Nota lepid. 22 (3): 212–226; 01.IX.1999 ISSN 0342–7536

Notes on some Western Palaearctic species of *Bucculatrix* (Gracillarioidea, Bucculatricidae)

Wolfram Mey

Museum für Naturkunde, Humboldt-Universität Berlin, Invalidenstraße 43, D-10115 Berlin

Summary. The type material of 12 species of *Bucculatrix* Zeller, 1839 deposited in the Museum für Naturkunde Berlin is revised. *B. imitatella* Herrich-Schäffer, [1855], and *B. jugicola* Wocke, 1877, are sunk in synonymy of *B. cristatella* (Zeller, 1839). Two other synonyms have been established: *B. alpina* Frey, 1870 = *B. leucanthemella* Constant, 1895, **syn. n.**; *B. infans* Staudinger, 1880 = *B. centaureae* Deschka, 1973, **syn. n.** The male genitalia of the species are figured. Lectotypes have been designated for 5 species.

Zusammenfassung. Es wird das Typenmaterial von 12 Arten der Gattung *Bucculatrix* Zeller, 1839 revidiert, die sich im Museum für Naturkunde Berlin befinden. Zwei Namen stellten sich als neue Synonyme heraus: *B. imitatella* Herrich-Schäffer, [1855], **syn. n.** und *B. jugicola* Wocke, 1877, **syn. n.** von *B. cristatella* (Zeller, 1839). Zwei weitere Synonyme werden bekanntgemacht: *B. leucanthemella* Constant, 1895, **syn. n.** von *B. alpina* Frey, 1870 und *B. centaureae* Deschka, 1973, **syn. n.** von *B. infans* Staudinger, 1880. Für fünf Arten werden Lectotypen festgelegt.

Résumé. Le matériel-type de 12 espèces du genre *Bucculatrix* Zeller, 1839, déposé au Museum für Naturkunde Berlin, a été révisé. Deux noms sont apparus comme étant de nouveaux synonymes: *B. imitatella* Herrich-Schäffer, [1855], **syn. n.** et *B. jugicola* Wocke, 1877, **syn. n.** de *B. cristatella* (Zeller, 1839). Deux autres synonymes sont révélés: *B. leucanthemella* Constant, 1895, **syn. n.** de *B. alpina* Frey, 1870 et *B. centaureae* Deschka, 1973, **syn. n.** de *B. infans* Staudinger, 1880. Pour cinq espèces, un lectotype a été désigné.

Key words: Lepidoptera, Bucculatricidae, *Bucculatrix*, types, taxonomy, Europe, Turkey.

Introduction

The genus *Bucculatrix* Zeller, 1839 is a large group of leaf miners (at least as early instars) and gall makers. The genus has a worldwide distribution. More than 220 species have been recognised up till now (Heppner, 1991). A concentration of species can be observed in North America and Eurasia with about 100 and 80 species respectively (cf. Baraniak, 1996; Davies, 1963;

Seksjaeva, 1993). From other continents much lower numbers of species are known: South and Central America — 14, Africa — 21, South Asia — 10 (Heppner, 1991), Australia — 14 (Nielsen *et al.*, 1996). It is questionable if this contrasting diversity reflects a real difference between the northern and southern continental regions. South America, Africa and Australia are largely unexplored. A more intensive faunistic and taxonomic work in these areas will undoubtedly lead to the discovery of many more species. However, the discovery of unknown species in North America or Europe is by no means a closed chapter. New species descriptions are published frequently (e.g. Deschka, 1992a, b; Deschka & Huemer, 1997; Rubinoff & Osborne, 1997; Seksjaeva, 1996). The permanent addition of new species to the Western Palaearctic fauna was regrettably not accompanied by a taxonomic treatment of the genus nor prompted it such a synthetic study. Meanwhile the genus has become unwieldy and difficult to handle especially in the Mediterranean and adjacent regions. Many species are very similar both in genitalic characters and wing patterns. They are difficult to identify correctly without performing a comparison based on extensive material of all related species. Photographs and line drawings of the genitalia are often not sufficient enough to allow a clear separation. In addition, the type material of species established during the 19th Century (e.g. Constant, Millière, Chrétien, Staudinger, Frey, Herrich-Schäffer etc.) has hardly been a subject of revisionary studies, which had been followed by a subsequent publication of the results. The only exception is the account on the Scandinavian species by Svensson (1971). Thus, there are still a lot of associations between species and names, which are based on outdated opinions, new interpretations or conventions, but not on the types. Today, an examination of these types is a basic requirement because it helps to clarify specific names attribution and to stabilize the taxonomy of *Bucculatrix*.

During curatorial work on the Bucculatricidae material of the Museum für Naturkunde Berlin I found type specimens of a number of European *Bucculatrix* species. According to labels some of them have been studied earlier by Deschka, Hering and Patzak, but no comments or redescriptions have been published so far. The other part of type specimens apparently remained

untouched since Staudinger's time. Some specimens were inadequately labelled, and their status as types thus remains doubtful. Others were simply misplaced. It soon became obvious that a rearrangement of the *Bucculatrix* material could not be done without a revision of the type material. It is not my intention, however, to provide an elaborate revision of the species including a complete synonymy and detailed descriptions. These are issues for a monographic revision. Because a revision of the Western Palaearctic species cannot be expected to appear within the next years, a publication on the types deposited in the Museum für Naturkunde Berlin might be a helpful step towards taxonomic clearness in Bucculatricidae of the Western Palaearctic.

Methods

The structures of the genitalia are at a premium in recognition of the species-group taxa identity. Consequently, the genitalic characters were used extensively to define the species. The genitalic preparation followed common practice: maceration in boiling KOH, rinsing in distilled water, clarification in alcohol, staining with "Kongorot", embedding in Euparal as genital slide or in glycerine in a small tube attached to the pin, labelling. The figures of the genitalia were produced after staining and mounting all structures in natural position.

Abbreviations

NHML — The Natural History Museum, London,
MNHB — Museum für Naturkunde der Humboldt-Universität, Berlin.

List of species

Bucculatrix alpina Frey, 1870 (fig. 1)

B. alpina Frey, 1870: 287.
B. leucanthemella Constant, 1895, **syn. n.**

Lectotype ♂, (designated here) with handwritten label "Schweiz, Engadin, Sils Maria, Juli 1867", printed "Frey Coll. Brit. Mus. 1819-62"; genitalia slide labelled on printed form "Brit. Mus. (Nat. Hist). Microlepidoptera" with handwritten inscription "26610 ♂" designated with printed label on red paper "Lectotypus" (NHML).

Paralectotypes: ♂, same label data as of lectotype; genitalia preparation (glycerine tube pinned to the specimen) "Mey 4/1998" (NHML); 2♂, with handwritten (Herrich-Schäffer hand) label "n. sp. / Samaden", printed "H.-Sch.", coll. Herrich-Schäffer in coll. Staudinger, genitalia slide: Mey, 12/97 (MNHB); 2♂, ♀ with handwritten labels "19/7.[1867]", "Ob. Engadin, m.[ihi]" (both Staudinger hand), coll. Staudinger, genitalia slides (♂): Mey 5/97 (MNHB).

According to the original description, the type series was collected by Herrich-Schäffer, Nickerl, Staudinger and Frey during a joint excursion. The species was tentatively identified as *B. imitatella* H.- S. Later on, Herrich-Schäffer sent a specimen of his *B. imitatella* to Frey. He recognized the species as being quite different and described an alpine species as *B. alpina*. Herrich-Schäffer obviously came to the same conclusion, because he wrote on the label of his Engadin specimens "n. sp.". His collection, together with the Staudinger collection, is deposited now in the Museum für Naturkunde Berlin. While visiting the Natural History Museum in London in December 1997, I examined Frey's type specimens and found them to be conspecific with the specimens of Herrich-Schäffer and Staudinger. Since all the material was mentioned in the original description, it should be considered as belonging to the type series.

Comparison of material of *B. leucanthemella* Constant, 1895 in the Staudinger and Hinneberg collection (MNHB), collected by Constant in Cannes, revealed its conspecificity with *B. alpina*.

Bucculatrix argentisignella Herrich-Schäffer, [1855] (figs. 2, 6, 7)

B. gracilella Frey, 1856 — Staudinger, 1901: 220.

Lectotype ♀ (designated here), with labels: printed on white paper "H.[errich]-Sch.[äffer]", printed on pink paper "Origin.", designated with printed label on red paper "Lectotypus"; genitalia slide Mey 14/97. Paralectotypes: 5♀, one with handwritten (Herrich-Schäffer hand) label on white paper in printed box "argentisignella / HS / *" and printed on pink paper "Origin.", no locality label; one with printed labels "H.-Sch." and "Origin", one with small handwritten "16/5 Klbg", two without labels; all from coll. Herrich-Schäffer, in coll. Staudinger (MNHB).

The Staudinger collection contains a couple of *B. argentisignella* H.-S. collected while in copula by Frey near Zürich. The sexual dimorphism in this species is thus obvious and very pronounced. The male has a uniform grey colour and lacks the four silvery spots on the forewings. Thus, the male resembles small specimens

of *B. cristatella* (Zeller, 1839), with which it was sometimes confused (cf. Leraut, 1997).

Bucculatrix atagina Wocke, 1877 (fig. 3)

Lectotype ♂ (designated here), with labels: handwritten on green paper in printed box "Meran / 15.7.[18]76 Z[ucht] / Artem.[isia] camp.[estris]" printed on pink paper "Origin." printed on white paper "Genitalpräparat / No. [no number inscribed] / J. Klimesch, Linz a. D." designated with printed label on red paper "Lectotypus", coll. Staudinger (MNHB).

The genitalic armature in the slide is slightly distorted. However, the diagnostic characters are clearly visible. Figure 3 is made from another male specimen collected at the type locality.

Bucculatrix artemisiella Herrich-Schäffer, [1855]

No type specimens of *B. artemisiella* H.-S. were found in the Staudinger collection.

Bucculatrix basifuscella Staudinger, 1880 (fig. 8)

Lectotype ♂ (designated here), with labels: handwritten on white paper "10/5", handwritten on yellow paper "Amasia m.[ihi] [10.5.1875]", printed on pink paper "Origin.", handwritten (Staudinger hand) on white paper "Basifuscella Stgr.". It is supplied now with a printed label on white paper with handwritten inscription "Genit. Unters. / Nr. *Deschka* / Zool. Mus. Berlin". coll. Staudinger, designated with printed label on red paper "Lectotypus" (MNHB). Paralectotypes: 2♀, 10.5. and 31.5.1875, same label data as lectotype (MNHB).

The genitalic structures of the species were never published. As far as I know the species is only known from the type locality. Certainly, it has a much wider distribution and perhaps is recorded under a different name.

The male genitalia are very peculiar, especially the shape of the valvae and the internal structure of the phallic complex.

The preparation consists of two slides: one for the genitalia and another for the rest of the abdomen (both labelled by Deschka).

Bucculatrix cristatella (Zeller, 1839) (figs. 11–13)

B. imitatella Herrich-Schäffer, [1855], **syn. n.**
B. jugicola Wocke, 1877, **syn. n.**

B. imitatella H.-S.: Holotype ♀ (by monotypy) with labels: handwritten (von Heyden hand?) "Juli vom Waldgras im / Taunusgebirge <illegible> / Fühler solang als <illegible>", handwritten (Herrich-Schäffer hand) on white paper in printed box "imitatella HS.", printed on pink paper "Origin.", coll. Herrich-Schäffer, in coll. Staudinger; designated with printed label on red paper "Holotypus" (MNHB).

B. jugicola: Lectotype ♂ (designated here), with handwritten (Wocke hand) label on white paper "Jugicola Wk.", handwritten on yellow paper "[Süd-Tirol] Trafoi / m. [ihi]", and printed on pink paper "Origin."; genitalia slide: Mey 4/97; designated with printed label on red paper "Lectotypus" (MNHB). Paralectotypes: 2♂, 5♀, with printed label on pink paper "Origin.". coll. Staudinger, (MNHB);

The holotype is almost completely destroyed. Only the head and the pro- and mesothorax have remained on the minuten. The colouration of frons, vertex, collar and frontal tuft is very similar to *B. cristatella* (Zeller, 1839). In the absence of any other diagnostic differences I consider the holotype of *B. imitatella* as conspecific with *B. cristatella*. Thus, *B. imitatella* is put into the synonymy of *B. cristatella*. This is also in accordance with the distributional area of *B. cristatella*, which extends from France to Russia. Further specimens in the collections of the MNHB identified by Herrich-Schäffer and Staudinger as *B. imitatella* proved to be *B. alpina*. This species is known to occur in France and Italy, under the name *B. leucanthemella* (Baraniak, 1996).

There are no clear morphological characters, both external and genitalic, that enable a differentiation between *B. jugicola* and *B. cristatella*. Klimesch (1942) noted a slight variability in the wing coloration of the alpine specimens, which is observable in lowland populations too. The long separation of *B. cristatella* and *B. jugicola* (e.g. Burmann, 1991) was probably maintained because of the different larval host plants in the Alps (*Chrysanthemum alpinum*) and in other regions (*Achillea millefolium*).

Interestingly, *B. jugicola* was already considered a synonym by Seksjaeva (1993: 107). However, she did not clearly indicate this new synonymy.

A male specimen of *B. jugicola* in NHML bears a lectotype label. This designation is unavailable, since the specimen does not belong to the original type series.

Bucculatrix demaryella (Duponchel, 1840) (fig. 10)

B. scoticella Herrich-Schäffer, [1855] — Rebel, 1901: 219.

B. scoticella: Holotype ♂ (by monotypy) with labels: printed on blue stripe-like paper "6. Demaryella, Sta[inton?]", handwritten (Herrich-Schäffer hand) on white paper in printed box "scoticella HS. / England", coll. Herrich-Schäffer, in coll. Staudinger, genitalia slide: Mey 10/97; designated with printed label on red paper "Holotypus" (MNHB).

The type specimen was sent to Herrich-Schäffer by Stainton. The dark pattern of the forewings is in strong contrast to specimens from Central Europe, and this obviously prompted Herrich-Schäffer to describe it as a distinct species. However, the genitalic preparation revealed the specimen to be conspecific with *B. demaryella* (Duponchel, 1840).

Bucculatrix humiliella Herrich-Schäffer, [1855] (figs. 4, 5)

B. fatigatella var. *obscurella* Klemensiewicz, 1899, **syn. n.**
B. capreella Krogerus, 1952 — Deschka, 1992b: 19.
B. merei Pelham-Clinton, 1967 — Svensson, 1971: 100; Deschka, 1992b: 19.

Lectotype ♀ (designated here), with labels: printed on white paper "H.[errich]-S.[chäffer]" and on pink paper "Origin.", "Genit. Unters. / Nr. Mey 7/97 / Zool. Mus. Berlin" coll. Herrich-Schäffer, in coll. Staudinger, designated with printed label on red paper "Lectotypus" (MNHB). Paralectotypes: ♂, 2♀, with the same printed labels, one bearing handwritten "Mai" and "851" (MNHB). Genitalia preparations: paralectotype ♀, Mey 8/97; paralectotype ♂, Mey 9/97 (MNHB).

The type series of *B. humiliella* was never examined. Therefore, in the absence of any illustrations, the species was treated as dubious or *incertae sedis* in the European literature (cf. Baraniak, 1996). However, the types have been available all the time in the MNHB. Their present examination shows them to represent a distinct species described under three different names in the past.

Bucculatrix infans Staudinger, 1880 (fig. 9)

B. centaureae Deschka, 1973, **syn. n.**

Holotype ♂ (by monotypy), with labels: handwritten (Staudinger hand) on white paper "Infans / Stgr.", handwritten on yellow paper "Amasia m.[ihi]", printed on pink paper "Origin." and small hand-written "25/7", coll. Staudinger (MNHB). Genitalia slide: G. Deschka 1979 (without name and number on labels) (MNHB).

Since the external appearance of the holotype corresponds perfectly with a photograph of *B. centaureae* as well as the

genitalic structures do (fig. 9), there is no doubt as to the identity of *B. infans* with *B. centaureae*.

Bucculatrix oppositella Staudinger, 1880

Holotype ♂ (by monotypy), with labels: handwritten (Staudinger hand) on white paper "Oppositella Stgr.", handwritten on yellow paper "Amasia m.[ihi]", printed on pink paper "Origin." and small handwritten "10/5", coll. Staudinger (MNHB). Genitalia slide: G. Deschka 1979 (without name and number on the labels, genitalia armature lacking) (MNHB).

The only known type specimen designated here as holotype by monotypy. There is no record of other specimens in the literature.

At a first glance, the holotype looks like a specimen of *B. albella* Stainton, 1867. The colour of head and thorax and the forewing pattern correspond quite well with the characters of *B. albella*.

However, the lacking abdomen of the holotype makes it impossible to decide finally about the status of *B. oppositella*. New material of *Bucculatrix* from the region of Amasya would be helpful to clarify the identity of the species.

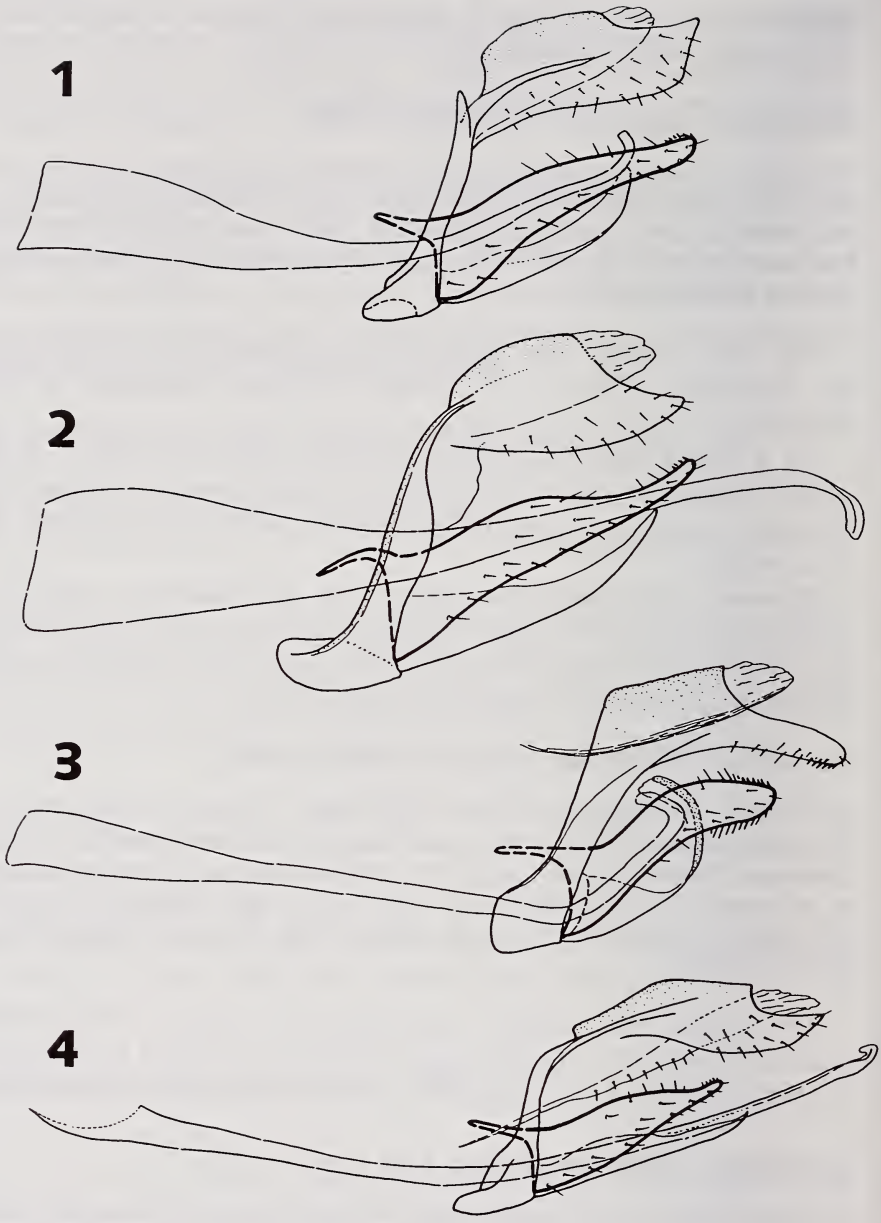
Bucculatrix rhamniella Herrich-Schäffer, [1855]

Lectotype ♀ (designated here), with labels: printed on white paper "H.[errich]–Sch.[äffer]" and on pink paper "Origin.", coll. Herrich-Schäffer, in coll. Staudinger; "Eukitt Präparat Nr. 915" / G. Deschka", designated with printed label on red paper "Lectotypus"(MNHB). Paralectotype (sex unknown; left-side fore- and hindwings only, head, thorax and abdomen lost) with same printed labels as lectotype (MNHB).

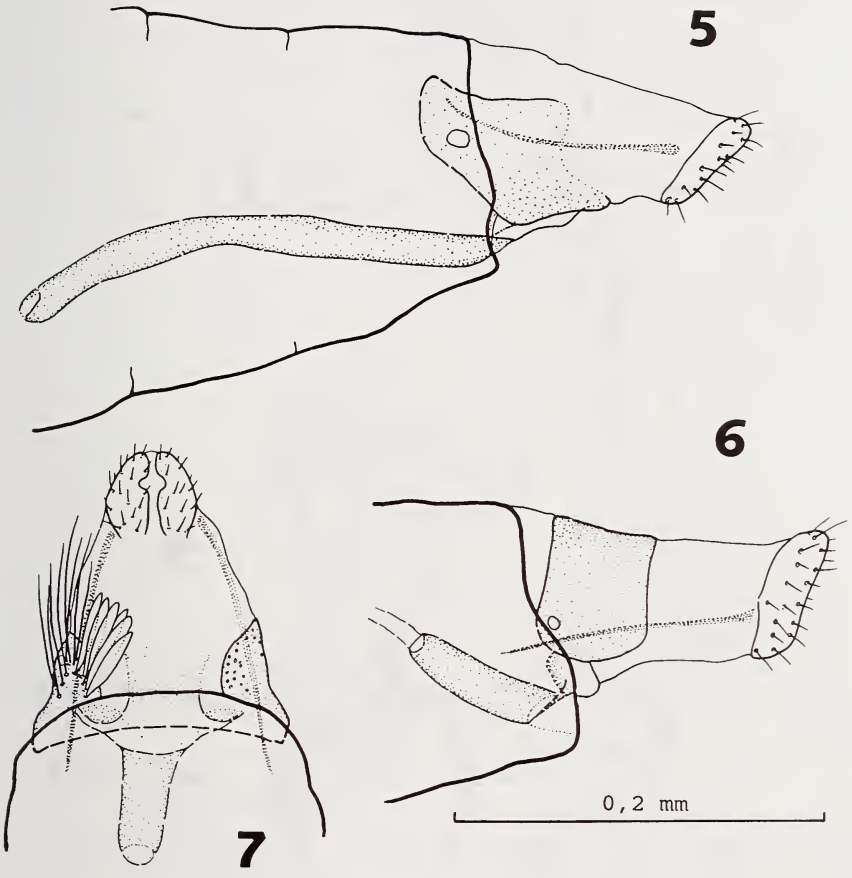
The species was recently redescribed by Buszko (1992). His figures fit perfectly with the traits of the lectotype and its genitalic preparation. So, I can resign from producing a new illustration.

Bucculatrix ulmifoliae Hering, 1931 (figs. 14, 15)

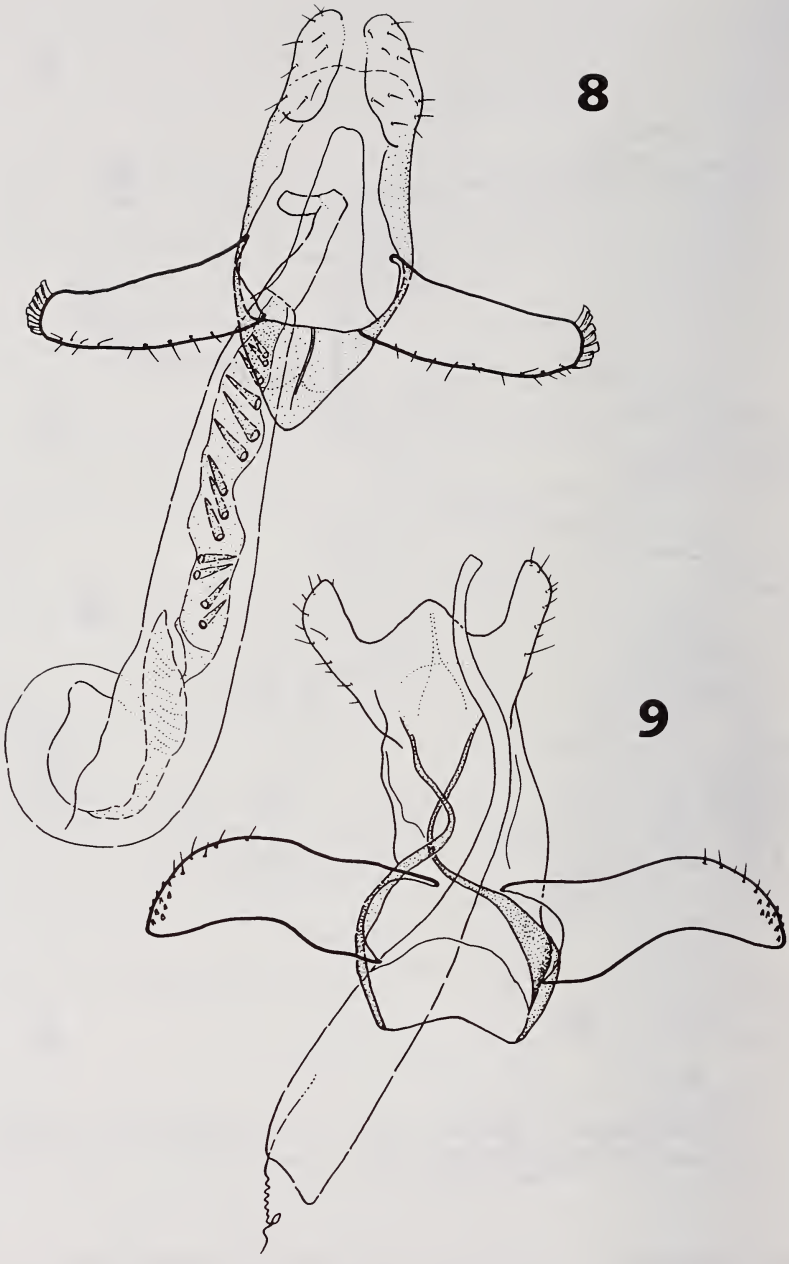
Lectotype ♂ (H. Patzak designated here) with labels: printed on white paper with handwritten inscriptions "Crossen a. O. [now in Poland] / *19.VII.1931* / No. 3843 [Zucht] Hering", printed on white paper with handwritten (Hering) inscriptions "Mine an: *Ulmus* / *campestris*" handwritten (Hering) "*Bucculatrix* / *ulmifoliae m.*[*ihi*] ♂ *Type*" on printed form "det. Mart. Hering", printed on green paper "coll. Hypon. / M. Hering", handwritten (Patzak) on white paper in box "Genit. Präp. / ♂ 2678



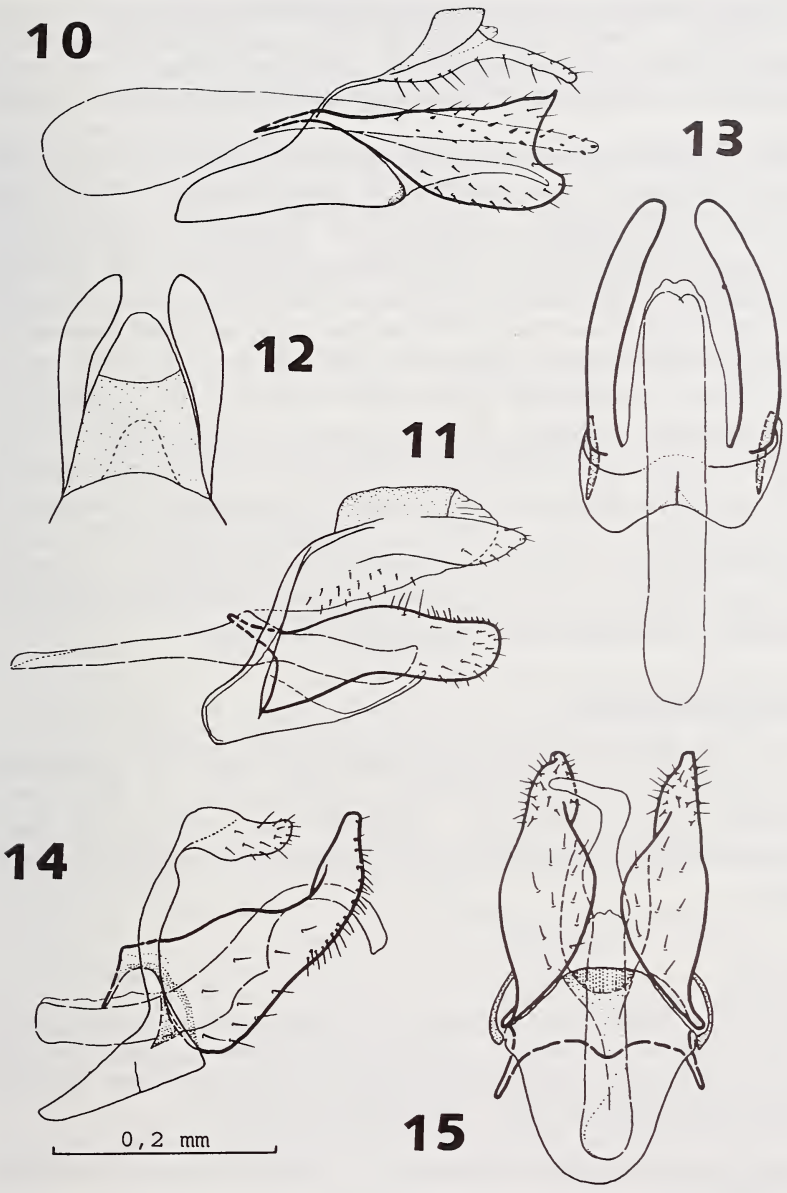
Figs. 1–4. Male genitalia of *Bucculatrix* spp., lateral view: 1 — *B. alpina* Frey, paratype, 2 — *B. argentisignella* H.-S., 3 — *B. atagina* Wke, lectotype, 4 — *B. humiliella* H.-S.



Figs. 5–7. Female genitalia of *Bucculatrix* spp.: 5 — *B. humiliella* H.-S., paratype, 6, 7 — *B. argentisignella* H.-S., paratype (5, 6 — lateral view, 7 — ventral view).



Figs. 8–9. Male genitalia of *Bucculatrix* spp., caudal view: 8 — *B. basifuscella* Stgr., lectotype, 9 — *B. infans* Stgr., lectotype.



Figs. 10–15. Male genitalia of *Bucculatrix* spp.: 10 — *B. demaryella* Dup. (holotype of *B. scoticella* H.-S.), 11–13 — *B. cristatella* Z., 14, 15 — *B. ulmifoliae* Her. (10, 11, 14 — lateral view, 12 — dorsal view, 13, 15 — ventral view).

/ H. Patzak"; designated with a handwritten (Patzak) label on pink paper "Lectotypus / B. ulmifoliae / Patzak desig." (MNHB); Paralectotypes: ♂, same data as lectotype; ♀, Berlin-Karlshorst, 1.6.1930, coll. Hering, genitalia slide: Patzak 2679; ♂, Berlin-Buch, 18.7.1921, Zucht 1827 on *Ulmus campestris*, coll. Hering (all in MNHB).

The genitalic armature of this species is pretty distinctive and sharply different from that of *B. ulmella* Zeller, 1848, which externally is extremely similar to *B. ulmifoliae*. There are no appropriate illustrations of the male genitalia in the literature. The figures in Seksjaeva (1993) are misleading. They probably prevented Puplesis *et al.* (1991) to correctly associate their newly described *Bucculatrix caspica* Puplesis & Sruoga, 1991, reared from *Ulmus carpinifolia* in Southern Russia, with *B. ulmifoliae*. The genitalic armature of both species is remarkably similar. There are only slight differences visible from the original drawings of *B. caspica*. However, they could be regarded as caused by the preparation process. Future studies have to show if *B. caspica* really represents a distinct species. For comparison purposes I give here a figure of the male genitalia (figs. 14, 15) of specimens collected in Potsdam (coll. Hinneberg, MNHB).

Acknowledgements

For the loan or donation of material I would like to express my gratitude to M. Gerstberger, Berlin, Dr. A. Hausmann, München, Dr. P. Huemer, Innsbruck and Mr. K. R. Tuck, London. Helpful comments of P. Huemer are gratefully acknowledged.

References

Baraniak, E., 1996. Bucculatricidae. *In*: Karsholt, O. & Razowski, J. (eds.). The Lepidoptera of Europe. — Apollo Books, Stenstrup. 380 p. (p. 47–48)

Braun, A. F., 1963. The genus *Bucculatrix* in America north of Mexico (Microlepidoptera). — *Mem.Am.ent.Soc.* 18: 1–207.

Burmann, K., 1991. Beiträge zur Microlepidopteren-Fauna Tirols. XV. Bucculatricidae (Insecta: Lepidoptera). — *Ber.naturw-med.Ver.Innsbruck* 78: 161–172.

Buszko, J., 1992. Studies on the mining Lepidoptera of Poland. XII. Redescription of *Bucculatrix rhamniella* Herrich-Schäffer, 1855 (Bucculatricidae), with comments on its present distribution. — *Polskie Pismo ent.* 61: 71–78.

Constant, M. A., 1895. Microlépidoptères nouveaux de la faune française. — *Bull.Soc.ent.Fr.* 11: 1–4.

Davies, D. R., 1963. Lyonetiidae. *In*: Hodges, R. W. *et al.* (eds.). Check list of the Lepidoptera of America north of Mexico. — E. W. Classey Ltd., London. XXI + 284 p.

Deschka, G., 1973. *Bucculatrix centaureae* spec. nov. (Lepidoptera, Bucculatricidae). — *Ent.Ber.Amst.* 33: 141–144.

Deschka, G., 1992a. *Bucculatrix frigida* sp. nov. aus der borealen Nearktis (Lepidoptera, Lyonetiidae). — *Entomofauna* 13(33): 545–556.

Deschka, G., 1992b. Blattminierende Lepidopteren aus dem Nahen und Mittleren Osten. VI. Teil: *Bucculatrix armeniaca* sp. n. aus Russisch-Armenien (Lepidoptera, Lyonetiidae). — *Z.ArbGem.öst.Ent.* 44(1–2): 17–19.

Deschka, G. & Huemer, P., 1997. Eine neue *Bucculatrix*-Art aus den Alpes Maritimes (Frankreich) (Lepidoptera, Bucculatricidae). — *NachrBl.bayer. Ent.* 46: 54–57.

Frey, H., 1856. Die Tineen und Pterophoren der Schweiz. — Meyer & Zeller, Zürich. 430 p.

Frey, H., 1870. Ein Beitrag zur Kenntnis der Microlepidopteren (Schluss). — *Mitt.schweiz.ent.Ges.* 3: 277–289.

Heppner, J. B., 1991. Faunal regions and the diversity of Lepidoptera. — *Tropical Lepidoptera* 2, suppl. 1: 1–85.

Hering, E. M., 1931. Minenstudien 12. — *Z.Pflkrankh.PflPath.PflSchutz.* 41: 529–551.

Herrich-Schäffer, G. A. W., 1853–1855. Systematische Bearbeitung der Schmetterlinge von Europa, zugleich als Text, Revision und Supplement zu Jakob Hübner's Sammlung europäischer Schmetterlinge. Band 5: Die Schaben und Federmotten. — Regensburg. 394 p.

Klimesch, J., 1942. *Bucculatrix jugicola* Hein.-Wck. (Lep., Bucculatrigidae [sic]). — *Z.wien.ent.Ver.* 27: 259–266.

Leraut, P., 1997. Liste systématique et synonymique des Lépidoptères de France, Belgique et Corse. — Paris. 526 p.

Nielsen E. S., 1996. Bucculatricidae. *In*: Nielsen, E. S., Edwards, E. D. & Rangsi, T. V. (eds.). Checklist of the Lepidoptera of Australia. — *Monographs on Australian Lepidoptera* 4: xiv + 529 p.

Puplesis, R., Seksjaeva, S. & Sruoga, V., 1991. Leaf-mining Lepidoptera (Nepticulidae, Bucculatricidae, Gracillariidae) from *Ulmus* in Northern Caspiya (Kaspia). — *Tijdschr.Ent.* 134: 69–73.

Rebel, H., 1901. Catalog der Lepidopteren des palaearctischen Faunengebietes. 2. Teil: Famil. Pyralidae-Micropterygidae. — Friedländer & Sohn, Berlin. 368 p.

Rubinoff, D. Z. & Osborne, K. H., 1997. Two new species of Asteraceae-feeding *Bucculatrix* (Bucculatricidae) from California. — *J.Lepid.Soc.* 51(3): 227–236.

Seksjaeva, S. V., 1993. Review of the mining moths (Lepidoptera, Bucculatricidae) of the fauna of Russia. — *Trudy zool.Inst. St.Petersburg* 255: 99–120 (in Russian).

Seksjaeva, S. V., 1996. Additions to the fauna of bucculatricid moths (Lepidoptera, Bucculatricidae) of the Primorsk Territory, Russia. — *Ent. Obozr.* 75: 884–887 (in Russian).

Staudinger, O., 1880. Lepidopteren-Fauna Kleinasiens. — *Horae Soc. ent. Ross.* 15: 159–435.

Svensson, I., 1971. Scandinavian *Bucculatrix* Z. (Lep. Bucculatricidae). — *Ent. scand.* 2: 99–109.

Wocke, M. F., 1877. Die Motten und Federmotten, Heft II. *In*: Heinemann H. v. & Wocke, M.F.: Die Schmetterlinge Deutschlands und der Schweiz. Zweite Abteilung, Kleinschmetterlinge. — Schwetschke und Sohn, Braunschweig. P. 389–825.