

TAXONOMY AND DISTRIBUTION OF *TRIFURCULA*  
*SQUAMATELLA* STAINTON SP. REV., A SENIOR  
 SYNONYM OF *T. MAXIMA* KLIMESCH (LEPIDOPTERA:  
 NEPTICULIDAE)

ERIK J. VAN NIEUKERKEN

Rijksmuseum van Natuurlijke Historie, P.O. Box 9517, 2300 RA  
 Leiden, The Netherlands

In the northern half of Europe, including the British Isles, most authors recognize only two larger, uniformly coloured species of *Trifurcula* (subgenus *Trifurcula* Zeller). The rarer of the two species, *T. beirnei* Puplesis, was previously misidentified as *T. pallidella* Zeller (Van Nieuwerkerken & Johansson, 1987). The other one is the common *T. immundella* (Zeller, 1839), which is associated with Broom (*Cytisus scoparius* (L.) Link), in which the larva makes barkmines (cf. Emmet, 1976). Stainton (1849) described a third species from Britain, *T. squamatella*, which has been regarded as a synonym of *T. immundella* by all later authors, probably because Stainton (1854) himself wrote that "perhaps it is only a variety" [of *immundella*].

On the Continent, Klimesch (1953) discovered a new species amongst *immundella* specimens from southern Germany: *T. maxima* Klimesch. This species was subsequently recorded only from Jutland in Denmark (Pallesen & Palm, 1975; 1977; Buhl *et al.*, 1984) and The Netherlands (Huisman *et al.*, 1986). More material of this species was found by me in several collections, hidden under *T. immundella*. In 1986 I discovered to my surprise that the specimens under *squamatella* in the Stainton collection (BMNH) actually belong to the same species and not to *immundella*.

It will be shown here that *Trifurcula squamatella* Stainton is the correct name for this species. It is redescribed, the female genitalia are described for the first time and notes on distribution and biology are given. It is also recorded for the first time from France.

For notes on taxonomy and phylogeny of the genus and family, the reader is referred to Van Nieuwerkerken (1986b).

Abbreviations of depositories:

BMNH British Museum (Natural History), London, U.K.

LNK Landessammlungen für Naturkunde, Karlsruhe, West Germany

MNHN Muséum national d'Histoire naturelle, Paris, France

NHMA Naturhistorisk Museum, Århus, Denmark

NMW Naturhistorisches Museum, Vienna, Austria

RMNH Rijksmuseum van Natuurlijke Historie, Leiden, Netherlands

- ZMA Zoologisch Museum, Amsterdam, Netherlands  
(Instituut voor Taxonomische Zoölogie)  
ZMUC Zoologisk Museum, University of Copenhagen,  
Denmark

*Trifurcula squamatella* Stainton, 1849 sp. rev.

(Figs 1–11)

*Trifurcula squamatella* Stainton, 1849: 30. 2 syntypes, ENGLAND: London area; Bristol (*Sircom*, *Bedell*) (probably lost) [not examined].

*Trifurcula squamatella* Stainton; Stainton, 1854: 307.

*Trifurcula immundella* var. *squamatella* Stainton; Tutt, 1899: 355.

*Trifurcula maxima* Klimesch, 1953: 167–168, figs 13, 14. LECTO-TYPE ♂, GERMANY: Nürnberg, 23.viii (genitalia slide no. 6321 NMW), here designated [examined]. *Syn. n.*

*Trifurcula maxima* Klimesch; Pallesen & Palm, 1975: 77; 1977: 14; Buhl *et al.*, 1984: 3; Van Nieuwerkerken, 1986a: 16; Huisman *et al.*, 1986: 138.

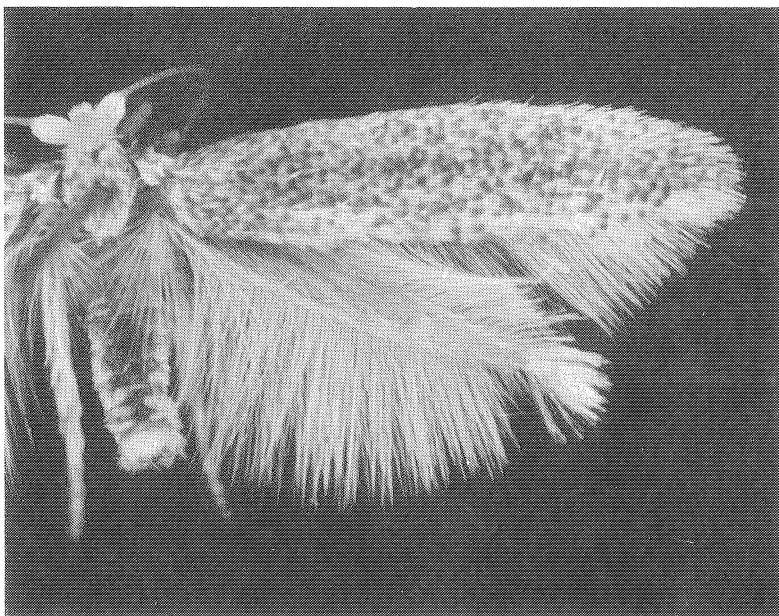
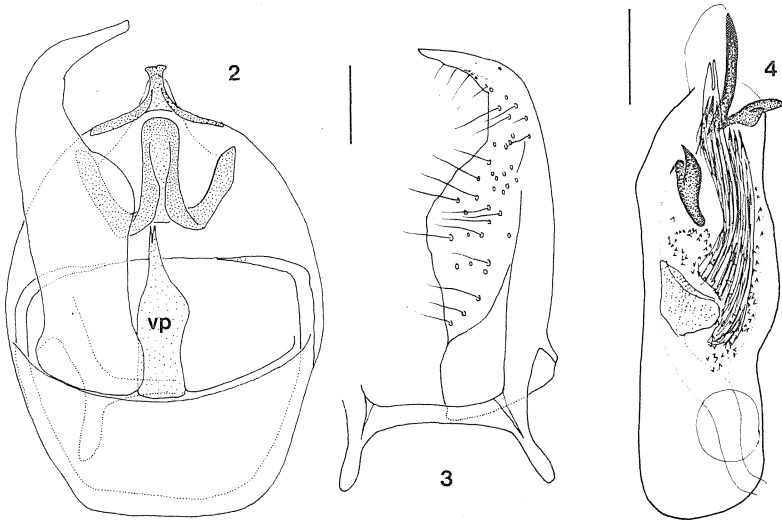


Fig. 1. *Trifurcula squamatella* Stainton, ♂, Netherlands, Best, 18.viii.1984.

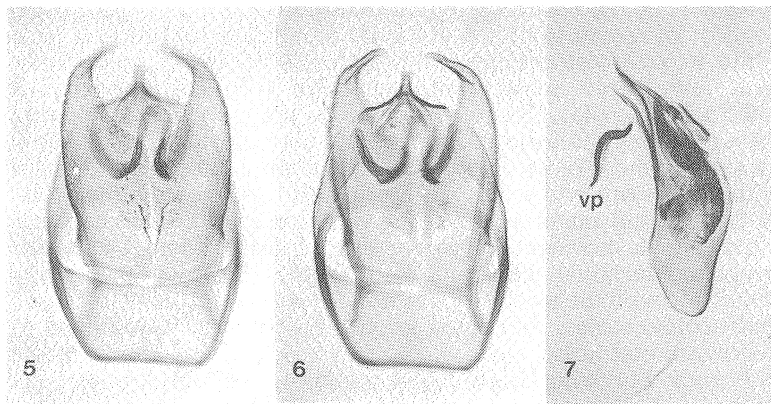
**Description**

*Male* (Fig. 1). Forewing length (3.00) 3.6–4.6 mm ( $4.13 \pm 0.29$ ,  $n=47$ ), wingspan (6.6) 7.8–9.8 mm. Head: frontal tuft yellowish white to yellowish orange, collar paler; scape white, sometimes with few brown scales; antennae with (42) 46–55 segments ( $50.5 \pm 2.7$ ,  $n=45$ ). Thorax concolorous with forewing. Forewing rather narrow, uniform greyish brown irrorate, this colour being formed by three types of scales: white (almost transparent), scales with yellow tips and scales with brownish tips; these colours tend to fade in old material; forewing often paler along dorsum and costa, which increases the impression of narrow wings; cilia-line irregular, terminal cilia yellowish white. Hindwing pale grey, underside with the usual (for *Trifurcula*) velvet-like patch of raised androconial scales. Abdomen greyish brown, with three pairs of yellowish anal tufts.

*Female*. Forewing length 3.8–4.6 mm ( $4.18 \pm 0.26$ ,  $n=6$ ), wingspan 8.4–10.0 mm. Antennae with 42–49 ( $46.8 \pm 2.5$ ,  $n=6$ ) segments. Further as male.



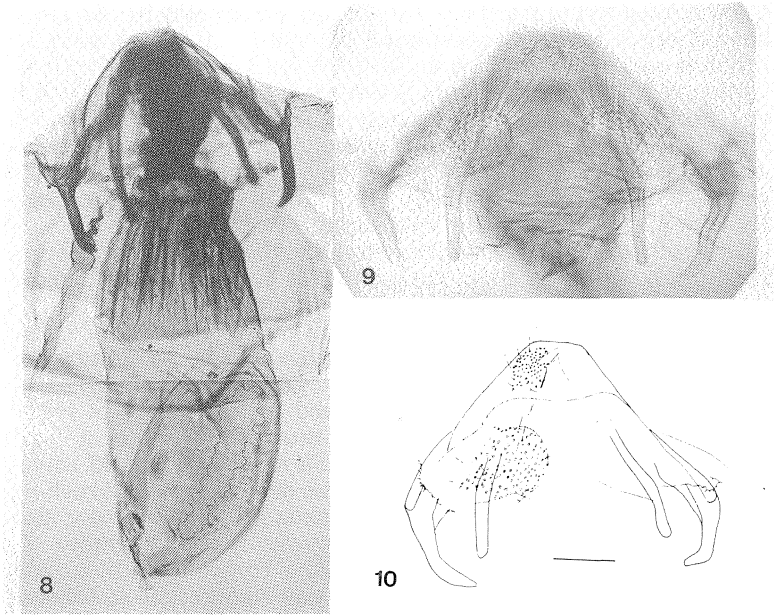
Figs 2–4. Male genitalia of *Trifurcula squamatella*, slide EJvN 2503, Netherlands, Best. 2, ventral aspect, aedeagus and right valva not shown, vp = ventral process; 3, valva, dorsal aspect; 4, aedeagus, ventral aspect. Scales 0.1 mm, 2 and 3 on same scale.



Figs 5–7. Male genitalia of *Trifurcula squamatella*, slide EJvN 1966, France, St. Cécile. 5, 6, ventral aspect, with different focusing; 7, aedeagus, lateral aspect, vp = ventral process.

*Male genitalia* (Figs 2–7). Comparatively large, capsule length 540–600  $\mu\text{m}$ . Vinculum with short, anteriorly rounded ventral plate. Tegumen a triangular pseuduncus. Uncus with medial projection terminally widened and bilobed. Gnathos very large, with wide, terminally rounded central element, lateral arms without anterior processes. Valva long, inner margin sinuate; terminally ending in long narrow, inwardly curved tip; transtilla with straight transverse bar. Aedeagus 460–570  $\mu\text{m}$  long, with single ventral, medial carina, with bifurcate tip, fused by ventral process to vinculum; vesica with two groups of long needle-like cornuti at right side, many small denticulate cornuti and three large cornuti: one long and straight, another long and curved and the third short and curved, with large base.

*Female genitalia* (Figs 8–10). Bursa copulatrix short, exceeding segment 7 with half its length; covered with minute spines and pair of indistinct narrow reticulate signa (length 270–400  $\mu\text{m}$ ), often with incomplete cells. Ductus spermathecae with 3 convolutions. T8 laterally swollen, with a group of more than 100 long setae on either side, few scales laterally. Anterior apophyses short, slightly curved; posterior apophyses short and straight, reaching less far anteriorly than anterior apophyses. Anal papillae each with approximately 60 setae. The hairy terminalia are easily visible without dissection.



Figs 8–10. Female genitalia of *Trifurcula squamatella*. 8, ventral aspect, slide BMNH 24105, France, Ondres, one signum outlined; 9, dorsal aspect of terminalia, slide BMNH 24088, England, Charlton; 10, dorsal aspect of terminalia, slide EJvN 2588, Netherlands, Best. Scale 0.1 mm.

### Remarks

Stainton described the species from two specimens, respectively collected by Sircom and Bedell, without any locality specified. Sircom's specimen came from Bristol (Tutt, 1899) and Bedell's most likely from the London area. The collections of both seem to be lost after auctioning, and the types of *squamatella*, which could not be found in BMNH, are therefore probably also lost. The identity of *squamatella* is based on the only three subsequent specimens identified as such by Stainton, in the Stainton collection (BMNH), and Stainton's (1854) second description, which is more detailed than the first. The specimens are conspecific with the lectotype of *T. maxima*, and not with *immundella*. We may assume that Stainton had compared his specimens with the types, or at least remembered the differences with *immundella*. He further never mixed the two species: all his *immundella* are real *immundella*. We must therefore conclude that Stainton was very well able to separate these two species, which have since then been mixed

for more than a century. The rarity of the species may be the cause that nobody afterwards questioned the synonymy of *squamatella* with *immundella*. According to Tutt (1899), Bankes confirmed the synonymy after examination of Staintons "type-specimens", which were probably the Charlton specimens from Stainton's collection. Tutt (1899) also mentioned two subsequent records of *squamatella*: Scarborough (*Wilkinson*) and Brandon, 20.vii.1878 (*Bowler*). Both must tentatively be regarded as doubtful, especially Bower's, because of the early date.

Klimesch described *T. maxima* on the basis of one male and one female. The male is here designated as lectotype, the female apparently is a misidentified female of *T. immundella*.

*T. squamatella* can usually be distinguished from *immundella* by its on average larger size, narrower wings and larger number of antennal segments (in *immundella* male: 35–43, female: 31–40). Further the forewing colour is composed of three types of scales versus two in *immundella* (white and brown) and the costa and dorsum are usually paler. In *squamatella* males the curved valval tips and often the gnathos as well can be seen simply by brushing away some scales, and the hairy terminalia in the female are also conspicuous. In the genitalia *squamatella* resembles more *T. beirnei*, which has much broader wings, a truncate gnathos, and less hairy terminalia in the female (see Van Nieuwerkerken & Johanson, 1987). The very different male genitalia of *T. immundella* are illustrated by Beirne (1945) and Klimesch (1953). The female genitalia of *immundella* differ from *squamatella* by the much longer bursa, the longer distinct signa and the terminalia with few setae only.

*T. squamatella* is very closely related to *T. beirnei*, of which it probably is the sister-species.

### Biology

The immature stages are unknown, but the host-plant almost certainly is *Cytisus scoparius* (L.) Link (= *Sarothamnus scoparius*), on which most of the specimens have been found. In the Dutch locality Best, the males were found in August and September, flying actively just before sunset only. They were mostly seen on warm evenings, usually together with *T. immundella*, but *squamatella* seemed to prefer the highest bushes of broom, whereas *immundella* was more often seen flying over the lower plants. Only one female was caught here by H. W. van der Wolf, probably sitting on the plant (Van der Wolf, pers. comm.). Since only six females are known now, I suspect that the female does not fly frequently. Throughout the area of *squamatella*, adults have been caught in August and September only.

After the discovery of this species in Holland, I made monthly visits to the locality Best during one year in order to find the larva, but despite thorough examination of all parts of Broom I failed to

do so. Probably *T. squamatella* does not make stem mines similar to those of *immundella*, but feeds somewhere inside the plant so that it is less visible. It is very well possible that its life-style resembles the unknown biology of *T. beirnei*, which feeds on *Genista* (Van Nieuwerkerken & Johansson, 1987).

**Distribution (Fig. 11)**

With certainty known from Denmark (Jutland), southern England, southern half of The Netherlands, southern West Germany and three widely separated localities in France (first record from France). To be expected in Belgium, East Germany

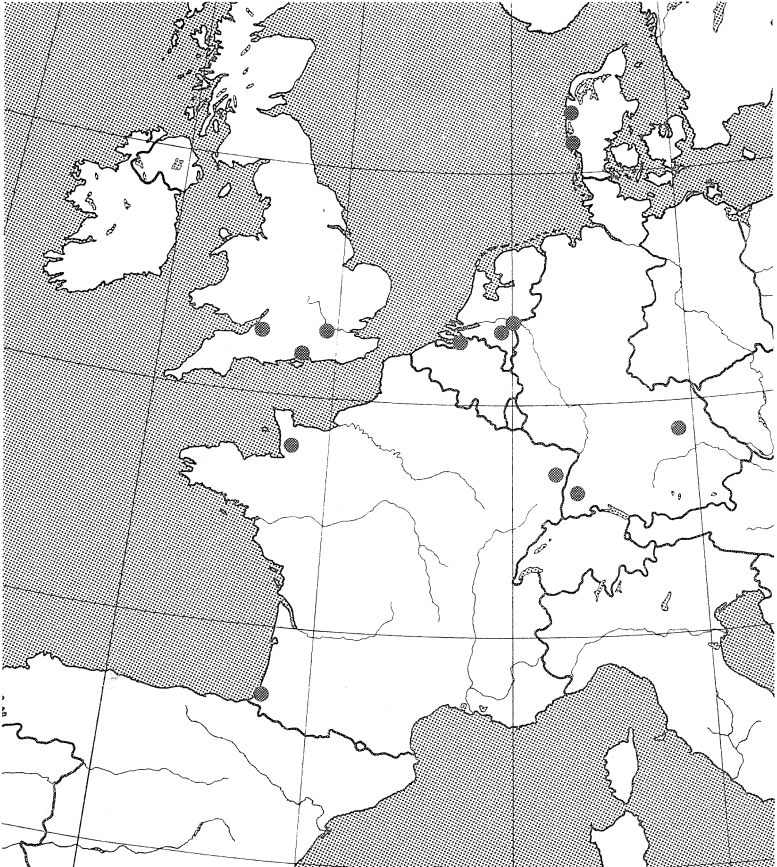


Fig. 11. Distribution of *Trifurcula squamatella* Stainton.

and northern Spain. The locality Wolfsbrunnen in Baden could not be located exactly, since there are three localities with that name (Kaltenbach, *in litt.*).

### Material examined

*Trifurcula squamatella* (55 ♂, 6 ♀): **Denmark:** 2 ♂, Blåvand [W. of Esbjerg], Jylland, 2.viii.1973 (*Karsholt*) (ZMUC, coll. Johansson); 1 ♂, 1 ♀, Blåvand, 18.viii.1973 (*Jelnes*) (ZMUC); 1 ♂, Ulfborg, WJ, 9–12.viii.1983 (*Karsholt*) (ZMUC); 1 ♂, 1 ♀, Vind [near Ulfborg], 11, 13.viii.1980 (*Holst*) (NHMA). **England:** 1 ♂, Charlton [London], "Broom", 9.viii.1849, no. 4137 (*Stainton*) (BMNH); 1 ♂, 1 ♀, same data, but 20.viii.1849, nos 4328 + 4329 (BMNH). **France:** 1 ♀, Ondres, Landes, 22.ix.1938 (*Adkin*) (BMNH); 2 ♂, Ste Cécile [near Villedieu-les-Poêles], Manche, 7 and 9.ix.1910 (*Le Marchand*) (MNHN); 1 ♂, St. Nabor [N. of Barr], Vosges, 13.viii.1934 (*Le Marchand*) (MNHN). **Netherlands:** 1 ♂, Bergen op Zoom, 11.viii.1982 (*Asselbergs*) (Coll. Asselbergs); Best, industrial area, following data: 1 ♂, 1.viii.1976; 1 ♂, 13.viii.1977; 2 ♂, 18.viii.1984; 32 ♂, 1 ♀, 13.viii–12.ix.1985 (*Gielis, Van Nieukerken, Van der Wolf*) (BMNH, RMNH, ZMA, colls Gielis, Johansson, Klimesch, Van Nieukerken, Svensson, Van der Wolf); 1 ♀, Nijmegen Z., 4.ix.1929 (*Lycklama à Nijeholt*) (ZMA). **West Germany:** 3 ♂ (excluding lectotype of *maxima*), Nürnberg, 21, 23 and 29.viii (LNK, MNW); 2 ♂, St. Peter [Schwarzwald], 14.viii.1891 (*Reutti*) (LNK); 1 ♂, Wolfsbr[unnen] [Baden] (*Reutti*) (LNK); 1 ♂, locality unknown [round label, purple], 14.ix.1890 (*Reutti*) (LNK).

Additional record: **England:** 1 specimen, Southampton, 20.viii.1935 (*Fassnidge*) (A. M. Emmet, *in litt.*).

*T. immundella* (misidentified paralectotype of *maxima*): 1 ♀, **West Germany:** Dürkheim, 13.vii.1890 (NMW).

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