

Further Notes on the Stomopteryx Group (Lepid. Gelechiidae)

By

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(With plates 3-4).

A. Introduction.

While undertaking a revision of the Danish material of Microlepidoptera preserved in the collection of the Zoological Museum of Copenhagen in order to correct some obvious misdeterminations, my attention was, some years ago, attracted by the difficult genus *Anacampsis* auct. (*Stomopteryx* Hein. sensu Gaede 1937).

In the Danish lists (Larsen 1916: 179-180, 1927: 98-100) the following 9 species are enumerated as having been found in Denmark:

<i>patruella</i> Mann	<i>anthyllidella</i> Hb.
<i>nigritella</i> Zell.	<i>vorticella</i> Scop.
<i>biguttella</i> HS.	<i>vorticella</i> var. <i>ligulella</i> Zell.
<i>sangiella</i> Stt.	<i>cincticulella</i> HS.
<i>remissella</i> Zell.	<i>taeniolella</i> Zell.

My revision proved that only four of these species were correctly determined, viz.:

<i>vorticella</i> Scop.	<i>anthyllidella</i> Hb.
<i>taeniolella</i> Zell.	<i>remissella</i> Zell.

In addition I found that the material included two further species -- both superficially excessively similar to *vorticella* Scop. -- one of which was a *nova species* while the other proved to have been illustrated, though wrongly identified, by Pierce & Metcalfe (1935, pl. 11).

To arrive at these conclusions I had to examine a considerable number of specimens originating from various collections in different countries. A study of the genitalia proved that in almost every collection the *Stomo-*

pteryx species were tremendously intermixed, and that a critical revision of the entire number of species, at present included in the genus *Stomopteryx* auct., is urgently needed. The fact that some species which generally have a distinct white transverse band on the forewings may occur in a unicoloured form, or may have the white fascia reduced to such an extent that only two white apical spots are left, have added considerably to the confusion. A study of this genus which is not based upon examination of the genitalia, will be worthless.

Although I have not been able to undertake a complete examination of the total number of species, my study of the group with reference to the Danish species has in addition enabled me to contribute to some extent to our knowledge of a number of species occurring outside Denmark, to correct some previous misconceptions regarding their taxonomy, and to define some previously undescribed species.

The present paper, which intends to invite to further study of this highly interesting group, deals with the above results.

B. Material examined.

All the species enumerated in the Danish lists (Larsen 1916, 1927) have been examined and compared with reliable material. The major part of the Danish specimens studied were included in the collections of the Zoological Museum of Copenhagen. A considerable number of species of foreign origin used for comparison were also available in the coll. Zool. Mus. Copenh. This material was formerly included in the collections of Mr. C. S. Larsen and aquired by him through Staudinger & Bang-Haas. The entire collection of the Zool. Mus. Copenh. has in a most generous way been placed at my disposal by Dr. S. L. Tuxen, who, as usual, was always ready to offer every possible help.

During a visit to London in 1952 I was enabled, through the courtesy of Mr. W. H. T. Tams and Mr. J. D. Bradley, to examine type material from the collections of Zeller and Stainton as well as F. N. Pierce's original genital slides preserved in the British Museum (Natural History). Later on I have, in addition, had the opportunity to examine some of A. C. Vine's specimens included in E. Bankes coll., and specimens from coll. Frey (also in the BMNH).

Dr. P. Benander (Höör in Sweden) for my study collected material of Swedish "*albipalpella*", and he and Mr. Ingvar Svensson (Österslöv in Sweden) have been kind enough to enable me to examine some interesting Swedish specimens as well as some slides from their own collections.

Dr. J. Klimesch (Linz in Austria), besides presenting me with most valuable material from his own collection, assisted me in other ways, partly by examining certain specimens from the collections of the Museum of Vienna, partly by mediating a loan of some of v. Heinemann's original specimens which Mr. Gross of the Niedersächsisches Landesmuseum in Hannover permitted me to examine. In addition Mr. Gross sent me some genital slides for study, and gave me valuable information concerning the Heinemann collection.

Dr. R. Schönmann of the Museum of Natural History, Vienna, enabled me to study some dubious specimens from the collections of this Museum.

Mr. P. Weber (Zürich) kindly furnished me with material from his own collection.

Dr. L. A. Gozmány, of the Museum of Natural History, Budapest, supplied me with specimens of *Stom. detersella* Zell., the generotype of the genus, and most kindly sent me some genital slides of his material (incl. holotypes) for study.

I am greatly indebted to all the above-mentioned for their kind help.

C. The Male Genitalia.

Since I started my study of the group, two important papers (Hering 1952, Gozmány 1957) have appeared. While Hering, whose paper deals with generic problems, illustrates the genitalia of only 3 species, Gozmány shows the genitalia of a total of 28 species belonging to the *Anacamptis* auct. — *Stomopteryx* Hein. group. These illustrations are merely schematic and sometimes difficult to interpret.

In future the group will undoubtedly attract attention, and a number of new species will be discovered. As the taxonomy is still insufficiently studied, I consider it useful to illustrate the male genitalia of each species occasionally examined, and to draw these illustrations in such detail that future misconceptions as to the identity of the various species treated may be excluded.

The females may as well exhibit useful taxonomic differences, and I have dissected a number of females, but due to the uncertainty of obtaining correctly determined females, I preferred to leave them entirely out of account rather than to take the risk of referring a female to a wrong species.

Pierce & Metcalfe (1935: 18—19, pl. 10—11) describe and illustrate the genitalia of 8 species. Although the details are carelessly, and in some cases incorrectly, drawn, their illustrations enable a safe definition of these 8 species.

The male genitalia of the group are difficult to mount in such a way as to obtain the same position of the important parts in the preparations. In several species the extraordinary ventro-dorsal thickness of the genitalia makes it necessary during the dissection to displace the aedeagus-part in proportion to the tegumen-part in order to obtain a correct ventral aspect of the tegumen including the uncus. It is also highly important to study the organs in a ventral as well as in a lateral position.

The fusion of some parts and the displacement of others, make them difficult to interpret, and although it is doubtful whether the names of the various organs applied by previous authors (Pierce & Metcalfe 1935, Hering 1952, Gozmány 1957), leaving parts such as the anellus, the juxta, etc., out of consideration, are correct, I largely use the same terminology, referring to the schematic illustration (Fig. 1) in which the abbreviations of the names agree with the list in Tuxen (1956: 11—16).

Uncus (un) rounded, in some species more (Figs. 42, 45) or less (Figs. 33, 47) cleft, on either side set with a number of strongly sclerotized, black pegs, differently arranged in the various species, below with long bristles.

Gnathos (gn) consisting of two independently movable links on either side (Figs. 30, 35), connected to a cross-bar carrying a central hook, the shape of which is variable, but constant within the species.

Tegumen (tg) smooth, oblong, rounded.

Of the three components of the valva, the costa seems to be absent. In one case Pierce & Metcalfe (1935) mention the costa, but having checked Pierce's original slide of the species in question, I must state that this part corresponds to the organ to which, in their remaining descriptions, they apply the term sacculus.

The part interpreted by Pierce & Metcalfe (1935) as the valvula (vla), is long, lightly sclerotized, set with hairs. In some species the valvulae are smooth, slender (Fig. 43), in others carrying projections, the exact position of which it is difficult to ascertain in the mounts owing to the flexibility of the lightly sclerotized membrane enclosing them (Figs. 41, 42).

The parts identified by Pierce & Metcalfe (1935: 18—19) as the third component of the valva, the sacculi (sl), are, indeed, pushed far back from the valvulae, and it seems uncertain whether these parts do belong to the valvae, or whether they are structures of the vinculum. If

a species has a well developed saccus (sa), the "sacculi" are in most cases placed caudad to this organ (Figs. 42, 47), if not, they form flanges or flaps surrounding the aedeagus (Figs. 22, 35). Irrespective of the homology of these parts, they are of extreme taxonomic importance.

The saccus (sa), easily recognized in some species (Figs. 33, 42, 45), may appear to be absent (Fig. 23), atro-

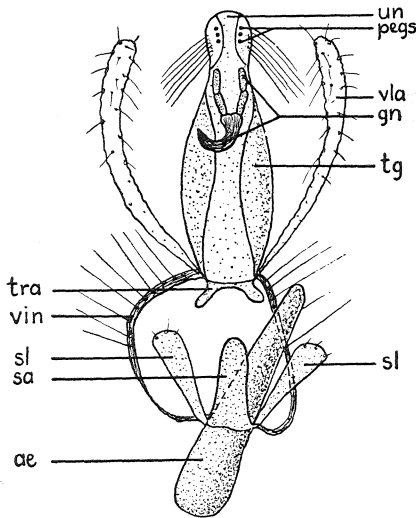


Fig. 1. *Stomopteryx* (s. lat.). Male genitalia (schematic).

Abbreviations: un: *uncus*, vla: *valvula*, gn: *gnathos*, tg: *tegumen*, tra: *transtilla*, vin: *vinculum*, sl: *sacculus*, sa: *saccus*, ae: *aedeagus*.

phied (Fig. 39), lightly developed (Fig. 32), or prominent (Fig. 51). It may be split longitudinally, and the halves may be pushed away from each other to such an extent that e. g. the formations shown cephalad to the sacculi in Fig. 50 could hardly be allocated to the saccus without the assistance of Figs. 47—48, exhibiting a development of the saccus between Fig. 33 and Fig. 50. A comparison between Figs. 49, 46, and Fig. 37, respectively, may lead to the supposition that in cases where the sac-

culi form large flaps (Figs. 35, 37) their cephalic terminations may perhaps originate from a split saccus.

From the lateral aspect of the genitalia it appears that the aedeagus-part is placed at some distance from the tegumen-part. The connecting link between these two parts, the vinculum (Fig. 1: vin), consists of a pair of bands, usually set with long, stiff hairs, easily broken off during dissection.

Hering (1952: 203—204) in his Fig. 3 applies the term transtilla to all the parts surrounding the aedeagus (including the sacculi, of which he makes no mention at all), but in his Fig. 4 apparently only to the sacculi, while Pierce & Metcalfe (1935) do not use the term transtilla in connection with this group. The part to which I apply the term transtilla (Fig. 1: tra) connects the dorso-proximal angles of the valvae, and seems to correspond to this formation in e. g. *Nepticulidae*.

Between the tegumen-part and the aedeagus-part obscure structures, difficult to study and to arrange in the mounts, sometimes occur. Fig. 49 shows a pair of large, thin, triangular flaps, affixed to the vinculum (shown only in lateral view), and Fig. 40 shows an apron-like membrane, set with two patches of long, stiff hairs. Also stumpy protuberances, hairy (Fig. 23) or naked (Fig. 35), may occur. Such formations are not uncommon in the *Gelechiidae* (cf. e. g. Busck (1939: pl. 58—64), where a number of such structures of utterly different shape are shown).

The aedeagus (ae) varies considerably in shape, and may be simple (Fig. 31), bulbed (Fig. 50), more or less pointed (Figs. 46—48, 39—40), or even "branched" (Figs. 33, 41—42). An example of extreme "branching" is illustrated in Figs. 44—45.

The vesica is usually without cornuti, but may be set with a limited number of strong thorns (Figs. 35, 37), or contain a bunch of numerous spines (Fig. 22).

The genitalia of two of the species examined (*detersella* Zell., and *remissella* Zell.) differ from the above description as follows: (I) Uncus pointed, thickly covered with long hairs, (II) The characteristic strongly sclerotized black pegs are absent, (III) Gnathos without central hook, (IV) Aedeagus carries a process, terminating in a short, bent hook. These characteristics, together with their different colouration and wing markings, distinguish them from the remaining species.

D. The Genus *Stomopteryx* Hein. (sensu latiori).

The present group of species was formerly included in the bulky genus *Gelechia* Hb., which was stated by Stainton (1867: 2—59) to contain a total of 231 European species.

Previously e. g. Herrich-Schäffer (1854: 43, 189—203) had incorporated these species in the genus *Anacamptis* Curt., and later on this generic name has been generally used, thus e. g. by Meyrick (1895: 581—583). Heinemann (1870: 311—313), too, placed these species in *Anacamptis* Curt., and in addition erected a new genus *Stomopteryx* Hein. containing a single species, *detersella* Zeller (1847: 846), and this arrangement has been followed e. g. by Rebel (1901: 153—154, 157), Meess in Spuler (1910: 373—374, 376), Benander (1928), and Larsen (1916, 1927). It may be mentioned that the three last-named authors apply the author name of Heinemann instead of Curtis to the genus *Anacamptis*.

As the species *populella* Cl. proved to have been chosen as the generotype of *Anacamptis* (Curtis 1827) as well as of *Tachyptilia* (Heinemann 1870), the last-named generic name was sunk to a synonym, and consequently the well known species *Tachyptilia populella* Cl. had to be restored to *Anacamptis* Curt. As it had been pointed out by Walsingham (1895: 40—43) that the genus *Anacamptis*, sensu Rebel (1901) and Meyrick (1895), did not contain Curtis's specified type and thus

nomenclatorily was left nameless, Durrant (1897: 221) re-named the said genus: "*Aproaerema* (= not the thing chosen before), with the type, *Tinea anthyllidella*, Hb., for the genus as defined by Meyrick, which has so long been wrongly known as *Anacamptis*." The genus *Schützeia* Meess in Spuler (1910: 373, Fig. 128), which covers a group of species differing from the remaining *Anacamptis* "Hein." species as regards the neuration, has the same specified generotype (*anthyllidella* Hb.) as *Aproaerema* Durr., and thus is merely a synonym of this genus.

Although accepted by Dyar (1902: 509) in the North American Catalogue, a parallel to the European Catalogue of Staudinger-Rebel (1901), the generic name *Aproaerema* Durr. has been in little use. In the second edition of his "Handbook", Meyrick (1928: 639—641) neglects it, and instead transfers all his previous *Anacamptis* species to the genus *Stomopteryx* Hein., though the generotype of this genus (*detersella* Zell.) indeed looks very different from them. The species are treated in the same way in the Insect Catalogue of the World (Meyrick 1925), where 63 *Stomopteryx* species are enumerated, in the Catalogue of the *Gelechiidae* of the World by Gaede (1937), and in recent lists, e. g. those of Benander (1946: 42), Hackman (1950: 20), and Gozmány (1952: 178).

Hering (1952: 201—207) discusses the genera *Stomopteryx* Hein. versus *Aproaerema* Durr., concluding that both are valid genera and that all previous *Anacamptis* auct. species (except *remissella* Zell., which — as originally stated by Walsingham — should be transferred to the "hexenkessel" *Aristotelia* Hb.) can be arranged in one or the other of these two genera. Hering illustrates the genitalia of two species, which he includes in *Stomopteryx* (*detersella* Zell., and *taeniolella* Zell.), and of one *Aproaerema* species (*anthyllidella* Hb.), pointing out that differences in the neuration coincide with differences in the genitalia. In *Stomopteryx* vein m_1 in the forewing is free-

(Fig. 2), and in the genitalia the "transtilla" (the formation termed sacculi by Pierce & Metcalfe (1935)) is well developed, while the saccus (vinculum) is absent. In *Aproaerema* vein m_1 in the forewing rises out of r_{4+5} (Fig. 14), or out of r_3+r_{4+5} (Fig. 3), and in the genitalia the "transtilla" (sacculus) is lightly developed, the saccus is prominent, and the aedeagus has a peculiar projection, giving that organ the appearance of being "double".

On the basis of the differences in the neurulation (but apparently without any examination of the genitalia) Hering separates those of the species mentioned in the present paper (under the numbers affixed) which were accessible to him as follows:

(a) *Stomopteryx* Hein.:

(1) *vorticella* Scop., (5) *taeniolella* Zell., (6) *coronillella* Tr., (8) *patruella* Mann, (17) *detersella* Zell., (19) *biguttella* HS., (21) *melagonella* Const., (22) *nigritella* Zell.

(b) *Aproaerema* Durr.:

(11) *cincticulella* HS., (11) *biformella* Schütze, (12) *anthyllidella* Hb., (13) *vinella* Bks., (14) *albipalpella* HS., (16) *captivella* HS., (16) *sarothamnella* Zell.

Gozmány (1957:107—129), having examined the genitalia of a considerable number of previous *Anacampsis* species, excludes some of them as unmistakably belonging to other genera (*Xystophora* Hein., *Iwaruna* Gozm.), and arranges the remainder in four closely allied genera, the chief characteristics of which are stated to be as follows:

(a) *Stomopteryx* Hein. Neurulation: " r_{4+5} on long stalk, m_1 free". Male genitalia: "A fused sacculus vinculum-aedeagus complex". Uncus covered with very dense, stiff hairs.

(b) *Aproaerema* Durr. Neurulation: " r_3 and m_1 on the long stalk of the short r_{4+5} ". Male genitalia: Aedeagus appears to be "double".

(c) *Syncopaema* Meyr. Neurulation: "A stalked $r_{3+4+5} + m_1$ system, with r_3 on a very short stalk, or originating from the same point as the common stalk of the three other veins." Male genitalia: "shows the peculiarly hinged structure of the vinculum-sacculus-aedeagus complex with the valva-uncus complex."

(d) *Lixodessa* Gozm. 1957. Neuration: "r₁ and r₂ far back from tip of cell, r₄₊₅ on a short stalk of the long stalk of m₁, r₃ from the point of origin of the former stalk on apex of cell." Male genitalia: "The aedeagus-transtilla pair, though separate, is situated so near and fixed so strongly to the valva-uncus complex that these two portions represent a strictly cohering unity." . . . "flat, appressed state of the sacculus-aedeagus-transtilla complex to the uncus valva complex. The compact build of the organ does not allow any distortion of its two main components under pressure, owing to the short connecting arms of the vinculum."

Gozmány places the species discussed in the previous paper (under the numbers affixed), and familiar to him, into these four genera as follows:

(a) *Stomopteryx* Hein.:

(17) *detersella* Zell., (18) *remissella* Zell.

(b) *Aproaerema* Durr.:

(10) *karvoneni* Hackm., (11) *cincticulella* HS., (12) *anthyllidella* Hb.

(c) *Syncopacma* Meyr.:

(1) *vorticella* Scop., (2) *larseniella* Gozm., (4) *sangiella* Stt., (5) *taeniolella* Zell., (6) *coronillella* Tr., (7) *incognitana* Gozm., (8) *patruella* Mann, (9) *albifrontella* Hein. (*azosterella* Gozm. nec HS.), (14) *albipalpella* HS.

(d) *Lixodessa* Gozm.:

(13) *vinella* Bks. (*biguttella* Gozm., nec HS.), (16) *captivella* HS.

Based upon my study of the group I arrived at the following conclusions:

(1) It is true that some of the previous *Anacampsis* species must be entirely removed from this group. *A. melagonella* Const. should be transferred to *Monochroa* Hein. sensu Benander (1945: 125—135), *A. nigritella* Zell. belongs to *Lamprotes* Hein., and *A. biguttella* HS. (nec. Gozm.) must be placed in a separate genus (recently described as *Ivaruna* Gozmány 1957). Another species (*klimeschi* n. sp.) belonging to the same genus is described below (no. 20).

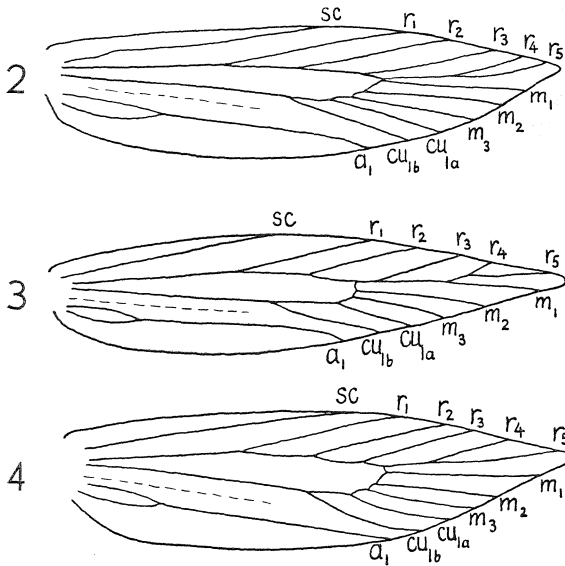
(2) Two of the species ((17) *detersella* Zell., and (18) *remissella* Zell.) — and in addition three others recorded by Gozmány (1957) — are, though allied to the remainder,

generically separate. As one of them is the generotype of *Stomopteryx* Hein. there can be no doubt as to the correct generic name of this genus.

(3) The neuration separates the remaining species as follows:

m_1 free:

(1) *vorticella* Scop., (2) *larseniella* Gozm., (3) *wormiella*



Neuration of forewing in: Fig. 2: *Stomopteryx* (s. s.) *detersella* Zell. ($\times 10$), Fig. 3: *Stomopteryx* (s. l.) *anthyllidella* Hb. ($\times 15$), Fig. 4: *Iwaruna biguttella* HS. ($\times 15$).

n. sp., (4) *sangiella* Stt., (5) *taeniolella* Zell., (6) *coronillella* Tr., (7) *incognitana* Gozm., (8) *patruella* Mann, (11) *cincticulella* HS.

m_1 out of r_{4+5} , or out of $r_3 + r_{4+5}$:

(9) *albifrontella* Hein., (10) *karvoneni* Hackm., (12) *anthyllidella* Hb., (13) *vinella* Bks., (14) *albipalpella* HS., (15) *suecicella* n. sp., (16) *captivella* HS.

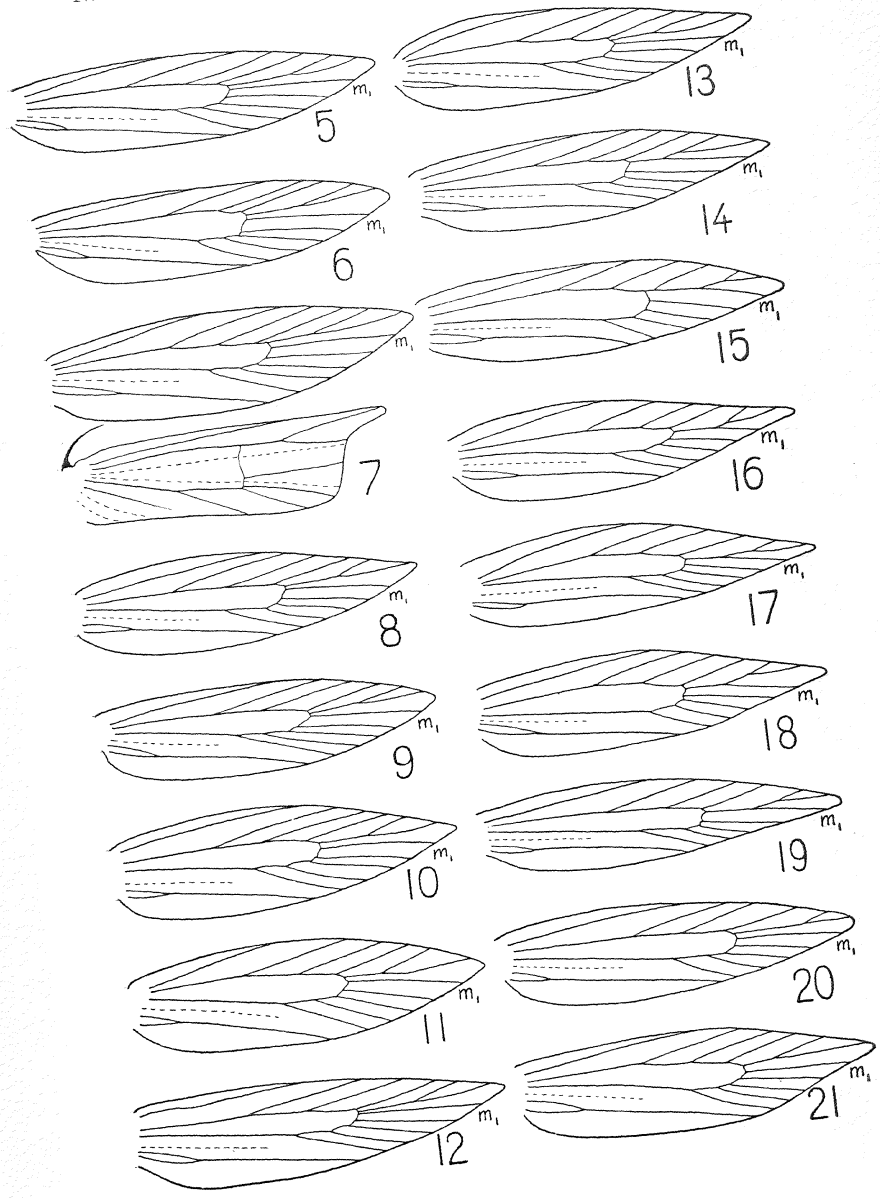
The statement by Hering (1952) mentioned above,

according to which the characters based upon the neuration agree with those based upon the genitalia, suggesting a division of all the species of the group into two genera, *Stomopteryx* Hein., and *Aproaerema* Durr., respectively, has not been confirmed. It is true that the saccus seems to be atrophied or absent in most of the species in the first division, but e. g. *cincticulella* HS. has a saccus not very much different in development from that of *anthyllidella* Hb. A separation taking the neuration as well as the genitalia into account requires more than two genera.

The retention of the generic name *Aproaerema* Durr. (generotype: *anthyllidella* Hb.) requires a new genus for *cincticulella* HS., but still it will prove difficult to account for the apparently close relationship based upon the genitalia, together with the differences in the neuration, between species such as *cincticulella* HS., and *albipalpella* HS.

4) The erection of the new genus *Lixodessa* Gozm. does not seem justifiable. Having been unable to illustrate the generotype (*ochrofasciella* Toll), I refer to Figs. 46—47—48, which show the genitalia of a "*Lixodessa*" species, built up in exactly the same way (saccus split, sacculi strongly sclerotized arms) as in the generotype. It will be seen that the basic character of the genus, "the short connecting arms of the vinculum", (Fig. 1: vin), stated to prevent any distortion of the "sacculus-aedeagus-transtilla complex" in relation to the "uncus-valva complex" are, in fact, long and flexible enough to allow a

Neuration in: Fig. 5: *S. vorticella* Scop., Fig. 6: *S. larseniella* Gozm., Fig. 7: *S. wormiella* n. sp. Fig. 8: *S. sangiella* Stt., Fig. 9: *S. taeniolella* Zell., Fig. 10: *S. coronillella* Tr., Fig. 11: *S. incognitana* Gozm., Fig. 12: *S. patruella* Mann, Fig. 13: *S. cincticulella* HS., Fig. 14: *S. vinella* Bks., Fig. 15: *S. albifrontella* Hein., Fig. 16: *S. captivella* HS., Fig. 17: *S. suecicella* n. sp., Fig. 18: *S. albipalpella* HS., Fig. 19: *S. karvoneni* Hackm., Fig. 20: *S. remissella* Zell., Fig. 21: *Iwaruna klimeschi* n. sp. (Magn. between 12× and 20×).



considerable displacement of these two parts caudad-cephalad (Figs. 47—48) as well as dorsad-ventrad (Fig. 46). The picture of another "*Lixodessa*" species (Fig. 57) shows the same flexibility as usual in the group.

(5) The generotype of *Harpagus* Stephens (1834: 278), a genus to which attention is called by Fletcher (1929: 104) and Hering (1952: 206), *cinctella* Linné (not Stephens as stated by Fletcher), is a species which can be tracked back to Clerck (1759: pl. 11, fig. 2). Fig. 66 shows a photograph of Clerck's illustration of *cinctella*, a Swedish species most likely the same as *vorticella* Scop. An application to Naturhistoriska Riksmuseet in Stockholm, where the collections left by Clerck, via Vetenskapsakademien, (Löwegren 1952: 338), may have landed, brought no material to light.

(6) As to the generic name *Syncopacma* Meyrick (1925: 72), erected for a species from Transvaal, and used e. g. by Janse (1951: 241—263) in his paper on South African moths, is by Gozmány applied to the majority of the previous *Anacamptis* species, but as appears from Figs. 5—18 only 2 of the 9 species examined by me, which Gozmány refers to *Syncopacma* Meyr., agree with his description of the neuration within this genus, while the remainder have m_1 free (as in *Stomopteryx* s. str.). Some of the European species may prove to belong to this genus, but until all nomenclatoric problems concerning this name, and probably more generic names too, applied to species occurring in other parts of the world, and published before 1925, have been definitely cleared up this generic name can hardly be accepted for the majority of the European species.

(7) Until this group has been more thoroughly studied, I consider it safe to retain the species mentioned below (numbers 1—18) in *Stomopteryx* (s. lat.), pointing out that in fact only two (*detersella* Zell., and *remissella* Zell.) are true *Stomopteryx* Hein. (s. str.) species.

E. Synopsis of the Species Studied.

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|----------------------------------|----------------------------------|
| 1. <i>S. vorticella</i> Scop. | 12. <i>S. anthyllidella</i> Hb. |
| 2. <i>S. larseniella</i> Gozm. | 13. <i>S. vinella</i> Bks. |
| 3. <i>S. wormiella</i> n. sp. | 14. <i>S. albipalpella</i> HS. |
| 4. <i>S. sangiella</i> Stt. | 15. <i>S. suecicella</i> n. sp. |
| 5. <i>S. taeniolella</i> Zell. | 16. <i>S. captivella</i> HS. |
| 6. <i>S. coronillella</i> Tr. | 17. <i>S. detersella</i> Zell. |
| 7. <i>S. incognitana</i> Gozm. | 18. <i>S. remissella</i> Zell. |
| 8. <i>S. patruella</i> Mann | 19. <i>I. biguttella</i> HS. |
| 9. <i>S. albifrontella</i> Hein. | 20. <i>I. klimeschi</i> n. sp. |
| 10. <i>S. karvoneni</i> Hackm. | 21. <i>M. melagonella</i> Const. |
| 11. <i>S. cincticulella</i> HS. | 22. <i>L. atrella</i> Hw. |

1. *Stomopteryx vorticella* Scop.(Phalæna *Vorticella* Scopoli 1763: 252).

The species the genitalia of which are described and illustrated by Pierce & Metcalfe (1935: 19, pl. 19) as *vorticella* Sc., seems to be the most widely distributed and most common of the white-banded species within the group. As Scopoli's types were lost already in 1766 (Horn & Kahle 1936: 252), and as his description ("nigra; alis anticis fascia alba, lineari") may cover other species, Pierce & Metcalfe (1935) must be regarded as the first revisors restricting the name *vorticella* Scop., which seems to have been in use ever since 1763, to a distinct species. Dr. Klimesch has kindly assisted me in examining the genitalia of material from *locus typicus* (Krain Front) which proved to agree with *vorticella* Scop. as illustrated by Pierce & Metcalfe.

The species varies considerably in size (wing expanse 10—15 mm). The white transverse band is usually distinct (Fig. 63), but may be absent (Fig. 64) or represented only by a small white spot at the costa (Fig. 65). The unicolourous form *sircomella* Stt., which Meyrick (1928: 641) refers to *taeniolella* Zell., belongs to *vorticella* Scop. (Pierce & Metcalfe 1935: 19). Neuration (Fig. 5), m_1 free.

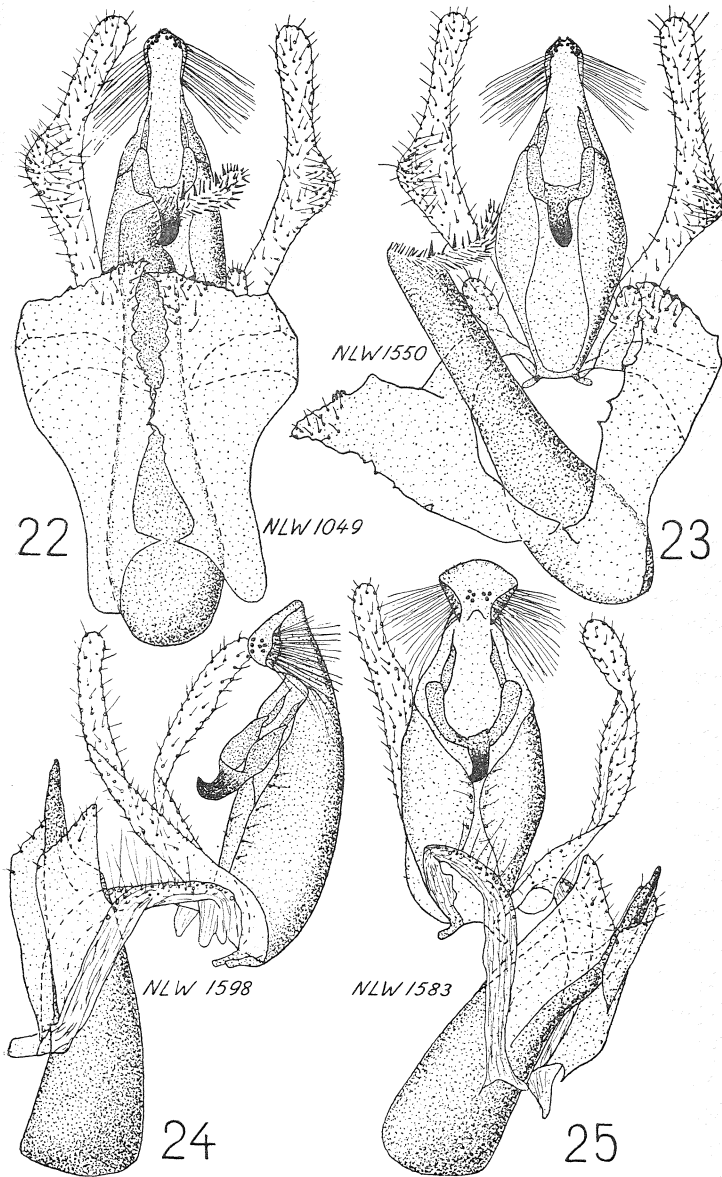
The genitalia are shown in Figs. 22—23. Uncus ventrad narrow, apically with two minute, often nearly in-

visible, points. Pegs 4—6 on either side, near apex. Gnathos hook short. Vinculum arms broad, merging into the large sacculi, which are triangular in shape, more or less serrated at the edges. Aedeagus bottle-shaped. Cornuti a bunch of numerous small spines.

The Danish specimens recorded by Larsen (1916: 179—180, 1927: 98—100) as *patruella* Mann, *nigritella* Zell., *sangiella* Stt., *vorticella* Sc. var. *ligulella* Zell., and *cincticulella* HS., respectively, all belong to *vorticella* Scop. (preps. NLW 1049, 1550, 1553, 1571, 1577, 1579, 1585, 1727).

The trivial name *ligulella*, which has long been used within the group, dating back to Schiffermüller & Denis (1775: 79), is generally quoted as *ligulella* Zell. The differences pointed out by Zeller (1839: 201) between *Gelechia* (*Brachmia*) *ligulella* (“Die schneeweisse Querlinie ist nach innen zu gekrümmt und scheint auf der Unterseite nur am Vorderrande als Fleck durch”) and *vorticella* (“Die schneeweisse, ziemlich breite, gerade Querlinie scheint auf der Unterseite nur am Vorderrande durch”) are, indeed, insignificant, and by most authors *ligulella* Zell. is considered merely a “var.” of *vorticella* Scop. According to Herrich-Schäffer (1854: 194), *ligulella* is stated as “major”, and *vorticella* as “minor”, and this simple, though unreliable, means of distinguishing them is accepted as the basic criterion of their specific distinction by the authors, e. g. Heinemann (1870: 316—317), Nolcken (1870: 577), and Rapp (1936: 121), who treat *ligulella* Zell. and *vorticella* Scop. as separate species.

On my behalf Mr. Bradley kindly dissected the genitalia of the specimen in the Zeller coll. labelled “Type” (prep. BMNH 2743). From Fig. 26, showing an outline drawing which I sketched at the BMNH in 1952 it appears that *ligulella* Zell. is — as was expected — but a synonym of *vorticella* Scop.



Male genitalia ($\times 75$) of: Figs. 22—23: *S. vorticella* Scop., Figs. 24—25: *S. larseniella* Gozm.

The oldest trivial name within the group is *cinctella*, first mentioned by Clerck (1759: pl. 11, fig. 2). Two years later Linné (1761: 373), without quoting Clerck, gave a description of: "1380. *Ph(alena) Tinea cinctella*" and, another two years later, Scopoli (1763: 252) in his description of *vorticella* quoted Linné. In the following period the name *cinctella* was in common use (often referring to Hübner: 1801, Fig. 142), as appears from Stephens (1854: 81), who gives no less than 16 literary quotations of this name within the period 1764—1829. During the last 125 years the name has been little used, and a possible restoration of the name *cinctella* seems most inconvenient. Fig. 66

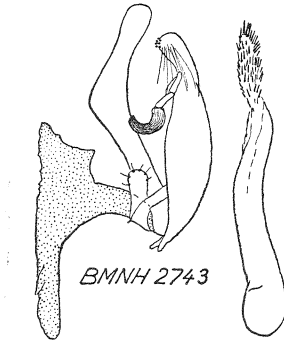


Fig. 26. Male genitalia of Zeller's specimen of *Gelechia (Brachmia) ligulella*, labelled "Type" in the BMNH ($\times 50$).

shows a photograph of Clerck's illustration of *cinctella* which is most likely identical with *vorticella* Scop.

On the basis of a single Finnish specimen, with a white fascia on the forewing, Gozmány (1957: 119—120) describes a new species under the name of *finlandica*. Fig. 27 shows a photograph of Gozmány's illustration of the genitalia. A detailed examination of the mount of the holotype, which Dr. Gozmány kindly permitted me to study, did not enable me to establish any specific distinction from *S. vorticella* Scop.

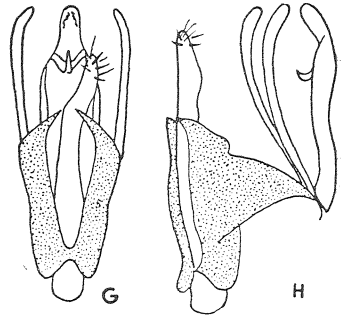


Fig. 27. Male genitalia of *S. finlandica* Gozm., after Gozmány (1957: 120, Fig. 4).

Distribution: Finland, Sweden, Denmark, Great Britain, Germany, Austria, Switzerland, Hungary etc., probably the whole of Europe.

2. *S. larseniella* Gozm.

(*Syncopacma larseniella* N. Wolff, Gozmány 1957: 116).

Under the name of *Stomopteryx ligulella* Z., Pierce & Metcalfe (1935: 19, pl. 11) describe and illustrate the genitalia of a species differing distinctly from the remainder. Among the Danish "*vorticella*" preserved in coll. Zool. Mus. Copenh. I have found several specimens of the same species, all originating from the island of Funen (Tornehavemosen 4/VII 1912, Faaborg 11/VII 1917, C. S. Larsen leg.). On the Danish island of Fanö, in a strictly limited locality, I found (4/VII 1948, 23—29/VI, 3/VII 1952) this species swarming abundantly at dusk in a meadow grown with *Lotus corniculatus*.

I have compared my mounts of the Danish specimens with Pierce's original slides, and found them to agree.

The material of foreign origin in coll. Zool. Mus. Copenh. also contained a specimen of this species (locality: "Mahlen" ²⁶/₆ 1889, prep. NLW 2267). If the locality name stands for Mahlenhof, this specimen was taken in Lithuania. Gozmány (1957: 116) also records a single specimen of this species (locality: Germany, Pomerania, coll. Hung. Nat. Hist. Mus., Budapest).

Since the specimen of *ligulella* in Zeller's collection labelled "Type" belongs to *vorticella* Scop., as stated above, the name *ligulella* cannot be maintained, and the species illustrated by Pierce & Metcalfe will have to be re-named.

Before Gozmány had finished his paper on the group, I informed him that I intended to re-name this species *larseniella*, and, expecting that my description would appear before his own paper, Gozmány (1957) treats this species under the name of *larseniella* Wolff. As Gozmány's paper, however, predates the present, the correct name of the species must be *larseniella* Gozm.

The species is little variable, and specimens without the clear white fascia have not been met with. Neuration (Fig. 6) as in *vorticella* Scop., m_1 free.

This species (Fig. 67) can hardly be separated from *vorticella* Scop. without examination of the genitalia (Figs. 24—25). Uncus arched, ventrad broad. Pegs 3—5 on either side, remote from the apex. Gnathos hook short. Sacculi edges almost parallel, smooth, apical edge slightly serrated, oblique. Vinculum arms long. Aedeagus pointed.

Distribution: Great Britain, Denmark, Germany, ?Lithuania.

Note: Named in honour of the late Mr. C. S. Larsen (Odense), who collected the first Danish specimens, and whose huge collection of Microlepidoptera forms the basis of the Danish collections in the Zool. Mus. Copenh.

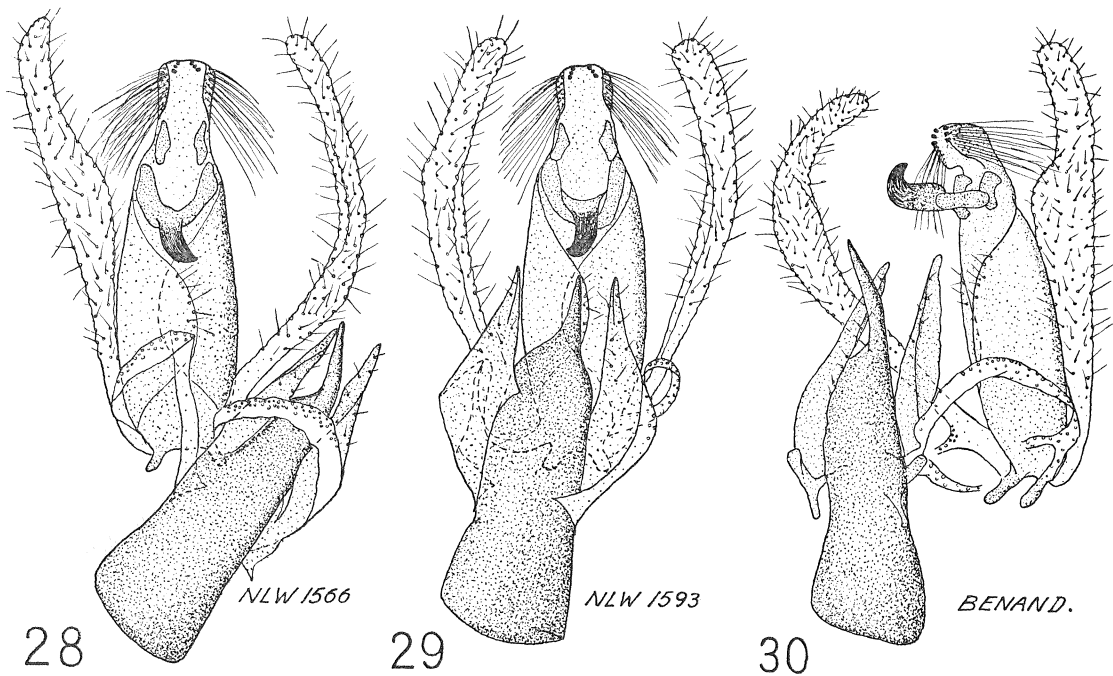
3. *S. wormiella* n. sp.

An examination of the Danish material of "*vorticella*" disclosed the presence of 3 specimens of an undescribed species, nearly related to, but specifically distinct from, both *vorticella* Scop. and *larseniella* Gozm.

All the specimens originated from the same locality, Amager: 10/VII 1940 (1 spec. Worm-Hansen leg.), 9/VII 1950 (2 specimens, E. Kjær leg.), where they were taken among *Ononis spinosa*.

Later on I have had a check on Dr. Benander's mounts, which proved to include several Swedish specimens of this hitherto unknown species, having been taken on the island of Öland 3/VII—2/VIII 1931 (5 specimens, Benander leg.) and on the island of Gotland 6/VII, 15/VII 1933 (2 specimens, Benander leg.), respectively.

Among Pierce's slides of "*ligulella* Zell." in the coll. BMNH I also found a mount (prep. no. BMNH 2400) — by Pierce labelled "G. f. 4—? LIGULELLA-Staudinger" — of the same species (locality not stated) of which, thus, at least 11 specimens are known at present.



28 29 30
 Male genitalia ($\times 90$) of *S. wormiella* n. sp. Fig. 28: Paratype (locality: Denmark), Fig. 29: Holotype, Fig. 30: Paratype (locality: Sweden).

The forewings (Fig. 77) are shorter and broader than in *larseniella* Gozm., and the white fascia prominent, otherwise similar. The species also occurs in a form without fascia (Fig. 78). Neuration (Fig. 7) as in *vorticella* Scop. and *larseniella* Gozm., m_1 free.

Genitalia (Figs. 28-29-30). Uncus intermediate in shape between *vorticella* and *larseniella*, apically slightly incurving. Pegs 3 on either side close to the apex. Gnathos hook longer than in *larseniella*. Valvulae long. Sacculi edges converging to a tip. Aedeagus pointed.

Distribution: Denmark, Sweden.

Holotype: labelled Amager ¹⁰/₇ 1940, Worm-Hansen leg., incl. genital slide NLW 1593 in the coll. Zool. Mus. Copenh. Paratypes in the coll. P. Benander (Höör in Sweden) and in the coll. of the author.

Note: Named in honour of Mr. J. G. Worm-Hansen, for a period of more than 70 years an enthusiastic, and still active, collector of Lepidoptera, who took the first Danish specimen.

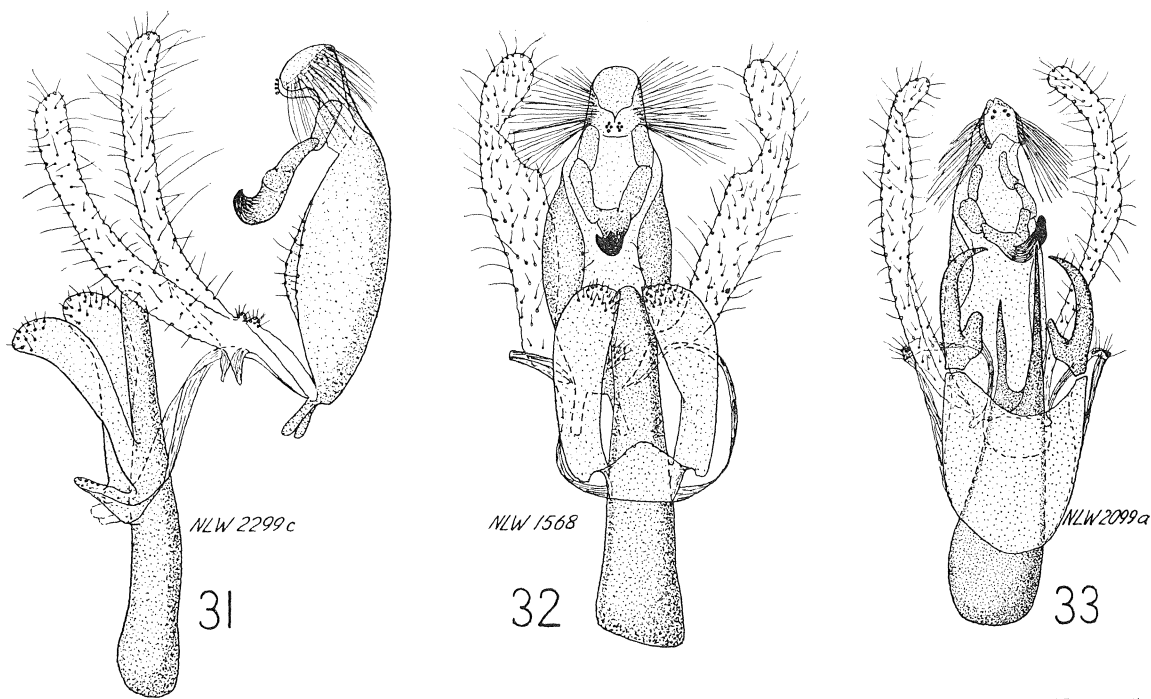
4. *S. sangiella* Stt.

(*Gelechia sangiella* Stainton 1863: 149).

The lateral aspect of the genitalia of a specimen of *S. sangiella* Stt. originating from Stainton's type material is shown in Fig. 31. I have also studied the lectotype, designated by Mr. Bradley in 1952 (prep. BMNH 2934), as well as Pierce's genital preparations upon which his description (Pierce & Metcalfe 1935: 19, pl. 11) is based. Pierce's material agrees in all details with the type material.

An unmistakable *sangiella* Stt. is illustrated by Osthelder (1951: 153, Fig. 2 a), although he, erroneously, states this figure to represent *S. nigrifella* Zell.

The characteristic shape of the sacculi in this species also distinctly appears from Gozmány's illustration (1957: 114, Fig. 3 (H)).



Male genitalia ($\times 75$) of: Fig. 31: *S. sangiella* Stt. (Paratype), Fig. 32: *S. sangiella* Stt. (locality: Finland).
 Fig. 33: *S. albifrontella* Hein. (f. *ignobiliella* Hein. Type).

As mentioned above, the Danish records of *S. sangiella* Stt. (Larsen 1927: 99) actually refer to *S. vorticella* Scop. Also the specimen of "*Xystophora questionella* HS." which Larsen (1927: 101) states to belong to *A. sangiella* Stt. proved to belong to *S. vorticella* Scop. (prep. NLW 1553). Fig. 32 shows the ventral aspect of the genitalia of a specimen of *S. sangiella* Stt. from Finland. I have also examined a mount of a Swedish specimen (Benander 1953: 96) which proved to be correctly identified.

Forewings blackish-fuscous, apical spots small, ochreous-whitish. Neuration (Fig. 8), m_1 free.

Genitalia (Figs. 31—32). Uncus rounded. Pegs 2—4 on either side, distant from apex. Gnathos hook short, stout, pointed. Sacculi long, outer edge smooth, inner edge incurving, apically rounded. The sacculi in the Swedish and Finnish specimens appear a little broader than those in specimens examined from Great Britain and Switzerland, but as they agree in all other details, I consider this difference to be within the normal limits of deviation. Saccus lightly developed. Aedeagus simple.

Distribution: Finland, Sweden, Great Britain, Germany, Switzerland (ex coll. P. Weber), Hungary, Bulgaria, France, Spain.

Lectotype: labelled Darlington incl. genital slide no. BMNH 2934 in the coll. BMNH.

5. *S. taeniolella* Zell.

(*Gelechia* (*Brachmia*) *taeniolella* Zeller 1839: 201).

Although superficially similar to other white-banded species, as e. g. *S. vorticella* Scop., this species is easily recognizable by means of the white transverse band on the forewing, which also appears on the under-surface, where it forms a distinct white fascia on the forewing and a costal spot on the hindwing, as also stated in the original description. The only additional European species exhibiting a similar character is *S. albifrontella* Hein., which, however, is much smaller, and lighter in colour. Neuration (Fig. 9), m_1 free.

Except that unicolourous specimens of *S. vorticella* Scop. according to Pierce & Metcalfe (1935: 19) have erroneously been referred to this species — which does not seem to have been observed in unicolourous forms — the identification of *S. taeniolella* Zell. caused but little difficulty.

Genitalia (Figs. 36—37). Uncus slightly arched. Pegs 2—4 on either side. Gnathos hook very long. Valvula widening towards apex, then tapering. Sacculi long, caudad broader, flaps having a ventral projection, but otherwise regularly edged, and enclosing the stout aedeagus. Cornuti 4 thorns, one of which rises from a strongly sclerotized, angulated base.

Distribution: All Europe, Asia Minor.

6. *S. coronillella* Tr.

(*Lita coronillella* Treitschke 1833: 87—88).

The British specimens recorded as *S. coronillella* Tr. and examined by Pierce & Metcalfe (1935: 19) proved to belong to *S. vinella* Bks. The records from Sweden (Benander 1928: 87, 1946: 42) and Livonia (Nolcken 1870: 578) are also most likely based upon misdeterminations.

The specimens the genitalia of which are shown in Figs. 34—35, were received from Dr. Klimesch, and I have verified their identity by comparison with a mount of the genitalia of a paratype ex. coll. Treitschke, which Dr. Gozmány kindly placed at my disposal.

In his description Treitschke states: "*coronillella* unterscheidet sich aber standhaft von der einen und der andern dadurch, dass die weissen Stellen auf ihren Vorderflügeln nicht aus Punkten, sondern aus einem zusammenhängenden Querstreiche bestehen, welcher nur am Anfange und am Ende fleckenartig stärker wird". This description is probably correct in most cases, but the narrow connecting band mentioned may be entirely

absent and even the white apical spots may have disappeared. Treitschke also states that this species "ist von den kleinsten Schaben jetziger Gattung, kaum so gross als die bekannte *Vorticella*, Scop." The seven specimens in my collection (from Austria and Switzerland), however, are all fairly large (wing expanse 12.5—13.0 mm).

Forewings broad, ground colour brownish, sometimes nearly black. Neuration (Fig. 10), m_1 free.

Although *S. taeniolella* Zell. and *S. coronillella* Tr. are unlike in appearance, the genitalia (Figs. 34—35) to some extent show relationship, e. g. by the presence of large cornuti. Uncus broad. Pegs 3—4 on either side, longer and more lightly sclerotized than usual in the group. Gnathos hook short, widening at base. Valvula slender. Sacculi very broad flanges, apical edge incurving, terminating in two projections, sometimes far more pronounced than in the specimen shown in Fig. 35. Between the tegumen-part and the aedeagus-part stumpy formations occur. Aedeagus tapering. Vesica set with 4 thorns, easily broken off (none were left in the preparation of the paratype).

Distribution: Probably southern part of Central Europe.

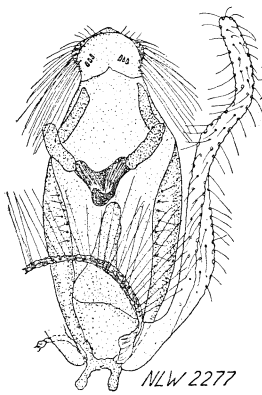
Lectotype: labelled Treits. 3735 incl. genital slide Gozm. 897 in the coll. Hung. Nat. Hist. Mus., Budapest.

Note: The statement by Gozmány (1957: 117—118), according to which *Gelechta nigritlella* Zell. is a synonym of *S. coronillella* Tr., is not correct (vide 22. *Lamprotes atrella* Hw.).

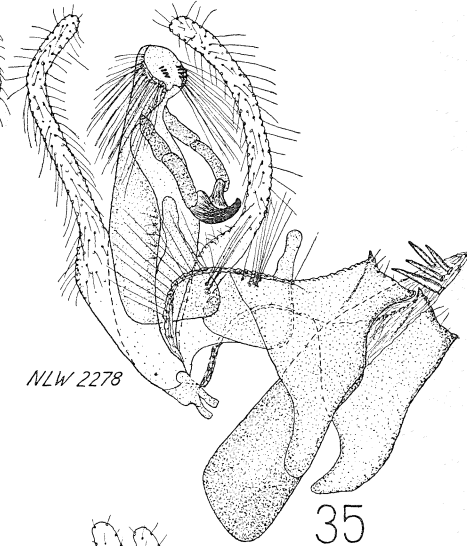
7. *S. incognitana* Gozm.

(*Syncopacma incognitana* Gozmány 1957: 118—119).

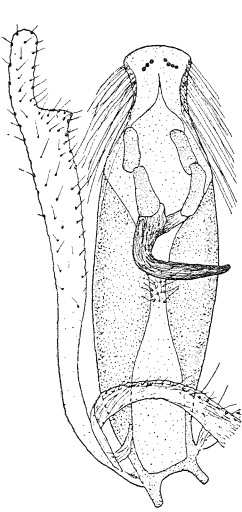
In his description of *S. karvoneni*, Hackman (1950: 23) mentions that the material of "*Stomopteryx ignobiliella* Hein.", used for comparison, proved to consist of two different species. The genitalia of one of these specimens (ex coll. Nat. Hist. Mus. Vienna, labelled: Grünstadt ¹⁹/₇ 1870) which (in 1949) had been mounted by Dr. Klimesch,



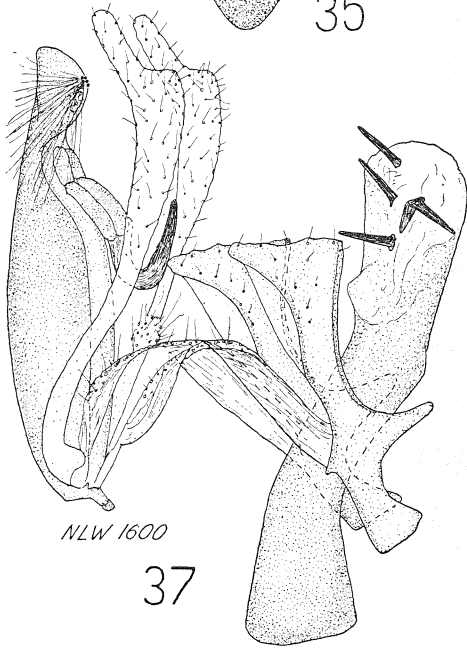
34



35



36



37

Male genitalia ($\times 65$) of: Figs. 34—35: *S. coronillella* Tr.,
Figs. 36—37: *S. taeniolella* Zell.

is illustrated in Fig. 38, based upon a sketch which Dr. Klimesch sent me some years ago.

The species to which this specimen belongs, differs from the holotype of *A. ignobiliella* Hein. which I examined in 1956 (see later), and has recently been described

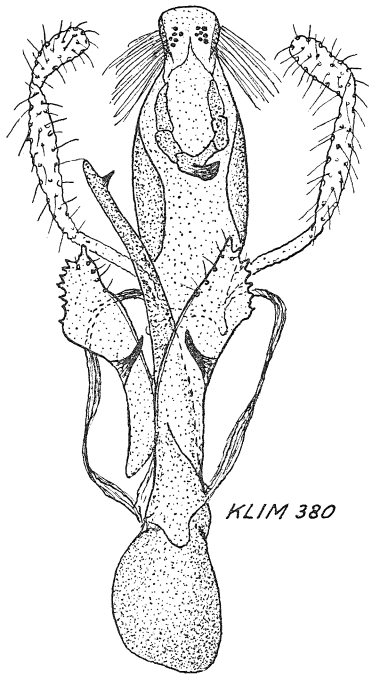


Fig. 38: Male genitalia ($\times 80$) of: *S. incognitana* Gozm.

by Gozmány (1957: 118—119, Fig. 4 D) under the name of *S. incognitana*. Dr. Gozmány based his description upon 4 Austrian specimens (ex coll. Hung. Nat. Hist. Mus.) which had been taken for *coronillella* Tr. Although schematic, Gozmány's illustration of the genitalia of *S. incognitana* Gozm. seems to correspond to Fig. 38, but to be on the safe side I asked for a loan of his slides. Dr. Gozmány most kindly sent me two mounts (holotype

and paratype, respectively) which enabled me to demonstrate with certainty that the species shown in Fig. 38 belongs to *S. incognitana* Gozm.

The moth (Fig. 73), the genitalia of which are illustrated in Fig. 38, were kindly sent me by Dr. Schönmann, Vienna, for study.

Forewings dark ochreous brown, apex and ciliae dotted with coarse, darker scales, the usual spots on costa and termen just indicated by a few light-coloured scales. Wing expanse 11.0 mm. Neuration (Fig. 11), m_1 free.

Genitalia (Fig. 38). Uncus rounded, caudad flattened. Pegs 6–7 on either side. Gnathos hook medium-sized. Valvula slender. Sacculi with sides almost parallel, apical edge oblique, serrated, and a pair of strongly sclerotized hooks. Aedeagus long, slender, cephalad bulbed, with a thorn near the orifice.

Distribution: Austria.

Holotype: labelled Austria inf., Gumpoldskirchen, ex *Onobrychis sativa*, leg. Krone, incl. genital slide Gozm. 742 in the coll. Hung. Nat. Hist. Mus., Budapest.

8. *S. patruella* Mann.

(*Gelechia patruella* Mann 1857: 180).

As mentioned above, the Danish specimens of *S. patruella* Mann recorded by Larsen (1916: 179) actually refer to *S. vorticella* Scop. The Swedish records (Benander 1946: 42) are dubious, and should probably be referred, partly to *S. vorticella* Scop., partly to *S. suecicella* n. sp.

The genitalia of *S. patruella* Mann are illustrated by Klimesch (1950) and Osthelder (1951: 153, Fig. 2 b). These illustrations are based upon correctly determined material, as appears from Gozmány (1957: 115, Fig. 3 C), who examined Mann's type material.

This species is generally larger (wing expanse 13–16 mm) and stouter than the remaining species. Ground colour of fore-wing brown, sometimes nearly black, and

often with a bluish tint. Apical spots yellowish white. They may be entirely absent or forming a very narrow cross-line. Neuration (Fig. 12), m_1 free.

Genitalia (Figs. 39—40). Uncus rounded, slightly arched. Pegs about 5 on either side. Gnathos hook of medium size. Valvula with a projection near base. Sacculi pointed, outer edges even, inner edges serrated. Between the tegumen-part and the aedeagus-part a lightly sclerotized apron-like membrane, carrying two curved projections and set with two patches of very long hairs. Aedeagus regularly cone-shaped, terminating caudad in two minute, strongly sclerotized, points.

Distribution: Germany (Regensburg ex coll. Zool. Mus. Copenh.), Switzerland, Austria, Italy, and (according to Gozmány 1957) Hungary, Roumania.

Lectotype: labelled Istrien 1853 incl. genital slide Gozm. 875 in the coll. Mus. Nat. Hist. Vienna.

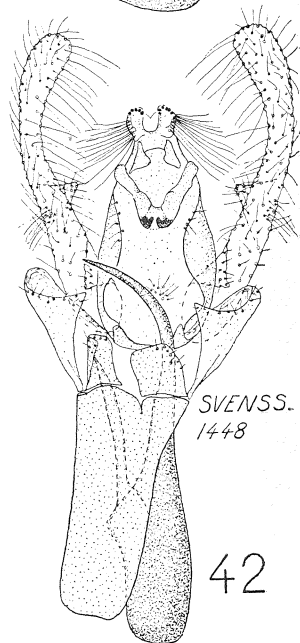
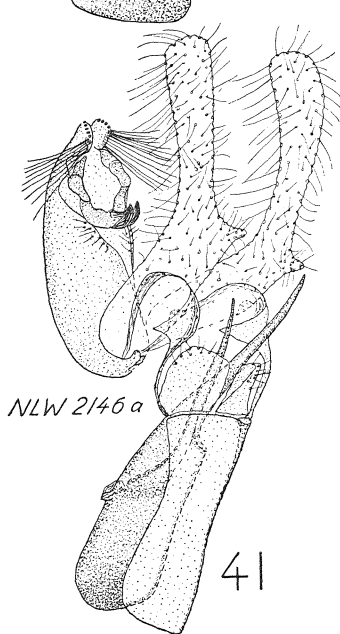
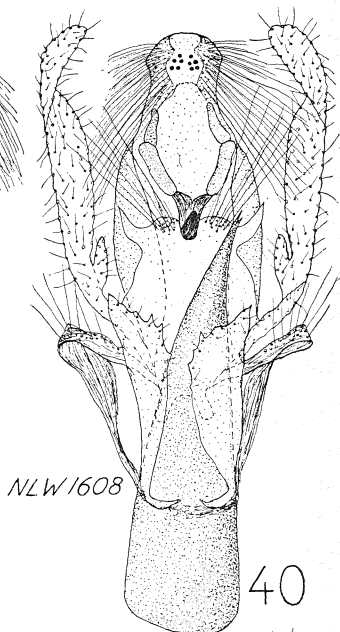
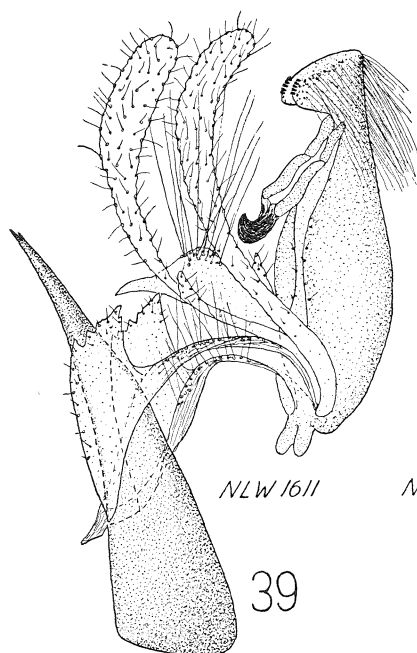
9. *S. albifrontella* Hein.

(*Anacamptis albifrontella* Heinemann 1870: 319)

Although based upon a single specimen only, the characters which Heinemann (1870: 319) states in his description of this species make a "typical" specimen easily recognizable.

From his detailed and careful description I quote: "Vdfl. schwärzlich bleigrau, mit einem weissen Querstreif hinter der Mitte, die Htfl. weisslich, der Kopf grau, im Gesichte schmutzig weiss. $1\frac{3}{4}$ L. . . . Der Querstreif kaum etwas schräg, ziemlich schmal und gleich breit, über der Mitte in einer schwachen Ecke saumwärts vortretend. . . . Die Unterseite weisslich grau, mit deutlich hellerem Querstreif. . . . Ein Stück von Baden in der Schweiz."

Heinemann does not mention from which collection the specimen described originated, but Mr. Gross informs me that in coll. Heinemann in Mus. Hannover no



Male genitalia ($\times 65$) of: Figs. 39—40: *S. patruella* Mann,
Figs. 41—42: *S. karvoneni* Hackm.

specimen of *albifrontella* Hein., and not even (as is otherwise often the case) a label stating the name of the species is present. As the species seems never to have been in Heinemann's possession, he must have described the Swiss specimen mentioned from some other collection, not unlikely from that of Frey.

From coll. Frey (in the BMNH) Mr. Bradley sent me for study two specimens (Figs. 68—69) both determined as *albifrontella* Hein. and agreeing with Heinemann's description to such an extent that no doubt exists as to their identity. Both seem to have been labelled by Frey. The specimen shown in Fig. 68 carries a label stating: "G. Albifrontella v. Heinem. Zürich (v. Heinem. vid.)", and the specimen illustrated in Fig. 69 is labelled "Baden. Lagern". It is highly probable that the last-mentioned specimen is actually the holotype of *albifrontella* Hein. but the identification of the two said specimens is at any rate correct. Both of them were males, and the shape of their characteristic genitalia will appear from Fig. 33.

Gozmány (1957: 120—121) records 3 white-banded specimens agreeing regarding the genitalia with Fig. 33. The first of these specimens was included in the collection of the Museum of Cracow (determined as *S. taeniollella* Zell.), and also originated from coll. Frey (locality: Zürich) while the other two were present in coll. Issekutz (locality: Isazeg, Hungary, Issekutz leg.). Gozmány, who in his revision of the group makes no mention of *S. albifrontella* Hein., refers these specimens to *S. azosterella* HS., a statement which I am unable to accept (see below: "Note 1").

Heinemann (1870: 313—314) also described a new, unicolourous, species under the name of *ignobiliella*. The type of this species is still present in the coll. Mus. Hannover, and by the courtesy of Mr. Gross I have had the opportunity to study the specimen, which besides the

locality label: "Regensburg HS.", carried an extra label with the name "*ignobiliella*" in Heinemann's handwriting. A photograph of the specimen is shown in Fig. 70, and the genitalia, drawn from this specimen, are illustrated in Fig. 33.

As the very characteristic genitalia of the five white-banded specimens mentioned above (*albifrontella*) and those of the unicolourous specimen (*ignobiliella*) are identical, it is beyond doubt that these two species, in spite of their superficial distinctness, are conspecific, and it will be seen that this species does vary in exactly the same manner as e. g. *vorticella* Scop., or *wormiella* n. sp., being normally white-banded, but occurring occasionally in a unicolourous form. The names *ignobiliella* and *albifrontella* are published at the same time (the fact that the former name appears 6 pages before the latter is of no nomenclatoric value), and as the consequence of rejecting the name *albifrontella* in favour of *ignobiliella* would be that the appearance of "typical" specimens of the species would differ largely from the type specimen, I select *albifrontella* Hein. as the trivial name of the species, leaving *ignobiliella* Hein. as the name of its unicolourous "aberration".

This species has only been rarely mentioned in the literature. Rebel (1901: 154) and Meyrick (1925: 112) as well as Gaede (1937: 333) treat *albifrontella* Hein. as a doubtful synonym of *S. sarothamnella* Zell. (a synonym of *captivella* HS., see later), and Meess (1910: 374), though treating it as a separate species, adds a ? to its name. It may be mentioned that Hering (1932: 132) treats the species correctly, stating the characters separating *albifrontella* Hein. from the remaining species.

Forewings narrow, dark greyish, or ochreous with a narrow white, straight transverse band (Figs. 68—69). Neuration (Fig. 15), m_1 rises out of $r_3 + r_{4+5}$. The species also occurs in a form without fascia (Fig. 70).

Genitalia (Fig. 33). Uncus lightly cleft, dorsad with a keel. Pegs 2—3 on either side. Gnathos hook long. Sacculi inwardly curving, strongly sclerotized, hooks carrying a projection at base. Saccus a shield-shaped plate. Aedeagus "cleft", terminating caudad in a long and a shorter spine.

Distribution: Germany, Switzerland, Hungary.

Holotype(?): labelled Baden, Lagern incl. genital slide NLW 2301 in the coll. BMNH.

NOTE 1: The identity of the species which Herrich-Schäffer (1854: 194) described under the name of *Anacamptis azosterella* and which has been accepted by most authors (e. g. by Rebel (1901), Meess (1910), Meyrick (1925), Gaede (1937), Gozmány (1952)), has in fact never been cleared up, and I have not succeeded in tracking any reliable material to which this name may be applied.

The reasons which Gozmány (1957: 120) states for referring the specimens mentioned above, agreeing in regard to the genitalia with Fig. 33, to *azosterella* HS. are the following: "I have not seen the type of this species, but the description of the usually laconic HERRICH-SCHÄFFER is so poignant — in spite of its one and a half lines of text — that it is absolutely unmistakable. The chief characteristic of the species (concerning its external appearance) is that the fore wing is "röthlich schimmernd", to quote HEINEMANN (l. c. p. 316), who had HERRICH-SCHÄFFER's type specimen before him when he made his more detailed description. The white cross-band is also very distinct, sharp, pure."

The literal wording of the original description of *Anacamptis azosterella* HS. reads, however, as follows: "Fascia albida obsoletior, rectissima, angusta. Die weisse Binde schmal, ganz gerade, etwas bräunlich, der Saum der Hinterflügel vor der Spitze viel tiefer eingebogen. 1 Exemplar fand H. Lederer bei Wien." As an important supplement to this rather insignificant description, Herrich-Schäffer (l. c.: 189) in his "Synopsis specierum" gives the following additional information concerning *azosterella*, *ligulella*, *vorticella*, and *cincticulella*: "Unten keine weisse Binde", and concerning *taeniolella*: "Unten die Vorderflügel mit durchziehender weisser Binde". In the description of *A. azosterella* HS., given by Heinemann (1870: 316), which, as usual, is detailed, the species is stated to be a little larger than e. g. *vorticella*, and the underside of the forewing is described as brownish-grey just with an inconspicuous costal spot.

From these descriptions it appears that the tiny *albifrontella*, which, like *taeniolella*, has a light transverse band also on the under-surface of the forewing, cannot be synonymized with *azosterella* HS. The fact that the specimen ex coll. Mus. Cracow is stated to have been originally identified as *taeniolella* Zell. also indicates that this specimen must have a light band across the under-side of the forewing.

As Herrich-Schäffer's type specimen, as stated by Hering (1952: 206), has been lost, it seems impossible to arrive at a safe identification of "*azosterella* HS." which, judging from Heinemann's description, may be synonymous with *vorticella* Scop.

Note 2: Gozmány (1957) includes this species in *Syncopacma* Meyr., though the presence of a "double" aedeagus would rather refer it to *Aproaerema* Durr.

10. *S. karvoneni* Hackm.

(*Stomopteryx karvoneni* Hackman 1950: 23—25).

This species, which has hitherto been known exclusively from Finland, was recorded by Karvonen (1941: 75), who during the period 28/V—3/VI 1940 collected about 15 specimens in the South of Finland, as belonging to *S. ignobiliella* Hein., but was afterwards described by Hackman (l. c.) under the above name.

Figs. 41—42 show the genitalia of two Swedish specimens (locality: Västerbotten, Vännäs, 17/VI 1952, Ingvar Svensson leg.) which I have had the opportunity to examine. The genitalia of *S. karvoneni*, as described by Hackman, are so characteristic that no doubt exists as to the identification of the last-named specimens.

Forewings narrow, unicolourous dark brownish grey, dotted with darker scales, no wing markings present. Wing expanse of one of the Swedish specimens 13.5 mm (the Finnish specimens are recorded as ♂: 13 mm, ♀: 11.5 mm). Neuration (Fig. 19), m_1 out of r_{4+5} .

Genitalia (Figs. 41—42). Uncus deeply cleft, excavation wide, apically bordered with 5—6 pegs on either side. Gnathos hook cleft into two short, pointed hooks. Valvula apically widening with blunt protuberances mid-

way and near base. Tegumen cephalad wide. Vinculum arms carry a pair of triangular projections. Saccus very long. Sacculi (by Hackman stated to be atrophied) appear in both mounts as a pair of well-developed flaps, attached caudad to the saccus. Aedeagus, as in *S. albifrontella* Hein., terminating in a long, curved, pointed, and a shorter spine.

Distribution: Finland, Sweden.

Holotype: labelled Kouvola 1/VI 1940, leg. V. Karvonen, in coll. Mus. Zool. Helsingfors.

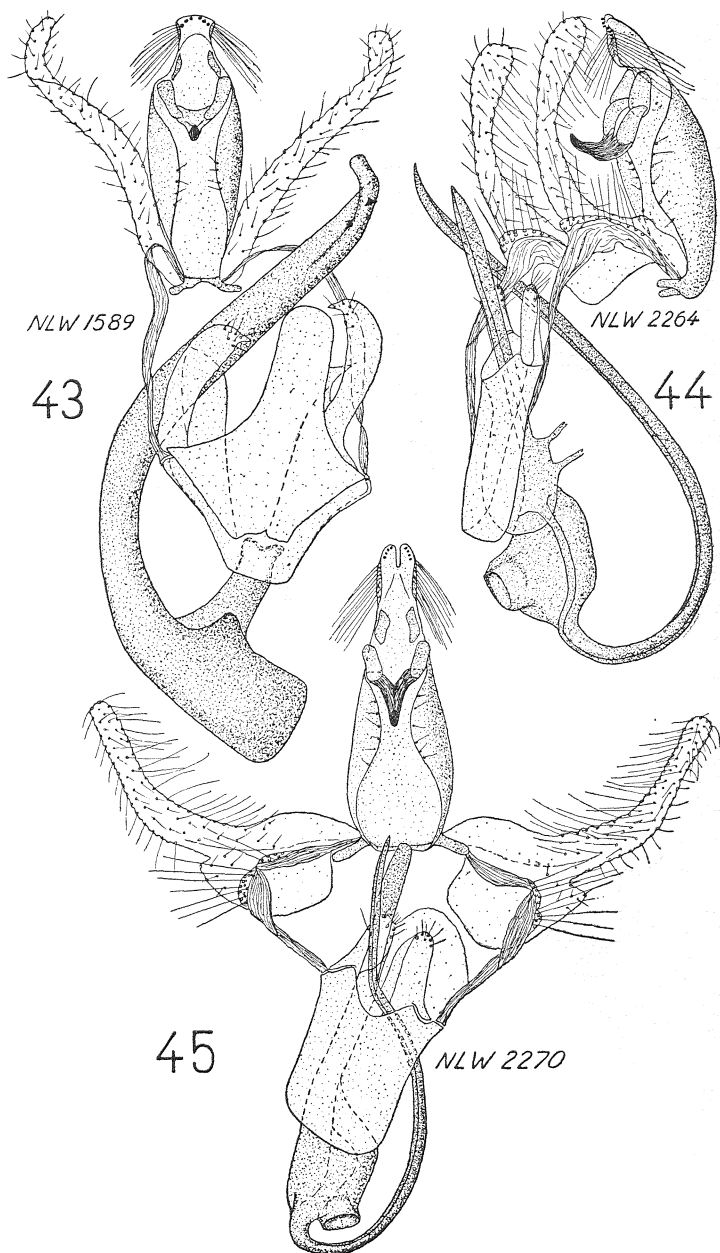
11. *S. cincticulella* HS.

(*Anacamptis cincticulella* Herrich-Schäffer 1854: 194).

As previously stated, the Danish records of *S. cincticulella* HS. (Larsen 1916: 179—180, 1927: 100) refer to *vorticella* Scop. The species has also been recorded from Sweden (Benander 1928: 88) but does not appear in the latest Swedish list (Benander 1946: 42).

In his "Synopsis specierum" Herrich-Schäffer (1854: 189) makes no attempt to state any differences between the following species: *azosterella*, *ligulella*, *vorticella*, and *cincticulella*, and as the characteristics of *cincticulella* mentioned in his description (l. c.: 194 ("Die kleinste, mit den schmalsten Flügeln, das weisse Band rechts etwas S-förmig geschwungen")) do not permit a safe distinction between this species and *vorticella* Scop., it is not to be wondered at that these two species — sometimes regarded as synonyms e. g. by Meyrick (1895: 582) — have often been confused.

S. cincticulella is, in fact, a bona species, well defined by means of the genitalia. As the British "*cincticulella*" examined proved to be *vinella* Bks., Pierce & Metcalfe (1935: 19, pl. 11) give a figure of a German *cincticulella* ♂, and this corresponds in detail with e. g. those of a small series of *cincticulella* preserved in the coll. Zool. Mus. Copenh. (locality Lausitz, Saxony) ex coll. C. S.



Male genitalia ($\times 65$) of: Fig. 43: *S. cincticulella* HS.,
Figs. 44—45: *S. anthyllidella* Hb.

Larsen (purchased through Staudinger & Bang-Haas). As Herrich-Schäffer's type material is lost, Pierce & Metcalfe must be regarded as the first revisors restricting the name *cincticulella* HS. to a distinct species.

Neuration (Fig. 13), m_1 free. Judging from the morphology of the genitalia, it might be expected that m_1 would have had its offspring from r_{4+5} , as also stated by Hering (1932: 132), who treats *cincticulella* as belonging to the genus *Schützeia* Spul. (a synonym of *Aproaerema* Durr.), although, regarding *cincticulella*, he states that "Angeblich sollen auch hier Stücke mit frei entspringender Ader m_1 im Vdfl. vorkommen". The forewing, the neuration of which is shown in Fig. 13, belongs to the same specimen, the genitalia of which appear from Fig. 43, and additional specimens examined likewise proved to have m_1 free.

Genitalia (Fig. 43). Uncus arched. Pegs 2—3 on either side, close to apex. Gnathos hook medium-sized. Sacculi a pair of narrow, curved, sharply pointed protuberances. Saccus prominent, extended centrally, hinged to the extremely long, slender, curved aedeagus, which carries a short, blunt projection near its cephalic widening, and a minute thorn near the orifice.

Distribution: Germany, Austria, Southern Europe.

Note: Schütze (1902: 13) described an *Anacamptis* species under the name of *biformella*, characterized by a pronounced sexual dimorphism, the forewing of the male carrying only two whitish apical spots, while the female is white-banded. Gozmány (1957: 113, 123), having examined specimens of *biformella* ex coll. Schütze (now in the coll. Hung. Nat. Hist. Mus.), established that this — in reality very unlikely — statement of such a sexual dimorphism within the group is due to an error. Schütze had intermixed two different species, of which the white-banded specimens belonged to *cincticulella* HS., and the remainder to *vinella* Bks. (*biguttella* Gozm. nec HS.).

12. *S. anthyllidella* Hb.

(*Tinea anthyllidella* Hübner 1803: t. 43, fig. 330).

Being the commonest and most widely distributed of the species whose wing-markings are confined to one or

two light apical spots, *S. anthyllidella* occurs in most cases correctly identified in the collections. This, however, does not exclude that other species, e. g. *vinella* Bks., may be found to be confused with *anthyllidella*.

The genitalia, illustrated by e. g. Pierce & Metcalfe (1935: pl. 10), differ distinctly from those of all the other species of the group.

Neuration (Fig. 3), m_1 out of r_3+r_{4+5} .

Genitalia (Figs. 44—45). Uncus long, narrow, deeply cleft, excavation narrow, bordered with 3—4 pegs on either side. Gnathos hook rather long, wide at base. Sacculi a pair of rounded, weakly sclerotized protuberances. Saccus prominent. Aedeagus most peculiarly shaped, cephalad wide and short, terminating in a long sword-shaped projection, and carrying a long and slender, serpentine-lined branch, emerging cephalad and ending caudad.

Distribution: Widely distributed through Europe, Asia Minor.

Note 1: Under the name of *Schützeia natrixella*, Weber (1945: 381—382) described a species bred from *Ononis natrix*. Dr. Klimesch sent me a specimen (determined as ?*natrixella*) which he had bred from *Ononis natrix* (locality: Italia sept. Lonato Desenzano ep 29. 7.—5. 8. 1944). This specimen proved to belong to *anthyllidella* ♂ (prep. NLW 2279). Recently Mr. Weber has been kind enough to enable me to examine two paratypes (♀♂) of *natrixella* Weber. They also proved to belong to *anthyllidella* (prep. ♂ NLW 2284).

Note 2: From Arabia Amsel (1958: 68, 80—81) described a new species, *Aproaerema alfalfella* Ams. (“*anthyllidella* zweifellos sehr nahe”). The sketch of the genitalia strongly reminds of Fig. 44. The base of the valvula is by Amsel stated to be narrow, and thus to differ from that in *anthyllidella* Hb. Only a single male specimen has been examined.

13. *S. vinella* Bks.

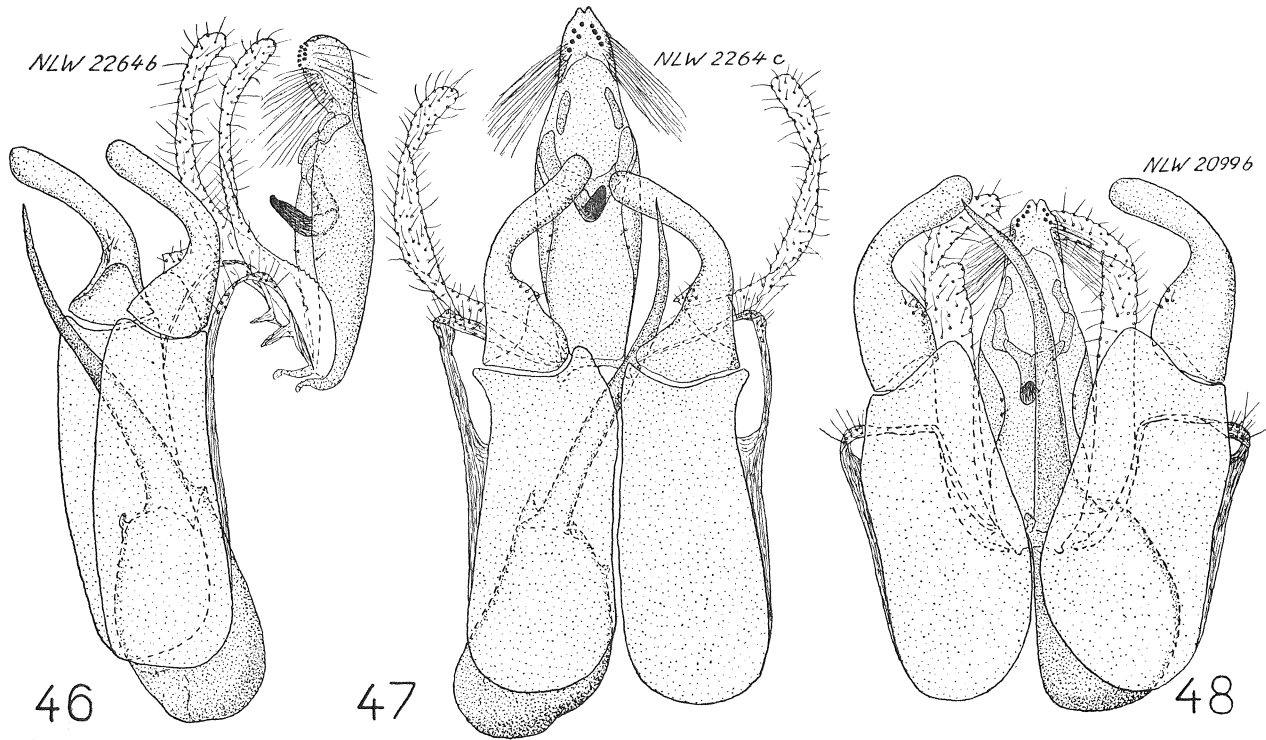
(*Aproaerema vinella* Bankes 1898: 242—244),

Although hitherto considered an exclusively British species, *S. vinella* Bks. had, in fact, been found on the Continent nearly 30 years before it was described by Bankes.

Ex coll. v. Heinemann I have identified as *vinella* a

specimen (labelled Regensburg $16/8$ 1871) determined as *ignobiliella* Hein. (Figs. 48, 72), and in the same collection Gozmány (1957: 117) found another specimen of *vinella* Bks. (*biguttella* Gozm. nec. HS.) mentioned by Heinemann (1870: 316) as belonging to *albipalpella* HS. or "Vielleicht eigene Art". This specimen was also labelled Regensburg. Among German "*anthyllidella*" in the coll. Zool. Mus. Copenh. (obtained from Staudinger & Bang-Haas) I also found *vinella* (labelled Zobten), and Weber's Swiss material of *S. anthyllidella* also included *S. vinella* (labelled Salorino Tessin). As stated by Gozmány (1957: 123), even Schütze's "male" specimen of *biformella* Schütze (labelled Saxonia) turned out to belong to *vinella* Bks.

From the illustration of the characteristic genitalia shown by Gozmány (1957: Fig. 5 D) it appears without any doubt that he is treating *vinella* Bks., although he applies the name *biguttella* HS. to the species in question, giving *vinella* Bks. as a doubtful synonym. The type material of *biguttella* has been lost, but the description of *biguttella* (based upon a material of 16 specimens) given by Herrich Schäffer (1854: 189, 192—193) is unusually detailed. In his "Synopsis specierum" he emphasizes as the basic character the sharply defined blackish line across the ciliae of the forewing (not present in *vinella*), and in his description he states *biguttella* to be "Viel schwärzer als *Anthyllidella* mit kürzeren, stumpferen Flügeln, deren Vorderrandsfleck rein weiss und etwas geschwungen ist, und welchem am Innenrande ein unbestimmter weisser gegenüber steht." Although *vinella* is a variable species, which besides occurring in the unicolourous form (Meyrick 1928: 640 states: "Forewings normally without spots") may have one or two light apical spots (or in rare cases even a light transverse band (Bankes 1899: 205)), it is most unlikely that a systematist having 16 random specimens of *vinella* before him



Male genitalia ($\times 75$) of: *S. vinella* Bks.: Figs. 46—47 ex coll. Vine via Bankes, Fig. 48 ex coll. v. Heinemann.

would have chosen the name *biguttella* for that species. Gozmány also states that the species to which he applies the name *biguttella* "is characterized by its brown basic colour, with the almost complete lack of any blackish hue", a characteristic which does not fit in well with the description of *biguttella*. Another species which seems to agree with this description will be treated later (see 18. *Icaruna biguttella* HS.).

The specimen of *S. vinella* shown in Fig. 72 from the Heinemann collection was determined as *ignobiliella* Hein., but since it had been taken (1871) after the publication of the name *ignobiliella* (1870), it does not belong to the typoid material.

Forewings dark violet-brownish; seldom small white opposite costal and dorsal spots, rarely united into a fascia. Neuration (Fig. 14), m_1 out of r_{4+5} .

The genitalia are easily recognized from the illustration published by Pierce & Metcalfe (1935: pl. 10). Figs. 46—47 show the genitalia of two specimens belonging to the original material (ex coll. Vine via coll. Bankes), and Fig. 48 depicts the genitalia of the specimen mentioned ex coll. Heinemann.

Uncus pointed, apically slightly cleft. Pegs 4—5 on either side. Gnathos hook rather long. Sacculi strongly sclerotized, inwardly curving, apically rounded arms. Saccus well developed, cleft into two solid plates. Aedeagus cephalad bulbed, caudad pointed, very long and slender.

Distribution: Great Britain, Germany, Switzerland, probably more widely distributed, but overlooked.

Type: labelled Brighton, bred 1893 (gen. 1) in the coll. BMNH.

Note: Gozmány includes this species in *Lixodessa* Gozm. although "the peculiarly hinged structure of the vinculum-sacculus-aedeagus complex with the valva-uncus complex" would rather refer it to *Syncoptema* Meyr.

14. *S. albipalpella* HS.

(*Anacamptis albipalpella* Herrich-Schäffer 1854: 195).

The original description reports this species as having been found in Austria (Vienna) and Germany (Regensburg). In his magnificent books on certain groups of British Microlepidoptera worked out in collaboration with Frey and Zeller, Stainton (1867: 206) records the following localities for *albipalpella*: Great Britain (Woking, Guildford, York), Belgium (Louvain), Germany (Regensburg), and Austria (Vienna).

The genitalia are illustrated by Pierce & Metcalfe (1935: pl. 10) based upon British material, and afterwards by Gozmány (1957: 117), who illustrates a German specimen ex coll. Heinemann (labelled ?Braunschweig e. l. 25. 7.). As the type has been lost and as the original description may cover more species, Pierce & Metcalfe must be regarded as the first revisors restricting the name *albipalpella* HS. to a distinct species.

Fig. 51 is drawn from one of Pierce's original mounts — the same as was used for his illustration on pl. 10 — and Fig. 52 shows the lateral aspect of the genitalia of the specimen pictured in Fig. 71 (locality Brighton, ex coll. Vine). This material was placed at my disposal by Mr. J. D. Bradley. Gozmány's illustration, which I reproduce as Fig. 53, is merely schematic, and in his description he makes no mention of the apical thorn on the penis shown in Figs. 51—52, which according to Pierce & Metcalfe is characteristic of *albipalpella*. To be on the safe side, I borrowed Gozmány's slide (no. 893) from the Museum in Hannover, and the study of this mount proved that the thorn was present, and that the preparation corresponds in detail with Fig. 51.

Forewings dark greyish-fuscous, with two small whitish apical spots (Fig. 71). Neuration (Fig. 18), m_1 out of r_{4+5} .

Genitalia (Figs. 51—52). Uncus short, broad. Pegs 2 on either side, distant from apex. Gnathos hook short,

pointed. (The parts interpreted by Pierce & Metcalfe (1935: 19) as the costal arms and the sacculi, respectively, should probably rather be homologized as the sacculi and the saccus, respectively). Sacculi a pair of parallel-edged, apically rounded, flaps. Saccus prominent, hinged to the curved aedeagus, which is cephalad wider and caudad carrying a strongly sclerotized thorn.

Distribution: Great Britain, Germany.

Note: The Swedish record of "*albipalpella* HS." mentioned by e. g. Hering (1952: 206) has reference to 15. *S. suecicella* n. sp.

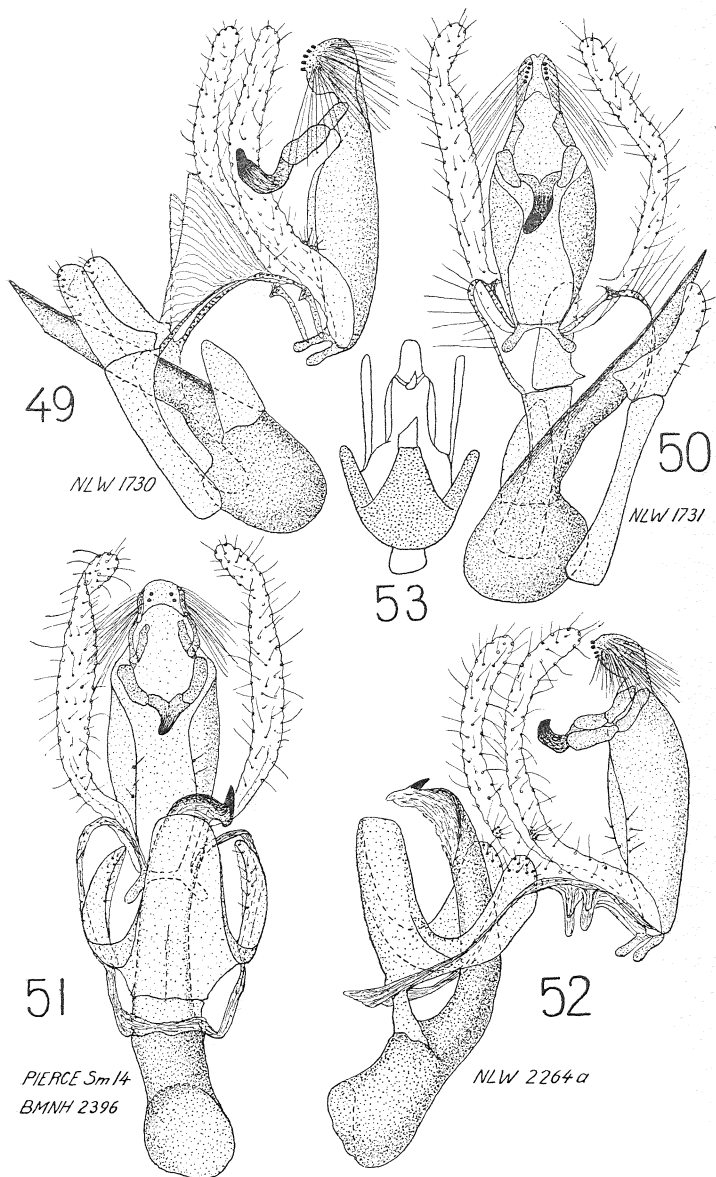
15. *S. suecicella* n. sp.

In Sweden *S. albipalpella* HS. has been recorded from Halland (Benander 1928: 87, 1946: 42), and Dr. Benander has kindly supplied me with specimens from this locality, as well as from Scania (Bonarpshed, Skåne, 21/VII 1953), where he took the specimens in a locality grown with *Genista pilosa*.

The genitalia of two of the Swedish specimens are shown in Figs. 49—50. A glance at the oblique orifice of the aedeagus in Fig. 53, a reproduction of the genitalia of *albipalpella* HS. as illustrated by Gozmány (1957: 114), might lead to the supposition that Gozmány illustrates the Swedish species, but, as stated above, a comparison between Gozmány's original mount and Pierce's slide shows that they are identical, and consequently that the Swedish specimens belong to a hitherto unidentified species, which I describe as *S. suecicella* n. sp.

Forewings (Fig. 79) greyish black, apical area and ciliae with darker coarse scales, costal and dorsal spots distinct, clear white. A minute spot, consisting of only a few white scales at fold. Wing expanse 8.5—9.5 mm. Face light ochreous, darker above. Inner surface of palpi and antennae pure white. Neuration (Fig. 17), m_1 out of r_{4+5} .

Genitalia (Figs. 49—50) difficult to interpret. Uncus narrow, apically lightly cleft. Pegs 4—5 on either side.



Male genitalia ($\times 75$) of: Figs. 49—50: *S. suecicella* n. sp. (Holotype and paratype, respectively), Fig. 51: *S. albipalpella* HS. (same preparation as illustrated by Pierce & Metcalfe 1935, pl. 10), Fig. 52: *S. albipalpella* HS. (ex coll. Vine via coll. Bankes), Fig. 53: *S. albipalpella* HS. (Male genitalia after Gozmány 1957: 114, Fig. 3, 1).

Gnathos hook wide, blunt. Sacculi elongate, caudad rounded, cephalad with a projection. Saccus appears to be split into two long formations. Aedeagus cephalad bulbed, carrying a flap, caudad narrow, pointed. Between the tegumen-part and the aedeagus-part a pair of large, transparent, triangular, thin membranes (not shown in Fig. 50).

Distribution: Sweden.

Holotype: labelled Bonarpshed 21. 7. 53. P. Benander leg. incl. genital slide NLW 1730 presented to the coll. Zool. Mus. Copenh. Paratypes in the coll. of the author.

16. *S. captivella* HS.

(*Anacamptis captivella* Herrich-Schäffer 1854: 194).

The material upon which the description of the above species was based originates from Mann (collected "Bei Fiume, Abends an Eschen"). Although Herrich-Schäffer's *Anacamptis* types have been lost, original material of *captivella* still exists.

From coll. Frey and coll. Stainton (both in the BMNH) I received for study a female labelled "G. Capitella Mann. Fiume (Mann)" and a male determined as *captivella* HS. and labelled "5. Fiume. Oakbush, Mann, 11/51", respectively. Fig. 74 shows the last-mentioned specimen.

Wing expanse 7.5—8.5 mm. Head and palpi bright white. Fore-wings dark brownish, lighter at base, apically sprinkled with black, coarse scales. A distinct white fascia. Neuration (Fig. 16), m_1 out of r_{4+5} .

Genitalia (Fig. 57). Uncus broad, short. Pegs 4 on either side. Sacculi oval, caudad terminating in a minute, strongly sclerotized curved projection. Aedeagus cephalad broad, rounded, apically tapering to a point.

Distribution: Germany, Switzerland, Roumania, Hungary, Italy.

Note 1: Under the name of *Gelechia sarothamnella*, Zeller (1868: 615—616) describes a small, white-banded species closely related to *captivella* HS. The basic difference is stated to be the unicoloured — not whitish — costa of the forewing. As the specimen of this species labelled "Type" in the Zeller coll. (BMNH) is

a female, Mr. Bradley has enabled me to examine a similar-looking male, labelled "e. l. Stettin, Zeller" (shown in Fig. 75). This locality is mentioned by Zeller (l. c.) as a *locus typicus*. The genitalia of the said specimen, and of another specimen of *sarothamnella* Zell. ex coll. Zool. Mus. Copenh. (labelled ?Nürnberg) agree in detail with those of the authentic specimen of *captivella* HS., and *sarothamnella* Zell. must be regarded as a synonym of *captivella* HS.

Note 2: Gozmány (1957: 123—124), who also treats *sarothamnella* Zell. and *captivella* HS. as conspecific, includes this species in *Lixodessa* Gozm., although the "sacculus-aedeagus complex" in *captivella* is hinged in the same way as is the case in the species referred to *Syncopacma* Meyr.

17. *S. detersella* Zell.

(*Gelechia detersella* Zeller 1847: 846).

This species, the generotype of *Stomopteryx* Heinemann (1870: 324), looks very different from the preceding species of the group. Wing expanse 16—20 mm. Forewings whitish ochreous, with brownish longitudinal striae apically, and three distinct brown elongate spots, two in the fold, one at the cell. Neuration (Fig. 2), m_1 free.

Genitalia (Fig. 54). Uncus pointed, covered with long hairs. No sclerotized pegs. Gnathos without central hook. Sacculi large, hairy flaps enclosing caudal part of the aedeagus, which is bluntly pointed and carries a curved thorn.

Distribution: Restricted to Southern Europe, Asia Minor, etc.

Lectotype: labelled Syrac. 22 Jun., incl. genital slide BMNH 2776 in the coll. BMNH.

18. *S. remissella* Zell.

(*Gelechia remissella* Zeller 1847: 854).

The genitalia of two of the Danish specimens recorded by Larsen (1927: 99) are shown in Figs. 55—56. As these illustrations, according to a comparison made by Mr. Bradley, agree with the genitalia of Zeller's specimen labelled "Type" (BMNH 4619), they proved to be correctly identified.

Although this species in the later literature (e. g. Gaede 1937, Hering 1952) is rejected from the present

group, a glance at Figs. 54 and 55, respectively, shows that *remissella* is closely related to *detersella* Zell., and consequently that both of them are true *Stomopteryx* (s. str.) species.

Forewings greyish-brown, dotted with darker scales. Three distinct blackish elongate spots, one at fold, two along cell; one or two light apical shades, which may be absent. Neuration (Fig. 20), m_1 free.

Genitalia (Figs. 55—56). Smaller than, but similar to those of *detersella*. Aedeagus cephalad bulbed, carrying a long, apically curved thorn.

Distribution: Sweden, Denmark, Germany, Switzerland, Southern Europe.

Lectotype: labelled Syracus. 9 Mai, incl. genital slide BMNH 4619 in the coll. BMNH.

19. *Iwaruna biguttella* HS.

(*Anacamptis biguttella* Herrich-Schäffer 1854: 189, 192—193, pl. 70, fig. 521).

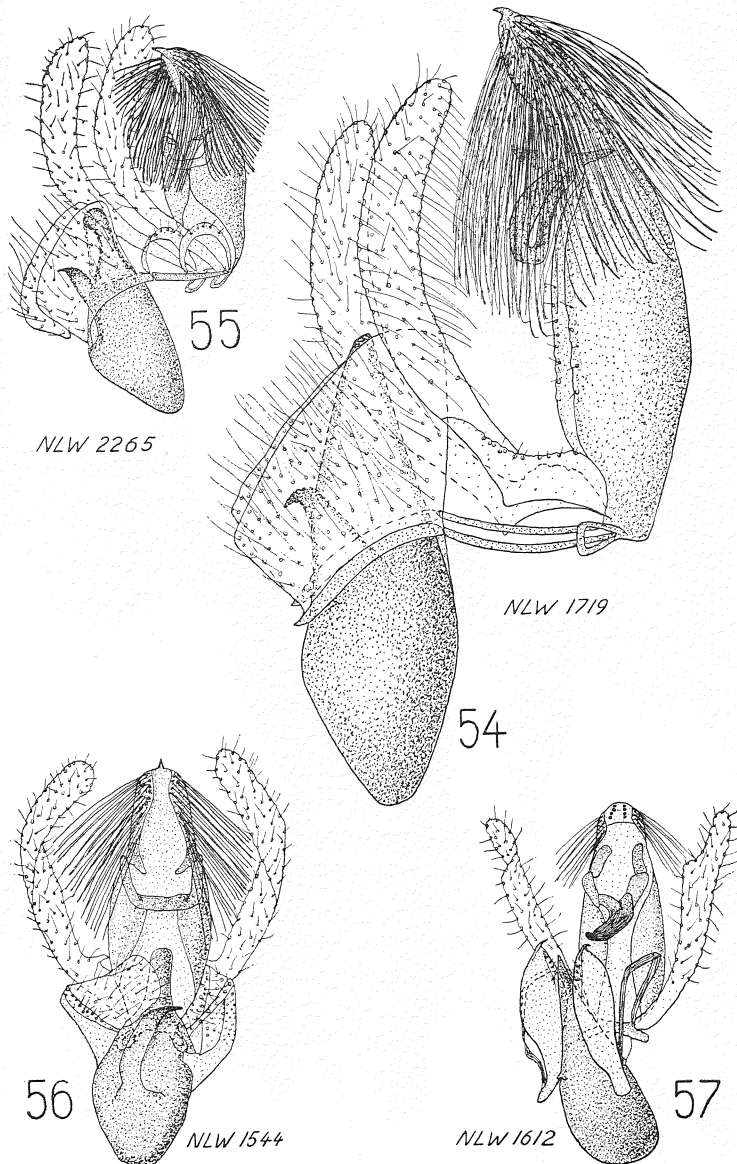
The Danish specimens recorded as *Anacamptis biguttella* HS. (Larsen 1916: 179) are wrongly identified, belonging partly to *Stomopteryx anthyllidella* Hb. (Larsen 1927: 99), partly to *Bryotropha affinis* Hw. (prep. NLW 1563).

As regards the Swedish specimens (Benander 1928: 87—88, 1946: 42), their identification as *biguttella* HS. must be considered dubious, and Dr. Benander informs me that he has not seen the specimens recorded.

As mentioned above, the species treated by Gozmány (1957: 122—123) as *Lixodessa biguttella* HS. belongs to *Stomopteryx vinella* Bks.

The coll. Zool. Mus. Copenh. contains a few specimens (1 ♂, 2 ♀♀, locality Cannes, Gall. m.) determined as *Anacamptis biguttella* HS., and obtained by Mr. C. S. Larsen from Staudinger & Bang-Haas.

As appears from Fig. 76, the male mentioned agrees with Herrich-Schäffer's description of *biguttella* ("mit



Male genitalia ($\times 75$) of: Fig. 54: *S. detersella* Zell., Figs. 55—56: *S. remissella* Zell., Fig. 57: *S. captivella* HS.

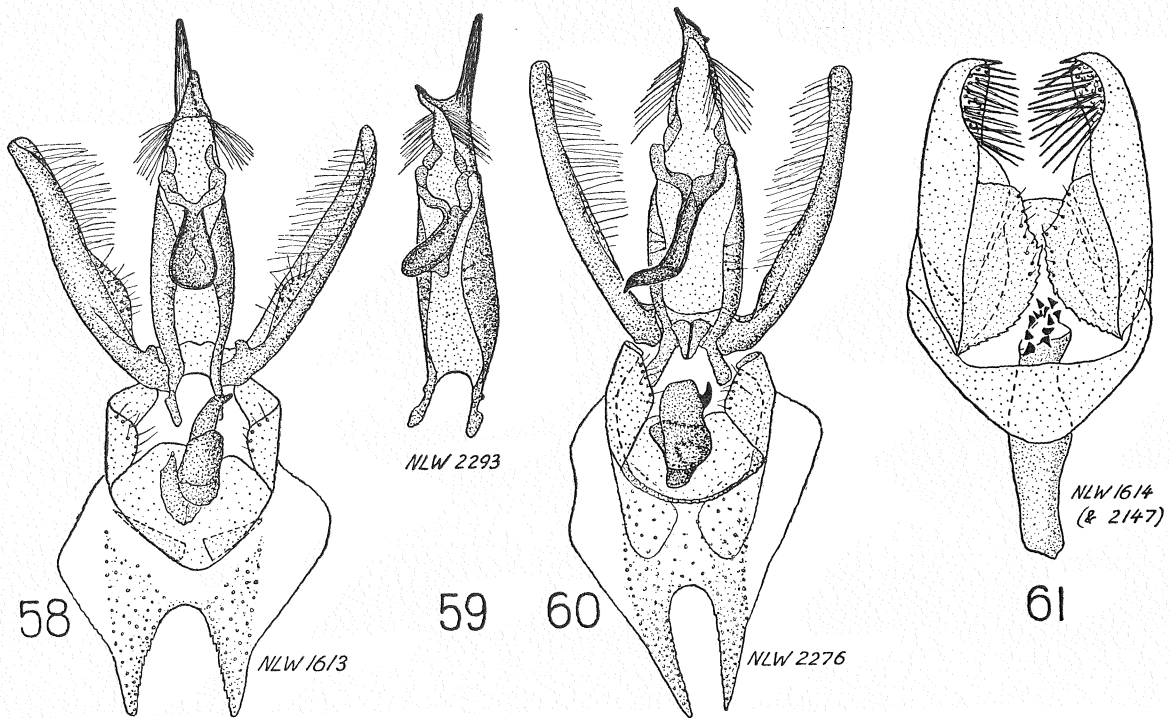
kürzeren, stumpferen Flügeln, deren Vorderrandsfleck rein weiss und etwas geschwungen ist, und welchem am Innenrande ein unbestimmter weisser gegenüber steht, fast ferner von der Wurzel. Die Franzen führen eine doppelte, ziemlich regelmässige Theilungslinie aus dichten Schuppen, beide gerundet").

Having dissected the genitalia of the male specimen (Fig. 58), which proved that this specimen did not belong to the *Stomopteryx* group, but should be placed in a separate genus, I sent the slide to the BMNH, asking Mr. Bradley to compare the mount with the genitalia of *Anacampsis biguttella* HS. in the coll. BMNH. The answer was: "Agreed".

Dr. Klimesch recently supplied me with a male (locality Dalmatia, vicinity of Gravos) bred by him from *Dorycnium* (20/VI 1939) and determined as *biguttella* HS. The uncus-tegumen part of the genitalia of this specimen, which correspond in detail with those of the male just mentioned, is shown in Fig. 59.

The genitalia are built up in a way entirely different from what is the case in the *Stomopteryx* (s. lat.) species. Uncus pointed, scaphium prominent, gnathos central "hook" large, spoon-shaped, dorsad carrying a keel. Valvae parts fused (as in e. g. most *Geometridae*), without leaving valvula and sacculus free. Aedeagus short, crinkled. Eighth sternite forming a free abdominal plate, ventrad covering the genitalia. The abdominal plate extends in two diverging projections, surrounding a wide excavation, ending in a semicircle. In Fig. 58 this plate is shown turned away from the genitalia.

This species undoubtedly belongs to the genus *Iwaruna*, erected by Gozmány (1957: 125—126) for a new species, *heringi* Gozm., of which he found in the coll. Hung. Nat. Hist. Mus. 10 specimens (locality Pola, Istria) bred from *Dorycnium hirsutum*, and determined as *biguttella* HS. Most likely *heringi* Gozm. is identical with



Male genitalia of: Figs. 58—59: *Iwaruna biguttella* HS., Fig. 60: *Iwaruna klimeschi* n. sp. (Holotype),
 Fig. 61: *Monochroa melagonella* Const. (Figs. 58—59—60: $\times 45$, Fig. 61: $\times 100$).

biguttella HS., but as *Iwaruna* Gozm. may contain other closely allied species, I dare not synonymize them on the basis of Gozmány's illustrations.

Distribution: France, Yugoslavia (Herrich-Schäffer, whose records cannot be verified, states Germany, Austria).

20. *Iwaruna klimeschi* n. sp.

Having asked Dr. Klimesch for material of *Anacamptis azosterella* HS., I received from him (in 1953) a sketch of the genitalia of a specimen which under this name was included in the coll. Nat. Hist. Mus. Vienna. The sketch proved this specimen to belong to a genus definitely separated from *Stomopteryx* (s. lat.).

Later on I have had the opportunity to examine this mount (prep. Klimesch 1038) as well as the specimen (labelled "Mödling 1870, *albipalpella* in coll. M(ann)"), and I have been able to establish that it belongs to the same species as a specimen from Vienna (Leopoldsberg 7/VI 1915) bred from *Dorycnium*, recently sent me by Dr. Klimesch as a probable *Anacamptis biguttella* HS.

There can be no doubt that the species to which these two specimens belong should be included in the genus *Iwaruna* Gozm. The genitalia (Fig. 60) are built up in exactly the same way as in *I. biguttella* HS. but differ as follows: uncus peak very short, central "hook" of gnathos "hollow" as in *biguttella* HS., but narrow and extremely long, pointed. Aedeagus with a short, strongly sclerotized, curved hook. Projections of abdominal plate converging, excavation narrow. The genitalia of both specimens agree in every detail.

The forewings of the last-mentioned specimen (Fig. 80) are dark brownish-black, costal and dorsal spots white, very distinct. The forewings of the first-mentioned specimen are blackish-brown, and tend to develop a faint transverse whitish band. On both specimens three black dots, one in the fold, two at the cell, all accompanied by a few white scales.

Distribution: Austria.

Note: Named in honour of the well-known Microlepidopterist Dr. Josef Klimesch (Linz), whose immense work on various genera of Microlepidoptera has greatly increased our knowledge of these groups, and whose name has already been associated with several species in other genera.

Holotype: labelled Wien, Leopoldsberg $7/6$ 15 incl. genital slide NLW 2276 presented to the coll. Zool. Mus. Copenh. Paratype in the coll. Nat. Hist. Mus. Vienna.

21. *Monochroa melagonella* Const.

(*Anacampsis melagonella* Constant 1895: 53—54).

The above species, described from France (Alpes maritimes) has — like most of the previous *Anacampsis* auct. species (except *remissella* Zell.) — been transferred to *Stomopteryx* Hein. (Gaede 1937).

The coll. Zool. Mus. Copenh. includes under this name some specimens (obtained by Mr. C. S. Larsen from Staudinger & Bang-Haas) which seem to be correctly determined. An examination of the genitalia of two males (locality Cannes Gall. m.) proved that they belong to the genus *Monochroa* Hein. (sensu Benander 1945).

Gozmány (1957: 129) states that he has examined paratypes of *melagonella* Const. from the coll. Hung. Nat. Hist. Mus., and has arrived at the same conclusion, referring them to *Xystophora* auct. (*Monochroa* Hein. sensu Ben.).

As Gozmány does not illustrate the genitalia, because he only had access to females, the male genitalia of the above material are shown in Fig. 61.

22. *Lamprotes atrella* Hw.

(*Gelechia nigritella* Zeller 1847: 857).

The identification of the species described by Zeller as *Gelechia nigritella*, which according to e. g. Meess in Spuler (1906: 373) is stated to occur in Andalusia, Sicilia, and Dalmatia, has caused various difficulties.

As mentioned above, the illustration of the genitalia of "*Anacampsis nigritella* Zell." published by Osthelder

(1951: 153) actually represents those of *Stomopteryx sanguella* Stt., and the Danish record of "*A. nigritella* Zell." (Larsen 1927: 98) refers to *Stomopteryx vorticella* Sc. A series of "*Anac. nigritella* Zell." (localities: Regensburg, and Wallis) in the coll. Zool. Mus. Copenh., obtained by

Mr. C. S. Larsen from Staudinger & Bang-Haas, proved to belong to *Stomopteryx patruella* Mann.

On my behalf Mr. Bradley (in May 1952) dissected the genitalia of the lectotype of *Gelechia nigritella* in Zeller's collection (labelled Messin. 3 April), and sent me the sketch reproduced in Fig. 62. Afterwards I have studied the mount (BMNH no. 2775) at the BMNH.

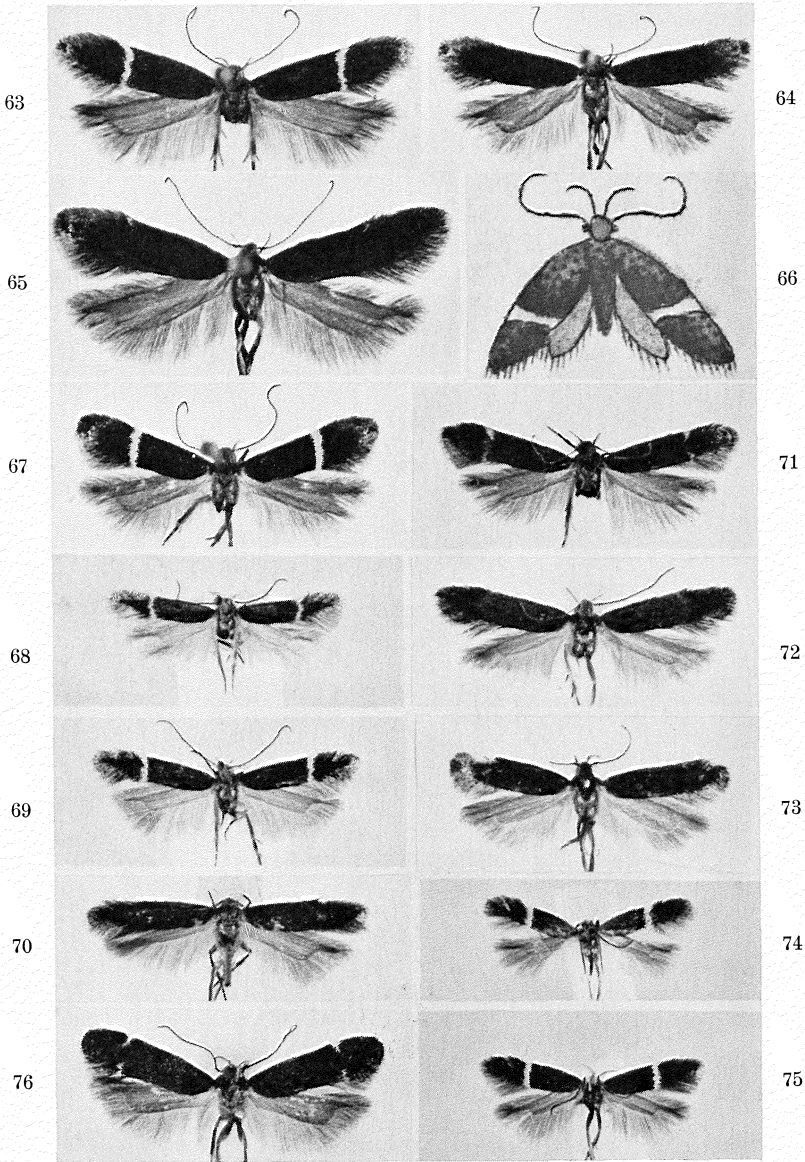
To inform Dr. Gozmány, before he concluded his studies on *Stomopteryx*, that *nigritella* Zell. had to be excluded from this group, I supplied him with a copy of

the sketch (Fig. 62), pointing out that Zeller's specimen labelled "Type" did not belong to the genus *Stomopteryx*. In his paper Gozmány (1957: 117—118), however,



Fig. 62: Male genitalia of *Lamprotes atrella* Hw. (Zeller's specimen of *Gelechia nigritella*, labelled "Type" in the BMNH.) ($\times 40$).

Specimens ($\times 3$) of: Figs. 63—64—65: *S. vorticella* Scop., Fig. 66: *L. cinctella* Clerck 1759: pl. 11, Fig. 2 (photo-copy), Fig. 67: *S. larseniella* Gozm., Figs. 68—69: *S. albifrontella* Hein. (ex coll. Frey), Fig. 70: *S. albifrontella* f. *ignobiliella* Hein. (Type), Fig. 71: *S. albipalpella* HS., Fig. 72: *S. vinella* Bks. (ex coll. v. Heinemann), Fig. 73: *S. incognitana* Gozm. (ex coll. Nat. Hist. Mus. Vienna), Fig. 74: *S. captivella* HS. (authentic specimen), Fig. 75: *S. captivella* HS. (*sarothamnella* Zell. ex coll. Zeller via Stainton), Fig. 76: *Iwaruna biguttella* HS.



H. V. Christensen phot.



Fig. 77. *Stomopteryx (s. l.) wormiella* n. sp., Holotype ($\times 5$)

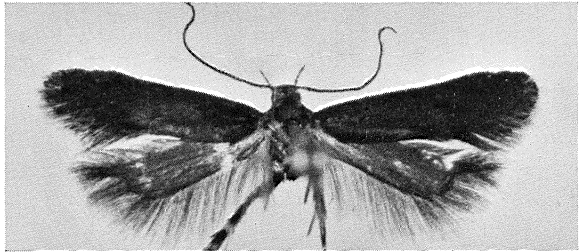


Fig. 78. *S. wormiella* n. sp. Form without fascia ($\times 5$)

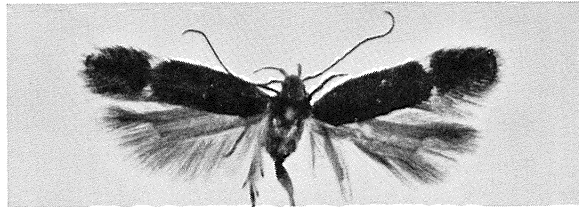


Fig. 79. *S. suecicella* n. sp., Holotype ($\times 5$)

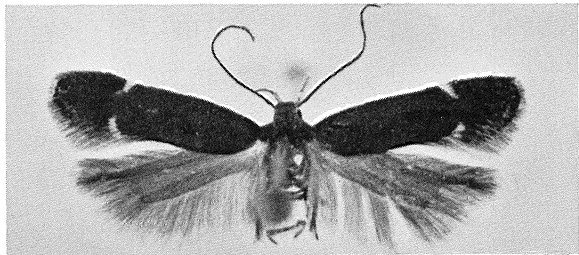


Fig. 80. *Iwaruna klimeschi* n. sp., Holotype ($\times 5$)

H. V. Christensen phot.

by some mistake erroneously states that I (in litt.) had demonstrated that *nigritella* Zell. belonged to *Stomopteryx coronillella* Tr.

Having now made the necessary dissections of the genitalia of species which might be suspected to have genitalia like those shown in Fig. 62, I arrived at the final conclusion that these genitalia belong to *Lamprotes atrella* Hw., a species which is not uncommonly wrongly identified as a *Stomopteryx* species.

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