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(Diptera)

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New and unrecorded species of Drosophilidae
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(With 8 Text figures)

Until recently, in total ninety two species of the Drosophilidae has so far been recorded from Hokkaido, and the total number of the species recorded from Japan being more than two hundred species. It is very difficult, so often impossible, to identify the species from old records where no specimens are available, as the synonym is much confused.

A Drosophila survey of Hokkaido has progressed since 1954, resulting in the discovery of twenty one new species which were described by Momma & Takada 1954, Okada 1956, Okada & Kurokawa 1957, Takada & Okada 1958, Wakahama & Okada 1958, Takada 1959, Takada & Okada 1960, Kaneko, Tokumitsu & Takada 1964, Kaneko & Takada 1966, Moriwaki, Kitagawa & Okada 1967, Takada 1968, Takada & Toda 1973 and Okada 1977.

This paper deals with the description of thirteen new and three hitherto unrecorded species of drosophilid flies in Hokkaido, Japan.

The materials are collected by Dr. Masahito T. Kimura, Messrs. Hideaki Watabe and Naotaka Minami, Hokkaido University, whose name are given under description of species, except in the case of the present junior authors own collections.

1) This study was supported in part by a grant from the School Board of Sapporo University, 1977.

Types are deposited in the Biological Laboratory, Sapporo University, 243, 3-jo, 7-chome, Nishioka, Toyohiraku, Sapporo, Hokkaido, Japan.

The authors wish to give their sincere thanks to Professor Eizi Momma, Hokkaido University, for his kind direction.

Table 1. New and unrecorded species of Drosophilidae from Hokkaido (1979).

New Species	Localities	Collectors
1) <i>Amiota</i> (<i>Amiota</i>) <i>taurusata</i>	Koryu Kozan	Toda 1974
2) <i>A.</i> (A.) <i>delta</i>	Misumai	Toda 1973, Beppu 1975
3) <i>A.</i> (A.) <i>aquilotaurusata</i>	Nukabira	Watabe 1975
4) <i>A.</i> (A.) <i>neochungi</i>	Misumai	Toda 1975
5) <i>A.</i> (A.) <i>falcilis</i>	Koryu Kozan	Toda 1975
6) <i>A.</i> (A.) <i>forficula</i>	Namarikawa	Beppu 1977
7) <i>A.</i> (A.) <i>balaenodentata</i>	Tomakomai	Toda 1977
8) <i>Scaptomyza</i> (<i>Scaptomyza</i>) <i>amplialata</i>	Misumai	Toda & Minami 1977
9) <i>Nesiodrosophila</i> <i>sufflava</i>	Tomakomai	Toda & Minami 1977
10) <i>Drosophila</i> (<i>Sophophora</i>) <i>eniwae</i>	Koryu Kozan	Toda 1974
11) <i>D.</i> (<i>Drosophila</i>) <i>flavofasciata</i>	Otoineppu	Kimura & Beppu 1974
12) <i>D.</i> (D.) <i>quadrisetata</i>	Soranuma	Beppu 1976
13) <i>D.</i> (?) <i>calidata</i>	Jozankei	Beppu 1976
Unrecorded Species		
1) <i>Amiota</i> (<i>Amiota</i>) <i>promissa</i> Okada, 1960	Namarikawa	Beppu 1977
2) <i>Drosophila</i> (<i>Sophophora</i>) <i>clarofinis</i> Lee, 1959	Misumai	Toda 1975
3) <i>D.</i> (<i>Drosophila</i>) <i>limbata</i> von Roser, 1840	Ashoro	Beppu 1977

Family Drosophilidae
 Subfamily Steganinae
 Genus *Amiota* Loew, 1862
 Subgenus *Amiota* Loew, 1862

✓ ***Amiota (Amiota) promissa* Okada, 1960.**

Amiota (Amiota) promissa Okada, 1960. Mushi, 34, 3 : 93.

Specimen examined. One male, Namarikawa, near Sapporo, Hokkaido, Japan, July 1, 1977 (K. Beppu).

○ ***Amiota (Amiota) taurusata* Takada, Beppu & Toda, n. sp. (Fig. 1 ; a, b)**

Amiota sp. 1, Beppu, Kaneko, Toda & Kimura, 1977. Seibutsu Kyozaï 12 : 2.

Male and female. Body dark brown, about 2.5–2.8mm, wings about 2.7mm in length. Face, humerus, halteres and vertical cleft of wing base are milky white. Head black, eye dark red and bear. Antennae reddish brown. Arista with about ten branches, fork apparently absent, ventral branches about four, much shorter than the dorsal ones. Palpi yellowish brown, fusiform with a few ventral hairs. Ocellar triangle dark brown. Front black and velvety when viewed from certain angles. Periorbits pale brown. Anterior reclinate orbital bristle about one-half as long as other orbitals, situated twice as apart from posterior reclinate orbital bristle as from proclinate orbital bristle. Only one prominent oral bristle.

Mesonotum and scutellum dark brown. Acrostichal hairs in about ten irregular rows. Anterior scutellars divergent, rather longer than the posterior ones. Prescutellars as long as anterior dorsocentrals which is about half as long as the posterior ones. Sterno-index about 0.7. Legs yellow, fore femur with a row of about seven long bristles on its posterior surface. Wings hyaline, veins yellow ; Costal-index about 2.0 ; 4V-index about 2.4 ; 4C-index about 1.4 ; 5x-index about 1.3 ; AC-index about 5.0. C3 fringe ratio about 1 : 2. Cx-index about 0.7. Abdominal tergites pale brown ; sternites yellowish grey.

Periphalliac organs : Genital arch dark brown with low heel, toe broad and rounded. Clasper broader than long, distally with about eight teeth, medially with irregularly arranged strong setae, lower caudal corner exceedingly projected like a finger. Anal plate pale brown, elliptical, with about twenty five hairs.

Phallic organs : Aedeagus black, slender and diverged, basally with a strong thorn-like process, black. Anterior parameres black apically, horn-shaped, basal half very thick.

Holotype : Male Koryu Kozan, near Eniwa ; July 4, 1974, collected at forest canopy (M. J. Toda).

Allotype : Female, collected together with holotype.

Paratype : Two males and one female, collected together with holotype.

Distribution. Hokkaido, Japan.

Relationships. Closely allied to *Amiota (A.) sigma* Okada, 1971, but differs in having horn shaped anterior parameres of male genitalia.

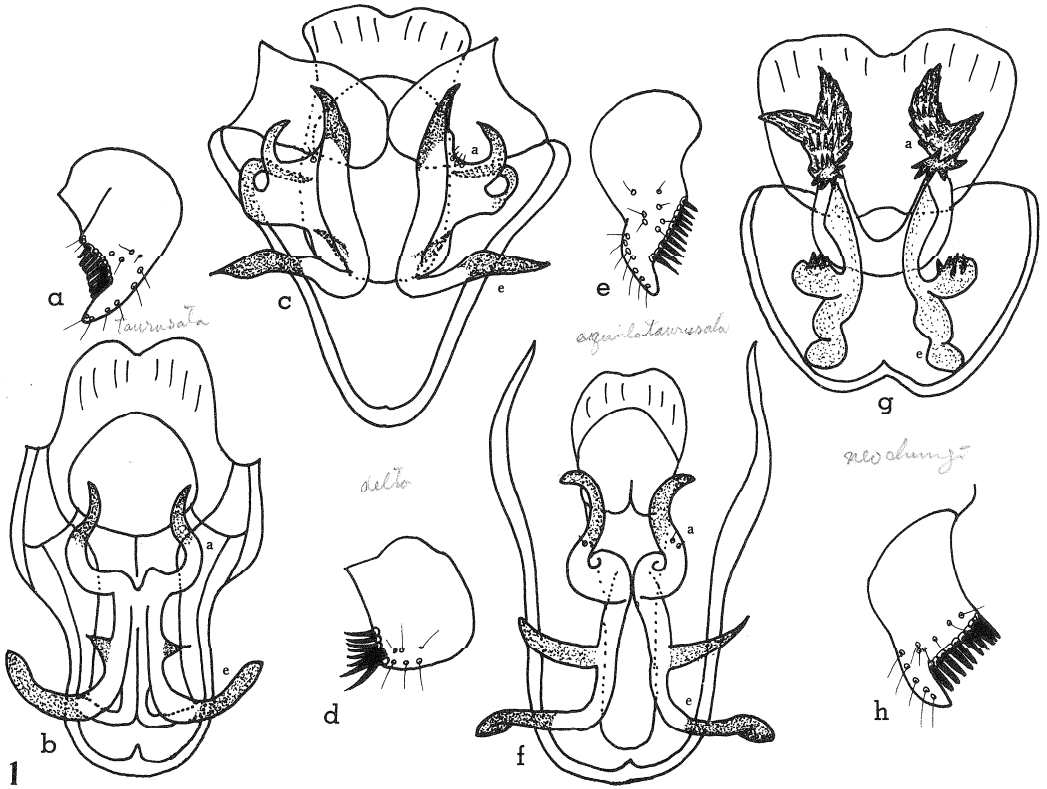


Fig. 1. *Amiota (Amiota) taurusata* n. sp.; a, clasper. b, phallic organs : a-anterior paramere. e-aedeagus. *Amiota (Amiota) delta* n. sp.; c, d. *Amiota (Amiota) aquilotaurusata* n. sp.; e, f. *Amiota (Amiota) neochungii* n. sp.; g, h.

1 *Amiota (Amiota) delta* Takada, Beppu & Toda, n. sp. (Fig. 1 ; c, d)

Amiota sp. 3; Beppu, Kaneko, Toda & Kimura, 1977. Seibutsu Kyozaï 12 : 2.

Male. Body greyish brown, about 2.3mm, wings about 2.2mm in length. Third joint of antenna dark brown, elongate and elliptical. Arista with 4 long branches on dorsally, ventral branches about three or four, much shorter than dorsal one, fork apparently absent. Humerals three; one long and two minute. Halteres, face, humerus and vertical cleft of wing base are pale yellow. Ocellar triangle black, front pale brown. Periorbits dark brown. Anterior reclinate orbital bristle four-fifth length of posterior reclinate orbital bristle and two-thirds length of proclinate orbital bristle, situated twice as apart from posterior reclinate as from proclinate. Only one prominent oral bristle.

Mesonotum and scutellum dark brown. Acrostichal hairs in about ten rows. Anterior scutellars divergent, rather longer than the posterior ones. Prescutellars rather shorter than anterior dorsocentrals which is about half as long as the posterior ones. Sterno-index about 0.75. Legs yellow, hind three succeeding tarsal joints which from second to fourth are short, **flat and triangular shaped**. Wings hyaline, veins yellow; Costal-index about 1.9; 4V-index about 2.8; 4C-index about 1.7; 5x-index about 1.7; C3 fringe ratio about 7:10. Cx-index about 0.7. Abdominal tergites pale brown, sternites pale.

Peripheral organs: Genital arch dorsally not truncate, hairy and pubescent. Clasper overl. pale, projected below genital arch, with a row of about eight apically blunt teeth on upper half, lower distal margin rounded, with short sensilla-like hairs. Anal plate large, pale, fusiform, hairy and pubescent, separated from genital arch.

Phallic organs: Aedeagus apparently fused to anterior parameres to become a pair of black sharp lobes, basally with broad and large apodeme. Anterior parameres black, distally broaden and with trifurcate claws at posterior edge, subapically with a few sensilla. Posterior parameres fused with each other.

Holotype: Male, Misumai, near Sapporo, Hokkaido; Sept. 5, 1973 (M. J. Toda).

Paratype: Male, Jozankei, near Sapporo; July 23, 1975 (K. Beppu). Distribution. Hokkaido, Japan.

Relationships. Distinguishable from the other Japanese members of subgenus *Amiota*, mainly in having hind three succeeding tarsal joints broad, flat and triangular shaped.

✓ *Amiota (Amiota) aquilotaurusata* Takada, Beppu & Toda, n. sp. (Fig. 1 ; e, f)

Male. Body dark brown, about 3.2mm, wings about 3.0mm in length. Face, humerus, halteres and vertical cleft of wing base are milky white. Head black. Arista with about four long branches on dorsally, ventral branches about three, much shorter than dorsal ones, fork apparently absent. Ocellar triangle black, with eight interocellar setae. Anterior reclinate orbital bristle four-fifth length of posterior reclinate orbital bristle and proclinate orbital bristle, respectively ; situated twice as apart from posterior reclinates as from proclimates. Only one prominent oral bristle.

Mesonotum and scutellum dark brown. Acrostichal hairs in about ten irregular rows. Prescutellars equal in size of anterior dorsocentrals. Sterno-index about 0.9. Legs yellow. Wings hyaline ; Costal-index about 2.2 ; 4V-index about 3.0 ; 4C-index about 1.7 ; 5x-index about 1.3 ; AC-index about 5.0 ; C3 fringe ratio about 1 : 2. Cx-index About 0.5. Abdominal tergites pale brown.

Periphalllic organs : Clasper pale yellow, longer than broad, with minute hairs on outer and inner surfaces ; lower caudal corner exceedingly projected like a finger ; distally with about ten long blunt teeth, arranged in a convexed row, upper teeth slightly shorter than lower teeth.

Phallic organs : Aedeagus black, stout and bifurcated, apically flattend, basally with a ^{pair of} strong sword-like process, symmetrically. Anterior paramere black apically, horn shaped, basal half very thick, with a sensillum at middle.

Holotype : Male, Nukabira, Hokkaido ; July 1, 1975 (H. Watabe).

Distribution. Hokkaido, Japan.

Relationships. Closely related to the foregoing species, *A. taurusata*, but differs in having aedeagus apically flattend and basally with a pair of strong sword-like process.

✓ *Amiota (Amiota) neochungi* Takada, Beppu & Toda, n. sp. (Fig. 1 ; g, h)

Male. Body black, about 4.0mm, wings about 3.6mm in length. Antennae with third joint dark brown, elongate, elliptical. Arista with six long branches on dorsally, ventral branches about three, fork apparently absent. Humerals one. Halteres, face, humerus and vertical cleft of wing base are milky white. Ocellar triangle black and ocellar setae long. Front black. Only on prominent oral bris-

tle. Palpi yellowish brown, fusiform, with several stout bristles. Anterior reclinate orbital bristle about three-fourth length of posterior reclinate bristle and proclinate orbital bristle.

Mesonotum and scutellum shining black. Acrostichal hairs in about ten rows. Sterno-index about 0.8. Legs yellow. Wings hyaline; Costal index about 2.0; 4V-index about 2.5; 4C-index about 1.5; 5x-index about 1.3; C3 fringe ratio about 5:9. Cx-index about 0.7. Abdominal tergites black, except first and second tergites, ^{which are} pale yellow, the latter with lateral black spots; fifth to sixth abdominal sternites dark brown.

Periphallic organs: Genital arch black, narrowing above, heel rectangular, toe broad, posterior margin with about five, toe and undermargin with about fifteen hairs, respectively. Anal plate yellow, elliptical. Clasper brownish yellow, longer than broad, lower caudal corner exceedingly projected like a finger; distally with about ten long blunt primary teeth, arranged in a straight row, upper teeth slightly shorter than lower teeth.

Phallic organs: Aedeagus black, bifid, slender and apically knob-shaped, subapically with a protuberance and basally sword-like, thick. Anterior parameres black, striated, apically bifurcated in a thick V-shape.

Holotype: Male, Misumai, near Sapporo, Hokkaido; Aug. 20, 1975 (M. J. Toda).

Distribution. Hokkaido, Japan.

Remarks: Closely related to *A. chungii* Okada, 1971, in having well developed finger-like process of the clasper and large striated anterior parameres, but differs in having aedeagus large and bifid, slender and apically knob-shaped, subapically with a protuberance (minute and divided in *A. chungii*)

***Amiota (Amiota) falcilis* Takada, Beppu & Toda, n. sp. (Fig. 2; c, d)**

Male. Body brownish black, about 3.0mm, wings about 3.0mm in length. Arista about 5 branches on dorsally, ventral branches about 4, terminal fork undeveloped. Front mat black, with whitish pruinose below in when viewed from certain angle. Face orange brown, lower half milky white. Clypeus narrow, dark brown. Anterior reclinate orbital bristle about one-half as long as posterior reclinate orbital bristle; proclinate orbital bristle about five-sixth as long as posterior



Fig. 2. *Amiota (Amiota) forficula* n. sp.; a, b. *Amiota (Amiota) falcilis* n. sp.; c, d. *Amiota (Amiota) balaenodentata* n. sp.; e, f.

reclinates. Cheeks orange brown, about one-tenth as broad as the greatest diameter of eye. Palpus orange brown, slender, with several ventral hairs. Vibrissa long but thin.

Mesonotum and scutellum subshining, deep black. Thoracic pleura black. Anterior scutellars divergent. Acrostichal hairs in about ten irregular rows. Halteres white. Sterno-index about 0.9. Abdominal tergites black, anterior segments somewhat yellow, second tergite yellow at middle. Legs yellow. Wings hyaline, veins yellow; Costal-index about 2.1; 4V-index about 2.6; 4C-index about 1.3; 5x-index about 1.2; AC-index about 4.0, C3 fringe ratio 2 : 3.

Cx-index about 0.6.

Periphallidic organs : Genital arch dark brown, interrupted at mid-dorsal line ; heel slightly projected anteriorly ; toe rounded. Anal plate fuscous, oblong. Clasper quadrate, pale yellowish brown, distally with a straight row of about seven or eight long black teeth, with a finger-shaped process below the teeth row, and with a crest of fine bristles discally.

Phallic organs : Lobe of aedeagus and anterior parameres fused basally. Aedeagus black, bill-hook shaped. Anterior parameres black, distally broaden and with a horn-like claw at lateral side, subapically serrated at margin, and with two sensilla. Posterior parameres separated, dorsally to which projected a pair of apically tapering flaps.

Holotype : Male, Koryu Kozan, near Eniwa, Hokkaido ; June 11, 1975 (M. J. Toda).

Paratype : Ten males, Koryu Kozan, near Sapporo, July 10, 1975 (M. J. Toda).

Distribution. Hokkaido, Japan.

Relationships. Closely related to *A. dispina* Okada, 1960, but distinguished from the latter in having bill-hook shaped aedeagus of male genitalia.

***Amiota (Amiota) forficula* Takada, Beppu & Toda, n. sp. (Fig. 2 : a, b)**

Male. Body blackish brown, about 2.7mm, wings about 2.6mm in length. Antennae dark brown, third joint darker and oval. Arista with eight upper and four shorter lower branches, without prominent fork. Palpi brown, slender, with a few ventral hairs. Ocellar triangle and front deep black. Face mat brownish black, lower half milky white. Carina undeveloped. Clypeus deep black. Cheeks narrow, grayish brown, black along insertion of orals. Vibrissa long and thin, other orals fine. Anterior reclinate orbital bristle two-thirds as long as others, twice as apart from posterior reclinate orbital bristle as from proclinate orbital bristle.

Mesonotum and scutellum deep black. Thoracic pleure mat black, with distinct white spots on humerus and below wing base. Humeral one, prominent. Anterior scutellars somewhat divergent ; posterior scutellars convergent. Sterno-index about 0.7. Legs orange brown. Abdominal tergites dark brown. Halteres white. Wings dusky on ^{anterior} upper half, veins brown ; Costal index about 2.0 :

4V-index about 3.0 ; 4C index about 1.7 ; 5x index about 1.7 ; AC-index about 5.0 ; C3 fringe ratio about 7 : 10. Cx-index about 0.7.

Periphalllic organs : Genital arch dark brown, slightly narrowing above, constricted at middorsal line, broad and slightly rounded below. Clasper globular, distally with about five black long teeth in a straight row.

Phallic organs : Aedeagus paired, lanceolate, black. Anterior parameres large, apiculated, black at anterior margin, with six or seven sensilla at subapically. Apodeme of aedeagus fan-shaped. Posterior parameres fused, showing a shape which looks like a chinese character "Yama" (mountain).

Holotype : Male, Namarikawa, near Sapporo, Hokkaido ; July 1, 1977 (K. Beppu).

Distribution. Hokkaido, Japan.

Relationships. Closely related to *A. lanceolata* Okada, 1971, of Japan in having aedeagus lobe and anterior parameres clearly separated, but differs in having much larger anterior parameres and larger costal-index of wings.

✓ ***Amiota (Amiota) balaenodentata* Takada, Beppu & Toda, n. sp. (Fig. 2 ; e, f)**

Amiota sp. 8, Minami, Toda & Beppu, 1979. Reserch report of Exp. Forest., Dept. of Agri., Hokkaido Univ., 36, 2 : 482.

Male. Body blackish brown, about 3.6mm, wings about 3.7mm in length. Arista with about six long branches on dorsally, ventral branches about four, without terminal fork. Front deep black. Face brown, lower half milky white. Carina undeveloped. Clypeus narrow, black medially. Cheeks narrow, black along insertion of orals. Anterior reclinate orbital bristle about three-fifth as long as posterior reclinate orbital bristle and proclinate orbital bristle. Vibrissa long but thin. Palpi brown, elongate and curved upward, setigerous below.

Mesonotum and scutellum mat black. Thoracic pleura black. Humeral region white as usual, with one long humeral. Halteres white. Abdominal tergites mat black ; first and second tergites proximally pale brown. Abdominal sternites dark brown. Wings hyaline, veins yellow ; Costal-index about 2.3 ; 4V-index about 3.0 ; 4C-index about 1.6 ; 5x-index about 1.3 ; AC-index about 4.0 and C3 fringe ratio 1 : 2. Cx-index about 0.7.

Periphalllic organs : Genital arch black, dorsally broad, ventrally rather broadly

truncate. Anal plate black, cocoon shaped, separated from genital arch. Clasper pale brown, broader than long, medianly with a irregular row of about five black thick teeth, distally with a row of five bristles and posterior marginally with a few weak setae.

Phallic organs : Aedeagus black, whale-bone shaped, bifurcated. Anterior parameres paired, black, rod-shaped, subapically with a spine, medially with about five sensilla.

Holotype : Male, Tomakomai, Hokkaido ; Aug. 6, 1977 (M. J. Toda).

Distribution. Hokkaido, Japan.

Relationships. Somewhat resembles *A. lanceolata* Okada, 1971 of Japan in having general characteristics of body, but very differs from it in having whale-bone like aedeagus of male genitalia.

Subfamily Drosophilinae

Genus *Scaptomyza* Hardy, 1849

Subgenus *Scaptomyza* Hardy, 1849

Scaptomyza (Scaptomyza) amplialata Takada, Beppu & Toda, n. sp. (Fig. 3 ; a, b, 5c)

Male and female. Body blackish brown, about 3.0mm, wings about 3.3mm in length. Antennae yellow, arista with about six branches including a large fork, one below. Front orange yellow with a few frontal hairs. Anterior reclinate orbital bristle and proclinate orbital bristle with their bases at about the same level. Anterior reclinates about one-thirds of proclimates and about one-fourth length of posterior reclinate orbital bristle. Ocellar triangle and orbits black. Ocellar bristles parallel. Vibrissa strong, second orals weaker, about one-half as long as vibrissa. Palpi yellow with a few apical setae.

Mesonotum and scutellum blackish brown. Acrostichal hairs in four rows. Humerals two. Halteres white. Abdominal tergites dark brown ; sternites dark brown. Frontal coxae yellow and other legs dark brownish yellow. Wings clear and slender ; Costal-index about 3.0 ; 4C-index about 0.6 ; 5x-index about 1.3 ; AC-index about 2.5. C3 fringe on basal two-fifth.

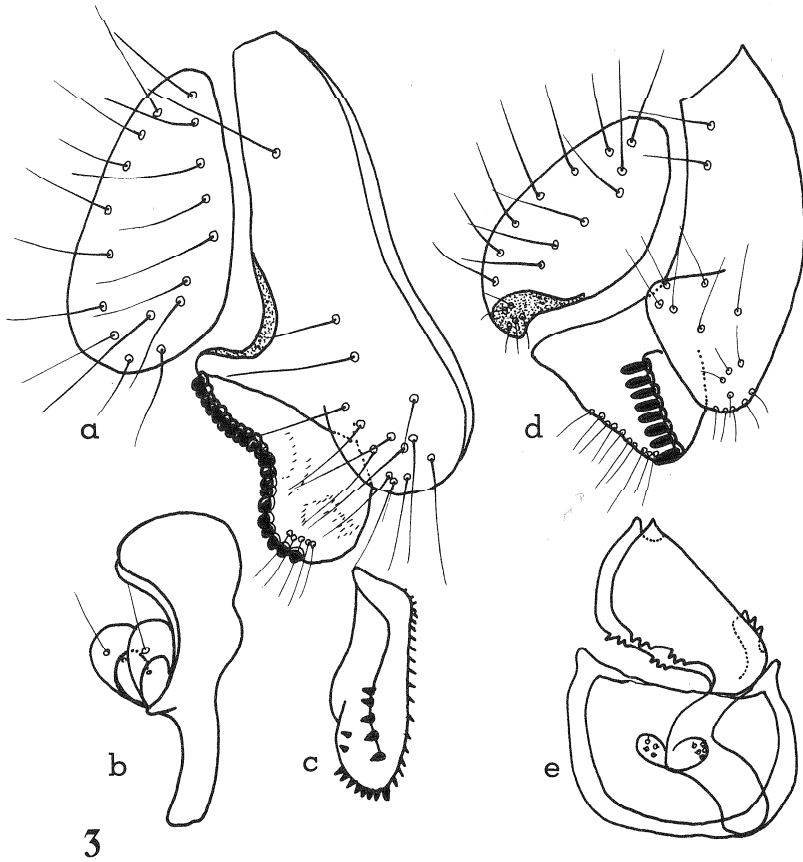


Fig. 3. *Scaptomysza* (*Scaptomysza*) *amplialata* n. sp.; a, peripheral organs. b, phallic organs. c, egg-guide of female. *Nesiodrosophila* *sufflava* n. sp.; d, e.

Peripheral organs : Genital arch dark brown, broad, under margin rounded and with about 10 bristles. Clasper large, dark brown, with about 21 minute primary teeth which are brown and arranged in concave row, occupying distal margin. Anal plate large, dark brown, separated from genital arch, broaden below.

Phallic organs : Aedeagus pale brown, broad and rounded at tip on lateral view, ventral margin bare. Anterior parameres minute, with a apical sensillum. Novasternum pale brown, trapezoid, with a pair of submedian spines.

Egg-guides : Lobe brown, rectangular, and with about 28 marginal and about 7 discal black spines. Basal isthmus short.

Holotype : Male, Misumai, near Sapporo, Hokkaido ; May 5, 1977 (M. J. Toda & Minami).

Allotyp : Female, collected together with holotype.

Paratype : One male, collected together with holotype.

Distribution Hokkaido, Japan.

Relationships. Closely allied to *Scaptomyza* (*Scaptomyza*) *teinoptera* Hackman, 1955. These two species differs, however, from each other in detailed features of the male genitalia.

Genus Nesiodrosophila Wheeler and Takada, 1964

Nesiodrosophila sufflava Takada, Beppu & Toda, n. sp. (Fig. 3 ; d, e)

Drosophila sp. 8, Minami, Toda & Beppu, 1979. Reserch Report of Exp. Forest., Dept. of Agri., Hokkaido Univ., 36, 2 : 488.

Male. Body yellow, about 3.2mm, wings about 3.1mm in length. Eyes obliquely oval. Arista with about four dorsal and two ventral branches and with a large fork. Ocellars long, inserted slightly outside of ocellar triangle. Front tannish yellow, with a few stout frontal hairs. Face yellow. Carina high, tannish yellow. Vibrissa long. Palpi yellow, with a apical seta.

? *thoraciflavum*
Mesonotum and scutellum yellowish gray, with a slightly brown stripe along middorsal line at anterior mesonotum. Acrostichal hairs in six rows, no prescutellars. Halteres yellowish gray. Sterno-index about 0.7. Abdominal tergites yellow, each with narrow brownish posterior bands. Legs yellowish gray. Wings clear, veins yellow ; Costal-index about 3.1 ; 4V-index about 1.5 ; 4C-index about 0.7 ; 5x-index about 1.3 ; AC-index about 2.0. C3 fringe on basal threec-eighth.

Periphallic organs : Genital arch grayish brown, narrow above, broader below; middle and lower portions with about fifteen bristles ; upper portion with two bristles ; under margin strongly convex, toe high and covers clasper. Anal plate fusiform, separated from genital arch ; tip slightly projected. Clasper large, conical, grayish brown, submedially with a row of about seven or eight large

pointed black teeth.

Phallic organs : Aedeagus robust, grayish yellow, apparently bifurcated laterally, ventral margin serrated and quadrate in lateral aspect. Anterior parameres small, elliptical shape, with a few apical sensilla.

Holotype : Male, Tomakomai, Hokkaido ; July 29, 1977 (M. J. Toda & N.

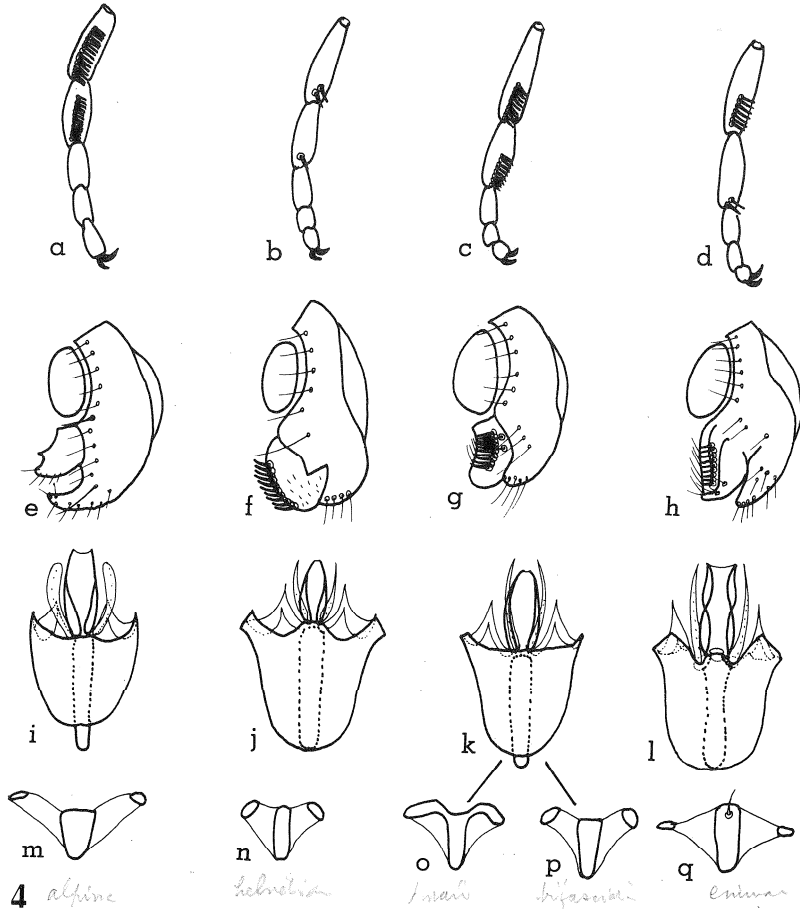


Fig. 4. Male external characteristics of the *obscura* species group in Hokkaido. a-d, sex-combs of male tarsus. e-h, peripheral phallic organs. i-l, ventral aspect of phallic organs. m-q, decasternum (bridge of clasper) of phallic organs. *Drosophila* (Sophophora) *alpina* Burla ; a, e, i & m. *D. (S.) helvetica* Burla , b, f, j & n. *D. (S.) imaii* Moriwaki, Kitagawa & Okada ; c, g, k & o. *D. (S.) bifasciata* Pomini , c, g, k & p. *Drosophila* (Sophophora) *eniwae* n. sp.; d, h, l & q.

Minami).

Distribution. Hokkaido, Japan.

Relationships. Allied to *Nesiodrosophila varidentata* (Okada & Chung), in having rather well developed anterior dorsocentrals, but differs from each other in shape of the male genitalia.

Genus *Drosophila* Fallén, 1823

Subgenus *Sophophora* Sturtevant, 1942

Obscura group Sturtevant, 1942

✓ ***Drosophila (Sophophora) eniuae* Takada, Beppu & Toda, n. sp.**

(Fig. 4 ; d, h, l & q)

Drosophila sp. 2, Beppu, Kaneko, Toda & Kimura, 1977. Seibutsu Kyozaï 12 : 5.

Malc. Body dark brown, about 2.4mm, wings about 2.5mm in length. Front blackish brown and with a few front-orbital setae. Cheeks about two-seventh as broad as the greatest diameter of the eyes. Vibrissa long. Anterior reclinate orbital bristle situated far before to proclinate orbital bristle, about two-fifth proclinate and posterior reclinate, respectively. Arista with about seven branches, including a terminal fork and two below it. Palpi with a apical stout bristle and a few ventral setae.

Mesonotum dark brown, medially with a broad anteriorly narrowing blackish longitudinal stripe, laterally with diffuse dark patches before and behind suture. Scutellum dark brownish black, laterally with dark brown. Pleurum dark brown. Acrostichal hairs in six row ; anterior scutellars parallel. Sterno-index about 0.8. Halteres white. Legs pale yellowish gray ; fore femora dark brown ; first and second fore tarsal joints with black sex-combs, upper comb with about seven teeth and lower comb about one or two teeth. Wings golden tint, veins yellow ; Costal-index about 3.0 ; 4V-index about 2.3 ; 4C-index about 1.0 ; 5x-index about 2.3 ; AC-index about 1.6 ; C3 fringe on basal three-eighth. C1 bristles two. The middle part of distal section of the fifth vein brown. Abdominal tergites dark brown ; sternites slightly brown.

Periphallic organs : Genital arch dark brown, triangular below ; upper portion

with about eleven hairs, lower portion with about sixteen hairs. Primary clasper large, pale brown, with a row of about eight black teeth at middle of its caudal margin, secondary clasper broad with many short but stout bristles. Anal plate fusiform, separated from genital arch. Decasternum brown, rod-like, and distally broad, with a apical hair.

Phallic organs : Aedeagus pale brown, bifid, subapically flattened. Anterior parameres orange brown, equal in size to aedeagus, lanceolate, gently curved and tapering distally, and with a row of about nine or ten sensilla arranged on almost entire length of the parameres, except apical part. Posterior parameres orange brown, pointed at tip, and bilobed below. Novasternum with a pair of short submedian spines. Ventral fragma pale brown, fused to novasternum and bell-shaped. Basal apodeme of aedeagus dark brown. Phallosomal index about 0.7.

Holotype : Male, Koryu Kozan, near Eniwa, Hokkaido ; July 4, 1974 (M. J. Toda).

Distribution. Hokkaido, Japan.

Relationships. Closely related to *D. (S.) imaii* Moriwaki, Kitagawa & Okada, 1967, obscura group, but differs in having one or two teeth of the sex-combs of second fore tarsal joints and anterior parameres equal in size to aedeagus.

Melanogaster group Sturtevant, 1942

The ananassae subgroup Hsu, 1949

κ *D. (Lordiphora)*

nipponica ?

***Drosophila (Sophophora) clarofinis* Lee, 1959 (Fig. 5)**

Drosophila (Sophophora) clarofinis Lee, 1959. Kor. Jour. Zool., 2, 2 : 43-45.

Drosophila clarofinis Lee, 1959. Beppu, Kaneko, Toda & Kimura, 1977. Seibutsu Kyozai 12 : 4.

Male. Body amber, about 2.0mm, wings about 2.3mm in length. Arista with about eight branches including a small fork, two below it. Palpi yellow with a prominent apical bristle. Anterior reclinate orbital bristle fine, about one-thirds proclinate orbital bristle and about one-fifth posterior reclinate orbital bristle. Second oral bristle about half size of vibrissa.

Mesonotum and scutellum amber. Humeral bristles two, upper one shorter. Acrostichal hairs in six rows ; no prescutellar. Halteres white. Sterno-index

about 0.5. Legs yellow. Proximal two joints of fore tarsi of male with sex-combs of about eight and twelve black teeth, respectively. Wings hyaline ; Costal-index about 2.4 ; 4V-index about 1.7 ; 4C-index about 0.9 ; 5x-index about 1.8 ; AC-index about 2.8. C3 fringe on basal four-eleventh.

Abdominal tergites yellow, with brownish black bands interrupted at middle from second to fourth tergites, fifth and sixth tergites with anterior black bands.

Periphallic organs : Genital arch pale yellow, broad, upper portion with about five or six bristles, lower portion with about fifteen stout bristles. Clasper broad and oblong, upper portion rounded ; with about four long and seven short black teeth occupying about half length of lower distal margin, about 10 upright setae on the inner surface of clasper and with three fine hairs on the edge of distal margin. Anal plate pale yellow, separated from genital arch, and protruding at lower tip.

Phallic organs : Aedeagus bifid, apically serrated. A pair of elongated hook-like process present at the lateral sides of aedeagus. Anterior parameres triangular and with about five sensilla at ventral margin. Ventral fragma pale yellow and isosceles triangular. Phallosomal index about 0.5.

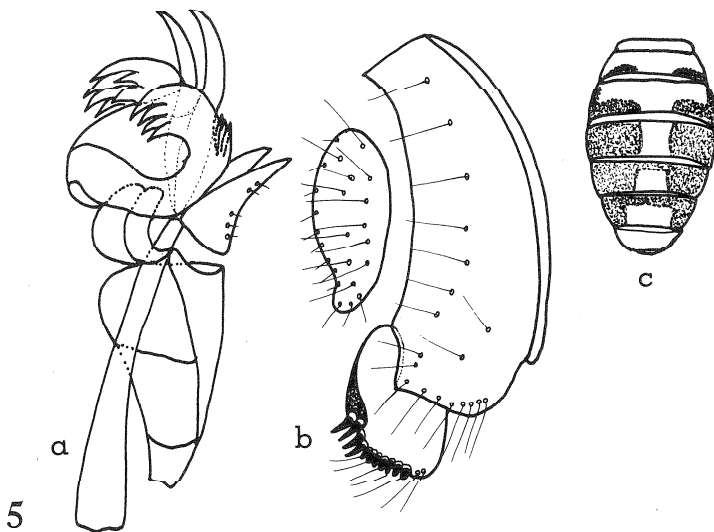


Fig. 5. *Drosophila* (*Sophophora*) *clarofinis* Lee, 1959.

a, lateral aspect of phallic organs. b, periphallic organs. c, abdominal aspect of tergites of male.

Specimen examined : Male, Misumai, near Sapporo, Hokkaido ; June 7, 1975
(M. J. Toda).

Distribution. Korea and Japan (New record)

Remarks. Probably same species to *D. (S.) clarofinis* Lee, 1959 from Korea,
but differs in having fifth and sixth tergites with anterior black bands and about
eight black teeth of upper sex-comb.

Subgenus *Drosophila* Fallén, 1823
Quinaria group Sturtevant, 1942

✓ ***Drosophila (Drosophila) limbata* von Roser, 1840**

Drosophila limbata von Roser, 1840. Duda, O. 1935. Burla, H. 1951. Rev. Suisse
de Zool., 58 : 23-175.

Specimen examined : Male, Ashoro, Hokkaido ; June 1, 1977 (K. Beppu).

Grandis group Okada, 1966

✗ *Zaprionus*

✓ ***Drosophila (Drosophila) flavofasciata* Takada, Beppu & Toda, n. sp. (Fig. 6).**

Male. Body tannish brown, about 4.2 mm, wings about 4.2 mm in length.

Female. Body about 3.7 mm, wings about 3.6 mm in length. Arista with
about four branches above and two below, except a terminal fork. First oral
bristle prominent. Anterior reclinate orbital bristle about three-seventh posterior
reclinate orbital bristle, and about three-fourth proclinate orbital bristle, situated
slightly before from proclinate. One prominent apical bristle on each palpus.
Cheeks yellow, their greatest width about one-fourth diameter of the eyes. Eyes
rather smaller than the other species of subgenus *Drosophila*.

Mesonotum yellowish brown, with dark brownish tridental stripes. Scutel-
lum dark brown. Acrostichal hairs in eight rows ; no prescutellars. Postvertical
bristles and anterior scutellar bristles parallel. Sterno-index about 0.6. Wings

cheeks yellow

fuscous, fifth vein thick and brown, apically thin ; Costal-index about 2.6 ; 4V-index about 1.5 ; 4C-index about 0.8 ; 5x-index about 1.0 ; AC-index about 2.2. C3 fringe on basal seven-ninth. Abdominal tergites dark dull-brown, with yellowish areas on lateral sides of each segments from the second to the sixth tergites.

legs
kallier?

Peripheral organs : Genital arch pale brown, slender ; heel rounded and toe pointed ; upper portion without bristle, lower portion with about fifteen bristles. Anal plate very large, pale brown, with about seventy hairs and separated from the genital arch. Clasper pale brown, with about fifteen black long teeth arranged in a row.

Phallic organs : Aedeagus pale brown, broaden and ventrally curved at distal half, basally bilobed, apically pointed. Anterior parameres large and triangular with many hairs and two apical sensilla. Phallosomal index about 2.7.

Egg guides : Lobes pale yellow, apically curved dorsad, narrowly pointed at tip and with about eight marginal teeth.

Holotype : Male, Otoi-neppu, Hokkaido ; Sept. 29, 1974 (M. T. Kimura & K. Beppu).

Allotype : Female, collected together with holotype.

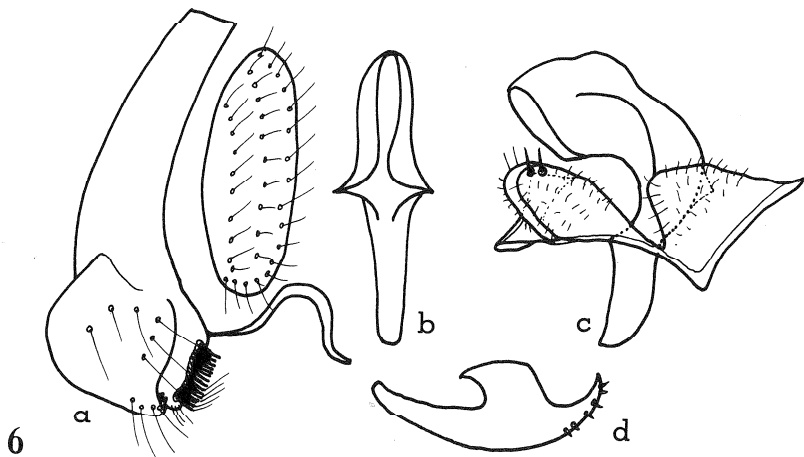


Fig. 6. *Drosophila (Drosophila) flavofasciata* n. sp.

a, periphallitic organs. b, ventral view of aedeagus. c, lateral aspect of phallic organs. d, egg-guide of female.

Paratype : One male, Jozankei, near Sapporo, Hokkaido ; July 18, 1976 (K. Beppu).

Distribution. Hokkaido, Japan.

Relationships. Belongs to the Grandis group, subgenus *Drosophila*. Closely allied to *D. grandis* Kikkawa & Peng, 1938, differing from which in larger costal-index of wings ; without ^{setae} on upper half of the genital arch and shape of aedeagus.

Remarks. Collections were made by the use of small retainer baited with fermenting banana and suspended by strings from the branches of bushes near river side.

Polychaeta group Sturtevant, 1942

Drosophila (Drosophila) quadrisetata Takada, Beppu & Toda, n. sp. (Fig. 7)

Drosophila sp. 3, Beppu, Kaneko, Toda & Kimura, 1977. *Scibutsu Kyozaï* 12 : 5.

Male and female. Body dark dull-brown, about 4.0 mm, wings about 4.3 mm in length. Front and postfront black ; ocellar triangle dark dull-brown, with frontal setae. Cheeks about three-eighth as broad as the greatest diameter of the eyes. Vibrissa long. Carina high. Anterior reclinate orbital bristle situated equal and outside proclinate orbital bristle, about four-fifth proclinate and about two-fifth posterior reclinate orbital bristle. Arista with about five branches, including a terminal fork and one below it. Palpus with numerous setae.

Mesonotum and scutellum dark dull-brown, medially with two blackish dull-brown longitudinal stripes, unreached anteriorly. Anterior scutellars convergent. Acrostichal hairs in six rows, including three pairs of postsutural dorsocentrals at middle. Four pairs of dorsocentral bristles long. Pleurum dark dullbrown. Halteres white. Squama and upper squamal callus with blackish hairs. Sterno-index about 0.7. Legs dark brown. Wings brownish tint, veins brown ; Costal-index about 3.6 ; 4V-index about 1.7 ; 4C-index about 0.7 ; 5x-index about 1.3 ; AC-index about 2.0. C3 fringe on basal five-seventh. Abdominal tergites dark dull-brown.

Periphallic organs : Genital arch narrow, lower portion with about nine bristles, heel not pronounced, being an obtuse angle. Anal plate very large and roundish, with about ten short stout bristles at tip. Clasper with narrow stalk ; pri-

mary teeth about seven ; four fine hairs on upper surface of clasper.

Phallic organs : Aedeagus broaden and ventrally curved at distal half, basally bilobed, dorsally convexed. Anterior parameres small, oval, and without sensillum. Novasternum deeply notched and without submedian spine. Ventral fragma dark brown and quadrate.

Spermathecae of female : Black and small, elongate oval with narrow orifice.

Egg-guides : Lobe yellowish orange. broadly rounded at tip with about six orange teeth including three discal teeth, and with numerous minute spines all over the lower half.

Holotype : Male, Soranuma, near Sapporo, Hokkaido ; June 26, 1976 (K. Beppu), collected on a delta of mountain stream.

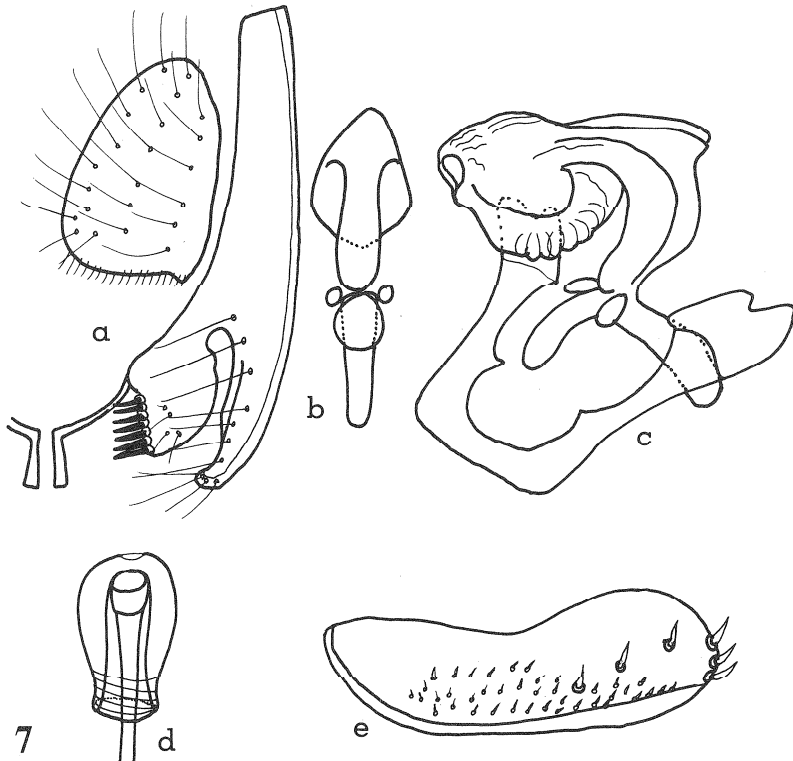


Fig. 7. *Drosophila* (*Drosophila*) *quadrisetata* n. sp.

a, periphallic organs. b, ventral view of phallic organs. c, lateral aspect of phallic organs. d, spermatheca. e, egg-guide.

Allotype : Female, collected together of holotype

Paratype : Male, collected together of holotype.

Distribution. Hokkaido, Japan.

Relationships. Distinguished from other members of the Polychaeta group, subgenus *Drosophila*, by having long vibrissa and four pairs of dorsocentrals. Somewhat resembles the *Robusta* group, in ecological niche and shape of phallic organs, but differs in having peculiar egg-guides and small spermathecae.

Ungrouped Species

***Drosophila calidata* Takada, Beppu & Toda, n. sp. (Fig. 8)**

Drosophila sp. 5, Beppu, Kaneko, Toda & Kimura, 1977. Seibutsu Kyozaï 12 : 6.

Male and female. Body dark dull-brown, about 3.2 mm and wings about 3.0 mm in length. Front blackish brown, with frontal setae, front-orbital setae and ocellar setae. Cheeks about three-tenth as broad as the greatest diameter of the eyes. Vibrissa long. Carina low. Ocellar triangle convexed, ocellar bristles long. Anterior reclinate orbital bristle situated before to proclinate orbital bristle, and about three-fourth proclinate, and about three-seventh posterior reclinate orbital bristle. Arista with about eight branches, including a terminal fork and two below it. Palpi with numerous setae. Eyes reddish brown. 8/4

Mesonotum pale brown, medially with a narrow dark brown longitudinal stripe, unreached anteriorly. Scutellum dark brown. Anterior scutellars divergent. Just above ϕ of the wing base dark brown. Acrostichal hairs in eight rows. Anterior sternopleural setae short. Sterno-index about 0.4. Halteres white. Abdominal tergites dark dull-brown. Legs pale brown. Wings clear, apically slightly pointed ; Costalindex about 2.0 ; 4V-index about 1.8 ; 4C-index about 1.1 ; 5x-index about 1.4 ; ⁴4C-index about 2.5. C3 fringe on basal nine-tenth.

Periphalliac organs : Genital arch pale brown, broad and convex below, lower portion with about twelve bristles ; toe high and pointed, covering a part of clasper and strongly sclerotized ; heel slightly rounded, with a large bristle. Anal plate large, brown and separated from the genital arch. Primary clasper dark brown, with about fourteen long black primary teeth ; outer surface of clasper broad and semispherical.

Phallic organs : Aedeagus broad and straight, with divided tip and rounded at

ventral view. Anterior parameres elliptical, with a few apical sensilla. Ventral fragma quadrate and longer than broad. Phallosomal index about 2.0.

Holotype : Male, Jozankei, near Sapporo, Hokkaido ; Sept. 1, 1976 (K. Beppu).

Allotype : Female, collected together with holotype.

Paratype : Two males, collected together with holotype.

Habitat. Four specimens were collected at a cliff shelter by sweeping among the broken roots of tree.

Distribution. Hokkaido, Japan.

Relationships The affinities of this new species are uncertain but a relationship with the subgenus *Hirtodosophila* seems most likely. To discuss the relationships of species on the basis of only a few organs can be dangerous, but it

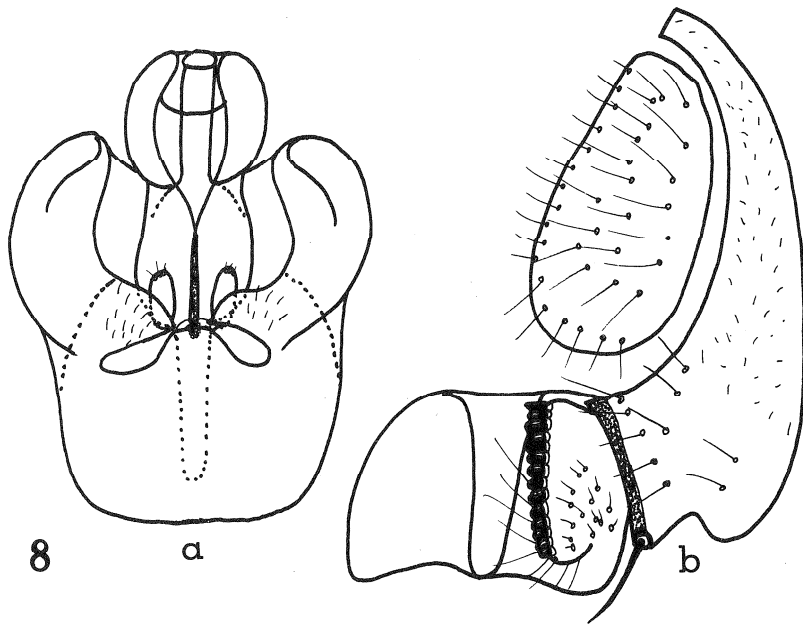


Fig. 8. *Drosophila calidata* n. sp.

a, ventral aspect of phallic organs. b, peripheral phallic organs.

is allowable when one is dealing with the male genitalia which is composed of several morphologically distinct elements.

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