

Notes on the Japanese Agromyzidae (Diptera), 7

New genus *Didymyza* Sasakawa (2020)

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Abstract : A new genus *Didymyza* Sasakawa (type-species: *Liriomyza decempunctata* Sasakawa, 1961) is described in having a pair of chitinous processus longus on the expandium inner-dorsally and long horn- or knob-like surstylus ventrally, together with the Australian *L. caulophaga* (Kleinschmidt, 1960), North American *L. pechumani* (Spencer, 1986) and European *Phytomyza cinerea* (Hendel, 1935) are designated.

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Genus *Didymyza* nov. (Greek: *didymos* + *myza*)

Type of genus : *Liriomyza caulophaga* (Kleinschmidt), 1960 (Australia, New Zealand, Indonesia)
L. decempunctata Sasakawa, 1961 (Japan)
L. pechumani Spencer, 1986 (U. S. A.)
Metapomyza griiffthsi (Sehgal) (Europe)
Phytomyza cinerea Hendel, 1935 (Europe)

Etymology: The generic name refers to the presence of two projecting sclerites on inner dorsal part of the epandrium and surstylus ventrally.

This new genus is detached from the genera *Liriomyza* Mik, 1894, *Metapomyza* and *Phytomyza* Fallén, 1819, by having the peculiar male genitalia, that is, the epandrium inner dorsally with a pair of chitinous processus longus (Sasakawa, 1961: 497: fig. 77c; Langfortsatz by Nowakowski, 1973) and long- or knob-like chitinous surstylus ventrally; ejaculatory apodeme with a pair of round or pear-shaped chitinous plates on lateral sides of the basal lobe; female T9 trifurcated at base (Sasakawa, 1962: fig. 77c, h). Stridulatory apparatus in male is absent. The larva is provided with 4-6 opening bulbs on anterior and posterior spiracles, respectively. The leaf-mining host-plants are known in *L. decempunctata* on the wild orchids (Liliaceae), *L. caulophaga* on *Beta* (Chenopodiaceae), and *Piinerea* on *Centaurea* (Cardueae), but unknown yet on *pechumani*.

Didymyza caulophaga (Kleinschmidt, 1960) n. comb.

Holomyza caulophaga Kleinschmidt, 1960: 14; 1970: 367.

Liriomyza caulophaga (Kleinschmidt): Spencer, 1963: 332; 1977: 191.

Liriomyza haplomyzina Spencer, 1961: 89.

This is a leafminer on *Beta* sp. in Australia and Queensland. Following Spencer's description mainly (1977: 191): head including antenna and postorbit yellow, parafrontalia distinctly projecting beyond eye-margin in profile, *ors* & *ori* each two, vertical situlae lacking, gena, 13.2-10.5 eye height; 1st antennal flagellomere weakly angulated on anterodorsal apex; mesoscutum ash-gray black, almost silvery; scutellum yellow; stridulatory apparatus lacking; epandrium with a pair of distinct processus

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longus inner dorsally (fig. 300) surstylus with a strong spine; distiphallus with tubules broadened on apices; ejaculatory apodeme minute (fig. 293-299).

Host plant: *Beta vulgaris varicella* (Chenopodiaceae).

Mine: Larva mines and pupates in midrib and petiole of a leaf.

Distribution: Australia, New Zealand, Indonesia (Lombok).

Remarks: This dark species has a paired distinct processus longus on epandrium inner dorsally. Spencer (1977) suggested that this species may belong to a monotypic genus between *Liriomyza* and *Carodoritha*. Here is clearly justified its generic position by having the processus longus in epandrium.

***Didymyza cinerea* (Hendel, 1920) n. comb.**

Phytomyza cinerea Hendel, 1920: 167; 1931: 377; Spencer, 1976: 458; 1990: 255.

The male genitalia are unique within the genus in having distinctly the processus longus at inner dorsal area of the epandrium (Spencer, 1990: fig. 951). Although Spencer (1990) thought that this species is only unique and primitive in the genus *Phytomyza*, but here is distinctly combinable with a leaf miner of *Didymyza* judging by its epandrial character.

This is a leafminer on *Centaurea scabiosa* (Spencer, 1990). Its occurrence in Japan is unknown at present. According to Hendel, head gray-black, lunule yellow, parafrontalia projecting beyond eye-margin in profile; *ors* & *ori* each two; gena very broad, 1/2 eye height; 1st antennal flagellomere short; thorax grayish black: 1 + 3 *dc*, *acr* in 2-4 rows; wing 1.7-2.0mm costa ending at R₄₊₅, abdomen black, terminates in male each with pale caudal margin; mesophallus and distiphallus unchitinized (Spencer, 1976: 1990: fig. 590). The several larvae are making a communal mine at apex of the leaf, and the puparia are remaining loosely in the mine. Spencer (1990) suggested that this species is primitive in having the dark color, deep gena and specialized epandrium in adult, and a communal mine within several larvae at apex of the leaf anointernal pupation.

Distribution: Europe.

***Didymyza decempunctata* (Sasakawa) n. comb. (Japanese name: yaburan-hamoguribae)**

Liriomyza decempunctata Sasakawa, 1961: 396; 2014: 638.

This leafminer is commonly found in the wild orchids. *Liriopea* spp. growing in the lowland forests.

Description. adult: large, yellowish species, with wing 2.8-3.3mm long; calypter yellowish white or gray, with fringe brown to black; halter yellow; head including antenna of pulps yellow, postorbital shortly brown, not extending to vertical angle, both *vt* growing on yellow area; parafrontalia of parafacialia distinctly projecting behind eye-margin in profile; frons 1.7 times as wide as eye; *ors* & *ori* each two, *os* erect or reclinate, in a row or two irregular rows; lunule slightly lower than semicircle; gena 1/3 - 1/5 of eye height; 1st antennal flagellomere small, rounded apically; as long as broad, minutely pilose; arista long; thorax yellow, mesoscutum with five shining or mat-black vittae, of which median one cruciform and extending posteriorly midway between 4th *dc* and scutoscutellar suture, anterior cross-bar not reaching to bases of *prs*; lateral two vittae between transverse suture and p-level, usually connecting at anterior part, posterior *dc* usually growing on yellow line; 1+3 *dc*. *acr* in 4-6 rows; *ia* 12-18 in three rows, 3-4 times length of *acr*, growing on yellow or black part; *sa* at edge of black, *pa* on yellow area; hypopleuron and sternopleuron each with small brown triangle; scutellum yellow; wing hyaline, costa extending to M at wing tip, three costal sections in 3.3 : 1 : 0.9 in length, r-m distinctly beyond mid-point of discal cell, M₁ ratio about 10 : 1, m-cu present; ultimate section of CuA₁ nearly twice (1.2-1.8) length of penultimate. Abdominal tergites II - VI yellow, darkened centrally or each with a pair of brown suboval spots; epandrium brown but dorsomesally and cercus yellow; a pair of processus longus distinct on inner dorsal side, somewhat hooked posteriorly and surstylus slightly longer than the former; hypandrium U-shaped, with side piece narrow, postgonite with a distinct projection on apex; basiphallus with sclerites narrow, with a spine-like membranous process at base; hypophallus with sclerites slender, covered with membrane; mesophallus suborbicular and spinulose on membranous surface; distiphallus with distal tubules narrow but longer than basiphallus;

ejaculatory apodeme with bulb expanded triangularly, 230 μm long, 280 μm wide, basal lobe chitinized laterally and expanded in pear-shaped; egg-guide 150 μm long; female T9 trifurcated at base, about 200 μm long; S9 U-shaped 120 μm long; spermathecae orbicular, 52 x 56 μm .

Larva: anterior and posterior spiracles each with 4(5) - 6 opening bulbs of which ventral one largest.

Puparium: brown, 2.2-2.6mm long; anterior spiracles small; posterior spiracles each with 5-6 bulbs, of which ventral one largest; abdominal segment with a pair of minute papillae at middle between base of posterior spiracles and anus.

Mine: whitish linear of the upper surface type.

Host plants: *Liriope platyphylla* Wang et Tang; *Ophiopogon japonicus* Ker-Gollowl (Lilliaceae) in lowland and forests.

Holotype ♂, paratypes 6♂ 1♀, Momoyama, Kyoto, 8 V 1954, on *Liriope*; paratypes: 1♀, Minagi, Okayama, 2 V 1953, K. Koizumi; 2♂ 2♀, Korigaoka, Hirakata, Osaka Pref., 5 V 1987 & 13 X 1988, on *Ophiopogon japonicus*, M. Sasakawa; 8♂ 9♀, Mt. Hiei, Kyoto, 11-15 V 1990, on *Liriope*, T. Imura; 3♂ 1♀, Imperial Palace, Tokyo, 20 V 1976, T. Hayashi; 1♂ 2♀, Tokiwamatsu Imperial Villa, Tokyo, 25-26 IV 1995, on *Liriope* & 4 VI 2003, S. Shinonaga swept & Malaise trap; 18♂ 16♀, Toba, Mie Pref., 25-26 IV 1995, on *Liriope* (larvae coll. 23 IV 1995), M. Sasakawa.

Distribution: Japan (Honshu).

Remarks: This species is quite different from the European *Liriomyza uriphorina* Mik (1894), *Lilium* bud-feeder and *L. wachtli* Hendel (1920), *Veratrum* leaf or seed miner, in the coloration of the mesoscutum and abdominal terminates, and structures of the male genitalia and numbers of spiracular bulbs of the larvae. Also, this species is somewhat similar to the North American *L. pechumani* Spencer (1986) in the wing length, largely yellow body coloration, presence of the distinct projections on the epandrium and surstylus, but the phallic structures are quite different from each other. Also, there is no information on the stridulatory mechanism, and the coloration of mesoscutum and abdominal terminate, structures of the male genitalia and number of bulbs on the larval spiracles.

***Didymyza pechumani* (Spencer, 1986) n. comb.**

Liriomyza pechumani Spencer, 1986: 291 (figs. 635-639).

This new genus is includable the North American *L. pechumani* Spencer.

Holotype: Florida, Collier Co., Copelandd, 31 III 1969, L. L. Pechman.

Description mainly and figures by Spencer (1986: 110, 401). Head yellow, parafrofrontalia with ventral part distinctly projecting above eye in profile; *ors* & *ori* each two or recline in 2 irregular rows; 1st antennal flagella small, round, yellow, arista distinctly pubescent; mesoscutum gray-black, divided into two bands posteriorly: 1 + 2-3 *dc*, *acr* in some 6 rows anteriorly, *ia*-setulae in 4 rows; scutellum and pleura yellow, mesopleuron & sternopleuron with many hairs; wing 3.00-3.25mm long, discal cell large, calypter yellowish gray, with margin and fringe black; femora yellow, tibiae & tarsi yellowish brown; epandrium with a pair of crescent-shaped processus longus inner dorsally (fig. 639); ultimate section of M about 1.2 times length of penultimate; surstylus knob-like; basipallus and ventral process distinct (fig. 636); distiphallus setulose at base, with distal tubules broad but constricted at middle, distally membranous and broadened at ends (fig.636-7); ejaculatory apodeme large, with large, round, chitinizes plates on basal lobe (fig. 638).

Holotype ♂, Florida, Coolier Co., Copeland, 31 III 1969, L. L. Pechuman.

Host plant: unknown.

Remarks: Although this species has a short surstylus, the inner dorsal processus longus on the epandrium are distinctly long, crescent and the ejaculatory apodeme is distinctly provided with a pair of chitinous plates laterally in basal lobe. Spencer's description on the male genitalia (fig. 639) was mistaken.

Holotype ♀, Brisbane, Qld, NSW, Australia.

***Didymyza griffithsi* (Sehgal) n. comb.**

Metopomyza griffithsi Sehgal, 1971: 342; Tschirnhaus, 1981: 332; Spencer, 1986: 162.

Metopomyza scutellata (Fallén): Spencer, 1976: 286; 1981: 336.

The male genitalia are distinctive in having the processus longus with serration posteriorly at inner dorsal part of epandrium (Spencer, 1976: 287, fig. 514; 1990: 347-8, fig. 1311). This is a leafminer on *Carex* spp. (*silvatica*, Cyperaceae) known in Germany (Groschke, 1954).

Description by Spencer (1976: 286). Minute black species, with wing 1.2-1.6mm long, calypter whitish, with margin and fringe brown; frons brownish-ocherous dorsally, more black ventrally, parafrontalia black and broad; mesoscutum shining black, with 3 *dc*: scutellum yellow; wing with cross-vein m-cu (rarely absent), discal cell small, ultimate section of M₃₊₄ about thrice length of cross-vein m-cu (rarely absent; Groschke, 1954). Stridulating mechanism in male lacking. Epandrium with processus longus distinctly serrated posteriorly; surstylus very long; basiphallus well-developed, with ventral process long; mesophallus broadened distally; distiphallus narrow basally but with distinct tubules broadened distally respectively (Spencer, 1986: figs. 1030-1, as *scutellata*).

Distribution: Europe.

Remarks: The wing venation and presence of the inner dorsal processus longus on the epandrium was shown distinctly by Spencer (1976: figs. 512 & 4).

(to be continued)