

## New and rare Nepticulidae in the Netherlands (Lepidoptera)

by

ERIK J. van NIEUKERKEN

*Department of Animal Systematics and Zoogeography, Vrije Universiteit, Amsterdam*

**ABSTRACT.** — Eleven species of Nepticulidae are recorded from the Netherlands for the first time. Eight of these have been collected as larvae during recent field work: *Ectoedemia hannoverella* (Glitz), *E. mediofasciella* (Haworth), *E. spinosella* (Joannis), *E. arcuatella* (Herrich-Schäffer), *Trifurcula cryptella* (Stainton), *Stigmella aeneofasciella* (Herrich-Schäffer), *S. poterii* (Stainton), and *S. crataegella* Klimesch. On the basis of old collection material *E. longicaudella* Klimesch, *E. bradfordi* Emmet and *S. svenssoni* (Johansson) can be added to the list. A single specimen of *E. bradfordi* appears to be only the second one known. Some notes on rare species are given. *S. regiella* (Frey) is recorded for the first time from Belgium.

### INTRODUCTION

In 1978 our department started with research on systematics of the leafmining moth family Nepticulidae. The main aims of this research are to study the phylogeny of the family on a world-basis, but mainly of the Holarctic fauna; moreover to study aspects of speciation and host-plant formation in some groups. The problems are tackled by three approaches: the morphological, the ecological and the biochemical (electrophoresis of allozymes). To obtain the material needed we undertake many fieldtrips, mainly in the Netherlands. We normally collect the larvae as these are much easier to find than adults. As a by-product we, of course, acquire considerable faunistic knowledge, which we hope will result in a survey of the distribution. To date, we have already collected eight species which were previously unknown from the Netherlands. They are discussed here.

The author with the cooperation of students began to revise the Dutch collections and several changes in the faunistic list resulted from this work. In this paper the previously unrecorded species and some rare species are treated.

In the treatment the new localities are given under the species headings, arranged under the provinces. The locality-data are provided with the UTM-codes for  $1 \times 1$  km squares. Unless otherwise stated, the specimens were collected by the author in cooperation with the other staff-members and students of our department. Only a part of this material is conserved in the collection, as much is used in experiments. Material will be deposited in one or more of the major Dutch museums. Examples of mines from most localities are kept in our collection.

No extensive descriptions are given because, except for *E. longicaudella* and *E. hannoverella*, all species are fully described by Emmet (1976a).

The following abbreviations are used:

f. n. sp. — New record to the Netherlands

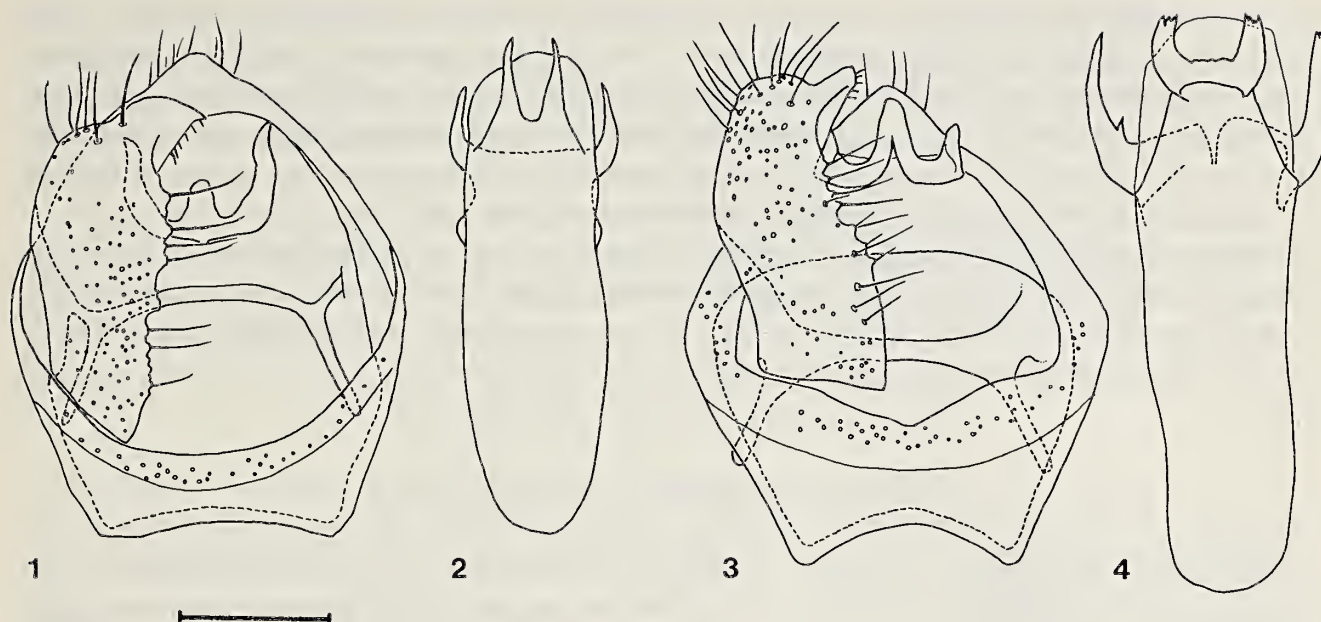
RMNH — Rijksmuseum van Natuurlijke Historie, Leiden

VU — Biologisch Laboratorium, Vrije Universiteit, Amsterdam

ZMA — Instituut voor Taxonomische Zoölogie (Zoölogisch Museum), Amsterdam

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Figs. 1-4. 1,2. *Ectoedemia hannoverella* (Glitz); 3,4. *E. turbidella* (Zeller). 1,3. male genitalia, ventral aspect, right valva and aedeagus removed; 2,4. Aedeagus, ventral aspect. Scale line represents 0.1 mm.

### SYSTEMATIC TREATMENT

#### *Bohemannia pulverosella* (Stainton) comb. nov.

*Scoliaula pulverosella* (Stainton); Borkowski, 1975

*Ectoedemia pulverosella* (Stainton); Emmet, 1976a; Lempke, 1976

Noord-Holland: Texel, De Koog, FU 2084, mines 16.VII.1969 (coll. van Frankenhuyzen); 10.VII.1979, 1 larva; Hilversum, FT 4688 19.VII.1979, mines. Zuid-Holland: Wassenaar, Duinrell, ET 9477, larvae 12.VII.1979 (1 ♀ V.1980), 6.VII.1980; Rockanje, ET 7248, 8.VII.1980, 1 mine. Zeeland: Renesse, ET 5230, larvae 8.VII.1980 (3 ♀♀ IV-V.1981), larvae 30.VI.1981; Haamstede, ET 5028, larvae 8.VII.1980 (3 ♀♀ IV-V.1981), idem, ET 5129, larvae 30.VI.1981.

This species was included in Lempke's checklist (1976) on the basis of van Frankenhuyzen & Houtman (1972), but no localities have been published. Van Frankenhuyzen showed us the orchard from which his mines originated, but we could only collect one larva. Since then we have collected the species in a number of orchards, mainly along the dunes. Near Haamstede and Renesse it is abundant, but elsewhere it seems to be a very scarce species. The larvae can be found in apple leaves from the last week of June until the first week of July, mainly in old orchards without chemical treatment. R. A. Johansson (pers. comm.) suggested that this species is parthenogenetic in western Europe, as males are only known from eastern Europe. The generic name *Bohemannia* Stainton, 1859, has been wrongly rejected as a junior homonym of *Bohemia*, therefore it must be retained and replace the junior name *Scoliaula* Meyrick, 1895.

#### "*Ectoedemia*" *bradfordi* Emmet, f. n. sp.

Gelderland: Hatert, 21.VI.1931, Lycklama à Nijeholt, 1 ♂ (gen. slide VU 115; wing slide VU 379), coll. ZMA.

This is a very remarkable addition to the Dutch fauna, since this species was only known from the holotype male, which was found in Kent, England (Emmet, 1974). The Dutch specimen was found amongst unidentified specimens in ZMA. The externals and genitalia corre-

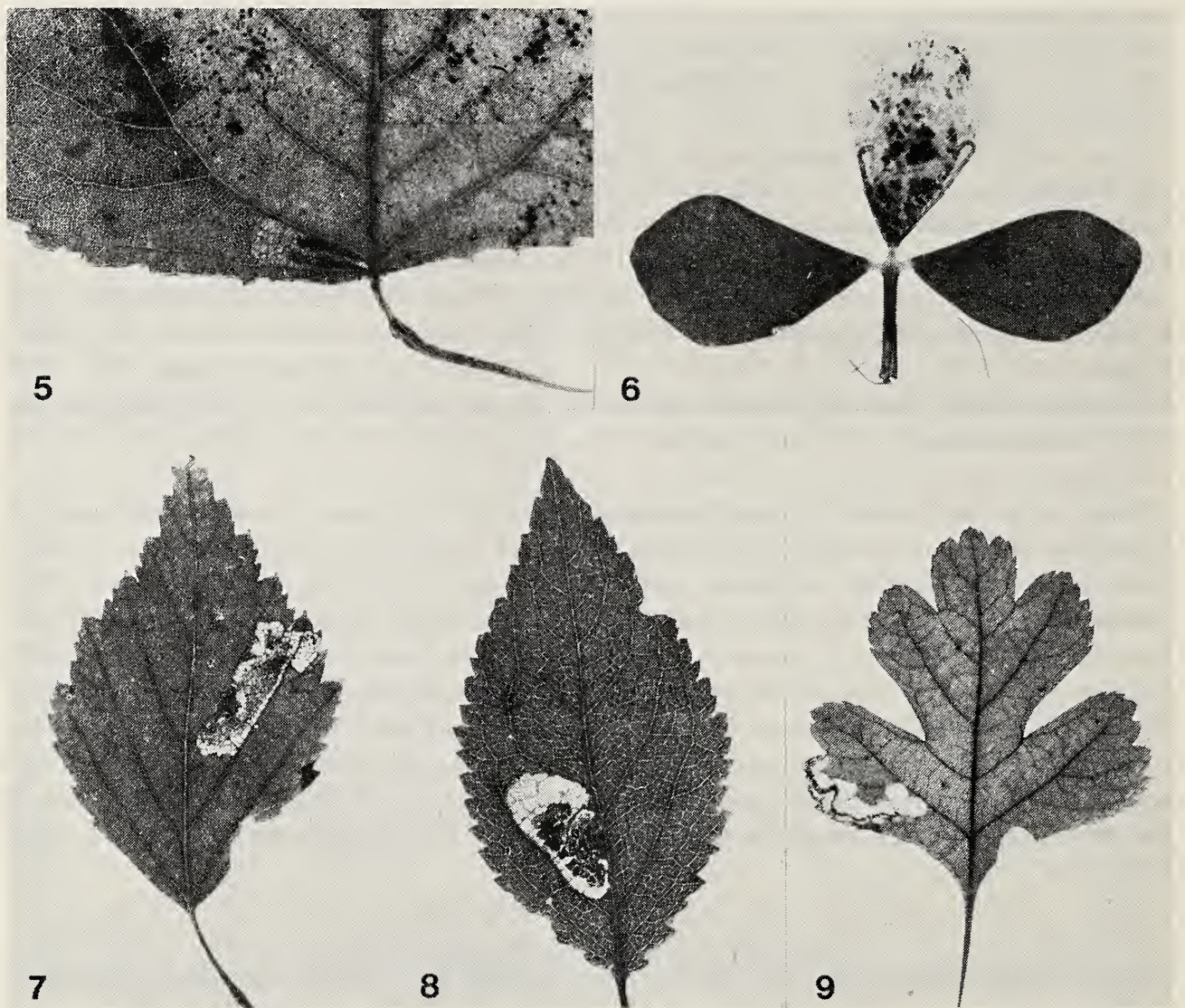
spond with Emmet's description very well. Since only two specimens of this species have so far been found it is unlikely to be a miner in leaves, otherwise it could hardly have escaped attention. The holotype was found on *Sorbus torminalis* Crantz, a tree which does not occur in the Netherlands. Near Hatert there are mainly heaths and woods consisting of *Quercus* and *Betula* with *Sorbus aucuparia* L. as a common undergrowth tree. If *Sorbus* is the foodplant, it is likely to be a shoot, bark or bud-miner, but other foodplants are still possible.

Collectors of Microlepidoptera are asked to look out for Nepticulidae which are beaten or collected at light during the summer months. The systematic position of *E. bradfordi* is still uncertain, but in my opinion it does not belong to *Ectoedemia* in the present sense. It is probably closer to *Bohemannia*, but a definite recombination will be given in a later, revisionary publication.

*Ectoedemia longicaudella* Klimesch, f. n. sp.

Gelderland: Nijmegen, Lycklama à Nijeholt, 14.VII.1926, 1 ♂; 21.VII.1929, 1 ♂; 11.VII.1932, 1 ♂ (ZMA); 11.VII.1932, 1 ♂ (RMNH, coll. Bentinck) (genitalia slides respectively VU 254, 255, 256, 830).

When examining the material under *E. atrifrontella* (Stainton) in the Dutch collections, all male specimens collected in Nijmegen were in fact *E. longicaudella*, a species which was con-



Figs. 5-9. Mines of Nepticulidae. 5. *Ectoedemia hannoverella* (Glitz) on *Populus × canadensis*; 6. *Trifurcula cryptella* (Stainton) on *Lotus corniculatus*; 7. *E. mediofasciella* (Haworth) on *Betula pubescens*; 8. *E. spinosella* (de Joannis) on *Prunus spinosa*; 9. *Stigmella regiella* (Herrich-Schäffer) on *Crataegus laevigata*.

fused with *atrifrontella* until 1953, when Klimesch clarified the situation. Both species are externally very similar, but the thorax is generally brown in *longicaudella* as opposed to the white thorax in *atrifrontella*. The male genitalia are figured by Klimesch (1953). The main differences lie in the longer transtillae of *longicaudella* and its smooth margins on the ventral aedeagal projections as opposed to the serrated margins in *atrifrontella*.

Although *E. longicaudella* has never been bred, it is thought to be a barkminer of deciduous *Quercus* as is *E. atrifrontella*, — it is generally collected in stands of oaks. Nijmegen seems to be the most western locality of *E. longicaudella* which is also known from Hungary, Yugoslavia, Italy, Austria, Poland and Sweden.

*Ectoedemia hannoverella* (Glitz), f. n. sp.

Overijssel: De Lutte, Kribbenbrug, LC 6599/LD 6500; Denekamp, Singraven, LD 6105. Gelderland: Winterswijk, LC 4157, LC 4459, LC 4558, LC 4662. Noord-Brabant: Ulvenhout, FT 2612; Chaamse Bosch, FT 2610. Limburg: Thorn, klooster Bethaniën, FS 9972; Bunde, Bunderbos, FS 9243/9344. Many adults bred from De Lutte, Winterswijk and Bunde. ZMA: Geulle, 9.VII.1977, 1 ♀, G. A. Langohr.

In October 1978 we collected the first Dutch mines of this species in large numbers near Winterswijk. The foodplant is *Populus nigra* L. and its hybrids (*P. canadensis* Moench). As in *E. turbidella* (Zeller) and *E. argyropeza* (Zeller) the larva feeds during the early stages in the petiole and only during the last stage in the lamina (fig. 5). When the leaves discolour, the part around the mine stays green. This makes collecting very easy, as the fallen leaves with the conspicuous green islands can be picked up easily. The adults fly in May and we have reared them outdoors between 15 May and 5 June. Externally *E. hannoverella* is almost indistinguishable from *E. turbidella*, although the females can be separated by the blunt ovipositor as opposed to the pointed ovipositor in *E. turbidella*. The male genitalia are diagnostic, especially in the shape of the valves and the relative length and shape of the projections on the aedeagus (figs. 1-4).

This species seems rather common in the east and the south of the Netherlands, where it was mainly found in the lowland valleys of rivers and streams. Attempts to find the species in the west of our country proved ineffective. Abroad it occurs in central Europe with Denmark as the northern limit and Belgium and France together with Holland form the western limit.

*Ectoedemia intimella* (Zeller)

Overijssel: Ootmarssum, Agelerbroek, LD 5806, larvae 15.X.1980 (2 ♂♂, 4 ♀♀ 8-15.V.1981), Zuid-Holland: Rockanje, Voornes Duin, near Breede Water, ET 7250, larvae 1.XI.1979 (5 ♂♂ 17.VI-4.VII.1980).

This species was first recorded from the Netherlands by Langohr (1977) who captured three specimens in Schinveld (now in ZMA). We collected the larvae on *Salix cinerea* L. in moderately wet marshlands. Although the localities are very far apart, the species is possibly more widespread. It is perhaps overlooked because the larva normally is not visible before the middle of October, for it feeds in the midrib during its early stages. Its main foodplants are *Salix caprea* L. and *S. cinerea*, but it has also been mentioned from several other *Salix* species.

*Ectoedemia mediofasciella* (Haworth), f. n. sp.

Zuid-Holland: Rockanje, Voornes Duin, near Breede Water, ET 7149/7250, 1 larva and mines, 26.IX.1979 (1 ♀, 20-21.V.1980); idem, ET 7250, mines 29.VIII.1981; Oostvoorne, Voornes Duin, ET 7351/7352, 1 larva and mines, 29.VIII.1981; Overijssel: Dalfsen, Hessum, LD 1721, 2 larvae and mines, 12.IX.1981; Ommen, Vilsteren, LD 2120, mines, 12.IX.1980; Den Ham, Eerder Achterbroek, LD 2918, mines, 13.IX.1980; Mariënborg, Beerzerveld, LD 3219, mines, 13.IX.1981.

When collecting mines from *Betula pubescens* Ehrh. in the dune reserve of Voorne I happened to find some vacated mines of this species. Although a little late in the season for this species, I was lucky enough to find one larva in a second spot which produced the above mentioned female. In 1981 during some scattered collecting the species seemed to be not uncommon in moist vegetation of *Betula* both in Voorne and the region of Ommen.

The mines of this species are very characteristic with the contorted gallery widening into a large blotch (fig. 7). However, the adults are hardly separable from *E. argentipedella*, a common species in the Netherlands. The species occurs in northern and central Europe and might be expected throughout the Netherlands, but presumably very scarce, as is the situation in Great-Britain (Emmet, 1976a). The best period to collect the larvae is August.

*Ectoedemia spinosella* (Joannis), f. n. sp.

Limburg: Gulpen, GS 0333, 10.IX.1979, larvae (7 ♂♂, 7 ♀♀, 7-20.VI.1980), 2.IX.1981, few larvae; Wijlre, Wrakelberg, GS 0437, 12.IX.1979, larvae (1 ♂, 2 ♀♀, 11-30.VI.1980); Wijlre, Stokhem, GS 0235, 9.X.1979, larvae (2 ♀♀, 25.V-4.VI.1980); 2.IX.1981, 50 larvae.

This species had been found during field work in the southern part of Limburg. *E. spinosella* lives here on *Prunus spinosa* L. shrub, mainly growing on southern chalk slopes. In one locality it occurred together with the common *Stigmella plagicolella* (Stainton) and the rare *S. prunetorum* (Stainton). The species seems to be confined to warm places as we failed to find it in other localities where *P. spinosa* was abundant. The mine is depicted in fig. 8. It is likely that Limburg is the northern limit of its distribution. *E. spinosella* is also known from southern England, France, Austria and Italy. The larvae can be found from the end of July until October, but the most favourable period is the end of August and the first week of September.

*Ectoedemia arcuatella* (Herrich-Schäffer), f. n. sp.

Limburg: Wijlre, Stokhem, GS 0235, 2.IX.1981, 14 larvae.

The larvae of this species were found for the first time, a few meters from one of the localities of the previous species. It was feeding here on *Fragaria vesca* L. growing in a thicket of *Corylus avellana* L., *Cornus sanguinea* L., *Rhamnus catharticus* L., and *Clematis vitalba* L. next to a chalk grassland. Although the adults will not emerge before June 1982, the identification of this species is certain for there is only one blotch mine-making nepticulid on *Fragaria*. Because of its distribution and ecology *E. arcuatella* was expected to occur in Limburg. Borkowski recently (1975) considered this species and *E. rubivora* (Wocke) as two forms of the same species for reasons which are unclear. Both species differ in many aspects as Emmet (1973) had already shown.

*Trifurcula cryptella* (Stainton), f. n. sp.

Limburg: Kunrade, Kunderberg, GS 0839, 7 larvae, 5.IX and 8.X.1979 (1 ♂, 2 ♀♀, 23.V-9.VI.1980); idem, GS 0739, larvae, 14.VII.1980 (7 ♂♂, 12 ♀♀, 11-27.IV.1981); Sibbe, Gerendal, GS 0035, larvae, 15.VII.1980 (5 ♀♀, 14-22.IV.1981); Maastricht, St. Pietersberg, S. part, FS 8833, 3 mines, 16.VII.1981.

This species has been collected in calcareous grasslands, but only where the vegetation was comparatively high and dense. The vegetation consisted mainly of *Brachypodium pinnatum* (L.) P.B., *Arrhenatherum elatius* (L.) P.B. ex J. et C. Presl., *Origanum vulgare* L., *Centaurea scabiosa* L., *Agrimonia eupatoria* L., *Sanquisorba minor* Scop., *Leontodon hispidus* L. and the foodplant *Lotus corniculatus* L. In the grassland reserves nearby we searched in vain for the larvae. *T. cryptella* seems to prefer the taller vegetation, possibly because it induces *Lotus* to make larger leaves, or simply because it likes shadow. Emmet (1976a) reports a preference for a woodland biotope. The mine is figured in fig. 6. As in Great Britain, this species turns out to be univoltine — as July larvae produce adults the following year. The few larvae I collected in

September and October could be the offspring of a small second generation. The adults are presumably on the wing during May and June. Our specimens which emerged in April were brought indoors on the second of that month. In spite of extensive attempts we failed to find the species outside Limburg. This species could have been expected to occur in the Netherlands, because of its wide distribution in Europe.

*Stigmella aeneofasciella* (Herrich-Schäffer), f. n. sp.

Limburg: Kunrade, Kunderberg, GS 0739/0839, larvae, 8.X.1979, 14.VII.1980, 23.VI.1981; Bemelen, Bemelerberg, FS 9437, larvae 9.X.1979; Cadier & Keer, Schiepersberg, FS 9534/9535, larvae, 11.X.1979, 11.VI.1981; Maastricht, St. Pietersberg, S. part, FS 8833, larvae, 16.VII.1981. More than 50 adults bred from all localities.

The mines of this species appeared to be abundant on *Agrimonia eupatoria* in similar habitats to *T. cryptella*. It often occurs on the same plants as *Stigmella aurella* (Fabricius) (= *S. nitens* (Fologne)), which is much more widespread. The identification of the mines is not difficult because *S. aeneofasciella* makes a blotch in contrast with the linear mine of *S. cf aurella*. The mine of *S. aeneofasciella* could be confused with that of *Ectoedemia agrimoniae* (Frey), a species not yet recorded from the Netherlands, but the latter usually pupates inside the mine. The adult is very characteristic, having on the forewing a broad brassy, subbasal, fascia and a second, golden, postmedial, fascia. There are two or three, partly overlapping generations. The species has a wide distribution throughout Europe.

*Stigmella cf poterii* (Stainton)?, f. n. sp.

Limburg: Wijlre, Wrakelberg, GS 0437, 12.IX.1979, 7 larvae on *Sanguisorba minor*; Kunrade, Kunderberg, GS 0739, 8.X.1979, 2 mines on *S. minor*.

In 1979 we collected several larvae on chalk grassland, which could belong to this species, but we failed to rear adults. As also other species might occur on *Sanguisorba minor*, the species cannot be added with certainty to the Dutch list, although the mines correspond with the existing descriptions (Hering, 1957; Emmet, 1976a) very well. Recently several authors (Borkowski, 1975; Karsholt & Nielsen, 1976) have synonymised this species with the *Potentilla* feeding *S. comari* (Wocke), *S. occultella* (Heinemann), *S. serella* (Stainton) and some other species. Although these species seem to have similar genitalia, I am rather hesitant to accept the synonymy of *S. poterii* with this group, because of their very different habitats: *S. poterii* lives in hot, dry, grasslands, and the others mainly in marshy areas. The synonymy of *S. comari*, *S. occultella*, *S. serella* and possibly also *S. tengstroemi* (Nolcken) and *S. diffinis* (Wocke) however, seems justified. Experimental research, including rearing and biochemical methods, is needed for clarifying the status of these forms. *S. poterii* is only known with certainty from England.

*Stigmella speciosa* (Frey)

In RMNH: Rotterdam, Snellen, 27.V.1877, 1 ♀; 21.VI.1877, 1 ♀; 21.VII.1879, 1 ♀; 28.VI.1901, 1 ♂. Mines from the following localities: Gelderland: Hulshorst, near station, FU 8403; Noord-Holland: Ankeveen, Spiegelpolder, FT 4094; Zuid-Holland: Wassenaar, Meijendel, ET 9377, Oostvoorne, dunes, ET 7552/7351; Noord-Brabant: Ulvenhoutse Bosch, FT 2313; Chaamse Bosch, FT 2709; Limburg: Thorn, Bethaniënklooster, FS 9972; Valkenburg, FS 9938; Oud-Valkenburg, Schaelsberg, GS 0038; Sibbe, Biebos, FS 9937; Kunrade, Kunderberg, GS 0739. Only 3 ♂♂ bred from Limburg.

Although this species was included by Lempke (1976) on the basis of van Frankenhuyzen & Houtman (1972), no localities have been published previously. Nevertheless, the species was already known by Snellen (1882), but he misidentified it as *S. aceris* (Frey). His description

entirely fits *S. speciosa*, and he also found it on *Acer pseudoplatanus* L., the usual foodplant, whereas *S. aceris* feeds on *Acer campestre* L.

*S. speciosa* seems to be widespread in the Netherlands, but generally scarce except in Limburg. The life cycle is not very clearly demarcated into generations as larvae can be found over a long period (June-November), without clear peaks. Emmet (1976a) regards it as mainly univoltine with a small proportion of adults emerging in August. We also reared one male adult in August.

*Stigmella svenssoni* (Johansson), f. n. sp.

Gelderland: Hulshorst; 27.VI.1944, L. Vári, 1 ♀ (ZMA, gen. slide V.924).

Since Johansson (1971) showed clearly that what had been called *S. ruficapitella* (Haworth) in reality consisted of at least four species, the occurrence of some of these species in the Netherlands might well be expected. Gielis & Hull (1975) recorded *S. roborella* (Johansson) for the first time, which according to our experience is by far the commonest species of this group. *S. ruficapitella* sensu stricto is much less common, but *S. svenssoni* had not been found until it was discovered when checking the specimens under *S. viscerella* (Stainton) in the Amsterdam collection. Also outside the Netherlands this species seems to be scarce, and has only been recorded from Sweden, England, Italy and Hungary, Emmet (1976b) imputes its apparent scarcity to an unusual life cycle, which is possibly univoltine, with the majority of larvae feeding in August. We hope that further collecting during that month will yield more specimens of *S. svenssoni* from the Netherlands.

*Stigmella regiella* (Herrich-Schäffer)

Overijssel: Oldenzaal, Tankenberg, LC 6098/6099; Denekamp, near Kampbrug, LD 6502; Gelderland: Winterswijk, LC 5060, LC 4157, LC 4257, LC 4859; Limburg: Oud-Valkenburg, Schaelsberg GS 0038/0138, Sibbe, Biebos, FS 9937; Sibbe, Gerendal, GS 0035; Kunrade, Kunderberg, GS 0739; Epen, Bovenste Bosch, GS 0426; Epen, Heimansgroeve, GS 0627; Cadier & Keer, Schiepersberg, FS 9534/9634; St. Geertruid, Eijsderbosch, FS 9430; Rijckholt, Rijckholterbosch, FS 9331. Adults bred from Winterswijk, Sibbe, Cadier, Oldenzaal, Denekamp.

This species which had been previously only mentioned once from a single mine near Epen (Vári, 1944) is in fact rather common in the eastern and southern part of the Netherlands. It could be found mainly on *Crataegus laevigata* (Poir.) DC. and *C. monogyna* Jacq. growing in woods. In hedges and other open habitats it is apparently much less common. From the western part of the Netherlands we have no certain records, although we have a couple of mines which could be credited with this species. In some cases it is very difficult to distinguish the mine from that of *S. hybnerella* (Hübner), a very common species. Fresh mines, however, are generally easy to recognise by the reddish frass and the gallery which follows the leaf margin (fig. 9). We also found the species in Belgium, Comblain-au-Pont, Roches Noires, on 10.X.1979 (adults in VI.1980). Lhomme (1963) does not mention the species, so possibly it is a new record for Belgium. Emmet (1976a) states that the species is univoltine, but in Holland it is, at least partly, bivoltine. We have collected the larvae as early as June 16th and in July, which gave rise to adults in July and August.

*Stigmella crataegella* Klimesch, f. n. sp.

Limburg: Wijlre, Stokhem, GS 0235, mines, 10.IX.1979; Kunrade, Kunderberg, GS 0739, mines, 10.IX.1979; 6 larvae, 14.VII.1980 (1 ♀, 10.IV.1981); Sibbe, Gerendal, GS 0035, larvae 15.VII.1980 and 16.VII.1981; Cadier & Keer, Schiepersberg, FS 9534/9634, 7 larvae, 15.VII.1980 (2 ♂♂, 2 ♀♀, 8-13.IV.1981); Maastricht, St. Pietersberg, FS 8833, mines, 2.IX.1981.

This is the sixth species which seems to be restricted to the chalkhills of Limburg. It has been



Fig. 10. Mine of *Stigmella crataegella* Klimesch on *Crataegus monogyna*.

found mainly in open sunny places, where it feeds on *Crataegus monogyna*. Vacated mines (fig. 10) are difficult to distinguish from those of *S. perpygmaeella* (Doubleday), but tenanted mines do not give problems as the larva is bright green opposed to the yellow larva of *S. perpygmaeella*. *S. crataegella* is univoltine and feeds usually in the first half of July. In 1980 many larvae were feeding on 15th July, but in 1981 only one larva could be found on the same date in the same localities. Although we have collected widely on *Crataegus* we have never found this species outside Limburg. *S. crataegella* is common in the British Isles, France (Léauté, 1977), Austria, Hungary, Italy and southern Sweden.

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Postbus 7161, 1007 MC Amsterdam.

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THE PESTS OF CROPS IN INDONESIA, by L. G. E. Kalshoven revised by P. A. van der Laan with cooperation of G. H. L. Rothschild, 1981. XIX + 701 pp, 16 colorplates, 493 black/white illustrations, Hostplant/pestindex 13 pp. General index 49 pp. P. T. Ichtiar-van Hoeve, Jalan Majapahit 6 Jakarta, Indonesia/Elsevier, Amsterdam. Distributed by Van Tongeren, P.O. Box 8111, 1005 AC, Amsterdam. Price (bound) U.S. \$ 65.00; Dutch Fl. 160.00.

Much applied entomological research was conducted during the colonial period in Indonesia. The results obtained were mainly published in various Dutch reports and journals. In this period chemical control was still in its infancy. The research efforts were therefore largely concentrated on the identification and description of pests, the type of damage, population development and epidemiology, hostplants, parasitoids and predators.

Insect control was mainly based on cultural methods and where possible on the introduction of parasitoids and predators. Thanks to efforts of the late Dr. L. G. E. Kalshoven all the available information was compiled in one single publication: „De plagen van de cultuur-gewassen in Indonesië” issued in Dutch in 1950/51. Soon it was obvious that the information contained in this book would have to be made available to a much wider public and especially to the present and future generations of Indonesian entomologists.

However, it was not until a capable editor was found and funds became available that an English version could be prepared. It was a wise decision not to prepare a mere translation of Kalshoven's book, but to revise the text critically, to omit what is at present no longer relevant and to add new data available, notwithstanding the work involved.

In the present revision the text was reduced from 1065 to 701 pp., more than half of the original illustrations have been maintained, whereas 114 new figures were added. Additional information a.o. includes recent data on plant and leaf hoppers in rice and on lepidopterous stemborers. The bibliography consists of 305 references of which about 50% refers to literature after 1950. An extensive pest/hostplant and general index facilitates the use of this book. Details of control measures are not given as these are constantly subject to revision. Although the original text had to be revised to a considerable degree the character of Kalshoven's work was preserved. The number of printing errors is minimal, the publication of this book is well presented. The present revision can be considered as very successful and will remain a sound basis for applied entomological research in Indonesia and South East Asia for years to come. Thanks to the efforts of the editor, this book is available at a reasonable price. — G. G. M. Schulten