication is here confirmed also for Fieber's specimens of Issidae.

Material and methods

To stabilize the nomenclature in the group (ICZN 1999: Art. 74), we determine the primary type status for specimens from Puton's and Noualhier-Lethierry's personal collections deposited in the Muséum National d'Histoire Naturelle (Paris, France).

Photographs of the specimens were made with Nikon video camera SMZ 1500, images are produced using the software ACT-2U Combine Z5.

For several of the species studied here, Metcalf's catalogue (1958) provides the reference with two pages: i.e. "264 (254)". The first refers to the original publication in the *Revue et Magasin de Zoologie* while the second refers to the separate of the same publication. The pagination is different since each separate is renumbered and starts at page 1. Later on, some of these separates were bound together into books. Some of these volumes are still available, which is the case in the Paris entomological library or on the web, in the Biodiversity Heritage Library. This explains the discrepancy concerning the page numbers given in the literature.

Abbreviations

MNHN: Muséum national d'Histoire naturelle, Paris, France NMW: Naturhistorisches Museum, Wien, Austria PC: Puton Collection (in MNHN) NLC: Noualhier-Lethierry Collection, (in MNHN) MC: Mangini Collection, (in MNHN)

Fieber's original drawings and manuscript

As long known, Fieber's handwritten manuscript in German with descriptions of European Auchenorrhyncha is kept in the entomological library of MNHN. The manuscript is registered as a gift from Maurice Noualhier in the "Livre particulier d'entrée, des instruments, livres, meubles et autres objets composant le matériel du laboratoire" (1867-1955) of the library, under number 84 of the year 1898. Noualhier died on the 7th of April 1898, so the manuscript was most likely given by his family after his death. It was translated into French by Ferdinand Reiber and mostly published in "*Revue et magasin de zoologie*" from 1875 to 1879.

Recently, a parcel with books of original drawings by Fieber of various Hemiptera species, kept also in the entomological library in Paris, was re-examined. The pencil and water coloured drawings were meant to illustrate the manuscript but remained unpublished. Forty-three species recognised as issids at those time by Fieber are represented on these plates. Fourteen of these species are illustrated and described as new by Fieber and are presented in this article. Each drawing corresponds to a type specimen examined and then drawn by Fieber as he clearly mentions it in his book preface presented in the first publication of 1875. Generally each species is illustrated on a small plate 3.7 cm high by 5.7 cm wide. These species plates are assembled on a larger plate 18.5 cm high by 11.5 cm wide containing a total of 10 small plates each. In total 7 of these large plates were available for the issids comprising the 43 issid species *sensu* Fieber. It appears that after the death of Fieber in 1872, the manuscript with its preface and these illustrations were separated.

First the manuscript was given by the family to an editor in Vienna for publication as reported by Puton (1872) but it was never published since the manuscript was incomplete. It was later bought by Auguste Jean Baptiste Puton, Ferdinand Reiber and Lucien François Lethierry as written by Lethierry (1875), then translated by Reiber and completed for the missing genera by Puton and Lethierry. It was finally published in different parts in the *"Revue et magasin de zoologie"* between 1875 and 1879. Note that Reiber's name was misspelt as "Rieber" in the article of 1876.

The drawings that were missing after Fieber's death as mentioned by Puton (1872), reappeared as the property of Lethierry and Puton as reported in the footnote in the preface of Fieber (1875). These plates were sent later by Puton to Professor Louis Eugène Bouvier, appointed to the chair of the articulated animals of the Muséum national d'Histoire naturelle in 1895 until his retirement in 1931. The pencil and water coloured drawings were kept in this original wooden parcel until deposited in the library.

Family ISSIDAE SPINOLA, 1839 Subfamily ISSINAE SPINOLA, 1839 Tribe ISSINI SPINOLA, 1839 Subtribe ISSINA SPINOLA, 1839 GENUS *ISSUS* FABRICIUS, 1803

Issus climacus Fieber, 1876

Issus climacus Fieber, 1876: 266, [separata 1876: 256] (Fig. 1)

Type material examined. \bigcirc , lectotype (here designated) (MNHN(EH)7475), with Noualhier's hand-written label: "Type Fieber" (NLC).

Note. The species was based on a female (or females) from Portugal. The female from NLC corresponds to Fieber's drawings (hind margin of VII sternum with characteristic two small horn-shaped acuminate projections medially) and it is here designated as the lectotype.

Sergel (1986) examined two males from Madrid, deposited in the NMW, determined by Melichar as *Issus clima-cus*, and figured their genitalia. The taxonomic position of this material is unclear. Sergel (1986) reinstated *I. clima-cus* from synonymy with *I. lauri* Ahrens, 1814 which had been proposed by Haupt (1926).

Issus frontalis Fieber, 1876

Issus frontalis Fieber, 1876: 264, [separata 1876: 254] *Issus novaki* Dlabola 1959: 152, **syn. n.** *Issus truncatus sensu* Holzinger, Kammerlander & Nickel 2003: 451, fig. 247. (Fig. 2)

Type material examined. ♂, lectotype (here designated) (MNHN(EH)7476), with hand-written label: "Görz" (NLC); ♂, paralectotype (MNHN(EH)7477), with Noualhier's hand-written label: "Type Fieber" (NLC).

Note. Fieber mentioned Italy, Southern France, and Tyrol as type localities for the species. According to Fieber's manuscript he studied at least a male and a female. Two males from NLC correspond to Fieber's drawings (male genitalia are figured). The male from Görz (Austria, Tyrol) is here designated as the lectotype and another male without geographical label is here recognised as a paralectotype. Apparently the last male was figured by Fieber, because it has genitalic complex exposed and accordingly this male is from Croatia as written on the drawing. We prefer to designate the specimen from Görz as the lectotype because Tyrol was mentioned as one of the type localities while Croatia was not. In NLC and PC there are also females in a row "*Issus frontalis*", but their taxonomic position is unclear, because identification is only possible for males. These may be the female specimens mentioned by Fieber (1876) in his original description of the species and, if so, are paralectotypes.

The synonymy of *I. frontalis* and *I. muscaeformis* proposed by Löw (1883) and supported by Holzinger, Kammerlander & Nickel (2003) is incorrect.

Issus muscaeformis (Schrank, 1781)

Cicada muscaeformis Schrank, 1781: 253 *Issus truncatus* Fieber, 1876: 265, syn. fide Melichar, 1906: 192 *Issus frontalis sensu* Holzinger, Kammerlander & Nickel 2003: 449 (Fig. 3)

Type material examined. \mathcal{J} , lectotype (here designated) of *Issus truncatus* Fieber (MNHN(EH)7478), with Noualhier's hand-written label: "Type Fieber" (NLC).

Note. *I. truncatus* was based on a male (or males) from Southern France. The male from NLC corresponds to Fieber's drawings (male genitalia are figured) and it is here designated as lectotype.

I. truncatus was placed in synonymy with *I. muscaeformis* by Melichar (1906). The synonymy of *I. truncatus* and *I. novaki* Dlabola, 1959, proposed by Holzinger, Kammerlander & Nickel (2003), is incorrect.

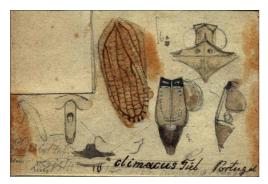


FIGURE 1—*Issus climacus* Fieber, 1876 (as "*climacus* Fieb").



FIGURE 2—*Issus frontalis* Fieber, 1876 (as "*frontalis* Fieb").



FIGURE 3—*Issus muscaeformis* (Schrank, 1781) (as "*truncatus* Fieb").



FIGURE 4—*Latissus dilatatus* (Fourcroy, 1785) (as "*luteus* Fieb").



FIGURE 5—*Tingissus melanophleps* (Fieber, 1877) (as "*melanophleps*").



FIGURE 6—*Iberanum fuscovenosum* (Fieber, 1877) (as "*fuscovenosum*").



FIGURE 7—*Bubastia obsoleta* (Fieber, 1877) (as "*H. obsoletum* Fieb").



FIGURE 8—*Palmallorcus phaeophleps* (Fieber, 1877) (as "*phaeophleps*").

GENUS LATISSUS DLABOLA, 1974

Latissus dilatatus (Fourcroy, 1785)

Cicada dilatata de Fourcroy, 1785: 193. *Latissus dilatatus* (Fourcroy), Dlabola, 1974: 299. *Issus luteus* Fieber, 1876: 260, syn. fide Puton, 1899: 105. (Fig. 4)

Note. *Issus luteus* was based probably on two males from Italy. In NLC there is a male with Noualhier's hand-written label: "Type Fieber", but without a small green square and with genital segments invisible externally, while Fieber has figured the male genitalia of possibly a second specimen. We prefer to designate a male with exposed male genitalia as a lectotype if one can be found in the future.

SUBTRIBE AGALMATIINA GNEZDILOV, 2002

GENUS TINGISSUS GNEZDILOV, 2003

Tingissus melanophleps (Fieber, 1877), **comb. n.** *Hysteropterum melanophleps* Fieber, 1877: 5 *Hysteropterum melanophleps* (Fieber), Dlabola, 1984: 31, figs. 16-26 *Agalmatium melanophleps* (Fieber), Gnezdilov, 2003: 77 (Fig. 5)

Type material examined. \bigcirc , lectotype (here designated) (MNHN(EH)7470) (PC).

Note. The species was based on a female (or females) from Bielsa (Huesca Province of Spain) collected by (or received from) Scott. The female from PC without label corresponds to Fieber's drawings and it is here designated as lectotype.

The species belongs to the genus *Tingissus* Gnezdilov, 2003, according to the characteristic rounded transverse keels on the gonoplacs, the anal tube twice as long as wide and the presence of 7 intermediate spines on the first metatarsomere apically. Dlabola (1984) figured male genitalia of *H. melanophleps* but incorrectly placed *H. fuscovenosum* Fieber, 1877 (see below) and *H. guadarramense* Melichar, 1906 in synonymy under it. Examination of the types of all mentioned species supported their validity (Gnezdilov, 2010 and present data). Recently Gnezdilov (2003) incorrectly transferred *H. melanophleps* to the genus *Agalmatium* Emeljanov, 1971.

GENUS IBERANUM GNEZDILOV, 2003

Iberanum fuscovenosum (Fieber, 1877), comb. n. *Hysteropterum fuscovenosum* Fieber, 1877: 29 *Iberanum nuragicum* Gnezdilov & Mazzoni, 2003: 355, syn. n. (Fig. 6)

Type material examined. \Im , lectotype (here designated) (MNHN(EH)7471), with hand-written label: "Muls" and small white rectangular (PC); \Im , paralectotype (MNHN(EH)7479), with small green square (NLC). Other material examined. Italy, Sardegna: $1\Im$, $2 \Im$, Porto Santoru, 13.VI.1936, F. Hartig (MC) MNHN(EH)16444-16446.

Notes. The species was based on a male (or males) from Southern France collected by (or received from) Mulsant. The male from PC, with unbent fore wing and exposed genitalia, with hand-written label "Muls" (apparently meaning Mulsant) corresponds to Fieber's drawings (male genitalia were figured) and is designated here as the lectotype. The male from NLC, with small green square is therefore a paralectotype.

H. fuscovenosum Fieber belongs to the genus *Iberanum* Gnezdilov, 2003 and according to the structure of the male genitalia is a senior synonym of *Iberanum nuragicum* Gnezdilov & Mazzoni, 2003 described from Sardinia (Gnezdilov & Mazzoni, 2003). Recently the species was recorded also from Corsica (Gnezdilov, 2010).

SUBTRIBE HYSTEROPTERINA MELICHAR, 1906

GENUS BUBASTIA EMELJANOV, 1975

Bubastia obsoleta (Fieber, 1877)

Hysteropterum obsoletum Fieber, 1877: 24 *Bubastia obsoleta* (Fieber), Dlabola 1980: 229 (Fig. 7)

Note. The species was based on a male (or males) and a female (or females) from Dalmatia collected by (or received from) Erber. In PC there is a female labelled with small grey and blue squares and in NLC there is a female labelled with a small green square. However Fieber figured both male and female genitalia. We prefer to designate a male as a lectotype if one can be found in the future and these two female specimens are left here as syntypes.

GENUS PALMALLORCUS GNEZDILOV, 2003

Palmallorcus phaeophleps (Fieber, 1877), comb. n.

Hysteropterum phaeophleps Fieber, 1877: 6 (Fig. 8)

Note. The species was based on a male (or males) from Italy. No type material has been located. According to Fieber's drawing the species probably belongs to the genus *Palmallorcus* Gnezdilov, 2003.

GENUS THABENA STÅL, 1866

Thabena fissala (Fieber, 1876), comb. n.

Issus fissala Fieber, 1876: 259, [separata 1876: 249] (Figs 9; 10A, B)

Type material examined. Lectotype (here designated) (MNHN(EH)7480) (specimen without abdomen), with Noualhier's hand-written label: "Type Fieber" (NLC).

Note. The species was based on a male (or males) from Portugal (in Fieber's manuscript: "Aus Portugal (Fieber)"). The specimen from NLC corresponds to Fieber's drawings and this is here designated as lectotype.

I. fissala belongs to the Oriental genus *Thabena* Stål, 1866, redefined recently by Gnezdilov (2009), according to the features: metope with median carina crossed by transverse carina below its upper margin, fore wings narrowing apically, without hypocostal plate, clavus with cuspidal caudo-dorsal angle, hind wings well developed, bilobed. Fieber figured a very wide male anal tube which is also a characteristic feature of some species of the genus *Thabena*.

GENUS TSHURTSHURNELLA KUSNEZOV, 1927

Tshurtshurnella striolata (Fieber, 1877), comb. n.

Hysteropterum striolatum Fieber, 1877: 32 (Figs 11; 12A, B; 13A, B)

Type material examined. \mathcal{J} , lectotype (here designated) (MNHN(EH)7472), labelled with a small light blue square (PC). \mathcal{Q} , paralectotype (MNHN(EH)7481), labelled with a small green square (NLC).

Note. The species was based on a male (or males) and a female (or females) from Greece. The male with exposed genitalia from PC corresponds to Fieber's drawings (male genitalia were figured) and it is here designated as the lectotype with the female from NLC corresponding to Fieber's drawings therefore a paralectotype.

H. striolatum is closely related to Tshurtshurnella zelleri (Kirshbaum, 1868) and T. uvarovi Gnezdilov, 2002

according to the structure of male genitalia (Dlabola, 1979, figs 1-9; Gnezdilov, 2002, figs 19-26). *H. striolatum* was incorrectly placed in synonymy under *Falcidius apterus* (Fabricius, 1794) by Metcalf (1958).



FIGURE 9-Thabena fissala (Fieber, 1876) (as "fissala").

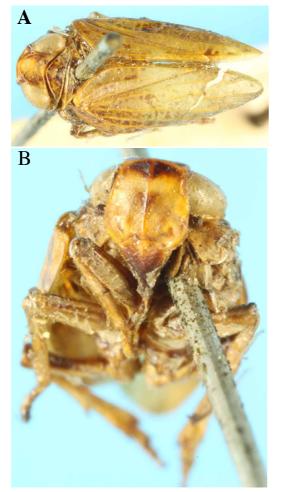


FIGURE 10—*Thabena fissala* (Fieber, 1876): A, dorsal view; B, frontal view.



FIGURE 11—*Tshurtshurnella striolata* (Fieber, 1877) (as "*striolatum*").

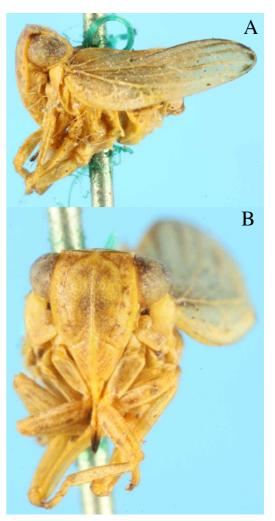


FIGURE 12—*Tshurtshurnella striolata* (Fieber, 1877): A, lateral view; B, frontal view.

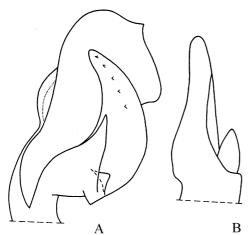


FIGURE 13—*Tshurtshurnella striolata* (Fieber, 1877), male genitalia: A, penis, lateral view; B, anal tube, lateral view.



FIGURE 14—*Fieberium impressum* (Fieber, 1877) (as "*impressum*").



FIGURE 15—*Bergevinium angulare* (Fieber, 1877) (as "*angulare*").

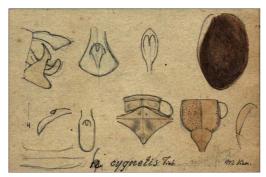


FIGURE 16—*Latematium cygnetis* (Fieber, 1877) (as "*cygnetis* Fieb").



FIGURE 17—*Thabenula sulcata* (Fieber, 1876) (as *"sulcatus* Fieb").



FIGURE 18—*Thabenula sulcata* (Fieber, 1876): A, dorsal view; B, frontal view; C, hind wing.

GENUS FIEBERIUM DLABOLA, 1980

Fieberium impressum (Fieber, 1877)

Hysteropterum impressum Fieber, 1877: 31 Fieberium impressum (Fieber), Dlabola 1980: 233 (Fig. 14)

Type material examined. \bigcirc , lectotype (here designated) (MNHN(EH)7473), with hand-written label "Madrid" and small green square (PC). \bigcirc , paralectotype (MNHN(EH)7482), with hand-written label "Espagne" and small green square (NLC).

Note. The species was based on females from Spain collected by (or received from) Puton and Lethierry. In both PC and NLC there are two females labelled with small green squares. We prefer to designate the female in PC as the lectotype because Fieber wrote on his drawing "Puton, madrd" (as written), which means that the female in NLC is a paralectotype.

GENUS BERGEVINIUM GNEZDILOV, 2003

Bergevinium angulare (Fieber, 1877)

Hysteropterum angulare Fieber, 1877: 39 *Fieberium angulare* (Fieber), Dlabola 1984: 36 *Bergevinium angulare* (Fieber), Gnezdilov 2003: 60 (Fig. 15)

Type material examined. \Diamond , lectotype (here designated) (MNHN(EH)7483), with hand-written label "Malaga" and small green square (NLC). \bigcirc , paralectotype (MNHN(EH)7484), with hand-written label "Malaga" and small green square (NLC).

Note. The species was based on a male (or males) and a female (or females) from Malaga in Spain. In NLC there are a male (with exposed genitalia) and a female, both corresponding to Fieber's drawings (male and female genitalia were figured) and the male is designated here as the lectotype with the female therefore a paralectotype.

GENUS LATEMATIUM DLABOLA, 1979

Latematium cygnetis (Fieber, 1877)

Hysteropterum cygnetis Fieber, 1877: 27 Falcidius cygnetis (Fieber), Dlabola 1979: 280 Latematium cygnetis (Fieber), Gnezdilov 2003: 67 (Fig. 16)

Type material examined. 1 $\stackrel{?}{\circ}$ syntype (MNHN(EH)7485), with printed label: "Mann, 1862, Spalato" and small green square (NLC). 1 $\stackrel{\circ}{\downarrow}$ syntype (MNHN(EH)7474), with small green square (PC).

Note. The species was based on a male (or males) and a female (or females) from Dalmatia (Spalato). According to Fieber's manuscript the specimens are in NMW. This was confirmed by Gnezdilov (2003) who studied male and female syntypes deposited in NMW. We therefore prefer to leave all the specimens in NLC and PC as syntypes until a lectotype is designated from the material in NMW.

Thabenula gen. nov.

Type species: Mycterodus sulcatus Fieber, 1876: 251, [separata 1876: 241]

Diagnosis

Metope with lateral keels turned at right angle and joined to lateral margins of coryphe. Sublateral carinae present only in apical part of metope. Sublateral carinae of metope fused apically below anterior margin of coryphe. Median carina of metope distinct only in upper ¼. Clypeus with angularly convex metopoclypeal suture. Postclypeus flattened dorsally, without keels. Antennal pedicel cylindrical. Rostrum reaching hind coxae. Coryphe elongate, with triangular anterior part and with weak median carina. Pronotum with convex anterior margin and straight posterior margin. Paradiscal fields narrow. Paranotal lobes large. Mesonotum longer than pronotum, with median carina. Fore wings narrowing apically, without hypocostal plate. Radius bifurcate, media trifurcate, cubitus anterior simple (R 2, M 3, CuA 1). Radius bifurcated near to its base, media at middle of wing. Clavus 0.7 times as long as wing, with cuspidal caudo-dorsal angle. Cubitus posterior turned at obtuse angle before caudo-dorsal angle of clavus and reaching wing margin beyond claval apex. Each hind wing in shape of two equal lobes, with anterior margin concave and with deep cleft between remigium and vannus. Radius, cubitus anterior and cubitus posterior, and first anal veins simple, media and postcubitus bifurcate (R 1 M 2 CuA 1 CuP 1 Pcu 2 A₁ 1). Cubitus anterior and cubitus posterior fused before notch of wing margin. Hind margin of female VII sternum with large square median process. Anal tube elongate. Anal column short.

Comparison

Externally similar to the genus *Mycterodus* Spinola. The new genus is closely related to the Oriental genus *Thabena* Stål, 1866 (*sensu* Gnezdilov, 2009) according to the lateral keels of metope angularly turned to the anterior margin of the coryphe, the venation of fore wings, the clavus with cuspidal caudo-dorsal angle, cubitus posterior of fore wing reaching wing margin beyond claval apex, the bilobed hind wings and the hind margin of female VII sternum with a large median process. It differs from *Thabena* by the triangular anterior part of the coryphe and the more narrow vannus of the hind wings.

Etymology

The generic name is derived from Thabena to which it is closely related. Feminine in gender.

Thabenula sulcata (Fieber, 1876), comb. n.

Mycterodus sulcatus Fieber, 1876: 251, [separata 1876: 241] (Figs 17; 18A–C)

Type material examined. \bigcirc , lectotype (here designated) (MNHN(EH)7486), with small green square and Noualhier's hand-written label: "*Mycterodus sulcatus* Fieb." (NLC).

Total length. 7.0 mm.

Note. The species was described based on a female (or females) collected in Sicily (Italy). The female specimen in NLC with bilobed hind wings pasted on paper square corresponds to Fieber's drawings and it is here designated as the lectotype.

Acknowledgements

We are sincerely grateful to Dr. Dominique Pluot-Sigwalt and Mr. Armand Matocq (Paris, France) for useful references and discussion, Mr. Laurent Fauvre (Paris, France) for the photos of type specimens, Prof. Claude Dupuy (Paris, France) who gave us some advices for our search on the history of the documents and to reviewer who provided very interesting comments on the manuscript. First author was financially supported by a MNHN grant for invited scientists.

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