

NOTES ON TWO BRITISH SPECIES OF
NEUROPTERA (*BORIOMYIA MORTONI* (McL.) AND
B. KILLINGTONI (MORTON)), WITH A DESCRIPTION OF
A NEW SPECIES OF THE *MORTONI* GROUP OF
*BORIOMYIA**

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A request from Dr. Bo Tjeder, of Lund, for information about the species *Boriomyia mortoni* (McLachlan) and *B. killingtoni* (Morton) has led me to undertake an investigation of the types of the former species. Owing to war-time conditions, the latter were not available to the late Lt.-Col. F. C. Fraser when he was preparing his paper to validate Morton's manuscript name *Kimminsia killingtoni* for the mis-identified species *B. mortoni* (McLachlan, partim), Killington and others. Tjeder sent me drawings of the male and female genitalia of three species of the *mortoni* group, to which he had applied the names *mortoni* McL., *killingtoni* Morton and *enontekiensis* Klingstedt. He was satisfied that the two latter were correctly applied but was doubtful about *mortoni*.

There were no authentic examples of *mortoni* in the British Museum (Natural History), but through the kindness of Mr. A. R. Waterston, I have been able to study the entire series of *B. mortoni* (sens. lat.) from the K. J. Morton collection, now in the Royal Scottish Museum. *Hemerobius mortoni* was described by McLachlan in 1899, who based his description upon a long series of examples from various European localities, and who stated that the types (both sexes) were taken by Morton at Rannoch (Scotland). Shortly before he died, Morton wrote to Fraser that two species were confused under the name *mortoni* in his collection and that the bulk of the material was distinct from the types. As this second species was the one which Killington had described and figured as *mortoni* in his Ray Society monograph, Morton proposed to call it *killingtoni*. In 1942, Fraser included the relevant correspondence with other notes as a posthumous publication of the name by Morton.

Examination of the Morton series of specimens confirmed, as might be expected, the presence of two species, distinct not only in

*In this paper I have followed the practice of Dr. Tjeder and have used the name *Boriomyia* (sensu Banks, 1905) in place of *Kimminsia* Killington, 1937. My reasons for so doing are set out in an application to the International Commission on Zoological Nomenclature to validate the name *Boriomyia* Banks in the sense which the author originally intended.

genital structure of the male and female, but also in general appearance. Comparison of the genitalia with the figures sent me by Tjeder justifies Morton's suggestion (see Fraser's 1942 paper) that *mortoni* McLachlan and *enontekiensis* Klingstedt are synonymous, the former, of course, having priority. Tjeder had originally opposed this suggestion on the grounds that the description of *mortoni* mentioned that there were dense tufts of golden hair on the dorsum of the male abdomen towards the apex, which were lacking in *enontekiensis*. The Morton Collection contains not only the male and female types of *mortoni*, but also a female from Balerno (Midlothian) and a male and female from Domaas, Norway. (Tjeder informs me that this locality is now generally spelt Dombas). Unfortunately neither of these males has retained its abdomen in its original state (dry), both having been cleared in caustic potash and mounted in Canada balsam by Morton, when investigating the possibility of a second species in the *mortoni* group. In these preparations there is now no dense tuft of golden hairs on the abdominal tergites, nor are the hair sockets unusually dense.

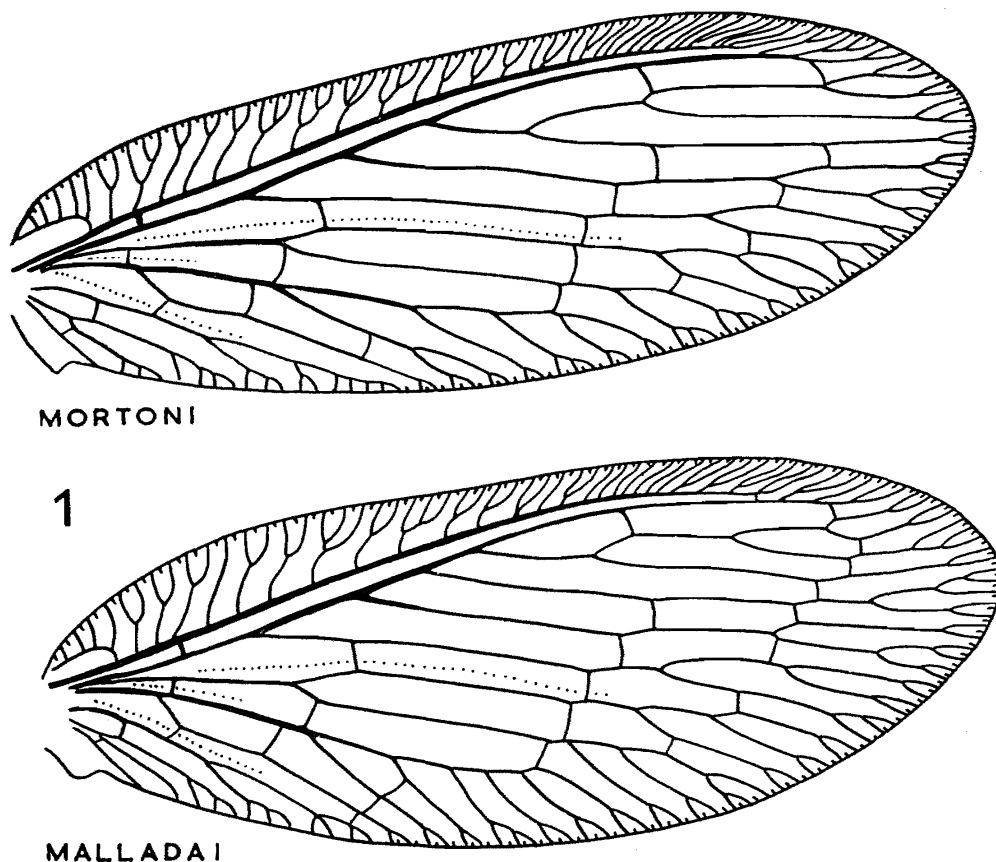


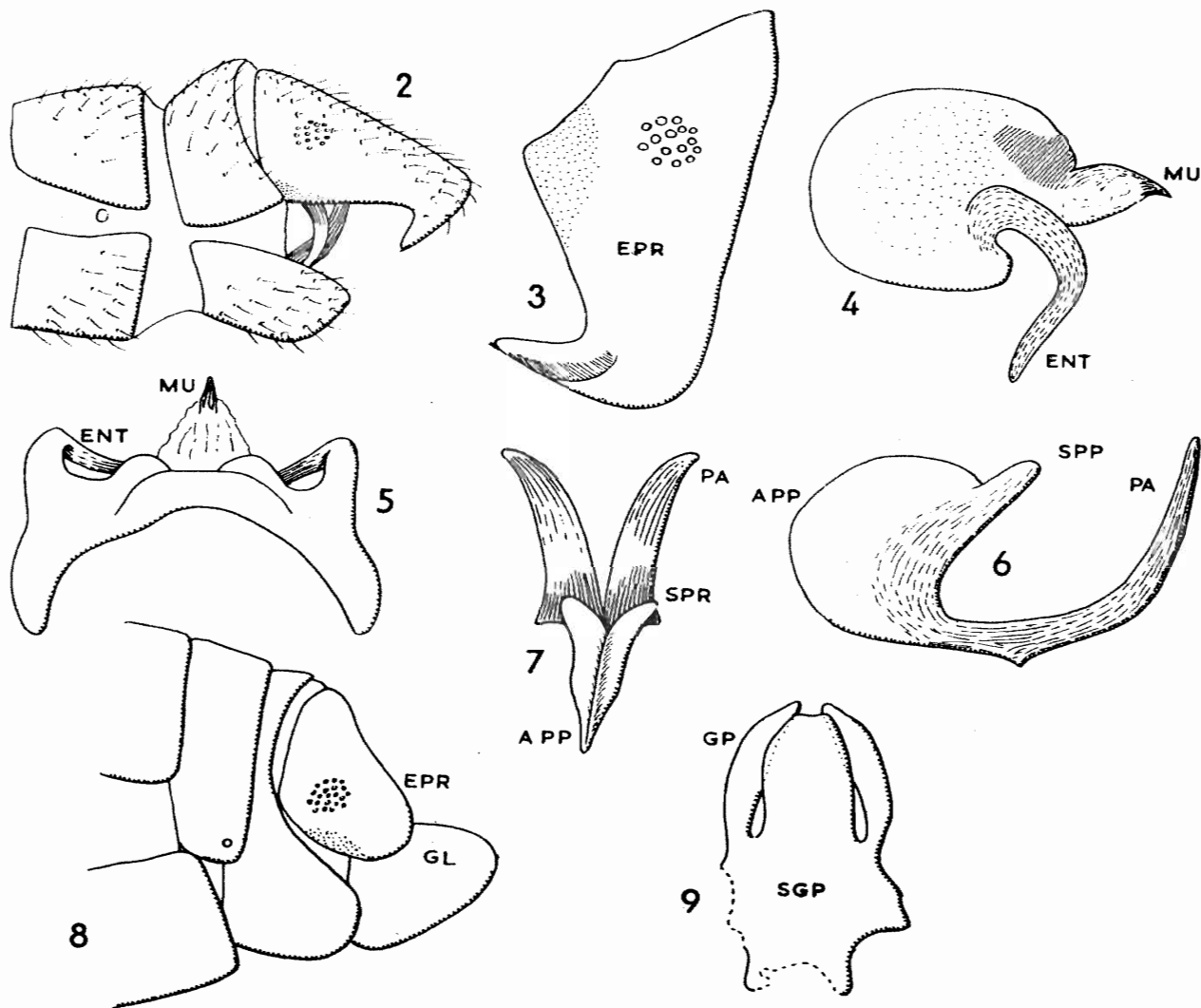
Fig. 1: Fore wings of *Boriomyia mortoni* (McL.)—♂ lectotype (upper), and *B. malladai* (Navás) (lower).

Preparations of *killingtoni* males made at the same time by Morton do show a dense clothing of hairs on the tergites, so that these hairs are not necessarily removed in the process of clearing and mounting in Canada balsam. It seems justifiable therefore to assume that the male type of *mortoni* and the male from Dombas did not possess a dense tuft of golden hairs in life, especially as the male genitalia agree in structure with *enontekiensis*, which is also without the dense golden tufts. The McLachlan collection possesses a long series (of *mortoni* sens. lat.), all of which prove to be *killingtoni* Morton, the males possessing the dense golden tufts. It would therefore appear that McLachlan drew up his description of *mortoni* largely from his own collection, but specified as types the pair in Morton's collection, from the male of which Morton prepared the illustration of the anal appendages for McLachlan's paper. This is the illustration referred to by Morton in his letter to Fraser as 'the quite imperfect figure of the male appendages.' We have thus the curious case of McLachlan specifying as types of *mortoni*, two specimens (possibly the only two) which are specifically distinct from the remainder of his type-series.

As the types of *mortoni* McLachlan have not been discussed since the original composite description, it seems desirable to give a brief description, mentioning the features in which they differ from Killington's descriptions and figures of *mortoni* (= *killingtoni* Morton) in his Ray Society monograph.

Head as in *killingtoni*. Thorax testaceous, meso- and metanota faintly brownish at sides. Legs as in *killingtoni*. Forewing relatively narrower than in *killingtoni*, pale yellowish grey. Membrane with pale fuscous sagittate markings. Longitudinal veins pale, with numerous dots or short streaks of fuscous (not dark with pale streaks as in *killingtoni*). Radius with normally three branches. Cross-veins mainly fuscous, gradates clouded with fuscous. Hind wing clear pale grey, margins scarcely shaded. Abdomen fuscous, male apparently without a conspicuous tuft of golden hairs on dorsum before apex. Epiprocts (EPR) of male broad basally, tapering towards the apex, which is truncate, its lower angle triangularly produced downwards and inwards and armed on its inner surface with a curved row of comb-like teeth. Extreme apex acute, not serrate. Mediuncus (MU) short, in the type directed caudad, but capable of being bent downwards. In side view there is the appearance of a ventral tooth near the apex. Entoprocessi (ENT) long, slender, bent downwards and inwards about midway. Parameres (PA) slender, fused basally. In side view they are upcurved, broader and divergent in dorsal view, tapering to acute apices. Superprocessi (SPP) in side view forming short, divergent, spatulate projections.

The description and figures of the male genitalia have been made from the type (Figs. 2-9). In Morton's preparation, the abdomen had rolled, presenting a semi-lateral aspect, unsuitable for illustration. The Canada balsam was therefore dissolved from the preparation and the figures were made from the abdomen in glycerine. The preparation has since been remounted in Canada balsam. Morton's preparation of the female anal appendages was in poor condition, having been badly torn by him in endeavouring to dissect out the



Figs. 2-9: Genitalia of *Boriomyia mortoni* (McL.)—2-7, ♂ lectotype, 8-9, ♀ lectoallotype; (2) apex of abdomen, lateral; (3) epiproct, lateral; (4) gonarcus, lateral; (5) the same, dorsal; (6) parameres, lateral; (7) the same, dorsal; (8) apex of abdomen, lateral; (9) subgenital plate, dorsal.

subgenital plate (SGP). In his preparation the latter was considerably tilted and foreshortened. In order to make an illustration of it, the balsam was similarly dissolved away and the preparation remounted with the subgenital plate under a separate cover glass. The anal appendages were too damaged for figuring but enough could be seen sufficiently to decide that another of Morton's preparations was conspecific, and the lateral aspect has therefore been made from this example from Dombas, Norway.

The gonapophyses laterales (GL) differ slightly in shape from those of *enontekiensis* Klingstedt, as depicted in sketches sent me by Tjeder, being relatively a little shorter and broader and with the lower margin slightly convex rather than concave. The subgenital plate of the allotype of *mortoni* is practically identical with that of *enontekiensis*. The base is narrow, then expanded and gradually tapering to a narrow, truncate apex. The gonapophyses posteriores (GP) are slender, free for most of their length, slightly incurved, about half the length of the subgenital plate.

I take this opportunity of designating the Rannoch male as the lectotype of *Hemerobius mortoni* McLachlan, 1899. It bears the following labels, 'Rannoch, 11-14.vi.1898, K. J. Morton,' 'Type,' '*Kimminsia mortoni* McLachlan, 1899, Type, det. A. R. Waterston' and '*Hemerobius mortoni* McL., ♂, Lectotype, det. D. E. Kimmins, 1961.' Part of the abdomen and the anal appendages are mounted as a separate preparation in Canada balsam. The Rannoch female is designated lectoallotype and is similarly labelled, with the addition of a label 'See preparation for abdomen' and my label '*Hemerobius mortoni* McL., ♀, Lectoallotype, det. D. E. Kimmins, 1961.' Anal appendages mounted in Canada balsam as a separate preparation. Both the types and their preparations are housed in the Morton Collection, Royal Scottish Museum, Edinburgh.

Whilst I was working on this paper, Tjeder drew my attention to the description of *Hemerobius malladai* Navás, from Bulgaria (a species which Navás compared with *H. subnebulosus* Stephens), and suggested that it might be a senior synonym of a species in the *mortoni* group. Through the kindness of Dr. K. K. Günther, of the Zoological Museum, Berlin, I have been able to study the type of *malladai* Navás. It is a *Boriomyia* and examination of the cleared anal appendages of the male shows that it is so close to the species which we have been calling *killingtoni* Morton that the two cannot be considered other than conspecific. *Boriomyia malladai* Navás therefore replaces *Kimminsia killingtoni* Morton in the list of British Neuroptera.

Boriomyia malladai (Navás)

Hemerobius malladai Navás, 1925, *Rev. Acad. Ci. Zaragoza*, **9**:30-32, Figs. 7a, b.

Hemerobius mortoni McLachlan, 1899, *Ent. mon. Mag.* **35**:79 (partim).

Boriomyia mortoni (McLachlan), Killington, 1937, *Mon. Brit. Neur.* **2**:70-73, pl. 16, Fig. 3, text-figs. 80-81.

Kimminsia mortoni (McLachlan), Killington, *op. cit.* :255.

Kimminsia killingtoni Morton, in Fraser, 1942, *Ent. mon. Mag.* **78**:80. **Syn. nov.**

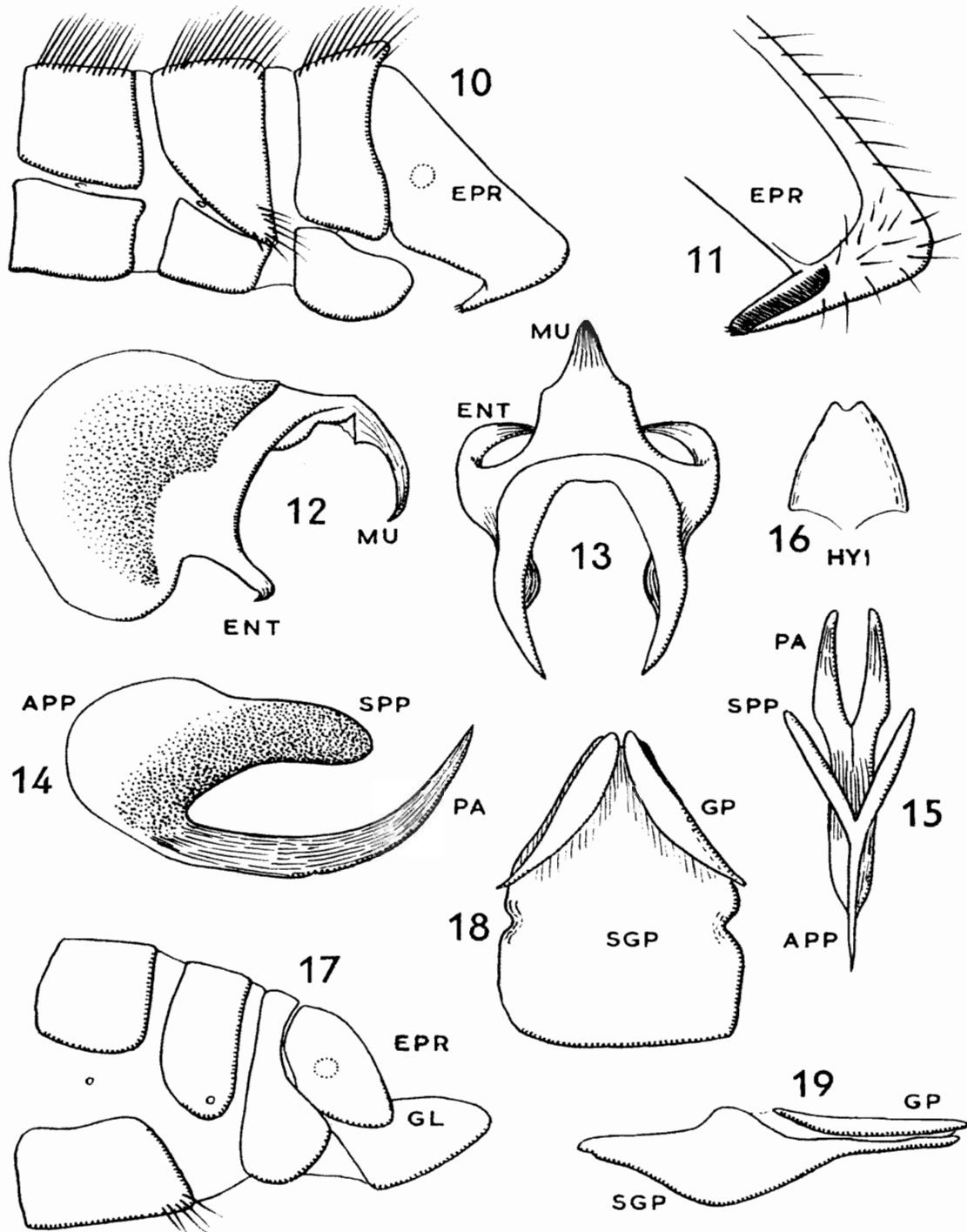
The drawings referred, with some doubt, by Tjeder to *mortoni* McLachlan are distinct from that species and I agree with him that they represent yet another species of the *mortoni* group, as far as I know undescribed. Tjeder has sent me his material of this species, with the request that I should describe it in this paper.

Boriomyia tjederi sp. n.

♂ Holotype. Frons shining blackish brown, clypeus, labrum and genae yellowish brown. Palpi pale fuscous. Antenna with basal segment fuscous beneath, paler above apically, second segment paler fuscous; flagellum very pale fuscous, becoming darker apically. Epicranium with a pair of ochreous brown spots, separated by a fuscous median line. Pronotum ochraceous, with a narrow, longitudinal, median line and the lateral margins fuscous. Meso- and metanota ochraceous, with fuscous lateral margins. Legs pale yellowish fuscous, anterior femur with a narrow fuscous line dorsally, posterior femur shaded with fuscous apically. Anterior tibia clouded with fuscous at base and apex, median and posterior tibiae clouded only apically. Apices of terminal tarsomeres of all legs fuscous.

Fore wing moderately broad, oval, membrane hyaline or faintly greyish, and with pale grey sagittate markings along the veins. All margins with alternate light and dark spaces. Longitudinal and costal veins fuscous, interrupted with whitish streaks. Cross-veins mostly fuscous, the membrane bordering them not noticeably darker, the intra-median cross-vein in the inner gradate series and the basal cubito-anal cross-vein whitish. Posterior cross-vein in the inner gradate series not conspicuously bordered with fuscous. Hind wing hyaline, veins whitish in basal third, becoming fuscous beyond. Abdomen mainly dark fuscous, with conspicuous, up-standing tufts of golden hairs on tergites 7-9.

Genitalia (Figs. 10-16). Ectoproct (EPR) similar in general shape to *mortoni* and *malladai*, but differing in the produced apical portion.



Figs. 10-19: Genitalia of *Boriomyia tjederi* sp. n.—10-16, ♂ holotype; 17-19, ♀ allotype. (10) apex of abdomen, lateral; (11) inner surface of epiproct, lateral; (12) gonarcus, lateral; (13) the same, dorsal; (14) parameres, lateral; (15) the same, dorsal; (16) hypandrium internum, dorsal; (17) apex of abdomen, lateral; (18) subgenital plate, dorsal; (19) the same, lateral.

This is longer and more acute than in *mortoni*, terminating in several teeth, and with the internal row of comb-like spines extending inwards only a little way beyond the inner margin. Gonarcus with large lateral lobes, which are rounded basally; mediuncus (MU) slender, claw-like, with a small tooth on its ventral margin near the base. In the holotype, the mediuncus is directed more or less downwards. Entoprocessi (ENT) slender, incurved. Parameres (PA) fused basally to form a thin, plate-like apophysis proximus (APP), slightly divergent apically, slender, spiniform and gently upcurved. Superprocessi (SPP) spatulate in side view, apices divergent and separated from the parameres by a deep, rounded excision. Hyandrium internum (HYI) rather broader at its base than in *malladai*, apex shallowly excised.

♀ Allotype. In general appearance resembling the male, the fuscous markings somewhat paler. In the fore wing, the longitudinal veins rather pale at base.

Genitalia (Figs. 17-19). Ninth tergite deep, much widened at its lateral margins. Gonapophyses laterales (GL) about twice as long as wide, tapering to rounded apices. Subgenital plate (SGP) broad, about one and a half times as long as wide, slightly constricted before midway, then tapering to a shallowly excised apex. Gonapophyses posteriores (GP) forming a pair of narrow, slightly curved plates above the lateral margins of the subgenital plate.

Length of fore wing: ♂, 9.5 mm.; ♀, 9 mm.

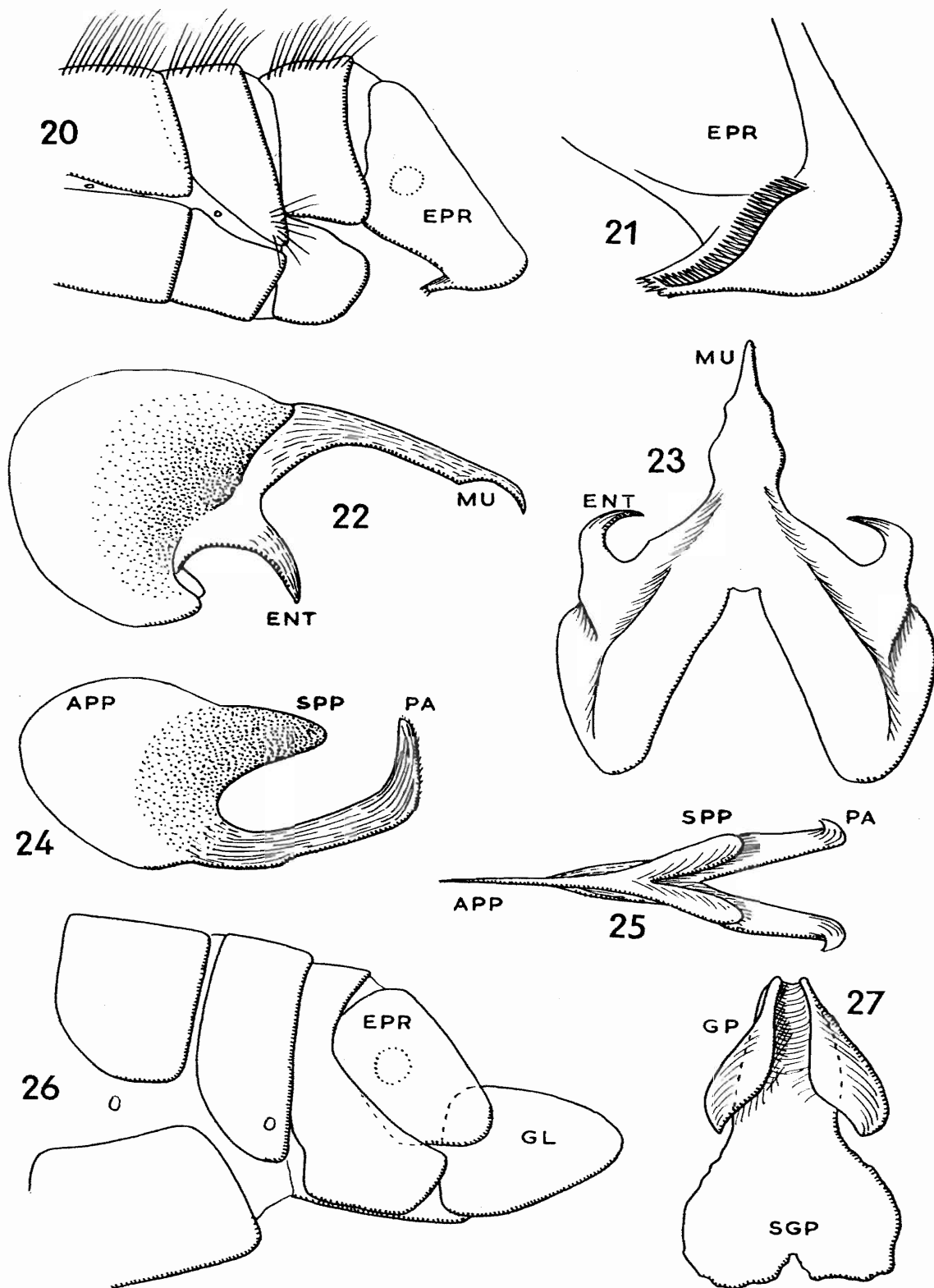
♂ Holotype: YUGOSLAVIA: Julian Alps, Vrsic, 1650 m., 12.vii.1959, H. Hölzel. Abdomen cleared and in glycerine; in the British Museum (Natural History).

♀ Allotype: Same data as holotype, abdomen cleared and in glycerine; in the Tjeder collection.

♂ Paratypes: YUGOSLAVIA: Same data as holotype, 6 ♂, 2 ♀; in Hölzel collection. ITALY: Bedole, 5.viii.1932, A. Fiori, abdomen cleared and in glycerine; in the Tjeder collection.

It gives me great pleasure to dedicate this species to Dr. Bo Tjeder, and I wish to express my thanks to him for allowing me to study these specimens and also for so generously presenting the holotype to the British Museum (Natural History).

This species is very closely related to *B. malladai* (Navás) in the genital structure of both sexes. The differences are not easy to define in words and I am therefore giving comparative figures of that species also, drawn from British Museum material (Figs. 20-27).



Figs. 20-27: Genitalia of *Boriomyia malladai* (Navás)—20-25, ♂; 26-27, ♀. (20) apex of abdomen, lateral; (21) inner surface of epiproct, lateral; (22) gonarcus, lateral; (23) the same, dorsal; (24) parameres, lateral; (25) the same, dorsal; (26) apex of abdomen, lateral; (27) subgenital plate, dorsal.

The three examples of *B. tjederi* before me are definitely paler than the normal *malladai*, rather more yellowish in colouring and the fore wings have scarcely any fuscous mottling. In the male, the row of comb-like epiproctal spines on the inner surface of the apical process extends only slightly beyond the lower margin of the epiproct, whereas in *malladai* it extends halfway across the epiproct and is more strongly toothed apically. The mediuncus of the gonarcus has a more definite basal tooth and the apical claw is relatively longer than in *malladai* and is definitely bent downwards, though this may be variable. The parameres are more gently up-curved in side view and are scarcely divergent in dorsal view. The superprocessi in side view are parallel-sided, with a rounded apex, not subtriangular as in *malladai*, and the excision beneath them is deeper and narrower. In the female, the subgenital plate is relatively broader, and its apical part forms a much broader triangle.

CATOCALA FRAXINI L. (LEP.) IN HAMPSHIRE

A Clifton Nonpareil came to our m.v. trap on the night of 14th September 1963. The trap was in the middle of our lawn in the garden, which is roughly half a mile from Shawford Downs, near Winchester. There is a wood about 300 yards from the trap. The specimen was inside the trap, along with about five *C. nupta* L. (Red Underwing) and almost nothing else.

Cartersland,

PETER AND MICHAEL MACKENZIE-SMITH.

Southdown Road, Shawford, Hants.

ZYGAENA VICIAE SCHIFF. (MELILOTI ESP.) (LEP.) IN SCOTLAND

An examination of a good map of Western Scotland shows many areas of wild country to be completely inaccessible to the ordinary visitor without unlimited time and energy but one inch Ordnance Maps are so good that it is possible to visualize the countryside with some accuracy and to select sites that appear worth the effort of a visit.

With four days available for wandering in Western Scotland in search of birds, plants and insects two sites were selected which, from a knowledge of the habits of *Z. purpuralis*, seemed worthy of investigation.

The first site, a south facing cliff yielded *Satyrus semele* in considerable numbers with occasional *Lycaena icarus*, *Argynnis aglaia* and *Z. filipendulae* and then when the more inaccessible parts were reached *Z. purpuralis* appeared in abundance.

On the next day a visit to the second site yielded *A. aglaia* in fair quantities on the upper slopes and the females tended to be darker than those from the south. Time was short and the weather poor but three burnets were collected which have proved to be *Z. viciae (meliloti)* the New Forest Burnet. One of these specimens is now at the British Museum (Natural History) and I am indebted to Mr. W. G. Tremewan for its identification.

This seems a remarkable insect to find so far north of its previously only known British locality but the coastal areas of Western Britain afford some very warm habitats particularly on sites with a southern aspect where unexpected things may yet turn up.

It is to be hoped that further search will disclose new colonies of this moth in the West.

Vivod,

F. C. BEST.

Llangollen.

Bibliography of the Neuropterida

Bibliography of the Neuropterida Reference number (r#):

240

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