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TAXONOMIC STUDIES ON  
THE LITHOCOLLETINAE OF JAPAN  
(LEPIDOPTERA : GRACILLARIIDAE)

Part II<sup>1)</sup>

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In this part there are given twenty-nine species attacking Ulmaceae, Rosaceae, Leguminosae, Aceraceae, Ericaceae and Caprifoliaceae, and two host-unknown species of the Lithocolletinae. Moreover, two new genera are erected for the reception of four new species attacking Leguminosae.

**7. Species attacking Ulmaceae**

**32. *Lithocolletis tritorrhecta*** Meyrick (Fig. 1; 3, I-K)

*Lithocolletis tritorrhecta* Meyrick, 1935, Exot. Microlep. 4 : 596; Issiki, 1950, Icon. Ins. Jap. : 454, f. 1224.

*Phyllonorycter tritorrhecta*: Inoue, 1954, Check list Lep. Jap. 1 : 28.

This species is represented by the aestival and autumnal forms, which are different in colour.

Aestival form: ♂♀. Face silvery-white; palpus whitish, with a blackish streak on posterior surface; tuft of head golden-ochreous, mixed with many whitish scales in centre; antenna white, each segment ringed with dark brown apically. Thorax golden-ochreous, with two white, wide lines running along inner margins of tegulae, and with a white, small spot at posterior angle. Legs whitish; fore tibia clouded inside; mid tibia with three oblique black streaks outside; all tarsi with black blotches or spots at base, basal 1/3, 3/5 and 4/5.

Fore wing golden-ochreous, with white markings. Medio-basal streak rather narrow, nearly straight, almost touching first fascia, without any dark marginal scales. Three narrow fasciae, of which the first is placed at basal 1/4, second at middle and last at 3/4, slightly oblique inwardly from costa, moderately angulated outwardly just above middle across wing, and sparsely margined with dark irrorations internally; last fascia usually interrupted at its angle with a wide streak of black irrorations, which extends outwardly along dorsal edge of a white, inwardly oblique costal streak placed near apex of wing. A black-speckled line in cilia running along apical margin of wing between tornus and third

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1) Part I: Insecta Matsumurana, Vol. 25, No. 2, pp. 53-90, April, 1963.

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costal mark; cilia pale ochre-grey. Hind wing grey, with cilia pale grey.

Expanse of fore wings, 5.0-6.0 mm.

Male genitalia symmetrical. Valva rather short, ending in a downward pointing beak-shaped spine, and being weaker and wrinkled on costal area. Saccus very short. Flap of ninth sternite as long as wide, subrectangular, the apical margin being a little convex medially. Juxta slender, touching middle of aedoeagus. Aedoeagus much complicated in form as shown in the figures.

Female genitalia symmetrical. Antapophysis very short,  $1/3$  as long as postapophysis. Ostium bursae opened at cephalic part of a large, circular hole on ventrum of eighth seg-

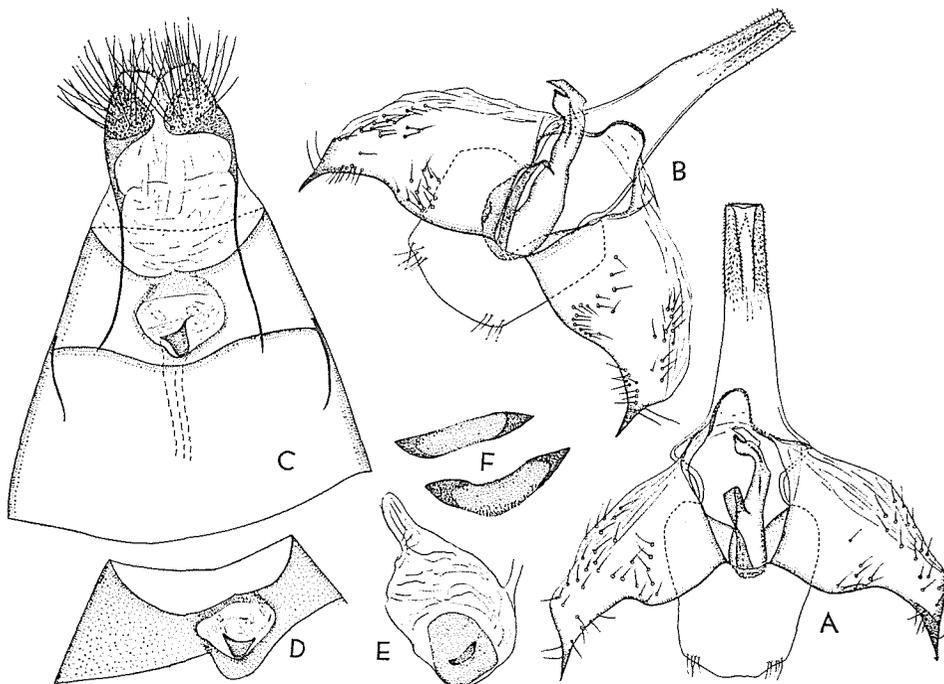


Fig. 1. *Lithocolletis tritorrhecta* Meyrick.

A & B: caudal view of male genitalia; C: ventral view of female genitalia; D: ventral view of eighth abdominal segment of female; E: corpus bursae; F: variations of sclerotized projections of signa.

ment; sterigma consisting of well-sclerotized lamella antevaginalis, which is elliptical and very small.

Autumnal form: ♂♀. This form differs from the aestival only by the colour-pattern as follows:— Antennae more distinctly annulated with black. Frontal tuft white, mixed with a few blackish-brown scales anteriorly. Thorax white, densely speckled with dark brown scales on whole surface. Fore wing dark brown, rather densely scattered with white scales, with golden-ochreous, broader markings, which are the same in position and shape as the white markings of the aestival form.

Specimens examined: 2 ♂♂ & 3 ♀♀, Tokyo, Honsyu, on *Zelkova serrata*.

Host plants: *Zelkova serrata* Makino.

Distribution: Japan (Honsyu).

Mine: Ptychonomous, on the upper surface of leaves.

Remarks: Judging from Meyrick's original description, he described only the aestival form based on three specimens collected at Tokyo, Japan.

33. *Lithocolletis zelkovae*, sp. nov. (Fig. 2, A-F)

♂♀. Face snow-white; palpus white, lined with a blackish streak posteriorly; tuft of

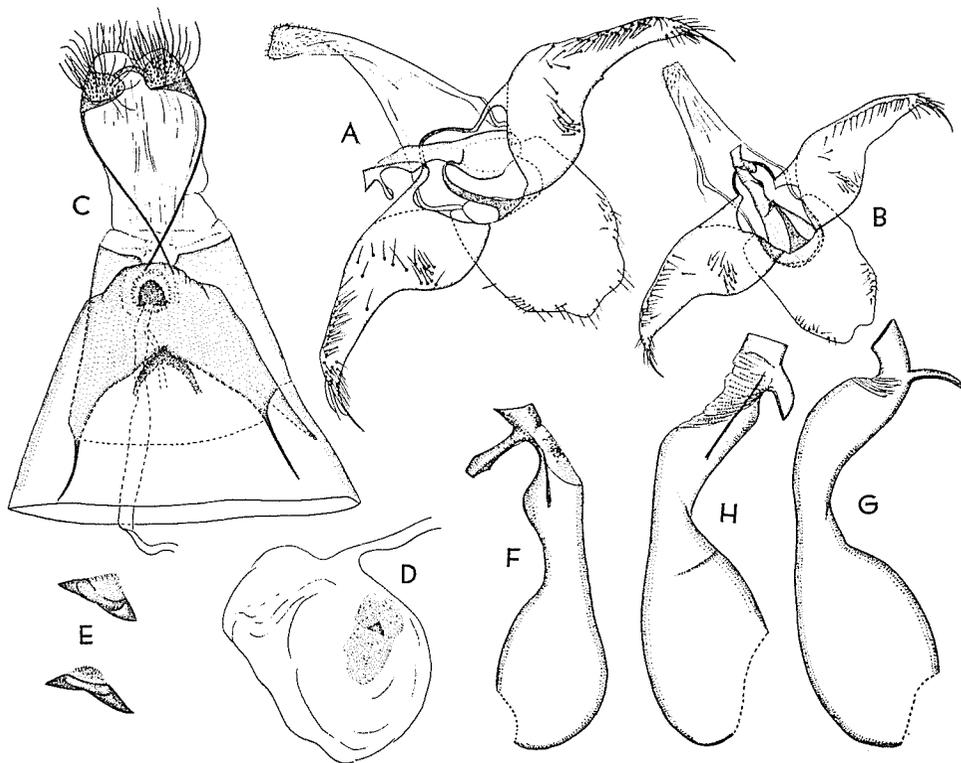


Fig. 2. A-F: *Lithocolletis zelkovae*, sp. nov.; G: *Lithocolletis bicinctella* Matsumura; H: *Lithocolletis tristrigella* (Haworth).

A & B: caudal view of male genitalia; C: ventral view of female genitalia; D: corpus bursae; E: variations of sclerotized projections of signa; F-H: aedeagus.

head golden-ochreous, mixed with a few paler scales in centre; antenna whitish, each segment conspicuously ringed with dark brown apically. Thorax golden-ochreous, with two broad, white lines, which are connected each other through white patagia. Legs pale ochreous; fore tibia blackish inside; mid tibia with three oblique, black streaks outside; each segment of all tarsi spotted with black apically.

Fore wing golden-brown, with white markings. Medio-basal streak very short, at most extending to basal 1/7, without any dark marginal scales. Three wide fasciae, of which

the first is placed at basal 1/4, second just before middle and last at basal 2/3, narrowly margined with black scales internally, rather vertical, almost straight except that the last is obtusely angulated outwardly at the middle; dark margin of first fascia disappearing on its dorsal half. A costal streak placed near apex of wing, very oblique inwardly, and margined dorsally with an irregularly black-irrorated apical streak. Apical margin of wing sparsely darkened; cilia ochre-white. Hind wing grey, with cilia pale ochre-grey.

Expanse of fore wings, 6.0-7.0 mm.

Male genitalia symmetrical. Valva rather elongate, suddenly becoming narrower towards apex from basal 1/3, ending in a much sclerotized, slender, long spine, with some slender setae along costal margin. Saccus very short. Flap of ninth sternite slightly longer than wide, the lateral margins being somewhat constricted at about apical 1/6, then the apical margin slightly incised medially. Juxta slender, touching middle of aedeagus. Aedeagus complicated in form as shown in the figures.

Female genitalia symmetrical. Seventh sternite fairly projecting caudally. Ostium bursae opened on inside near top of the projecting seventh sternite; sterigma consisting of lamella antevaginalis, which is semicircular and very small.

Holotype: ♂ (host: *Zelkova serrata*), Kitahukuoka, Iwate-ken, Honsyu, 12. VIII, 1958, T. Oku leg. Paratypes: 1 ♀ (host: *Z. serrata*), Kitahukuoka, Iwate-ken, Honsyu, 5. VIII, 1958, T. Oku leg.; 1 ♀ (host: *Z. serrata*), locality unknown, 6. VI, 1938, A. Kawada leg.; 1 ♂ (host: *Z. serrata*); Hikosan, Kyusyu, 23. IV, 1956, H. Kuroko leg.; 1 ♀ (host: *Z. serrata*), Hikosan, Kyusyu, 16. VII, 1956, H. Kuroko leg. The paratypes collected by Dr. H. Kuroko are deposited in the collection of Entomological Laboratory, Kyusyu University, and a paratype in the collection of the National Institute of Agricultural Sciences, Tokyo.

Host plants: *Zelkova serrata* Makino.

Distribution: Japan (Honsyu; Kyusyu).

Mine: Ptychonomous, on the lower surface of leaves.

Remarks: This species is closely related to *L. tristrigella* (Haworth) in the colour-markings and female genitalia, but differs from the latter by the more elongate and narrower valva and the peculiar structure of the aedeagus as shown in the figures. It is also readily distinguished from the preceding species, *L. tritorrhecta* Meyrick, by the more reddish fore wing with three vertical fasciae, of which the basal two are almost straight and the last never interrupted with the black irrorations, by the aedeagus with a very long subapical projection, by the caudally projecting seventh sternite of the female, and by the fact that the larva mines into the lower surface of leaves.

#### 34. *Lithocolletis ulmi*, sp. nov. (Fig. 3, A-H)

This species is represented by the aestival and autumnal forms, which are distinctive in colour. It is very closely related to *L. tritorrhecta* Meyrick, but is distinguished from the latter by the combination of the following characters:-

Aestival form: ♂. Tuft of head snow-white, mixed with only a few golden-brown scales anteriorly. Costal margin of fore wing more densely scattered with dark scales; dorsal half of first fascia of fore wing somewhat rudimentary.

Expanse of fore wings, 5.0-6.0 mm.

Male genitalia: An apical strong spine of valva pointing downward, and then a little curved inwardly. Flap of ninth sternite somewhat circular in outline. Aedoeagus conspicuously differing from that of *tritorrhecta* as shown in the figures (Fig. 3, G-J).

Autumnal form: ♂♀. This form is distinguished from the aestival by the fore wing

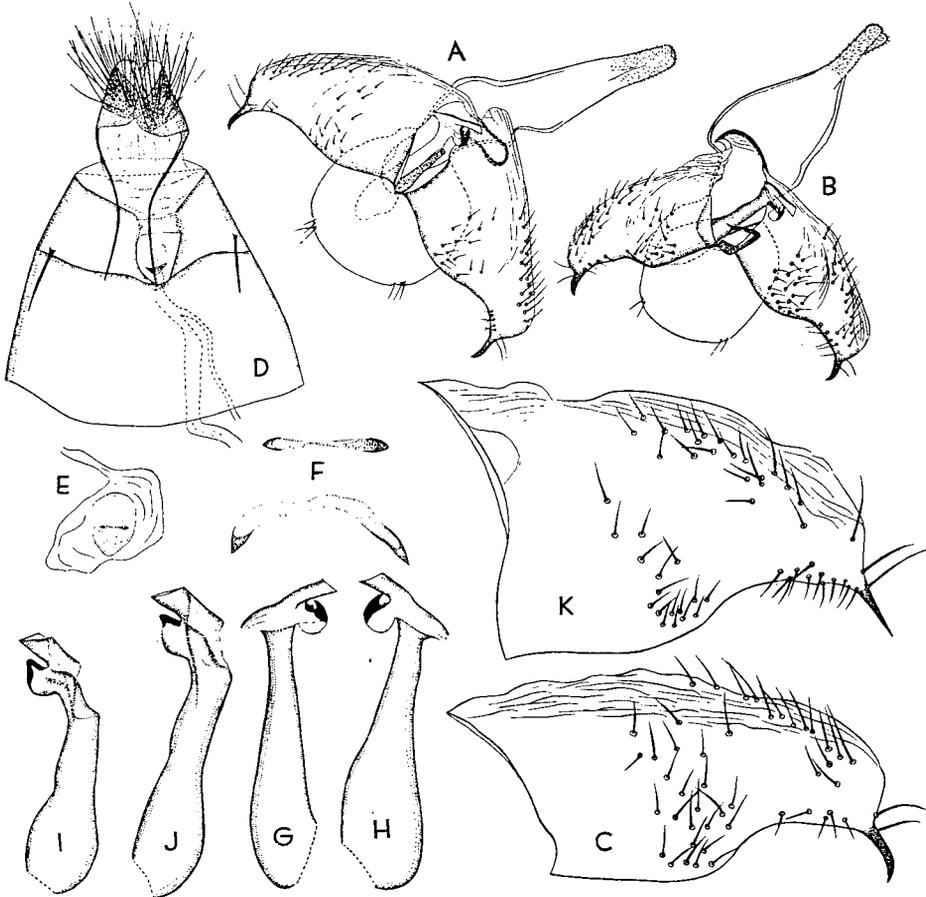


Fig. 3. A-H: *Lithocolletis ulmi*, sp. nov.; I-K: *Lithocolletis tritorrhecta* Meyrick.

A & B: caudal view of male genitalia; C & K: right valva; D: ventral view of female genitalia; E: corpus bursae; F: variations of sclerotized projections of signa; G-J: aedoeagus.

and the thorax, both of which are mixed with dark-brown and white scales on the whole surface as in that of *tritorrhecta*, but it differs from that of *tritorrhecta* by the following features:— frontal tuft almost wholly snow-white; whitish thorax irrorated with only a few dark scales; whitish fore wing less densely scattered with dark scales on entire surface, but most densely on inner margins of golden-ochreous streaks, which are narrower and sometimes interrupted irregularly.

Holotype: ♂ (host: *Ulmus Davidiana* var. *japonica*), Sapporo, Hokkaido, 19. IX, 1958, T. Kumata leg. Paratypes: 2 ♂♂ (host: *U. Davidiana* var. *japonica*), Sapporo, Hokkaido, 21. VII, 1956, T. Kumata leg.; 1 ♂ & 3 ♀♀ (host: *U. Davidiana* var. *japonica*), Sapporo, Hokkaido, 17-19. IX, 1958, T. Kumata leg.; 1 ♂ & 2 ♀♀ (host: *U. laciniata*), Sapporo, Hokkaido, 17-22. IX, 1958, T. Kumata leg.

Host plants: *Ulmus Davidiana* Planchon var. *japonica* Nakai and *Ulmus laciniata* Meyr.

Distribution: Japan (Hokkaido).

Mine: Ptychonomous, on the upper surface of leaves.

Remarks: There are no definite differences between this species and *tritorrhecta* in the colour-markings and the female genitalia. But in the male genitalia, especially in the

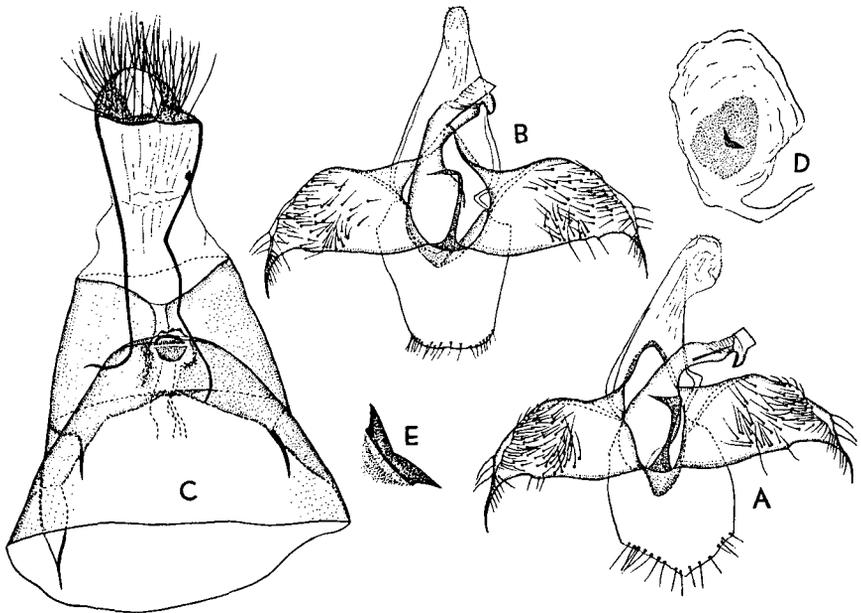


Fig. 4. *Lithocolletis tristrigella* (Haworth).

A & B: caudal view of male genitalia; C: ventral view of female genitalia; D: corpus bursae; E: sclerotized projections of signum.

aedoeagus as shown in the figure, and in the host plant, *ulmi* may be distinctly separated from *tritorrhecta*.

**35\*. *Lithocolletis tristrigella* (Haworth) (Fig. 4; 2, H)**

*Tinea tristrigella* Haworth, 1828, Lep. Brit.: 576.

*Lithocolletis tristrigella*: Wocke, 1877, in Hein., Schmett. Deutsch. 2: 588; Meyrick, 1927, Handb. Brit. Lep.: 780; Petersen, 1927, Stett. Ent. Zeit. 88: 167, f. 59; Pierce et Metcalfe, 1935, Genit. Tin. Brit.: 77, pl. 47; Benander, 1944, Opusc. Ent.: 112; Gregor et Povolný, 1950, Ent. listy 13: 136, fs. 12 & 22-28.

This species is characterized by the following features:— ♂♀. Tuft of head pale golden-ochreous, without any whitish scales; antenna whitish, distinctly annulated with dark brown except for apical eight to ten segments, which are entirely snow-white. Thorax golden-

brown, with two silvery-white lines running along inner margins of tegulae. Fore wing golden-brown; whitish medio-basal streak extremely short, without any dark marginal scales; three white fasciae, of which the first is placed at basal 1/4, second just before middle and last at 3/4, margined with dark scales internally, the first two being slightly arched outwardly, and the last moderately angulated at middle across wing; a whitish streak extending from angle of last fascia to costa before apex of wing, bordered beneath with a black apical streak. Male genitalia symmetrical; valva rather short, arched upwardly, and ending in an acute spine, which points downward; flap of ninth sternite trapezoid in shape, the apical margin being slightly convex; aedeagus ovate on basal half, with a rather large subapical projection; juxta slender. Female genitalia symmetrical; seventh sternite hardly projecting caudally; ostium bursae opened on top of the projecting sternite.

The present specimens from Japan agree well enough with the descriptions of *tristrigella* given by European authors stated above. It will be mentioned, however, that the Japanese form differs slightly from the European one by the fact that the inner dark margins of the first and second fasciae of the fore wing are conspicuously widened near the costa and form triangular, black costal blotches.

Specimens examined: 10 ♂♂ & 1 ♀, Sapporo, Hokkaido, on *Ulmus laciniata*.

Host plants: *Ulmus laciniata* Mayr in Japan and *Ulmus* spp. and *Alnus* sp. in Europe.

Mine: Ptychonomous, on the space between two veins of the lower surface of leaves.

**36. *Lithocolletis bicinctella* Matsumura (Fig. 2, G)**

*Lithocolletis bicinctella* Matsumura, 1931, 6000 Ill. Ins. Jap.: 1101, f. 2288; *ibid.*, 1931, Ins. Mats. 6: 200; Kumata, 1959, Ins. Mats. 22: 75, fs. 1B & 3.

*Phyllonorycter bicinctella*: Inoue, 1954, Check list Lep. Jap. 1: 28.

This species occurs abundantly in Hokkaido as a leaf-miner of *Ulmus*-trees. It is quite peculiar in the colour-markings of the fore wing and in the structure of the female genitalia. The most obvious characters are as follows:—fore wing with two white, transverse fasciae, of which one is placed just before middle and the other at the basal 2/3; caudal margin of seventh sternite of female deeply concave medially, the ostium bursae being opened at its concavity.

Specimens examined: Types of *bicinctella*; 2 ♂♂ & 1 ♀, Ebetu, 3 ♂♂ & 1 ♀, Nopporo 3 ♂♂ & 7 ♀♀, Sapporo, 1 ♂ & 1 ♀, Teine, and 1 ♀, Tomakomai, Hokkaido, on *Ulmus Davidiana* var. *japonica*.

Host plants: *Ulmus Davidiana* Planchon var. *japonica* Nakai.

Distribution: Japan (Hokkaido).

Mine: Ptychonomous, on the space between two veins of the lower surface of leaves.

**37. *Lithocolletis celtidis*, sp. nov. (Fig. 5)**

♂♀. Face and palpus white; palpus with a black blotch on posterior surface; tuft of head golden-ochreous, and mixed with many white scales in centre; antenna whitish, each segment with a dark brown spot on upper surface. Thorax golden-ochreous, with two white lines, which are connected with each other through white patagia. Legs whitish; fore femur and tibia blackish inside; fore tarsus ringed with black at 1/3 and 2/3; mid tibia with three

oblique, black streaks outside; hind tibia clouded outside; each segment of mid and hind tarsi blotched with black apically.

Fore wing golden-ochreous, with white markings. Medio-basal streak very narrow, extending to about basal 1/3, slightly bent upwardly at its apical 2/3, without any dark marginal scales. Two fasciae moderately oblique inwardly from costa, the first being placed just before middle, obtusely angulated near costa, narrowly margined with black internally, and the second at apical 1/3, interrupted at middle with an obliquely crossed black narrow streak, which runs along inner edge of the dorsal half of the fascia and along outer edge of the costal half. A costal streak placed near apex of wing, hardly oblique inwardly, sometimes extending to middle of second fascia, and bordered dorsally with an irregularly

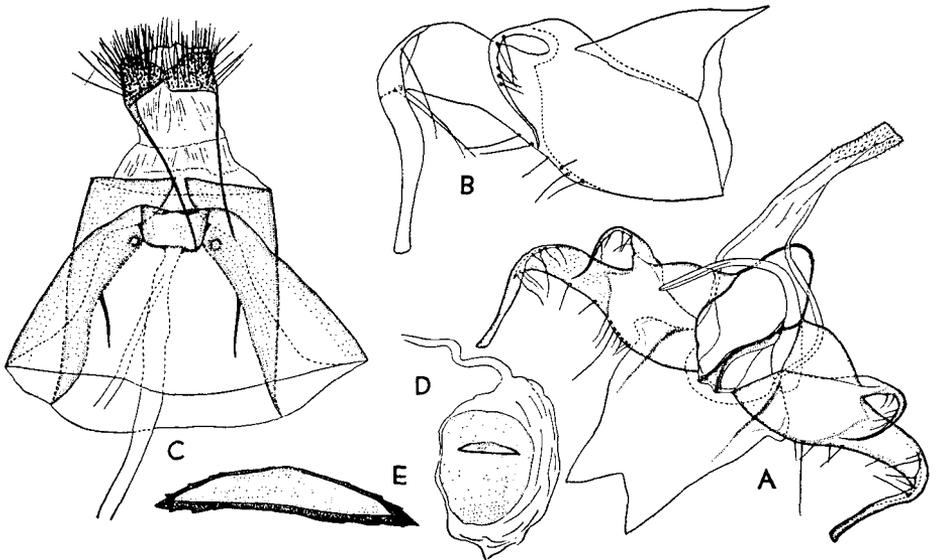


Fig. 5. *Lithocolletis celtidis*, sp. nov.

A: Caudal view of male genitalia; B: left valva; C: ventral view of female genitalia; D: corpus bursae; E: sclerotized projections of signum.

black-irrorated apical blotch. Apical margin of wing not darkened; cilia yellowish-white. Hind wing grey, with cilia yellowish-white.

Expanse of fore wings, 6.5-7.0 mm.

Male genitalia symmetrical. Valva very peculiar in shape as shown in the figures, i. e. apically much narrowed valva being twisted inwardly and bent downward at apical 1/3, and an acute costal process of valva also twisted and bent at its apical 2/3 as well. Saccus very short. Flap of ninth sternite narrowed apically, with its apical margin deeply incised or notched. Aedoeagus slender, somewhat dilated on base, strongly curved, without any projection; juxta slender, touching basal 1/3 of aedoeagus.

Female genitalia symmetrical. Antapophysis very short. Eighth segment joined so tightly with seventh one that it is not distinctly recognized from seventh one; seventh+

eighth sternite much widened, and a little projecting caudad. Ostium bursae opened on top of the projecting seventh+eighth sternite.

Holotype: ♂ (host: *Celtis sinensis*), Hikosan, Kyusyu, 16. V, 1957, H. Kuroko leg. Paratypes: 1 ♂ & 1 ♀ (host: *C. sinensis*), Hikosan, Kyusyu, 1. VI, 1957, H. Kuroko leg. Holotype and one female paratype are deposited in the collection of Entomological Laboratory, Kyusyu University.

Host plants: *Celtis sinensis* Persoon.

Distribution: Japan (Kyusyu).

Mine: Ptychonomous, on the lower surface of leaves.



Fig. 6. *Lithocolletis pulchra*, sp. nov.

A & B: caudal view of male genitalia; C: right valva; D: ventral view of female genitalia; E: corpus bursae; F: variations of sclerotized projections of signa.

Remarks: The new species is somewhat similar to *L. celtisella* Chambers, a leaf-miner of *Celtis* in North America, but differs immediately from the latter by the medio-basal streak without any dark marginal scales and the second fascia being obliquely crossed with a narrow black streak. It is also quite distinct from *L. milliereella* Staudinger described from South Europe by the peculiar feature of the valva.

#### 8. Species attacking Rosaceae

##### 38. *Lithocolletis pulchra*, sp. nov. (Fig. 6)

♂♀. Face silvery-white, with some golden reflections; palpus golden-yellow; tuft of head wholly golden-brown; antenna dark brown, the scape being golden-yellow, and the

apical ten to twelve segments paler. Thorax golden-ochreous, with two silvery lines passing along inner margins of tegulae. Legs golden-yellow; mid tibia with three oblique, black streaks outside; hind tibia clouded outside; all tarsi ringed with black subbasally and subapically.

Fore wing reddish-yellow, strongly tinged with golden reflections, with purplish-black and silvery-white markings. Silvery-white medio-basal streak shorter than  $1/15$  length of wing, scarcely detached from base. A black, triangular blotch occupying costal area of wing between base and basal  $1/7$ . A silvery, small dorsal spot placed at basal  $1/10$ , without dark marginal scales. Two silvery-white, narrow fasciae, of which one is placed at basal  $1/4$  and the other just before middle, rather vertical, slightly arched outwardly, and narrowly margined with black scales internally; in some specimens second fascia interrupted with ground colour at the middle. A very conspicuous, purplish-black costal blotch occupying almost whole area of costal half between two silvery fasciae. A pair of opposite costal and dorsal blotches at apical  $1/3$  silvery-white, rectangular, rather vertical, narrowly surrounded by black scales, the dorsal blotch being a little longer than the costal. A black-margined, silvery costal streak placed near apex, extending towards base in parallel to termen, but detached from paired blotches. Black apical blotch or streak absent. A dark, narrow line in cilia running along apex of wing; cilia pale ochreous. Hind wing grey, with cilia ochre-grey.

Expanse of fore wings, 6.5–7.5 mm.

Male genitalia symmetrical. Valva arched upwardly in its costal margin, ending in a strong, acute spine, with a tuft of many setae near apex, and with one or two rows of slender setae along costal margin. Flap of ninth sternite spatular in shape, with apical margin slightly sinuate. Uncus very wide. Aedoeagus rather short, hardly dilated towards base, with a minute, upwardly pointed spine on apex. Juxta very wide, touching apical  $1/3$  of aedoeagus.

Female genitalia symmetrical. Antapophysis very short. Seventh sternite very narrow, and extending into middle of eighth segment. Sterigma globose, placed on top of extending seventh sternite.

Holotype: ♂ (host: *Rubus illecebrosus*), Hikosan, Kyusyu, 19. IV. 1954, H. Kuroko leg. Paratypes: 1 ♀ (host: *R. illecebrosus*), Hikosan, Kyusyu, 2. V, 1954, H. Kuroko leg.; 1 ♂ (host: *R. illecebrosus*), Hikosan, Kyusyu, 27. VII, 1954, H. Kuroko leg.; 1 ♀ (host: *R. illecebrosus*), Hikosan, Kyusyu, 17. IV, 1954, H. Kuroko leg. Holotype and one female paratype are deposited in the collection of Entomological Laboratory, Kyusyu University.

Host plants: *Rubus illecebrosus* Foche.

Distribution: Japan (Kyusyu).

Mine: The larva mines into the inter-parenchyma of the leaves of the food plant.

Remarks: This species is readily distinguished from any other known species by the fore wing with a very large purplish-black blotch on the costal area between two silvery-white fasciae and by the golden-yellow legs. On account of the basally dilated aedoeagus and the much sclerotized juxta, it is somewhat allied to the species attacking Ulmaceae in Japan, but differs immediately by the markings of the fore wing and the structure of the

genitalia.

**39. *Lithocolletis ringoniella* Matsumura**

*Lithocolletis triflorella*: Matsumura, 1921, Gaiyû-zensyo 1: 230 (nec Peyerimhoff, 1872).

*Lithocolletis ringoniella* Matsumura, 1931, 6000 Ill. Ins. Jap.: 1102, f. 2290; *ibid.*, 1931, Ins. Mats. 6: 200; Kumata, 1959, Ins. Mats. 22: 71, fs. 1 A & 2.

*Lithocolletis lantanella*: Matsumura, 1931, 6000 Ill. Ins. Jap.: 1102, f. 2289 (nec Schrank, 1801).

*Phyllonorycter ringoniella*: Inoue, 1954, Check list Lep. Jap. 1: 28.

*Phyllonorycter lantanella*: Inoue, 1954, Check list Lep. Jap. 1: 28 (nec Schrank, 1801).

*Lithocolletis blancardella*: Issiki, 1957, Icones Heterocer. Jap. Coloribus Naturalibus 1: 27, pl. 4, f. 98 (nec Fabricius, 1794).

This species is one of the most important pests of apples in North Japan. It has been often misidentified as *L. blancardella*, a pest of apples in Europe, *L. lantanella*, a leaf-miner of *Viburnum*, or *L. triflorella*, a leaf-miner of *Cytisus*, by various authors. The present species can be, however, readily distinct from the other three species by the first costal streak reaching near the base along the costa of the fore wing, and by the very slender valva with a tuft of many setae on the hind half of the apex.

Specimens examined: Types of *ringoniella*; 1 ♂ (determined as *L. lantanella* Schrank by S. Matsumura, 1931), Sapporo, Hokkaido; 4 ♂♂ & 13 ♀♀, Sapporo, Hokkaido, and 4 ♀♀, Morioka, Honsyu, on *Malus pumila*; 8 ♂♂ & 12 ♀♀, Sapporo, and 1 ♀, Esasi, Hokkaido, on *Malus Toringo*.

Host plants: *Malus pumila* Miller and *Malus Toringo* Siebold.

Distribution: Japan (Hokkaido; Honsyu).

Mine: Ptychonomous, on the space between two veins of the lower surface of leaves.

**40. *Lithocolletis aino*, sp. nov. (Fig. 7)**

♂♀. Face and palpus brilliant yellowish-white, the latter being blotched apically with black; tuft of head white, mixed with a few scales laterally; antenna wholly grey. Thorax golden-brown, with two white stripes passing along inner margins of tegulae. Legs yellowish-white; fore femur and tibia blackish inside; fore tarsus blackish, with two narrow, white median rings; mid and hind tibiae blackish outside; hind tarsus blackish on basal half.

Fore wing golden-brown, with brilliant white markings, all of which are conspicuously surrounded by dark scales. Medio-basal streak straight, extending to basal 2/7 in parallel with costa, and sharply pointed apically. Dorso-basal streak 2/3 as long as the medio-basal. First pair of opposite costal and dorsal blotches placed just before middle, slightly oblique outwardly, the apices of the blotches being scarcely detached by a narrow line of ground colour just above middle across wing; internal dark margin of dorsal blotch extending towards base along dorsal margin of wing. Second pair of blotches placed at apical 2/5 in parallel with first pair, wedge-shaped or triangular; internal dark margin of the dorsal blotch also extending towards base, then united with external dark margin of first dorsal one. Two costal blotches placed near apex, wedge-shaped, vertical or slightly oblique inwardly. A black blotch placed on discal area near apex; a white, very small spot placed just before the black blotch. Apical margin of wing broadly purplish-black; cilia yellowish-white. Hind wing dark grey, with cilia yellowish-grey.

Expanse of fore wings, 5.5–6.0 mm.

Male genitalia asymmetrical in costal processes of valvae alone. Valva slender in whole length, slightly arched upwardly, with a number of slender setae on inner surface; costal process of right valva very long, about half as long as valva, flattened-tubular, with filament-like seta short and hook-shaped; costal process of left valva very short, about 1/6 as long as the right, fusiform, with filament-like seta slender and straight. Saccus rather elongate. Flap of ninth sternite triangular. Aedeagus slender, long, with a round subapical barb.

Female genitalia symmetrical. Sterigma consisting of lamella antevaginalis alone, which is placed on ventrum of eighth segment, circular, and slightly depressed on its cephalic area.

Holotype: ♂ (host: *Spiraea salicifolia*.), Tomakomai, Hokkaido, 24. VIII, 1957, T.

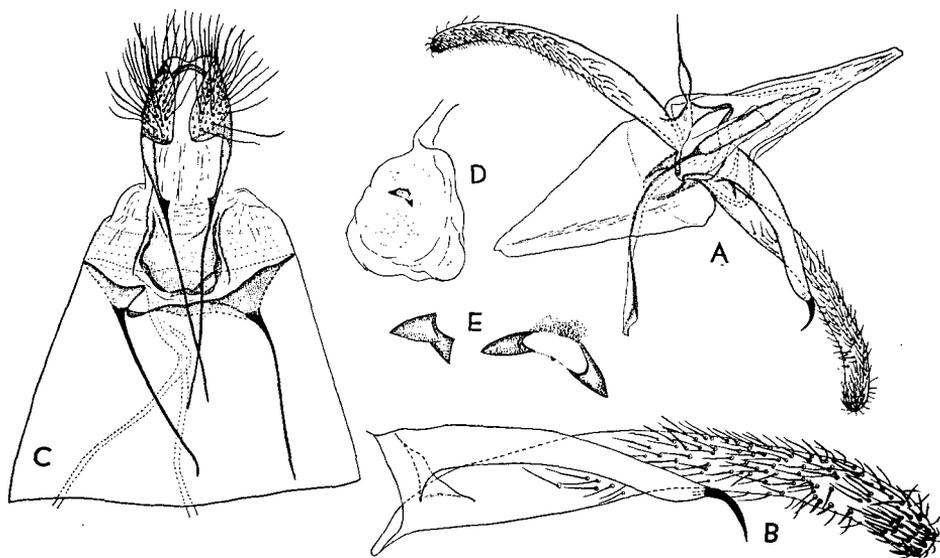


Fig. 7. *Lithocolletis aimo*, sp. nov.

A: caudal view of male genitalia; B: right valva; C: ventral view of female genitalia; D: corpus bursae; E: variations of sclerotized projections of signa.

Kumata leg. Paratypes: 4 ♀♀ (host: *S. salicifolia*), Tomakomai, Hokkaido, 24–27. VIII, 1957, T. Kumata leg.

Host plants: *Spiraea salicifolia* Linné.

Distribution: Japan (Hokkaido).

Mine: Ptychonomous, on the lower surface of leaves.

Remarks: In the male genitalia, especially in the feature of the costal processes of the valvae, this species is much allied to *L. oxyacanthae* Frey, *L. mespilella* (Hübner), *L. gregori* Povolný, and *L. cydoniella* (Fabricius), all of which are miners of various species of Rosaceae in Europe. It is, however, distinguished from *oxyacanthae* by the left costal process merely reaching about middle of the valva, by the sterigma consisting of circular lamella antevaginalis alone, and by the first pair of opposite costal and dorsal blotches of

fore wing margined with dark scales not only internally but also externally. It differs also from *cydoniella* and *gregori* by the more slender valva, by the circular lamella antevaginalis placed on the ventrum of the eighth abdominal segment, and by the darker ground colour of the fore wing. From *mespilella* it may be distinguished by the medio-basal streak of the fore wing surrounded by black scales, and by the shorter filament-like seta of the right costal process.

41. *Lithocolletis watanabei*, sp. nov. (Fig. 8)

♂♀. Face and palpus white; tuft of head white, mixed with many golden-ochreous

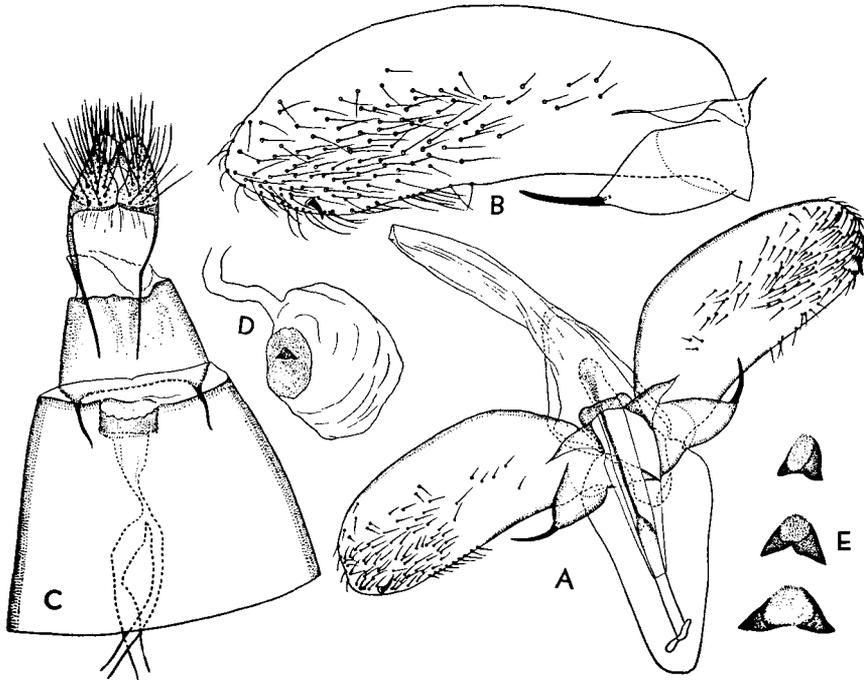


Fig. 8. *Lithocolletis watanabei*, sp. nov.

A: caudal view of male genitalia; B: left valva; C: ventral view of female genitalia; D: corpus bursae; E: variations of sclerotized projections of signa.

scales laterally; antenna whitish, barely spotted above with black. Thorax golden-ochreous, with three white, rather narrow stripes; apical half of tegula white. Legs silk-white; fore femur and tibia blackish inside; fore and mid tarsi with two or three black rings; hind tarsus with a black spot at middle of upper side.

Fore wing golden-ochreous, with white markings. Medio-basal streak extending to basal 1/3 in parallel with costa, sharply pointed apically, without any dark marginal scales. Dorso-basal streak 2/5 to 1/2 as long as the medio-basal, which is about twice as wide as the former. First pair of opposite costal and dorsal blotches placed at middle, slightly oblique outwardly, scarcely detached by a narrow line of ground colour from each other

near costa, and margined with black irrorations internally. Second pair of blotches placed at apical 1/3 or just before tornus, vertical or scarcely oblique outwardly, wedge-shaped or triangular, margined with black irrorations internally, the dorsal one being a little larger than the costal. Two costal blotches placed near apex of wing, oblique inwardly, wedge-shaped, and margined with dark irrorations internally. An indistinct white spot at middle of termen not extending into cilia, sometimes fused with last costal blotch. A small spot of black irrorations placed at apex of wing. A black-irrorated line in cilia running along apex of wing; cilia pale yellow. Hind wing grey, with cilia yellowish- to whitish-grey.

Expanse of fore wings, 5.5-6.0 mm.

Male genitalia symmetrical. Valva rather broad, rounded apically, with a short, spine-like seta near apex of hind margin, and with many slender setae on apical half of inner surface; costal process cone-shaped, rather large, with filament-like seta strong, and shorter than costal process itself. Saccus short. Flap of ninth sternite spatular in shape, rather slender, and rounded apically. Aedoeagus straight, with a short barb at apex.

Female genitalia symmetrical. Antapophysis very short, about 1/4 as long as post-apophysis. Sterigma ring-shaped, the caudal margin being dentate.

Holotype: ♂ (host: *Pourthiaea villosa*), Tomakomai, Hokkaido, 26. VIII, 1957, T. Kumata leg. Paratypes: 3 ♂♂ & 6 ♀♀ (host: *P. villosa*), Tomakomai, Hokkaido, 20-28. VIII, 1957, T. Kumata leg.; 5 ♂♂ & 4 ♀♀ (host: *P. villosa*), Ino, Kôti-ken, Sikoku, 15-29. VI, 1957, T. Kumata leg.; 1 ♂ (host: *P. villosa*), Hikosan, Kyusyu, 14. VIII, 1954, H. Kuroko leg. The paratype collected by Dr. H. Kuroko is deposited in the collection of Entomological Laboratory, Kyusyu University.

Host plants: *Pourthiaea villosa* Decne.

Distribution: Japan (Hokkaido; Sikoku; Kyusyu).

Mine: Ptychonomous, on the space between two veins of the lower surface of leaves.

Remarks: This species is closely related to *L. corylifoliella* (Haworth), a leaf-miner of various species of Rosaceae in Europe, but in the appearance of the white marks of the fore wing and in the structure of the female genitalia it differs conspicuously from the latter by the following points:— medio-basal streak of fore wing merely extending to basal 1/3; first pair of costal and dorsal blotches at middle of fore wing being not so strongly oblique, and separated from each other by only a very narrow line of ground colour; eighth abdominal segment of female smooth, without such acute, long spines or projections as in *corylifoliella*. Moreover, the apical barb of the aedoeagus of the male genitalia is markedly shorter than that of *corylifoliella*.

#### 42. *Lithocolletis sorbicola*, sp. nov. (Fig. 9)

♂♀. Face and palpus white; palpus with a black apical spot posteriorly; tuft of head white, mixed with many golden-ochreous scales laterally; antenna whitish, annulated with black above. Thorax golden-ochreous, with two white stripes passing along inner margins of tegulae. Legs silk-white; fore femur and tibia clouded inside; mid tibia with three dark, oblique streaks outside; hind tibia clouded outside; hind tarsus with a dark median ring.

Fore wing golden-ochreous, with white markings, which are margined with dark scales

internally. Medio-basal streak nearly extending to basal 1/3, parallel to costa, straight, and scarcely margined with dark scales around its pointed apex. Dorso-basal streak a little shorter than the medio-basal, much widened apically, without any dark marginal scales. First pair of opposite costal and dorsal blotches placed at middle, rectangular, moderately oblique outwardly, the apices of the blotches being scarcely detached by a narrow line of ground colour near costa, while in some specimens these blotches completely fused with each other in an angulated fascia. Second pair of blotches placed at about apical 1/3, triangular, scarcely oblique outwardly and nearly equal to each other in size. Third pair of blotches placed at apical 1/5, usually fused with each other in a vertical fascia. A costal

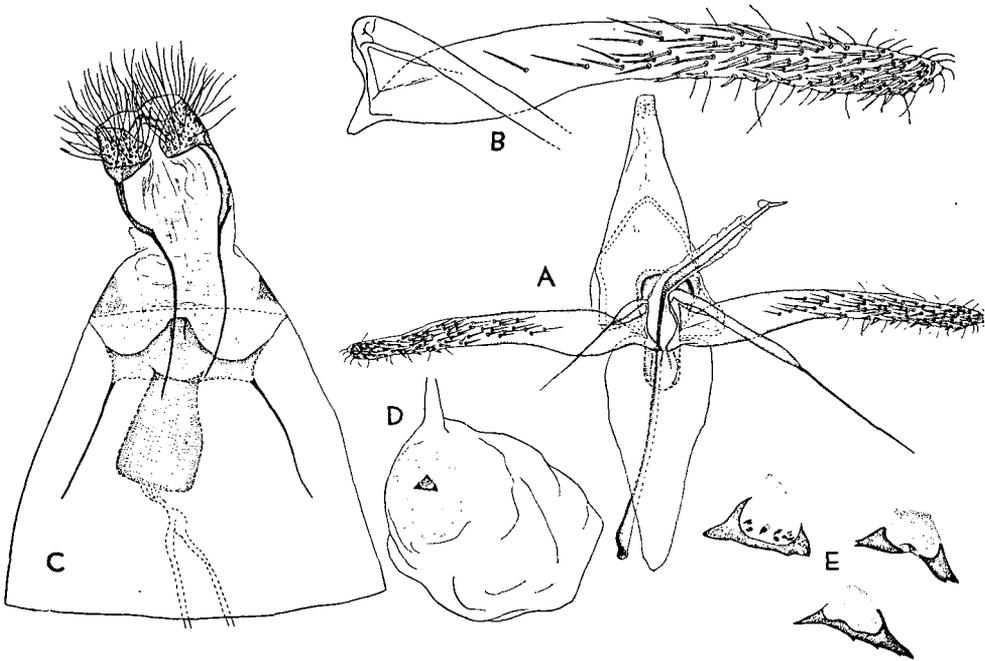


Fig. 9. *Lithocolletis sorbicola*, sp. nov.

A: caudal view of male genitalia; B: right valva; C: ventral view of female genitalia; D: corpus bursae; E: variations of sclerotized projections of signa.

blotch placed near apex of wing, wedge-shaped, and oblique inwardly. A short streak of black irrorations placed on discal area near apex of wing. A black line in cilia running along apex of wing; cilia yellowish-white. Hind wing grey, with cilia pale yellowish-grey. Expanse of fore wings, 6.0-7.0 mm.

Male genitalia asymmetrical in costal processes of valvae alone. Valva very slender in whole length, with some short, spine-like setae on apical area, and with a number of slender setae on inner surface; costal process of right valva very narrow, tubular, a little shorter than half length of valva, with filament-like seta very slender and long; costal process of left valva fusiform, 1/4 to 1/5 as long as the right one, with filament-like seta very

slender and much shorter than the right. Saccus rather elongate, rounded apically. Flap of ninth sternite elongate, subtriangular, and bluntly pointed apically. Aedoeagus very long, slender, with a T-shaped barb at apex.

Female genitalia symmetrical. Sterigma consisting of lamella antevaginalis and antrum as shown in the figure; the lamella antevaginalis convex medially on its caudal margin; the antrum cylindrical, dilated cephalad. Antapophysis originating from either corner of cephalic margin of lamella antevaginalis.

Holotype: ♂ (host: *Sorbus Matsumurana*), Sapporo, Hokkaido, 7. VII, 1956, T. Kumata leg. Paratypes: 2 ♂♂ & 4 ♀♀ (host: *S. commixta*), Wakkanai, Hokkaido, 6-8. VIII, 1958, T. Kumata leg.; 11 ♂♂ & 3 ♀♀ (host: *S. Matsumurana*), Sapporo Hokkaido, 6-12. VII, 1956, T. Kumata leg.; 2 ♀♀ (host: *S. alnifolia*), Sapporo, Hokkaido, 9-17. VII, 1956, T. Kumata leg.

Host plants: *Sorbus Matsumurana* Koehne, *Sorbus commixta* Hedlund and *Sorbus alnifolia* C. Koch.

Distribution: Japan (Hokkaido).

Mine: Ptychonomous, on the lower surface of leaves.

Remarks: This species is closely related to *L. blancardella* (Fabricius) (= *concomitella* Banks), from which it may be distinguishable by the sterigma consisting of the lamella antevaginalis and the antrum, and by the fore wing with a white, transverse fascia at the apical 1/5.

#### 43. *Lithocolletis uchidai*, sp. nov. (Fig. 10)

♂♀. Face and palpus pure white; tuft of head dark reddish-brown, mixed with white scales in centre; antenna blackish, each segment annulated with pale grey basally. Thorax dark reddish-brown, with two white, narrow stripes passing along inner margins of tegulae. Fore leg blackish, the tibia being whitish outside; mid and hind legs whitish; mid tibia with three oblique, black streaks outside; hind tibia clouded outside; each segment of mid and hind tarsi ringed with black apically.

Fore wing brilliant reddish-brown, rather densely irrorated with dark scales on the almost whole surface, with white markings. Medio-basal streak extending to basal 1/3, very narrow, sinuate, sometimes irregularly interrupted by ground colour, and margined with dark scales on apical 1/3 of the upper edge. A very small costal blotch placed at basal 1/4, slightly oblique outwardly, margined widely with dark scales internally; the dark margin sometimes extending towards base along costa. In some specimens basal area of dorsal margin of wing densely irrorated with dark scales. A pair of opposite costal and dorsal streaks placed on middle, very narrow, strongly oblique outwardly, margined widely with dark scales internally, the dorsal being more than twice length of the costal, while in a few specimens the streaks fused with each other in an acutely angulated fascia. A dorsal streak placed on tornus, very small, represented by a row of a few scales, oblique outwardly; two or three indistinct, costal streaks placed near apex. A dark-irrorated, long streak running on discal area from middle to apex of wing. Termen broadly paler; a dark line in cilia running along apex of wing; cilia pale ochre-yellow. Hind wing silvery-grey, with cilia

pale ochre-yellow.

Expanse of fore wings, 6.0-7.0 mm.

Male genitalia asymmetrical. Left valva a little wider and longer than the right one, slightly widened apically, with a minute process at middle of hind margin bearing a rather short filament-like seta. Right valva much alike to the left one in shape, with a more minute process situated just before middle of hind margin. Flap of ninth sternite elongate and rectangular. Aedoeagus slightly longer than valva, with a minute apical barb.

Female genitalia symmetrical. Ninth segment slightly elongate. Sclerotized area of eighth segment visible on tergite alone, which is extremely narrow, without antapophysis. Ductus bursae becoming conspicuously broader caudad, but entirely membranous. Sterigma

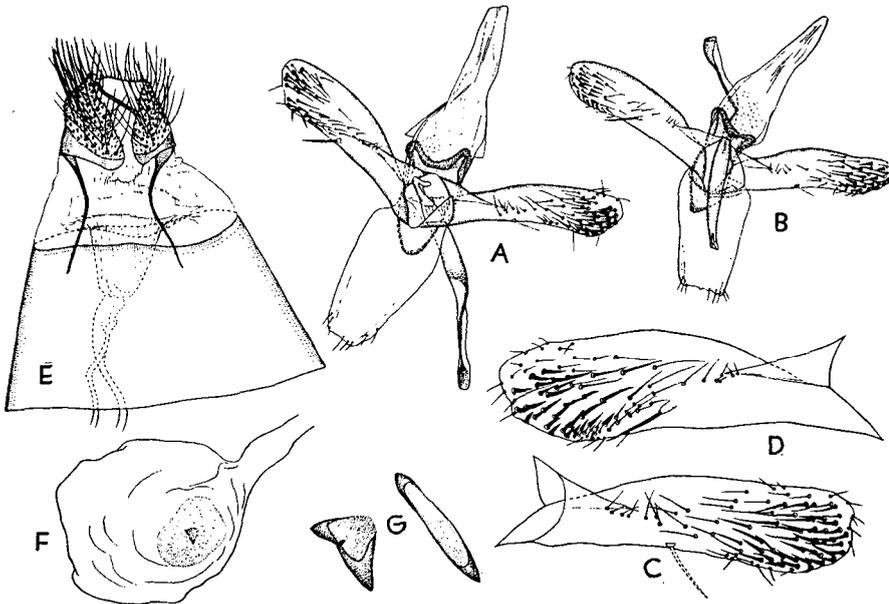


Fig. 10. *Lithocolletis uchidai*, sp. nov.

A & B: caudal view of male genitalia; C: right valva; D: left valva; E: ventral view of female genitalia; F: corpus bursae; G: variations of sclerotized projections of signa.

or genital plate absent.

Holotype: ♂ (host: *Sorbus alnifolia*), Sapporo, Hokkaido, 17. IX, 1958, T. Kumata leg. Paratypes: 13 ♂♂ & 9 ♀♀ (host: *S. alnifolia*), Sapporo, Hokkaido, 17. IX, -4. X, 1958, T. Kumata leg.

Host plants: *Sorbus alnifolia* C. Koch.

Distribution: Japan (Hokkaido).

Mine: Ptychonomous, on the upper surface of leaves.

Remarks: This species is very similar to *L. hancola* Kumata, *L. japonica* Kumata, *L. styracis* Kumata and *L. juglandis* Kumata in the structure of the female genitalia, i. e. eighth abdominal segment being almost wholly membranous, antapophysis absent, and ninth

abdominal segment more or less elongate. It can be, however, immediately distinguished from *styracis* and *juglandis* by the fore wing without a white fascia at the basal 1/4, the apically widened right valva without a process of ampulla, the ductus bursae opened at the middle of dorsum, etc. From *hancola* and *japonica* it is also distinguished by the brilliant reddish-brown fore wing with a black-irrorated streak on the discal area of the apical half, the apically widened both valvae, the symmetrical female genitalia, etc.

### 9. Species attacking Leguminosae

#### 44. *Lithocolletis viciae*, sp. nov. (Fig. 11)

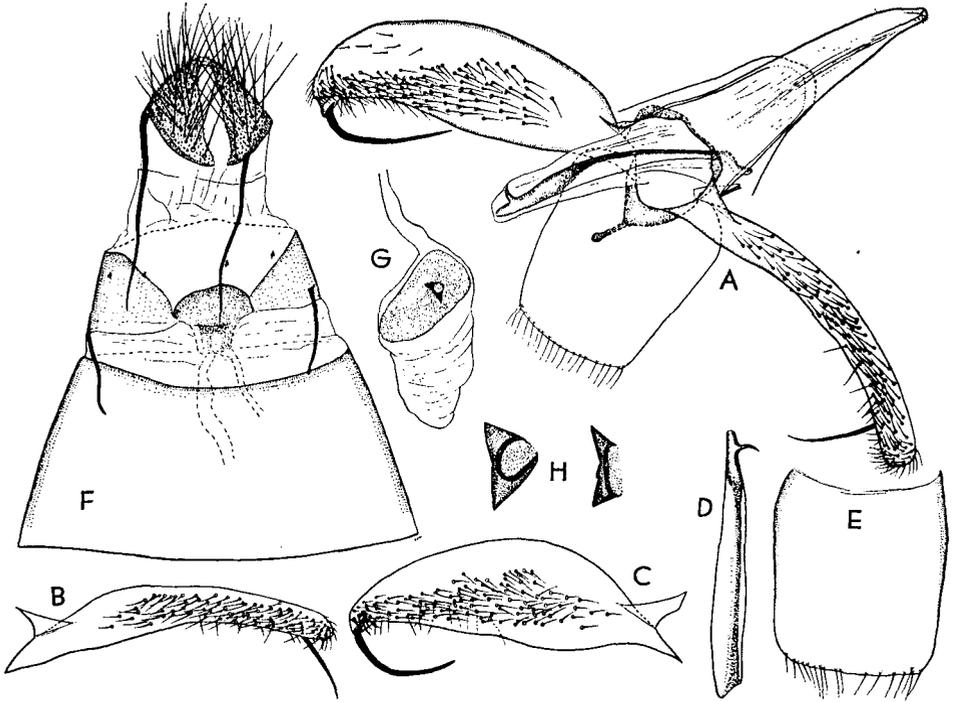


Fig. 11. *Lithocolletis viciae*, sp. nov.

A: caudal view of male genitalia; B: right valva; C: left valva; D: aedoeagus; E: flap of ninth sternite of male; F: ventral view of female genitalia; G: corpus bursae; H: variations of sclerotized projections of signa.

♂♀. Face leaden-metallic; palpus whitish; tuft of head pale yellowish-grey; antenna dark grey, with apical ten segments white. Thorax dark golden-ochreous, with a median and two lateral lines leaden-metallic. Fore leg dark brown, the tarsus being blackish, with three white rings; mid and hind legs muddy whitish; hind tibia clouded outside; first and third segments of mid and hind tarsi blackish.

Fore wing orange-yellow, hardly tinged with golden reflections, with silvery-white markings, which are margined with dark scales internally. Medio-basal streak extending to about

basal 1/3, straight, widened apically, and margined with dark scales on whole edge. Dorso-basal streak as long as or a little shorter than the medio-basal, narrower, and margined with dark scales on upper edge. A rather broad fascia placed just before middle, vertical, and gently arched outwardly. First costal blotch placed at apical 2/5, vertical, rectangular, and extending to costal 1/3 across wing; second and third costal blotches smaller than the first, wedge- or hook-shaped, and slightly oblique inwardly. First dorsal blotch placed on tornus, triangular, and extending to middle between first and second costal blotches; second dorsal spot at middle of termen smallest among white marks, and not extending into cilia. A black, elliptical spot placed at apex of wing. A marginal line in cilia broadly darkened, extending around apex of wing; cilia yellowish-white. Hind wing silvery-grey, with cilia pale yellowish-grey.

Expanse of fore wings, 6.0–7.0 mm.

Male genitalia asymmetrical in valvae. Left valva hardly arched on its costal margin, about thrice as wide as right one at widest part, with an inwardly curved, very long, spine-like seta on apex of its ventral margin, with many slender setae on inner surface, and with a row of slender setae on apical half of outer surface; right valva very slender on whole length, rounded apically, with a long, erect, spine-like seta at apical 1/8, and with a number of slender setae on inner surface. Saccus short, with an apical projection on its top; this projection slightly longer than the saccus itself. Flap of ninth sternite rectangular in form. Aedoeagus with an hook-shaped subapical barb.

Female genitalia symmetrical. Seventh segment without scales or setae on the tergite. Sterigma consisting of lamella antevaginalis, fan-shaped, and connected with seventh segment on the sides.

Holotype: ♂ (host: *Vicia japonica*), Esasi, Hokkaido, 23. XII, 1958, T. Kumata leg. Paratypes: 2 ♂♂ & 2 ♀♀ (host: *V. japonica*), Esasi, Hokkaido, 23. XII, 1958,–5. II, 1959, T. Kumata leg.; 1 ♂ (host: *Lathyrus maritimus*), Esasi, Hokkaido, 16. VI, 1959, T. Kumata leg.

Host plants: *Vicia japonica* A. Gray and *Lathyrus maritimus* Bigelow.

Distribution: Japan (Hokkaido).

Mine: Ptychonomous, occupying on the whole lower surface of a single leaf, which is exactly folded longitudinally.

Remarks: In the colour-pattern and the mine this species is very similar to *L. nigrescentella* Rogan and *L. insignitella* Zeller, both of which are leaf-miners of *Vicia sepium* Linné and other species of Leguminosae in Europe. Judging from the descriptions and the figures of the male genitalia of *insignitella* and *nigrescentella* given by Petersen (1927) and Pierce & Metcalfe (1935), however, the present species may be distinguished from *nigrescentella* by the left valva having a strong, inwardly pointing seta at the apex, while in *nigrescentella* the left valva has an outwardly pointing seta at the apical 1/5 of the hind margin; and from *insignitella* by the saccus having an apical projection and by the right valva having a long subapical seta.

45. *Neolithocolletis hikomonticola*, sp. nov. (Fig. 12)

♂♀. Face pure white; labial palpus, clouded outside; tuft of head dark brown, mixed with a few paler scales in centre; antenna whitish, with each segment ringed with dark brown; scape pale brown, irrorated with dark scales, the lower side being white. Thorax golden-brown, somewhat darkened anteriorly. Legs whitish; fore tibia extremely blackish-brown inside; mid and hind tibiae clouded or spotted with dark brown outside; fore and mid tarsi with two black, narrow rings; hind tarsus with three black, narrow rings.

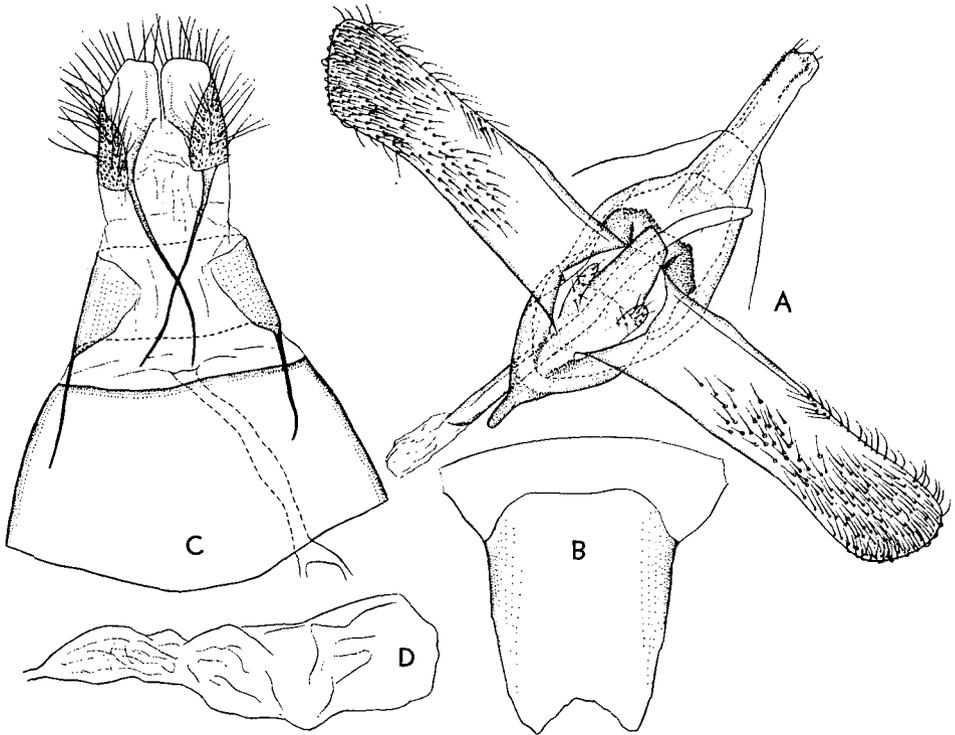


Fig. 12. *Neolithocolletis hikomonticola*, sp. nov.

A: caudal view of male genitalia; B: flap of ninth sternite of male;  
C: ventral view of female genitalia; D: corpus bursae.

Fore wing reddish-brown, tinged with golden reflections, with white markings, which are markedly margined with dark scales internally. Medio-basal streak absent. Three fasciae, of which the first is placed at basal 1/4, second at middle and third at 3/4, vertical, moderate in width, the first two of these fasciae being bluntly angulated or arched outwardly just above middle across wing, and the last one rather acutely angulated outwardly above middle across wing and sometimes interrupted by dark scales at the angulated portion. A costal blotch situated near apex of wing, triangular, vertical or scarcely oblique inwardly. Termen broadly paler, irrorated with many dark spots; apical area of wing also irrorated with dark spots. A marginal line in cilia dark brown, extending around apex of wing from tornus to last costal blotch; cilia pale ochre-yellow. Hind wing pale brownish-grey, with cilia pale ochre-yellow.

Expanse of fore wings, 5.5 mm.

Male genitalia symmetrical. Valva very elongate, quadrate, about 1/4 as wide as long, with a number of slender setae on apical area of inner surface. Transtilla very wide, with its cephalic margin concave. Uncus very elongate, with four apical setae and some microspines on outer surface. Saccus triangular, with its apex slightly projecting medially. Flap of ninth sternite slightly narrowed apically, with the apical margin deeply concave. Lateral process of anellus wart-shaped, with several setae on the top. Aedoeagus very long, tubular, and slightly sinuate on apical half.

Female genitalia symmetrical. Sclerotized area of eighth segment broadly interrupted on ventrum. Ostium bursae opened on ventrum near caudal margin of seventh segment. Sterigma or genital plate absent. Corpus bursae wholly membranous, without signa.

Holotype: ♂ (host: *Pueraria lobata*), Hikosan, Kyusyu, 21. VII, 1956, H. Kuroko leg. Paratypes: 1 ♀ (host: *P. lobata*), Hikosan, Kyusyu, 28. V, 1955, H. Kuroko leg.; 2 ♂♂ & 1 ♀ (host: *P. lobata*), Hikosan, Kyusyu, 24-28. VII, 1955, H. Kuroko leg. The types excluding two paratypes are deposited in the collection of Entomological Laboratory, Kyusyu University.

Host plants: *Pueraria lobata* Ohwi.

Distribution: Japan (Kyusyu).

Mine: According to Dr. H. Kuroko the mine of this species is found on the lower surface of leaves.

Remarks: In the colour-pattern, this species is somewhat similar to *Lithocolletis pentadesma* Meyrick, a leaf-miner of *Pterocarpus indicus* (Leguminosae) in Java, but is immediately distinguished from the latter by the absence of a black, transverse bar of the thorax and a black basal fascia of the fore wing, and the presence of a white, triangular costal blotch near the apex of the fore wing.

*Neolithocolletis*, gen. nov.

♂♀. Head with a tuft of long scales on vertex. Antenna about as long as fore wing; scape slightly thickened, with a basal pecten of a few hairs. Ocellus not perceptible. Labial palpus short, drooping, filiform, and pointed. Maxillary palpus very minute, almost rudimentary. Proboscis moderate in length. Thorax without crest. Fore and mid tibiae smooth; hind tibia with loosely appressed hairs on its upper and lower surface.

Fore wing very elongate, lanceolate, with nine veins;  $Cu_1$ ,  $M_2$  and  $R_1$  absent,  $An_2$  simple,  $An_1$  rudimentary,  $Cu_2$  originating from lower angle of cell,  $M_1$ ,  $R_3$  and  $R_4$  almost united at apex of cell,  $R_2$ - $R_4$  remote, and  $R_4$  originating from basal 3/4 of cell. Hind wing 3/4 as long as fore wing, narrowly lanceolate, with five veins;  $Cu_1$ ,  $M_2$  and  $M_3$  absent, discoidal cell opened,  $An$  rudimentary,  $Cu_2$  simple, and  $R$  ending at apical 1/3 of costa; cilia expanding 4 times breadth of the wing.

Male genitalia symmetrical. Transtilla present and very wide. Valva very simple; cucullus very elongate. Uncus well sclerotized, and very elongate. Saccus rather wide and elongate. Ninth sternite produced into fairly wide flap. Anellus conspicuously sclerotized, with a pair of hairy processes on its dorso-laterals.

Female genitalia symmetrical. Sclerotized area of eighth abdominal segment normally

separated from that of the seventh, without sclerotized genital plate. Ductus bursae very short, without sclerotized antrum; corpus bursae entirely membranous, without signa.

Type species: *Neolithocolletis hikomonticola*, sp. nov.

Remarks: On account of the venation of the hind wing, the hind tibia with loosely appressed hairs on its upper and lower surfaces, and the male genitalia with transtilla and flap of ninth sternite, this genus resembles closely the genus *Lithocolletis*, but differs from the latter by the fore wing with vein  $R_3$ , and by the male genitalia with a pair of hairy processes on the sclerotized anellus.

46. *Hylaconis puerariae*, sp. nov. (Fig. 13)

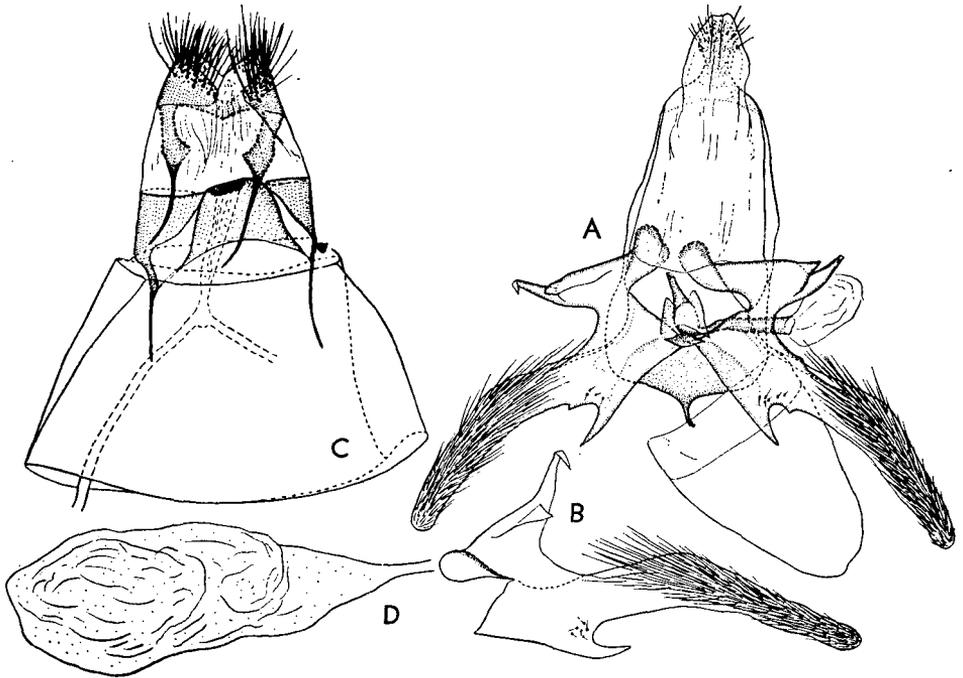


Fig. 13. *Hylaconis puerariae*, sp. nov.

A: caudal view of male genitalia; B: right valva; C: ventral view of female genitalia; D: corpus bursae.

♂♀. Face brilliant leaden-metallic; labial palpus whitish; tuft of head black; antenna black, apical ten to eleven segments wholly whitish. Thorax leaden-metallic, slightly tinged with brown. Legs brilliant leaden-metallic, tinged with golden reflections outside; each segment of hind tarsus broadly ringed with dark grey basally.

Fore wing orange-brown, tinged with golden reflections, with black and silvery-white markings. A black, triangular blotch situated on base of costa, beneath which a silvery-white or leaden spot is placed on fold. Two silvery-white fasciae, of which one is placed at basal  $1/4$  and the other at  $2/5$ , slightly oblique inwardly, almost straight, moderate in width, and margined with black scales internally and sometimes externally, while in a few

specimens the fasciae broadly interrupted at middle as paired blotches. A pair of opposite costal and dorsal blotches at basal  $3/5$  silvery-white, semicircular or hook-shaped, surrounded by black scales, the dorsal one being slightly curved outwardly and a little larger than the costal. A silvery-white, linear streak longitudinally placed in discal area between the last paired marks and apex of wing, rather shorter than  $1/7$  length of wing, and surrounded by black scales. Termen of wing broadly darkened; cilia pale brownish-grey. Hind wing dark grey, with cilia pale brownish-grey.

Expanse of fore wings, 5.5–6.5 mm.

Male genitalia symmetrical. Transtilla absent. Valva slender, slightly bent downward at middle, with an ovate knob at base of costa, a costal process, a process of sacculus, and a number of long, slender setae on apical half of inner surface; costal process triangular, somewhat dilated at middle, with a small, triangular projection near its top. Saccus very broad, rounded on its cephalic margin, with a short, slender projection at top. Flap of ninth sternite spatular in shape. Aedoeagus rather short, about half as long as valva, and partially swollen at apical  $1/3$ .

Female genitalia symmetrical. Postapophysis suddenly widened on basal half. Lamella antevaginalis rather large, trapezoid or semicircular in shape. Ductus bursae sclerotized only on caudal extremity; corpus bursae wholly membranous, without signa.

Holotype: ♂ (host: *Pueraria lobata*), Teine, Hokkaido, 29. I, 1959, T. Kumata leg. Paratypes: 2 ♂♂ & 1 ♀ (host: *P. lobata*), Teine, Hokkaido, 23. XII, 1958, T. Kumata leg.; 8 ♂♂ & 10 ♀♀ (host: *P. lobata*), Teine, Hokkaido, 12. I,–5. II, 1959, T. Kumata leg.; 1 ♂ (host: *Amphicarpaea Edgeworthii* var. *japonica*), Teine, Hokkaido, 27. IV, 1959, T. Kumata leg.

Host plants: *Pueraria lobata* Ohwi and *Amphicarpaea Edgeworthii* Bentham var. *japonica* Oliver.

Distribution: Japan (Hokkaido).

Mine: Orthogenous, entirely flat, on the lower surface of leaves; cocoon orbicular in form, white, spun in the centre of the mine-cavity.

Remarks: In general appearance, the new species is somewhat similar to *Lithocolletis dorinda* Meyrick, a leaf-miner of *Desmodium*, *Pueraria* and *Uraria* in the Oriental region, but is clearly distinctive from the latter by the presence of two silvery-white fasciae and a longitudinal apical streak on the fore wing.

**47. *Hyloconis desmodii*, sp. nov.** (Fig. 14)

♂♀. Face leaden-metallic; labial palpus yellowish white; tuft of head black; antenna blackish brown, apical ten to twelve segments wholly white. Thorax brilliant leaden-metallic. Legs leaden-metallic, somewhat tinged with golden reflections outside; hind tarsus wholly dark.

Fore wing orange-yellow, tinged with golden reflections, with black and silvery-white markings. A black, triangular blotch occupying almost whole basal area of wing; whitish medio-basal spot or streak absent. A silvery-white fascia placed at basal  $1/4$ , vertical, straight or slightly arched outwardly, and margined with black scales internally and externally, the black external margin disappearing on dorsal half. Two pairs of opposite costal

and dorsal blotches, of which the first pair is placed just before middle and the other at basa  $3/4$ , silvery-white, surrounded by black scales, the costal blotches being semicircular, and the dorsal ones wedge- or hook-shaped and slightly curved outwardly. A silvery-white, linear streak longitudinally placed in discal area near apex of wing, slightly shorter than  $1/7$  length of wing, and wholly surrounded by black scales. Termen broadly darkened; cilia pale brownish-grey. Hind wing dark grey, with cilia pale brownish-grey.

Expanse of fore wings, 5.0-6.0 mm.

Male genitalia symmetrical. Transtilla absent. Valva slender, slightly bent downward at middle, with an ovate knob at base of costa, and with a number of slender, long setae on apical half of inner surface; sacculus occupying about basal  $1/4$  of valva, and ending in an angulated top; costal process absent. Saccus quadrate, about as long as wide, parallel-

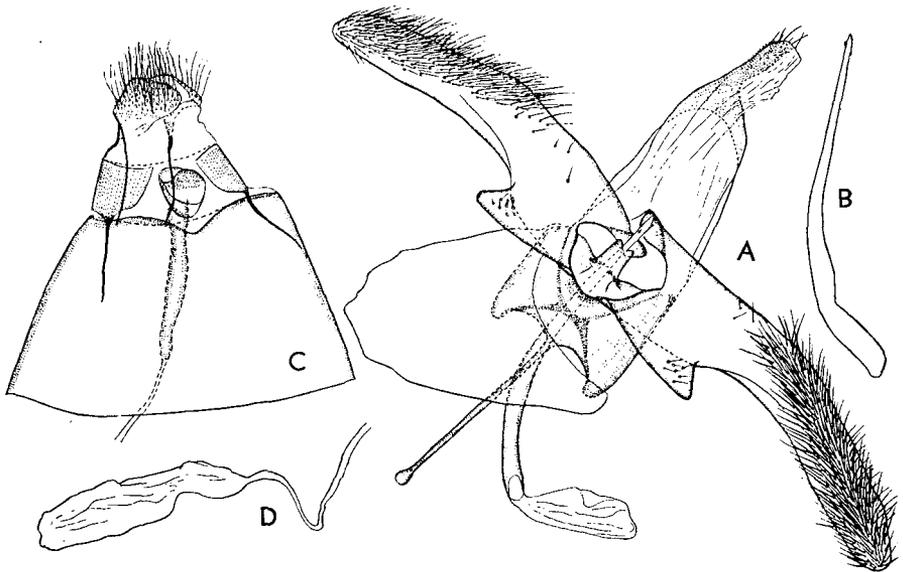


Fig. 14. *Hyloconis desmodii*, sp. nov.

A: caudal view of male genitalia; B: aedeagus; C: ventral view of female genitalia; D: corpus bursae.

sided, sinuate on its cephalic margin, with a slender, long projection, which is about  $2/3$  as long as aedeagus. Flap of ninth sternite spatular. Anellus sclerotized, and rather elongate. Aedeagus slender, tubular, slightly curved, gradually tapering towards apex, with two minute projections near apex.

Female genitalia symmetrical. Postapophysis a little longer than antapophysis. Sterigma consisting of ovate lamella antevaginalis, lamella postvaginalis and long antrum; lamella antevaginalis connected with the lamella postvaginalis in a ring; antrum very long and slender, about  $3/4$  as long as seventh segment; membranous ductus bursae very long and slender; corpus bursae without signa.

Holotype: ♂, Hikosan, Kyusyu, 1. VI, 1957, T. Kumata leg. Paratypes: 1 ♂ (host: *Desmodium racemosum*), Hikosan, Kyusyu, 5. V, H. Kuroko leg.; 1 ♀ (host: *D. racemosum*),

Hikosan, Kyusyu, 23. VII, 1955, H. Kuroko leg. The paratypes are deposited in the collection of Entomological Laboratory, Kyusyu University.

Host plants: *Desmodium racemosum* de Candolle.

Distribution: Japan (Kyusyu).

Mine: Unknown.

Remarks: From the preceding species, *H. puerariae* the present species is markedly distinguished by the following aspects:— a black triangular blotch occupying almost whole basal area of fore wing; a silvery-white medio-basal spot absent; silvery-white median marks of fore wing usually separated from each other widely, and forming a pair of blotches; costal process of valva absent; saccus more elongate, with its projection much longer than

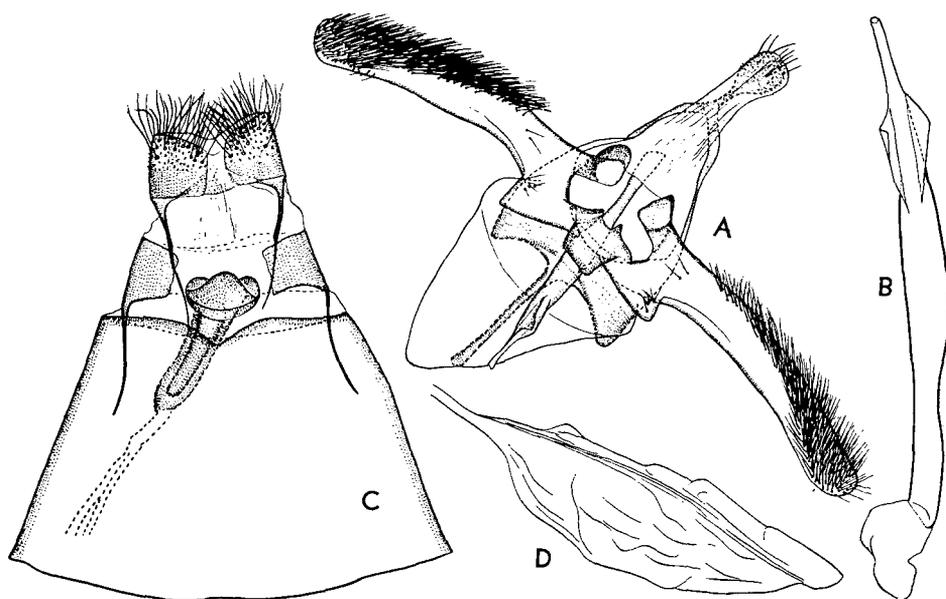


Fig. 15. *Hyloconis lespedezae*, sp. nov.

A: caudal view of male genitalia; B: aedoeagus; C: ventral view of female genitalia; D: corpus bursae.

1/3 length of valva; aedoeagus longer, wholly slender, with two minute projections near apex; antrum much longer, etc.

48. *Hyloconis lespedezae*, sp. nov. (Fig. 15)

♂♀. Face and thorax brilliant leaden-metallic; palpus whitish; tuft of head black; antenna blackish-brown, with apical ten to twelve segments wholly white. Legs leaden-metallic, tinged with yellowish or golden reflections outside; hind tarsus wholly dark grey.

Fore wing orange-yellow, tinged with golden reflections, characteristically darkened on apical 1/5, with black and silvery-white markings. A black blotch occupying almost whole basal area of wing, triangular, and rather large; whitish medio-basal spot or streak absent. Two pairs of opposite costal and dorsal blotches, of which the first pair is placed at the

basal  $1/4$  to  $1/5$  and the other at the middle, all being silvery-white, semicircular, wedge- or hook-shaped, markedly surrounded by black scales, the costal blotches being smaller than the opposite dorsal ones respectively; in a specimen first pair of blotches touching each other in an inwardly oblique fascia. Third silvery-white costal blotch placed at basal  $3/4$ , hardly oblique inwardly, but merely extending to costal  $1/4$  across wing, and surrounded by black scales. A silvery-white, very narrow streak longitudinally placed on discal area of basal  $3/4$  of wing, very long, about  $1/5$  as long as wing, and conspicuously surrounded by black scales. Cilia brownish-grey. Hind wing grey, with cilia brownish-grey.

Expanse of fore wings, 6.5–7.0 mm.

The genitalia of this species are very similar to those of preceding species, *H. desmodii*, but differ by the following features:—

Male genitalia: Aedoeagus rather straight, somewhat swollen at middle, with two large triangular lobes at apical  $1/5$ . Saccus about half as long as wide, with apical projection much shorter, about half as long as aedoeagus.

Female genitalia: Antrum thicker, and half as long as seventh abdominal segment.

Holotype: ♂ (host: *Lespedeza bicolor*), Sapporo, Hokkaido, 1. V, 1959. T. Kumata leg.  
Paratypes: 1 ♂ & 1 ♀ (host: *L. bicolor*), Sapporo, Hokkaido, 1. V. 1959, T. Kumata leg.

Host plants: *Lespedeza bicolor* Turczaninow.

Distribution: Japan (Hokkaido).

Mine: Orthogenous, entirely very flat, on the lower surface of leaves; cocoon white, orbicular in form, spun in the centre of the mine-cavity.

Remarks: This species is very closely related to *H. desmodii*, but is easily distinctive from the latter by the silvery-white streak placed longitudinally on the basal  $3/4$  of the discal area of the fore wing as well as by the genital structures stated above.

#### 49. *Hyloconis wisteriae*, sp. nov. (Fig. 16)

♂♀. Face and thorax leaden-metallic, somewhat tinged with golden reflections; labial palpus whitish; tuft of head golden-ochreous; antenna brown, with each segment ringed with dark brown apically. Legs leaden-metallic, clouded outside; fore tarsus blackish, with two white median rings; mid tarsi with a black median ring and a subapical one of the same colour; hind tarsus blackish, with median and apical segments whitish.

Fore wing golden-brown, with silvery-white markings. Medio-basal streak placed on fold, merely extending to basal  $1/8$ , sometimes ill defined, without any marginal dark scales. Two fasciae, of which one is placed at the basal  $1/4$  and the other at the middle, rather vertical, slightly arched or obtusely angulated outwardly, and markedly margined with dark scales internally. A pair of opposite costal and dorsal blotches placed on basal  $3/4$  triangular or semicircular, and surrounded by dark scales; in some specimens the blotches touching each other at middle across wing in a fascia. A black, oval blotch situated in disc near apex of wing, with a silvery-white, very small spot placed in its centre. Termen of wing broadly darker; cilia pale brownish-grey. Hind wing pale leaden-grey, with cilia pale brownish-grey.

Expanse of fore wings, 5.0–6.0 mm.

Male genitalia asymmetrical. Right valva rather slender, while slightly wider than the left, suddenly widened on apical 1/3, broadly truncated apically, with six stout spines on its apical margin and with some slender setae on whole inner surface. Left valva alike to the right in form, but its sacculus extremely projecting narrowly. Saccus slightly asymmetrical, i. e. its right side being wider than the other, with a long apical projection, which is slightly shorter than half length of valva, and gradually thickened towards top. Anellus entirely membranous. Aedoeagus slender, extremely long, and slightly narrowed and curved at about apical 1/3.

Female genitalia asymmetrical. Eighth segment completely united with the seventh,

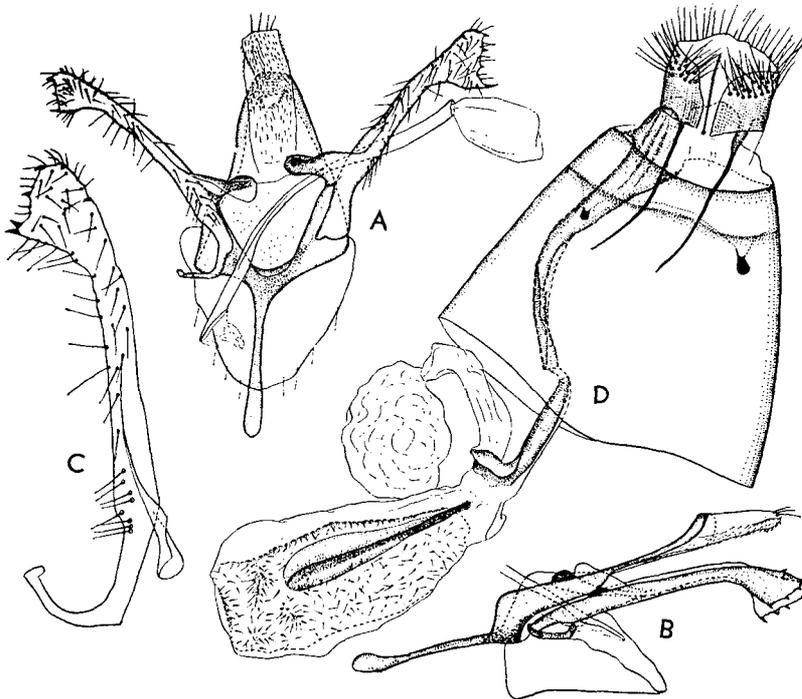


Fig. 16. *Hyloconis wisteriae*, sp. nov.

A: caudal view of male genitalia; B: lateral view of male genitalia;  
C: left valva; D: ventral view of female genitalia.

with a pair of globular antapophyses, of which the left one is smaller than the right. Ostium bursae opened at left side of dorsum of caudal margin of eighth segment; lamella antevaginalis tongue-shaped; ductus bursae strongly sclerotized almost on the whole. Corpus bursae bearing many minute spines on its cephalic half, with a very long signum, which is trifurcate in its cross section.

Holotype: ♂ (host: *Wisteria floribunda*), Ino, Kōti-ken, Sikoku, 18. VI, 1957, T. Kumata leg. Paratypes: 10 ♂♂ & 5 ♀♀ (host: *W. floribunda*), Ino, Kōti-ken, Sikoku, 14-25. VI, 1957, T. Kumata leg.; 2 ♀♀ (host: *W. floribunda*), Hikosan, Kyusyu, 12-22. V, 1954, H. Kuroko leg.; 1 ♀ (host: *W. floribunda*), Hikosan, Kyusyu, 3. IV, H. Kuroko leg.; 1 ♀,

Hikosan, Kyusyu, 3. VI, 1957, T. Kumata leg. The paratypes collected by Dr. H. Kuroko are deposited in the collection of Entomological Laboratory, Kyusyu University.

Host plants: *Wisteria floribunda* de Candolle.

Distribution: Japan (Sikoku; Kyusyu).

Mine: Orthogenous, entirely flat, circular or elliptical in form, on the lower surface of leaves; cocoon white, orbicular, and spun in the centre of the mine-cavity.

Remarks: This species differs distinctly from any other species of the genus *Hyloconis* by the asymmetrical genitalia in both sexes, the yellowish-brown tuft of the head, and the fore wing without any black basal blotch.

***Hyloconis***, gen. nov.

♂♀. Head with a tuft of long scales on vertex. Antenna about as long as fore wing; scape slightly thickened, with a basal pecten of a few hairs. Ocellus not perceptible. Labial palpus moderate or short, drooping, filiform, pointed, with terminal segment about twice as long as median one. Maxillary palpus rudimentary. Proboscis moderate in length. Thorax without crest. Fore and mid tibiae smooth; hind tibia with loosely appressed hairs on its lower surface alone.

Fore wing very elongate, lanceolate, with nine veins;  $Cu_1$ ,  $M_2$ ,  $M_3$  and  $R_1$  absent,  $An_2$  simple,  $A_1$  rudimentary,  $Cu_2$  originating from lower angle of cell,  $M_1$  arising from apex of cell to termen,  $R_5$  originating from apex of cell to costa,  $R_2$ - $R_5$  remote and  $R_2$  originating from basal 3/4 of cell. Hind wing about 3/4 as long as fore wing, narrowly lanceolate, with six veins;  $M_3$  and  $Cu_1$  absent, discoidal cell opened,  $An$  rudimentary,  $Cu_2$  simple,  $M_1$  and  $M_2$  stalked, and  $R$  ending at apical 1/3 of costa; cilia expanding 4 times breadth of wing.

Male genitalia symmetrical or rarely asymmetrical. Transtilla usually absent. Valva rather simple or complicate, with an ovate knob at base of costa. Saccus rather broad, with an apical projection. Ninth sternite produced into a fairly wide flap. Anellus sclerotized in most species, without any hairy process.

Female genitalia symmetrical or rarely asymmetrical. Sclerotized area of eighth abdominal segment normally separated from that of the seventh except *wisteriae*, with a sclerotized genital plate. Ductus bursae usually sclerotized at least on its caudal extremity.

Type species: *Hyloconis puerariae*, sp. nov.

Remarks: This genus is closely related to the genera *Lithocolletis* Hübner and *Cremastobombycia* Braun, but is distinguished from *Lithocolletis* by the following points:— (1) Fore wing having vein  $R_3$ , (2) hind wing having vein  $M_2$ , which is stalked with vein  $M_1$ , (3) male genitalia lacking transtilla, (4) mine entirely flattened, and (5) cocoon orbicular in shape. In the genus *Lithocolletis* the mines are usually ptychonomous and tentiformed, and the cocoons are ellipsoidal. From *Cremastobombycia* it is distinguished by the fore wing having vein  $R_3$  and lacking vein  $M_2$ . It differs immediately from *Neolithocolletis* Kumata by the venation of the hind wing, and by the absence of the transtilla of the male genitalia.

50. ***Lithocolletis dorinda*** Meyrick

*Lithocolletis dorinda* Meyrick, 1912, Exotic Microlep. 1: 21; Fletcher, 1921, Mem. Dept. Agric. India, Ent. Ser. 6: 140; Meyrick, 1935, Exotic Microlep. 4: 595; *ibid.*, 1936, *op. cit.* 5: 33; Kuroko, 1961, Science Bull. Fac. Agric. Kyusyu Univ. 18: 320, fs. 2 D & 8.

This species was originally described from Pusa, India. Although Dr. H. Kuroko recently recorded it from Yaku-sima near Kyusyu as a leaf-miner of *Desmodium Buergeri*, I have seen no representatives of this species.

Host plants: *Desmodium Buergeri* Miquel (after H. Kuroko) in Japan, *Pueraria thunbergiana* in Formosa, and *Desmodium* sp. and *Uraria neglecta* in India.

Distribution: Japan (Yaku-sima near Kyusyu), Formosa and India.

### 10. Species attacking Aceraceae

#### 51. *Lithocolletis jezoniella* Matsumura

*Lithocolletis jezoniella* Matsumura, 1931, 6000 Ill. Ins. Jap.: 1102, f. 2291; *ibid.*, 1931, Ins. Mats. 6: 200; Kumata, 1959, Ins. Mats. 22: 78, fs. 1 C & 4.

*Phyllonorycter jezoniella*: Inoue, 1954, Check list Lep. Jap. 1: 28.

This species is definitely distinct from any other known species by the following structures of the genitalia:— Male: costal process of valva nearly as long as valva proper and bearing a few short, spine-like setae instead of one filament-like seta; flap of ninth sternite with a globular projection at apex. Female: eighth abdominal segment deeply inserted into the seventh.

Specimens examined: Types of *jezoniella*; 1 ♀, Risiri Is., 1 ♀, Sapporo, and 1 ♀ & 2 ♂♂, Zyôzankei, Hokkaido, and 1 ♂, Nagano, Honsyu, on *Acer Mono*.

Host plants: *Acer Mono* Maximowicz.

Distribution: Japan (Hokkaido; Honsyu).

Mine: Ptychonomous, situated in the centre of the lower surface of leaves.

#### 52. *Lithocolletis kurokoi*, sp. nov. (Fig. 17)

♂♀. Face and palpus white, the latter spotted with dark brown on its apex; tuft of head white, mixed with brownish scales laterally; antenna buff white, annulated or spotted above with dark brown. Thorax golden-brown, with three white, narrow stripes, among which two pass along inner margins of tegulae. Legs buff white; fore femur and tibia blackish inside; mid tibia with three black, oblique streaks outside; hind tibia clouded outside; fore and mid tarsi broadly ringed with black subbasally and subapically; hind tarsus spotted above with black medially.

Fore wing golden-brown, with white markings. Medio-basal streak slender, very short, reaching at most basal 1/10, without marginal dark scales. A pair of opposite costal and dorsal blotches placed at basal 1/5, rectangular, slightly oblique outwardly, without marginal dark scales, the dorsal being a little shorter than the costal, which is situated more apically than the former. A narrow fascia placed just before middle, nearly straight, and margined with a few dark scales internally. Second pair of blotches placed at apical 1/3 beyond fascia, vertical or slightly oblique outwardly, margined with dark irrorations internally, the dorsal one being triangular and a little larger than the costal, which is rectangular. Two costal blotches placed near apex of wing, wedge-shaped, and margined with dark irrorations

internally. A small blotch at middle of termen ill defined in shape, scarcely margined with dark irrorations internally. A dark, short, linear streak placed in discal area of apex of wing. A dark, narrow line in cilia extending along apex of wing; cilia pale yellow. Hind wing grey, with cilia pale yellowish-grey.

Expanse of fore wings, 7.0-7.5 mm.

Male genitalia conspicuously asymmetrical. Right valva slender, sinuate, widened at apex, with a group of some short, spine-like setae on apical corner of hind margin and with many more slender setae on inner surface near apex; costal process very short, with filament-like seta slender, short and straight. Left valva much wider, bearing setae similar

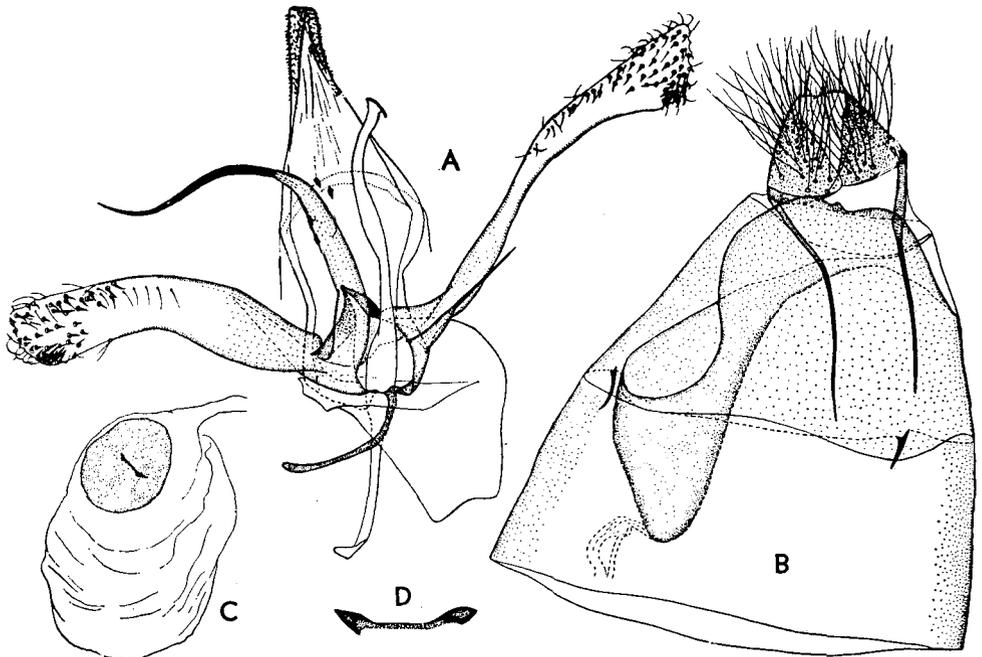


Fig. 17. *Lithocolletis kurokoi*, sp. nov.

A: caudal view of male genitalia; B: ventral view of female genitalia; C: corpus bursae; D: sclerotized projections of signum.

to the right one; costal process nearly as thick as right valva, and about half as long as left valva, with filament-like seta strong, long and sinuate. Saccus very narrow, with a slender, long projection at cephalic top. Flap of ninth sternite rather short, with apical margin concave. Aedoeagus very long, sinuate, with a minute apical barb.

Female genitalia conspicuously asymmetrical. Ostium bursae opened at left side of abdomen. Sterigma consisting of antrum alone, which is bag-shaped. Antapophysis very short, about 1/7 as long as postapophysis.

Holotype: ♂ (host: *Acer Mono*), Hikosan, Kyusyu, 24. IV, 1957, H. Kuroko leg. Paratype: 1 ♀ (host: *A. Mono*), Hikosan, Kyusyu, 25. IV, 1957, H. Kuroko leg. The types are deposited in the collection of Entomological Laboratory, Kyusyu University.

Host plants: *Acer Mono* Maximowicz.

Distribution: Japan (Kyusyu).

Mine: According to Dr. H. Kuroko the mine of this species is seen on the lower surface of leaves.

Remarks: This species is readily distinguished from any other known species by the asymmetrical form of the genitalia in both sexes, especially in the female genitalia.

53. *Lithocolletis orientalis*, sp. nov. (Fig. 18)

This species is represented by the aestival and autumnal forms, which are different in

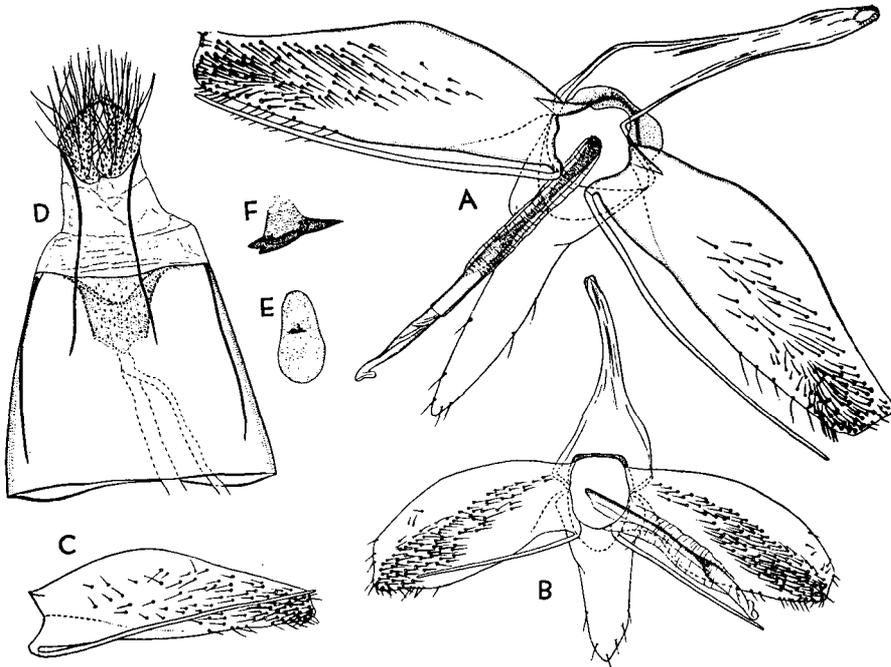


Fig. 18. *Lithocolletis orientalis*, sp. nov.

A: caudal view of male genitalia (holotype); B: ditto (locality: Formosa); C: right valva (locality: Kyusyu); D: ventral view of female genitalia; E: signum; F: sclerotized projections of signum.

colour.

Aestival form: ♂♀. Face and palpus white; tuft of head snow-white, scarcely mixed with brownish scales laterally; antenna whitish, spotted with dark brown above. Thorax golden-ochreous, with two white, broad stripes passing along inner margins of tegulae. Legs whitish; mid tibia with three black oblique streaks outside; hind tibia blotched with brown outside; each segment of all tarsi ringed with black.

Fore wing much elongate, golden-ochreous, with markings white. Medio-basal streak rather narrow, nearly extending to basal 1/3, upwardly bent at its apical 1/4, without any dark marginal scales. Dorso-basal streak shorter and narrower than the medio-basal,

without any dark marginal scales. A narrow fascia placed on middle of wing, acutely angulated outwardly at costal 1/3 across wing, margined with dark irrorations internally. Three costal blotches placed near apex of wing, wedge- or hook-shaped, slightly oblique inwardly, without any dark marginal scales. A dorsal streak placed just before tornus, curved or oblique outwardly, extending nearly to middle across wing, and scarcely margined with dark irrorations. A whitish, indistinct blotch situated behind tornus, and not extending into cilia. Discal area between apical 1/3 and apex of wing irrorated with blackish-brown scales. A dark brown line in cilia running along apex of wing; cilia greyish-white. Hind wing whitish-grey, with cilia greyish-white.

Expanse of fore wings, 5.5-6.0 mm.

Male genitalia symmetrical. Valva elongate, arched upwardly on costal margin, somewhat truncated apically, with a string-like projection at basal corner of hind margin, the projection being nearly as long as or slightly shorter than valva. Saccus moderate in length, and rounded apically. Flap of ninth sternite very slender on the whole, and pointed apically. Aedoeagus slender, almost straight, with a small apical barb.

Female genitalia symmetrical. Eighth abdominal segment wholly membranous, and recognized by the presence of antapophysis. Sterigma consisting of antrum alone, which is rather large and trapezoid or rectangular.

Autumnal form: ♂♀. This form differs from the aestival only by the colour-pattern as follows:- Tuft of head mixed with more blackish scales laterally; antenna more strongly spotted with black. Thorax mixed with golden-ochreous, brownish-black and white scales on whole area, with white stripes disappearing. Fore wing with a blackish large mark besides white marks, which is placed on costal area between base and white median fascia; black apical streak more distinct, and projecting into angle of the median fascia; dorsal half of fore wing densely irrorated with whitish scales.

Holotype: ♂ (host: *Acer Mono*), Zyôzankei, Hokkaido, 24. VII, 1956, T. Kumata leg. Paratypes: 1 ♀ (host: *A. Mono*), Zyôzankei, Hokkaido, 18. VII, 1956, T. Kumata leg.; 1 ♂ & 5 ♀♀ (host: *A. Mono*), Zyôzankei, Hokkaido, 30. IX,-3. X, 1957, T. Kumata leg.; 5 ♂♂ & 3 ♀♀ (host: *A. Mono*), Zyôzankei, Hokkaido, 11-17. IX, 1958, T. Kumata leg.; 1 ♂ & 3 ♀♀ (host: *A. japonicum*), Zyôzankei, Hokkaido, 9-11. IX, 1958, T. Kumata leg.; 2 ♀♀ (host: *A. Mono*), Sapporo, Hokkaido, 13. VII, 1957, T. Kumata leg.; 5 ♂♂ & 3 ♀♀ (host: *A. Mono*), Sapporo, Hokkaido, 12-20. IX, 1957, T. Kumata leg.; 1 ♂ (host: *A. japonicum*), Sapporo, Hokkaido, 20. IX, 1957, T. Kumata leg.; 2 ♂♂ & 2 ♀♀ (host: *A. palmatum*), Sapporo, Hokkaido, 19. IX,-3. X, 1957, T. Kumata leg.; 1 ♂ (host: *A. Mono*), Sapporo, Hokkaido, 4. X, 1958, T. Kumata leg.; 2 ♂♂ (host: *A. japonicum*), Sapporo, Hokkaido, 17-22. IX, 1958, T. Kumata leg.; 1 ♂ (host: *A. carpinifolium*), Hikosan, Kyusyu, 2. XI, 1955, H. Kuroko leg.; 2 ♂♂ (host: *Acer* sp.), Kankoh, Formosa 7. III, 1943, S. Issiki leg. The paratypes collected at Kankoh, Formosa, are deposited in Dr. S. Issiki's collection, and one paratype collected at Hikosan, Kyusyu, is in the collection of Entomological Laboratory, Kyusyu University.

Host plants: *Acer Mono* Maximowicz, *Acer palmatum* Thunberg and *Acer carpinifolium* Siebold et Zuccarini in Japan, and *Acer* sp. in Formosa.

Distribution: Japan (Hokkaido; Kyusyu) and Formosa.

Mine: Ptychnomous, on apical area of the lower surface of leaves.

Remarks: In colour-pattern of the aestival form, this species somewhat resembles *L. monspessulanella* Fuchs, a leaf-miner of *Acer* in Europe, but is readily distinguished from the latter by the valva having a string-like projection at the basal corner of the hind margin.

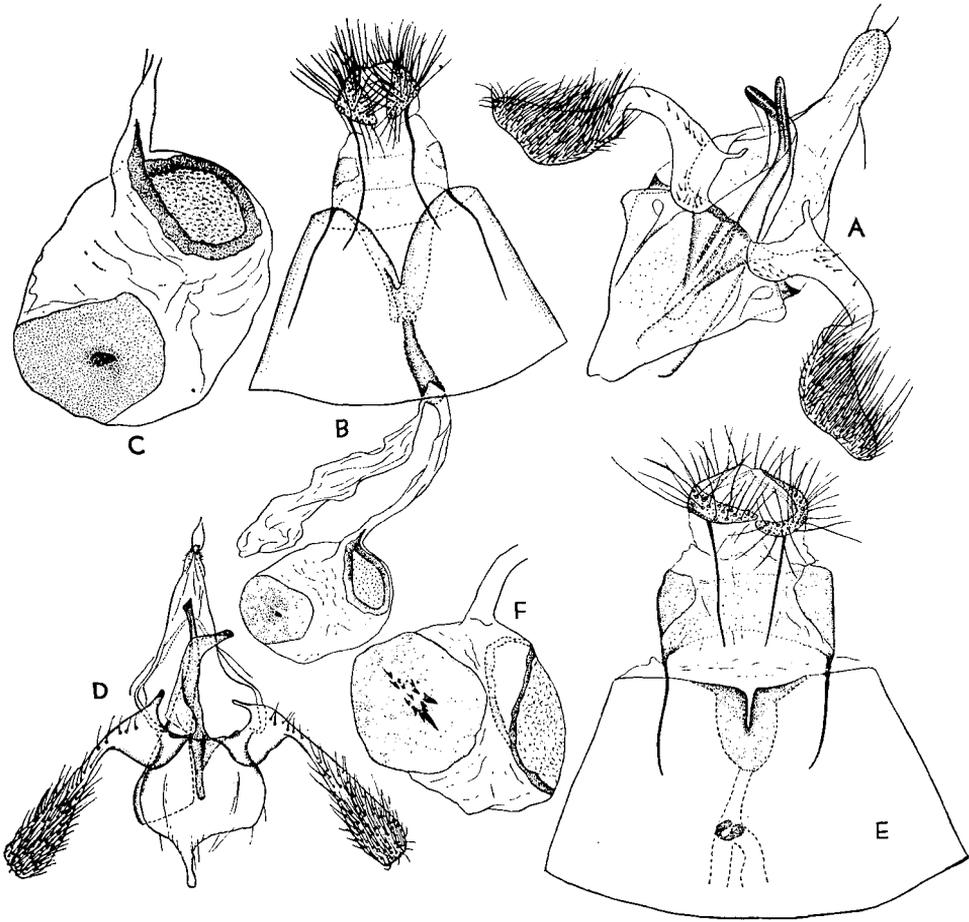


Fig. 19. A-C: *Cameraria acericola*, sp. nov.;

D-F: *Cameraria saccharella* (Braun).

A & D: caudal view of male genitalia; B & E: ventral view of female genitalia; C & F: corpus bursae.

54. *Cameraria acericola*, sp. nov. (Fig 19, A-C)

♂♀. Face pure white; palpus yellowish-white, clouded outside; tuft of head pale golden-ochreous, mixed with some whitish scales in centre; antenna yellowish-white, with each segment ringed apically with dark brown except for fifth, seventh and ninth segments from apex. Thorax golden-brown, with two white stripes running along inner margins of

tegulae. Legs yellowish-white, somewhat clouded or blotched with dark brown outside; fore and mid tarsi with black, rather wide rings at base, basal  $1/3$  and  $2/3$ ; hind tarsus with black, very narrow rings at basal  $3/5$  and  $4/5$ .

Fore wing golden-brown, with white markings, which are margined with dark scales externally. A short basal streak extending from base of dorsal margin to middle between base of wing and first dorsal streak in parallel with costa, and surrounded by dark scales. A pair of opposite costal and dorsal streaks placed at basal  $1/5$  to  $1/3$ , the dorsal being oblique or curved outwardly and extending to dorsal  $3/5$  across wing, the costal being very minute and shorter than  $1/5$  length of the dorsal. A fascia placed just before middle, rather acutely angulated outwardly at costal  $1/3$  across wing, with its dark external margin slightly extending apically from the angle. Second pair of streaks placed at apical  $1/3$  beyond the fascia, rather long, and curved outwardly, with dark external margin of the dorsal streak usually extending to and connected with that of last costal mark, which is placed near the apex of the wing. Median area of termen irrorated with dark scales. A dark, narrow line in cilia running along apex of wing; cilia yellowish. Hind wing grey, with cilia pale grey.

Expanse of fore wings, 6.5–8.5 mm.

Male genitalia symmetrical. Transtilla absent. Valva much narrowed on median part, slightly bent downward at middle, with a number of dense, slender setae on inner surface of its subtriangular apical half. Flap of ninth sternite triangular, and somewhat bluntly pointed apically. Saccus elongate, triangular, with its top narrowly projecting cephalad. Anellus much sclerotized, nearly extending to apex of aedoeagus. Aedoeagus longer than valva, rather thick, becoming narrower towards apex, and slightly bent downward at its apical  $1/5$ .

Female genitalia symmetrical. Caudal margin of seventh sternite rather deeply notched medially. Sclerotized antrum very long, and gradually becoming thicker cephalad. Corpus bursae with two signa, of which one is rectangular or elliptical and bearing a minute, cone-shaped projection in its centre, and the other somewhat annular and placed near the opening of ductus bursae.

Holotype: ♂ (host: *Acer Mono*), Teine, Hokkaido, 12. V, 1959, T. Kumata leg. Paratypes: 1 ♂ & 1 ♀ (host: *A. Mono*), Teine, Hokkaido, 5. V, 1958, T. Kumata leg.; 3 ♂♂ & 7 ♀♀ (host: *A. Mono*), Teine, Hokkaido, 12–26. VI, 1959, T. Kumata leg.; 2 ♂♂ & 3 ♀♀ (host: *A. Mono*), Sapporo, Hokkaido, 25–28. VI, 1950, Y. Nishijima leg.

Host plants: *Acer Mono* Maximowicz.

Distribution: Japan (Hokkaido).

Mine: Blotch-formed, entirely flat, on the upper surface of leaves; cocoon buff white, ellipsoidal, placed in centre of mine-cavity.

Remarks: The mine of this species is most commonly found on the leaf of *Acer Mono* in autumn from September to November in Hokkaido.

The present species much resembles *C. saccharella* (Braun), of which one female syntype and one male specimen were examined by myself by courtesy of Mr. J. F. Gates Clark of the U. S. National Museum. It is immediately distinguished from the latter by the fact that one white, short costal streak is placed at the basal  $1/3$  of the fore wing,

and that the white basal streak extends merely to the middle between the base of the fore wing and the first white dorsal streak; in *saccharella*, such a costal streak is absent on the basal 1/3 of the fore wing, and the basal streak is completely connected with the apex of the first dorsal streak. It differs markedly from *saccharella* in the structure of genitalia as shown in the figure (Fig. 19).

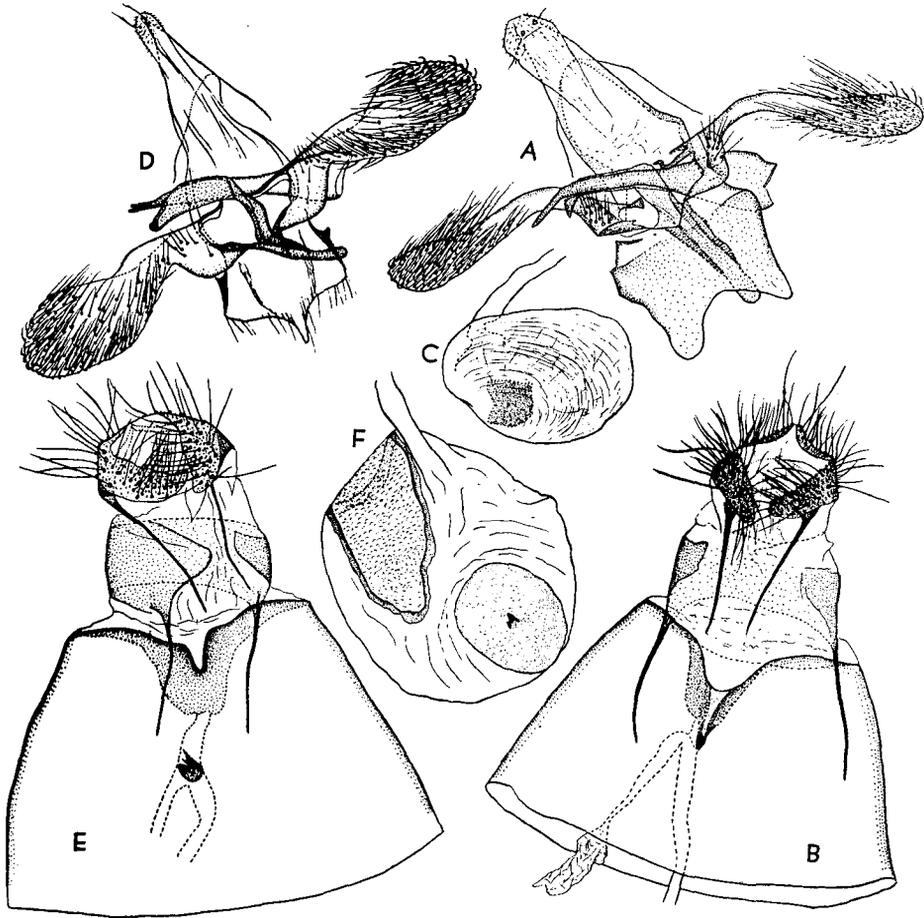


Fig. 20. A-C: *Cameraria niphonica*, sp. nov.;

D-F: *Cameraria aceriella* (Clemens).

A & D: caudal view of male genitalia; B & E: ventral view of female genitalia; C & F: corpus bursae.

55. *Cameraria niphonica*, sp. nov. (Fig. 20, A-C)

♂♀. Face pure white; palpus buff white, and clouded outside; tuft of head wholly golden-ochreous; antenna buff white, with each segment broadly ringed apically with dark brown, while on apical ten segments the black rings becoming paler. Thorax golden-brown, with two whitish, narrow stripes running along inner margins of tegulae. Fore leg blackish,

with the tarsus ringed with white; mid and hind legs buff white, somewhat clouded outside; mid tarsus with two black rings at basal  $1/3$  and  $2/3$ ; hind tarsus with two black, narrow rings at basal  $3/5$  and  $4/5$ .

Fore wing golden-brown, with white markings, which are margined with dark scales externally. A narrow basal streak extending from base of dorsal margin to middle between base of wing and first fascia in parallel with costa, and scarcely margined with dark scales on its hind margin alone. First fascia placed at basal  $1/4$ , slightly oblique inwardly from costa, and straight or obtusely angulated near costa outwardly; second fascia just before middle usually parallel with the first. Two costal streaks oblique inwardly, of which one is placed at apical  $2/5$  and very short, and the other situated near apex of wing and slightly longer. A very long dorsal streak placed at tornus, hardly curved or oblique outwardly, the external dark margin being connected with that of the last costal streak. Apical margin of wing very slightly darkened; cilia pale ochre-yellowish. Hind wing grey, with cilia pale yellowish-grey.

Expanse of fore wings, 6.0-8.0 mm.

Male genitalia symmetrical. Transtilla absent. Valva slightly bent at basal  $1/3$  downward, suddenly narrowed at basal  $1/5$ , then becoming gradually thicker towards apex, with a number of dense and slender setae on inner surface of its ovate or ellipsoidal apical half. Flap of ninth sternite somewhat rectangular, the apical margin being deeply concave. Saccus very slender and elongate. Anellus extending near top of aedoeagus. Aedoeagus about as long as valva, thickened on basal half, and slightly bent downward at its apical  $1/5$ .

Female genitalia symmetrical. Caudal margin of seventh sternite shallowly concave medially. Sclerotized antrum very minute; ductus bursae very long and narrow; corpus bursae with only a rectangularly sclerotized plate, which bears a very minute, cone-shaped projection in centre.

Holotype: ♂ (host: *Acer* sp.), Hikosan, Kyusyu, 1. V, 1954, H. Kuroko leg. Paratypes: 1 ♀, Nukabira, Hokkaido, 12. VII, 1959, T. Kumata leg.; 2 ♀♀ (host: *A. japonicum*), Zyôzankei, Hokkaido, 7-14. IV, 1958, T. Kumata leg.; 1 ♀ (host: *A. japonicum*), Zyôzankei, Hokkaido, 30. I, 1959, T. Kumata leg.; 1 ♂ (host: *A. japonicum*), Sapporo, Hokkaido, 11. IV, 1959, T. Kumata leg.; 1 ♀, Tomakomai, Hokkaido, 23. VI, 1959, T. Kumata leg.; 3 ♀♀ (host: *A. palmatum*), Gamusi, Hiyama, Hokkaido, 16. IV, 1959, T. Kumata leg.; 1 ♀ (host: *A. palmatum*), Hikosan, Kyusyu, 1. V, 1954, H. Kuroko leg.; 1 ♀ (host: *A. palmatum*), Hikosan, Kyusyu, 4. V, 1957, H. Kuroko leg. Holotype and two paratypes collected by Dr. H. Kuroko are deposited in the collection of Entomological Laboratory, Kyusyu University.

Host plants: *Acer palmatum* Thunberg and *Acer japonicum* Thunberg.

Distribution: Japan (Hokkaido; Kyusyu).

Mine: Blotch-formed, entirely flat, on the upper surface of leaves; cocoon white, ellipsoidal, placed in centre of mine-cavity.

Remarks: The new species is very closely related to *C. aceriella* (Clemens) living in North America. After the careful examination of representatives of these species, it has been found that *niphonica* is markedly distinguished from *aceriella* in the structure of the

genitalia as shown in the figure (Fig. 20). The present species differs also from *acericola* by the fore wing having two white fasciae at the middle and the basal 1/4, by the wholly golden-ochreous tuft of the head, and by the structure of the genitalia.

### 11. Species attacking Ericaceae

#### 56. *Lithocolletis melacoronis*, sp. nov. (Fig. 21)

♂♀. Face leaden-metallic; palpus whitish, with a black apical spot; tuft of head black; antenna dark grey, with apical nine segments snow-white. Thorax wholly leaden-metallic. Legs buff white, with their outsides brownish.

Fore wing golden-orange-yellow, slightly tinged with red, with white, leaden-metallic and black markings, all the white markings being margined with black scales internally, and

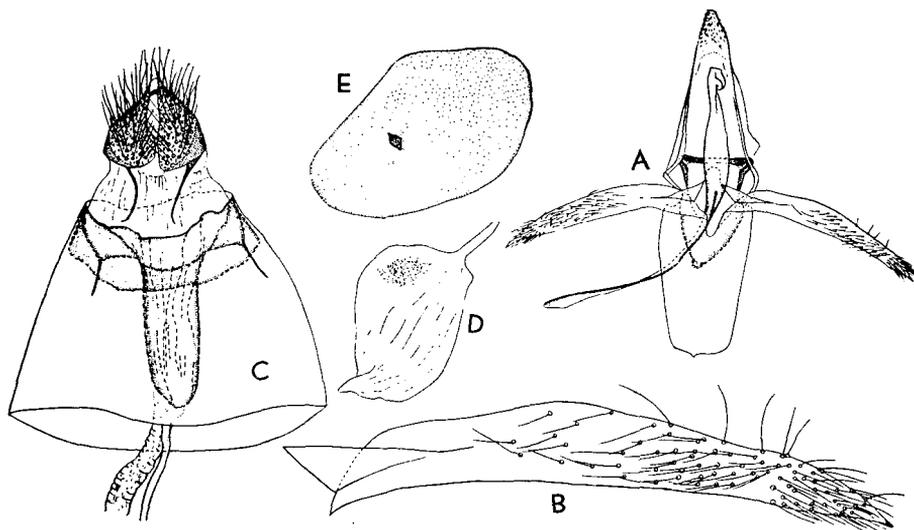


Fig. 21. *Lithocolletis melacoronis*, sp. nov.

A: caudal view of male genitalia; B: right valva; C: ventral view of female genitalia; D: corpus bursae; E: signum.

ing into leaden-metallic colour externally. A black spot situated on base of costa, small and triangular. A black line along dorsal margin of wing extending from base to basal 1/8 to 1/6. Medio-basal streak wholly leaden-metallic, extending nearly to basal 1/5, straight, somewhat widened apically, and markedly surrounded by black scales. A white fascia placed at about basal 1/3, vertical, and straight or slightly arched outwardly. A pair of white costal and dorsal blotches situated just beyond middle, the costal one being slightly oblique inwardly, and smaller than the dorsal, which is hardly curved or oblique outwardly. Two white costal blotches, one being at basal 2/3 and the other at basal 5/6, oblique inwardly, and smaller than the preceding costal blotches. A leaden-metallic dorsal spot placed at middle of termen, smallest among the markings, and margined with a few black scales internally. Moreover, a leaden-metallic streak longitudinally placed in disc near apex of

wing, and followed by a black, short apical streak. Apical margin of wing broadly darkened; cilia pale grey, and suffused with white on its tornal area. Hind wing dark grey, with cilia pale grey.

Expanse of fore wings, 5.0–5.5 mm.

Male genitalia symmetrical. Valva very slender, slightly arched upwardly, acutely pointed apically, with many slender setae on inner surface, and without any processes of costa and sacculus. Saccus rather elongate and triangular. Flap of ninth sternite spatular in shape. Aedoeagus swollen on its apical half, with an ovate apical barb.

Female genitalia symmetrical. Cephalic half of eighth segment much sclerotized, and inserted into seventh segment as shown in the figure (Fig. 21, C). Sterigma very large, tubular, with its cephalic end reaching near cephalic margin of seventh segment.

Holotype: ♂ (host: *Rhododendron* sp.), Hikosan, Kyusyu, 24. VII, 1954, H. Kuroko leg. Paratype: 1 ♀ (host: *Rhododendron* sp.), Hikosan, Kyusyu, 24. VII, 1954, H. Kuroko leg. All the types are deposited in the collection of Entomological Laboratory, Kyusyu University.

Host plants: *Rhododendron* sp.

Distribution: Japan (Kyusyu).

Mine unknown.

Remarks: This species may be immediately distinguishable from any other species by the following peculiar characters:— tuft of head black; medio-basal streak of fore wing wholly leaden-metallic; all white marks of fore wing margined with black scales internally and shading into leaden-metallic colour externally; slender valva of male genitalia very simple, without any process of costa or sacculus; cephalic half of eighth abdominal segment of female inserted into seventh abdominal segment.

### 57. *Lithocolletis lyoniae*, sp. nov. (Fig. 22)

♂♀. Face snow-white; palpus whitish, with apical segment blotched with dark brown outside; tuft of head whitish, mixed with several golden-ochreous scales laterally; antenna whitish, each segment being spotted above with dark brown. Thorax golden-ochreous, with two white stripes passing along inner margins of tegulae, and with a white spot at posterior angle. Fore leg blackish, the tibia being whitish, and each tarsal segment ringed with white apically; mid leg whitish, the tibia being obliquely lined with black outside, and the tarsus ringed with black at base, middle and subapex; hind leg whitish, the tibia being clouded outside.

Fore wing golden-ochreous, with white markings, which are margined with blackish irrorations internally. Medio-basal streak extending to basal 1/3, very narrow, bent upwardly at its apical 1/3, without any dark marginal scales. Dorso-basal streak a little shorter than the medio-basal, slender, without dark marginal scales. A very minute costal spot at basal 1/4 reaching near costal 1/6 across wing, and somewhat oblique outwardly. A very narrow fascia placed on middle, sharply angulated outwardly above middle across wing, its dorsal arm being much curved and more than twice as long as its costal one. A large, triangular blotch placed on tornus, curved outwardly, and extending to middle across wing; a small

costal blotch placed opposite to tornal one, rather vertical, and extending merely to costal  $1/4$  across wing. Two costal and one dorsal blotches placed near apex of wing, all being very small, wedge-shaped, and oblique inwardly. A dark-irrorated streak placed in disc near apex of wing, and running in parallel to termen. A dark brown line in cilia very distinct, and running along apex of wing; cilia pale ochreous. Hind wing pale grey, with cilia pale ochreous.

Expanse of fore wings, 6.5-7.0 mm.

Male genitalia distinctly asymmetrical. Left valva somewhat ovate in form, about twice as wide as right, sharply pointed apically, with a short, spine-like seta at the pointed apex,

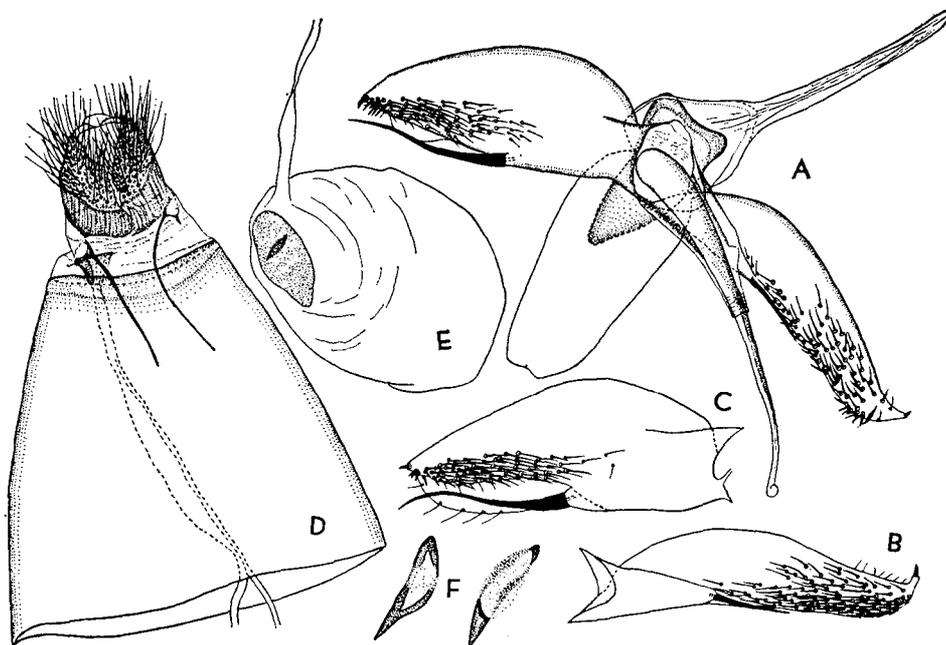


Fig. 22. *Lithocolletis lyoniae*, sp. nov.

A: caudal view of male genitalia; B: right valva; C: left valva;  
D: ventral view of female genitalia; E: corpus bursae; F: variations  
of sclerotized projections of signa.

with many slender setae on inner surface, and with a large lobe on apical half of ventral margin of valva; filament-like seta originating from middle of valva, sinuate, very strong, and extending to apex of valva. Right valva rather slender, upwardly bent near its apex, with a short seta and many slender setae as in the left valva, but without a lobe; filament-like seta originating from basal  $1/5$  of the valva, and extending to apical  $1/5$ . Saccus elongate and triangular. Flap of ninth sternite rather elongate and spatular, with its apical margin sinuate. Aedoeagus gradually thickened basally, with a globose apical barb.

Female genitalia slightly asymmetrical. Ninth segment elongate, about as long as papillae anales, with a short process produced from base of each slender postapophysis, the left process being slightly longer than the right one. Antapophysis absent. Ductus bursae

without sclerotized antrum.

Holotype: ♂ (host: *Lyonia ovalifolia* var. *elliptica*), Ino, Kōti-ken, Sikoku, 16. VI, 1957, T. Kumata leg. Paratypes: 2 ♂♂ & 3 ♀♀ (host: *L. ovalifolia* var. *elliptica*), Ino, Kōti-ken, Sikoku, 16-25. VI, 1957, T. Kumata leg.; 1 ♂ (host: *L. ovalifolia* var. *elliptica*), Hikosan, Kyusyu, 24. VII, 1954, H. Kuroko leg.; 1 ♀ (host: *L. ovalifolia* var. *elliptica*), Hikosan, Kyusyu, 15. VII, 1955, H. Kuroko leg. The paratypes collected at Hikosan, Kyusyu, are deposited in the collection of Entomological Laboratory, Kyusyu University.

Host plants: *Lyonia ovalifolia* var. *elliptica* Handel-Mazzetti.

Distribution: Japan (Sikoku; Kyusyu).

Mine: Ptychonomous, situated along the margin or rarely on the space between two

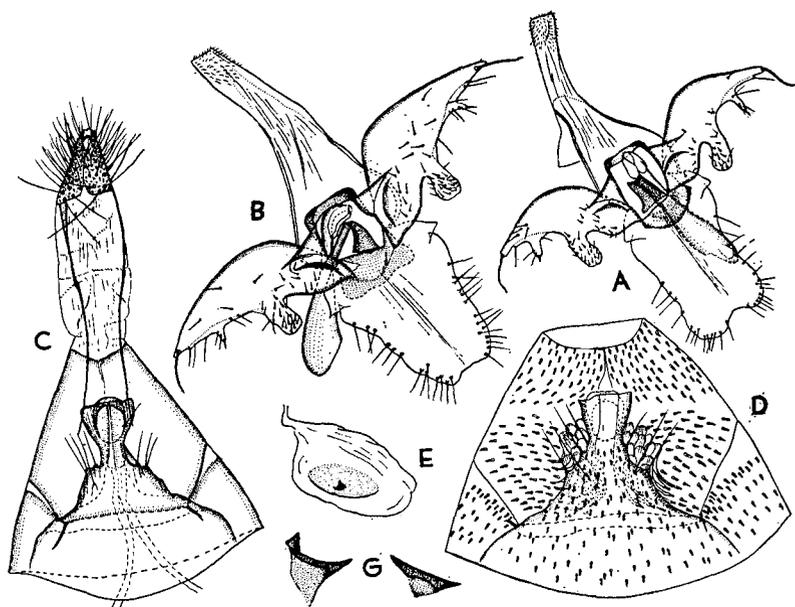


Fig. 23. *Lithocolletis loniceræ*, sp. nov.

A & B: caudal view of male genitalia; C: ventral view of female genitalia; D: ventral view of eighth abdominal segment of female; E: corpus bursae; G: variations of sclerotized projections of signa.

veins of the lower surface of leaves.

Remarks: This species is very closely related to *L. japonica* Kumata attacking *Carpinus*, *Ostrya* and *Corylus*, but differs from the latter by the following aspects:- white median fascia of fore wing very narrow, and acutely angulated outwardly; right valva bent upwardly near its apex, with many setae irregularly scattered on inner surface; left valva with a peculiar lobe on apical half of ventral margin; process produced from base of each postapophysis being much shorter; mine usually occurring upon the lower surface of leaves.

## 12. Species attacking Caprifoliaceae

58. *Lithocolletis loniceræ*, sp. nov. (Fig. 23)

♂♀. Face leaden-metallic, somewhat tinged with yellow anteriorly; palpus whitish, lined with dark brown posteriorly; tuft of head golden-ochreous, mixed with a few pale scales in centre; antenna pale grey, each segment being broadly ringed with dark grey apically. Thorax golden-ochreous, with two white stripes running along inner margins of tegulae. Legs yellowish-white; fore femur and tibia clouded inside; mid tibia with three oblique, black streaks outside; hind tibia clouded outside; all tarsi broadly ringed with black at base, basal  $1/3$  and  $2/3$ .

Fore wing golden-brown, with white markings. Medio-basal streak on fold narrow, very short, at most extending to basal  $1/10$ , without any dark marginal scales. Three fasciae, of which the first is placed at basal  $1/4$ , the second just before middle and the third at basal  $2/3$ , slightly oblique inwardly, margined with dark scales internally, the dark margins being abruptly widened towards costal and dorsal margins of wing, the first being rather straight, the second moderately angulated just above middle across wing, and the third acutely angulated at middle and sometimes interrupted by ground colour or dark irrorations at the angle. A costal streak placed near apex, strongly oblique inwardly. Median area of termen, costal area opposite it and external area of last costal streak irrorated with dark brown scales respectively. Apical margin of wing not darkened; cilia pale ochreous-grey. Hind wing dark grey, with cilia ochreous-grey.

Expanse of fore wings, 6.0–7.0 mm.

Male genitalia symmetrical. Valva strongly arched upwardly, ending in a long, spine-like seta, with two hind processes, of which one at basal  $1/3$  is rounded apically, and  $2/3$  as long as width of valva, and the other at basal  $2/3$  much smaller and pointed apically. Saccus short, much widened laterally, and somewhat rectangular. Flap of ninth sternite 1.8 times as long as wide, more or less constricted at apical  $1/3$ , with apical margin partially concave at middle. Juxta long, and touching apical  $2/5$  of aedoeagus. Aedoeagus much dilated on basal half, with two narrow lobes on apical  $1/5$  of lower side.

Female genitalia symmetrical. Eighth segment becoming much narrower caudad. Seventh sternite rather narrow, hardly projecting caudad, the projection being conspicuously constricted at its caudal  $2/5$ . Ostium bursae opened in an elliptical hole near top of the projection of seventh sternite.

Holotype: ♂ (host: *Lonicera japonica*), Asizuri-misaki, Kôti-ken, Sikoku, 3. VII, 1957, T. Kumata leg. Paratypes: 1 ♂ (host: *L. japonica*), Iwawakisan, Osaka, Honsyu, 21. X, 1949, S. Issiki leg.; 1 ♂, Saragamine, Ehime-ken, Sikoku, 27. V, 1959, M. Okada leg.; 1 ♂, Matuyama, Sikoku, 2. VI, 1956, M. Okada leg.; 1 ♂, Ino, Kôti-ken, Sikoku, 14. VI, 1957, T. Kumata leg.; 2 ♂♂ & 3 ♀♀ (host: *L. japonica*), Asizuri-misaki, Kôti-ken, Sikoku, 25. VI,–3. VII, 1957, T. Kumata leg.; 1 ♀ (host: *L. japonica*), Hukuoka, Kyusyu, 22. VI, 1957, T. Kumata leg.; 1 ♂ & 1 ♀, Hikosan, Kyusyu, 2. VI, 1957, T. Kumata leg. One paratype is deposited in Dr. S. Issiki's collection, and two paratypes in the collection of Entomological Laboratory, Ehime University.

Host plants: *Lonicera japonica* Thunberg.

Distribution: Japan (Honsyu; Sikoku; Kyusyu).

Mine: Slightly tentiformed, on the lower surface of leaves.

Remarks: In the colour-pattern, this species is closely related to *L. trifasciella* (Haworth) described from Europe and *L. fragilella* Frey et Boll from North America, both of which are leaf-miners of *Lonicera* spp. Judging from the descriptions and the figures of *trifasciella* given by Petersen (1927) and Pierce & Metcalfe (1935), *Lonicerae* is clearly distinguished from *trifasciella* by the valva having two hind processes and the aedoeagus having two narrow lobes on the apex. After the careful examination of specimens of *fragilella*, *lonicerae* is also separated from *fragilella* as follows:—thorax with two white stripes; valva rather elongate, semioval or crescent-shaped, with two hind processes; flap of ninth sternite

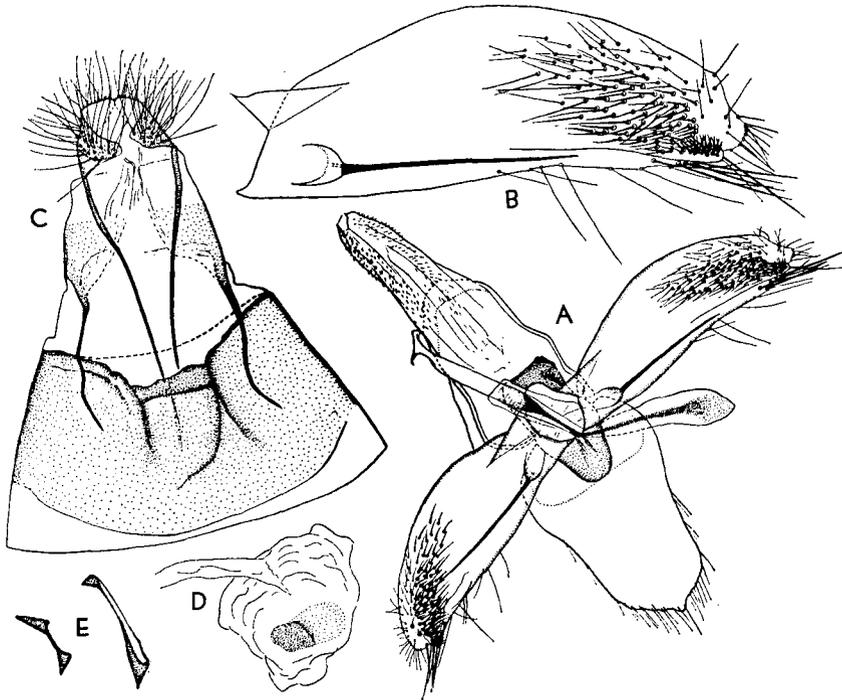


Fig. 24. *Lithocolletis viburni*, sp. nov.

A: caudal view of male genitalia; B: right valva; C: ventral view of female genitalia; D: corpus bursae; E: variations of sclerotized projections of signa.

of male subrectangular, with the apical margin sinuate; seventh sternite of female hardly projecting caudad: on the other hand, in *fragilella*, thorax lacking any whitish marks; valva very short, rectangular, without any process; flap of ninth sternite of male pentagonal, and pointed apically; seventh sternite of female not projecting caudad.

59. *Lithocolletis viburni*, sp. nov. (Fig. 24)

♂♀. Face silk-white; palpus white, with a dark apical line posteriorly; tuft of head golden-ochreous, mixed with some whitish scales in centre; antenna buff white, annulated with dark brown above. Thorax golden-brown, with three very narrow, white stripes, among which two run along inner margins of tegulae. Leg whitish; fore and mid femora

and fore tibia grey inside; mid tibia with three blackish, oblique lines outside; hind tibia clouded outside; all tarsi with two black, broad rings at basal 1/3 and 2/3.

Fore wing golden-brown, with white markings, which are margined with dark scales internally. Medio-basal streak on fold extending to about basal 1/6, rather narrow, without any dark marginal scales. A pair of opposite costal and dorsal blotches placed around basal 1/4, slightly oblique outwardly, and rectangular, the dorsal one being a little shorter than the costal, and placed more basally than the latter. A fascia placed on middle, rather slender, slightly oblique inwardly, and barely arched outwardly. A pair of blotches placed at apical 1/3 beyond the fascia, vertical or slightly oblique outwardly, and wedge-shaped or rectangular, the dorsal one being nearly twice as long as the costal. One or two costal blotches placed near apex of wing, slightly oblique inwardly, and wedge-shaped. A silvery spot sometimes placed at middle of termen, formed by only a few scales, and not extending into cilia. A black blotch placed on apex of wing, rather large, and sometimes surrounding the silvery spot. A black, narrow line in cilia running along apex of wing; cilia yellowish-white. Hind wing grey, with cilia pale yellowish-grey.

Expanse of fore wings, 6.5–8.5 mm.

Male genitalia symmetrical. Valva rather wide, arched upwardly, rounded apically, with a small subapical wart on hind margin and with many various kind of setae as shown in the figure (Fig. 24, B); costal process very minute, with filament-like seta straight. Saccus moderate in length, rounded apically. Flap of ninth sternite spatular, with its rounded apical margin partially projecting medially. Aedoeagus slender, long, with an acute apical barb.

Female genitalia symmetrical. Antapophysis about half as long as postapophysis. Sterigma sclerotized in a narrow, rectangular plate, and joined to caudal margin of seventh sternite.

Holotype: ♂ (host: *Viburnum erosum*), Hikosan, Kyusyu, 9. IV, 1954, H. Kuroko leg. Paratypes: 1 ♂ & 5 ♀♀ (host: *V. Wrightii*), Ino, Kôti-ken, Sikoku, 15–29. VI, 1957, T. Kumata leg.; 2 ♀♀ (host: *V. dilatatum*), Ino, Kôti-ken, Sikoku, 15–17. VI, 1957, T. Kumata leg. Holotype is deposited in the collection of Entomological Laboratory, Kyusyu University.

Host plants: *Viburnum erosum* Thunberg, *Viburnum Wrightii* Miquel and *Viburnum dilatatum* Thunberg.

Distribution: Japan (Sikoku; Kyusyu).

Mine: Ptychonomous, on the space between two veins of the lower surface of leaves.

Remarks: The new species differs from *L. lantanella* Schrank, a leaf-miner of *Viburnum* in Europe, by the valva with a costal process and many various kind of setae, by the fore wing with the first pair of costal and dorsal streaks placed at the basal 1/4, etc. It may be also distinctive from *L. viburnella* Braun living in North America by the white medio-basal streak without any dark marginal scales and by the first pair of white costal and dorsal streaks placed before the median white fascia in the markings of the fore wing.

#### 60. *Cameraria hikosanensis*, sp. nov. (Fig. 25)

♂♀. Face pure white; palpus golden-yellow, lined with black posteriorly; tuft of head

golden-ochreous, mixed with a few whitish scales in centre; antenna buff white, each segment annulated above with dark brown except for apical ten segments, which are wholly white. Thorax golden-brown, with two white, narrow stripes running along inner margins of *tegulae*. Legs pale golden-yellow or silvery-white; fore femur and tibia dark grey inside; mid tibia with three blackish, oblique lines outside; hind tibia blotched with brown outside; fore tarsus blackish, with four white, narrow rings; upper side of mid and hind tarsi with black, small spots at basal  $1/3$  and  $2/3$ .

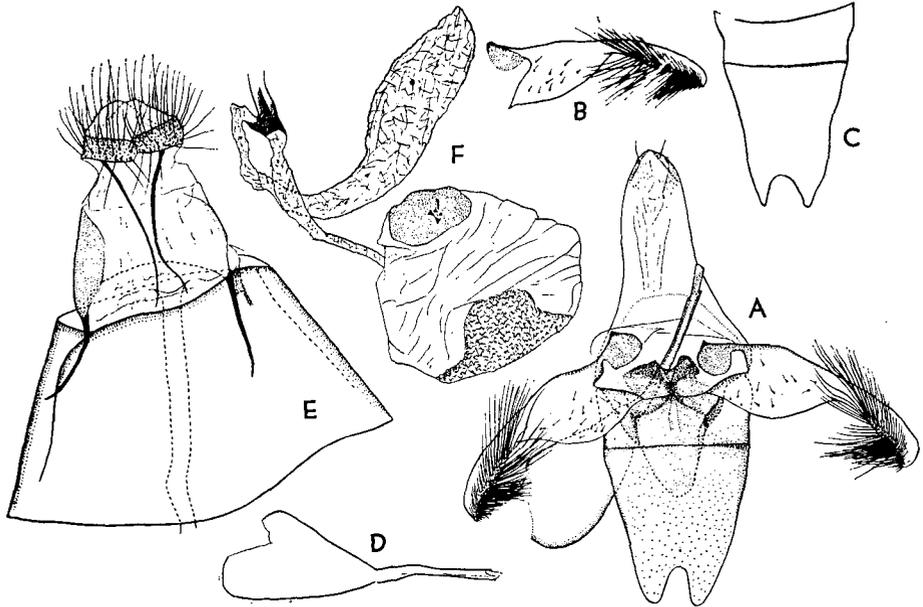


Fig. 25. *Cameraria hikosanensis*, sp. nov.

A: caudal view of male genitalia; B: right valva; C: flap of ninth sternite of male; D: aedoeagus; E: ventral view of female genitalia; F: corpus bursae.

Fore wing golden-brown, with white markings, which are margined with dark scales externally. A short basal streak extending from base of dorsal margin of wing to middle between base of wing and first fascia in parallel with costa, and margined with only a few black scales on its apex. First fascia placed at basal  $1/4$ , rather narrow, oblique inwardly from costa, slightly angulated near costa outwardly, and sometimes interrupted with ground colour at the angle; second fascia placed just before middle in parallel with first fascia, and rather straight. First pair of opposite costal and dorsal blotches placed at apical  $1/3$ , the costal blotch being oblique inwardly, wedge-shaped, and much shorter than the dorsal, which is crescent-shaped. Second pair of blotches situated near apex, very small, somewhat oblique inwardly, but never fused with first pair of blotches. An irregular blackish blotch placed just behind second pair of white blotches. Apical margin of wing scarcely darkened; cilia pale yellowish-grey. Hind wing dark grey, with cilia pale yellowish-grey.

Expanse of fore wings, 7.0-7.5 mm.

Male genitalia symmetrical. Valva suddenly narrowed on apical half, slightly arched upwardly, with a row of a number of slender setae on lower surface of entirely narrow apical half, and with a rather large, ovate knob at base of costa. Flap of ninth sternite gradually narrowed towards apex, its apex being deeply notched. Saccus rather elongate, triangular, and rounded apically. Anellus strongly sclerotized, never extending caudad. Aedoeagus globular on its basal half, and very slender and tubular on its apical half.

Female genitalia symmetrical. Caudal margin of seventh segment rather straight, without any genital plate. Ductus bursae long, weak, with a narrowly sclerotized part placed on middle; corpus bursae with an elliptically sclerotized plate bearing three minute, cone-shaped projections in centre, and with a reticulate-creasy area.

Holotype: ♂ (host: *Viburnum erosum*), Hikosan, Kyusyu, 9. V, 1956, H. Kuroko leg. Paratypes: 1 ♂ & 1 ♀ (host: *V. erosum*), Hikosan, Kyusyu, 10-13. VIII, 1954, H. Kuroko leg.; 1 ♂ & 2 ♀♀ (host: *V. erosum*), Hikosan, Kyusyu, 13. V, 1956, H. Kuroko leg.; 1 ♂ (host: *V. Sieboldi*), Hikosan, Kyusyu, 14. V, 1957, H. Kuroko leg. The types except for one male and one female paratypes are deposited in the collection of Entomological Laboratory, Kyusyu University.

Host plants: *Viburnum erosum* Thunberg and *Viburnum Sieboldi* Miquel.

Distribution: Japan (Kyusyu).

Mine unknown.

Remarks: In the colour-markings of the fore wing this species closely resembles *C. aesculisella* (Chambers), a leaf-miner of *Aesculus glabra* in North America. I am, however, much inclined to the opinion that the Japanese form may be provisionally regarded as a species. It should be noted that the host-relationships of both species are quite different. The present species is easily distinguishable from *C. acericola* or *C. nipponica* by having the last white dorsal blotch placed on the middle of termen of the fore wing as well as by the structure of the genitalia.

### 13. Host-unknown species

#### 61. *Lithocolletis turugisana*, sp. nov. (Fig. 26)

♂. Face white; palpus white, with a dark apical spot posteriorly; tuft of head yellowish-white, mixed with a few golden-ochreous scales laterally; antenna buff whitish, the segments being ringed with dark brown apically. Thorax golden-ochreous, with three white, narrow stripes, among which two run along inner margins of tegulae. Legs whitish; fore femur and tibia dark brown inside; fore and mid tarsi with a dark spot at middle.

Fore wing golden-ochreous, with white markings, which are margined with dark scales internally. Medio-basal streak rather narrow, straight, extending to basal 1/3, and margined with dark scales along upper and apical edges. Dorso-basal streak shorter and narrower than the medio-basal, without any dark marginal scales. First pair of opposite costal and dorsal streaks placed on middle, very oblique outwardly, the apices being pointed towards apex of wing, and the dorsal streak a little wider and longer than the costal. Second pair of streaks placed at about apical 1/3 or just before tornus, hook-shaped, less oblique than

the first pair; apex of dorsal streak reaching just beyond apex of the costal. Third dorsal streak placed beyond tornus, very narrow, and markedly united with third costal streak in an outwardly oblique, straight fascia; fourth costal streak placed near apex, hook-shaped, and smallest among the white markings. A black-irrorated streak longitudinally situated in disc near apex of wing. A dark brown, narrow line in cilia extending along apex of wing; cilia yellowish-white. Hind wing pale grey, with cilia yellowish-white.

Expanse of fore wings, 7.0 mm.

Male genitalia symmetrical. Valva slightly arched upwardly, somewhat widened apically, with a stout seta at apex of hind margin and a number of slender setae on apical half of inner surface; costal process tubular, slightly curved, with filament-like seta very short and curved. Saccus rather elongate; flap of ninth sternite somewhat elongate, oval, and some-

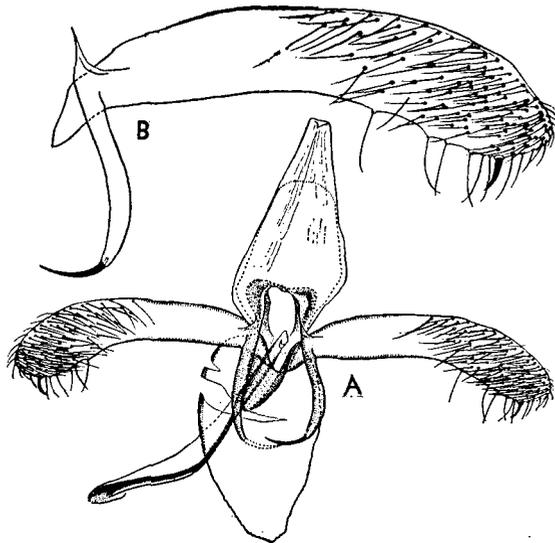


Fig. 26. *Lithocolletis turugisana*, sp. nov.  
A: caudal view of male genitalia; B: right valva.

what bluntly pointed apically. Aedoeagus long, slender, with a minute, globular subapical barb.

Holotype: ♂, Turugisan, Sikoku, 4. VI, 1957, M. Okada leg.

Distribution: Japan (Sikoku).

Remarks: The new species is allied to *L. sorbi* Frey, a leaf-miner of *Sorbus* in Europe, from which it differs immediately by the completely symmetrical costal process of the valva, by the valva having a stout seta on the apex of its hind margin, and by the third white costal and dorsal streaks completely united with each other in an outwardly oblique fascia.

**62. *Lithocolletis gigas*, sp. nov. (Fig. 27)**

♂. Face and palpus pale yellow, with metallic reflections; tuft of head ochre-yellow, somewhat paler in centre; antenna pale brownish-grey, the apical nine segments being entirely whitish. Thorax pale yellowish-brown, scarcely tinged with metallic reflections.

Legs pale ochre-grey; tibiae blotched with dark brown outside; tarsi with two or three dark spots.

Fore wing ochre-brown, slightly tinged with golden reflections, with markings whitish. Medio-basal streak absent. First fascia situated at basal  $1/6$ , vertical, and somewhat sinuate; whole area between first fascia and base of wing densely sprinkled with dark brown scales. Second fascia situated just before middle, vertical, scarcely arched outwardly, and slightly wider than first fascia; whole area between first and second fascia sprinkled with dark brown scales, especially densely along costal margin of wing and internal margin of second fascia, and sparsely along external margin of first fascia. A pair of opposite costal and dorsal blotches situated at about apical  $1/3$ , rather small, and hook-shaped; a very large,

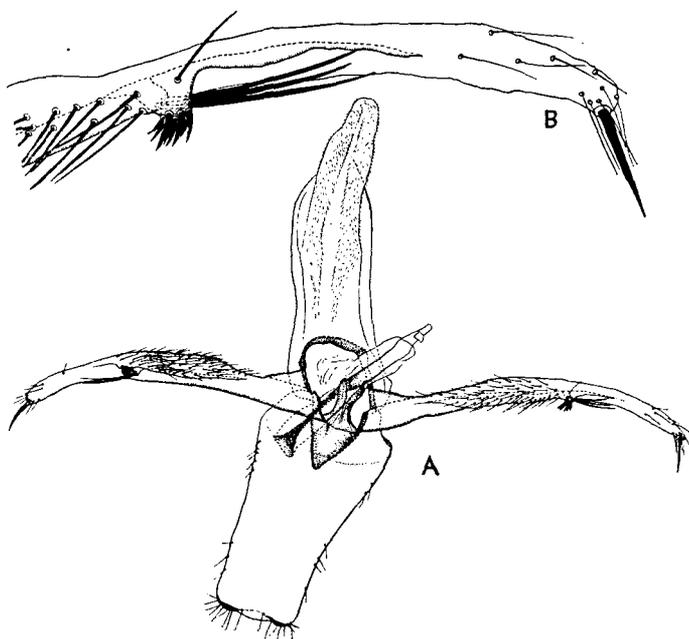


Fig. 27. *Lithocolletis gigas*, sp. nov.

A: caudal view of male genitalia; B: apical half of right valva.

dark-sprinkled blotch placed just behind these paired blotches, almost occupying whole area across wing, and somewhat extending towards base through discal area between the paired blotches. A costal blotch placed at apical  $1/6$ , very minute, and oblique inwardly. A costal blotch placed at apical  $1/6$ , very minute, and oblique inwardly. Apical margin of wing not darkened; cilia yellowish-white. Hind wing pale brownish-grey, with cilia pale yellowish-grey.

Expanse of fore wings, 11.0 mm.

Male genitalia symmetrical. Valva very slender, slightly arched upwardly, with three or four long, stout setae, of which one is situated at apex of valva, and the rest on top of a small projection at apical  $2/5$ ; seven to ten setae short, spine-like and situated together

at apical 2/5 of valva. Saccus triangular. Flap of ninth sternite elongate, rectangular, somewhat truncated apically, with a pair of small, inwardly bent lobes on its apical margin. Aedoeagus rather short, about 2/3 as long as valva, with a flap-like lobe near apex. Juxta strongly sclerotized, short, with lateral margin slightly concave.

Holotype: ♂, Kamikōti, Nagano-ken, Honsyu, 19. IV, 1951, A. Mutuura leg.

Distribution: Japan (Honsyu).

Remarks: This is the largest species of the genus *Lithocolletis* occurring in Japan. It is related to *L. froelichiella* Zeller, a leaf-miner of *Alnus* in Europe, but differs from the latter by the slender valva with a long, stout seta at the apex, and with two or three long, stout setae at the top of a small projection, which is placed at the apical 2/5 of the inner surface; in *froelichiella* the valva has only two long setae at the apex of the valva.

—To be continued—

**OCCURRENCE OF TWO SPECIES OF ICHNEUMONIDAE IN JAPAN.** In the collection of the Entomological Institute of the Hokkaido University and in my own collection there are two interesting Ichneumonflies, which will be put on record in the following lines:—

1. *Diacritus aciculatus* (Vollenhoven, 1878)

This species has been known to occur in Europe alone. On this occasion I will give Japan as its locality on the basis of the following material:— Hokkaido: 1♀, 9-viii-55, 2♀, 10-viii-58, 1♀, 12-viii-58, and 1♀, 22-viii-58, Sapporo, S. Momoi leg.; 1♀, 3-viii-58, Rishiri Is., S. Takagi leg. These specimens agree well enough with the descriptions of this species given by European writers as well as the authentic European specimen I have examined.

2. *Cynodusa orientalis* Uchida, 1956

This species was originally described from the Amami Islands, and yet no one has given Japan proper as its locality. In this paper are given the following habitats of this species in Japan proper for the first time:— Hokkaido: 1♀, 20-vi-30, Sapporo, K. Igarashi leg., and 1♀, 7-vii-52, Sapporo, T. Tomioka leg. Shikoku: 1♀, 17-viii-33, Kochi, Y. Sugihara leg. Kyushu: 3♀, 26~28-v-56, Hikosan, S. Momoi leg., and 1♀, 28-iv-56, Hikosan, Y. Murakami leg.

SETSUYA MOMOI

**BOOK REVIEW**

Hiroshi Takahasi: Fauna Japonica. Tabanidae (Insecta: Diptera). xii+143 pp., 74 Text-figs., 12 Plates, 1962.

Akinobu Habu: Fauna Japonica. Chalcididae, Leucospididae and Podagrionidae (Insecta: Hymenoptera). x+232 pp., 382 Text-figs., 19 Plates, 1962.

In 1962 the two entomological publications above-listed were issued as series of the "FAUNA JAPONICA" published by the Biogeographical Society of Japan (c/o National Science Museum, Uyeno Park, Taito-ku, Tokyo). These works will be of especial assistance to entomologists to identify the Japanese species. The publications are stated in English: the detailed description of each species with full bibliographic reference, the keys to the species, and the illustrations in colour are much useful for workers.

C. WATANABE

### Errata

- Vol. 26, No. 1, 1963, p. 37, line 11 from bottom, for "ing" read "shading".
- Vol. 26, No. 2, 1963, p. 79, line 10 from top, for "apically" read "basally".
- Vol. 26, No. 2, 1963, p. 79, line 15 from top, for "basally" read "apically".
- Vol. 27, No. 2, 1965, p. 82, line 9 from top, for "VII" read "VIII".
- Vol. 27, No. 2, 1965, p. 98, between lines 3 and 4 from bottom add "Distribution: Marshall Is. and Caroline Is."
- Vol. 27, No. 2, 1965, p. 114, line 10 from bottom; p. 115, line 15 from top; p. 116, line 7 from bottom; p. 117, line 17 from top and line 3 from bottom; p. 118, line 14 from bottom; p. 119, line 12 from bottom; p. 121, lines 8 and 11 from top; p. 122, lines 5 and 8 from top, for "ocellus" read "eye".

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### Errata

Vol. 26, No. 1, 1963, p. 19, line 13 from top; p. 26, line 5 from top; p. 36, line 11 from top; p. 37, line 5 from bottom; p. 41, line 15 from bottom; and p. 42, line 9 from bottom, for "hardly" read "strongly".

Vol. 29, No. 1, 1966, p. 4, line 9 from top and line 4 from bottom; p. 5, lines 11 and 12 from bottom; p. 6, line 23 from top; p. 12, lines 5 and 7 from bottom; and p. 16, line 11 from bottom, for "hardly" read "strongly".

Vol. 29, No. 1, 1966, p. 7, line 8 from top, for "borwn" read "brown"; p. 8, line 19 from top, for "Fig. 30" read "Fig. 32"; p. 13, line 15 from top, for "XVIII" read "XVII"; and p. 17, line 17 from bottom, for "posterior" read "anterior".

Vol. 29, No. 1, 1966, p. 22, line 6 from bottom, for "*Ltihocolletis*" read "*Lithocolletis*".