

**Some remarks on the Synonymy of  
the Fagus feeding Nepticulae  
(*Nepticulidae*, *Lepidoptera*).**

By

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The reestablishment of the old Staintonian species *tityrella* and *fulgens* by B. P. Beirne in "The Proceedings of the Royal Irish Academy", vol. 50 sect. B. no. 9, 1945 inspired the author to set on foot an investigation of the species of the biological group of Fagus feeding Nepticulae in continental Europe. The results of this work made it obvious, however, that a closer investigation of the rights of the established species was urgent.

On the following pages a contribution to such an investigation will be given.

According to the newest literature the following species are reported to spend their larval stage mining the leaves of *Fagus silvatica* L.:

1. *Nepticula basalella* H. S.
2.     "     *turicella* H. S.
3.     "     *hemargyrella* Zell.
4.     "     *tityrella* Stt.
5.     "     *fulgens* Stt.
6.     "     *brunensis* Skala.

1. ***Nepticula basalella* H. S.**

Established by Herrich-Schäffer in "Systematische Bearbeitung der Schmetterlinge von Europa", 1843—56, Regensburg, Bd. 5. Pag. 354, Nr. 1113.

## The original description in extenso:

1114. Alis anterioribus orichalceofuscis, basin versus pallidionibus, fascia longe pone medium lata argentea, media constricta, capite albo-lutea piloso, antennis subferrugineis.

Grösser und mit längeren schmaleren Flügeln als die bis jetzt beschriebenen Arten, nussbraun, fast ohne Metallglanz, die Wurzelhälfte lichter bronzefarbig. Die breite Silberbinde hinter der Mitte, am Innenrande weiter von der Wurzel entfernt, in der Mitte eingeschnürt, die Franzen deutlich doppelt, ihre Wurzelhälfte mit groben braunen Schuppen, die Hinterflügel an der Wurzel ihres Vorderrandes mit einem Pinsel langer grober schwarzer Schuppen. Der Kopf überall weisshaarig, die Fühler und Beine bleich rostbraun."

This species is a good and well defined one, and all specimens examined are in accordance with Herrich-Schäffers description.

To the original description must be added, that the tuft of black scales on the costal base of the hind-wing is only present in the male.

The male genitalia, which have never been pictured before, resemble very much the genitalia of *Nepticula atricapitella* Hw. and *N. ruficapitella* Hw. (fig. 1), while the female genitalia are quite different from those of the said two species, agreeing in the structure of bursa rather closely with that of *N. turicella* H. S., but differing from the genitalia of this species in the length of the apodemes and in the shape of the tip of the abdomen (fig. 2 and 3). The bursa in the two species has no visible signum but is all over covered with scattered crescent-shaped rows of very tiny dentated flat cornuti (fig. 4 and 5).

As regards the mine, the ovum is placed near to the margin of the leaf. The preliminary part of the mine is very contorted and nearly quite packed with black excrements, while the last  $\frac{2}{3}$  of the mine is rather broad with only a few windings, a more straight course and greyish-green excrements deposited in curved cross-

lines. The most prominent feature of the mine is, that its subterminal part invariably is directed towards the main rib.

From Mr. S. N. A. Jacobs in Bromley the author has got some very strangely slender and oddly placed *basalella*-mines, but no difference between English and continental imagines could be pointed out.

*Nepticula basalella* H. S. is as far as the author knows a very common species all over Europe, where *Fagus silvatica* grows, on which plant it is monophagous.

In Denmark the imago occurs very common on the trunks of *Fagus* from the last week of April, a very peculiar fact, as it is about a fortnight before its food plant will be in leaf. The imagines of the spring-generation are found to the end of May; and the first generation of the larvae is mining from the end of the first week of June to about the first week of August; while the second generation of the larvae has only been noticed in the first three weeks of October. To judge from this it is possible, that more than one generation is mining in the summer. The exact time of the occurrence of imagines in the summer has not yet been stated, due to the fact, that they are exceedingly difficult to obtain in the open, because in these months they never rest on the trunks, as they do in the spring-generation, and as net-catching is quite or nearly quite resultless.

## 2. *Nepticula turicella* H. S.

Established by Herrich-Schäffer l. c. pag. 355.

The original description:

“Etwas kleiner, resp. mit kürzeren Flügeln als *Hübnerella*, das Gelb des Kopfes matter, die Augendeckel nicht so glänzend weiss, daher beide nicht so von einander abstechend. Die Vorderflügel an der Wurzelhälfte bleich messinggelb, deshalb das weisse Band nicht so deutlich, es scheint mehr gegen den Afterwinkel gerichtet. Die Flügelspitze erzfarbig olivenbraun, ohne Violett, die Franzen um die Spitze herum ihrer Länge nach weisslich.”

Zeller in H. v. Heinemann: "Die Schmetterlinge Deutschlands und der Schweiz", 2. Abt. 2, pag. 753, improves the description in saying:

"Vorderflügel bis zur Mitte graulich olivenbraun, dahinter violettbraun, mit einer schrägen weisslichen seidenglänzenden Binde hinter der Mitte und an der Spitze lichtgrauen Franzen, Kopfhaare blass ockergelb, Nackenschöpfe und Augendeckel weisslich. 2—2½ L." (4,3—5,5 mm.).

To this Zeller adds:

"Die Vorderflügel unrein olivenbraun, selten schwärzlich oder, bei ♀, ins Gelbe ziehend, sehr schwach glänzend. . . . Die Binde . . . matt glänzend weiss, sie wird vorn von einem schmalen, wurzelwärts nicht scharf begrenzten violettbraunen Bande begrenzt. . . .".

All specimens examined agree with Zellers description.

The disagreement between Herrich-Schäffer and Zeller as regards the colour of the fore wings and the variation in colour mentioned by Zeller must be explained as follows:

When a *Nepticula* specimen is quite newly hatched it looks nearly quite black, very often to such a degree, that even a metallic fascia may be scarcely visible; but in a few hours the surplus of black scales are lost, and the specimen gains its "normal" appearance. In the course of time the insect is weared off, and due to its predilection for hiding in narrow crevices, the basal parts of the wings are the first to be rubbed off; the damage done to wing-colour and pattern is, however, practically impossible to detect; the weared-off part gets a whitish, greyish or yellowish silky appearance and looks in any other way quite intact, and if the species is unknown to the entomologist, the damage will be practically invisible to him.

Even the most clever entomologist may be humbugged if he is unaware of these facts; so Stainton has described *N. floslactella* from a weared-off specimen, a

fact which everyone can give a trial by rearing this common species and examine the freshly hatched imago, before it gets weared off in the rearing tube.

So the said differences and variations are due to a different degree of damage to the scales of the specimens examined; faulty descriptions beeing most frequent in papers published by earlier authors, due to their types being not reared but collected in the open in the adult stage.

In the male-genitalia (fig. 6) *turicella* is utterly different from *basalella*, but is closely allied to this species in the female-genitalia, only differing from it in, that the cornuti in crescent formed rows on bursa-copulatrix are even more minute, and in, that the last abdominal segments are very slender and elongated with very long internal apodemes and looking like an ovipositor (fig. 3).

The ova is placed in the angle between the main-rib and a secondary-rib. The mine is always confined to the space between two secondary ribs; in thin leaves, growing in the shaddow, the course of the mine is of a peculiar regularity, being quite regularly meander-formed with the windings close to each other. In thick insolated leaves or in the more heavily sclerotised leaves in the autumn, the mine is shorter, more stretched with but a few meander-formed windings, which are never touching each other. In the regular mines the excrements are thinly distributed, with each single excrement clearly visible; in the irregular ones, the excrements are packed into a dense opaque cloudy mass except for the terminal part of the mine, this difference being due to the amount of indigestible matter in the more sclerotised leaves.

*N. turicella* is in Denmark even more common than *N. basalella*; in the spring the imago occurs about three weeks later than this, i. e. about the middle of May. The first generation of the larva mines from the middle

of June to the first third of August, and the second generation from the last week of September to the first days of November.

To judge from the long period of mining and the fact, that young larvae occur even in the second half of July, it is possible, that more than two generations are present in the year.

### 3. *Nepticula hemargyrella* Zell.

The name *hemargyrella* has first been used by Kollar in: "Systematisches Verzeichnis der Schmetterlinge ins Erzherzogthum Oestreich" in: "Beitr. Landeskunde Oestreichs" II. 1832, p. 98.

Zeller in: "Linnaea Entomologica" Bd. III, 1848, pag. 323, altered the description i. e. described a quite different species, and as his species is the *hemargyrella* of today, Kollars species will be discussed later.

Zellers original description says:

"9. *Hemargyrella* Koll. (Zell.).

Alis anterioribus exalbidis nitidulis, apice fuscoviolacea; capillis pallidis, antennis fuscescentibus, conchula exalbida.

[List of synonymy omitted.]

Kleiner als *Argyropeza*, leicht kenntlich daran, dass die Vorderfl. von der Basis aus bis weit über die Mitte gelblichweiss sind. Rückenschild silbergrau und gelblich glänzend. Kopf blassgelb haarig. A. D. weisslich, ziemlich gross. Fühler hellbräunlich, glänzend. Beine schmutzig blassgelb mit Seidenglanz. Hinterleib hellgrau, an Bauch und Afterspitze weisslich gelb.

Vfl. nach hinten schmaler als bei *Argyropeza*, weisslich, gelblich beschmutzt, glänzend; das äusserste Flügeldrittel ist durch grosse Schuppen dunkelbraun violett wie ein einwärtsgerundeter und weiss begrenzter Fleck; die weisslichen Franzen schimmern an ihrer Basis um die Flügelspitze ein wenig gelblich. Hfl. und ganze Unterseite weisslichgrau, heller gefranzt."

Later on Zeller improved the description in Heinemann l. c. pag. 753, and says, now rejecting Kollar as the author of *hemargyrella*:

"*N. hemargyrella* Zell.

Vfl. schimmernd, bis zur Mitte gelblichweiss, dahinter braun, mit einer breiten weissen, etwas schrägen Binde hinter der Mitte, die vorn dunkel begrenzt ist, Franzen weisslich, Kopfhaare hell ockergelb, Nackenschöpfe gelblich, Augendeckel weiss.  $1\frac{3}{4}$ — $2\frac{1}{2}$  L." (3,8—5,5 mm).

The following more minute description is omitted here, but for two passages of interest: "Der *Turicella* ähnlich, doch überall bleicher gefärbt . . .", and ". . . Die Raupe von *Turicella* in Farbe und Mine sehr ähnlich zu gleicher Zeit mit ihr in Buchenblättern . . .".

In "Die sogenannten Kleinschmetterlinge Europas" 1913, Spuler however rejects *hemargyrella*, and places it as a synonym to *turicella*, while Hering in "Die Blattminen Mittel- und Nordeuropas" 1935—37, reestablishes the species, based, as he tells the author in a letter, upon the authority of Schütze, and he figures and describes the mine.

The *hemargyrella*-mine sensu Hering is however only the biological form of the *turicella*-mine in heavily scleroticed leaves, i. e. in leaves, which during the summer, due to strong insolation, grew thick, hard and leathery, and in the leaves in the late autumn, which by age get hard and ligneous. A large material of imagines reared from "*hemargyrella*-mines" during three years have been examined, and when freshly hatched, they agreed quite with imagines originating from typical *turicella*-mines, and all specimens examined in the genitalia of both sexes quite agreed with *turicella* and further all larvae from "*hemargyrella*-mines" quite agreed with normal *turicella* larvae.

Further several hundreds of imagines were collected on trunks on different localities and had their genitalia examined, but noly *turicella* was found. Some of the imagines collected agreed in outer appearance with the descriptions of *hemargyrella*, but so did too the reared imagines, which got weared off in the rearing-tubes;

so *hemargyrella* sensu Zeller represents a more or less weared-off *turicella*, and the species *hemargyrella* has to be rejected and placed as a synonym to *turicella*.

As regards this judgement, the renowned connoisseur of *Nepticulidae*, Mr. Klimesch in Linz fully agrees with the author.

As regards the occurrence of the two types of *turicella*-mines there is a peculiarity, which ought to have arisen the suspicion of the older entomologists.

In the spring the females of most *Nepticulae* prefer to place their eggs upon leaves growing in the deepest shadow as possible, and so do *turicella*; only very few eggs are casually placed on strongly insolated leaves; the result being, that in the first larval-generation the typical type of mine is very common, while the "*hemargyrella*-type" is only sparsely found.

Now one would expect, that in the autumn the typical type should be even more abundant, if it was produced by a special species, as believed formerly, but now we find a quite converse apportionment, now the "*hemargyrella*-type" is very abundant in the sclerotised autumnal leaves, while the typical type is exceedingly sparsely present, and only to be found on thin unsclerotised leaves in the darkest shadow.

#### 4. *Nepticula tityrella* Stt.

Established by Stainton in "Insecta Britannica. Lep. Tin." pag. 304, which description has not, however, been available to the author, but in "The Natural History of the Tineina": vol. I. pag. 150—52, Stainton describes this species in the following words:

"*Nepticula Tityrella*.

Exp.  $2\frac{1}{2}$  lines. Head and face pale yellow; palpi pale yellowish; the antennae fuscous, with the basal joint pale yellowish. The anterior wings are shining fuscous, with a very faint olive tint, darker towards apex; with a pale golden, rather oblique fascia beyond the middle, broadest on the inner margin, and its



posterior edge concave; the cilia are very pale grey. The posterior wings are pale grey, with pale grey cilia.

Thorax unicolorous with the base of the anterior wings; abdomen grey, the four anterior legs pale ochreous; the posterior pair greyish-ochreous; all the tarsi pale whitish-yellow. The underside of the anterior wings is unicolorous grey."

This species which for years has been regarded as a synonym to *N. basalella* was reestablished by Beirne l. c. The author, however, by the kindness of Dr. Beirne has had the opportunity of examining his homoeotypes\*) and is unable to find any difference between *N. tityrella* sensu Beirne and *N. turicella*.

Unfortunately the author has not had the opportunity of examining the male genitalia, but an examination of Beirne's drawing shows that the genitalia drawn in all probability belongs to *N. turicella*, the differences being due to a different position of the preparation. From these facts and the agreement between descriptions of *N. tityrella* and *N. turicella*, the author proposes to regard *N. tityrella* as a synonym to *N. turicella*, with which decision Mr. Klimesch agrees in a letter to the author.

##### 5. *Nepticula fulgens* Stt.

Established by Stainton in "Entomologists Monthly Magazine", vol. XXV, 1888—89, pag. 12, in the following words:

"Anterior wings shining olive-green to beyond the middle, then with a very brilliant silvery fascia, rather obliquely placed; sometimes the ground colour is a little darker immediately before the fascia; the apical portion of the wing is of a rich chocolate-brown, in certain lights looking blacker and contrasting strongly with the pale grey cilia; head whitish-ochreous, darker on vertex. Exp. al.  $2\frac{3}{4}$  lin."

Further Stainton adds:

"... Its most striking character is the effulgent metallic brilliancy... of the silvery fascia, but the glossiness of the basal por-

\*) Homoeotype i. e. a specimen, which by a later author, not the author of the species, has been compared with the holotype.

tion of the wing would alone serve to distinguish it from the usual beach-feeder *N. tityrella*, a much duller and more sober looking insect."

This species has formerly been regarded as a synonym of *N. turicella*, which interpretation, however, is wrong, as the description in every detail agrees with that of *N. basalella*, and *N. fulgens* therefore must be regarded as a synonym to *N. basalella*.

Due to the kindness of Dr. Beirne the author has had the opportunity of examining as well the two homoeotypes of *N. fulgens* sensu Beirne, as the sole genitalia preparation; but it is impossible to make out definitively to which species the two parts of the material belong. The homoeotypes consisted of two badly damaged specimens, one of which was a male *N. basalella*, the second was so badly preserved, that determination was impossible, but it did not belong to any Fagus-feeding *Nepticula* and was specifically different from the former species.

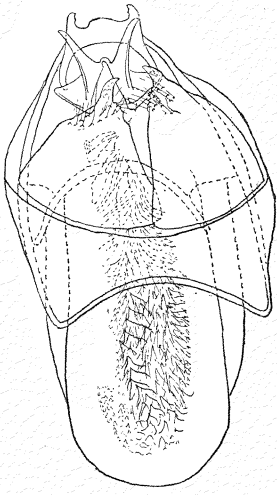
The sole genitalia preparation originating from a third lost specimen (Beirne l. c. pag. 214, fig. 41) is indeed a curious one and may perhaps belong to an unknown species, but the author is rather sure, that it presents a monstrose form of the genitalia of *N. turicella*.

#### 6. *Nepticula brunnensis* Skala.

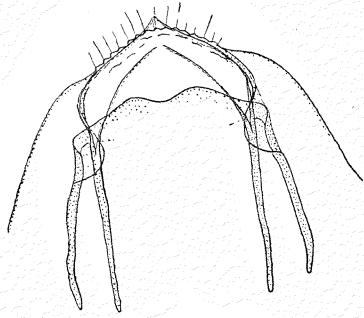
Established by Skala in "Zeitschrift der Wiener Entomologischen Gesellschaft" 24. Jahrg. pag. 144.

The establishment is based upon one empty and monstrose mine, so this "species" must be quite rejected.

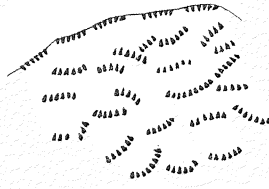
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- Fig. 1. *N. basalella* H.-S. Male genitalia.
  - Fig. 2. *N. basalella* H.-S. Tip of female abdomen.
  - Fig. 3. *N. turicella* H.-S. Tip of female abdomen.
  - Fig. 4. *N. basalella* H.-S. Part of bursa.
  - Fig. 5. *N. turicella* H.-S. Part of bursa.
  - Fig. 6. *N. turicella* H.-S. Male genitalia.



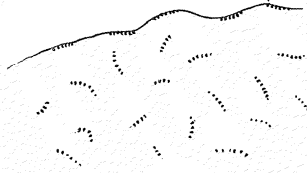
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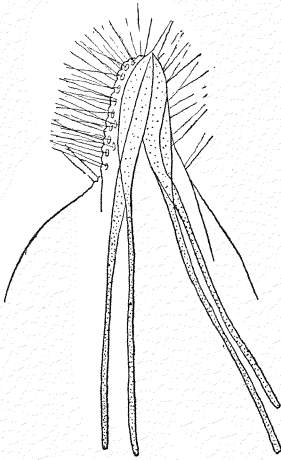
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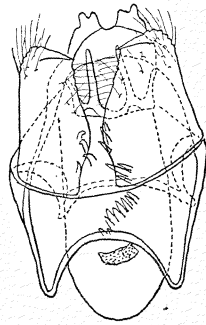
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6.

This way of establishing novae species cannot be too severely doomed, as such "novae" are conducive to throw the difficult study of *Nepticulidae* into a confusion, which even without such "help" is sufficiently present.

### Conclusion.

From this the author only admits two species in the biological group of Fagus-feeding Nepticulae, the synonymy of which will be established below.

The before mentioned description of *N. hemargyrella* by Kollar reads as follows:

"*Oecophora hemargyrella*.

Grösse und Form von *Nigrella*; einer der kleinsten Schaben. Kopf weiss geschopft, Fühler weisslich, metallisch glänzend. Vorderfl. von der Wurzel bis über die Hälfte dunkel silberfarben, matt; darauf folgt eine glänzende Silberbinde; Spitze dunkel-violet; Franzen lang und weiss. Hinterfl. weisslichgrau. In Buchenwäldern bei Wien selten in April und Mai."

There is no doubt, that the species examined by Kollar must be *N. basalella*, and then the synonymy must be as follows:

*Nepticula hemargyrella* Koll. (nec. Zell.)  
(= *basalella* H. S. = *fulgens* Stt.).

*Nepticula turicella* H. S.  
(= *hemargyrella* Zell. (nec. Koll.) = *tityrella* Stt.).

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