# Review of the unicolorous species of the subgenus *Blastotere* (Lepidoptera, Argyresthiidae) with descriptions of *Argyresthia svenssoni* sp.n. and *A. kulfani* sp.n.

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The unicoloured species of the subgenus *Blastotere* in the family Argyresthiidae are reviewed. Two new species, *Argyresthia svenssoni* sp.n. and *A. kulfani* sp.n., ‚are described and compared with closely related species. The biology of *A. svenssoni* seems to be essentially identical with that of *A. glabratella*, and the two species have a similar distribution pattern. However, when dissecting female specimens from north and south Sweden two different types emerged displaying totally different signa, which led to the conclusion that two good species were involved. *Argyresthia svenssoni* is so far recorded only from a few European countries, from Italy in the south to north of the Polar Circle in the north of Europe. *Argyresthia tatrica* Baraniak, Kulfan & Patočka, 2003, the description of which was based on material from Slovakia, is judged to be a junior synonym of *A. illuminatella* Zeller, 1839. The larva feeds on *Larix decidua* and possibly other species of *Larix*. The type material of *A. illuminatella* has been studied and a lectotype is designated. The status of *Argyresthia amiantella* (Zeller, 1847) is discussed and as the type material seems to be lost a neotype is designated. Also the type material of the *Blastotere* species reared from *Abies alba* is apparently lost and the taxon seems to have been misinterpreted. Subsequently, as it has no name the species is described here as *Argyresthia kulfani* sp.n. A recently described species, *A. uralensis* Baraniak & Junnilainen, 2011, has not been studied but the original description indicates that it might be a synonym of *A. illuminatella* but is not formally synonymized.

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The family Argyresthiidae was previously considered a subfamily (cf. for instance Karsholt & Razowski 1996: p. 57) but the subfamily Argyresthiinae was raised to family status by Nieukerken et al. (2011). *Argyresthia*, the only genus in the family, embraces many species difficult to determine. The species belonging to the subgenus *Blastotere* have proved to be especially notorious. The unicolorous species closely related to *A. glabratella* (Zeller, 1847) are particularly difficult to separate and embrace till now the following species: *A. laevigatella* Herrich-Schäffer, 1855, *A. illuminatella* Zeller, 1839, *A. amiantella* Zeller, 1847, *A. tatrica* Baraniak, Kulfan and Patočka, 2003, *S. uralensis* Baraniak & Junnilainen, 2011, and *A. bergiella* (Ratzeburg, 1840). All species feed on coniferous trees and appear to be host-specific on *Picea*, *Abies*, or

*Larix*. The external appearances are nearly identical and the genitalia almost indistinguishable, as well. The genitalia, especially in males, are to a large extent membranous without hard sclerotization, and this may be one reason why there have been so few specialists who have devoted their studies to this group.

For many years Ingvar Svensson kept in his private collection undetermined or enigmatic specimens in a small wooden box with the label 'UFOs' on the lid. From time to time he had placed, in his ordinary collection under *Argyresthia glabratella*, a specimen found in Värmland, Sweden, but the identity of the specimen was discussed several times during our visits to him.

When writing the manuscript (BÅB) and making the illustrations (RJ) for the Swedish project Nationalnyckeln (The Encyclopedia of the Swedish Flora and Fauna) (Bengtsson & Johansson 2011), we had to decide how to regard this mysterious specimen. Judged by its external appearance the specimen was supposed to belong to *A. glabratella*, but the genitalia differed considerably from those of *A. glabratella* by the signum possessing only one process and for this reason *A. laevigatella* Herrich-Schäffer, 1855 was also an option. However, *Larix* was not growing at the site where it was found, so the problem was left unsolved until 2010.

By coincidence RJ had reared a series of *Argyresthia* specimens from Boden (c. 66°N 22°E) in the province of Norrbotten, Sweden, and genitalia examination of females revealed that those also exhibited the same kind of genitalia, specifically a signum with one single process and not two as in *glabratella*. After checking more specimens in the authors' collections and consulting colleagues in Norway and Finland, it became clear that *glabratella* in fact consists of two species, one "northern" and one "southern". No known species name is available for the hitherto unknown taxon and a new species, *Argyresthia svenssoni*, is described herein.

For the description it was needed also to review other material from this difficult group and the result of that is presented species-wise below. Most importantly we found that *Argyresthia tatrica* Baraniak, Kulfan & Patočka, 2003 showed virtually identical male genitalia with *A. illuminatella* (Zeller, 1847). Moreover, the type material of *A. amiantella* Zeller, 1839 is by all judgement lost and a neotype is therefore selected.

## Methods and material

Different museums and private collections were visited with the purpose of finding out which species of this critical "*glabratella* species-group" occur in Sweden and Europe. In the Natural History Museum, London, the lectotype of *Argyresthia illuminatella* Zeller, 1839 and specimens judged to be *A. amiantella* (Zeller, 1847) were checked. In the Swedish Museum of Natural History, Stockholm, and in the coll. Ingvar Svensson (now in the Zoological Museum, Lund – MZLU) specimens from Central Europe, assumed to be *illuminatella*, were studied. Specimens believed to be *A. amiantella*, kept in the Tiroler Landesmuseum Ferdinandeum, Innsbruck, and *Argyresthia* specimens from Slovakia were dissected. Material from our own collections was thoroughly examined and many dissections were made to see if reliable differences between relevant taxa could be confirmed. Pertinent literature has been scrutinized but in no work have the new species been implicitly or explicitly mentioned.

The genitalia have been dissected according to the standard methods described by Robinson (1976). Staining is vital to see the details, as they are to a great extent membranous.

In this paper only the genitalia morphology and the biology are considered. As most type material is old, sequencing of DNA has not been done.

*Abbreviations*:

BMNH – Natural History Museum, London, UK
BÅB – Bengt Å. Bengtsson (private collection)
MZLU – Zoological Museum, University of Lund, Sweden
NRHS – Naturhistoriska Riksmuseet, Stockholm, Sweden
RJ – Roland Johansson (private collection)
SASZ – Slovak Academy of Sciences, Zvolen
TLMF –Tiroler Landesmuseum Ferdinandeum Innsbruck, Austria
ZMUC – Zoologisk Museum, University of Copenhagen, Denmark.

**Previous treatment**

*Argyresthia glabratella* was described by Zeller (1847) in his monograph "Die Argyresthien". It must be regarded the height of skilfulness (or luck?) being able to distinguish *glabratella* from *illuminatella* and *amiantella* on the basis of one male and two female specimens that Zeller had available and only comparing the external appearance. Even if most experts in the 19th century often reared the lepidopterous specimens and thus had a good knowledge of the immature stages, they did not know anything about genitalia examination or barcoding to distinguish various species from each other. In this case Zeller had found the three specimens of *A. glabratella* on spruce branches hanging down so he obviously assumed the specimens were associated with spruce.

Subsequent lepidopterists treated the three above-mentioned *Argyresthia* species partly relying on the observations of previous authors. E.g. Heinemann (1877: 658–659) presented very short re-descriptions of the species where the coloration and wing form were compared. For *A. illuminatella* he stated *Pinus* (sic!) being the host. In the nineteenth century pines, spruces and larches were all frequently assigned to the genus *Pinus*. For *A. glabratella* he only stated that imagines had been found "an *Pinus*, *Abies* und *Picea*", and for *A. amiantella* "um *Pinus Picea*". For *A. laevigatella* he mentioned "um *Pinus Larix*" [i.e. larch]. Martin Hering (1932) based his discrimination between the species merely on external appearances and cannot be used as a safe determination tool.

In his work on the Argyresthiidae, Friese (1969) acknowledged the difficulty of differentiating the species in *Blastotere*. He expressed his concern that the situation since Zeller had become increasingly confusing. One reason was the experience of the inter- and infraspecific variation being so great that determination by the external appearance was (and is) unfeasible. Yet, after having received assistance from Klaus Sattler with checking type material in the Natural History Museum in London, Friese deemed himself able to establish the status of the species concerned. In relation to this he expressed a clear admonition: "Die bisher in der Literatur vermerkten Färbungsunterschiede in der Kopfbehaarung, im Ton der Flügel wie in der Ringelung der Fühler sind nicht konstant und wechseln je nach Erhaltungsgrad, Alter und Geschlecht der Falter. Als Anhaltspunkte für die Determination können die Futterpflanzen der Raupen dienen, woran ja auch die Falter meist gefangen oder geklopft werden."

Friese (1969) stated the following host plants for the species (known to him) dealt with in this paper:

*A. laevigatella – Larix*

*A. illuminatella – Abies alba* [but is in fact *Larix decidua*; authors' note]

*A. glabratella – Picea abies*

*A. amiantella – Picea abies*

*A. bergiella – Picea abies*

Now we can add *A. svenssoni* sp.n. – *Picea abies* and *A. kulfani* sp.n. – *Abies alba*

For three of the species (*Argyresthia bergiella*, *A. svenssoni* and *A. glabratella*) taxonomic differences have been found in the pupal ornamentation and in the larval feeding pattern (Kulfan & Patočka, 1997). Examination of undetermined *Argyresthia* specimens (provided by J. Kulfan) from different localities in Slovakia turned out to be *A. glabratella* and *A. svenssoni* sp.n.

It is a well-known fact that most specimens with grey coloration turn browner or become paler with age. Even fresh specimens vary infraspecifically in coloration so much that one could easily imagine that different species of *Argyresthia* might be involved, even if it only concerns one single species. Safe determination can usually be achieved only by rearing in combination with genitalia examination.

Standfuß (1851) described *Argyresthia oleaginella* based on one single male found at Weistritsthale at Reinerz on 8th of June. It was listed with a question mark ten years later by Wocke (1861), and later, in Staudinger & Rebel's renowned catalogue on the Palaearctic Lepidoptera, suspected to be a synonym (Rebel 1901). *A. oleaginella* was fully synonymized with *A. glabratella* by Friese (1969), and this synonymy was accepted by other authors since then, e.g.

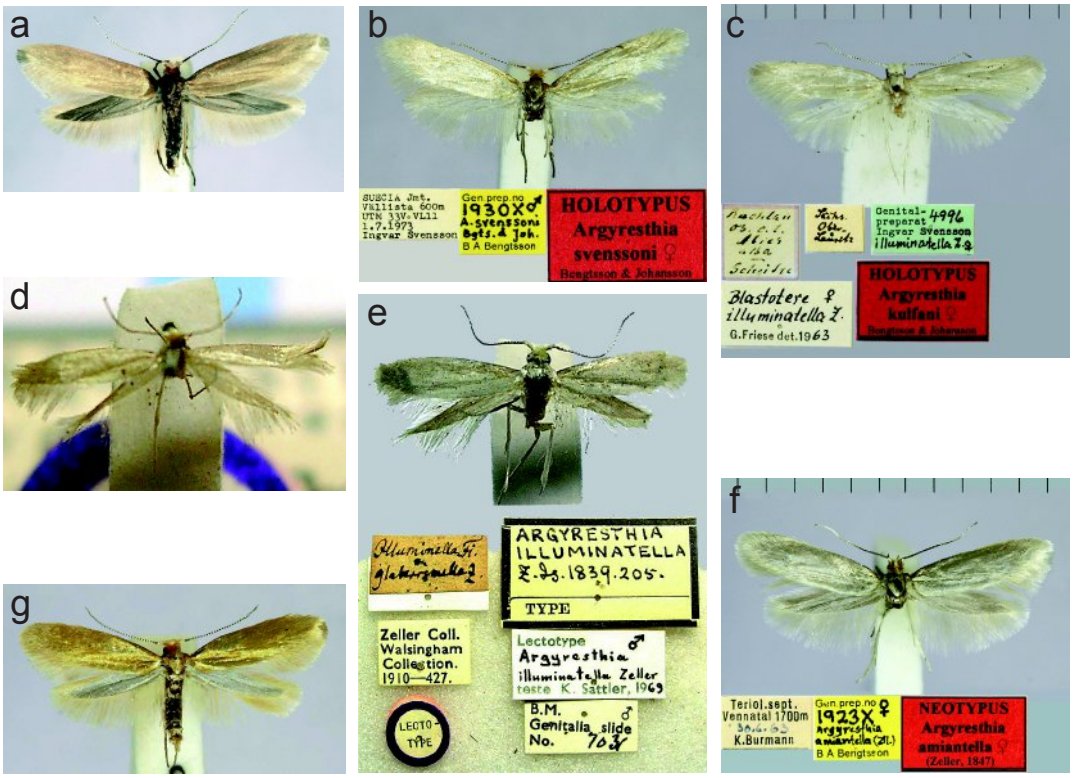



*Figure 1. Imago of – a)* ***Argyresthia laevigatella*** *Herrich-Schäffer, 1855. SUECIA, Sk., Vä, e.l. 10.VI.1978 [Larix decidua]. Leg. & coll. BÅB, – b)* ***Argyresthia svenssoni*** *sp. n. Holotype, – c)* ***Argyresthia kulfani*** *sp.n. Holotype, – d)* ***Argyresthia glabratella*** *(Zeller, 1847). Lectotype, – e)* ***Argyresthia illuminatella*** *Zeller, 1839. Lectotype, – f)* ***Argyresthia amiantella*** *(Zeller, 1847). Neotype, – g)* ***Argyresthia bergiella*** *(Ratzeburg, 1840). SUECIA, Sm, Mörtfors, St. Ramm, 31.V.2011, leg & coll. BÅB.*

*Fullbildade fjärilar av de arter som studerats i denna revision. Till de yttre är de ytterst lika varandra och snarast omöjliga att skilja åt.*

Leraut (1997). The taxon *Argyresthia oleaginella* is considered a synonym of *A. glabratella* also by the present authors.

According to Karsholt & Razowski (1996) the following species, belonging to the subgenus *Blastotere* Ratzeburg, 1840 in the genus *Argyresthia* Hübner, 1825, are recorded in the Nordic and the adjacent countries (with the addition of *A. svenssoni* sp.n. and *kulfani* sp.n. but excluding species occurring in other parts of the West Palaearctic):

*laevigatella* Herrich-Schäffer, 1855
*svenssoni* Bengtsson & Johansson sp.n.
*kulfani* Bengtsson & Johansson sp.n.
*glabratella* (Zeller, 1847)
*illuminatella* Zeller, 1839
*amiantella* (Zeller, 1847)
*bergiella* (Ratzeburg, 1840)
*praecocella* Zeller, 1839
*arceuthina* Zeller, 1839
*trifasciata* Staudinger, 1871
*dilectella* Zeller, 1847

**Key to the unicolorous species of the subgenus *Blastotere***

(This key is tentative and only serving as a rough guide. Several of the characters may be over-lapping.)

*Male genitalia (Fig. 2, 3)*

1 Phallus subapically with a cluster of microtrichiae on the outer surface, not minute teeth (Fig. 3e) .....*kulfani* sp.n.
- Phallus subapically with a cluster of minute teeth on the outer surface (e.g. Fig. 2b).....2
2 Anterolateral corners of vinculum round. Ridge with cornuti as long as half length of phallus (Figs. 2d, 3a, b, d).....*illuminatella*
- Anterolateral corners of vinculum pointed. Ridge with cornuti considerably shorter than half length of phallus.....3
3 Prongs of sclerotized fork on segment 8 usually very short, knobby, shorter than 0.004 mm (Fig. 2e)….....*amiantella*
- Sclerotized fork on segment 8 with well-defined prongs, each of them longer than 0.010 mm (e.g. Fig. 2a).....4
4 Forewing golden (Fig. 1g). Sclerotized fork on segment 8 with pair of thin and comparatively long prongs (>0.120 mm) (Fig. 2f)….....*bergiella*
- Forewing bronzy or glossy greyish. Sclerotized fork on segment 8 with pair of shorter prongs (<0.120 mm)….....5
5 Forewing bronzy (Fig. 1a). Phallus externally covered by rather distinct minute teeth (Fig. 2a).... .....*laevigatella*
- Forewing greyish, often with yellowish hue. Phallus externally covered by small, indistinct teeth only visible under high magnification….....6
6 Length of prongs of sclerotized fork on segment 8 usually at least 0.060 mm (Fig. 2b)..*svenssoni* sp.n.
- Length of prongs of sclerotized fork on segment 8 usually shorter than 0.060 mm (Fig. 2c).*glabratella*

*Female genitalia (Fig. 4)*

1 Signum with one process or without processes....2
- Signum with two processes.....3
2 Forewing greyish. Length of sclerotized tooth of signum less than 0.100 mm; antrum without distinct spines (Fig. 4b).....*svenssoni* sp.n.
- Forewing bronzy. Length of sclerotized process of signum exceeds 0.100 mm; antrum with distinct spines (Fig. 4a).....*laevigatella*
3 Processes in signum horn-shaped, almost parallel to each other, with few or no teeth (Fig. 9)..*glabratella*
- Processes with an angle of at least 60º to each other, densely covered with small teeth.....4
4 Each process at least three times as long as broad at base (Fig. 4d).....*amiantella*
- Each process about twice as long as broad at base.....5
5 Processes of signum at an angle of about 60º to each other, broadly united at their base (Fig. 4c). .....*kulfani* sp.n.
- Processes of signum at an angle of at least 120º to each other.....6
6 Forewing greyish. Toothed plate (attached to processes) only extending at one side of connection line between processes; angle between processes about 150º (Fig. 4f, g).....*illuminatella*
- Forewing golden. Toothed plate (attached to processes) visible on both sides of connection line between processes; angle between processes c. 120º to each other (Fig. 4e).....*bergiella*

***Argyresthia laevigatella*** Herrich-Schäffer, 1855 Syst. Bearb. Schmett. Eur. 5: 271.

*Argyresthia atmoriella* Bankes, 1896: Ent. M. Mag. 32: 25.

**Description:** (Fig. 1a): Wingspan 9.5–13.5 mm. Fresh specimens may be identified by the size and the bronzy coloration in the forewing. The male genitalia (Fig. 2a) may not easily be separated from those of some other species (e.g. *A. glabratella*) but the phallus exhibits a cluster of 16–25 small teeth, more conspicuous than in related species. The signum in female genitalia (Fig. 4a) is typical by having only one horn, usually of approximately double size (>0.100 mm) of that in *A. svenssoni* sp.n. Antrum exhibits minute but comparatively distinct spines.

**Distribution:** Occurs in Central Europe (from S Scandinavia and Finland to France and Italy, and from Ukraine to Ireland).

***Argyresthia svenssoni*** sp. n.

**Type material**: Holotype: ♀, with the following labels:

"SUECIA Jmt., Vällista 600 m, UTM 33V VL11, 1.7.1973, Ingvar Svensson" [white label]

"Gen. prep. no 1930X ♀, A. svenssoni Bgts. & Joh., B Å Bengtsson" [yellow label]

"HOLOTYPUS Argyresthia svenssoni ♀ Bengtsson & Johansson" [red label]

– In coll. MZLU.

40 paratypes: 2 ♂♂: SUECIA Nb., 4 km Ö Kaunisvara, UTM 34W FV0473, 1.VII.1976, leg. B. Bengtsson. – In coll. BÅB.

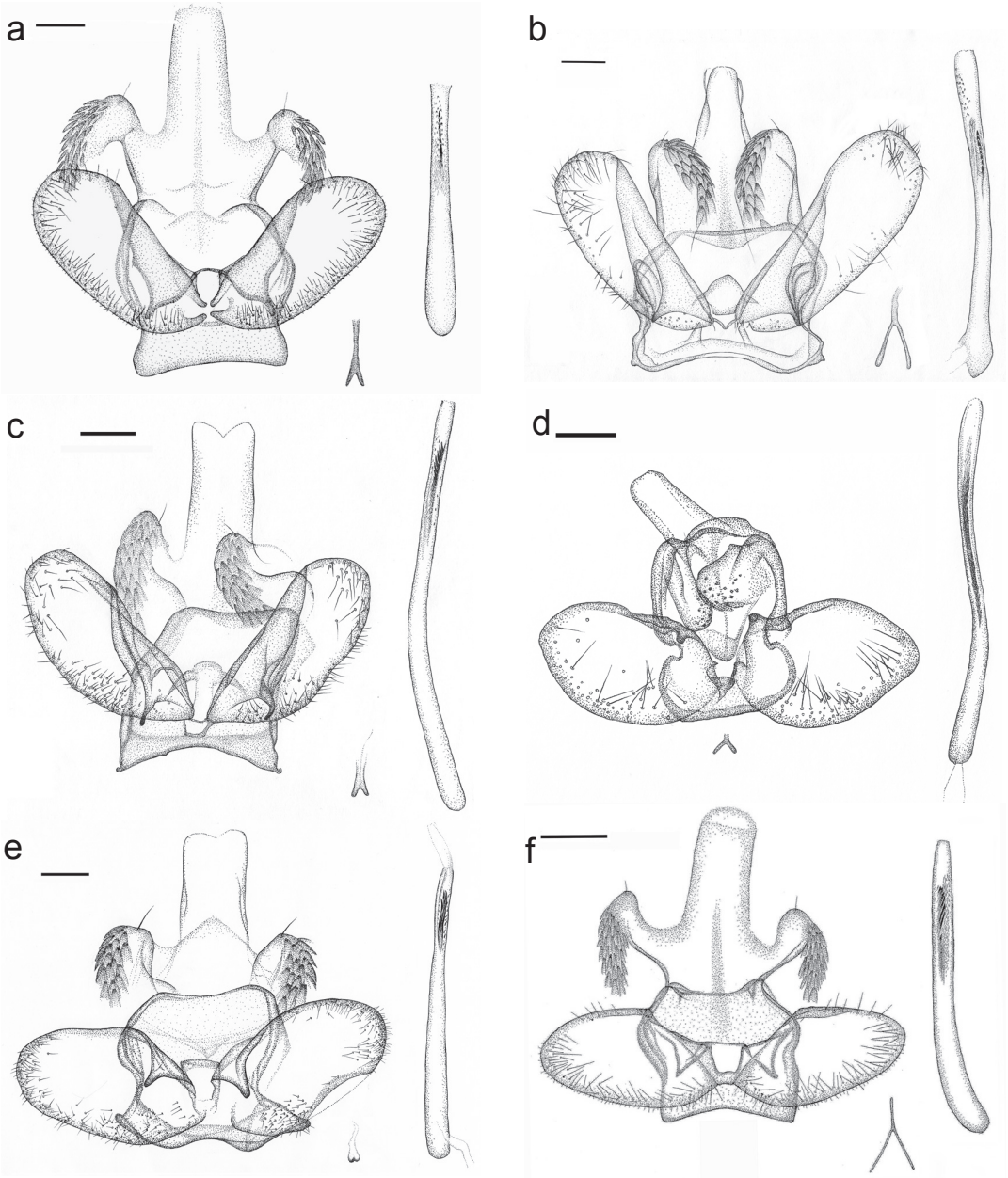



*Figure 2. Male genitalia of – a)* ***Argyresthia laevigatella*** *SUECIA, Öl., Böda, e.l. 12.VI.1959. Prep IS 6994. In coll. MZLU. Scale bar 0.10 mm, – b)* ***A. svenssoni*** *sp.n. Paratype: SUECIA, Lu, Muddus NP, Fallstugan, 1.VII.1977, leg. & coll. RJ. Gen. prep. RJ 2743. Scale bar 0.10 mm, – c)* ***A. glabratella****. SUECIA, Sm, Växjö, N.Åreda, e.l. 16.VI.2010, ex* ***Picea abies****, leg. & coll. RJ. Gen. prep. RJ 2744. Scale bar 0.10 mm, – d)* ***A. illuminatella****.. Lectotype. Scale bar 0.10 mm, – e)* ***A. amiantella****. Italia sept., Prov. Trient, Passo Lavazé, 1800 m, 6.VII.1995. P. Huemer leg. Gen. prep. BÅB 1928X. In coll. TLMF. Scale bar 0.10 mm, – f)* ***A. bergiella****. SUECIA, Sk., Österslöv, 1.VI.1961. Leg. & coll. Ingvar Svensson. Gen. prep. IS 4753.*

*Hanliga genitalier av några arter av släktet* ***Argyresthia****.*

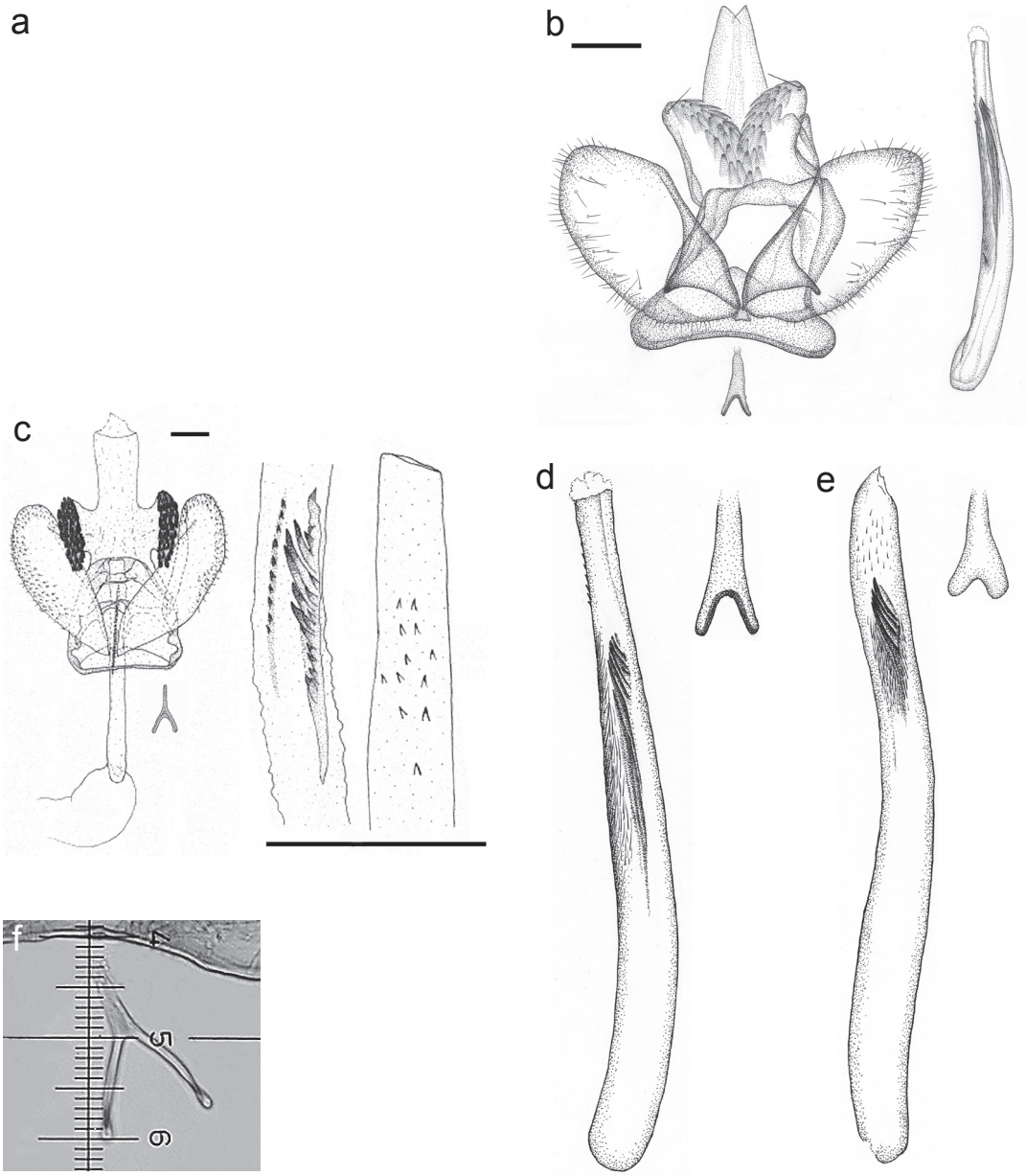



*Figure 3. Male genitalia of – a) **Argyresthia tatrica**. Paratype (?) [original illustration slightly edited]. Scale bar 0.10 mm. – b) **A. tatrica** (paratype) Northern Slovakia, High Tatra Mts, (Vysoké Tatry), Velická dolina, 1500 m, ex larva [Larix decidua], 1994, lgt. J. Kulfan. Gen. prep. BÅB 1942X. In coll. SASZ. Scale bar 0.10 mm, – c) **A. uralensis** [original illustration rearranged]. Scale bar 0.10 mm. – d) Phallus and sclerotized fork of **A. illuminatella**. Gen. prep. BÅB 1942X, – e) Phallus and sclerotized fork of **A. kulfani** sp.n. Gen. prep. RM 10533 (in coll. NRHS), – f) Length measurement of the longest prong of the sclerotized fork on segment 8 (**A. svenssoni**; here 0.102 mm).*

*a-e) Hangenitalier hos några arter av **Argyresthia** – f) visar hur mätningarna av....*

1 ♂: SUECIA Jä., Vallrun, Holmbuen, UTM 34V VL6461, 10.VII.2010, B.Å. Bengtsson. Genitalia on slide BÅB 5786. In coll. BÅB.
5 ♂♂: SUECIA Ån., Tåsjöberget, UTM 34V WM4723, 7.VII.2010, B.Å. Bengtsson. Genitalia of one male on slide BÅB 5787. In coll. BÅB.
2 ♀♀: SUECIA Ån., Tåsjöberget, UTM 34V WM4723, 7.VII.2010, B.Å. Bengtsson. Genitalia of one female on slide BÅB 5788. In coll. BÅB.
1 ♀: SUECIA Dr., Dala-Järna, UTM 34V VH6710, 20.VI.1980, B.Å. Bengtsson. Genitalia on slide BÅB 5701. In coll. BÅB.
1 ♂: SUECIA, Nb, 10 km NNW Pajala, UTM 34W EV9868, 2.VII.1976, leg. B. Bengtsson. In coll. BÅB.
1 ♂: S:Lu. Muddus natp., Fallstugan, 1-VII-1977, Roland Johansson. Genitalia slide No. 2743♂, R. Johansson. In coll. RJ.
4 ♂♂: Suecia, Nb. Boden, 29.5., 30.5., & 2.6.1963 (2♂♂), leg. R. Johansson. Ex *Picea abies*. Genitalia of first male on slide No. 2702♂, R. Johansson. In coll. RJ.
1 ♂: Sweden, To. Jukkasjärvi, 24.VI.1990, R. Johansson. In coll. RJ.
1 ♂: Suecia, Nb. Luleå, 15.6.1960, leg. R. Johansson. Genitalia slide No. 2593♂, R. Johansson. In coll. RJ.
3 ♀♀: Suecia, Nb. Boden, 31.5.1963, leg. R. Johansson. Ex *Picea abies*. – Genitalia on slides 2578♀, 2795♀ & 2706♀. In coll. RJ.
1 ♀: SUECIA NB, Pajala, UTM 34W EV9662, 17.6.1983, Ingvar Svensson. Genitalia on slide BÅB 1937X. In coll. MZLU.
1 ♀: SUECIA NB, Korpilombolo, UTM 34W EU9997, 18.6.1978, Ingvar Svensson. Genitalia on slide BÅB 1931X. In coll. MZLU.
1 ♀: SUECIA Me, Borgsjö, Jämtg., UTM 33W WK4551, 7.7.1987, Ingvar Svensson. Genitalia on slide BÅB 1932X.
1 ♂: SUECIA HR, Tännäs, UTM 33V UK8721, 5.7.1985, Ingvar Svensson. Genitalia on slide BÅB 1933X. In coll. MZLU.
1 ♀: Data as in holotype. In coll. MZLU.
1 ♀: SUECIA Nb, Tärendö, Y. Syl., UTM 34W EV4675, 4.7.1987, Ingvar Svensson. In coll. MZLU.
1 ♂: SUECIA To, Ounistunturi, UTM 34W EA2436, 22.6.2002, Ingvar Svensson. In coll. MZLU.
1 ♂: SUECIA PI, Arvidsjaur, UTM 34W DT2066, 18.6.1986, Ingvar Svensson. In coll. MZLU.
1 ♀: SUECIA HR, Funäsdalen, UTM 33V UK7039, 6.7.1981, Ingvar Svensson. In coll. MZLU.
1 ♂: NORWAY, Bv, Gol, Myking, 900–1000 m, 2.-7. vii.1984, O. Karsholt. Genitalia on slide BÅB 1954X. In coll. ZMUC.
1 ♀: ITALIEN, Prov. Südtirol, Ritten, Obergrünwald, 1750 m, 1.7.2010, leg. Huemer. TLMF 2010-019. Genitalia on slide BÅB 1921X. In coll. TLMF.
3 ♂♂: SLOVAKIA, Mala Fatra Mts, Slahorka, 960 m, e.p. IV-V.1996, [Kulfan & Patočka leg.]. Genitalia on slides BÅB 5956, 5958 and 5960. In coll. BÅB.
1 ♂: SLOVAKIA, Tatry Mts, Velicka dolina valley, 1500 m, e.p. IV-V.2000, [Kulfan & Patočka leg.]. Genitalia on slide BÅB 5965. In coll. BÅB.
1 ♂: SLOVAKIA, Tatry Mts, Velicka dolina valley, 1200 m, e.p. IV-V.2000, [Kulfan & Patočka leg.]. Genitalia on slide BÅB 5966. In coll. BÅB.
1 ♀: SLOVAKIA, Tatry Mts, Velicka dolina valley, 1200 m, e.p. IV-V.2000, [Kulfan & Patočka leg.]. Genitalia on slide BÅB 5949. In coll. BÅB.
1 ♀: SLOVAKIA, Tatry Mts, Gerlachov, 700 m, e.p. IV-V.2000, [Kulfan & Patočka leg.]. Genitalia on slide BÅB 5954. In coll. BÅB.
1 ♀: SLOVAKIA, Tatry Mts, Skalnata dolina valley, 1520 m, e.p. IV-V.1996, [Kulfan & Patočka leg.]. Genitalia on slide BÅB 5967. In coll. BÅB.

**Diagnosis:** As mentioned above the external appearance provides no help with determination. *Argyresthia svenssoni* sp.n. (Fig. 1b) is impossible to distinguish from *A. glabratella* (Fig. 1d), *A. illuminatella* (Fig. 1e), *A. kulfani* sp.n. (Fig. 1c), and *A. amiantella* (Fig. 1f) and the wingspan is roughly the same. Some specimens may also resemble *A. laevigatella* (Fig. 1a), which, however, in the normal case has bronze sheen in the forewing, not greyish or yellowish grey. Especially in the female genitalia, and to a certain extent also in the male genitalia, there are characters of specific value.

In *A. glabratella* the signum always has two long and slender, horn-shaped processes with bases apart, and originating from a moderately sclerotized plate with minute teeth (Fig. 9). Sparse minute teeth may also cover each horn, which occasionally form a very acute angle, but are usually parallel shaped as parentheses. Kulfan & Patočka (1997) mention a difference in the pupal armament; *A. svenssoni*, referred to as *amiantella*, has a girdle of small pegs on the penultimate segment, while *A. glabratella* has a girdle of bristles. For more information about the biology and pupal morphology of *A. glabratella* and *A. svenssoni*, see Kulfan & Patočka (1997).

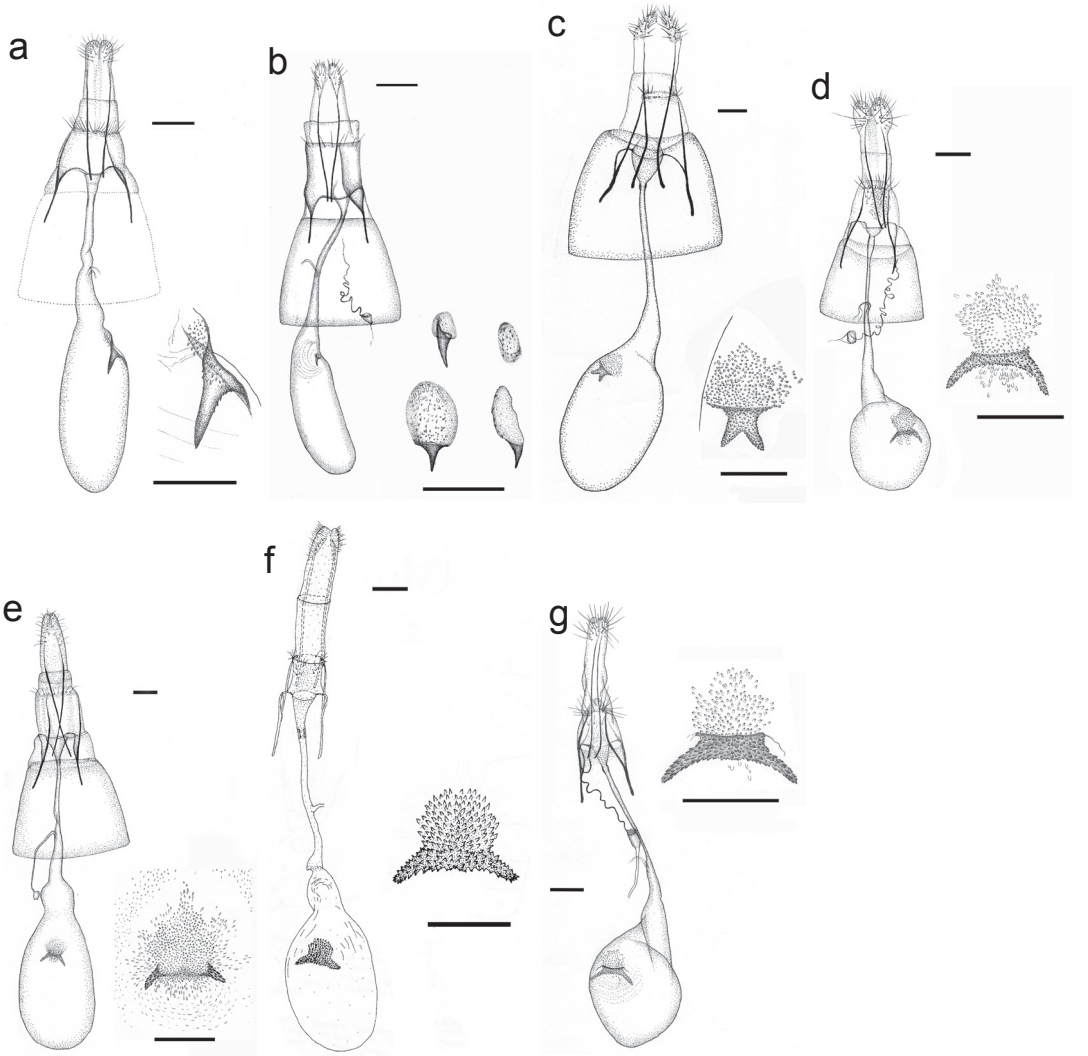



*Figure 4. Female genitalia of – a)* ***Argyresthia laevigatella*** *Denmark, NEZ, Gribskov, e.l. 10.vi.1980, leg. & coll. RJ. Gen. prep. RJ 2577. Scale bar 0.10 mm. – b)* ***A. svenssoni*** *sp.n. Holotype. Also different shape of signum in paratypes. Scale bar 0.10 mm. – c)* ***A. kulfani*** *sp.n. Holotype. Scale bar 0.10 mm. – d)* ***A. amiantella****. Neotype. In coll. TLMF. Scale bar 0.10 mm. – e)* ***A. bergiella****. SUECIA, Sm, Växjö, N.Åreda, e.p. 17.VI.2010, ex* ***Picea abies****, Gen. prep. RJ 2718. Leg. & coll. RJ. Scale bar 0.10 mm. – f)* ***Argyresthia tatrica****. Paratype [original illustration slightly edited]. Scale bar 0.10 mm. – g)* ***Argyresthia tatrica****. Paratype. Northern Slovakia, High Tatra Mts, (Vysoké Tatry), Velická dolina, 1500 m, ex larva [Larix decidua], 1994, lgt. J. Kulfan. Gen. prep. BÅB 1943X. In coll. SASZ. Scale bar 0.10 mm.*

*Hongenitalier av olika arter av* ***Argyresthia.***

In *A. illuminatella* the signum also has united horns, which may be rather short and crescent-shaped, standing at an angle of about 150° to each other; the processes are attached to a round membrane with numerous small teeth only posteriorly (Fig. 4f, g) (cf. Baraniak, Kulfan and Patočka, 2003). The illustration in Friese (1969: Fig. 10) shows the signum of *A. kulfani* sp.n.

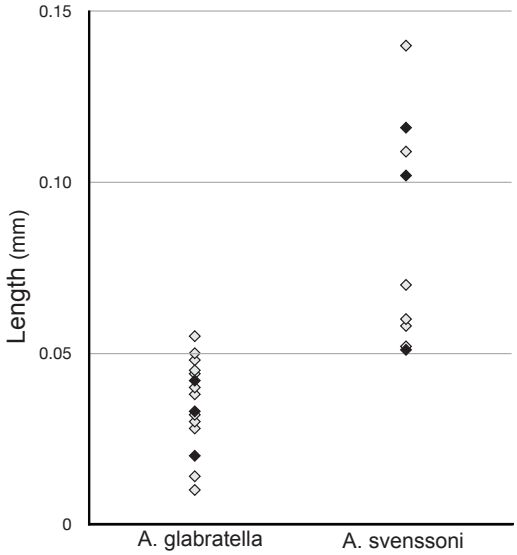



*Figure 5. Measurements of longest prong of sclerotized fork on segment 8 of* ***Argyresthia glabratella*** *and* ***A. svenssoni*** *(Fig. 3). The black dots indicate males with matching females found in the same locality at the same occasion.*

*Mätning av den längsta skänkeln på gaffeln på segment 8 hos* ***A. glabratella*** *och* ***A. svenssoni*** *(Fig. 3). Svarta punkter visar de hanar för vilka honor hittats på samma lokal vid samma tillfälle.*

*A. amiantella* has a similar signum to *A. glabratella* but the toothed, slender and united horns usually form a blunt angle and the teeth on the horns are larger and more numerous (Fig. 4d) (cf. also Friese 1969: Fig. 11). The central "plate" generally exhibits a "posterior window" without teeth and on the anterior side there is a considerable number of teeth. The signum in one of the paratypes of *A. tatrica* is very similar to that in a specimen of *amiantella* shown by Friese (1969; see also below under *Argyresthia amiantella*).

In *bergiella* clusters of teeth are visible on both sides (anterior and posterior) of the lateral horns and these stand at an angle of about 120º to each other (Fig. 4e), but the signum is variable, often resembling that of *amiantella* (Fig. 4d). However, in *bergiella* the forewing is distinctly golden and thus the species can be determined merely by the forewing coloration (Fig. 1g).

The signum in *A. svenssoni* sp.n. (Fig. 4b) has only one (rarely none) process, which is sclerotized and usually without visible teeth. It resembles thereby the signum of *A. laevigatella* (Fig. 4a) but is clearly smaller. The length of the sclerotized process is only approximately 0.050 mm in *svenssoni* (rarely more than 0.080 mm) but at least 0.200 mm in *laevigatella*, though only approximately 0.100 mm in Japanese material according to illustration in Moriuti (1977: Fig. 479). The illustrations by Friese (1969: Fig. 3-8) based on six different specimens may include *A. svenssoni* sp.n.; at least the small signum in Fig. 3 by Friese fits rather well to *A. svenssoni* sp.n., provided all signa are drawn to the same scale. *A. laevigatella* has minute spines in the antrum while such spines are absent in *A. svenssoni* but there is a dot pattern, more or less confluent with the pattern in the eighth segment. In a standard preparation, segment 8 in *svenssoni* is almost 1.5 times as long as broad while in *laevigatella* length and breadth are of equal length (see Bengtsson & Johansson 2011). Also the corpus bursae differ in shape, in *svenssoni* being considerably more slender.

In the male genitalia the differences between *A. svenssoni* and *A. glabratella* are small (Fig. 2b, c). The size of the sclerotized, wishbone-shaped fork on segment 8 is the most significant difference. Only the longest prong has been measured (Fig. 3f) as the prongs frequently are of unequal length, due to one of them usually being positioned along the sight line and thereby appearing shorter. The measurements have resulted in the following values: 0.010-0.055 mm for *glabratella* (average length = 0.032 mm; n = 27), and 0.051-0.116 mm for *svenssoni* (average length = 0.079 mm; n = 12) (see Fig. 5). In *A. svenssoni* there are generally 4-6 large cornuti, in *glabratella* usually 5-10; the number of cornuti may be overlapping but the size rarely does so.

The male genitalia of *A. amiantella* (Fig. 2e) are foremost characterized by the very short-pronged and knobby fork on segment 8.

In *A. illuminatella* the cornuti are aligned along a sclerotized ridge extending about half the length of phallus (Fig. 1d, 2a-d), and the anterior corners of the vinculum in *illuminatella* are pronounced round, not pointed as in other


*Figure 6. Distribution area of* ***Argyresthia svenssoni*** *sp.n. Dots represent the finding places of dissected specimens and the shaded area the hypothetical distribution area based on not dissected information from various collectors.*

*Utbredningen av* ***Argyresthia svenssoni*** *sp.n. Prickar visar konstaterade fyndlokaler och det grå området den sannolika utbredningen i nuläget.*

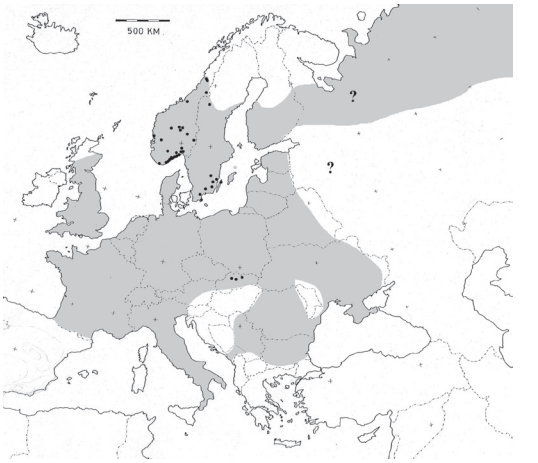



*Figure 7. Distribution area of* ***Argyresthia glabratella****. Dots represent the finding places of dissected specimens and the shaded area the hypothetical distribution area, partly based on information from various collectors.*

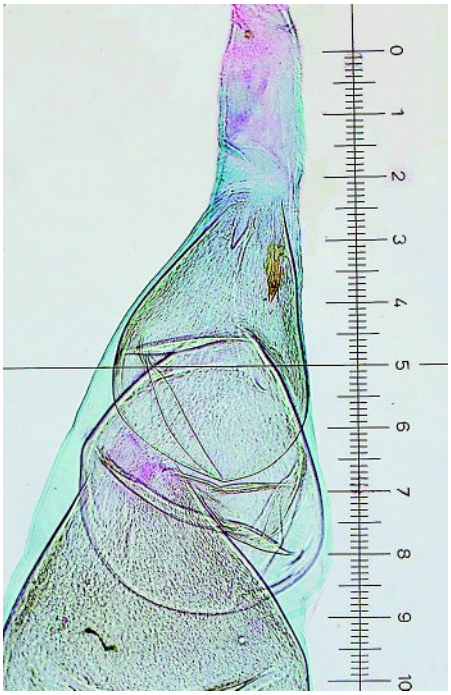
*Utbredningen av* ***Argyresthia glabratella****. Prickar visar konstaterade fyndlokaler och det grå området den sannolika utbredningen i nuläget.*

species in the subgenus *Blastotere*. In different preparations this structure may appear differently from time to time in other species, but not in *illuminatella*.

**Description** (Fig. 1b): Wingspan ♂: 9.0–12.5 mm, ♀: 8.5–10 mm. Hair-scales on head pale beige or pale yellow-ochreous, face silvery in male, dark silvery in female. Scape, pecten and first segment of flagellum pale yellow-ochreous, sometimes darker than head; rest of flagellum fuscous, segments in inner half of flagellum with dark fuscous base, apical half serrate in both sexes but more so in male. Length of antenna 0.7 x that of forewing. Labial palp drooping, pale beige or greyish beige; third segment as long as diameter of eye, second segment slightly shorter. Tegula and thorax greyish bronzy. Forewing may vary in colour but usually greyish with faint yellowish sheen, costa near base darker, occasionally extending to fringes. Hindwing greyish, moderately glossy, width approximately ¾ of forewing. Fringes in both wings greyish with yellow tinge. Foreleg fuscous with yellow tinge dorsally, dirty ivory ventrally. Midleg similarly coloured but still paler dorsally. Hindleg pale yellow-ochreous, tarsus darker terminally. In dark specimens legs may be entirely fuscous in varying shade. Abdomen grey, semi-metallic; valvae in male covered by pale yellowish scales; terminal segment in female pale beige, papillae anales protruding.

**Male genitalia:** (Fig. 2b): Uncus and gnathos absent. Socius a lateral extension with approximately 20 peculiar scales. Valva oblong, at margins with short bristles. Vinculum anteriorly straight or slightly concave. Phallus c. 1.4 times as long as valva, almost straight, and tip truncate. Number of large cornuti usually 4-6, longest c. 0.04 mm. "Handle" of sclerotized fork on eighth sternite typically 1.0-2.0 times as long as prongs, both of which are standing at an angle to each other of 40º-60°.

**Female genitalia:** (Fig. 4b): Apophyses posteriores nearly 4 times as long as apophyses anteriores. Segment 8 nearly 1.5 times as long as broad. Antrum funnelled, without minute teeth but with microscopic granulation. Ductus bursae membranous, almost evenly broad, but towards corpus bursae gradually widened and imperceptibly entering the bursa. Corpus bursae



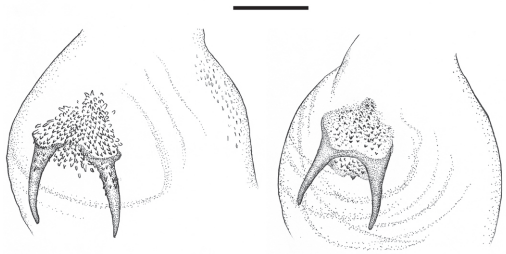



*Figure 9. Signa of* ***A. glabratella*** *(Zll.). To the left: SUECIA, Sm, Växjö, N. Åreda, e.p. 18.VI.2010, ex* ***Picea abies****. Gen. prep. RJ 2746. To the right: same data. Gen. prep. RJ 2717. Scale bar 0.10 mm.*

*Signa hos* ***A. glabratella****.*

*Figure 8. Signum of* ***A. svenssoni*** *sp.n. ITALY, Prov. Südtirol, Ritten, Obergrünwald, 1750 m, 1.7.2010, leg. P. Huemer. In coll. TLMF. Gen. prep. BÅB 1921X.*

*Signum hos* ***A. svenssoni*** *sp.n. (fr. Italien).*

long and slender. Signum a weakly sclerotized, minutely dentate plate (ca 0.10 mm long) with a strongly sclerotized tooth, 0.05 mm long at most. The tooth may rarely be almost absent.

**Biology:** Almost the same as for *Argyresthia glabratella*. The egg is to all appearances laid near the tip of a shoot of spruce *Picea abies*. The larva lives inside the shoot, first eating the bud and later the pith. After hibernation it continues eating until May when it makes an exit hole on the underside of the shoot, which loses the needles. The pupa rests inside the shoot. Imagines may be found in July in all kinds of habitats with spruce but seems to prefer edges or sparse stands.

According to Kulfan & Patočka (1997) – taking into account that their *A. amiantella* in fact is *A. svenssoni* sp.n. – there is a difference in the larval behaviour between *A. glabratella* and *A. svenssoni*. In *A. svenssoni* the larva excavates the extreme tip of the bud and makes the exit hole near the tip. In *A. glabratella* the larva eats the pith along a longer distance and places the exit hole further from the tip (c. 2-3 cm).

**Distribution:** *Argyresthia svenssoni* sp.n. is recorded from Sweden, Norway, Finland, Italy and Slovakia (Fig. 6) but is certainly distributed over a much wider area and can be assumed to occur in the northern taiga area eastwards to Asia. The potential distribution area may principally follow the natural distribution of *Picea abies* (Fig. 10). Planted stands of spruce are often inhabited by *A. glabratella* (e.g. in Denmark and Great Britain), possibly so also by *A. svenssoni*. One specimen in Friese (1969: Fig. 3) may originate from the east part of Germany. The two species have a sympatric distribution area (Fig. 6 & 7).

The distribution area of *A. amiantella* and *A. illuminatella* may be considered uncertain for the moment, but both are reported from the Alps and the mountainous areas in the eastern of Europe. For the distribution of *A. laevigatella* and *A. bergiella*, see Karsholt & Razowski (1996) and Agassiz (2011).

**Etymology:** *Argyresthia svenssoni* sp.n. is dedicated to the late Ingvar Svensson, who was


*Figure 10. Natural range of* ***Picea abies****.*
*Utbredningen av gran.*

*Figure 11. Natural range of* ***Abies alba****.*
*Utbredningen av ädelgran.*

the first collector to notice that *A. glabratella* might have a sibling species.

***Argyresthia kulfani*** sp.n.

**Type material**: Holotype : ♀, with the following labels:

1. [GERMANY] Rachlau [19]03. e.l. Abies alba, Schütze [white label]
2. Sachs. Ober-Lausitz; Blastotere illuminatella Z. ♀, G. Friese det. 1963 [white label]
3. Genitalpreparat Ingvar Svensson 4996, illuminatella Z. ♀ [green label]
4. HOLOTYPUS Argyresthia kulfani ♀ Bengtsson & Johansson [red label]. In coll. MZLU.

2 paratypes:

♂, labelled: Lusatia, [leg.] Starke. Genitalia on slide RM 10533. In coll. NRHS.

♂: ČSSR, V.[19]51, e.l. Hlinik u. H.; Abies, J. Patocka lgt [underside]; A. illuminatella. Genitalia on slide BÅB 1955X. In coll. ZMUC.

**Diagnosis:** As for many other species in the subgenus *Blastotere* this new species is impossible to separate from other unicolorous species. Only by dissecting the genitalia or/and rearing can safe determination be achieved. In the male genitalia the subapical cluster of microtrichiae on phallus is most decisive and in the female genitalia the shape of signum is characteristic.

**Description** (Fig. 1c): Wingspan 9.5 mm. Crown with whitish hairs, face silvery white. Labial palp short, porrect, pale ochreous brown, terminal segment almost as long as eye diameter, and second segment about half as long as eye diameter. Antenna annulate dark brown and pale beige, scape whitish. Thorax slightly paler than forewing and with greyish tinge, costa near base thinly fuscous. Forewing moderately glossy, pale brownish beige. Hindwing pale greyish. Inner side of fore leg dark brownish, otherwise pale beige; mid leg and hind leg pale beige.

The holotype probably has become paler since capture and fresh specimens most probably have darker coloration.

**Male genitalia:** Friese (1969: Fig. 18) illustrated the phallus of "*illuminatella*" (i.e *kulfani*) and the most significant feature is the low number of rather stout cornuti (c. 5) and the extremely short bristles (microtrichiae) on the outer side of phallus, not minute teeth as in the other species. A male specimen (paratype) kept in the NRHS has the same genitalia and the phallus is here illustrated (Fig. 3e).

**Female genitalia:** (Fig. 4c): Signum with two thick, toothed horns broadly united at base and standing at an angle of approximately 60° to each other. The horns are directed anteriorly, and posteriorly a cluster of teeth is extending.

**Biology:** Friese (1963: 716–717 & 752) described the bionomics, referring to Schütze (1917 & 1931: 32), and is here in general outline repeated: The infestation may be found in shady or semi-shady locations on low *Abies*, but sometimes on higher trees. The larva eats the pith in the shoot, occasionally up to 7 cm from the tip,

which makes the needles become yellowish already in the autumn whereupon they fall to the ground in late winter. Where the shoot is broken the larva covers the gallery with a web, which is removed immediately before pupation in order to make it possible for the imago to creep out. Pupation takes place in a flat cocoon in the gallery. The pupa has four thorns on the forehead with which it frees itself at ecdysis. Such spines are missing in other species in Argyresthiidae. Flight period from mid May to mid June.

**Distribution:** Uncertain. The holotype and the paratypes originate from the eastern part of Germany and Slovakia but the potential distribution of *kulfani* sp.n. is shown by the distribution of *Abies alba* (Fig. 11).

**Etymology:** This species is named in honour to Jan Kulfan, Zvolen, Slovakia who has studied the biology of *Argyresthia* species and provided important material for this paper.

***Argyresthia glabratella*** (Zeller, 1847)

*Blastotere glabratella* Zeller, 1847: Linn. Ent. 2: 293.

*Argyresthia oleaginella* Standfuss, 1851: Bresl. Zeitschr. Ent. 5: 60.

**Description:** (Fig. 1d) Wingspan 8-12 mm. Female usually smaller, paler and with slenderer wings. Cannot be safely separated from other similar species by external appearance. Male genitalia (Fig. 2c) as in e.g. *A. laevigatella* but phallus with smaller and fewer teeth. Fork on eighth segment with prongs measuring c. 0.030 mm (0.010-0.055 mm). Cf. diagnosis above for *A. svenssoni*. Female genitalia with typical signum, showing two bent horns with sharp tips (Fig. 9).

The lectotype, kept in BMNH, was designated by Klaus Sattler and is published for the first time here. It bears the following labels:

1. LECTOTYPE [round, purple-edged BMNH type label. Underneath it, upside down, the former round, red-edged BMNH TYPE label]
2. Reinerz, Mitte VII., Zeller [white handwritten label; uncertain whose handwriting it is]
3. Glabratella Z., Jul. Reinerz [old white label, Zeller]
4. Zeller Coll., Walsingham Collection 1910-427 [printed BMNH registration label]
5. ARGYRESTHIA (BLASTOTERE) GLABRATELLA, Z., Lin. Ent. II. 293-4 (1847); Type ♀ [white, black-edged Walsingham type label]
6. Abdomen Missing [printed on blue card]
7. Lectotype ♀, Blastotere glabratella Zeller, teste K. Sattler, 1968 [white label; Sattler's handwriting]

**Distribution:** The proper distribution area is unclear due to the new information of the species in the subgenus *Blastotere* but probably it embraces most of the west Palearctic area. See Fig. 7 and Agassiz (2011).

***Argyresthia illuminatella*** Zeller, 1839

Isis (Leipzig) 1839: 205.

*Argyresthia tatrica* Baraniak, Kulfan and Patočka, 2003 **syn.n**.

*Argyresthia glaberrimella* Zeller, [year?]. Manuscript name, handwritten by Zeller on the label of the lectotype of *illuminatella*.

**Description:** (Fig. 1e) Wingspan 9-12 mm. Cannot be separated externally from other unicolorous species in the subgenus *Blastotere*. Male genitalia (Fig. 2d, 3d) characteristic by the round anterolateral corners of vinculum. Phallus in the lectotype with long sclerotized ridge – approximately as long as half phallus length – with c. 5 rather stout cornuti. The fork on segment eight is Y-shaped, each of the three prongs with a diffuse reinforcement (Fig. 3a-d). Signum in female genitalia (Fig. 4f, g) reminding of that in *A. amiantella* (Fig. 4d) and A. *bergiella* (Fig. 4e) but with fewer teeth on a smaller plate from which two united and toothed horns are extending at a very blunt angle. The illustration in Friese (1969: Fig. 10) shows the signum of *A. kulfani* sp.n.

According to Zeller (1847: 292) *illuminatella* occurs in woods of *Pinus* and *Larix*, in that respect referring to Fischer von Röslerstamm, the collector who provided the types (from Bohemia) to Zeller. *A. tatrica* is likewise associated to *Larix* [*decidua*] and externally *tatrica* is stated to resemble *A. bergiella* and *A. amiantella,* but the genitalia differ in the shape of the fork on segment 8 and the signum. Judged by the original description (Baraniak, Kulfan and Patočka 2003: Fig. 3), the male genitalia of *tatrica* agree well with those of the lectotype of *A. illuminatella*, but the signum (Baraniak, Kulfan and Patočka 2003: Fig. 4) looks more like exceptional forms of that in *A. bergiella* or, sometimes, *A. amiantella*. The host plant and the combination of the genitalia characters in male

and female speak for a synonymy with *illuminatella* (see Note below). For more information, see Baraniak, Kulfan and Patočka (2003).

The type series of *A. illuminatella* was originally embracing at least two males and one female, explicitly indicated by Zeller (1847: 293). Only one male, kept in the BMNH, has been available for the designation of a lectotype, while the rest of the syntypes apparently are lost (Sattler pers. comm.). The lectotype (Fig. 1e & 2d) is here published for the first time and bears the following labels:

Illuminatella Fi. [=Fischer von Röslerstamm], glaberrimella Z. [handwritten by Zeller] [white label]
ARGYRESTHIA ILLUMINATELLA Z. Is. 1839. 205. Type [white label]
Zeller Coll. Walsingham Collection 1910–427 [white label]
Lectotype Argyresthia illuminatella Zeller teste K. Sattler, 1969 [white label]
B.M. ♂ Genitalia slide No. 7031 [white label]
Lectotype [white with blue ring at the margin].

**Biology:** Referring to Schütze (1917), Friese (1969) gave a detailed description of the biology of *A. illuminatella*, stating it to feed on *Abies alba*. The identity of the species feeding on *Abies alba* may have been originally correct, but the designation of the lectotype in combination with the experiences of Baraniak, Kulfan and Patočka (2003) demonstrate that *illuminatella*, as this species is now interpreted, has *Larix decidua* as a host. The description of the biology by Friese subsequently concerns *A. kulfani* sp.n.

**Distribution:** According to Agassiz (2011) found in many countries in central and south Europe but the records may be uncertain.

**Note:** The synonymization of *A. tatrica* with *A. illuminatella* is supported by the following shared characters:

1) The round anterolateral corners of vinculum (not present in other species of *Blastotere* with greyish forewings),

2) the long ridge with cornuti c. half length of phallus (not so in other species of *Blastotere* with greyish forewing),

3) the shape of the sclerotized fork on segment 8, though slightly variable,

4) the shape of the signum (approximately of the same shape in the dissected specimens of both taxa), and

5) both taxa are feeding on *Larix*; of other *Blastotere* species only *laevigatella* is feeding on *Larix*.

When this paper was ready for printing, Ole Karsholt made us aware of an article by Baraniak & Junnilainen (2011). In their paper a new species, *Argyresthia uralensis*, is described based on two male specimens. There is no indication of which specimen's genitalia are depicted but judged by the illustration (Fig. 3c) *A. uralensis* might be a junior synonym of, or at least very closely related to, *A. illuminatella*. The biology of *uralensis* is unknown but the specimens "were collected in a taiga forest with old coniferous trees such as *Picea abies*, *Larix sibirica* and *Abies alba*" (Baraniak & Junnilainen p. 501).

***Argyresthia amiantella*** (Zeller, 1847)

*Blastotere amiantella* Zeller, 1847: Linn. Ent. 2: 294.

**Description** (Fig. 1f): Wingspan 9-12 mm. Cannot be separated externally from other greyish, unicolorous species in the subgenus *Blastotere*. Male genitalia (Fig. 2e) may hardly be distinguished from those of *A. glabratella* except for the fork on segment eight that has even smaller prongs, almost like knobs. Female genitalia (Fig. 4d) with signum consisting of a large, toothed plate, usually with a "window"; the toothed horns are slender, bent and standing at blunt angle towards each other. Each horn is c. three times as long as its breadth at base.

Due to confusion between the unicolorous species in *Blastotere* it has apparently never been confirmed with which host plant *amiantella* is associated. The type material from Austria (in the 1840s, Austria (Kaiserthum Oesterreich) embraced the whole of Tirol, for instance also north-east Italy) should have been kept in "mus. Metzneri" (according to Zeller 1847: 294) but is obviously destroyed. For this reason the following neotype (Fig. 1f) is selected, bearing the labels:

Teriol. sept., Vennatal 1700m, 30.6.63, K. Burmann [white label]
Gen. prep. No 1923X, Argyresthia amiantella (Zll.) ♀, B Å Bengtsson [yellow label]
NEOTYPE *Argyresthia amiantella* (Zeller, 1847) ♀ [red label]
In coll. TLMF.

**Distribution:** According to Agassiz (2011) recorded from nine countries in central Europe but the records may be uncertain.

**Note:** Apparently Zeller never saw the type but referred to a narration by his colleague Vincenz Kollar. In the description of *A. amiantella*, Zeller compared the species with *Ocnerostoma piniariella*, specifically emphasizing the pointed hindwing, the weak gloss in the forewing, and unicolorous, grey antennae, characters by which he separated *amiantella* also from *glabratella*. Therefore it is not totally excluded that *amiantella* in fact might have been an *Ocnerostoma* species, in first place *O. friesei* Svensson, 1966. This can unfortunately never be verified. Notwithstanding this a neotype must be designated and we chose to assign it to *Argyresthia*, following the traditional opinion (e.g. Friese 1969).

***Argyresthia bergiella*** (Ratzeburg, 1840)

*Blastotere bergiella* Ratzeburg, 1840: Forst.-Ins. 2: 246, pl.. 15, f. 4.

*Argyresthia certella* Zeller, 1847: Linn. Ent. 2: 289.

**Description:** Wingspan 9–13 mm. Instantly recognized by the golden or brassy forewing (Fig. 1g). Even worn specimens should not be confused with other unicolorous species. Male genitalia (Fig. 2f) with a slender fork on segment eight. Female genitalia (Fig. 4e) with a large signum, consisting of an extended cluster of small teeth and rather short, toothed horns at a blunt angle with a narrow "bridge" connecting the horns. Host plant *Picea abies*. For further information, see Bengtsson & Johansson (2011: 309).

**Distribution:** Widespread in north and central Europe. For more information see Agassiz (2011).

## Additional species in the subgenus *Blastotere*

***Argyresthia praecocella*** Zeller, 1839

Isis (Leipzig) 1839: 205.

**Description:** Wingspan 8–9.5 mm. Recognized by the ochreous and dull brown forewing and the concoloured thorax. For further information, see Bengtsson & Johansson (2011: 310).

***Argyresthia arceuthina*** Zeller, 1839

Isis (Leipzig) 1839: 205.

*Phalaena argentella* Linnaeus, 1761 [: Fauna Suecica 1761: 367], *nec* Clerck, 1759 [: Icones Ins. Rariorum: pl. 11, Fig. 13.] Nom. praeocc.

**Description:** Wingspan 7–8.5 mm. Recognized by the greenish golden and glossy forewing, and the white head and thorax. For further information, see Bengtsson & Johansson (2011: 311).

***Argyresthia trifasciata*** Staudinger, 1871

*In* Staudinger & Wocke, Cat. Lepid. Eur. Faunengebiets: 425.

**Description:** Wingspan: 7–9 mm. Easily recognizable by the golden forewing traversed by three white fasciae. Host plants *Juniperus*, *Thuja*, *Chamaecyparis*, and *Cupressocyparis*. For further information, see Bengtsson & Johansson (2011: 312).

***Argyresthia dilectella*** Zeller, 1847

Linn. Ent. 2: 272.

**Description:** Wingspan: 7–9 mm. A species with reticulate pattern in outer half of forewing. Host plant *Juniperus communis*. For further information, see Bengtsson & Johansson (2011: 313).

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## Internet-source

https://commons.wikimedia.org/wiki/File:Abies_alba_distribution_map.svg

## Sammanfattning

Under arbetet med den andra volymen om småfjärilar i Nationalnyckelprojektet upptäckte författarna, att granknoppsmal *Argyresthia glabratella* (Zeller, 1847) egentligen består av två arter. I en ask med obestämda småfjärilar förvarade Ingvar Svensson ett honexemplar från Värmland, som inte stämde in på *glabratella*. Signum hade bara ett ”horn” istället för två, vilket *glabratella* har. Därför misstänktes exemplaret tillhöra lärkskottsmal *Argyresthia laevigatella* Heydenreich, 1851, som lever på lärk och där honan som enda hittills kända art i Palearktikum har ett enda horn på signum.

En av författarna (RJ) hade kläckt en serie enfärgade, gråglänsande exemplar av *Argyresthia* från gran i trakten av Boden. Dessa visade sig tillhöra samma art som Ingvar hade funnit.

Skillnaderna i hongenitalierna är tydliga, men i hangenitalierna finns bara mindre skillnader. Den nya arten får namnet *Argyresthia svenssoni* efter Ingvar, som var den som ledde oss in på att det rörde sig om två arter.

Inom undersläktet *Blastotere*, som förut accepterades som ett eget släkte vid sidan av *Argyresthia*, finns flera arter som är omöjliga att bestämma bara genom det yttre utseendet. Därför har typerna av de arter som kan förväxlas med den nya arten undersökts. I London har lektotypen av *A. illuminatella* Zeller, 1839 undersökts, liksom exemplar av *A. amiantella* (Zeller, 1847) från Freys samling. Exemplar från Österrike och Frankrike av den sistnämnda arten har undersökts.

Lektotypen av *A. glabratella* finns också i London men exemplaret saknar bakkropp. Material från Naturhistoriska Riksmuseet i Stockholm, Ingvar Svensson samling i Lund och Tiroler Landesmuseum i Innsbruck har lånats och granskats. Dessutom har ett stort antal exemplar från Slovakien och från våra egna samlingar undersökts. Sammantaget har nu en bild av de inblandade arterna kunnat skapas och en översikt över de enfärgade knoppmalarna inom släktet *Argyresthia* kan nu presenteras.

*Argyresthia svenssoni* kan lätt identifieras genom signums utseende och storlek. Hornet på signum är högst 0,10 mm långt medan det hos *A. laevigatella* är större än 0,10 mm, i Norden vanligen över 0,20 mm. Hos hanen är den sklerotiserade gaffeln på segment 8 olika hos *svenssoni* och *glabratella*: ganska långa och smala skänklar hos den förstnämnda (>0,06 mm, vanligen ca 0,08 mm), korta och knubbiga hos *glabratella* (<0,05, vanligen ca 0,03 mm).

Både *A. svenssoni* och *glabratella* är bundna till gran *Picea abies* och angreppen är likartade, men utgångshålet hos *glabratella* ligger en bit in från skottspetsen, medan det hos *svenssoni* ligger nära spetsen vid förbindelsen mellan de allra yttersta sidoknopparna. Larven lever inuti skottspetsen och när den förpuppas kommer spetsen att se vissen ut och barren lossnar lätt. För ytterligare information, se Bengtsson & Johansson (2011) och Kulfan & Patočka (1997).

De båda arternas utbredning är olika men överlappande i Sverige, Norge, Finland och Slovakien. *A. svenssoni* har, förutom i de nämnda länderna, också konstaterats från Italien och möjligen också från Tyskland. Sannolikt sträcker sig utbredningen genom den eurasiatiska tajgan långt österut. *A. glabratella* är spridd över större delen av Europa, men utbredningen är ännu osäker på grund av att av tvillingarterna hittills har uppfattats som en art och att flera andra arter inom gruppen kan ha felbestämts.

*A. svenssoni* har i Sverige en nordlig utbredning och har påträffats i Värmland, Härjedalen, Jämtland, Norrbotten, samt i Pite, Lule och Torne lappmarker. Helt säkert finns den över hela Norrland utom i den alpina regionen. Ingen annan art inom *Argyresthia* har denna utbredningstyp. Därför kan ett lämpligt svenskt namn vara **nordlig knoppmal.**

Under framtagandet av denna artikel konstaterades att värdväxten för *Argyresthia amiantella* är okänd. Dessutom är typmaterialet försvunnet varför en neotyp har utvalts. Inte heller *A. illuminatella* har haft en fastställd typ och därför publiceras för första gången lektotypen till denna art. Enligt författarna har *illuminatella* missuppfattats tidigare, men genom en utvald lektotyp är identiteten nu fastställd.

Den art, vars larv lever i skottspetsen på ädelgran och som ansetts vara *illuminatella*, är uppenbarligen obeskriven. Den beskrivs nu under namnet *Argyresthia kulfani* sp.n. Samtliga tre sistnämnda arter saknas i Sverige, men det är inte uteslutet att en eller flera av dem redan finns i landet eller kommer att påträffas här i framtiden.