

Notes on some Species of the Genus *Scoparia* Hw. (s. str.) (Lep., Pyraustidae)

By
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(With plates 1-2)

The genus *Scoparia* Hw. contains a number of similar looking species, the correct identification of which has caused severe difficulties. As a considerable variability of the wing pattern exists within the various species, an identification based upon the wing markings alone, becomes most unreliable.

Nearly half a century ago Chapman (1912: 501-518) undertook a revision of the group on the basis of an examination of the genitalia in both sexes of all British and some Continental species. His microphotographs are admirably sharp, although hardly sufficiently enlarged, and his paper has highly assisted in clearing up previous errors. He divided the genus into two main sections, the 'root-feeders' (*Scoparia* s. str.), and the 'moss-feeders'. In the 'root-feeders' the sacculus of the valva carries a hooked, sclerotized protrusion, and the aedeagus contains cornuti, characters not present within the 'moss-feeders'.

The five British *Scoparia* (s. str.) treated by Chapman are the same as are known to occur in Great Britain to-day (Beirne 1952: 120-122), and the same five as occur in e. g. Denmark (van Deurs 1942: 77-80), and Sweden (Benander 1946: 10), viz.: *cembrae* Hw., *ambigu-
alis* Tr., *ulmella* Kngs., *basistrigalis* Kngs., and *dubitalis* Hb.

The illustrations of the genitalia of both sexes published by Pierce & Metcalfe (1938: pl. 21) are drawn on a rather small scale, and, regarding the females, somewhat schematic, but still enable a safe identification of the British species.

Recently Marion (1959: 15-22) has published a paper on the French species, illustrated by photographs of

specimens and outline drawings of the male genitalia alone.

Although the genus has been far from being neglected by systematists, there still seems to remain problems which have to be solved before a safe identification of even common and widely distributed species has been made possible. In the following note a hitherto apparently unacknowledged species is described and compared with its allies, and in this connection attention is called to some incorrect statements in the previous literature concerning some of these species.

The female genitalia exhibit characters most useful for identifying the various species and deserve more attention than is generally paid to them. The aspect of ductus bursa is an important character, whereas the bursa itself is less convenient for study due to its tendency to collapse during the dehydration of the preparation. In the male genitalia the shape of the cornuti is a character of utmost taxonomic importance.

It may be added that the study of the cornuti in some species (e. g. *ingratella*, and *dubitalis*) is often obstructed because the spines are generally superposed and their tips concealed which gives the impression that they are but one long rod. This difficulty can be overcome in the following way. After the genitalia have been dissected and placed in a small drop of water the valves are spread out and, by means of a stumpy needle, some pressure is put on the surface of the aedeagus at the precise spot beneath which the cornuti are situated. At the moment when the spines become sufficiently separated, the needle is kept in position, and a drop of Absolute Alcohol is applied to the preparation by means of a pipette. The whole manipulation must be constantly supervised through a powerful binocular microscope, and care must be taken not to damage the spines. The pressure must not be released until the position of the spines has been fixed by

the hardening action of the Alcohol, a process which happens within a short time.

1. *Scoparia sylvestralis* n. sp.

In late June and early July 1959 I collected a number of specimens of a *Scoparia* occurring very numerously in a forest at Jungshoved (Denmark, south-eastern part of Zealand). As regards size and wing markings the specimens resembled *basistrigalis* Kngs., but the cilia of the forewing was not barred, and in the male genitalia the cornuti consisted of a single row of spines, thus distinctly differing from *basistrigalis*. The only other *Scoparia* present in the locality was *dubitalis* Hb., which, however, was much less common.

Being unable to identify the species on the basis of the literary sources I applied to the British Museum (Natural History) in London, and Mr. Paul E. S. Whalley, having examined my material and compared it to numerous specimens of *basistrigalis* and *ambigualis*, concluded that he was unable to match the species. I am greatly indebted to Mr. Whalley for his valuable assistance. In the Palaearctic Collection of the Zoological Museum of Copenhagen I happened to find a (male) specimen (locality: Switzerland, St. Gallen, 23. VI. 12) resembling the species in question; by dissection the genitalia, as well, proved identical. This specimen was identified as *ingratella* Zell., a species which generally is considered a 'forma' of *dubitalis* Hb. Examination of original material of *ingratella* Zell. (see later) proved, partly, that *ingratella* Zell. is a valid species, partly that the Swiss specimen was wrongly identified.

Afterwards I have found more Danish specimens in various collections, some originating from the island of Falster, some from the island of Lolland, both localities situated in the south-eastern part of Denmark.

No doubt this species occurs in several collections, also abroad, confounded with e. g. *ambigualis*, or *basistrigalis*. In the course of

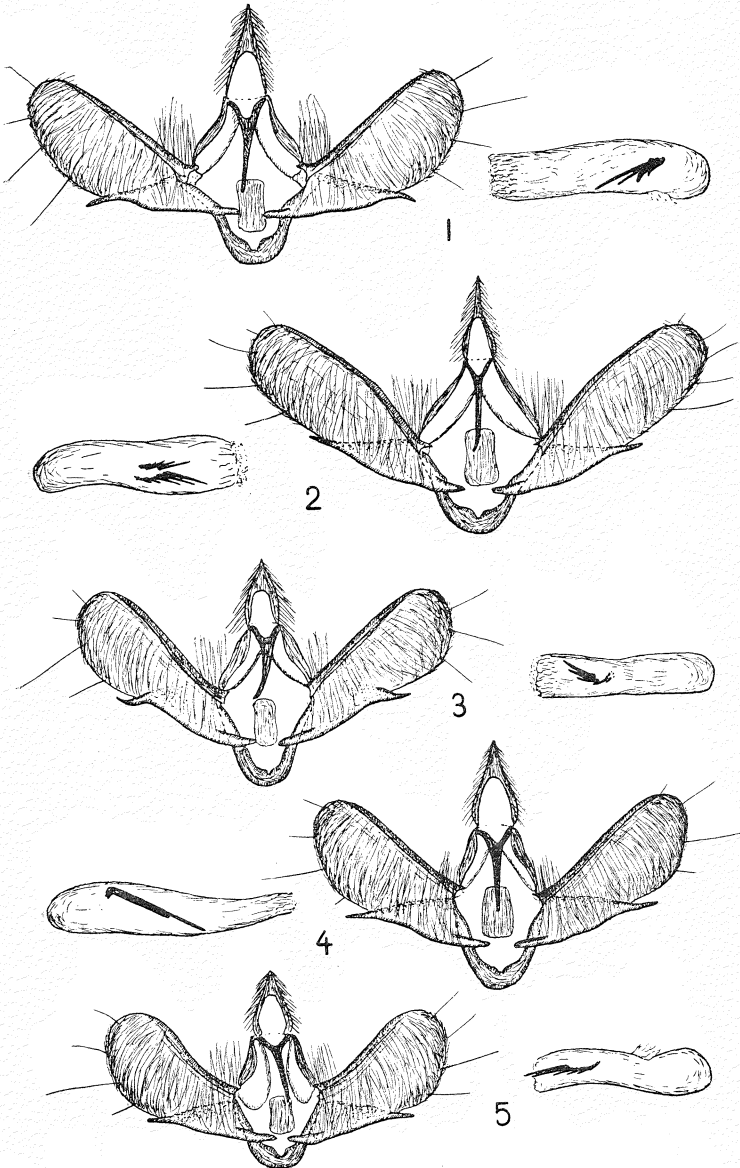
time a number of *Scoparias*, now regarded as synonyms of *ambiguialis*, have been named (vide e. g. Klima 1937: 13—15) without any notice of their genitalia. It cannot be excluded that an examination of the type specimen (ordinary collection material will not do) of the entire number of such 'forms' may prove one of them to have the same genitalia as this species. As hunting up the complete material may take several years, I consider it most practical now to draw attention to this interesting, and at any rate unacknowledged, species by giving a description, even if the name in future may happen to be added to the list of synonyms within this genus.

Scoparia sylvestralis n. sp. (Figs. 31—32). Wing expanse 21—24 mm. Regarding wing markings close to *S. basistrigalis* Kngs. First cross-line whitish, apically bordered with a blackish shade including a distinct black streak running parallel to dorsum. Second cross-line white, its inner edge less black-marked than in *basistrigalis*, meeting costa at an almost right angle. Cilia not barred, but divided by a sharply defined blackish line. Fresh specimens have orbicular and claviform filled up with yellow-ochreous scales.

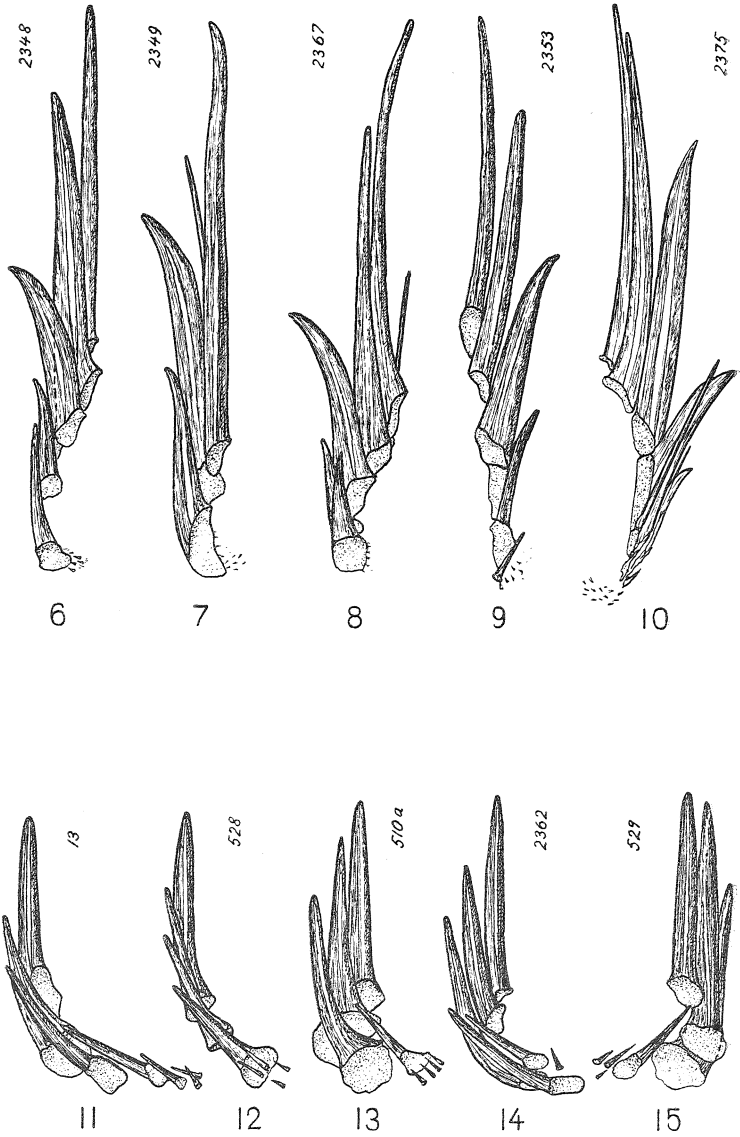
Male genitalia (Fig. 1). Uncus long, evenly tapering to a point. Gnathos long. Cornuti (Figs. 6—10) arranged in a single row, consisting of 2—3 long spines followed by 2—3 shorter, stout, curved ones. At the base of the group of spines an indefinite number of extremely minute thorns. The specimen, the cornuti of which are shown in Fig. 10, originates from Switzerland, those illustrated in Figs. 6—9 are of Danish origin.

Female genitalia (Fig. 26). Ostium wide, a sclerotized plate near ostium, ductus bursae twisted just before widening into bursa, which is squamous on one side, spined on the other.

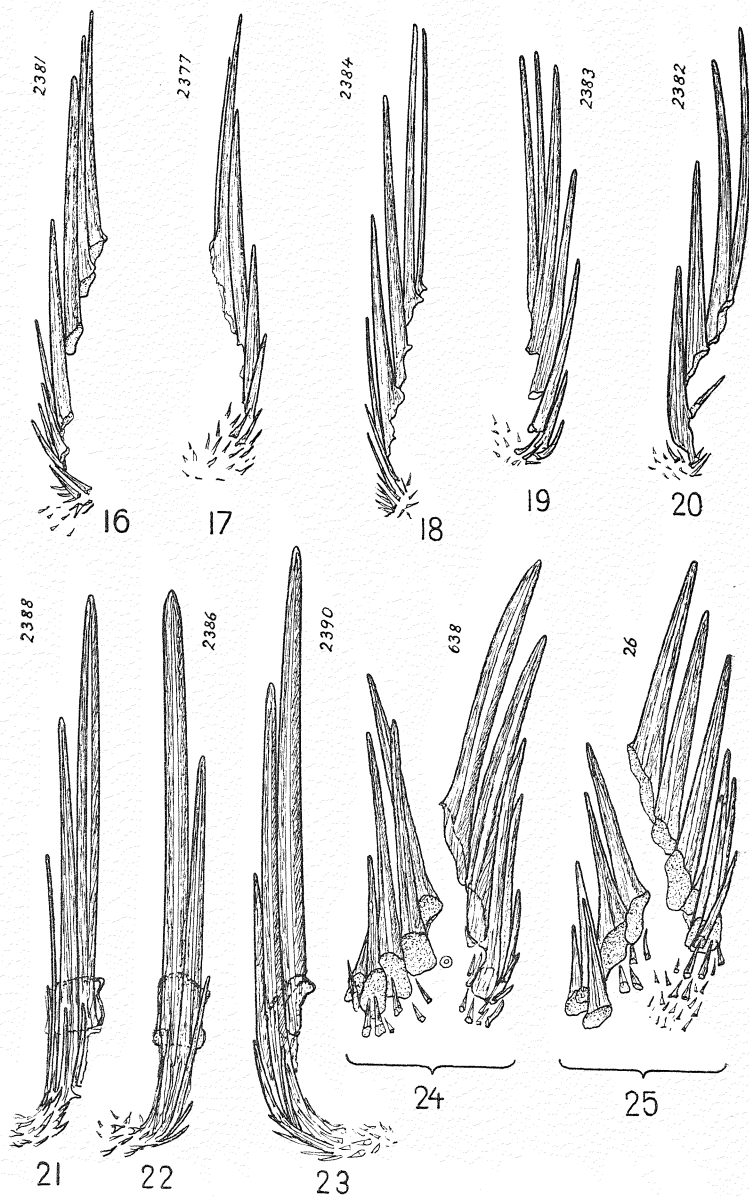
Material studied: 57 specimens. Genitalia dissected: 9 males, 6 females. Holotype (♂), locality Dania, Jungshoved 20. VI. 1959 incl. genit. slide NLW 2348, and allotype (♀), locality Dania, Jungshoved 4. VII. 1959. incl. genit. slide NLW 2366 are presented to the Zoological Museum of Copenhagen.



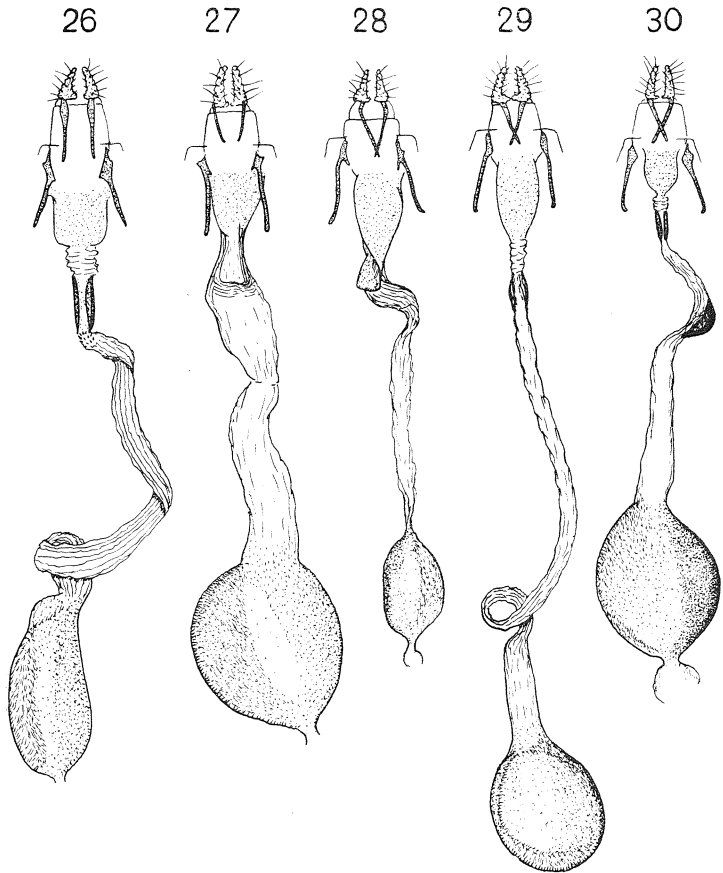
Male genitalia ($\times 20$) of: Fig. 1: *Scoparia sylvestralis* n. sp., Fig. 2: *S. basistrigalis* Kngs., Fig. 3: *S. ambigualis* Tr., Fig. 4: *S. ingrattella* Zell., Fig. 5: *S. dubitalis* Hb.



Cornuti ($\times 110$) of: Figs. 6—10: *Scoparia sylvestralis* n. sp.,
Figs. 11—15: *S. ambigualis* Tr.



Cornuti ($\times 110$) of: Figs. 16—20: *Scoparia dubitalis* Hb., Figs. 21—23: *S. ingratella* Zell., Figs. 24—25: *S. basistrigalis* Kngs.



Female genitalia ($\times 13$) of: Fig. 26: *Scoparia sylvestralis* n. sp., Fig. 27: *S. basistrigalis* Kngs., Fig. 28: *S. ambigualis* Tr., Fig. 29: *S. ingrattella* Zell., Fig. 30: *S. dubitalis* Hb.

Distribution. Known from Denmark and Switzerland, but probably widely distributed.

2. *Scoparia basistrigalis* Kngs.

This species (Fig. 33) is easily distinguished from *sylvestralis* by its sharply barred cilia. In the male genitalia

(Fig. 2) the uncus is long, narrow, pointed. Gnathos long. The cornuti are placed in two separate groups, an arrangement also present in *S. cembrae*. As the shape of the cornuti is utmost different in these two species, and as these, regarding colour and wing markings, do not resemble each other, no possibility of confounding them exists.

Figs. 24—25 show the cornuti of (a Danish and a German) *basistrigalis*. The one group consists of 3—4, the other of 2—3, strong spines, followed by some smaller ones. At the base of each group a large number of minute spines.

The female genitalia (Fig. 27) have at $\frac{1}{3}$ an abrupt widening on ductus bursa which, itself, is wide before reaching bursa.

Distributed from Great Britain through e. g. France, Germany, Northern Europe, incl. Denmark and Sweden.

3. *Scoparia ambigualis* Tr.

S. ambigualis is widely distributed and in many localities in Europe a common species. Fig. 34 gives an idea of the normal appearance of Danish specimens. In the Northern part of its area (e. g. Ireland, Scotland, Faroes) it is substituted by ssp. *atomalis* Stt., which is smaller and far more variable, sometimes occurring as an aberration having in the forewing the central band white, and the basal part, as well as the outer area, unicolourous black. This aberration has been described (from the Faroes) as a separate species, *S. klinckowströmi* Hamfelt (1917: 3—7). In a paper dealing with the Lepidoptera of the Faroes (Wolff 1929: 15—17) I have established that all Faroese Scoparias recorded, irrespective of the variation of their wing markings, belong to only one species. In the said paper I, however, made a mistake, treating the Faroese species under the name *S. atomalis* Stt. instead of as *S. ambigualis* Tr. ssp. *atomalis* Stt. This error happened because a specimen of a "typical *ambigualis*" which I obtained from Germany for comparison in rea-

lity belonged, not to *ambigualis*, but to *basistrigalis*, a species unfortunately not familiar to me in 1929. The names *atomalis* and *ambigualis* in the paper mentioned consequently have to be altered into *ambigualis* ssp. *atomalis*, and *basistrigalis*, respectively.

Fig. 3 shows the male genitalia of *S. ambigualis*. Tip of uncus shorter, and broader, gnathos shorter, than in preceding species. Concerning the cornuti Chapman (1912: 512) gives the following description: "The cornuti are in a group of two rather long (0.25 mm) and strong, a third smaller, and three or four others deminishing so that the smallest is hardly visible." Pierce & Metcalfe (1938: 36) state: "Cornuti rather variable, two or three strong thorns with three or more smaller ones at the base". I have, myself, examined numerous *ambigualis* (localities: Denmark, Faroes, Great Britain (also Pierce's original slides)) and have found the appearance of the cornuti in all cases to fit well in with these two characteristics. The specimens the cornuti of which are shown in Figs. 11—15 originate partly from the Faroes (Fig. 11, "*S. klinckowströmi*"), partly from Denmark (Figs. 12—15).

Although insufficiently detailed the figure of *ambigualis* ♂ published by Müller-Rutz (1925: 432) agrees fairly well with Fig. 3 above. Zerny (1935: 34) has drawn the cornuti of his *ambigualis* as a solid bulk, which makes it impossible to state definitely its identity, but it seems not absolutely out of question that his illustration may concern *sylvestralis*.

The illustration of the genitalia of "*ambigualis*" published by Marion (1959: 19) together with his remark (l. c.: 17): "Sous faible grossissement les cornuti paraissent semblables à ceux de *dubitalis* mais deux fois plus grands. Un fort grossissement montre qu'en réalité chaque cornutus est composé lui-même de plusieurs épines, ce qui n'est pas le cas chez *dubitalis*. Les figures de PIERCE et METCALFE et de CHAPMAN sont inutilisables, le fait leur

ayant échappé" clearly indicate that Marion does not illustrate *ambigualis* (as shown in Fig. 3) but some different species. His illustration of the cornuti of "*ambigualis*" (P. No. 468 a) reminds of *sylvestralis*.

I have discussed the problem with dr. Marion who has been kind enough to inform me that he agrees concerning the supposition that his *ambigualis* corresponds with my Figs. 6—10, instead of with Figs. 11—15, but he is still of the opinion that he is illustrating a true *ambigualis* Tr. and, consequently, that *ambigualis* sensu Chapman, Pierce & Metcalfe, Wolff etc. is wrongly identified.

Treitschke's coll. in Budapest contains 5 *ambigualis*, regarded as typoides. They carry no locality label, but each specimen is marked 'Treits 3401'. Unfortunately only two have their bodies left, and an examination of the genitalia proved that both were — *cembrae* Hw. ♂(!). Dr. Gozmány, whose kind help I highly appreciate, has enabled me to study the remaining bodyless specimens. Two were unmistakably *cembrae*, but as to the third I do not doubt that it belongs to what I illustrate (Fig. 34) as *ambigualis* Tr.

As *locus typicus* of *ambigualis* is stated by Treitschke (1829: 185) to be Austria, I have applied to dr. Klimesch (Linz) who kindly assisted in examining the genitalia of Austrian *ambigualis* from his own coll., proving these to correspond with my Figs. 11—15, thus confirming the occurrence of this species in Austria.

To preserve the name *ambigualis* Tr. (1829) I have — in spite of its lack of abdomen — selected as the lectotype the specimen mentioned above. The name *cembrae* Haworth (1812) remains unaffected.

Should in future the material now present in coll. Treitschke be doubted as 'authorized typoides' the name *ambigualis* Tr. can still be preserved by regarding Chapman (1912) as the 'first revisor' restricting this name to a distinct species.

Female genitalia (Fig. 28). Ostium apically connected to a bent, lightly sclerotized, plate. Ductus bursa not wide before reaching bursa.

4. *Scoparia ingrattella* Zell.

In his revision of the Scoparias Chapman (1912: 507—508), concerning this species, made a mistake concluding that *ingrattella* was not a *bona species* but a form of *dubitatalis* Hb. This error has largely been repeated by subsequent authors, thus by e. g. Meyrick (1928: 440), Pierce & Metcalfe (1938: 36), and Marion (1959: 16).

The material of *S. ingrattella* Zell. which I have been able to study (a total of 7 specimens) originates partly from the Zeller collection preserved in the British Museum in London (BMNH), partly from the Humboldt Museum in Berlin. I am greatly indebted to the Authorities of both Museums for their generous help. Mr. Paul E. S. Whalley of the BMNH has kindly enabled me to dissect 3 males and 2 females. The appearance of the cornuti of these males, prepared as mentioned above, appears from Figs. 21—23, and the genitalia of one of the females are shown in Fig. 29.

According to the original description Zeller (1846: 283—285) described this species on the basis of a material consisting of 8 specimens (7 ♂♂, 1 ♀). Professor Erich M. Hering has kindly informed me that the Museum in Berlin originally possessed 3 of these specimens of which one still is present. As Zeller, himself, did not select types, this specimen — although carrying a label stating it to be the holotype (no. 14199) — must be regarded as the lectotype. In appearance it is somewhat different from the specimens in the BMNH, and a previous student has fixed a label to the pin stating: "*Scoparia basistrigalis* (Knaggs) det. M. Maslowski". The genitalia had already been mounted, and these are indeed very different from *basistrigalis*. In the preparation the cornuti are super-

posed, and difficult to study in details, but compared to the genitalia of four males in the Zeller coll. (BMNH) they all prove to belong to the same species, and thus to be true *ingratella*.

Fig. 35 shows a male which seems to be a fair representative of the species. As stated by Chapman it somewhat resembles *dubitalis*, although larger.

Male genitalia (Fig. 4). Uncus narrower than in *ambigualis*. Basal part of valva stronger. Cornuti (Figs. 21—23) consist of 2—3 long, strong spines, curved close to base, and followed by an indefinite number of slender, slightly curved spines. At the base of the patch of larger cornuti, as usual in the genus, a number of minute spines.

Female genitalia (Fig. 29). Ostium long, followed by a short, sclerotized part. Ductus bursa long, narrow, twisted at $\frac{2}{3}$ before widening into bursa.

S. ingratella is in fact a *bona species*, distinctly separated from *dubitalis*, and Chapman would undoubtedly not have considered them conspecific, if he had been able, also in this case, to examine the genitalia of both sexes.

As *ingratella* for so many years has been confounded with *dubitalis*, its distribution is not known with certainty. The type material came from Austria.

5. *Scoparia dubitalis* Hb.

Although variable this species (Fig. 36) is in most cases recognizable by its whitish ground colour and distinct cross-lines. It is distributed over greater parts of Europe.

Male genitalia (Fig. 5). Valva shorter and more evenly rounded than in preceding species. Uncus short. The cornuti (Figs. 16—20) consist of a row of generally 4 long, slender, very lightly curved spines, sometimes followed by 2—4 shorter ones. At the base a number of small spines. The long cornuti are often superposed and require to be somewhat dislocated during dissection, before they can be studied in details.

Female genitalia (Fig. 30). A narrow, sclerotized plate with margins salient, just beneath ostium. Ductus bursa curved at $\frac{1}{3}$, at this point strongly sclerotized at the outer part of the bend, evenly widening towards bursa.

In the present paper I have made use of the same trivial name — *dubitalis* Hb. — for this species as is used in all references, except one, quoted, but from a nomenclatorial point of view this is not correct. As stated by Benander (1946: 74) the name *dubitalis* Hübner (not earlier than 1796) has to be replaced by *arundinata* Thunberg (1792: 61).

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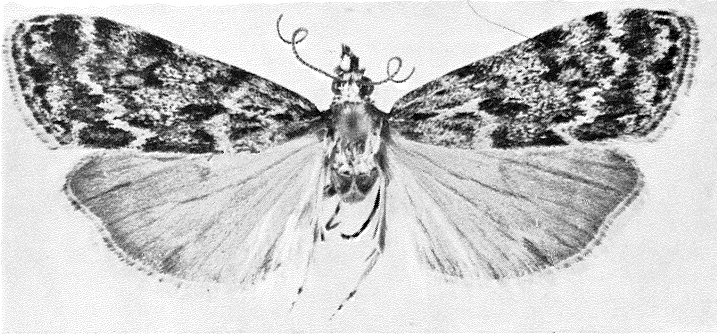


Fig. 31. *Scoparia sylvestralis* n. sp. ♂ Holotype (×4)

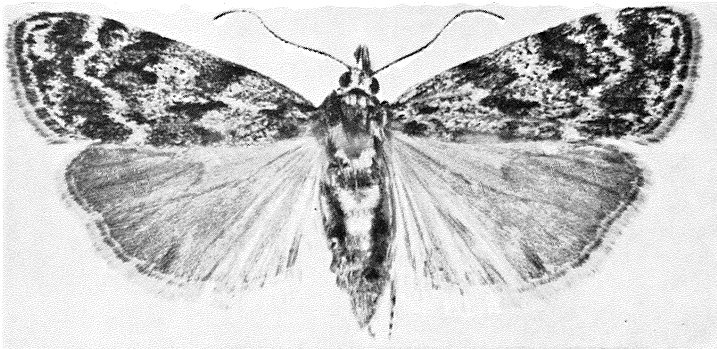


Fig. 32. *Scoparia sylvestralis* n. sp. ♀ (×4)

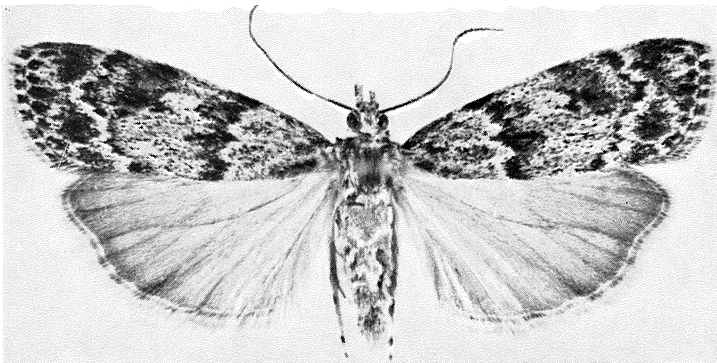


Fig. 33. *Scoparia basistrigalis* Kngs. ♀ (×4)

H. V. Christensen photo.

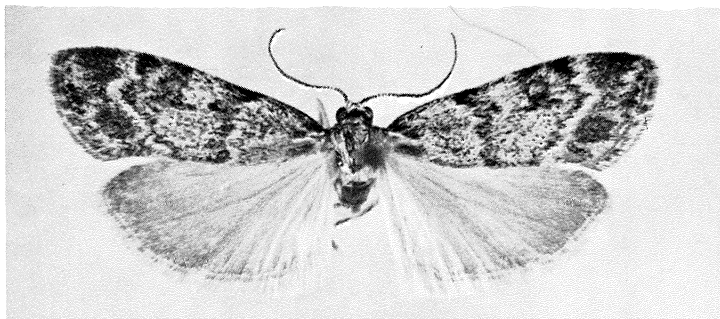


Fig. 34. *Scoparia ambigualis* Tr. ♂ (×4)



Fig. 35. *Scoparia ingrattella* Zell. ♂ (×4)



Fig. 36. *Scoparia dubitalis* Hb. ♂ (×4)

H. V. Christensen photo.