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Fungus Gnats Associated with Flowers of the Genus *Arisaema* (Araceae) Part 3. Sciaridae (Diptera)¹⁾

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Abstract The following seven new species of the family Sciaridae associated with the flowers of *Arisaema serratum* (THUNBERG) are described from Japan: *Phytosciara* (*Prosciara*) *arisaemae*, *Phytosciara* (*Dolichosciara*) *insolita* and *P. (D.) megumiae*, *Paractenosciara longimentula*, *Bardysia divaricata*, *Corynoptera dumosa* and *C. licina*. *Paractenosciara* n. gen. is characterized by the presence of macrotrichia on the fork of vein media. *Phytosciara* (*Prosciara*) *ungulata* (WINNERTZ) is newly recorded from Japan.

Key words: Sciaridae; Diptera; *Arisaema*; new genus and species; Japan.

This is the third in a series of taxonomic papers of the Japanese fungus gnats associated with the pistillate and staminate flowers of *Arisaema* species (Araceae). All of the materials upon which this paper is based were collected from the spadices of *Arisaema serratum* (THUNBERG) by Miss M. ODAKI, Kyoto Institute of Technology, on the hillsides in Toyama Prefecture in May 1991, and Mr. E. ISHITANI, Chiba Prefectural Forest Experimental Stand (CPFES), in the forest stands in May 1993.

The most dominant gnats attracted to the pistillate flowers of *Arisaema serratum* were the species of either the Mycetophilidae or the Sciaridae. Their dominance varied from locality to locality. In the forest stands of CPFES, for example, the number of the mycetophilid and keroplatid gnats reached a percentage of 42 and that of the sciarid gnats 35%, while in Toyama Prefecture the sciarid gnats showed the high percentage of 74 (average of 3 places collected) and the mycetophilid gnats only 11%.

In this part I treat the Sciaridae and describe a new genus, *Paractenosciara* (type species: *P. longimentula* n. sp.) and six new species of the genera *Phytosciara*, *Bradysia* and *Corynoptera*. *Paractenosciara* is one of the advanced groups of Sciaridae in having the macrotrichia on the posterior veins, setal comb on the inner apex of fore tibia, untoothed claws, and oviform styli of the male genitalia. The holotypes are deposited in the collection of the Kyoto Prefectural University (KPU), Shimogamo, Kyoto.

Phytosciara (*Prosciara*) *arisaemae* n. sp.

(Fig. 1)

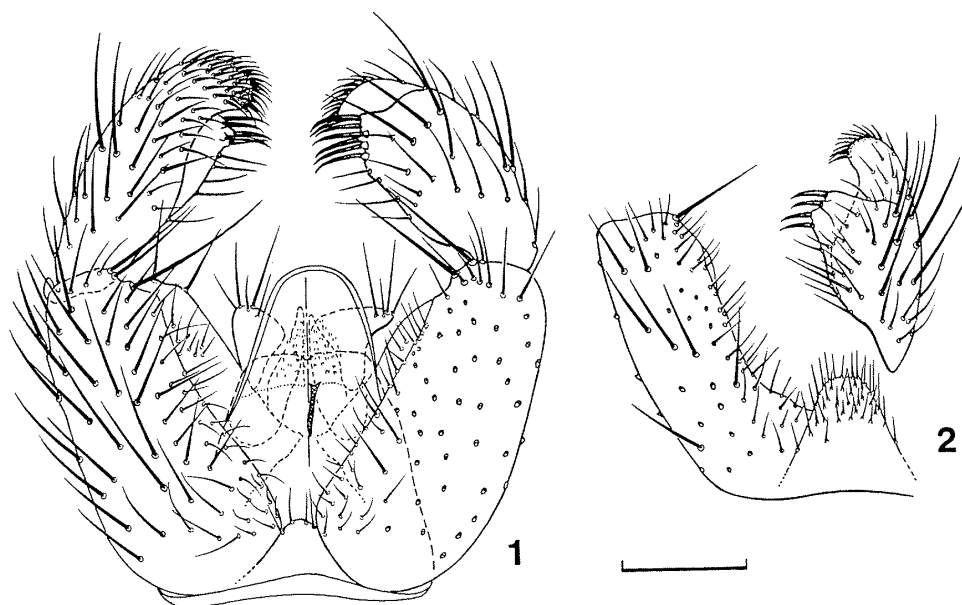
Male. Head pale testaceous yellow; vertex brown, prefrons and clypeus yellow.

1) Contribution No. 273 from Entom. Lab., Kyoto Prefectural University.

low; antenna with scape and pedicel yellow, flagellar segments brown; palpus brown. Thorax with scutum, scutellum and mediotergite testaceous, pleura pale testaceous but anterior anepisternum, dorsal process of anterior epimeron, ventral margin of katepisternum and pleurotergite distinctly brown. Wing faintly tinged with brown; halter pale testaceous, yellowish at base of stalk. Legs yellow, tibiae and tarsi faintly brown tinged. Abdomen with tergites brown, sternites testaceous yellow; coxites testaceous, stylus distinctly brown on tip; cercus brown. Setae on body and legs, and macrotrichia on wing brown to dark brown.

Eye-bridge narrow, consisting of 2 (1–3) facets. Prefrons usually with 3–4 median setae longer than others. Antenna with flagellar segments more or less roughened around the setal base; 4th segment 0.21–0.24 mm long, about 4 times as long as wide, covered with setae which are as long as or a little longer than width of segment, with neck about 1/5–1/6 the whole length of segment; 14th segment slightly longer than the 4th. First palpal segment with a group of sensillae distinct but not arranged in a pit, 2nd segment shortest, and 3rd subequal to the 1st in length.

Scutum with 6–8 long setae in *dc*-row, without *acr*-row; scutellum with 3 pairs of long median marginal setae; anterior pronotum with 5–7 long or short setae. Wing 3.13 (2.8 in holotype–3.4) mm in length, with costa extending slightly beyond midpoint between apices of R_{4+5} and M_1 ; R_1 short, nearly 2/3 length of R , ending in costa well basad to level of Cu_2 -apex; R_{4+5} ending at midpoint between levels of M_1 - and M_2 -apex; stem of M slightly longer than fork; stem of Cu as long as or slightly longer than 'x' (base of M); both forks of M and Cu , and distal 1/4–1/5 of M -stem with macrotrichia; 'y' (r-m) 1.5–2 times as long as 'x', usually with 4



Figs. 1–2. Male genitalia of *Phytosciara* (*Prosciara*) *arisaemae* n. sp. (1) and *P. (P.) unguolata* (WINNERTZ) (2). 1, ventral view and stylus (right) in dorsal view; 2, coxite, ventral view, and stylus, dorsal view. Scale 0.1 mm.

macrotrichia but variable in number, ranging from 0 to 9 (0 or 2 at distal end in holotype); 'x' entirely bare. Fore leg with tibial comb consisting of a single row of 7 (6–10) setae; metatarsi of all legs longer than each femur; claws toothed, usually with 4 minute teeth at ventral base.

Tergite 9 gradually narrowed distally; coxites with 2 long setae on each inner dorsal and ventral apex, intercoxal basal lobe subtriangular, sparsely setose (4–6 slender setae); stylus bilobate, with dorsal lobe shorter than ventral one, bearing usually 7 (5–8) strong seta-like spines on tip, and ventral lobe elongate, densely setulose (short but spine-like setulae) on apical part.

Female. Thorax and abdomen darker than those of male; cercus, hypogynal valve and vaginal furca blackish brown; antenna with flagellar segments distinctly shorter than those of male (almost 1/2) and scantily roughened, 4th segment 0.09–0.12 mm long, nearly 3 times as long as wide, with neck about 1/9–1/10 the whole length of segment; wing length 3.56 (3.1–3.9) mm, R_1 only a little shorter than R and ending at or just before level of Cu_2 -apex.

Holotype male, CPFES, Haniya, Sanbu-machi, Sanbu-gun, Chiba Pref., 26 May 1993, on pistillate flower of *Arisaema serratum*, leg. E. ISHITANI (KPU No. 267, on slide). Paratypes: 14 males & 5 females, same data as holotype except for collecting date: 25 & 26 May.

Distribution. Japan (Honshu).

Remarks. This species is characterized by the long and rough flagellar segments of male antenna, macrotrichial forks of posterior veins M and Cu , and bilobed styli of the male genitalia. The stylus of *arisaemae* is similar to that of the European *ungulata* (WINNERTZ, 1867) and *porrecta* (LENGERSDORF, 1929) in the shape and spinosity, but in *arisaemae* the dorsal lobe is more densely spinose than those of the related species, that is, 4–5 spines in *ungulata* and *porrecta*, respectively. Also, in *ungulata* the vein Cu_2 is bare, and in *porrecta* the wing is 4–5 mm in length.

Phytosciara (Prosciara) ungulata (WINNERTZ)

(Fig. 2)

Sciara ungulata WINNERTZ, 1867: 142.

Lycoria (Lycoria) ungulata: LENGERSDORF, 1928–30: 30.

Phytosciara (Prosciara) ungulata: TUOMIKOSKI, 1960: 104.

Brown, with legs yellowish; wing length 2.5 (2.4–2.6) mm in male, 2.9 mm in female. Differs from *arisaemae* in the following points: 4th flagellar segment 2.5–3.5 times as long as wide and with neck 1/9 the whole length of segment in male, but female 4th segment 2/3 length of male one and with neck less than 1/10 of segment; Cu_2 bare, stem of Cu shorter than 'x'; intercoxal lobe distinctly projected posteriorly and densely setigerous.

Specimens examined. Five males & 1 female, Yatsuo-machi, Nei-gun, Toyama Pref., 4–5 May 1991, on flowers of *Arisaema serratum*, leg. M. ODAKI; 2 females, Nitchû Ruins, Tateyama-machi, Nakaniikawa-gun, Toyama Pref., on pistillate

flowers of *Arisaema serratum*, 5 May 1991, leg. M. ODAKI.

Distribution. Europe, Japan. New to Japan.

***Phytosciara (Dolichosciara) insolita* n. sp.**

(Fig. 3)

Male. Yellowish brown; prefrons, clypeus, scutellum, pronotum, episternum and abdominal sternites pale; antenna brown; palpus yellow. Wing very faintly tinged with yellowish brown; halter entirely yellow. Legs pale testaceous yellow, tarsi more or less brownish; spurs yellow. Setae yellowish brown to brown.

Vertex sparsely setose; eye-bridge 2–3 facets wide. Prefrons with 2 or 3 pairs of long setae on ventromedian part in addition to lateral groups of 4–14 short setae; clypeus usually with 2–4 setae on median longitudinal line but rarely absent. Antenna 1.6–1.7 mm long; scape and pedicel each with a ventral row of setae; 4th flagellar segment about 0.13 mm long, 3.2–3.4 times as long as wide, almost smooth on surface but only a little produced above the setal sockets, with setae arranged more or less sparsely and slightly shorter than width of segment, neck nearly 1/8 the whole length of segment; 13th segment nearly 4/5 length of the 4th; 14th segment a little shorter than the 4th. Palpus with segments in proportion of 3:2.5:3.5; 1st segment with 14–16 sensillae which are not arranged in a pit.

Scutum with 6–7 setae in *dc*-row, *acr* in 2 irregular and sparse rows; scutellum with 2 pairs of median marginal setae distinctly longer than lateral marginals; anterior pronotum with 4–5 setae; mediotergite bare. Wing 2.3 (holotype)–2.5 mm in length, with costa extending to almost 2/3 the distance between apices of R_{4+5} and M_1 ; R_1 slightly longer than 1/2 of R and ending before or at level of Cu_2 -apex; R_{4+5} ending at or beyond level of M_2 -apex; M_1 approximately 3/4 length of M -stem; 'y' longer than 'x'; stem of Cu slightly shorter than 'x'; all R , M -fork, about distal 1/2 of M -stem, Cu -fork except for base and 'y' with macrotrichia; halter dorsally with 2 rows of setulae. Fore tibia with comb pale, consisting of a single row of 10–11 setae which are about 1/4 length of spur; fore metatarsus slightly shorter than femur; fore tibial spur slightly longer than 2/3 of outer hind tibial spur; claws each with 4–6 teeth ventroproximally.

Tergite 9 with long setae sparsely on distal half; coxites narrowly separated from each other on ventral side, without intercoxal lobe, bearing 3 short setae on membrane between coxites; stylus narrow, subcylindrical, bearing a distinct dorso-apical spine in addition to usually 7 (6–8) apical and subapical (4 along inner margin) spines; aedeagal apodeme 50 μ m long.

Female. Similar to male, but flagellum more smooth on surface; 1st palpal segment with 20–24 sensillae; wing 2.9–3.1 mm long; cercus subequal to or a little longer than tergite 10 and slightly shorter than half of hypogynal valve.

Holotype male, Nitchû Ruins, Tateyama-machi, Nakaniikawa-gun, Toyama Pref., 5 May 1991, on pistillate flower of *Arisaema serratum*, leg. M. ODAKI (KPU No.



Fig. 3. Male genitalia of *Phytosciara (Dolichosciara) insolita* n. sp., ventral view (left half) and tergite 9 (right half), dorsal view; apex of stylus, dorsal view.

268, on slide). Paratypes: 2 males & 2 females, same data as holotype, all on slides.

Distribution. Japan (Honshu).

Remarks. This species is unusual in having the short stem of Cu, but can be recognized as *Phytosciara* by the presence of macrotrichia on all forks of veins M and Cu, true comb on the fore tibia and teeth on the claw. It is similar to the European *P. saetosa* (LENGERSDORF, 1929) in the presence of macrotrichia on the cross vein r-m ('y'), which is a character uncommon to the subgenus *Dolichosciara*. In *insolita*, the scutum, 1st segment of palpus and halter are unicolored, while *saetosa* has the trivittate scutum, blackish subapical patch on the 1st palpal segment and dark knob of halter, and the hairy mediotergite.

Phytosciara (Dolichosciara) megumiae n. sp.

(Figs. 4-5)

Female. Testaceous; prefrons, clypeus, scutellum, pronotum, episternum, coxae, femora and abdominal sternites pale; antenna except for yellowish scape and

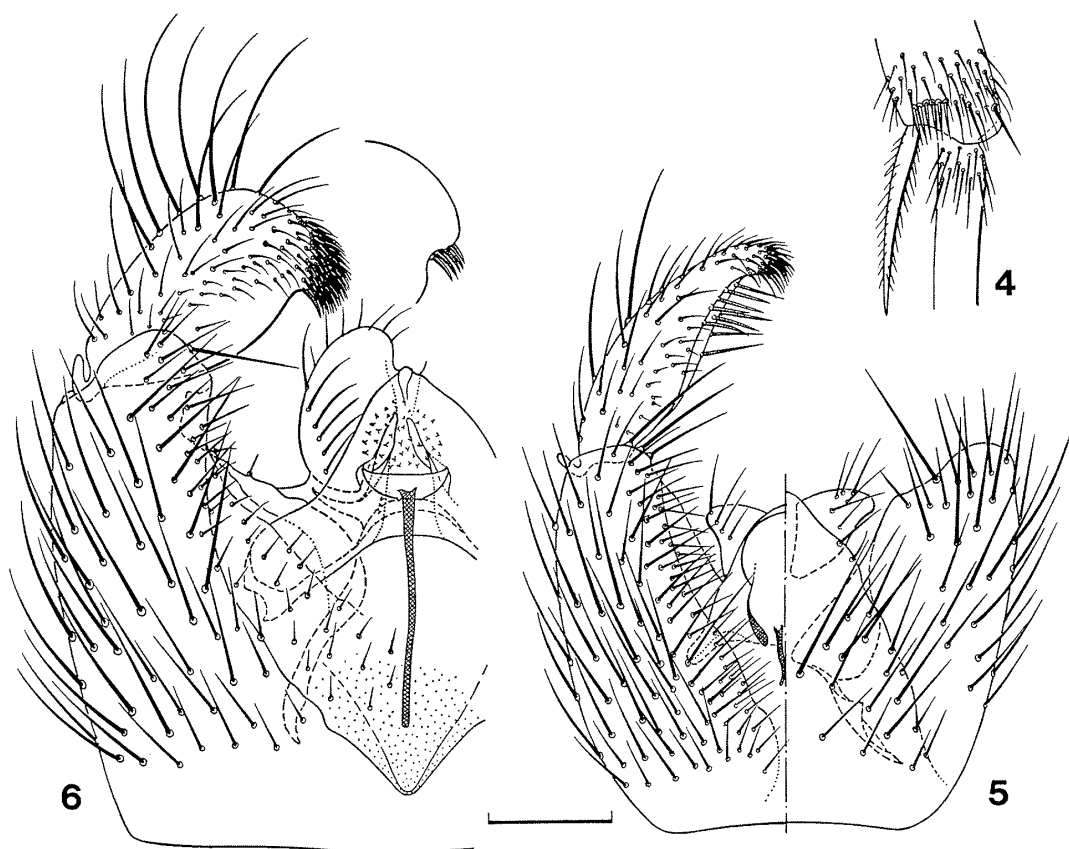
pedicel, palpus, anterior anepisternum, ventral half of katepisternum, pleurotergite, posterolateral part of mediotergite, abdominal tergite 10, cercus and distal segment of hypogynal valve more darkened; scutum with 3 vittae which are variable in degree of darkness, median vitta separated from lateral ones by yellowish lines along *dc*-rows. Wing very faintly tinged with yellowish brown; halter with knob more or less brownish at base. Legs with tibiae and tarsi faintly brown tinged; spurs yellow. Setae brown.

Vertex very sparsely setose; eye-bridge 2 (1–3) facets wide; prefrons with 3–4 ventromesal setae which are longer than setae on lateral sides; clypeus with 1 dorso-median seta. Antenna 1.4 (1.38–1.45) mm long; scape and pedicel each with a ventral row of setae; 4th flagellar segment 0.1 mm long, nearly thrice as long as wide, with weakly rough outline and sparse setae which are almost $2/3$ as long as width of segment, neck $1/10$ – $1/12$ the whole length of segment; distal 5–7 segments distinctly roughened just above setal sockets; 12–13th segments each $3/4$ length of the 4th; 14th segment subequal to the 4th in length, ending in a few minute sensory spines. Palpus with segments in proportion of 4:3:4.5; 1st segment with 18–20 sensillae which are not arranged in a pit.

Scutum with 7–8 setae along *dc*-row, several *acr* in a row anteriorly; scutellum with 3 (rarely 2) pairs of posterolateral marginal setae longer than median marginals and anterolateral ones; anterior pronotum sparsely setose; mediotergite bare. Wing 3.2 (holotype)–3.5 mm long, with costa ending at or slightly beyond middle of distance between apices of R_{4+5} and M_1 ; R_1 short, $1/2$ – $2/3$ length of R , ending before level of Cu_2 -apex; R_{4+5} ending almost at middle between levels of M_1 - and M_2 -apex; 'y' 1.3–3.0 times as long as 'x' which is subequal to or slightly shorter than Cu -stem; M_1 subequal to M -stem in length; all R , M - and Cu -fork (excepting bases and apical part of M -stem) with macrotrichia; 'y' usually with 1 (–0) setula near distal end; halter with 2 irregular rows of setulae on dorsal side of knob. Fore tibia with comb brown, consisting of a single row of about 6 (5–7) setae which are about $1/5$ length of spur; fore metatarsus subequal to femur in length but metatarsi of other legs shorter than each femur; fore tibial spur slightly shorter than mid tibial one, or $3/4$ of outer hind tibial one; claws each with 6 minute teeth ventroproximally.

Cercus short, about $2/3$ length of tergite 10, or nearly $1/4$ length of hypogynal valve.

Male. Similar to female; stylus darkened apically; M -fork with macrotrichia through entire length; 'y' with 4 macrotrichia distally. Tergite 9 without setae on posteromedian part; coxites narrowly but indistinctly separated from each other by a membranous area in ventral side, covered densely with slender setae along inner margin, and with 3 long setae near each inner posteroventral apex; stylus cylindrical, distinctly narrowing apically, covered densely with about 20 dark brown, short spine-like setae on tip and with 6–7 brown straight spines before apex of inner side; aedeagal tegmen with a pair of curved and narrow sclerites at median base; aedeagal apodeme 50 μ m long.



Figs. 4–6. Apex of fore tibia (4) and male genitalia (5) of *Phytosciara* (*Dolichosciara*) *megumiae* n. sp., and male genitalia of *Paractenosciara longimentula* n. sp. (6). 5, ventral (left half) and dorsal (right half) views; 6, ventral view, and apex of stylus, dorsal view.

Holotype female, Nitchû Ruins, Tateyama-machi, Nakaniikawa-gun, Toyama Pref., 5 May 1991, on staminate flower of *Arisaema serratum*, leg. M. ODAKI (KPU No. 269, on slide). Paratypes: 1 male & 5 females, same data as holotype, on slides; 10 females, same data as holotype, in ethanol.

Distribution. Japan (Honshu).

Remarks. This species may be easily distinguished from *P. insolita* n. sp. by the large size, short 4th flagellar segment, trivittate scutum, sparse macrotrichia on cross vein r-m ('y'; 5–10 macrotrichia in *insolita*), sparse comb on the fore tibia, and densely spinose apex of the stylus.

Genus *Paractenosciara* SASAKAWA, n. gen.

Head: Eye-bridge broad; vertex and prefrons covered with short setae; clypeus with several setae on median longitudinal line; eye hairy; antenna 2+14-segmented, flagellar segment more or less roughened in outline, 3.3–4.7 times as long as wide, covered densely with setae, and with short and bicolored neck. Palpus 3-segmented,

1st segment with sensillae which are not arranged in a pit and are surrounded by many setae.

Thorax: Scutum with short setae along *dc*-line and on lateral sides; scutellum with marginal setae short, arranged densely in 2–3 irregular rows; anterior pronotum and prothoracic episternum sparsely setose; posterior pronotum and mediotergite bare. Wing with macrotrichia on radius except for radial sector, fork of media (M_1 and M_2) and 'y' (r-m); base ('x') and stem of media, and cubitus (Cu_1 and Cu_2) bare; R_1 rather long, ending beyond level of Cu_2 -apex; stem of Cu shorter than 'x'; macrotrichia absent on membrane; halter dorsally with 2 rows of setulae. Fore tibia with true inner comb consisting of a single, weakly curved, transverse row of subequal setae, separated from the other vestiture by a bare area; mid and hind tibiae each with 2 subequal spurs; tibial setae in posterior surface distinct but shorter than width of tibia; claws untoothed.

Male genitalia: Coxites without intercoxal lobe or setal tuft at middle of ventroproximal part; stylus somewhat oval in outline and slightly projected inwardly on tip, with many long setae on lateral side, numerous stout setulae all over the apex and a comb-like row of several spines on apical protuberance; parameres well developed, V-shaped. Ovipositor: Tergite 10 slightly longer than cercus which is twice as long as wide; hypogynal valve 1.3 times as long as tergite 10.

Type species: *Paractenosciara longimentula* n. sp.

Phylogenetic relationships: The genus *Paractenosciara* is most similar to *Ctenosciara* TUOMIKOSKI (1960) in the presence of macrotrichia on the posterior veins, and in having the true comb at inner apex of the fore tibia and the simple claws, but has no close relationship to the *Bradysia*-group. *Paractenosciara* is, however, apparently much advanced from *Ctenosciara* in the following characteristics: the macrotrichia present only on the fork of media, while all branches of the media and cubitus with macrotrichia in *Ctenosciara*; the first palpal segment with many setae around the sensory area, while with only 2 setae in *Ctenosciara*; the fore tibial comb composed of a single row of setae, while 2 separate combs in *Ctenosciara*; the stylus of male genitalia ovate in outline, while narrow and cylindrical in *Ctenosciara*.

Paractenosciara longimentula n. sp.

(Fig. 6)

Male. Head and thorax brownish black, abdomen dark brown; setae brown. Antenna brown, but neck of flagellar segment yellowish and brown-ringed apically; palpus pale brown, but yellowish at base of 1st segment. Wing tinged with brown, distinctly darkened along anterior margin; halter brown, with knob blackish. Legs brown, fore femur and base of other femora more or less pale.

Eye-bridge 4 facets wide; prefrons densely setose, 15–20 setae on each lateral half; clypeus with 2–4 setae almost on median line. Antenna 3.4 mm long; 4th flagellar segment 0.23–0.25 mm long, about 4.5 times as long as wide, bearing pale

brown setae which are subequal to or slightly shorter than width of segment, with neck about 1/7 the whole length of segment; 13th segment shortest, 4/5 length of the 4th; 14th segment slightly longer than the 4th. Palpus with segments in proportion of 3:2:3.5 in length; 1st segment dorsally with a group of 25–27 sensillae which are surrounded by 11–13 setae (1 or 2 laterodistal setae longer than others).

Scutum with 2 irregular rows of *dc*; 1 seta in *ia*-row distinctly long. Wing 3.7–4.2 (holotype) mm long, with costa extending to or very slightly beyond midpoint between apices of R_{4+5} and M_1 ; R_1 usually longer than R (4:3.5), ending beyond level of Cu_2 -apex and before level of forking point of M ; stem of M longer or shorter than M_1 , stem of Cu 1/2–3/5 of 'x'; 'y' subequal to or longer than 'x', with 5–12 macrotrichia almost throughout the whole length. Fore tibia with comb consisting of 12–15 setae, and with spur a little longer than apical width of tibia and 3/4 length of hind tibial spur; fore metatarsus 5/7 length of tibia; hind tibial spurs each about 1.5 times as long as apical width of tibia.

Genitalia: Stylus with a row of 4–6 spines on inner apical protuberance; aedeagal apodeme extremely long, 175–200 μ m in length.

Female. Differs from male in the following points: antenna 2.7 mm long; 4th flagellar segment 0.2 mm long, 5 times as long as wide, with neck 1/8–1/10 the whole length of segment; 13th segment 5/6 of the 4th; 14th segment equal to the 4th; 1st palpal segment with 30–31 sensillae; fore metatarsus 3/5 length of tibia; wing 4.7 mm long, R_1 longer than that of male, ending at level of forking point of M .

Holotype male, CPFES, Haniya, Sanbu-machi, Sanbu-gun, Chiba Pref., 26 May 1993, on pistillate flower of *Arisaema serratum*, leg. E. ISHITANI (KUP No. 270, on slide). Paratypes: 2 males, same data as holotype; 1 female, same data as holotype excepting date of collection: 25 May 1993; all on slides.

Distribution. Japan (Honshu).

Bradysia delectabilis MOHRIG et MENZEL

(Figs. 7–10)

Bradysia delectabilis MOHRIG et MENZEL, 1992: 29.

This species is characterized by the dark brown body, long antennal flagellum with bicolor neck and presence of 4 spines on the stylus. Some characters are added as follows: prefrons with 2 pairs of median ventro-marginal setae longer than dorso-lateral ones; antenna about 3 mm long, 4th flagellar segment 3.7–3.8 times as long as wide, with setae subequal to or slightly shorter than width of segment, and with neck about 1/7 the whole length of segment and brown-ringed on apical 1/4; scutum with setae very short excepting long *sa* and 1 *pa*; wing 3.5–3.7 mm long, R_1 ending at level of Cu_2 -apex, 'y' a little longer than 'x'; Cu -stem shorter than 'x'; fore tibial comb composed of 11–12 setae which are about 1/3 length of spur; claws untoothed, each with a row of 4–5 minute hairs on ventral base; stylus covered densely with spine-like setae on tip and with 4 spines near inner apex of dorsal side; aedeagal

apodeme 100–105 μm long.

Specimens examined. 2 males, Yatsuo-machi, Nei-gun, Toyama Pref., 4 May 1991, on flower of *Arisaema serratum*, leg. M. ODAKI.

Distribution. Japan (Honshu, Kyushu).

***Bradysia divaricata* n. sp.**

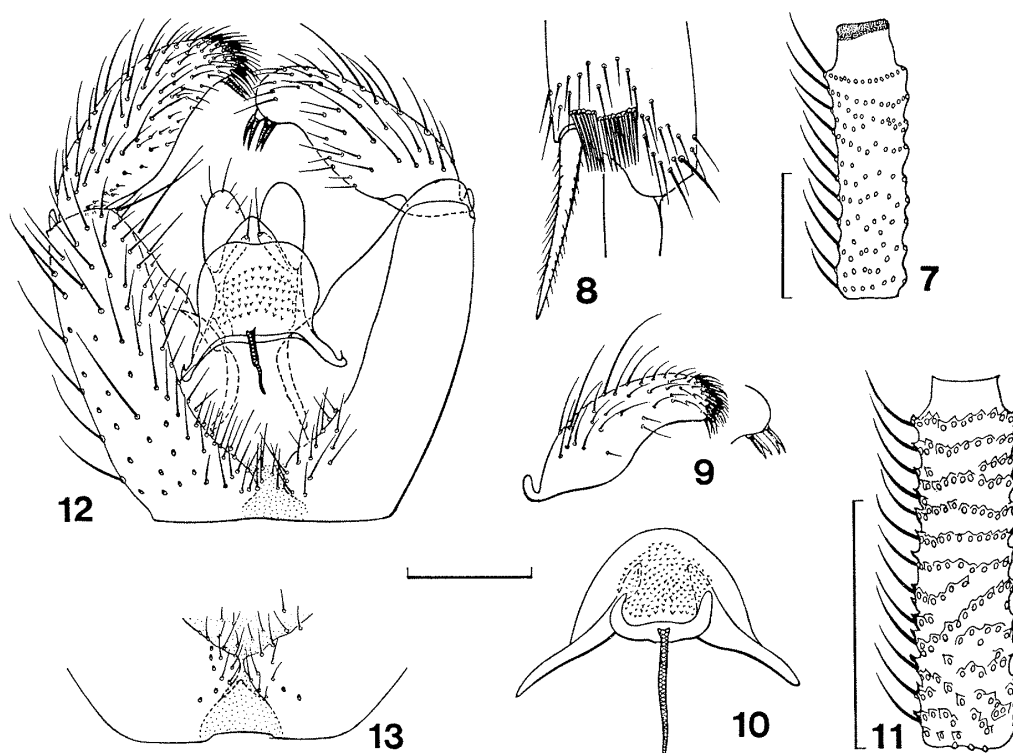
(Figs. 11–13)

Male. Brown; head darkened dorsally; antenna brown except for pale testaceous neck of flagellum; palpus brownish yellow, 1st segment with pale brown sensory area; scutum weakly shining, with 3 indistinct, blackish vittae separated from each other by dark brown lines along *dc*-rows: median vitta stretching for anterior 2/3 of notum but is distinctly divided into 2 stripes by a line along *acr*-rows in posterior 1/3 of its whole length; lateral sides and posteromedian 1/3 of scutum, and anterior 1/2 of scutellum more or less paler than vittae. Setae brown, but those on flagellum pale testaceous yellow. Wing very faintly brown tinged; halter entirely brownish yellow. Legs yellow, tibiae and tarsi very faintly brown tinged.

Vertex with 2 (rarely 1) pairs of short setae anteriorly; eye-bridge narrow, consisting of 2 (–3) facets; prefrons with 4 (3–5) median ventro-marginal setae which are distinctly longer than those on dorsal and lateral sides; clypeus with a long seta at middle of dorsal part. Antenna 2.1–2.2 mm long, about thrice as long as scutum; scape with a ventroproximal seta which is longer than 4 (3–6) ventrodistal setae; 4th flagellar segment 0.15–0.17 mm long, strongly roughened and with crenulate outline, 3.5–4 (rarely 3) times as long as wide, with setae distinctly shorter than width of segment, and neck short (1/8–1/12 length of segment); 14th segment as long as the 4th. First palpal segment with 36 (30–45) sensillae which are not arranged in a pit and a long dorsolateral seta which is distinctly longer than lateral and ventral setae; 3rd segment about 1.2 times as long as the 1st and setose on distal half.

Scutum with 6–8 pairs of long *dc*; *ia*, *sa* and *pa* also long; *acr* in a row anteriorly but in 2 rows posteriorly; scutellum with 2 pairs of median marginal setae which are distinctly longer than other marginals and with sparse setae before margin. Wing 2.9 (2.6–3.1, 3.0 in holotype) mm long, with costa extending to basal 2/3 (rarely 3/4) the distance between apices of R_{4+5} and M_1 ; R_1 subequal to R in length, terminating in costa slightly beyond level of Cu_2 -apex but distinctly before level of forking point of M ; R_{4+5} ending at midpoint between levels of M_1 - and M_2 -apex; 'y' subequal to 'x' in length and with 3 (2–6) macrotrichia in distal part; M -stem equal to or slightly longer than M_1 ; Cu -stem shorter than 'x'. Fore tibia with a comb consisting of 8 (7–10) setae which are 1/4 length of spur; fore metatarsus 5/8 length of tibia and 3/5–3/4 of femur; fore tibial spur 3/5 length of hind tibial one; mid tibial spurs each subequal to those on hind tibia; claws each with 3 minute teeth.

Coxites with ventral side almost connected with or narrowly separated from



Figs. 7–13. Fourth flagellar segment (7), apex of fore tibia (8), apex of stylus (9) and aedeagal tegmen (10) of *Bradysia delectabilis* MOHRIG et MENZEL; 4th flagellar segment (11), male genitalia (12, ventral view; right stylus, dorsal view) and ventroproximal part of coxites (13) of *Bradysia divaricata* n. sp.

each other at middle, without intercoxal lobe, only sparsely setose on membrane; stylus long, cylindrical, weakly concave before apex of inner side, bearing dark, dense and spine-like setae on apex and 4–5 (rarely 6) strong spines near inner apex of dorsal side; aedeagal apodeme 50–60 μm long.

Female. Unknown.

Holotype male, Yatsuo-machi, Nei-gun, Toyama Pref., 4 May 1991, on flower of *Arisaema serratum*, leg. M. ODAKI (KPU No. 271, on slide). Paratypes: 7 males, same data as holotype, on slides; 17 males, same data as holotype, in ethanol.

Distribution. Japan (Honshu).

Remarks. This species seems to belong to the *fungicola*-group in having the long and rough flagellar segments of antenna, pale brown sensory area on the 1st palpal segment, and cylindrical styli of the male genitalia, or to the *amoena*-group in the presence of macrotrichia on the cross vein 'y'. Especially, it resembles more closely the species of the former group: *B. divaricata* is separable from the known *fungicola* (WINNERTZ, 1867) by its short setae on the flagellar segments and narrow separation in the ventral side of coxites (as seen in the coxites of European *aprica* (WINNERTZ) (FREEMAN, 1983, fig. 145), and also from *atraconea* MOHRIG et MENZEL

(1992; type locality: Fukuoka, Kyushu) by its narrow eye-bridge, long flagellum, distinct sensory area of the 1st palpal segment and large size.

Corynoptera dumosa n. sp.

(Figs. 14–16)

Male. Head dark brown, antenna brown, palpus pale yellowish brown; thorax and abdomen brown but thoracic pleura and scutellum more or less pale; setae brown. Wing very faintly brown tinged; halter with knob darkened. Legs yellowish, with tibiae faintly, and distal parts of all metatarsi and distal 4 tarsal segments distinctly brown tinged.

Eye-bridge broad, consisting of 4 facets; prefrons with a pair of long ventral setae and a group of short setae on dorsal side. Antenna short; scape with 1 long and 2 short setae on ventral side; 1st flagellar segment longest and about 0.1 mm long; 4th segment 0.07 mm long, twice as long as wide, covered densely with short setae which are scarcely longer than 1/2 of segmental width, and with neck nearly 1/10 the whole length of segment. Palpus with 1st segment as long as the 3rd, bearing an extremely long seta, which is subequal to length of segment, on dorsoapical part, sensillae pale and not arranged in a pit; 2nd segment slightly shorter than the 1st.

Scutum with 6 long setae in *dc*-row, a row of *acr* in anterior half of notum; scutellum with a pair of long median marginal setae and 3 pairs of short lateral marginals. Wing 1.8 (holotype)–1.85 mm long, with costa extending to about 3/4 the distance between apices of R_{4+5} and M_1 ; R_1 3/4 or subequal to length of R , ending slightly before level of Cu_2 -apex; R_{4+5} ending almost at level of M_2 ; M -stem slightly longer than fork; Cu -stem about 1/4 of 'x'; 'x' and 'y' bare. Fore tibia with a group of 13–18 setae in a form of suboval, which is weakly delineated, at inner apex; hind tibial spur twice as long as apical width of tibia.

Tergite 9 constricted at middle of lateral sides; coxites narrowly united with each other at base of ventromesal part, and with a pair of very long bristles near each inner dorsal and ventral apex; stylus long, cylindrical, concave before inner apex, bearing about 10 (8–12) seta-like spines around tip and usually 3 (2–3) pale, long seta-like spines, which are longer than apical ones, on inner side, but not bearing a distinct apical spine; aedeagal tegmen with a pair of small protuberances at middle of lateral sides, sparsely spinulose; aedeagal apodeme 30–32 μ m long.

Female. Similar to male, but antenna shorter than that of male, 1st flagellar segment 0.08–0.09 mm and the 4th 0.06–0.07 mm long; with length 1.8–2.0 mm.

Holotype male, CPFES, Haniya, Sanbu-machi, Sanbu-gun, Chiba Pref., 25 May 1993, on pistillate flower of *Arisaema serratum*, leg. E. ISHITANI (KPU No. 272, on slide). Paratypes: 1 male & 5 females, same data as holotype, all on slides.

Distribution. Japan (Honshu).

Remarks. This species runs into either the species group of *blanda* or *forcipata*



Figs. 14–16. First segment of male palpus (14), apex of fore tibia (15) and male genitalia (16, ventral and dorsal views) of *Corynoptera dumosa* n. sp.

in TUOMIKOSKI's key (1960), but differs from the species of the former group in the absence of a distinct apical spine on the stylus, and from the latter in the cylindrical shape of stylus. It appears to be closest to *C. curvispinosa* FREEMAN (1983), known from England, in the wing length, short flagellar segment of antenna, cylindrical shape and apical armature of stylus and absence of setal patch on ventromesal part between the coxites, but can be distinguished by its densely spiny stylus, long R_1 and sparse setae on the fore tibial apical armature.

Corynoptera licina n. sp.

(Fig. 17)

Male. Brown; antenna brown, palpus pale brown; abdominal sternites testaceous; wing very faintly brown tinged; halter pale brown; legs testaceous yellow, but coxae basally, apices of all 1st tarsal segments and distal 4 tarsal segments entirely brownish; spurs yellow.

Vertex sparsely setose; eye-bridge usually 2 (–3) facets wide; prefrons with a row of ventro-marginal setae, of which median 1 or 2 pairs of setae longer than others; clypeus with 1 long seta dorsomesally. Antenna 1.35–1.4 mm long; scape and pedicel each with a row of ventral setae, the former with 1 extremely long seta; 4th flagellar segment 0.08–0.1 mm long, about 2.5 (2.3–2.9) times as long as wide,

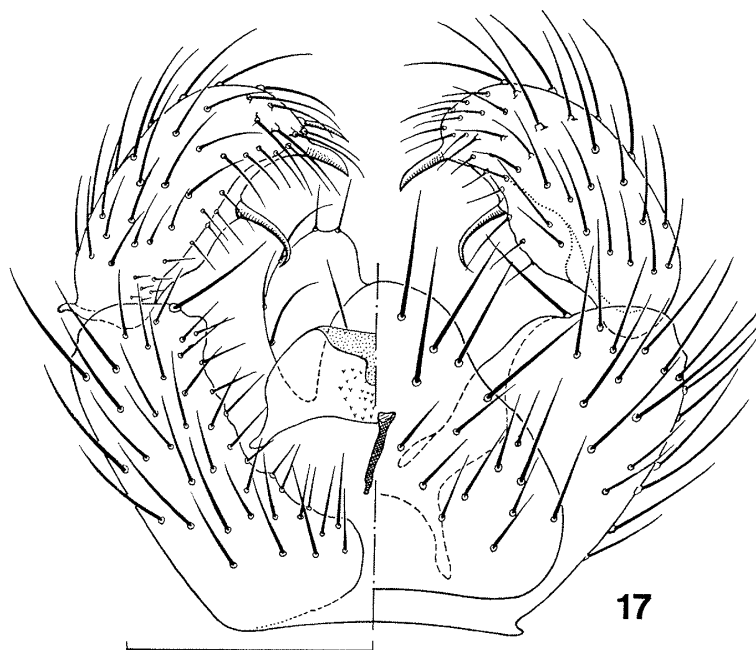


Fig. 17. Male genitalia of *Corynoptera licina* n. sp., ventral (left half) and dorsal (right half) views.

almost smooth on surface and very slightly protruded just above base of setal sockets, covered with setae which are pale and about $2/3$ as long as width of segment, with neck about $1/10$ – $1/13$ of whole length of segment; 13th segment almost $3/4$ length of the 4th; 14th segment as long as the 4th. Palpus with segments in proportion of 3:2.2:3.5; 1st segment with 18–25 sensillae in a shallow pit and 1–5 distal setae; 3rd segment with 2 apical setae slightly longer than others.

Scutum with 6–7 long setae in *dc*-row, *acr* in a row but in 2 rows anteriorly, and 5–6 long lateral setae; scutellum with 2 pairs of long median marginal setae, accompanying by irregular rows of setae before margin; anterior pronotum setose. Wing 2.0–2.2 (2.1 in holotype) mm long, with costa extending to $2/3$ – $3/4$ the distance between apices of R_{4+5} and M_1 ; R_1 slightly shorter than R (4.5–5:6), ending slightly before or at level of Cu_2 -apex; R_{4+5} ending before level of M_2 -apex; M -stem subequal to or a little shorter than M_1 ; Cu -stem usually $1/2$ ($1/4$ – $2/3$) of 'x'; 'y' subequal to or slightly shorter than 'x' and with a setula near apical base; halter with a row of setulae dorsally. Fore tibia with a subtriangular patch bearing 11 (8–13) setae; fore metatarsus slightly longer than $3/5$ length of femur; fore tibial spur about $3/5$ length of hind tibial one; mid tibial spur $4/5$ of hind tibial one; claws untoothed.

Coxites narrowly separated from each other on ventral side; stylus rather long, with apical spine black and distinct, accompanying by 1 or 2 spine above base of apical spine ventrally, and 1 long, dorsally curved spine at middle of inner side;

aedeagal tegmen incised at middle of distal margin and membranous distally; aedeagal apodeme 35–40 μm long.

Female. Unknown.

Holotype male, Nitchû Ruins, Tateyama-machi, Nakaniikawa-gun, Toyama Pref., 5 May 1991, on pistillate flower of *Arisaema serratum*, leg. M. ODAKI (KPU No. 273, on slide). Paratypes: 21 males, same data as holotype, on slides and in ethanol.

Distribution. Japan (Honshu).

Remarks. This species is very similar to *C. sasakawai* MOHRIG et MENZEL (1992; type locality: Tokushima, Shikoku) in general appearance. There are, however, the distinct differences between both species in the structures of male genitalia, that is, the stylus of *licina* is subcylindrical (*not* suborbicular) and provided with three kinds of spines: a strong apical spine, 1 or 2 subapical spines of normal size, and a long, upturned spine (*not* bristle-like) at middle of inner side; the aedeagal tegmen of *licina* is trapezoidal in outline (*not* vase-shaped) and membranous in the distal incised area. Also, it is somewhat related to the Eutopian *camptochaeta* TUOMIKOSKI (1960) of the *fulvicollis*-group in the size, structure of the palpus and the presence of macrotrichia (1–2) in the cross vein 'y', but *licina* has only 1 long spine on inner side of the stylus (2 in *camptochaeta*).

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