

Acrolepiopsis Gaedike, 1970

2. *suzukiella* Matsumura, 1931, 6000 Ill. Ins. Japan.: 1096 [*Argyresthia*]. = *dioscoreae* Moriuti, 1961, Pub. Ent. Lab. Univ. Osaka Pref., 6: 27 [*Acrolepia*].
Distribution: Japan (Honsyû and Kyûsyû).
3. *albicomella* n. sp.
Distribution: Japan (Honsyû).
4. *alliella* Semenov et Kuznetsov, 1956, Zool. Zhurn., 35: 1676 [*Acrolepia*].
Distribution: Japan (Hokkaidô, Honsyû, Sikoku, and Kyûsyû), Southern Kurile Islands, and Siberia.
5. *issikiella* Moriuti, 1961, Pub. Ent. Lab. Univ. Osaka Pref., 6: 25 [*Acrolepia*].
Distribution: Japan (Honsyû and Kyûsyû).
6. *postomacula* Matsumura, 1931, 6000 Ill. Inst. Japan.: 1096 [*Eidophasia*]. = *argolitha* Meyrick, 1932, Exot. Microlep., 4: 227 [*Acrolepia*].
Distribution: Japan (Hokkaidô and Honsyû).
7. *delta* Moriuti, 1961, Trans. Lep. Soc. Japan, 12: 30 [*Acrolepia*].
Distribution: Japan (Honsyû).
8. *clavivalvatella* n. sp.
Distribution: Japan (Honsyû).

Roeslerstammia Zeller, 1839

9. *nitidella* n. sp.
Distribution: Japan (Honsyû).
10. *bella* n. sp.
Distribution: Japan (Sikoku).

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TWO NEW ECONOMICALLY IMPORTANT SPECIES OF MICROLEPIDOPTERA INFESTING LARCH IN JAPAN (LEPIDOPTERA: COLEOPHORIDAE AND TORTRICIDAE)

SIGERU MORIUTI

Entomological Laboratory, College of Agriculture, University
of Osaka Prefecture, Sakai, Japan

Synopsis. Two new species are described: *Coleophora longisignella* belonging to Coleophoridae and *Spilonota eremitana* to Tortricidae, both being pests of larch in Japan. The former has hitherto appeared in the Japanese literature as *Coleophora laricella* (Hübner) and the latter as *Spilonota laricana* (Heinemann).

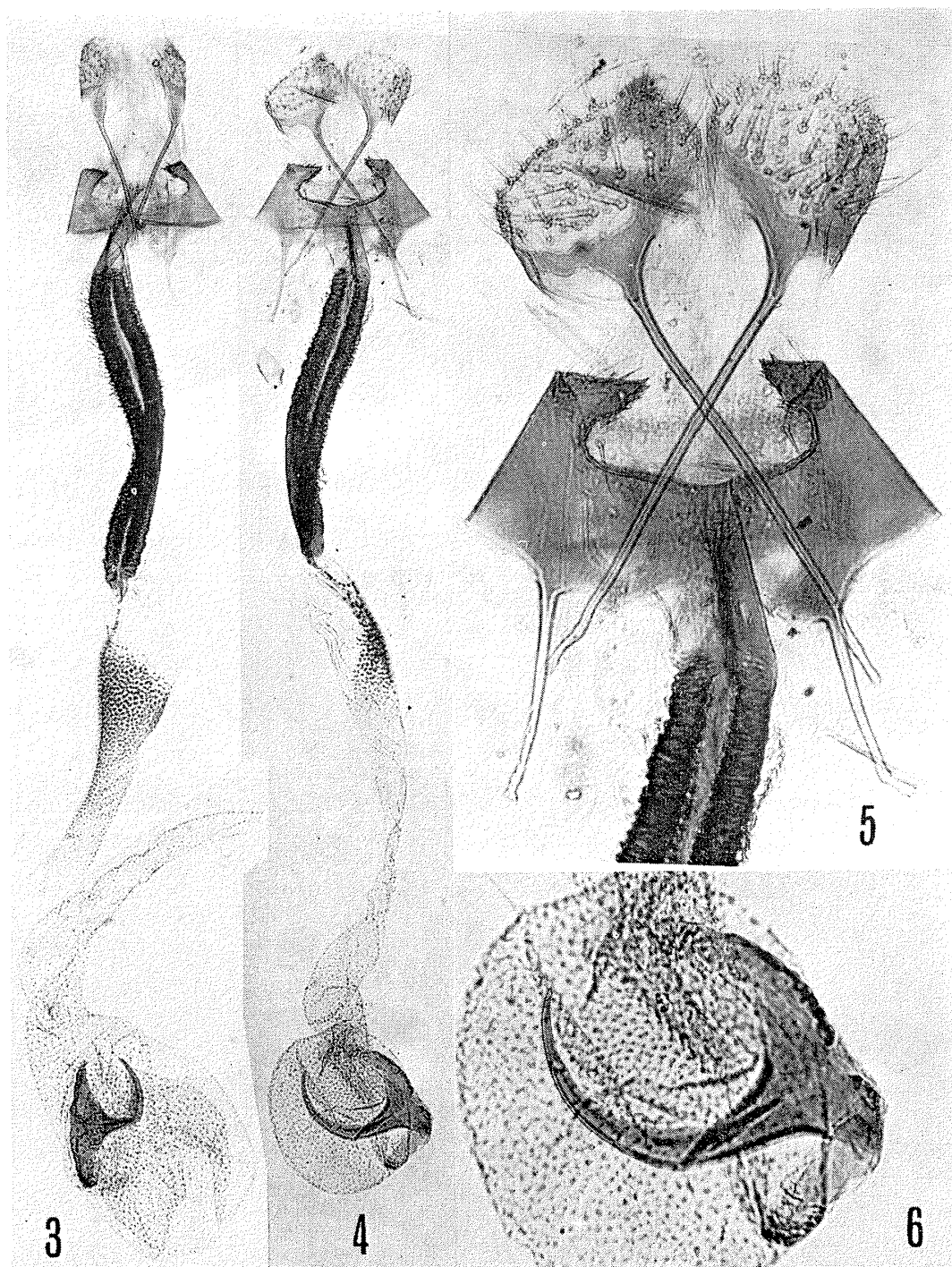
It is well known that *Coleophora laricella* (Hübner) and *Spilonota laricana* (Heinemann) are serious pests of larch in Japan. The Japanese and European specimens of both the species have been compared, thus establishing that they are not conspecific. The two Japanese species are described as new.



Coleophoridae

Coleophora longisignella n. sp. [Japanese name: Karamatu-tutu-minoga] (Figs. 1, 4–8)

Coleophora laricella: Murata (not Hübner, 1817), 1916, p. 448–455. — Kitayama, 1917, p. 15–18. — Matsumura, 1917, p. 493–494. — Ando *et al.*, 1919, p. 1–20. — Nijima, 1923, p. 261–264, f. 1–5. — Matsumura, 1931, p. 1100, f. 2280. — Matsushita, 1943, p. 249–251, f. 102. — Inoue, 1954, p. 29, no. 126. — Issiki, 1957, p. 31, no. 123, pl. 4, f. 123. — Okano, 1959, p. 275, pl. 182, f. 1. — Ito, 1959, p. 17–18, no. 1, f. A. — Issiki & Mutuura, 1961, p. 28–29, no. 13, f. 12; *id.*, 1962, p. 7, no. 58. — Issiki, Kodama & Moriuti, 1962, p. 14–15, f. 3 (A–H). — Ito & Aino, 1970, p. 127, f. 127 (1–4).



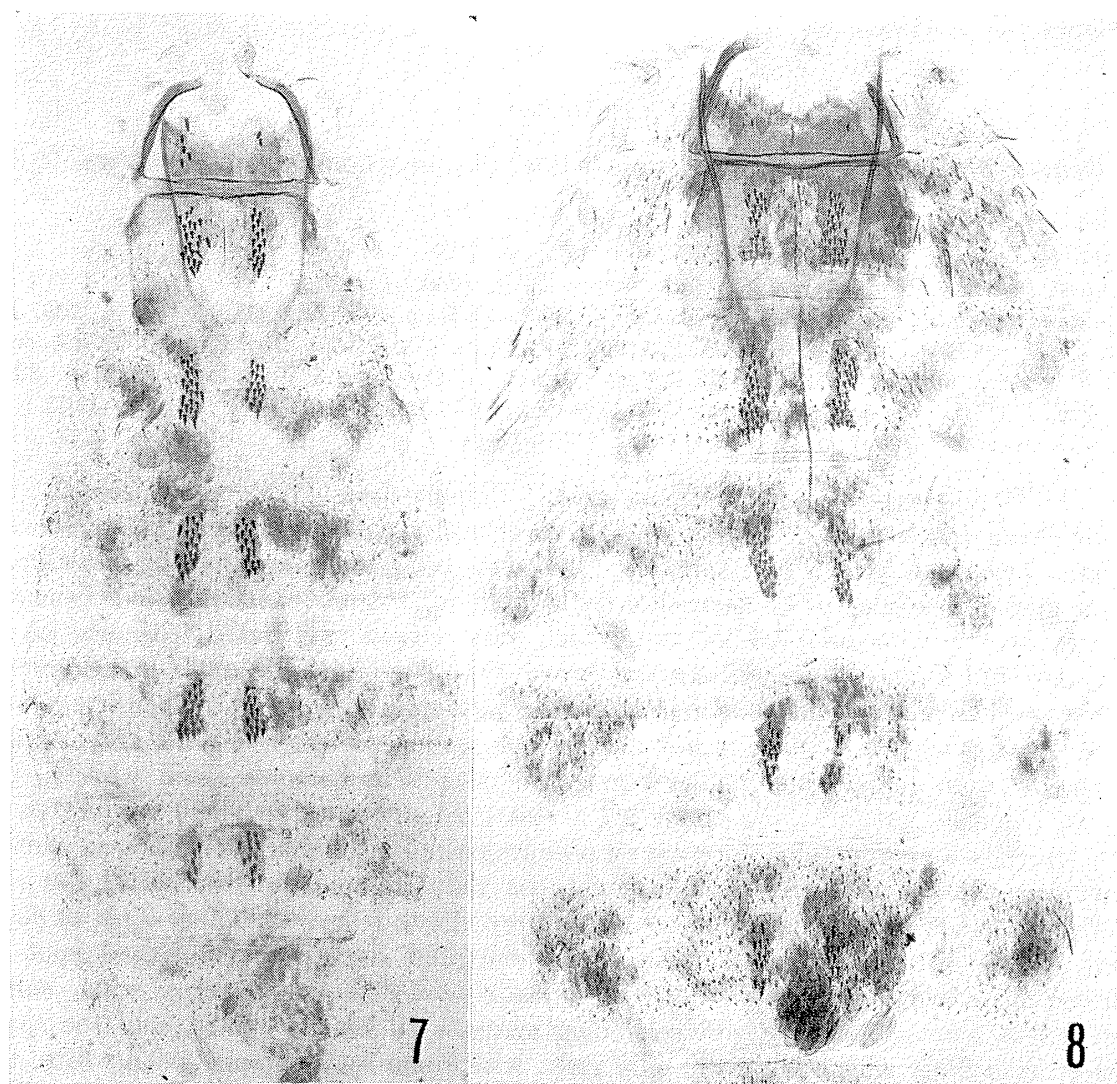
Figs. 3–6. *Coleophora* spp., ♀ genitalia: (3) *C. laricella* (Hübner), Berlin, Europe; (4) *C. longisignella* n. sp., paratype, Yatugadake, Japan; (5) *ditto*, bursa copulatrix omitted, paratype, Yatugadake, Japan; (6) *ditto*, signum, paratype, Yatugadake, Japan.

♂♀. 8–10 mm. Head, thorax, legs, and abdomen grey. Antenna grey, faintly annulated with greyish-brown; scape with rough scales. Palpus with middle segment a little longer than terminal one; dark grey, the inner side being suffused with greyish-white except at apex. Forewing dark grey, somewhat ochreous-tinged, with faint coppery gloss; cilia grey. Hindwing grey to dark grey; cilia concolorous with those of forewing.

Abdominal tergal spines as shown in figs. 7 and 8.

Male genitalia: as in fig. 1. Gnathal arm with several hairs; ventral plate broadly U-shaped in ventral view. Valva having a short, lightly sclerotized dorso-distal lobe with slender hairs; valvula well sclerotized, large, broad, clothed with stiff hairs, the distal margin being rounded; disc with a small subconical process; sacculus short, curving gently and terminating in a blunt apex. Anellus with a pair of unarmed lateral rods which are evenly bent ventrad and gradually narrowed to apices. Aedeagus curved; cornuti in a bundle of about 30 spines of varying size.

Female genitalia: as in figs. 4–6. Eighth abdominal segment with ventral distal corner strongly produced inwardly and hindwardly into a prominently elongate process, the apex of which is sharply pointed, and the margin of which is armed with many microscopic spines. Sterigma transversely narrow, simple, the anterior margin being nearly straight and the posterior margin weakly concave. Ductus bursae long, spiculate on its posterior



Figs. 7–8. *Coleophora longisignella* n. sp., abdomen, dorsal aspect: (7) ♂, 1st–6th segments, holotype; (8) ♀, 1st–5th segments, paratype, Yatugadake, Japan.

1/3 except for a short posterior portion, and prominently denticulate on its median portion; corpus bursae oval; signum long, curved, with a developed basal dilation.

Holotype, ♂, Tatesina, Nagano Prefecture, Honsyû, emerged 10. VI. 1968 (S. Moriuti), reared from larva feeding on leaves of *Larix leptolepis* Gordon, in the collection of Entomological Laboratory, University of Osaka Prefecture. Paratypes: 9♂, same data as for type; Honsyû— 1♂, Yatugadake-Nôgyô, Nagano Pref., emerged 8. VI. 1956 (S. Moriuti), reared from *L. leptolepis*; 2♂, 2♀, Yatugadake, Nagano Pref., emerged 9–10. VI. 1956 (T. Ito), reared from *L. leptolepis*; all in the Ent. Lab., Univ. Osaka Pref.

Distribution: Japan (Hokkaidô and Honsyû).

Host-plant: *Larix leptolepis* (Siebold et Zuccarini) Gordon (Pinaceae).

Remarks: This species is very closely related to *Coleophora laricella* (Hübner, 1817), with which it has long been confused. It is difficult to separate, with certainty, from *laricella* in superficial appearance and in female genitalia. The males can be easily separated by genitalia. The valvula of *longisignella* is much broader than that of *laricella*; the sacculus of *longisignella* is weakly curved but that of *laricella* strongly curved.

C. laricella known as the larch casebearer is of European origin and was introduced into North America. This species and *longisignella* are similar in the life history and habits. The immature forms, life history, and behaviour of *longisignella* have been given by Kitayama (1917), Issiki and Mutuura (1961), Issiki *et al.* (1962) and others, under the name *Coleophora laricella* (Hübner).

Tortricidae

Spilonota eremitana n. sp. [Japanese name: Karamatu-hime-hamaki] (Figs. 9, 12, 14–16)

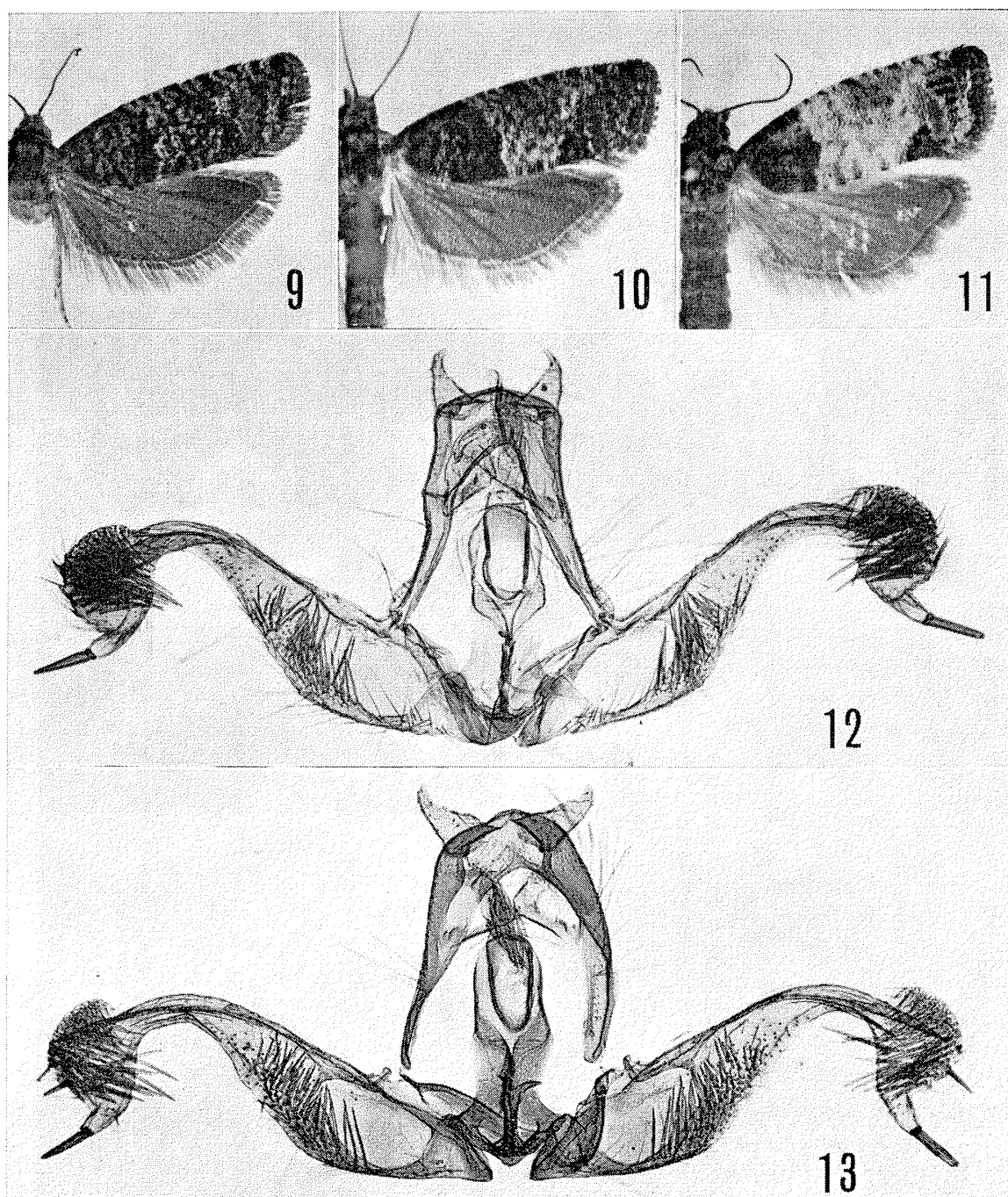
Spilonota ocellana 'larch-feeding form' Issiki, 1932, p. 1462.

Spilonota ocellana lariciana: Issiki (not Zeller, 1873), 1950, p. 480.

Spilonota laricana: Issiki (not Heinemann, 1863), 1957, p. 63, no. 293, pl. 10, f. 293. — Moriuti, 1957, pp. 8, 11, pl. 1, f. 9. — Okano, 1959, p. 260, pl. 174, f. 35. — Ito, 1959, p. 18–20, no. 2, f. B. — Issiki & Mutuura, 1961, pp. 27, 47, no. 10, f. 10. — Nakahara & Kobayashi, 1962, p. 23–33, pl. 1–2, f. 1–10. — Issiki & Mutuura, 1962, p. 5, no. 40. — Issiki, Kodama & Moriuti, 1962, p. 10–12, f. 2 (A–H). — Itô & Aino, 1970, p. 123, f. 126 (1–6).

♂♀. 11–15 mm. Head and antenna grey. Palpus dark grey, pale-speckled, the inner side being much paler. Thorax grey; tips of scales pale grey, forming an obscure irroration. Legs pale grey, pale-speckled, the mid tibia and tarsus being dark grey. Abdomen grey. Forewing with termen a little oblique, straight and rounded beneath; basal patch occupying nearly 2/5 of wing, dark grey, mixed or striated with whitish or leaden scales, and limited by a well-marked broad stria, sometimes its outer margin being obtusely angulated above fold; beyond this, wing predominantly grey, rather irregularly strigulated with white or whitish scales mixed with leaden scales; five dark grey streaks from costa between middle and before apex, and interstices between them whitish, the first streak being largest, reaching about 3/7 across wing, the anterior three tending to be confluent apically and sometimes forming an obscure costal patch marked with two whitish strigulae, and the fourth shortest and sometimes reduced to merely a costal dot; an irregularly shaped, weakly inwardly curved dark grey streak from just before apex of costa to about middle of termen; a distinct elongate-triangular dark grey praeternal spot on dorsum; ocellus enclosed by obscure leaden streaks reaching about 3/4 across wing, sometimes confluent beneath, the outer streak being mixed with whitish scales, and the space between streaks filled with dark grey; cilia grey, with some scales tipped with white, the basal line being leaden-grey. Hindwing grey; cilia pale grey, with a darker subbasal line.

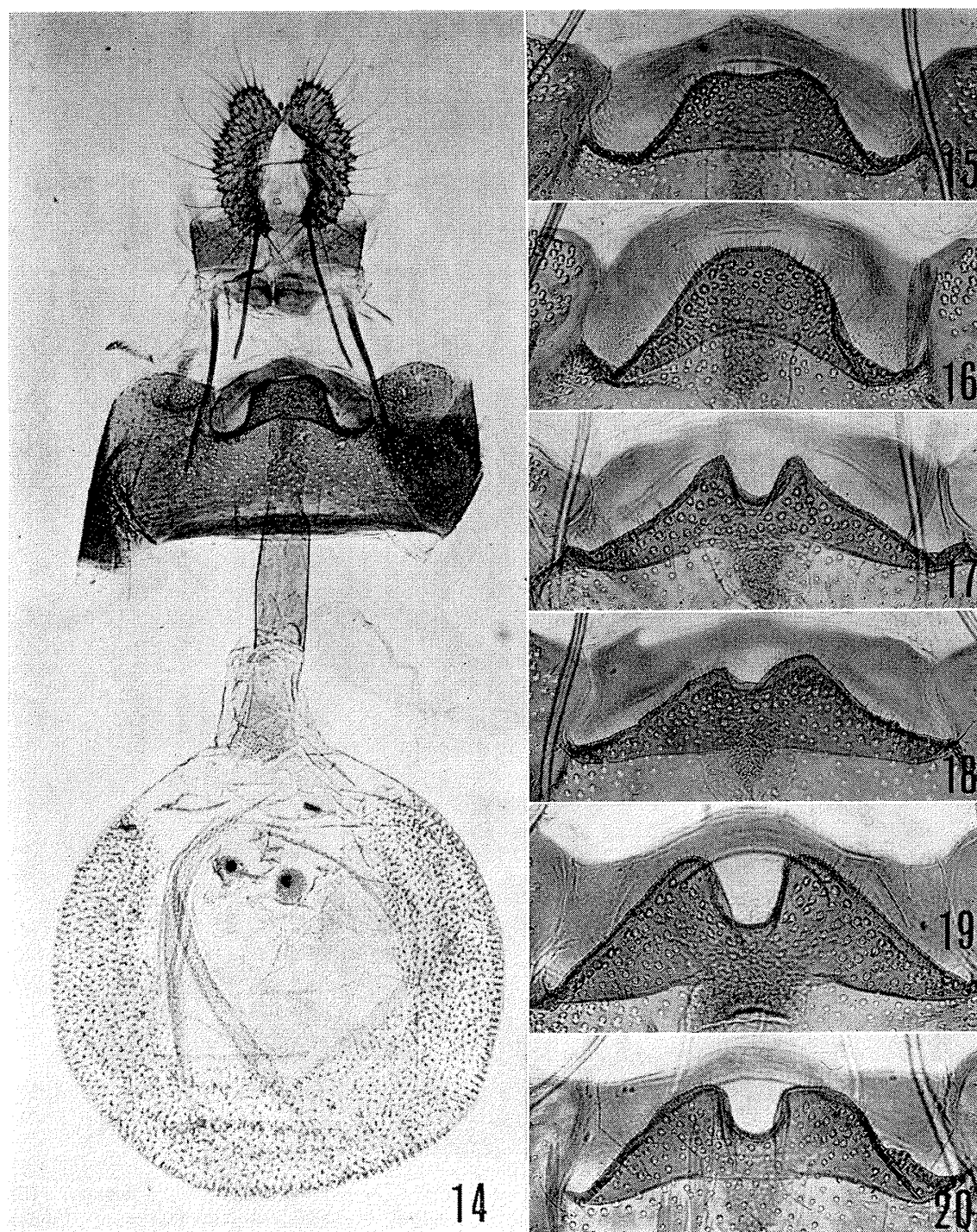
Male genitalia: as in fig. 12. Uncus greatly reduced. Socius erect, short, concave



Figs. 9-13. *Spilonota* spp., wings and ♂ genitalia: (9) *S. eremitana* n. sp., ♀, holotype; (10) *S. laricana* (Heinemann), ♂, Równica, Europe; (11) *S. ocellana* (Schifferrmüller et Denis), ♂, Ikeda, Japan; (12) *S. eremitana* n. sp., paratype, Sin'yu, Japan; (13) *S. laricana* (Heinemann), Wien, Europe.

at apical 1/3 in inner wall, and thence narrowing to apex. Gnathos free and weak. Valva elongate, narrow, and curved; cucullus armed with a strong spine; neck very narrow. Aedeagus short; supporting arm of anellus very stout; cornuti composed of a cluster of 7-9 slender, elongate spines and easily shed.

Female genitalia: as in figs. 14-16. Papilla analis flattened, with numerous hairs; anterior portion narrow and weakly bending inwards. Seventh abdominal sternite produced into a large, trapeziform to rounded lodix, the caudal margin of which is straight, slightly concave or evenly convex. Ostial opening oval; ductus bursae well sclerotized, except for a short membranous posterior portion; corpus bursae round, with a pair of short,



Figs. 14-20. *Spilonota* spp., ♀ genitalia; (15-20) lodix: (14) *S. eremitana* n. sp., paratype, Abasiri, Japan; (15) *ditto*, holotype; (16) *ditto*, paratype, Sin'yu, Japan; (17) *S. laricana* (Heinemann), Linz, Europe; (18) *ditto*, Równica, Europe; (19) *S. ocellana* (Schiffermüller et Denis), Hukusima, Japan; (20) *ditto*, Eberswalde, Europe.

curved, pointed signa, which are equal in size.

Holotype, ♀, Sin'yu, Nagano Prefecture, Honsyû, emerged 12. VI. 1956 (S. Moriuti), reared from larva feeding on leaves of *Larix leptolepis* Gordon, in the collection of the Entomological Laboratory, University of Osaka Prefecture. Paratypes: Hokkaidô- 1♀, Abasiri, 30. VII. 1963 (S. Moriuti); 1♂, Asahikawa, emerged 29. VI. 1958 (T. Yasuda), reared from *L. leptolepis*; Honsyû- 19♂, 27♀, Sin'yu, Nagano Pref., emerged 11-24. VI.

1956 (S. Moriuti), reared from *L. leptolepis*; 2♂, 5♀, Tatesina, Nagano Pref., emerged 13–19. VI. 1968 (S. Moriuti), reared from *L. leptolepis*; all in Ent. Lab., Univ. Osaka Pref.

Distribution: Japan (Hokkaidô and Honsyû). This species is distributed practically throughout the range of its host-plant.

Host-plants: *Larix leptolepis* (Siebold et Zuccarini) Gordon (Pinaceae). Besides it, *L. dahurica* Turczaninov var. *japonica* Maximowicz, *L. d.* var. *olgensis* Henry, and *L. decidua* Miller were recorded by Nakahara and Kobayashi (1962).

Remarks: This species is very closely allied to *Spilonota ocellana* (Schiffermüller et Denis, 1775) and *S. laricana* (Heinemann, 1863), but it may be distinguished from them by the following characters:

	<i>eremitana</i> n. sp.	<i>laricana</i> (Heinemann)	<i>ocellana</i> (S. et D.)
Forewing: width (length/width ratio)	medium ($2.62 \pm 0.03^*$).	narrow ($2.70 \pm 0.02^{**}$).	broad ($2.46 \pm 0.04^{***}$ or $2.47 \pm 0.07^{****}$).
Forewing: size of basal patch	occupying nearly 2/5 of wing (fig. 9).	occupying nearly 2/5 of wing (fig. 10).	occupying about 1/3 of wing (fig. 11).
Forewing: space between basal patch and praeternal spot	predominantly grey (fig. 9).	predominantly white or whitish-grey (fig. 10).	predominantly white (fig. 11).
Female genitalia: lodix	trapeziform to rounded, without an emargination (figs. 14–16).	subtriangular, with a median emargination (figs. 17, 18).	subtriangular, with a median emargination (figs. 19, 20).
Host (phagy)	<i>Larix</i> (monophagous).	<i>Larix</i> (monophagous).	<i>Prunus</i> , <i>Malus</i> , <i>Alnus</i> , etc. (oligophagous).

S. ocellana, known as the eye-spotted bud moth, ranges throughout most of the Palaearctic Region. The food plants include apple, pear, peach, plum, hawthorn, laurel, oak, alder, etc., and it is chiefly a pest of apple. *S. laricana*, known as the Lärchennadelwickler, occurs in Europe, and is a pest of larch. Both the species also occur in North America, the distribution being due to accidental importations.

The three species *eremitana*, *laricana* and *ocellana* form an extremely compact group. In the male genitalia it is difficult to separate one from the other, and no good specific characters can be found. However, in the female genitalia it is possible to distinguish *eremitana* from *laricana* and *ocellana* by the shape of lodix as mentioned above. In the superficial appearance the three species can be separated from one another as already mentioned. In the larval and pupal stages it is difficult to distinguish the three by morphological characters. On account of their close similarities it is believed that the three species have derived from a common ancestor (fig. 21). If the host relationship of the three species is taken into consideration, *laricana* and *eremitana* must be most closely related together, as shown in fig. 21, A. So far as based on the similarity in the male and female genitalia, however, *laricana* is much more closely related to *ocellana* than to *eremitana* as shown in fig. 21, B. I strongly incline to the view that *eremitana* is the earliest offshoot.

The life history and behaviour of *eremitana* have been given by Nakahara and Kobayashi (1962) in detail, and descriptions of the larva and pupa by Moriuti (1957), Issiki and Mutuura (1961), and others, under the name *Spilonota laricana* Heinemann.

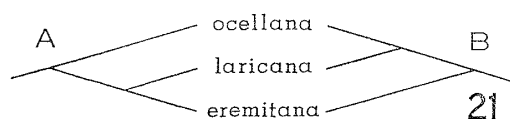


Fig. 21. Relationships between the three closely related species of *Spilonota*.

* 30 Japanese, ** 13 European, *** 30 Japanese, and **** 16 European examples were measured.

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