MALE GENITALIA OF THE SPECIES OF DEPRESSARIA HAWORTH S.L. (LEPIDOPTERA, OECOPHORIDAE) OCCURRING IN THE NETHERLANDS

by

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In a previous paper (Van Laar, 1961) the female genitalia of the species of *Depressaria* Hw. s.l. occurring in the Netherlands have been dealt with. In the present paper the male genitalia of these species will be treated. Although Hannemann (1953, 1954, 1958) already described the male genitalia of the species of *Depressaria* occurring in Europe, it was thought to be worth while to give here a survey of the male genitalia of the Dutch species, supplementing that of the female genitalia, in order to help students to discriminate between these rather uniform species.

In view of the complexity of these structures the most efficient way seemed to present elaborate illustrations and abbreviate the descriptions.

In the present work the classification used in the first paper is followed, viz., the division of *Depressaria* s.l. into a number of groups of generic status, of which *Depressaria* Haworth s.s., *Agonopterix* Hübner, and *Levipalpus* Hannemann are represented in the Netherlands.

A sketch of the male genitalia in ventral aspect is given in fig. 1. The valvae are bent backward. More exactly, the right side of the drawing gives an impression of the situation as is generally found in *Depressaria,* the left side as is found in *Agonopterix*. For the structures of the genitalia the terminology of Pierce (1909) is used.

Of certain species studied only limited material was available which made it difficult to get an insight of the variability of the genital characters within the species. Of certain species no male material from Dutch localities could be obtained; the genitalia of these species are described and figured after material from abroad.

As to the wing venation, *Agonopterix* and *Levipalpus* show the same situation, viz., Cu 1 and Cu 2 being united at the origin. They are entirely separated in the case of *Depressaria. Levipalpus* is further recognizable by the exceptional length of the second member of the palpus.

As to the characters of the genital structures the genera *Depressaria, Agonopterix* and *Levipalpus,* as represented in the Netherlands, may be

distinguished easiest by the peculiarities of the valvae. In general, however, the structural differences of anellus and aedeagus seem to be most important. Important parts of the harpe are clavus and cuiller (fig. 1).

In the key to the species the aedeagus index is used, i.e., its width, measured in the middle, in relation to its length.

The hairs, present on the valvae partly are figured entirely, partly only their bases are figured.

The mounts of the genitalia are preserved in the Rijksmuseum van Natuurlijke Historie, Leiden (M.L.), the Zoologisches Museum, Berlin (M.B.), and the Zoologisch Museum, Amsterdam (M.A.).

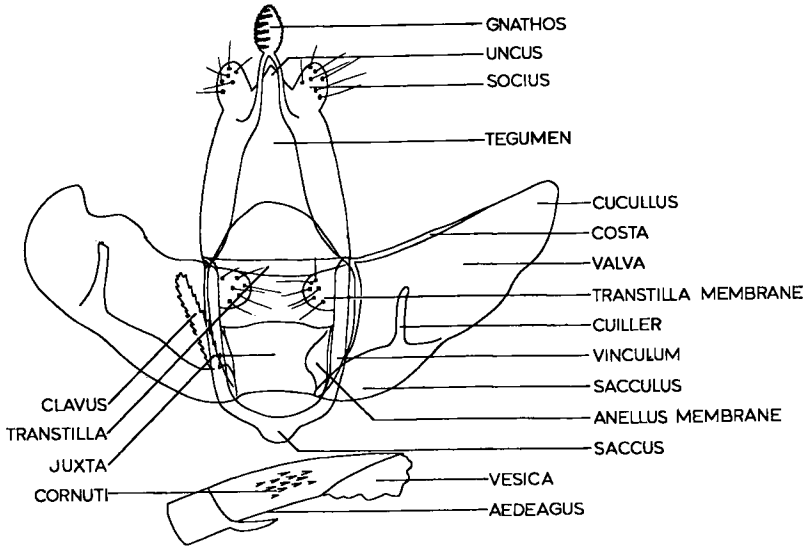

Fig. 1. Male genitalia of *Depressaria* Hw. s.l., in ventral aspect. The valvae are bent

A few corrections to the previous paper may be given here. In the key to the species of *Depressaria* (pag. 19) the species *D. albipunctella* Hübner has been erroneously omitted. The paragraph should read:

3.

—.

—. Upper part of the sternite covered with fine spines, increasing in size and density towards the middle. Two bare wedge-like strips on either side of the median line . . . . . *albipunctella*

The signum of *Depressaria pulcherrimella* Stainton (M.B. 1010) (pag. 22) is not elongate rectangular but rhomboidal. This part was bent in the

mount, which gave a wrong impression of its shape. The signum of *Agonopterix nanatella* (Stainton) (M.B. 692) probably is seen in lateral aspect, so that its real width may be greater.

Also the names of *A. angelicella* and *A. applana* have been interchanged throughout my 1961 paper.

My thanks are again due to Dr. H. J. Hannemann (Berlin) and to Dr. G. Kruseman Jr (Amsterdam), for the loan of a part of the material; and to Dr. A. Diakonoff, for his valuable advice.

DEPRESSARIA HAWORTH, 1811

The outline of the valvae of the different species shows a great diversity. It can be simply rounded-triangular or quadrangular, but sometimes is very complicated. Contrary to *Agonopterix,* a bundle of hairs in the upper inner edge of the valvae is not always present. Instead, a strip of hairs near to and parallel with the upper margin is often found.

With the exception of *D. discipunctella* Herrich-Schäffer and *D. chaerophylli* Zeller the species of *Depressaria* are in the possession of a clavus (never present in *Agonopterix*). A cuiller is present in *D. pulcherrimella* Stt., *D. douglasella* Stt. and *D. albipunctella* Hb. The other species (except *D. nervosa* Haworth which has nothing similar) possess a low, conical prominence near the lower margin of the valva, which might be an indication of a cuiller.

The gnathos can be single or partly divided by a distal incision; elongated or nearly round.

The anellus, which is well developed, is not provided with lateral lobes.

The aedeagus is also rather variably shaped. Sometimes it is provided with minute cornuti, sometimes a small number of larger teeth is present. It may also be devoid of these. Contrary to *Agonopterix* a prominence on the basal part is seldom present. If so, it has the shape of a lobe.

The heterogeneity of *Depressaria* has given rise to the division of this genus into a number of groups. The number is six in Europe (Hannemann, 1953) and five in America (Clarke, 1941).

The number of species occurring in the Netherlands is relatively small and some of the groups of Hannemann are not represented (see Van Laar, 1961).

Key to the species of *Depressaria*

1. Clavus and cuiller present; aedeagus without teeth or cornuti 2
— Cuiller absent, clavus present or absent; aedeagus with teeth or cornuti . . 4
2. Clavus S-shaped, the axial margin of the valva as long as the upper margin . . . . . *D. albipunctella*

— Clavus straight, the axial margin of the valva half as long as the upper margin 3
3. Cuiller shortly forked at the top . . . . . *D. douglasella*
— Cuiller not forked, top bent inwards . . . . . *D. pulcherrimella*
4. Clavus and cuiller absent 5
— Clavus present 6
5. Saccus elongate-conical. Socii small, less than a quarter of the gnathos . . . . . *D. discipunctella*
— Saccus not prominent. Socii big, nearly the size of the gnathos *D. chaerophylli*
6. Upper margin of valva straight 7
— Upper margin of valva irregularly shaped 8
7. Gnathos, a single body . . . . . *D. nervosa*
— Gnathos, partly divided . . . . . *D. ultimella*
8. Upper margin of valva with three lobes. Clavus slightly S-shaped . *D. badiella*
— Upper margin of valva indented. Clavus straight 9
9. Anellus gradually narrowing upwards, with some hairs at the upper part. Most distal process on valva rounded . . . . . *D. heracliana*
— Anellus without hairs. Most distal process on valva pointed . . *D. pimpinellae*

AGONOPTERIX HÜBNER, 1825

The genus *Agonopterix* seems very homogenous. The male genitalia do not differ much from each other.

The outline of the valvae is always simple, without conspicuous prominences or indentations. A clavus is always absent; a cuiller is present. In the Dutch representatives of the genus the top of the cuiller seldom extends beyond the upper margin of the valva. Numerous hairs are always present in the inner upper angle of the valva. Between this place and the sacculus a hairless space is present. The socii are often rather densely covered with hairs.

The anellus, which generally has a cordiform incurved upper margin, is in the possession of lateral lobes.

The aedeagus varies in length. A more or less elongate and pointed extension on the basal part is always present. Cornuti are generally present.

The differences in structure of the genitalia do not always suffice to characterize the species. In cases of doubt it is advisable to use the external characters in addition.

Key to the species of *Agonopterix*

1. Transtilla not widened or gradually widening towards the middle 2
— Transtilla abruptly widening in the middle 14
2. Cuiller with a pointed process in the axial margin, somewhat below the middle 3
— Cuiller with several thorns on the upper part 4
— Cuiller with bulbous top 5

— Cuiller otherwise 6
3. Aedeagus with a long basal prominence, reaching towards the middle. Gnathos rather widely ovate . . . . . *A. angelicella*
4. Socii small. Gnathos more or less pear-shaped. Cuiller with thorns on the outer side . . . . . *A. liturella*
— Socii large. Cuiller with thorns on the top . . . . . *A. assimellella*
5. Cuiller stout, with a deep indentation at the outer side . . . . . *A. arenella*
— Cuiller with axe-shaped top. Saccus with two incisions . . . . *A. pallorella*
6. Aedeagus very long (A.I. = 10 : 1), with thorns on top; basical prominence reaching approximately to the middle. Socii small. Cuiller extending beyond the costa . . . . . *A. zephyrella*
— Aedeagus shorter 7
7. Cuiller curved, distinctly pointing outward 8
— Cuiller straight or almost straight 10
8. Cuiller stout, top square . . . . . *A. costosa*
— Cuiller with rounded top 9
9. Socii small. Valvae with a large number of hairs . . . . *A. alstroemeriana*
— Socii wide. Valvae not abundantly covered with hairs . . . . *A. nanatella*
10. Valva very wide. Gnathos rounded-ovate. Cuiller slightly bent outward, top suddenly narrowed . . . . . *A. propinquella*
— Gnathos elongate-conical or elongate-ovate 11
11. Cucullus rather pointed. Cuiller slightly bent outward 12
— Cucullus rather rounded 13
12. Gnathos elongate-conical. Aedeagus long and narrow, A.I. = 10 : 1. *A. flavella*
— Gnathos elongate-ovate. Aedeagus stout. . . . . *A. atomella*
13. Anellus lobes narrow and elongate. Sacculus rather narrow. Cuiller straight or slightly bent inward . . . . . *A. subpropinquella*
— Anellus lobes wider. Sacculus not narrow, upper margin making an angle near vinculum. Cuiller almost straight, the top may be slightly bent outward *A. laterella*
14. Aedeagus long and narrow, A.I. = 1 : 9 15
— Aedeagus shorter 17
15. Basal prominence of aedeagus very long, extending beyond the middle. Cuculus wide. Gnathos rounded-ovate . . . . . *A. angelicella*
— Basal prominence not reaching towards the middle. Cucullus narrow. Gnathos elongate-ovate 16
16. Outer margin of cuiller making a square angle (see fig. 25) . . *A. yeatiana*
— Outer margin straight. Top of cuiller sharply pointed . . . . *A. cnicella*
17. Top of cuiller bulbous, with thorns 18
— Cuiller otherwise 19
18. Cucullus broad. Socii small . . . . . *A. conterminella*
— Cucullus very narrow. Socii moderate or large . . . . . *A. capreolella*
19. Cucullus very narrow 20
— Cucullus rather broad 21
20. Genitalia on the whole rather small. Socii small Gnathos elongate-conical. Anellus lobes narrow. Cuiller with pointed top. Basal part of aedeagus with two processes . . . . . *A. purpurea*
— Socii rather broad. Gnathos ovate, more or less elongate. Anellus lobes wide. Top of cuiller rounded. Basal part of aedeagus with one process . . . *A. umbellana*
21. Gnathos very long, more or less cylindrical. Upper margin of sacculus making an angle near vinculum. Anellus lobes strongly sclerotized. Saccus pointed *A. ciliella*
— Gnathos ovate. Anellus lobes not strongly sclerotized. Upper margin of sacculus smooth . . . . . *A. ocellana*

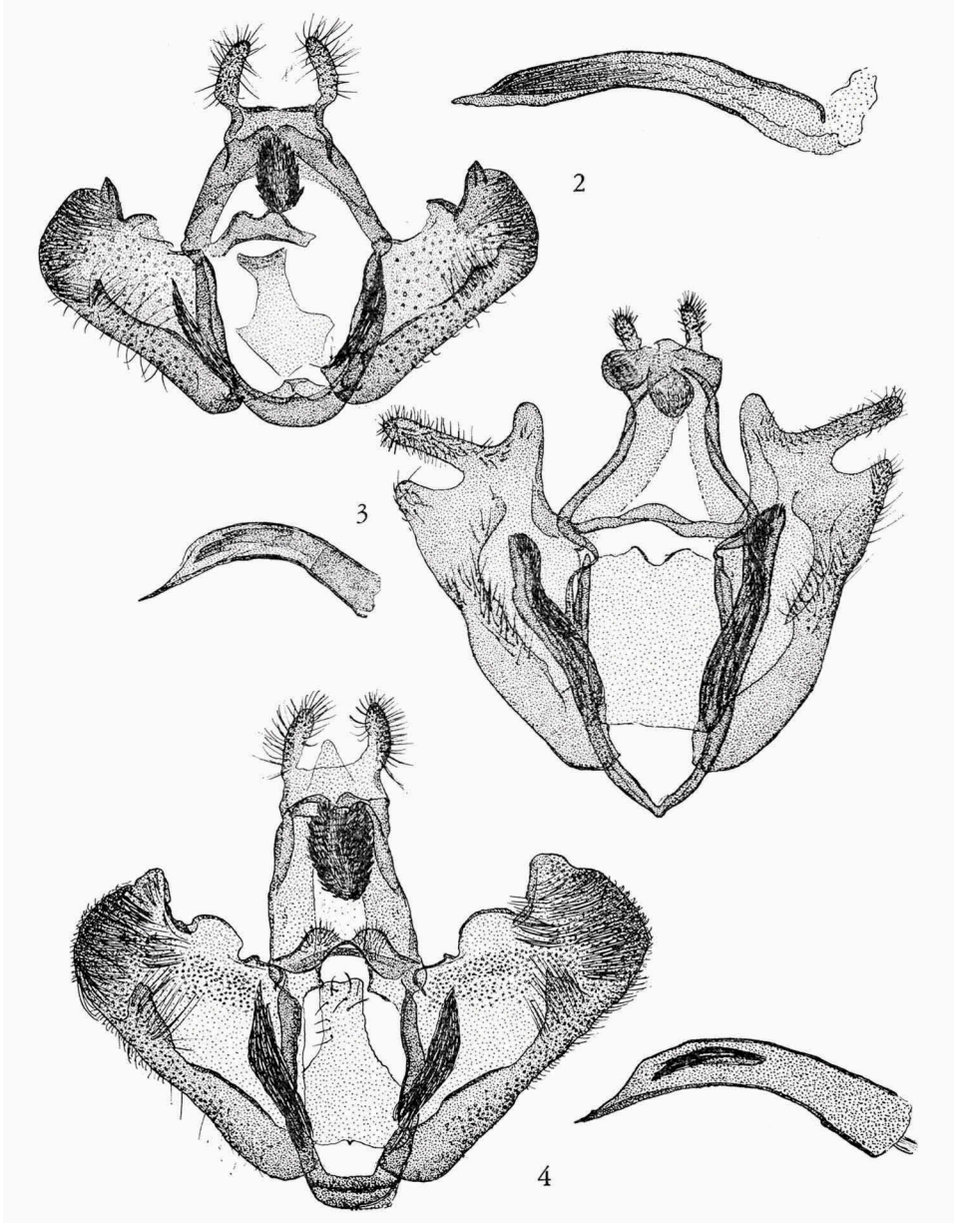

Fig. 2. *Depressaria pimpinellae* Zeller (gen. no. 3455, M.L.), Loc. unknown; found in last part of the 19th century. — Fig. 3. *D. badiella* Hübner (gen. no. 3323, M.L.), Soest; found in last part of the 19th century. — Fig. 4. *D. heracliana* (Linnaeus) (gen. no. 2488, M.L.), Baarn; 22-8-1940.

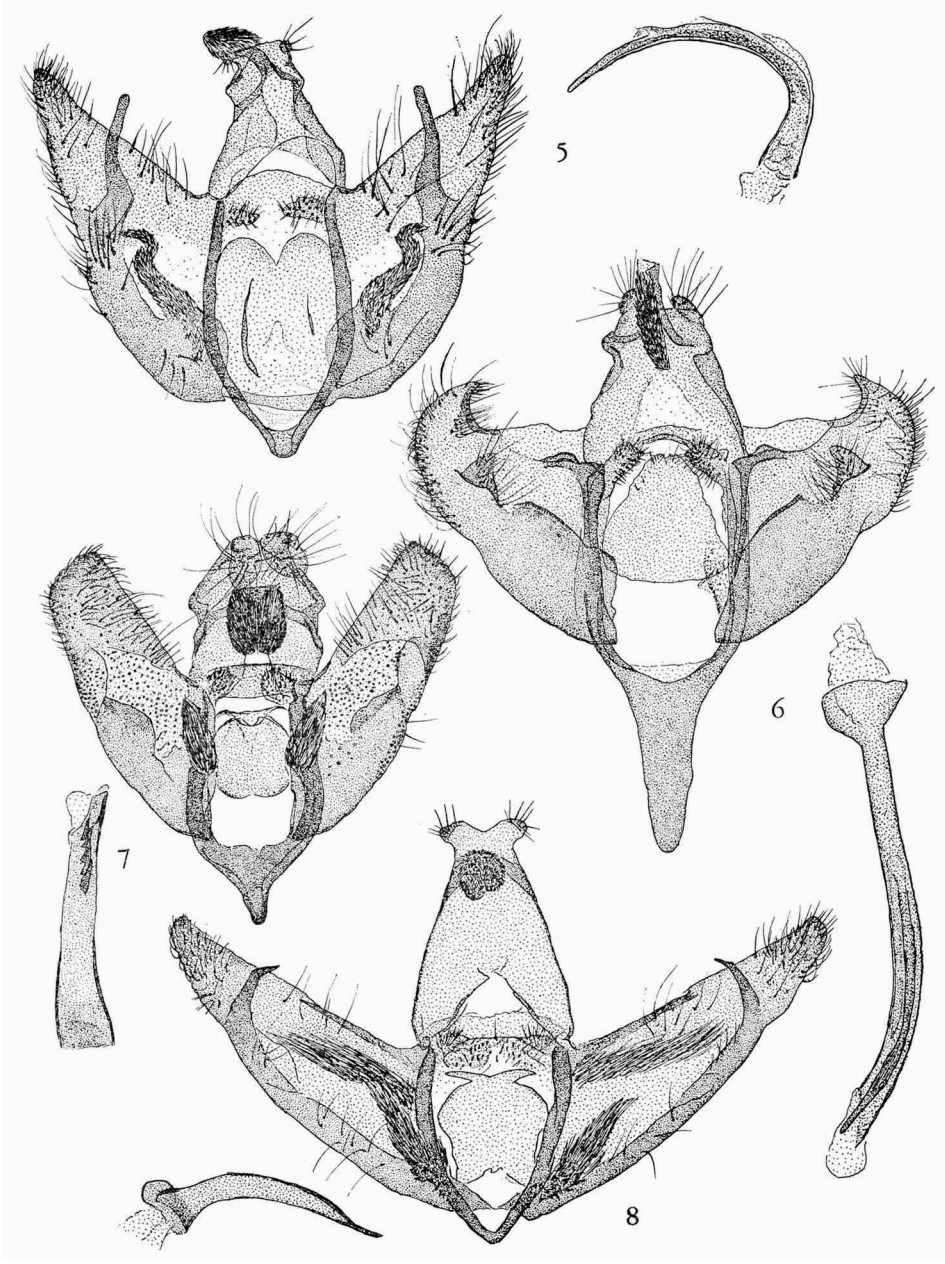

Fig. 5. *Depressaria albipunctella* Hübner (gen. no. 3387, M.L.). — Fig. 6. *D. discipunctella* Herrich-Schäffer (gen. no. 3381, M.A.), Arnhem. — Fig. 7. *D. ultimella* Stainton (gen. no. 3338, M.L.), Rotterdam; 17-8-1866. — Fig. 8. *D. pulcherrimella* Stainton (gen. no. 256, M. B.), Silezia.

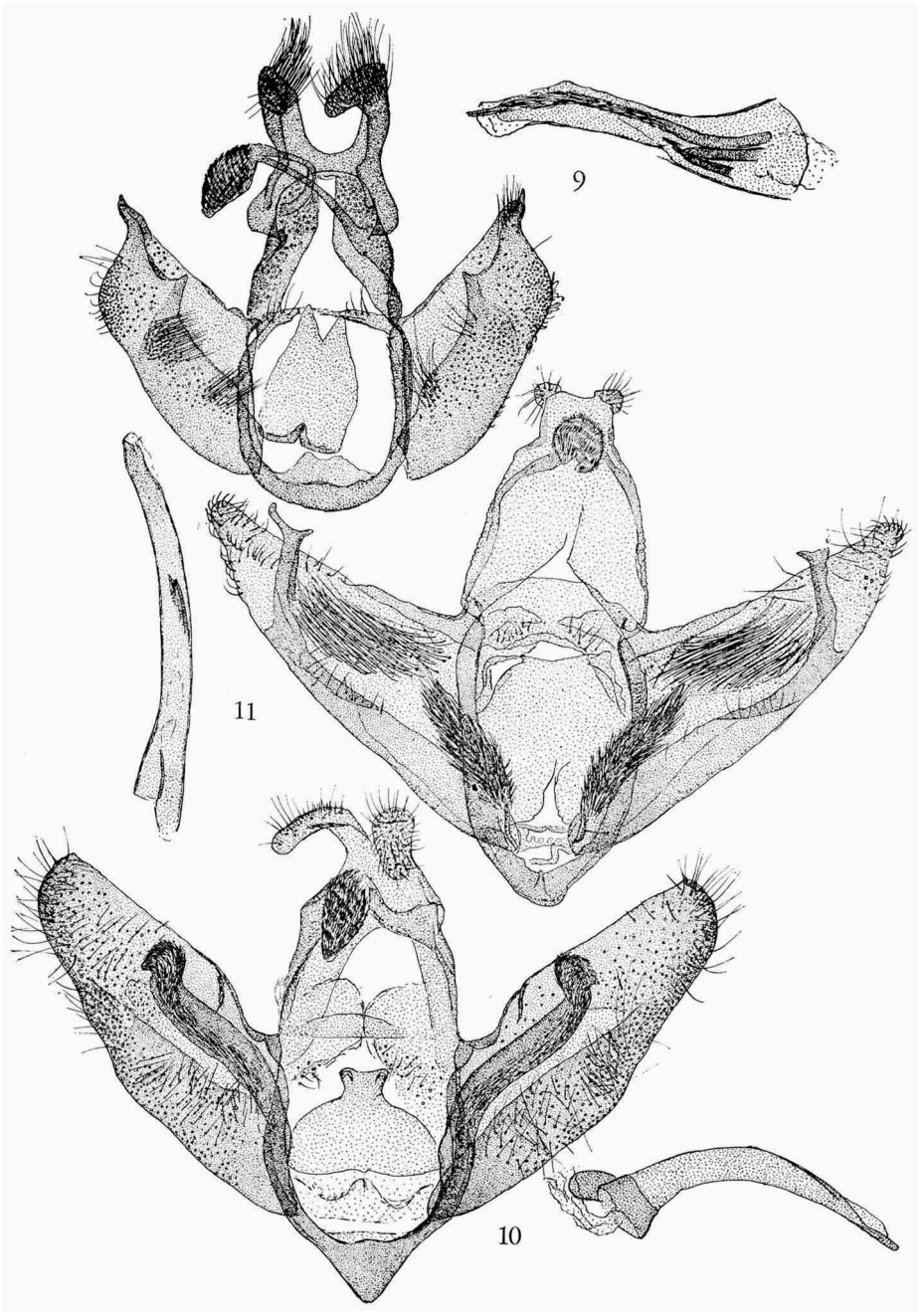

Fig. 9. *Depressaria chaerophylli* Zeller (gen. no. 3448, M.L.), Loc. unknown; found on 25-7-1876. — Fig. 10. *D. douglasella* Stainton (gen. no. 257, M.B.), Silezia. — Fig. 11. *D. nervosa* Haworth (gen. no. 2549, M.L.), Hilversum; 6-4-1937.

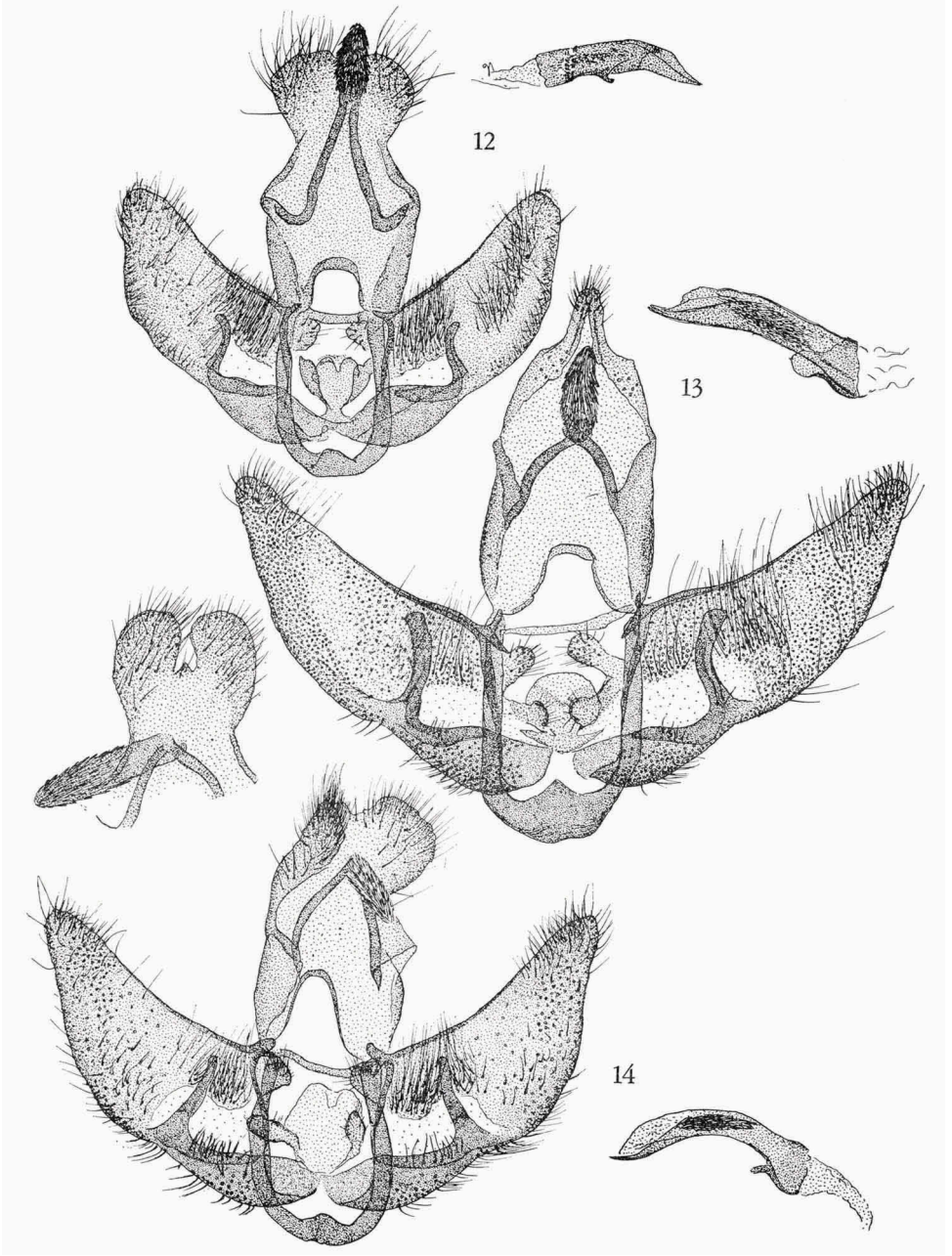

Fig. 12. *Agonopterix nanatella* Stainton (gen. no. 271, M.B.), Wiesbaden. A.I. = ± 1 : 5. — Fig. 13. *A. costosa* (Haworth) (gen. nos. 3305, 3467, M.L.), Loc. resp. Hilversum, Arnhem; found resp. 1-9-1949, last part of 19th century. A.I. = ± 1 : 6. — Fig. 14. *A. flavella* (Hübner) (gen. no. 3402, M.L.), Wageningen; 30-6-1946. A.I. = ± 1 : 10.

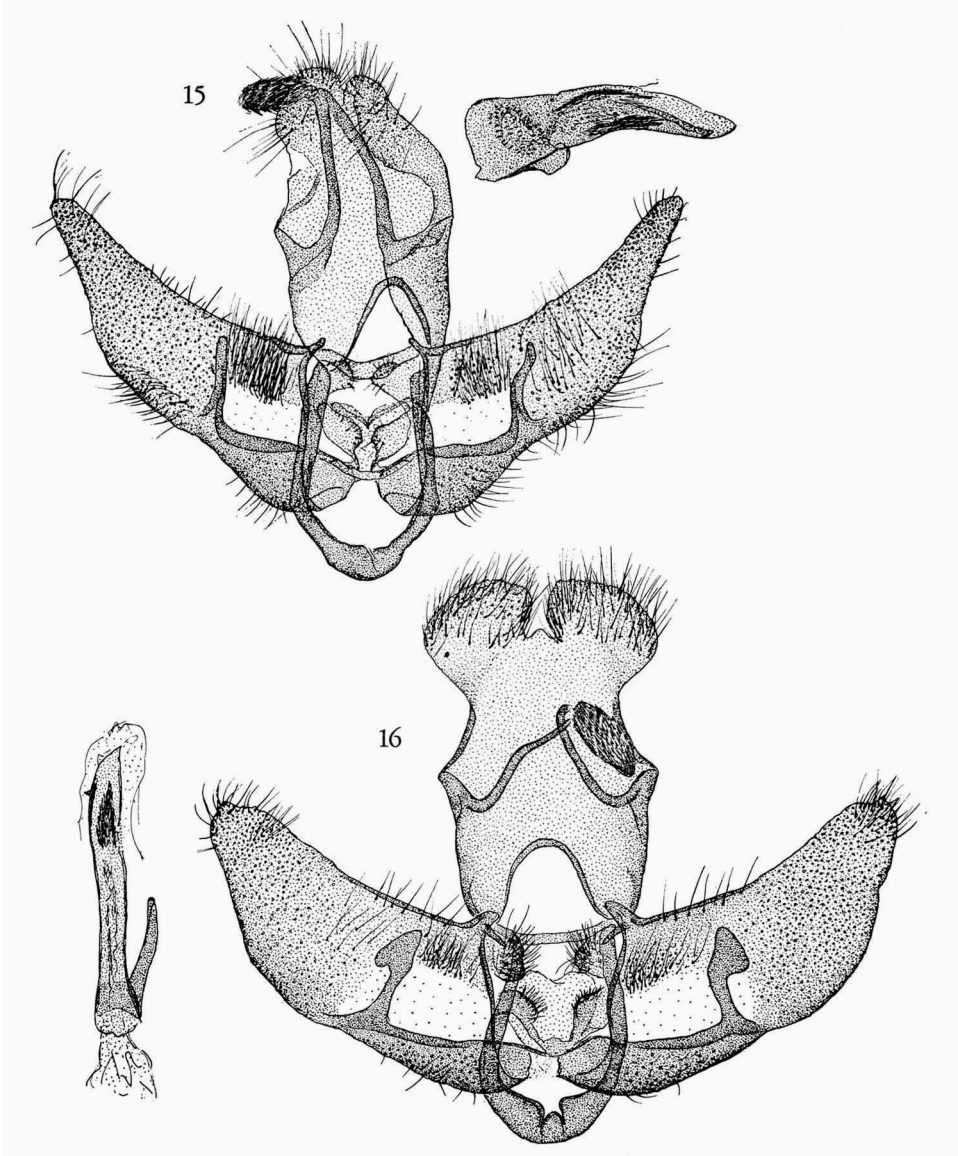

Fig. 15. *Agonopterix umbellana* (Stephens) (gen. no. 3402, M.L.), Den Haag; 1-8-1885. A.I. = ± 1 : 5. — Fig. 16. *A. pallorella* (Zeller) (gen. no. 3453, M.L.), Loc. unknown; found in last part of 19th century. Aedeagus with three big teeth; A.I. = ± 1 : 5.

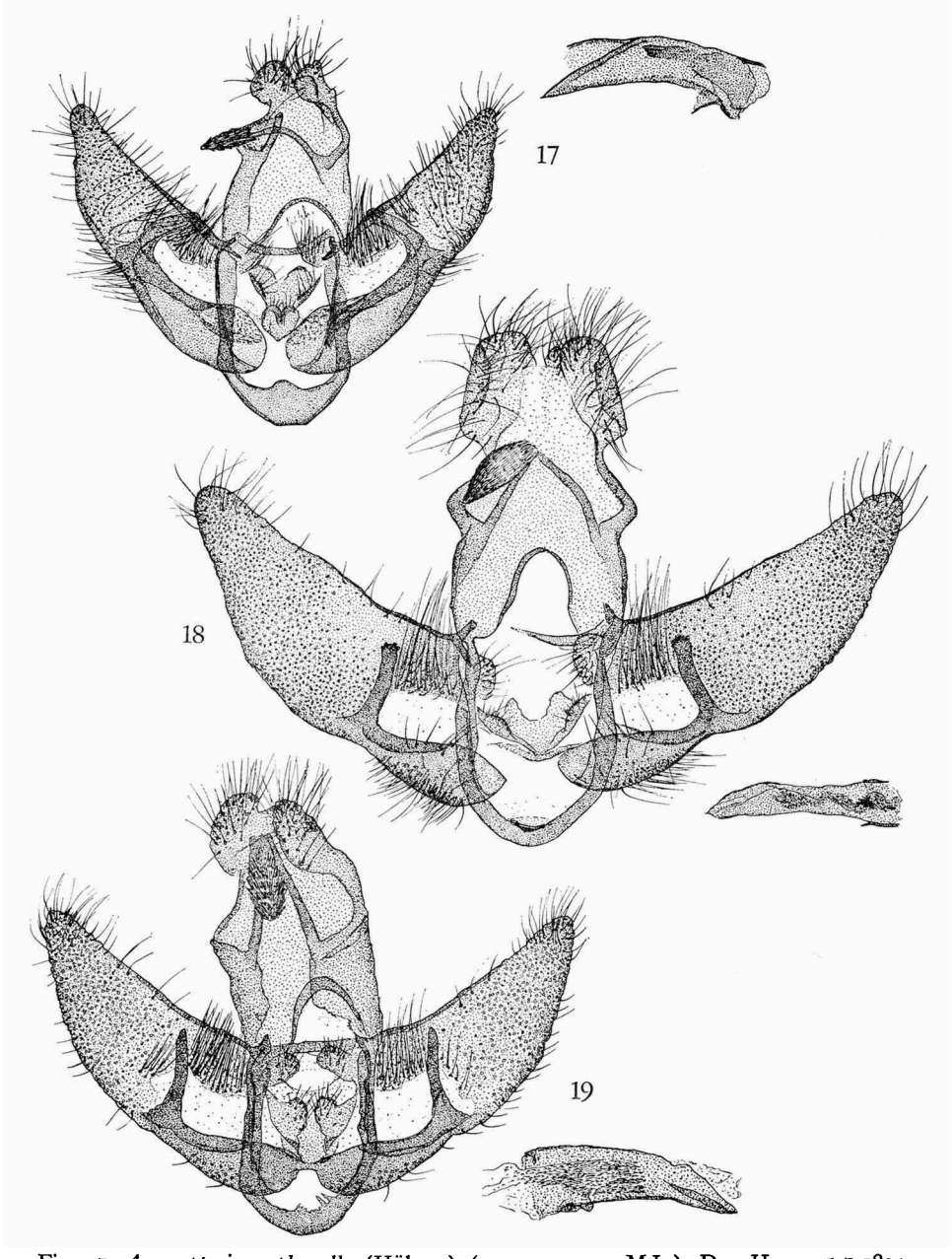

Fig. 17. *Agonopterix zephyrella* (Hübner) (gen. no. 3341, M.L.), Den Haag; 5-7-1894. Aedeagus very long, about the same length as the valva. A.I. = ± 1 : 10. — Fig. 18. *A. assimilella* (Treitschke) (gen. no. 3352, M.L.), Hilversum; 17-8-1939. A.I. = ± 1 : 5. Cuiller with square top. — Fig. 19. *A. atomella* (Hübner) (gen. no. 3384, M.A.), Aedeagus short by conical; A.I. = ± 1 : 3,5.

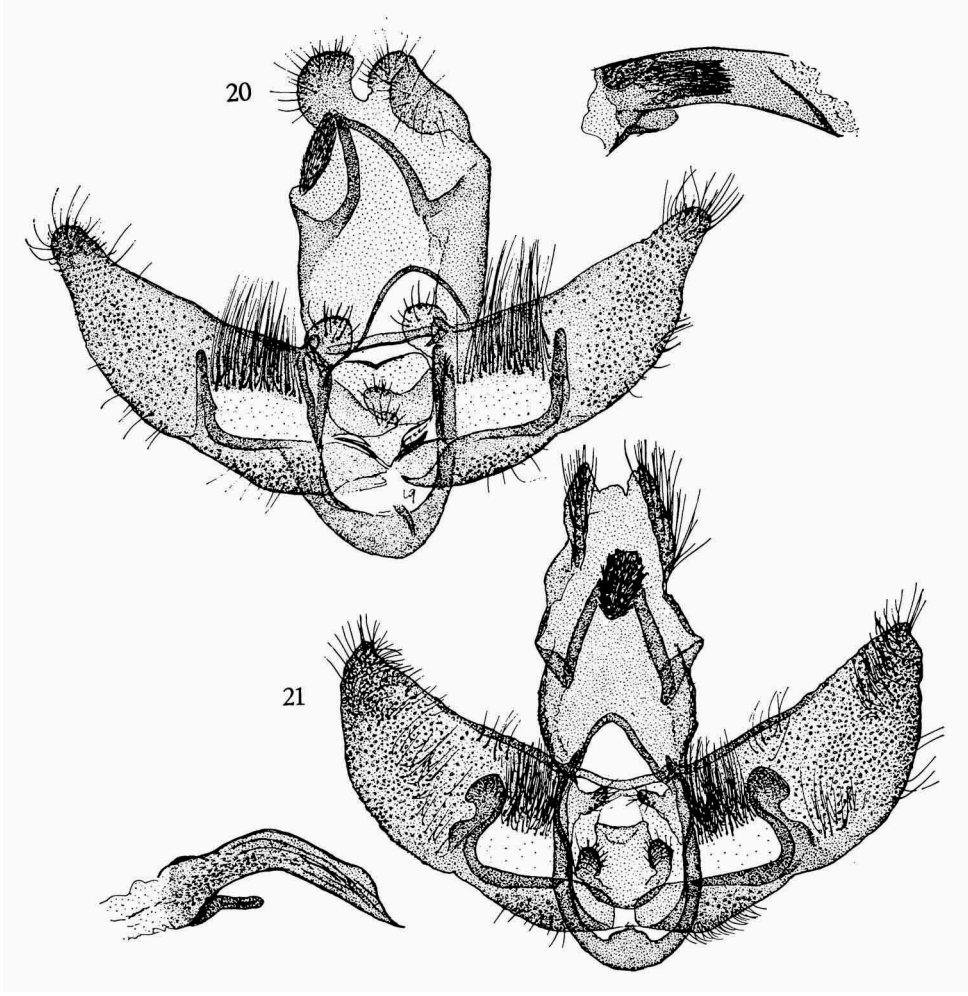

Fig. 20. *Agonopterix scopariella* (Heinemann) (gen. no. 3374, M.L.), Breda; 27-7-1870. A.I. = ± 1 : 4. Cuiller with small process on inner side. Transtilla with sclerotized lower margin. — Fig. 21. *A. arenella* (Schiffermiller) (gen. no. 2494, M.L.), Hilversum; 7-8-1943. A.I. = ± 1 : 7.

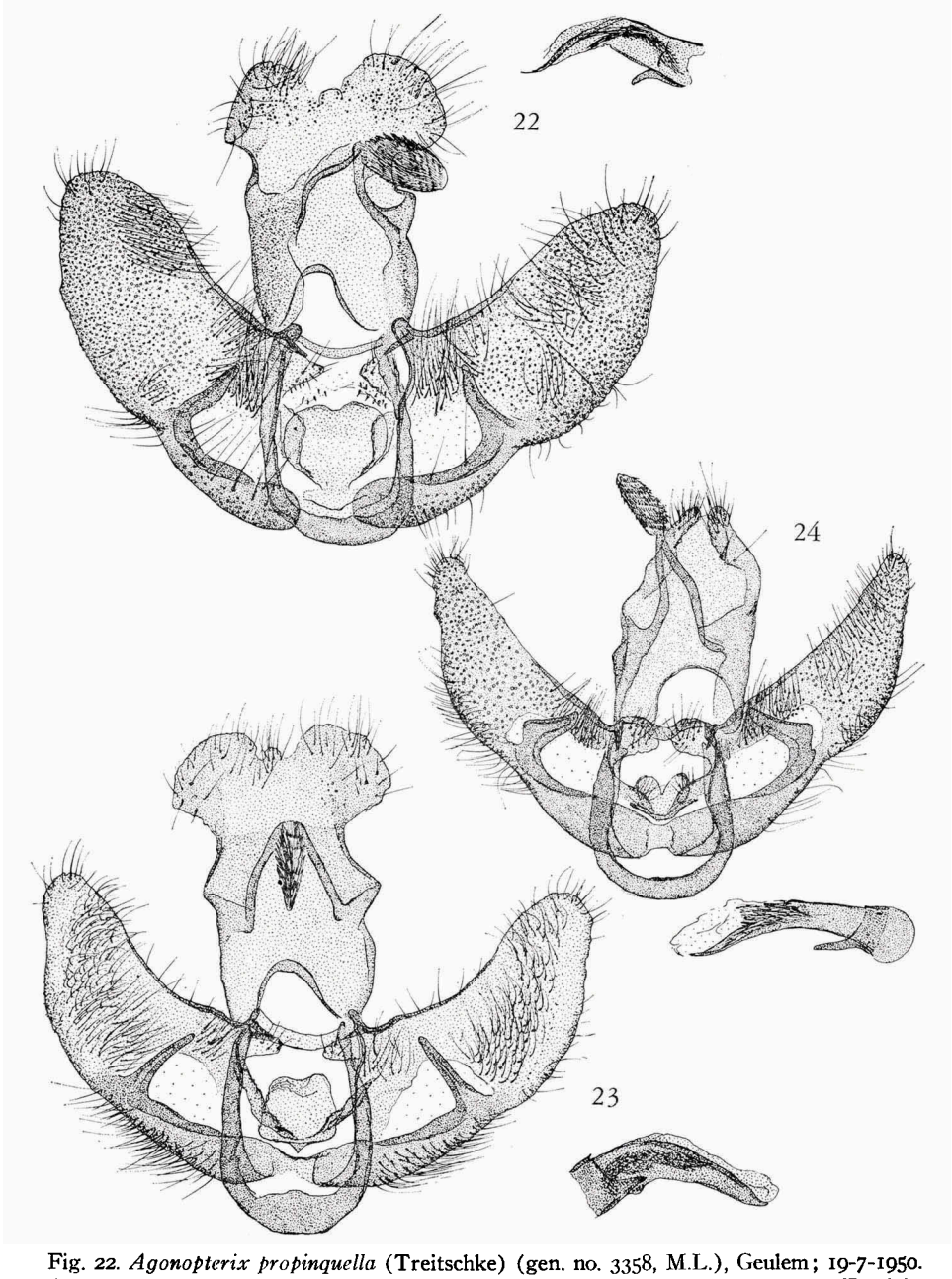

Fig. 22. *Agonopterix propinquella* (Treitschke) (gen. no. 3358, M.L.), Geulem; 19-7-1950. A.I. = ± 1 : 5,5. — Fig. 23. *A. subpropinquella* (Stainton) var. *rhodochrella* Herrich-Schäffer (gen. no. 3456, M.L.), Loc. unknown; found in last part of 19th century. A.I. = ± 1 : 5,5. — Fig. 24. *A. yeatiana* (Fabricius) (gen. no. 2536, M.L.), Dordrecht; 24-4-1913. A.I. = ± 1 : 9. Outer margin of cuiller making a square angle.

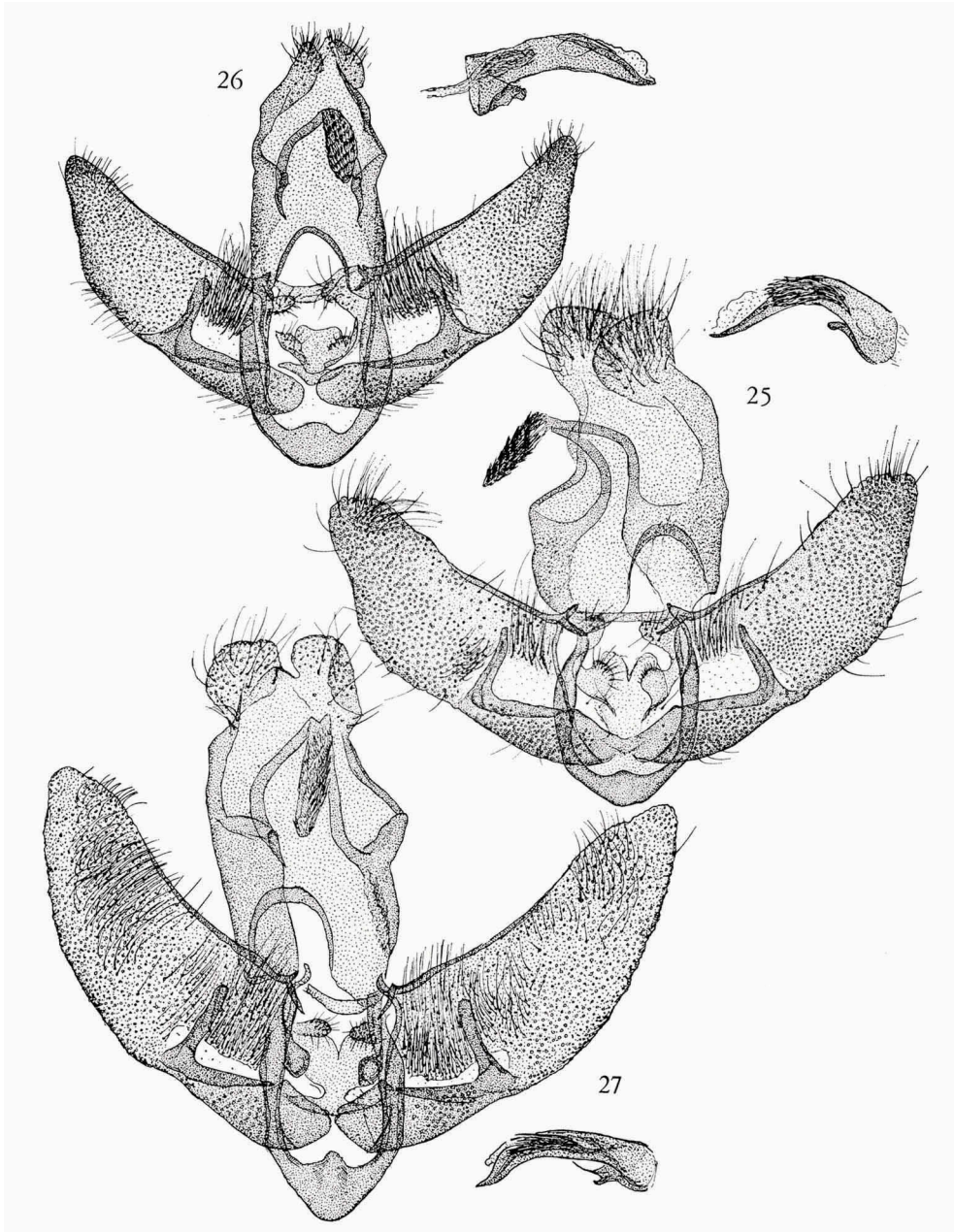

Fig. 25. *Agonopterix laterella* (Schiffermiller) (gen. no. 3397, M.L.), Vorden; 24-7-1910. A.I. = ± 1 : 9. — Fig. 26. *A. ocellana* (Fabricius) (gen. no. 2504, M.L.), Breda; 13-4-1906. A.I. = ± 1 : 5. — Fig. 27. *A. ciliella* (Stainton) (gen. no. 2510, aedeagus: gen. no. 2523, M.L.), Loc. resp. Kortenhoef, Breda; found on resp. 10-9-1939, 7-8-1870. A.I. = ± 1 : 7,5. Anellus lobes strongly sclerotized.

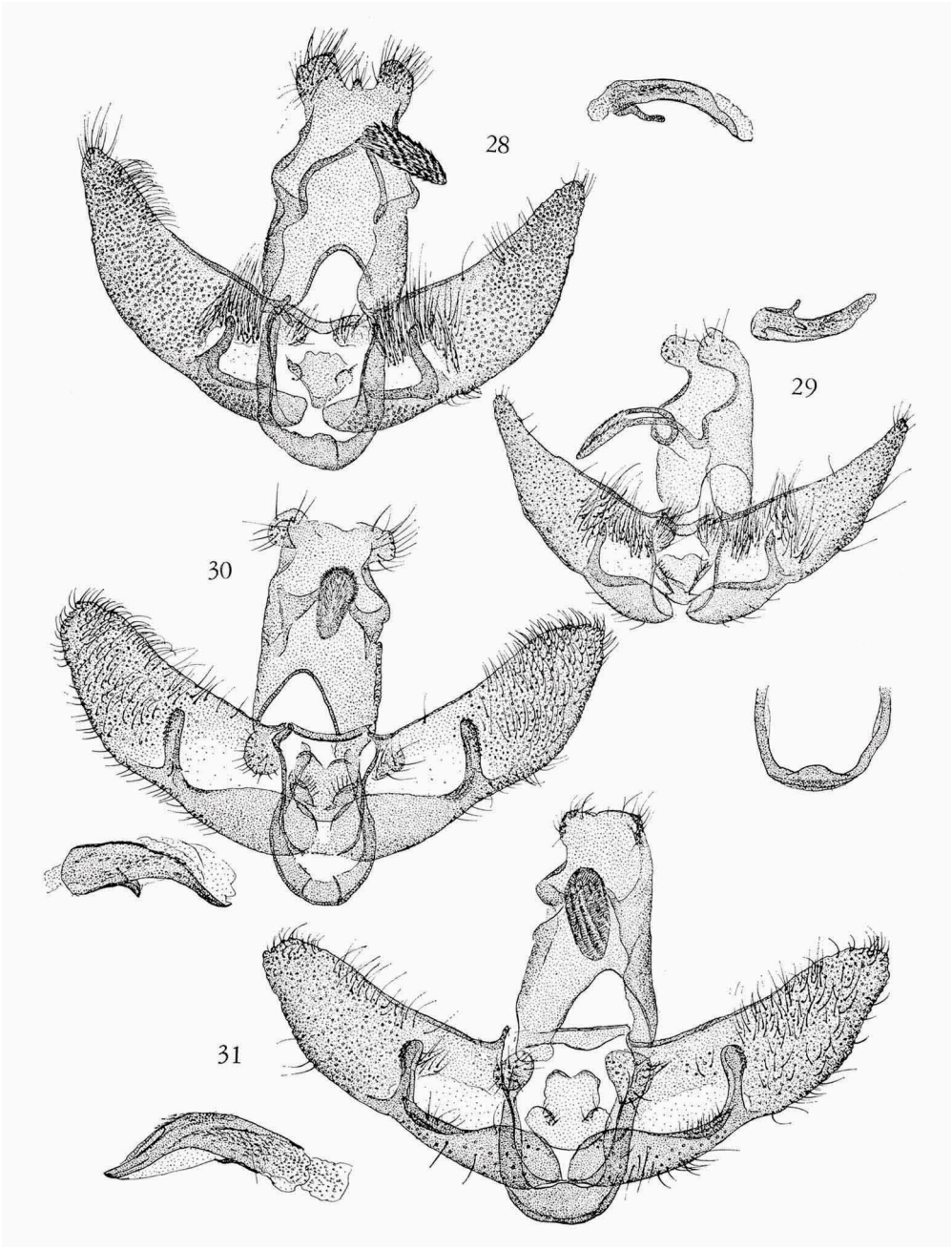

Fig. 28. *Agonopterix alstroemeriana* (Clemens) (gen. no. 3333, M.L.), Breda; found in last part of the 19th century. A.I. = ± 1 : 7. — Fig. 29. *A. purpurea* (Haworth) (gen. no. 3348, M.L.), Breda; 25-7-1874. A.I. = ± 1 : 7. — Fig. 30. *A. liturella* (Hübner) (gen. no. 3440, M.L.), Den Haag; 11-7-1875. A.I. = ± 1 : 5,5. Cuiller with thorns on the upper part. — Fig. 31. *A. conterminella* (Zeller) (gen. no. 2513, M.L.), Kortenhoef; 23-6-1942. A.I. = ± 1 : 7. Top of cuiller slightly bulbous.

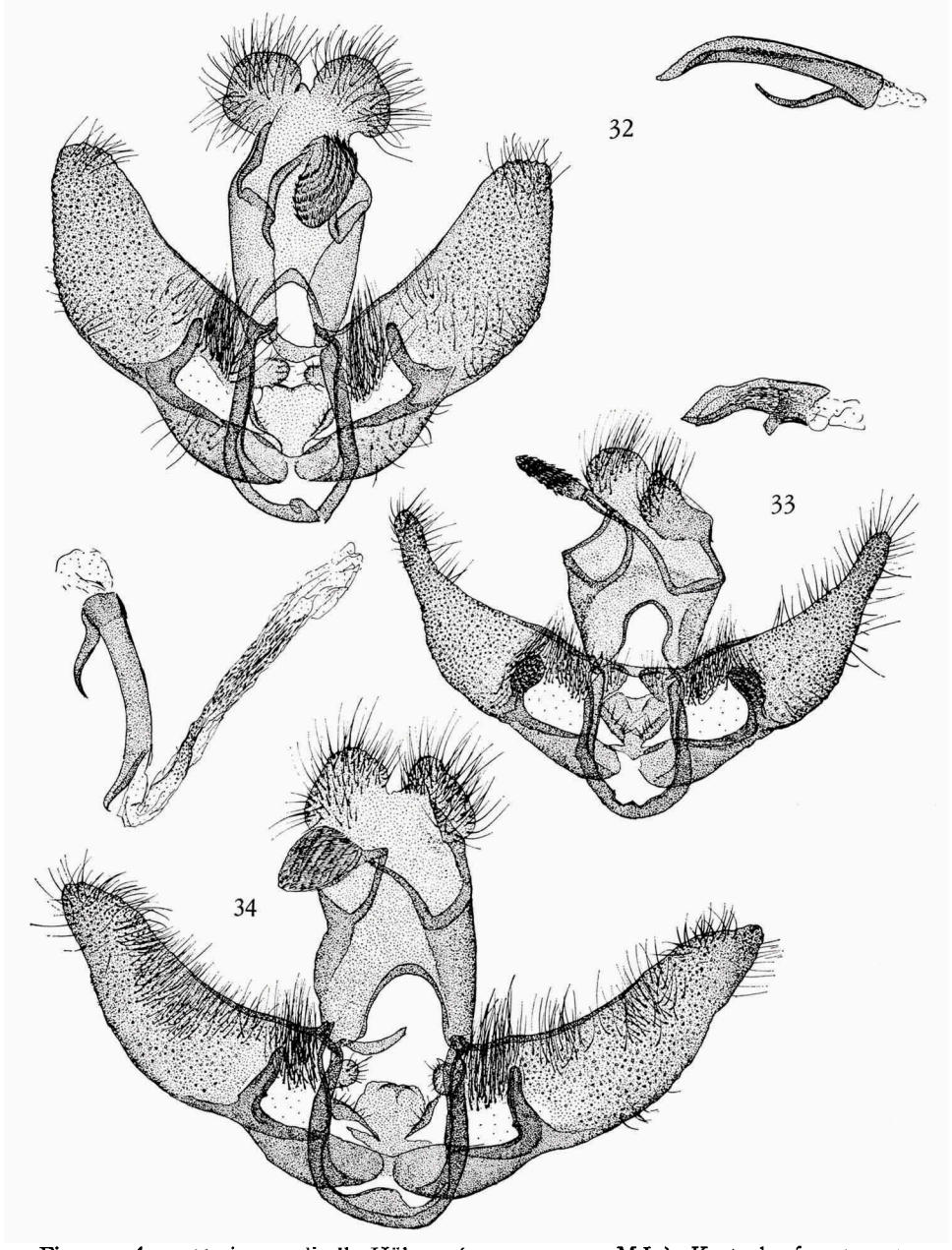

Fig. 32. *Agonopterix angelicella* Hübner (gen. no. 3312, M.L.), Kortenhoef; 3-7-1919. A.I. = ± 1 : 9. — Fig. 33. *A. capreolella* (Zeller) (gen. no. 3465, M.L.), Loc. unknown; found in last part of 19th century. A.I. = ± 1 : 6. Top of cuiller bulbous, granulated. — Fig. 34. *A. angelicella* (Hübner) (gen. no. 3462, M.L.), Rotterdam; 30-6-1895. A.I. = ± 1 : 9. Cuiller with a small process at the base.

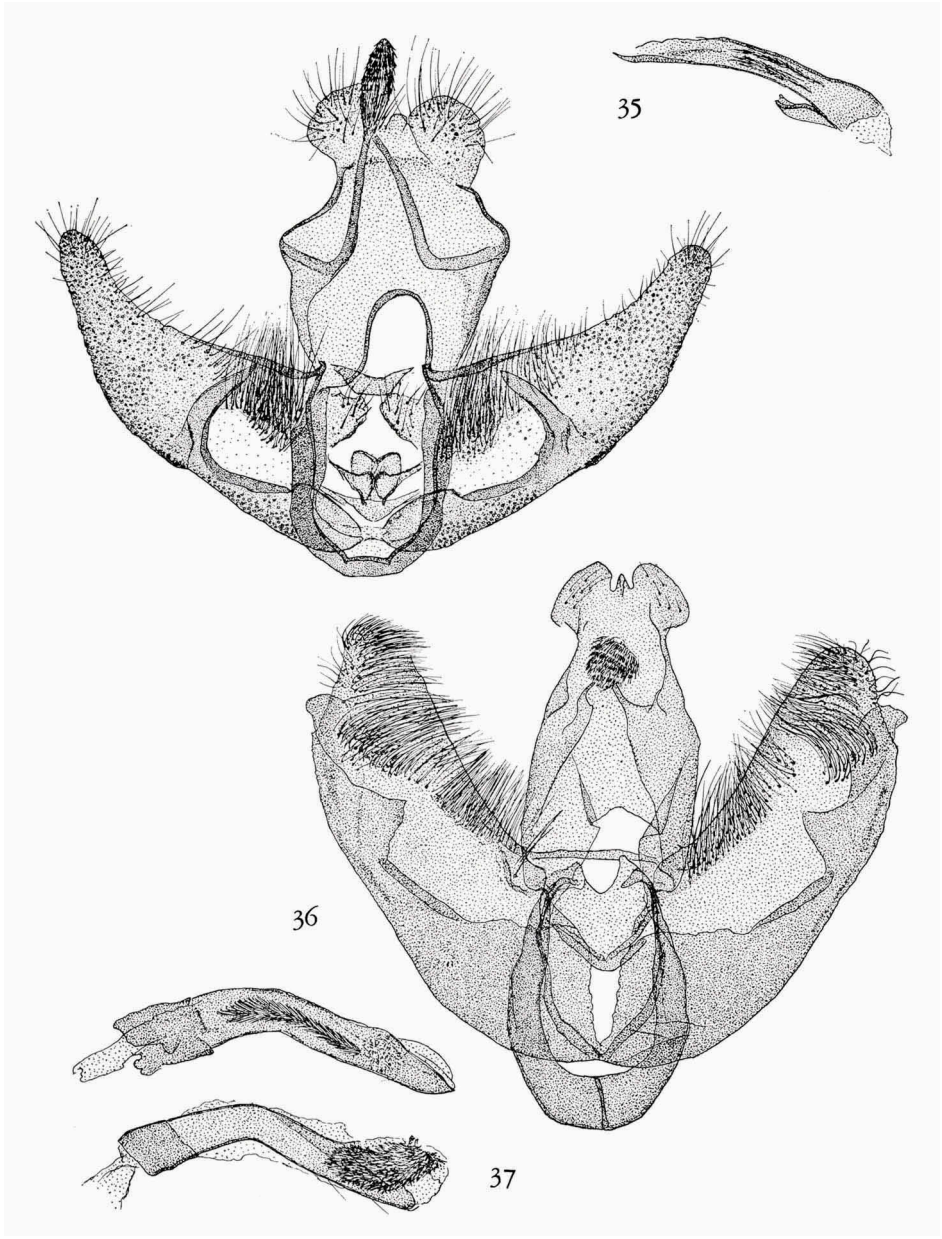

Fig. 35. *Agonopterix cnicella* (Treitschke) (gen. no. 3409, M.L.), Arnhem; 23-7-1871. A.I. = ± 1 : 10. Cuiller sharply pointed. — Fig. 36. *Levipalpus hepatariellus* (Zeller) (gen. no. 148, M.B.), Livland. A.I. = ± 1 : 9. Socii slightly axe-shaped. No transtilla lobes. A lobe near the cucullus, protruding beyond the lower margin of the valva. — Fig. 37. *L. hepatariellus* (Z.) (gen. no. 91, M.B.), Livland. Aedeagus.

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