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NEW OR LITTLE KNOWN SPECIES OF DROSOPHILIDAE OF JAPAN (Diptera)

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Five new and two hitherto unrecorded Japanese species of Drosophilidae are reported here. The materials are collected by the late Mr. K. Suzuki (Hokkaido Univ.), Messrs. T. Kikuchi (Tohoku Univ.), T. Kotake (Fukushima Univ.), K. Moriwaki (Tokyo Univ.), S. Toshioka (406th Medical General Laboratory), Y. Nozawa (Nagano Univ.), T. Kanehisa (Naniwa Univ.), and various present and former members of Tokyo Metropolitan University, whose name are given under description of species, except in the case of the present authors' own collection. Types are deposited in the Department of Biology, Tokyo Metropolitan University.

The authors wish to give their sincere thanks to Prof. Dr. D. Moriwaki for his kind direction, and also to those who are kind enough in collecting materials.

Microdrosophila congesta (Zetterstedt, 1847) Fig. 1 B, C, F.

Drosophila congesta Zetterstedt, 1847. Dipt. Scand., 6: 2558.

Duda (1923) referred it to the subgenus *Incisurifrons* of the genus *Drosophila*, and Sturtevant (1927) treated this subgenus as a synonym of the genus *Microdrosophila*. The Japanese form has general features strictly coincident with Duda's redescriptions (1923, 1924, 1935).

Periphallalic organs (Fig. 1 C): Genital arch narrow, pale yellow, lower end curved forward and with a few fine hairs on the upper margin. Claspers absent. Anal plate very large and nearly quadrate, with about 50 black setae, and paler and non-setigerous at lower end.

Phallic organs (Fig. 1 B): Aedeagus very slender, yellow, and with a black ring subapically. Apodeme of aedeagus curved ventrad in U-shape. Parameres seem to be absent. Ventral fragma narrow, proximal end being concaved. Nova-sternum bifid on each lateral side.

Egg-guides (Fig. 1 F): Lobes pale, distally narrowing and gently curved, and with a few setae. Basal isthmus obscure.

Internal structures: Proximal intestine coiled twice. Rectal papillae oblong. Malpighian tubes with common stalks rather short, posterior branches ending free, and anterior branches sometimes swollen subapically. Testis fusiform, not coiled, apically narrowing and curved backward, and basally narrowing to be contiguous to a slender common stalk. Paragonia oblong. Ejaculatory apodeme with long straight stem and oval plate. Spermatheca pale, with tip rounded, and stem swelling elliptically at middle. Parovaria similar to spermathecae in appearance. Ventral receptacle with about 4 semicircular folds.

Egg: Filament single, extraordinarily long, about 4.3 times as long as egg itself.

Puparium: About 2.6 mm. in length. Posterior spiracles closed. Anterior spiracle with about 9 branches, inserted on an S-shaped stalk. Horn-index about 3.0.

Chromosomes: Metaphase plate shows a pair of large V's, a pair of median V's, 2 pairs of rods, and a pair of dots.

Specimens examined: In Tokyo: Kunitachi, Meguro. In Kanagawa Pref.: Ôkurayama (Toda and Okada), Aburatsubo. Futtsu, Chiba Pref. (Toda); Senjôdake, Nagano Pref. (Kitagawa and Ono); Anjô, Aichi Pref. (Nozawa).

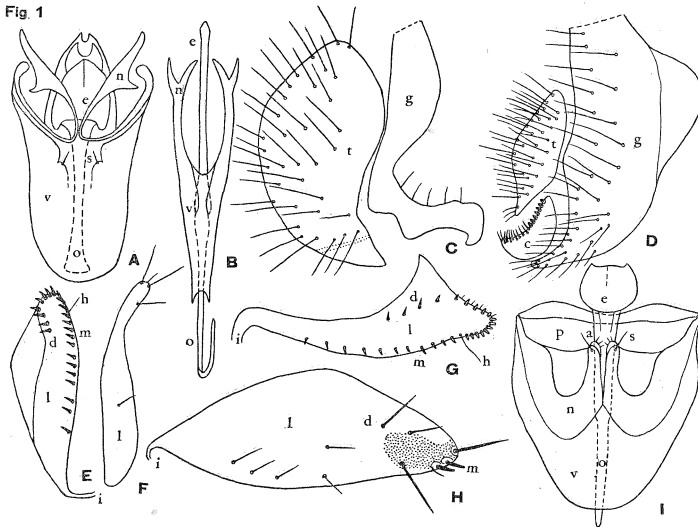


Fig. 1. A. *Parascaptomyza disticha* (Duda), phallic organs; B. *Microdrosophila congesta* (Zetterstedt), phallic organs; C. *ibid.*, periphallic organs; D. *Drosophila (Hirtodrosophila) histrioides* sp. nov., periphallic organs; E. *Drosophila (Drosophila) pengi* sp. nov., egg-guide; F. *Microdrosophila congesta* (Zetterstedt), egg-guide; G. *Drosophila (Hirtodrosophila) histrioides* sp. nov., egg-guide; H. *Parascaptomyza disticha* (Duda), egg-guide; I. *Drosophila (Hirtodrosophila) histrioides* sp. nov., phallic organs. a. anterior paramere; c. clasper; d. discal teeth; e. aedeagus; g. genital arch; h. subterminal hair; i. basal isthmus; l. lobe; m. marginal teeth; n. novasternum; o. basal apodeme of aedeagus; p. posterior paramere; s. submedian spine; t. anal plate; v. ventral fragma.

Habitats: Usually found associated with human dwellings and collected by sweeping, at fruit-traps, or in garbage. An exceptional case of collection shows a large number of flies secured by sweeping at an altitude of 2500 m in Senjôdake. Even in mid-winter, the flies were found hidden under rotten vegetables of sweet potato, at Ôkurayama.

Distribution: Honshu (Kanto, Chubu), Formosa, Java, Europe, New Guinea.

Parascaptomyza disticha (Duda, 1921) Fig. 1 A, H.

Scaptomyza disticha Duda, 1921. Jahrescheft Ver. Schfes. Ins. Breslau, 13: 64.

This species is at various occasions reported under the name *Scaptomyza graminum* (nec Fallén, 1823). Valid name applied here is proposed by Basden (1952) and Collin (1953). *Parascaptomyza* may, however, better be treated as synonymous with *Scaptomyza*, as indicated by Wheeler (1952).

Periphallic organs: As figured and described by Hsu (1949). Decasternum like a broad membranous arch, caudally having a pair of black patches.

Phallic organs (Fig. 1 A): Aedeagus greyish brown, massive, apically bifid, and ventrally with a subbasal and a pair of subapical large black processes. Anterior paramere small, black, and with about 3 apical sensilla. Novasternum brownish black, and medially with a pair of long orange brown ventral processes. Ventral fragma grey, longer than broad, and deeply notched.

Egg-guides (Fig. 1 H): Lobe fusiform, brown, apically with a large black patch and 2 black teeth, and with about 6 marginal and 3 discal bristles. Basal isthmus very short.

Internal structures: Proximal intestine coiled about twice. Rectal papillae elongate. Malpighian tubes with common stalks moderate in length, posterior branches apically apposed to each other. Male and female reproductive organs as described and figured by Patterson (1943).

Egg and puparium: As described by Patterson (1943).

Chromosomes: Metaphase plate shows 2 pairs of V's, a pair of rods, and a pair of dots (agree to the description of Metz, 1916).

Specimens examined: In Hokkaido: Kushiro (Suzuki), Sôunkyô, Asahidake, Sapporo (Suzuki), Hakodate. Azumayama, Fukushima Pref. (Kotake); Sendai (Kikuchi). In Tokyo: Meguro, Setagaya (Moriwaki et al), Kugayama, Kokubunji (Saito), Higashimurayama, Asakawa, Umenokidaira, Kumotoriyama. In Kanagawa Pref.: Noborito, Ôkurayama, Kikuna, Kamakura, Aburatsubo. In Chiba Pref.: Futtso (Toda), Gyôtoku (Toshioka). In Nagano Pref.: Komayu, Chausuyama (Nozawa). Tôjô, Hiroshima Pref.

Habitats: Most of specimens were collected by sweeping, sometimes at light traps (Setagaya, Gyôtoku), or from fungi (Asahidake), but seldom at fruit traps. Even in the coldest season the flies were found among bushes or under fallen leaves, but very rare in midsummer.

Distribution: Hokkaido, Honshu (Tohoku, Kanto, Chubu, Chugoku), Europe, N. America, Africa, Canary Is.

Drosophila (Hirtodrosophila) histrioides sp. nov. Fig. 1 D, G, I.

Drosophila (Hirtodrosophila) sp. like *histrio*, Okada, 1956, Systematic study of Drosophilidae and allied families of Japan: 87.

Male and female: Body about 3.5 mm, yellowish brown, with black abdominal bands. Head yellowish orange. Antenna yellowish orange, arista with about 9 branches including a small fork, 2 below it. Palpus yellowish orange, with about 2 or 3 prominent setae. Eyes bright red, roughly pilose. Lower reclinate orbital about 1/4 proclinate. 2nd oral weak. Ocellar triangle and periorbits orange brown. Front reddish brown, about half as broad as head-width, and with numerous frontal

hairs. Carina somewhat broad, high, and long. Cheek yellowish orange, and about 1/4 the greatest diameter of eye.

Mesonotum and scutellum orange grey. Thoracic pleura darker. 2 humerals, long and subequal in size. Acrostichals in about 8-10 somewhat irregular rows. Anterior dorsocentral less than half the length of posterior one; cross distance of dorsocentrals about thrice the length distance. Sterno-index about 0.6.

Legs yellow; preapicals on hind tibia; apicals on middle. Wings somewhat fuscous; crossveins clear. C-index about 3.3; 4V-index about 1.5; 4C-index about 0.7; 5X-index about 1.2. 1st costal section with 2 long bristles; 3rd costal section with heavy bristles on basal about half.

Abdomen with each tergite yellowish grey, and with a black caudal band, which is narrowly interrupted at middle and often laterally curved forward to reach the anterior margin. Caudal tergites black, especially in male. Abdominal sternites yellowish grey.

Periphallic organs (Fig. 1 D): Genital arch black, broad, slightly paler below, and narrowly projected ventrocaudad; upper portion with about 10 hairs, arranged in 2 rows; lower portion with about 25 hairs. Clasper dark brown, upper corner black, and with about 14 teeth arranged in a concaved row, and also with about 10 hairs. Anal plate separated from genital arch, pale brown, spindle-shaped, and with about 30 hairs. Decasternum with median dark brown longitudinal plate and a pair of large pale brown lateral transverse flaps.

Phallic organs (Fig. 1 I): Aedeagus orange brown, narrow, apically swollen and weakly trilobed. Anterior parameres fused with novasternum, pale brown, and each with about 3 apical sensilla. Posterior paramere is a weak cross-bar, connecting lateral arms of novasternum. Novasternum pale brown, and U-shaped. Ventral fragma triangular and pale grey.

Egg-guides (Fig. 1 G): Lobes pale brown, subapically broadest, apically triangular and obtusely pointed, and with about 23 marginal and about 5 apical black teeth. Basal isthmus broad, but short.

Internal structures: Proximal intestine about thrice coiled. Rectal papillae oblong. Malpighian tubes with short common stalks and comparatively short branches, posterior branches being looped. Testis orange, and with about 2 inner and 2 outer coils. Paragonia twice folded. Ejaculatory bulb slightly bilobed at each proximal and distal end. Ejaculatory apodeme with slender plate and proximally much dilated stem. Spermatheca brown, broader than long. Parovaria with oval tips. Ventral receptacle with about 8 proximal large coils and about 3 distal cross folds.

Egg: About 0.5 mm. Filaments 4, slender, and slightly shorter than egg itself (about 0.3 mm).

Puparium: Dark brown, about 3.7 mm in length. Posterior spiracles longer and broad, and divergent. Anterior spiracle with about 15 branches, and with stalk long and slightly arcuated outward and backward. Horn-index about 2.8.

Chromosomes: Metaphase plate shows a pair of large rods, 4 pairs of small rods, and a pair of dots.

Holotype: Male, Asakawa, Tokyo, 27 V '52 (Ohba).

Allotype: Female, Kumotoriyama, Tokyo, 2 VI '52 (Okada).

Paratypes: 19 males and 3 females, Kumotoriyama, Tokyo, 1-3 VI '52 (Okada);

1 male, Asakawa, Tokyo, 27 V '52 (Ohba); 2 females, Hakamoriyama, Iwate Pref., 7-11 X '52 (Okada).

Other specimens examined: In Hokkaido: Akkeshi (Moriwaki et al), Tōbetsu, Nakashibetsu (Okada & Kanehisa), Nishitappu (K. Moriwaki), Asahidake, Nopporo (Ohba), Imagane (Suzuki), Sapporo. In Aomori Pref.: Sukayu, Towada (Yoshida), Kinugawa, Tochigi Pref. (Moriwaki & Yoshida).

Habitats: Frequently attracted at fruit traps and fungi.

Distribution: Hokkaido, Honshu (Tohoku, Kanto).

Relationships: Somewhat resembles *D. (Drosophila) histrio* Meigen, but differs from which in having no eminent preapicals on fore tibiae, larger 5X-index, smaller C-index, and clear crossveins.

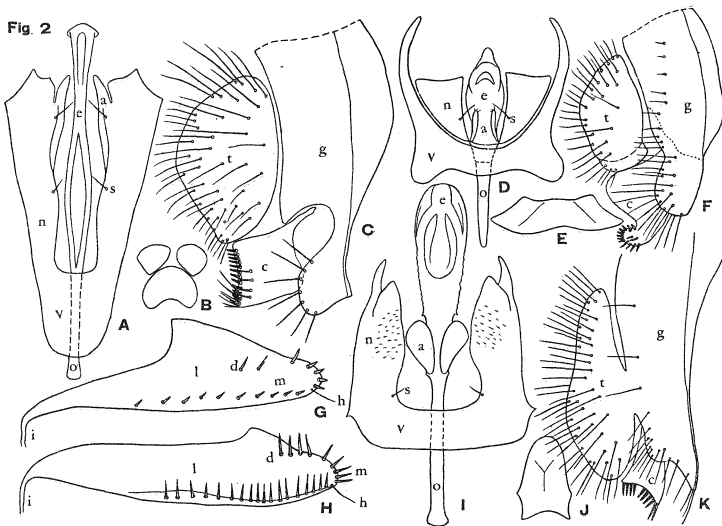


Fig. 2. A. *Drosophila (Drosophila) sternopleuralis* sp. nov., phallic organs; B. *ibid.*, decasternum; C. *ibid.*, peripheral phallic organs; D. *D. (D.) curviceps* sp. nov., phallic organs; E. *ibid.*, male decasternum; F. *ibid.*, peripheral phallic organs; G. *D. (D.) sternopleuralis* sp. nov., egg-guide; H. *D. (D.) moriwakii* sp. nov., egg-guide; I. *ibid.*, phallic organs; J. *ibid.*, male decasternum; K. *ibid.*, peripheral phallic organs. a-v. same as in Fig. 1.

***Drosophila (Drosophila) sternopleuralis* sp. nov. Fig. A-C, G.**

Drosophila (Drosophila) sp. of *quinaria* section, Okada, 1956, l. c. : 137.

Male and female: Body yellowish brown, about 3 mm in length. Antenna yellowish brown. Arista with about 9 branches including a large fork, 2 below it. Palpus with a few prominent bristles. Eyes bright red and with piles. Carina narrow and high. Front about half as broad as head-width. Cheek pale yellowish brown, about 1/5 as broad as the greatest diameter of eye. Lower reclinate orbital about 1/3 upper reclinate. Second oral as long as vibrissa.

Mesonotum yellowish brown. Scutellum brown. Thoracic pleura with 3 obscurely

demarcated dark brown longitudinal stripes. Humerals 2, subequal. Acrostichals in 8 rows. Cross distance of dorsocentrals nearly equal to the length distance. Anterior scutellars divergent. Sterno-index about 0.5. The third sternopleural, as long as posterior one, is located just anterior to posterior one.

Legs greyish yellow. Preapicals on all three tibiae; apicals on middle. Wings hyaline. Posterior crossveins slightly clouded. C-index about 4.0; 4V-index about 1.6; 4C-index about 0.6; 5X-index about 1.2. First costal section with 2 long apical bristles. Third costal section with heavy bristles on basal about half.

Abdominal tergites yellow, with black medially interrupted narrow caudal band on each tergite. The band is laterally curved forward to reach anterior margin.

Periphallic organs (Fig. 2 B, C): Genital arch black, narrowing below and truncate at tip; posterior margin deeply concaved at the insertion of clasper; upper margin bare; lower margin rounded and with about 8 stout setae. Clasper quadrate, distally with about 10 black teeth arranged in a straight row on the entire length of posterior margin. Secondary teeth about 4. Anal plate oval, black, separated from genital arch, and with about 45 hairs. Decasternum with median piece semicircular, lateral piece oval.

Phallic organs (Fig. 2 A): Aedeagus orange, long and straight, apically slightly broaden and triangular, and basally apparently bifid. Anterior paramere entirely fused with novasternum, and with a prominent sensillum. Novasternum with stout but short submedian spines. Ventral fragma much longer than broad, quadrate at tip, and with median notch quite deep.

Egg-guides (Fig. 2 G): Lobe dark yellowish orange, pointed at tip, and with about 17 marginal and 3 discal yellowish orange teeth, discal ones being longer than marginal ones. Basal isthmus short.

Internal structures: Proximal intestine about thrice coiled. Rectal papillae oblong. Malpighian tubes with common stalks short; posterior branches contiguous with each other at tips. Testis with about 2 inner and 2 outer coils. Paragonia once folded. Ejaculatory bulb oval, with 2 long coeca, about 5 times as long as the bulb. Ejaculatory apodeme with plate ovoid, pale yellow, and stem darker. Spermatheca dark brown and globular. Parovaria vase-shaped at tip. Ventral receptacle with about 6 small coils.

Chromosomes: Metaphase plate shows 4 pairs of rods.

Holotype: Male, Asakawa, Tokyo, 4 V '51 (Moriwaki et al).

Allotopotype: Female, collected together with holotype.

Paratopotypes: 39 males and 50 females, collected together with holotype.

Other specimens examined: In Tokyo: Setagaya, Meguro (Ohba and Okada), Asakawa (Ohba and Okada); Kumotoriyama. Aburatsubo, Kanagawa Pref.; Nishikomagatake, Nagano Pref.; Anjō, Aichi Pref. (Nozawa); Susaki, Kōchi Pref.; Asozan, Kumamoto Pref.; Kujūzan, Ōita Pref.

Habitats: Mountains and plains. Collected by sweeping as well as at fruit traps.

Distribution: Honshu (Kanto, Chubu), Shikoku, Kyushu.

Relationships: Characteristic in having 3 long sternopleurals, middle one being longer than anterior one. The same feature is also seen in *D. fenestrarum*

Fallén, and its allies: *D. forcipata* Collin and *D. acuminata* Collin, from Europe. These three species are, however, easily distinguished from the present species in having ac in 6 or less rows. Resembles *D. (D.) histrio* Meigen especially in the structures of genitalia, but differs from it in having smaller body, larger posterior reclinate orbital, and different manner of abdominal patches. Also allied to *D. macularis* Villeneuve, from Europe, but differs in the size of sternopleurals. *D. trisetata* de Meijère, from Java, has also 3 long sternopleurals, but the body is much smaller, crossveins clear, and abdominal bands not interrupted at middle. Belongs to the *quinaria* section of the subgenus *Drosophila*.

***Drosophila (Drosophila) curviceps* sp. nov.** Fig. 2 D-F.

Drosophila (Drosophila) sp. of *immigrans* group, Okada, 1956, l. c. : 148.

Male and female: Body dark brown, about 4-4.5 mm. Antenna yellow. Arista with about 7-8 branches including a large fork, one below it. Eyes dark red, with sparse reddish piles. Palpus yellow, with a few prominent bristles. Lower reclinate orbital about 2/5 as long as proclinate. Second oral variable in size, 1/5-4/5 vibrissa. Ocellar triangle black. Face yellow. Carina short, broad, and slightly sulcate. Front yellowish orange. Cheek orange, about 1/5 as broad as the greatest diameter of eye.

Mesonotum black, with 5 longitudinal yellowish brown obscurely demarcated stripes. Scutellum black, yellowish brown at lateral and posterior margins. Pleura dark brown, with 2 obscure black longitudinal stripes. Humeral 2. Humerus yellowish orange. Acrostichals in 6 rows. Cross distance of dorsocentrals about thrice the length distance. Anterior scut slightly divergent. Sterno-index about 0.6.

Legs yellowish brown; first and second fore tarsal joints in male with ventral hair tafts. Fore femur with a row of about 11 small black teeth on the apical half of inner surface. Preapicals on all three tibiae; apicals on fore and middle. Wings clear; posterior crossveins slightly clouded. C-index about 3.9; 4V-index about 1.7; 4C-index about 0.7; 5X-index about 1.1. First costal section with 2 long apical bristles; third costal section with heavy bristles on basal 1/3-1/4. Halteres white.

Abdomen black, with non-interrupted paler basal band on each tergites.

Periphallallic organs (Fig. 2 E, F): Genital arch black, lower half yellowish orange, and truncate at tip; upper portion with about 8 setae; lower portion with about 20 hairs. Clasper yellow, broad, ventrally narrowing and curved upward. The curved lower tip with about 8 black teeth, arranged in a convexed row. Anal plate separated from genital arch, black, oval, and with about 40 hairs. Decasternum narrow and trapezoidal, and with upper and lower margins concaved.

Phallic organs (Fig. 2 D): Figured by Okada (1955, Kontyū, 23:98, under the name of *Drosophila (Drosophila)* sp., *immigrans* group I). Aedeagus orange yellow, long fusiform in ventral view, thin and gently curved downward in lateral view; with one-jointed elliptical posterior-paramere-like flap at middle of dorsal surface. Anterior paramere short, separated from novasternum, and without sensilla. Novasternum broad, divided into 2 lateral plates, each plate being triangular and provided with a short submedian spine. Ventral fragma quadrate, just as broad.

Egg-guides: Lobe yellowish orange; upper margin much convexed beyond middle, and apically pointed; marginal teeth about 19 and discal teeth 4, all being brownish. Basal isthmus short and black.

Internal structures: Proximal intestine with about 2 coils. Rectal papillae elongate oval. Malpighian tubes with common stalks short, posterior branches completely looped. Testis bright yellow, with about 3 inner and 1.5 outer coils. Seminal vesicle narrow. Paragonia slender, folded about 1.5 times. Ejaculatory bulb elongate oval, with 4 or 5 long coeca nearly as long as bulb itself. Ejaculatory apodeme with plate elongate fusiform, proximally truncate, and with stem short. Spermatheca subspherical and pale brown. Parovaria with fusiform knobs. Ventral receptacle loosely coiled about 10 times.

Egg: About 1.5 mm in length. Filaments 4, slender and tapering apically, nearly as long as egg itself.

Puparium: Dark brown, about 3.5 mm in length. Posterior spiracles about twice as long as broad and distally closed. Anterior spiracle with about 10 short branches, inserted on short and straight stem.

Chromosomes: Metaphase plate shows a pair of V's, 2 pairs of rods, and a pair of J's.

Holotype: Male, Setagaya, Tokyo, 21 V '51 (Okada).

Allotopotype: Female, collected together with holotype.

Paratypes: 9 males and 24 females, Yatsugatake, Nagono Pref. (Kurokawa).

Other specimens examined: In Tokyo Setagaya, Suginami (Ohnishi), Meguro, Asakawa (Moriwaki et al), Kotaira (Saito), Kumotoriyama (Moriwaki et al); Hakone, Kanagawa Pref. (Toda); Hôshionsen, Gumma Pref. (Matsudaira); Shinkazawa, Gumma Pref. (Toda); Niihama, Chiba Pref. (Toshioka); Gyôtoku, Chiba Pref. (Toshioka). In Nagano Pref.: Hoppo (Ohnishi), Senjôdake (Kitagawa and Ono), Yatsugatake (Kurokawa), Tadeshina, Norikuradake (Nozawa); Kujûsan, Ôita Pref.

Habitats: Inhabiting high or low woodlands. Easily attracted at fruit-traps; often collected on breeding trees and fungi, or, more rarely, by sweeping and from garbage as well as at light-traps. Prevalent in both warmer and colder seasons.

Distribution: Honshu (Tohoku, Kanto, Chubu), Kyushu.

Relationships: Belongs to the *immigrans* species-group, differs, however, from the majority of the known members of the group in having dark brown coloration, obscurely striped mesonotum, and non-annulated legs.

***Drosophila (Drosophila) moriwakii* sp. nov.** Fig. 2 H-K.

Drosophila (Drosophila) sp. of *robusta* group, II, Okada, 1956, l. c. : 159.

Male and female: Body brownish black, large species with body-length about 4.5 mm. Antenna dark brown. Arista with about 9-11 branches including a moderate fork, 2 below it. Eyes dark red, with short black piles. Ocellar triangle marginally black. Periorbits with a row of minute bristles in front of proclinate orbital. Carina distinctly sulcate. Front dark velvety orange brown, about half as broad as head-width, and with scattered frontal hairs. Cheek broad, dark yellowish brown, about 3/7 as broad as the greatest diameter of eye. Lower reclinate orbital about 1/3 upper reclinate orbital, and half proclinate. Second oral weak, about 1/3 or half vibrissa. Palpus brown, with a few stout long black setae.

Mesonotum mat brownish black, with black median longitudinal stripe which is bifurcated distally, and black lateral longitudinal stripe outside to each dorso-central-line and interrupted at suture. Moreover, mesonotum is irregularly spotted with dark clouds, covering bases of bristles and hairs. Scutellum pale brownish yellow, sharply defined, and with anterior scutellars slightly convergent. Thoracic pleura black and pollinose. Humerals 2, subequal and strong. Acrostichals in 6 rows. Cross distance of dorsocentrals about $9/5$ the length distance. Sterno-index about 0.7.

Legs dark brownish black; femora, coxae, and ultimate tarsal joints darker. Preapicals on all three tibiae; apicals on middle. Wings slightly fuscous; veins yellowish brown. Posterior crossveins slightly clouded. C-index about 3.5; 4V-index about 1.5; 4C-index about 0.7; 5X-index about 1.2. First costal section with 2 large apical bristles. Third costal section with heavy bristles on basal $2/3$. Halteres greyish white.

Abdominal tergites glossy black, caudal margin and median longitudinal line of each tergite yellowish brown. Sternites brown, large, and quadrate.

Periphallalic organs (Fig. 2 J, K): Genital arch dark yellowish brown, paler below; upper margin with about 3 hairs; lower margin convexed at the base of clasper, and with about 15 hairs; lower tip narrowly pointed; anterior margin straight. Clasper yellowish brown, quadrate, upper margin concaved; primary teeth black, about 9, arranged in a concaved row. Anal plate large fusiform, dark greyish brown, fused with genital arch for a short distance, and with about 50 hairs. Decasternum pale orange brown, medially black, broad quadrate, and deeply forked at tip.

Phallic organs (Fig. 2 I): Aedeagus black, ventral half paler, fusiform in side view, and minutely serrated at almost entire length of dorsal margin. Anterior paramere small, separated from novasternum, and distally with sensilla and pubescent. Novasternum divided into paired lateral pieces, yellowish brown, medially pubescent, and with small submedian spines. Ventral fragma quadrate, dark brown, and with black lateral claws.

Egg-guides (Fig. 2 H): Lobe orange brown, narrow, obtusely pointed, and with about 22 marginal and 3 discal pointed orange brown teeth. Basal isthmus narrow and rather short.

Internal structures: Proximal intestine folded about thrice. Rectal papillae oval. Malpighian tubes with common stalks very long; branches short or sometimes single, ending free. Testis reddish orange, with about 4 inner and 4 outer coils. Seminal vesicle very slender. Paragonia folded about twice. Ejaculatory bulb oval, with 4 short sinuated coeca which are slightly longer than bulb. Ejaculatory apodeme with quadrate plate and distally dilated stem, the latter being darker and longer than the former. Spermatheca dark brown, ovoid, basally narrowing slightly and with transverse wrinkles. Parovaria with head elliptical. Ventral receptacle with about 10 loose coils.

Chromosomes: Metaphase plate shows a pair of large V's, 2 pairs of median V's, 2 pairs of rods and a pair of dots.

Holotype: Male, Akkeshi, Hokkaido, 12 VIII '51 (Moriwaki et al).

Allotopotype: Female, collected together with holotype.

Paratypes: 1 male and 1 female, Kumotoriyama, 15 VII '53 (Okada et al); 9 males and 2 females, Sounkyo, Hokkaido, 6-14 VIII '53 (Okada).

Other specimens examined: In Hokkaido: Akkeshi (Moriwaki et al), Aizankei (Ohba); Kumotoriyama, Tokyo (Kurokawa et al); Taishakukyo, Hiroshima Pref.

Habitats: Inhabits deep mountains. Attracted at fruit-traps as well as bleeding trees.

Distribution: Hokkaido, Honshu (Kanto, Chugoku).

Relationships: Belongs to the *robusta* species-group. Resembles *D. (D.) colorata* Walker, from N. America especially in having distinctly sulcate carina, but differs from which in the shape of genital arch, which is narrowly pointed below (rounded in the allied species).

Remarks: Chromosomal configuration of the present species was thoroughly studied by Momma (1954), under the name of "*Drosophila* sp. belonging to the *robusta* group". The result he obtained slightly differs, however, from what is reported herein.

***Drosophila (Drosophila) pengi* sp. nov. Fig. 1 E.**

This species was tentatively referred by Kikkawa & Peng (1938) to *Drosophila melanissima* Sturtevant. The present authors agree with Sturtevant (1942) to treat them as different species.

Male and female: General features as described by Kikkawa & Peng (1938) under the name mentioned above.

Periphallic organs: Genital arch brownish black, obliquely truncate below; upper portion bare; lower portion with about 10 hairs. Clasper grey, quadrate, and with about 10 black teeth arranged in a slightly concave row. Anal plate broad below, brownish black, and with about 40 hairs. Decasternum pale, oval, and with distal margin deeply concave.

Phallic organs: Aedeagus apparently bifid, pale brown, and broadly rhombic in lateral view; dorsal margin medially black and with a few serrations. Anterior paramere short and rod-like, dark brown, and separated from decasternum, which is deeply and widely notched, and with a pair of short submedian spines on the inner surface. Ventral fragma weakly quadrate and pale brown.

Egg-guides (Fig. 1 E): Lobe orange yellow, narrow and obliquely truncate at tip, and with about 25-31 marginal and 3 discal long pointed teeth, ultimate marginal one being longest. Basal isthmus narrow and short.

Internal structures: Proximal intestine coiled about thrice. Rectal papillae elongate. Malpighian tubes with common stalks rather short, and posterior branches apically fused to each other. Testis yellow or yellowish orange, and with about 3 inner and 4 outer coils. Seminal vesicle very narrow and long. Paragonia folded about twice. Ejaculatory bulb oval, bilobed distally, but without coeca. Ejaculatory apodeme with pale brown broad triangular plate, and with stem as long as plate. Spermatheca pale brown, oval, basally not narrowing. Parovaria usually as large as spermatheca. Ventral receptacle with about 20-25 rather kinky coils.

Egg: Filaments 2, long, and slightly thick beyond middle. Presence of 2 filaments is reported by Kikkawa & Peng (1938).

Puparium: Dark brown, about 3.5 mm. Posterior spiracles closed, as reported

by Kikkawa & Peng (1938), and about twice as long as broad. Anterior spiracle with stem straight, and with about 10 short branches. Horn-index about 23.0.

Chromosomes: Metaphase plate shows a pair of large V's, a pair of small V's, 2 pairs of rods, and a pair of dots. The configuration is same as shown by Kikkawa & Peng (1938).

Holotype: Male, Suginami, Tokyo, 30 VII '51 (Ohnishi).

Allotopotype: Female, 27 VII '51 (Ohnishi).

Paratypes: 1 male, Suginami, 25 VII '51 (Ohnishi); 1 female, Setagaya, Tokyo, 24 VII '51; 1 female, Akkeshi, Hokkaido, 15 VIII '51.

Other specimens examined: Daimonjiyama, Kyoto Pref. (Ôshima); Asakawa, Tokyo (Ohba).

Habitats: Feeding on tree-bloods.

Distribution: Hokkaido, Honshu (Kanto, Kinki). Kikkawa & Peng (1938) reported it from Kyoto and Kobe.

Relationships: Closely allied to *D. (D.) melanissima* Sturtevant, from N. America, but differs from which in having 2 egg-filaments (4 in the latter), longer lower reclinate orbital, and broader cheek. Difference from original description of Kikkawa & Peng (1938); C-index much larger, 2.8-3.9 (2.2 in original). It also resembles *D. (D.) melanica* Sturtevant, from N. America, but differs from which in having no coeca of ejaculatory bulb.

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