Redescription of *Stigmella kurilensis* Puplesis (Lepidoptera, Nepticulidae), found on Hokkaido

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蝶と蛾

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Abstract *Stigmella kurilensis* Puplesis, 1987 is recorded for the first time from the island of Hokkaido. The species is redescribed on the basis of the holotype and two specimens from Hokkaido. The generic position of this aberrant species is discussed.

Key words Lepidoptera, Nepticulidae, *Stigmella kurilensis*, redescription, Japan, Palaearctic region.

Stigmella kurilensis Puplesis, 1987 was described on the basis of a single male from Kunashiri Island in the Kuril Archipelago, close to Hokkaido.

Two specimens were taken in 1994 by K. Ijima in Shibecha, Hokkaido. Because we noticed some differences in the male genitalia from the figures by Puplesis (1987), we have examined the holotype, redescribe the species here and discuss its generic position.

The genus *Stigmella* in Japan was first revised by Kemperman *et al.* (1985), who recognized 40 species; Kuroko (1999) also listed 40 species. *Stigmella egregilustrata* Kemperman & Wilkinson, 1985 was subsequently synonymised with *S. caesurifasciella* Kemperman & Wilkinson, 1985 and *S. kurii* Kemperman & Wilkinson, 1985 and *S. chrysopterella* Kemperman & Wilkinson, 1985 were both tentatively synonymised with *S. fumida* Kemperman & Wilkinson, 1985 (Puplesis, 1994; Van Nieukerken & Liu, 2000), so that the total number of *Stigmella* species known from Japan, including *S. kurilensis*, is now 38.

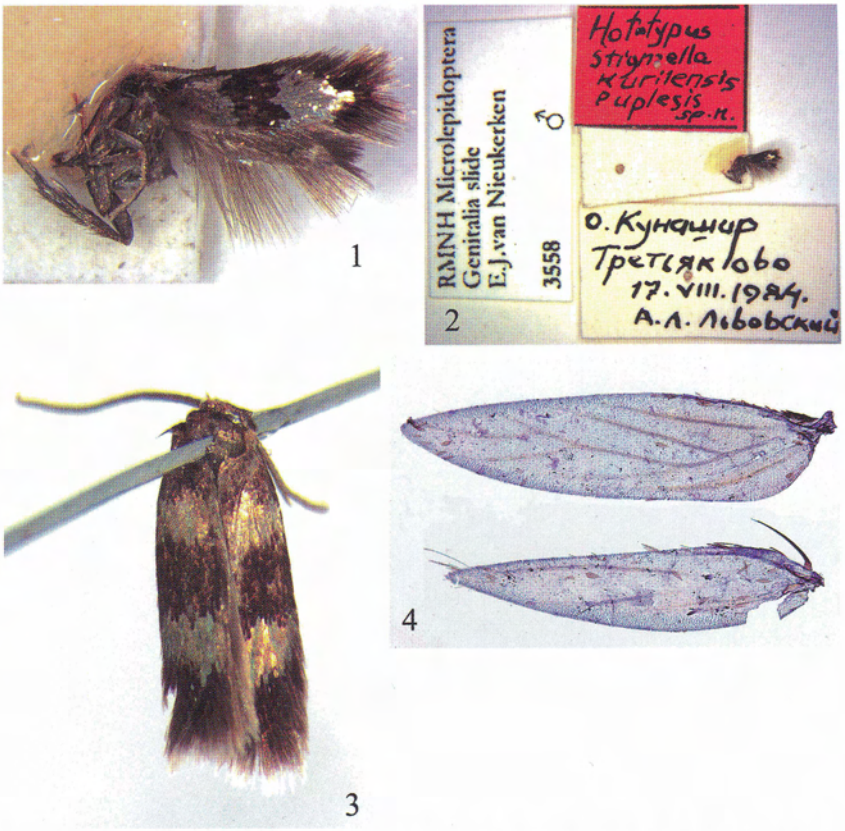
Methods

Genitalia were prepared following standard procedures, and embedded in Euparal. They were stained with Haemaluin acc. to Mayer (holotype) or with aceto-carmine. Photographs were taken with a Zeiss AxioCam digital camera attached to a Zeiss Axioskop H (genitalia and wing slides) or a Zeiss Stemi SV 11 (moths and labels), using Carl Zeiss AxioVision 3.0.6 software. Measurements of genitalia were taken digitally with photographs prepared in this way and calibrated scalings. The map was prepared with DMAP 7.0.

Stigmella kurilensis Puplesis (Figs 1–11)

Stigmella kurilensis Puplesis, 1987: 8–10, figs 1–2, 9; Puplesis, 1994: 62; figs 127–128; Puplesis & Diškus, 1997: 305, fig. 202: 2; Diškus & Puplesis, 2003: 324.

Redescription. Male. Forewing length 2.2–2.5 mm. Head: frontal tuft pale yellowish, collar worn in all specimens, scape white. Antenna long, with 48 segments. Thorax and forewing brown, forewing with two broad brassy fasciae, a basal one almost from wingbase to 1/3, a second one from 2/3 almost to wingtip, leaving a narrow brown patch at wingtip;



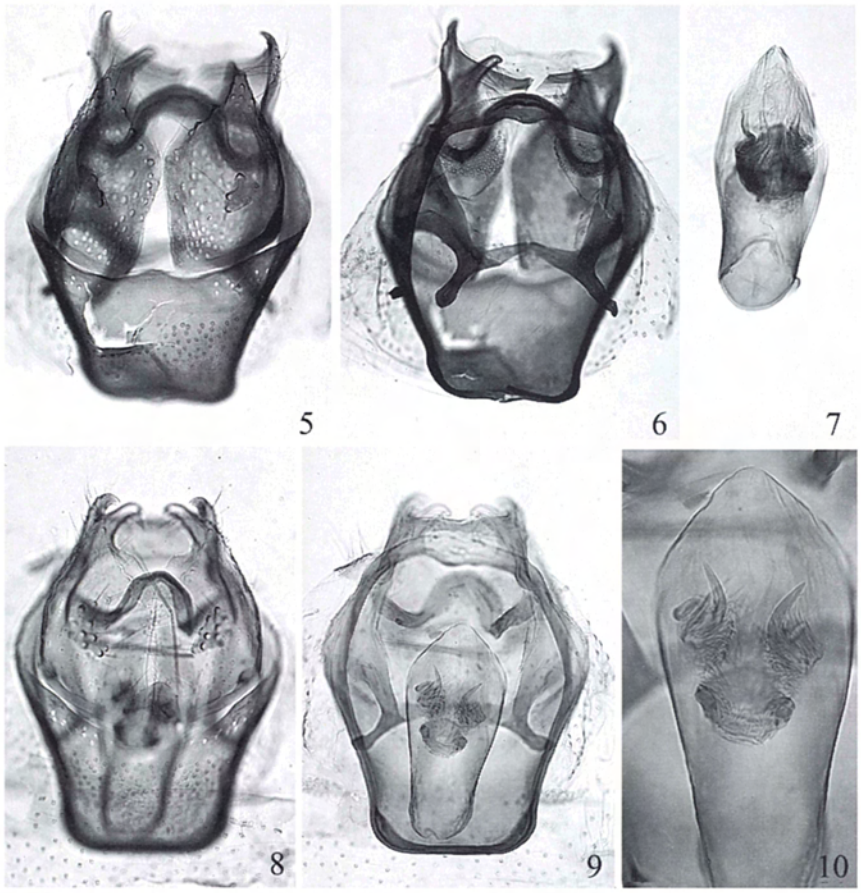
Figs 1–4. *Stigmella kurilensis*, ♂. 1, 2. Holotype glued on card, labels in 2. 3. Specimen from Japan. 4. Descaled left wings of holotype.

cilia line absent, cilia slightly paler, grey, at tips. Hindwing grey-brown, underside wings grey-brown. Abdomen brown; tergite 8 with a pair of prominent greyish tufts, pairs of smaller tufts present on tergites 5, 6 and 7.

Venation forewing (Fig. 4): Rs+M coalescing at base with Cu, with 6 terminal branches (R_1, R_{2+3}, R_{4+5}, M_1, M_2, Cu), no closed cell.

Male genitalia (Figs 5–10). Capsule length 290–295 μm. Vinculum with large anterior extension, anterior margin straight; tegumen reduced or absent. Uncus broad, lateral corners produced into curved posterior processes. Gnathos a broad and curved band. Valva length 200–205 μm, pointed, slightly curved distal process, inner margin slightly sinuous to straight; on dorsal face with setose lobe; transtilla with strong transverse bar, sublateral processes distinct. Aedeagus length 195–210 μm; ventrally with juxta-like lobed process. On vesica a pair of curved horns, length 35–39 μm, no other cornuti.

Specimens examined. Holotype ♂, [RUSSIA, (Sakhalin Obl.)], Kunashir Island, Tret'yakovo, 17. viii. 1984, A. L. Lvovskiy, Genitalia, wing slide EvN 3558 (Zoological Institute, Academy of Sciences, St. Petersburg); 2♂, JAPAN, Hokkaido, Shibecha, Kushiro, 6. vi. 1994, K. Ijima (Osaka Prefecture University, and National Museum for Natural History Naturalis, Leiden).



Figs 5–10. *Stigmella kurilensis*, ♂ genitalia, resp. more ventrally and more dorsally focused, aedeagus. 5–7. Holotype, slide EvN3558. 8–10. Japan, Shibecha, Kushiro, Slide HK1044, aedeagus enlarged.

Biology. Host unknown. Possibly bivoltine, adults taken in early June and August.

Distribution. Japan: Hokkaido [43°17′N, 144°34′E] and the S. Kurils: Kunashiri Island [43°59′N, 145°38′E]. See map (Fig. 11).

Remarks. The holotype is glued on a card (Figs 1, 2), in rather poor condition (antennae broken). The genitalia were kept in sugar solution, and were stained and remounted in 2004 by EvN into euparal. The descaled left wings were remounted from glycerine on the same slide in euparal, after staining with haemaluin according to Mayer (Fig. 4). The original figures of the genitalia did not correctly show the internal structures of the aedeagus (poorly visible in glycerine): the illustrated small cornuti are not present, but the pair of curved cornuti is (poorly) visible in the euparal slide (Fig. 7). The illustration of the venation by Puplesis shows one vein too many: a distinct Sc, which we did not see.

Discussion

Stigmella kurilensis does not resemble any other nepticulid, and its generic placement is

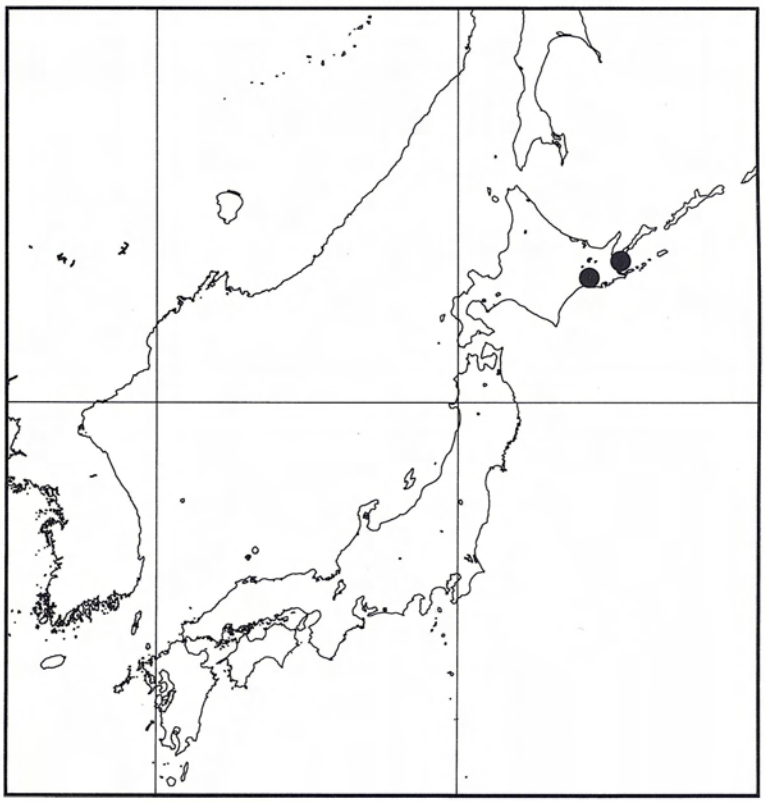


Fig. 11. Localities for *Stigmella kurilensis*.

therefore difficult to assess. Puplesis (1987, 1994) placed it in a separate monotypic species-group in *Stigmella*, without giving arguments for its generic placement. Double fasciae are rare in Nepticulidae, but occur frequently in the Asiatic species of *Enteucha* and in most *Ectoedemia* (*Etainia*). However, *S. kurilensis* does not share important apomorphic characters with these (see Van Nieukerken, 1986). The abdominal tufts are also remarkable: tufts on segments other than 8 occur in most *Trifurcula* and in the *Acalyptris repeteki* group; however these genera belong to the Trifurculini, and *S. kurilensis* does not share any of its apomorphies (Van Nieukerken, 1986).

The venation lacks the closed cell, and therefore resembles *Stigmella* most, although it has an unusually large number of terminal branches (see Van Nieukerken, 1986). In fact it is also rather similar to that of *Bohemannia*, which has entirely different genitalia and belongs also to the Trifurculini.

The condition of the uncus does however argue for inclusion in *Stigmella*, the bilobed uncus being the only adult autapomorphy for the genus, the other one is a larval character (Van Nieukerken, 1986). It resembles the condition of the uncus in several primitive *Stigmella* species. The gnathos is of the generalized nepticulid type, which occurs only in a few *Stigmella*. The condition of the collar, an apomorphy for *Stigmella* and *Enteucha*, could not be studied in these specimens.

For the time being, the best solution is to keep *kurilensis* in *Stigmella* on the basis of uncus

and venation. The whole concept of *Stigmella* is somewhat tenuous, there is a large core of species sharing several apomorphies, surrounded by groups of aberrant *Stigmella*. A first molecular analysis (Van Nieukerken & Groenenberg, unpublished) shows the possibility that *Stigmella* is actually paraphyletic, but support for this is still weak.

Acknowledgements

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摘　　要

北海道で発見された *Stigmella kurilensis* Puplesis (鱗翅類, モグリチビガ科) の再記載 (Erik J. van Nieukerken・黒子　浩)

Stigmella kurilensis Puplesis, 1987 (クナシリモグリチビガ) は千島列島, 国後島産の1♂に基づき記載された種であり, 暗褐色の前翅に金属光沢 (真鍮色ないし銀鉛色) の幅広い2横帯があるので, 同属の他種とたやすく識別できる. 今回, 北海道, 標茶で採集された飯島一雄氏の標本の中に2♂を発見したので, 北海道を新たな産地として報告すると共に, 正確な再記載を行った.

原記載においては aedeagus の内部構造が正しく理解されていない. 即ち aedeagus 内にあるとされる小さな多くの cornuti は存在せず, 中央先端寄りに1対の曲がった cornuti がある.

なお本種は *Stigmella* としては特異な形質をもった種であるので, 種の位置づけについても論じている.

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