Lobesia virulenta Bae & Komai, 1991 recorded for the first time in Europe, with description of a new subspecies (Lepidoptera, Tortricidae)

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Lobesia virulenta Bae & Komai, hitherto known only from East Asia is recorded from Denmark and Norway. Based on differences in wings and genitalia specimens from these countries are described as a new subspecies, Lobesia virulenta mieana Falck & Karsholt n. ssp. It is compared with L. reliquana (Hübner) and L. botrana (Denis & Schiffermüller); the adult moths and their genitalia are described and illustrated. A lectotype of Cochylis fischerana Treitschke, 1835 is published.

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Introduction

In the winter of 1997 the first author became aware of some peculiarities in two specimens in his series of L. reliquana (Hübner). The specimens, a male and a female, were dissected, and surprisingly the genitalia differed from those of reliquana. In looking for further specimens of this, to him, unknown species the collections of the Zoological Museum, Copenhagen and the private collection of Gert Jeppesen were examined, and they revealed eight further specimens. Some of these specimens were dissected and the genitalia examined, when it became evident that these series of supposed reliquana actually consisted of two distinct species.

A search in relevant European literature failed to clarify the identity of the unknown species. He then consulted the second author who draw attention to a recently published revision of the Japanese species of the genus Lobesia (Bae & Komai, 1991). One of the new species described there, L. virulenta Bae & Komai, seemed to be conspecific with the species he had discovered. A comparison of the material with specimens of virulenta from Japan revealed some small differences, and based on these we conclude that the populations from these two areas are different at subspecific level.

The genus Lobesia Guenée, 1845 contains more than 100 species and has a nearly worldwide distribution (Bae & Komai, 1991: 115). Nineteen species are currently recognized from Europe (Razowski, 1996: 145-146). They include L. botrana (Denis & Schiffermüller) (European Vine Moth), a serious pest of grapes. Among the European Lobesia species virulenta is, like reliquana, related to and easily confused with botrana (D. & S.), and these two species are therefore dealt with here in some detail. In East Asia several other closely related Lobesia species occur, viz. arguta Bae & Komai, 1991, yasudai Bae & Komai, 1991, pyriformis Bae & Park, 1992 and atsushii Bae, 1993. These species are very similar in both habitus and genitalia characters.
Figs 1-10. Adults of Lobesia. Figs 1-3, L. virulenta ssp. mieana Falck & Karsholt. 1, holotype ♂ Denmark, NEZ, Asserbo; 2, ♂ Denmark, NEZ, Grønholt; 3, ♀ Denmark, B, Paradiskæk. Figs 4,5, L. virulenta ssp. virulenta Bae & Komai. 4, ♀, Japan; 5, ♂, Japan. Figs 6-8, L. reliquana (Hb.). 6, ♂ Denmark, EJ, Hald; 7, ♂ Denmark, LFM, Hamborg Skov; 8, ♀ Denmark, NEZ, Asserbo. Figs 9,10, L. botrana (D. & S.). 9, ♂ Spain; 10, ♂, Corse.
Abbreviations.
Gs: Genitalia slide.
NHMÅ: Naturhistorisk Museum, Århus, Denmark.
NISK: Norwegian Forest Research Institute, Ås, Norway.
ZMUC: Zoologisk Museum, København Universitet, Denmark.
ZMUO: Zoologisk Museum, University of Oslo, Norway.

Lobesia virulenta ssp. virulenta
Bae & Komai. New status


Diagnosis. – Adult (figs 4–5). Wingspan 12-13 mm. Head pale ochreous. Antenna pale yellowish brown, ringed with darker brown. Labial palpus and thorax light yellowish brown suffused with dark brown. Ground colour of forewing light ochreous, suffused with plumbeous; basal patch ochreous brown, angled at outer edge; area between basal patch and central fascia light ochreous at costa and fuscos at dorsum; central fascia subtriangular, ochreous brown, upper half of outer margin edged with black; preternal and terminal patch tawny; apical spot ovate, surrounded by fuscous line; cilia lighter or darker ochreous with fuscous basal line. Hindwing in male subtriangular, with rather straight termen and pointed apex, pale greyish white, semi-pellucid, becoming darker towards apex; distance (in males) between veins CuA1 and CuA2 about twice the distance between CuA1 and M3; cilia white with a greyish subbasal line. Hindwing of female of normal shape, fuscous.

Genitalia, ♂ (fig. 11). Valva rather broad and angulated; sacculus with two spine clusters, linked by a series of small spines (16-20 spines in examined material). Aedeagus slightly shorter than half of caulis, gently curved at base, straight in middle and tapering distally, with a group of extremely minute dents on proximal half of its left wall. Abdominal segments weakly sclerotized.

Genitalia, ♀ (fig. 17). Sterigma pear-shaped, concave anteriorly, gradually tapering posteriorly; antrum with almost parallel walls; ductus bursae rather long; corpus bursae small and rounded; signum rather large, arrowhead-shaped.

Bionomics. – The mature larva has a body length of 8-12 mm. Head light yellowish brown with distinct black ocellar area. Prothoracic shield dark reddish brown. Anal shield dark brownish grey, irrorated with black. Body dark brown or black. The pupa is 7 mm long, uniformly yellowish brown. Host plants are: Pyrus sargentii, Larix leptolepis, Angelica sp., gall of Ceratovacuna nekoashi (Aphididae) on Styrax japonicus. When feeding on Pyrus, the larva attacks the fruits, on S. japonicus it feeds at the inner wall of galls made by C. nekoashi (Bae & Park, 1992: 129; Bae & Yasuda, 1992). In Japan the larva of virulenta is regarded as a pest on Pyrus (Bae & Yasuda, op. cit.).

Distribution. – Japan (Bae & Komai, 1991: 129), Korea (Bae & Park, 1992: 76), China (Liu & Bae, 1994: 853) and Taiwan (Bae, 1993: 519).

Lobesia virulenta mieana Falck & Karsholt. New subspecies.

Diagnosis. – Adult (figs 1-3). Wingspan 10-13 mm. Head pale ochreous. Antenna pale yellowish brown, ringed with blackish brown. Labial palpus and thorax yellowish brown, suffused with blackish brown. Ground colour of forewing ochreous, suffused with blackish; basal patch blackish brown, angulated at outer edge; area between basal patch and central fascia dark grey, lighter at costa; central fascia subtriangular, ochreous brown at dorsum, blackish at costa; on upper half of outer margin of central fascia a light yellow spot; preterminal and terminal patch tawny fuscous; apical spot ovate, indistinct, with darker centre, surrounded by fuscous line; cilia ochreous grey with fuscous basal line. Hindwing in male subtriangular, with sinuous termen and pointed apex, pale greyish white, semi-pellucid, becoming fuscous towards apex; distance (in males) between veins CuA1 and CuA2 about 1.5 times the distance between CuA1 and M3. Hindwing of female of normal shape, fuscous.

Genitalia, ♂ (figs 12, 15). Similar to those of L. virulenta virulenta, except that the two spine clusters at sacculus are linked by a shorter series of small spines (11-14 spines), caulis is smaller, and aedeagus is slightly longer than half length of caulis.

Genitalia, ♀ (fig. 18). Similar to those of virulenta virulenta, but sterigma more concave anteriorly, and ductus bursae about one fourth longer.

Bionomics. – Early stages unknown. Adults have been collected from the beginning of May to late
July in mixed deciduous forests. Gert Jeppesen (pers. comm.) found *L. virulenta mieana* by beating bushes of *Prunus padus*.

**Distribution.** – Denmark, Norway. *L. virulenta mieana* is less common than *reliquana*. Among the c. 160 specimens of *reliquana* in the collection of ZMUC we found only six specimens of *virulenta*.

**Remarks.** – *L. virulenta mieana* differs from the nominal subspecies in being overall darker, having the brownish areas of the forewings brownish to fuscous (ochreous to brownish in Japanese *virulenta*), and in having the light yellow spot on the upper half of the outer margin of the central fascia much more distinct. Japanese males of *virulenta* moreover have the light part of the hindwing more whitish, the termen of that wing more straight, and the distance between veins CuA1 and CuA2 about 1.5 times the distance between veins CuA1 and M3 (in *reliquana* this distance is about twice); the hindwing in females is similar to that of related species.

The forewing coloration and pattern in ssp. *mieana* are also very similar to those of *reliquana*, but in the latter the subtriangular dark area on the dorsal half between the basal patch and the central fascia is more pronounced; in ssp. *mieana* the small light yellow spot between the central fascia and the terminal patch is more distinct, and the plumbeous lines between the central fascia and the terminal patch are edged with light yellowish scales which give a more speckled appearance. The forewings of *reliquana* are more pointed apically compared with *virulenta*. Sexual dimorphism in *virulenta* ssp. *mieana* is slightly pronounced, with the male hindwing often darker than that of *reliquana*, subtriangular with a more sinuous termen (a fine diagnostic character); the distance (in males) between veins CuA1 and CuA2 about 1.5 times the distance between veins CuA1 and M3 (in *reliquana* this distance is about twice); the hindwing in females is similar to that of related species.

Our comparison of the specimens listed under `type material` below with material of *reliquana* and *virulenta* from Japan clearly shows that they are more closely related to the latter than to *reliquana*. Considering the small differences between the closely related species of this group in Asia we have, of course, discussed whether
Asthenia reliquana in fact represents a distinct species. However, to give a satisfying answer to this question one needs to study material from different intervening areas to see if intermediate populations occur. Information on the bionomics of *mieana* will probably also be helpful to clarify this. Based on our present knowledge we consider it, at least for the time being, most informative to treat *mieana* as a subspecies of *virulenta*.

**Type material.** – Holotype ♂, Denmark, NEZ, Asserbo, 31.v.1986 (P. Falck; gs. PF 1646; ZMUC).

Paratypes. DENMARK. WJ: Husby, 1♀ 27.vii.1979 (P. L. Holst; gs. PF 1678A; NHMÄ); LFM: Tømmerholt, 1♂ 13.vi.1970 (leg. K. Pedersen, ZMUC); Bøto, 1♀ 16.vi.1990 (G. Jeppesen; gs. PF 1656); Lognor, 1♀ 24.vi.1991 (P. Falck; gs. 1649); SZ: Gjørslev Bogeskov 1♂ 19.vi.1960 (E. Traugott-Olsen & N. L. Wolff; gs. ETO 906; ZMUC). NEZ: Tøkkeøb Hegn, 1♀ 28.v.1895 (C. S. Larsen; gs. PF 1677A; NHMÄ); Grønholt, 1♂ 4.vi.1965 (W. van Deurs; gs. PF ZM3; ZMUC); Ostrupgård, 1♂ 27.vi.1967 (J. E. Jelnes; ZMUC); Gribskov, 1♂ 7.v.1990 (G. Jeppesen; gs. PF 1657); B: Paradisbakkerne, 1♀ 1-2.vii.1978 (O. Karsholt; gs. OK 3243; ZMUC). NORWAY. Ø: Sarsborg, 1♂, 1♀ 25.v. & 5.vi.1921 (E. Barca; gs. ZMO 879, NISK 98016; NISK & ZMUC); VE: Larvik, Rakke, 1♂ 11.vi.1990 (L. Aarvik; gs. LAA 2543); AAY: Arendal, Bjelland, Tromøy, 1♂ 26.vi.1955 (A. Bakke; gs. NISK 98015; NISK), 1♂ same locality 25.vi.1986 (S. A. Bakke; gs. LAA 98043); STi: Trondheim, Sjetremyra, 1♂ 6.vii.1987 (S. A. Bakke; gs. LAA 98042).

Data from Norway are provided by Leif Aarvik. Where no depository is mentioned the specimens are in the collection of the collectors.

*Lobesia reliquana* (Hübner)

*Tortrix permixtana* Hübner, [1799] (misidentification).

*Asthenia reliquana* Hübner, [1825].

*Tortrix leucoptera* Frölich, 1828.

*Cochylis fischerana* Treitschke, 1835.

**Diagnosis.** – Adult (figs 6-8). Wingspan 12-14 mm. Forewing very similar to that of *virulenta* and *botrana* (compare these). Sexual dimorphism pronounced, in that males have the hindwing triangular with almost straight termen and pointed apex, whereas the hindwing in females is of normal shape. This is reflected in the venation of the male hindwing in which the distance between veins CuA1 and CuA2 is about double the distance between M3 and CuA1. The colour of the hindwing varies in males from whitish with dark grey apex to almost unicolorous blackish grey; all females have such unicolorous dark hindwings.

Genitalia, ♂ (figs 13, 16). Valva less broad and basally more curved compared with *virulenta*; sacculus also with two spine clusters, but the number of small spines linking the two clusters is less (4-8 in examined material). Aedeagus almost as long as caulis and almost twice as long as in *virulenta*, more curved and with a series of serrate dents on its dorsal wall. The abdominal segments distinctly sclerotized.

Genitalia, ♀ (fig. 19). Sterigma pear-shaped, more or less concave anteriorly, but abruptly tapering posteriorly; antrum becoming wider posteriorly; ductus bursa of same length as in *virulenta*; corpus bursae large and ellipsoidal; signum small and rhomboidal.

**Bionomics.** – The larva is described by Bradley et al. [1979: 68]. Its main host plant is *Quercus*, but larvae of *reliquana* have also been recorded from *Anchusa, Betula, Fagus, Juniperus, Prunus* and *Solidago* (Bradley et al., op cit.). Some of these host plants may eventually be referred to *virulenta*.

**Distribution.** – From Europe throughout the Palearctic region to Japan (Liu & Bae, 1994: 852; Razowski, 1996: 146).

**Remarks.** – *Tortrix permixtana* Hübner, [1799]: pl. 12, fig. 75 is a misidentification of *Tortrix permixtana* [Denis & Schiffermüller], 1775 (now in the Cochylini genus Gymnidomorpha). Hübner later on (1799: pl. 29, fig. 187) figured the correct *permixtana* D. & S., and he renamed ([1825]: 381) the species, which he had originally misidentified, *Asthenia reliquana*.

When Frölich (1828: 66) proposed the name *Tortrix leucoptera* he was apparently unaware that Hübner had already proposed a new name for his misidentified *permixtana*.

Treitschke (1835: 146-147) was aware of Hübner’s *reliquana*. However, he misidentified it and used the name for the European Vine Moth (*botrana*). Treitschke (1835: 145-146) moreover described a similar species as *Cochylis fischerana*. A single syntype of this taxon is kept in the Treitschke collection at The Natural History Museum in Budapest. Through the kindness of László Ronkay of that museum we had the opportunity to study that specimen. Judging from the wing pattern we consider it belongs to *reliquana* (Hb.). However, it has a (false) male abdomen glued on, and by dissection that proved to belong to *Phiaris*
Lobesia botrana
([Denis & Schiffermüller])


Diagnosis. – Adult (figs 9-10). Wingspan 9-14 mm. Forewing light greyish brown; outer margin of central fascia black from costa to the small yellowish spot between central fascia and terminal patch. Sexual dimorphism only slightly pronounced, with hindwing in male similar to that of female but lighter, especially towards base, and distance between veins CuA1 and CuA2 about equal to distance between M3 and CuA1 in both sexes.

Genitalia, ♀ (fig. 14). Resembling those of reliquaesa. Valva slender; spine clusters at sacculus not linked by row of small spines; aedeagus shorter than caulis, straight, gently tapering towards apex; with a few extremely minute dents on proximal half of its left wall. Abdominal segments weakly sclerotised.

Genitalia, ♂ (fig. 20). Sterigma tongue-shaped, wrinkled posteriorly; ductus bursae of about same length as in reliquaesa; signum about three quarters the length of corpus bursae, with distinct medial keel.

Bionomics. – A description of the larva is given, e.g., by Bradley et al. (1979: 70). It feed on various shrubs and climbing plants including Clematis, Svidia, Lonicera, Viburnum, Ligustrum, Ribes, Hedera and Berberis, but it is especially well known as a pest of grapes, Vitis vinifera. It is bivoltine in central Europe, but in warmer regions there are three or more generations (Bradley et al., op cit.). Because of its status as a serious pest on grapes there is an extensive literature on the biology and the control of this species (see Roerich & Boller (1991: 512-514) for further references).

Distribution. – Southern part of central Europe, South Europe, North and East Africa, Middle East, Central Asia (Bradley et al., 1979: 70; Razowski, 1996: 145). Records from Japan are due to misidentification (Bae & Komai, 1991: 115), as are records from North America. L. botrana has sometimes been found in North Europe, but such records probably refer to specimens introduced with grapes as larvae or pupae.

Remarks. – Kosako (1984: 136) considered Tortrix botrana Denis & Schiffermüller to be a nomen nudum and replaced it by vitisana Jacquin, 1788. However, this is not in accordance with the generally accepted interpretation of Denis & Schiffermüller’s names (Sattler & Tremewan, 1984).

Dansk sammendrag

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Literature


