

Taxonomy, and Geographical Distribution of
Drosophilidae (Diptera) in Korea

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C o n t e n t s

	Page
I. Introduction.....	(426)
II. Collection of materials.....	(427)
III. Key to the Korean species of Drosophilidae.....	(429)
IV. Species descriptions.....	(433)
V. Geographical distribution and feeding habits.....	(443)
VI. A list of species of Drosophilidae in Korea.....	(452)
VII. Summary.....	(455)
VIII. Acknowledgements.....	(455)
IX. References.....	(456)

I. Introduction

During recent years, investigations into the taxonomical, distributional and ecological features of Drosophilidae have made striking progress in various countries. Such studies have resulted in a considerable accumulation of data contributing to the Biology of *Drosophila* on the basis of population genetics and taxonomy.

Until quite recently, the knowledge concerning the drosophilid fauna in Korea has, until 1940, consisted of records of several species of *Drosophila* which were reported by Kikkawa and Peng (1938), and Nakayama and Okamoto (1940).

Since 1955, however, a drosophilid survey in Korea has attracted the attentions of taxonomists and geneticists, and repeated surveys have been carried out by Chung (1955, 1958, 1960), Chung et al (1956), Makino et al (1957), Paik and Kim (1957), Takada and Lee (1958), Paik (1958), Kang et al (1958, 1959, 1960), Lee and Takada (1959), Chung and Rho (1959), Lee (1959, 1962), Okada and Chung (1960), Okada and Lee (1961), Kang and Lee (1962), and Kim (1963). As the result of studying the above records, approximately 80 species of Drosophilidae occurred in Korea and were known to us. They are as follows;

Stegana kanoi, *Aniota alboguttata*, *A. alboguttata*, *forma koreana*, *A. variegata*, *Leucophenga argentosa*, *L. concilia*, *L. maculata*, *L. magnipalpis*, *L. ornatipennis*, *L. quadripunctata*, *L. quinque-maculata*, *L. quinque-maculipennis*, *Microdrosophila congesta*, *M. purpurata*, *Mycodrosophila basalis*, *M. japonica*, *M. koreana*, *M. palmata*, *M. poecilogastra*, *M. shikokuana*, *M. splendida*, *M. takachihonis*, *Liodrosophila aerea*, *L. castanea*, *Scaptomyza apicalis*, *S. graninum*, *S. polygonia*, *S. pallida*, *Drosophila raridentata*, *D. alboralis*, *D. histrioides*, *D. kangi*, *D. macromaculata*, *D. nokogiri*, *D. quadrivittata*, *D. sexvittata*, *D. trilineata*, *D. trivittata*, *D. busckii*, *D. coracina*, *D. puncticeps*, *D. rufifrons*, *D. bifasciata*, *D. helvetica*, *D. sukukii*, *D. unipectinata*, *D. lutea*, *D. takahashii*, *D. melanogaster*, *D. simulans*, *D. ficusphila*, *D. clarofinis*, *D. nipponica*, *D. magnipectinata*, *D. kikkawai*, *D. auraria*, *D. rufa*, *D. brachynephros*, *D. angularis*, *D. unispina*, *D. nigromaculata*, *D. kuntzei*, *D. testacea*, *D. bizonata*, *D. makinoi*, *D. sternopleuralis*, *D. histrio*, *D. grandis*, *D. temicauda*, *D. immigrans*, *D. curviceps*, *D. virgata*, *D. subtilis*, *D. pengi*, *D. virilis*, *D. daruma*, *D. sordidula*, *D. lacertosa*, *D. cheda* and *D. repleta*.

The author continued the collection of drosophilid flies during a period ranging from September 1956 to November 1963.

The present study is the result of collections of 8 years which were made in Korea.

Abbreviations used in the text are as explained below. *or*, oral bristle; *or*₁, first oral bristle or vibrissa; *or*₂, second oral bristle; *orb*, orbital bristle; *orb*₁, first or upper reclinate orbital bristle; *orb*₂, second or lower reclinate orbital bristle; *orb*₃, third or proclinate

orbital bristle; Sterno-index, the length of anterior sternopleural divided by the length of posterior sternopleural bristle; Costal index, the length of second section of the costal vein divided by the length of its third section; 4v-index, the length of fourth (distal) section of the fourth vein divided by the length of its third section; 4c-index, the length of third section of the costal vein divided by the length of third section of the fourth vein; 5x-index, the length of third (distal) section of the fifth vein divided by the length of the posterior crossvein; C 3-bristles, heavy bristles inserted on the proximal portion of the 3rd costal section; the range of C 3-bristles means a ratio between the length of the 3rd costal section with heavy bristles and the total length of the same section; T, abdominal tergite; 1 T, first abdominal tergite; Phallosomal index (PI), the length of aedeagus divided by the length of its basal apodeme.

II. Collection of materials

The collections of drosophilid flies were made at 54 localities of Korea during a period ranging from September 1956 to November 1963.

Localities and dates of collections are as mentioned in Table 1. Where the names of localities appeared in latitudinal order from South to North.

The major part of the collections was made by using large trap cans (30 cm high by 28 cm diam) which were baited with fermenting tomatoes, peaches and apples, and also was made by net sweeping in various sorts of vegetation.

The methods used for demonstrating genital structure are simple. The fly was dissected in *Drosophila* Ringer's solution, and the terminal segments of abdomen were boiled in 10% sodium hydroxide. This was done by transferring the genitalia to a drop of creosote, after clearing in a drop of phenol. The low powers of binocular dissection microscope were generally adequate, both for dissection and for observation of structure. All the drawings were made with the aid of an Abbe camera lucida.

Table 1. Localities and Dates of Collections

Localities	Dates
1. Quelpart Is.	Aug. '58, Aug. '59, Aug. '63
2. Yeosu	July '62, Aug. '63
3. Hampyong	Aug. '59
4. Mt. Bulkap	Aug. '59
5. Masan	Oct. '58
6. Mt. Chiri	Aug. '59, July '60

7. Namwon	July '59
8. Milyang	July, Aug. '58, Aug., Sept. '59
9. Mt. Naejang	Aug. '58, Aug. '59
10. Jeongeup	Aug. '58
11. Seonyu Is.	Aug. '59
12. Mt. Deokyu	Aug. '59, July '60
13. Muju	Aug., Sept., Oct. '58, July, Aug., Sept. '59, June–Nov. '60, Aug. '62
14. Mt. Palkong	July '60
15. Keumsan	Sept. '58
16. Mt. Daedun	Aug. '59
17. Kimcheon	Aug. '63
18. Yeongdong	July, Aug., Sept. '61
19. Nonsan	Aug. '59
20. Buyeo	July, Aug. '58, Aug., Sept. '59
21. Okcheon	July '59, Aug. '63
22. Daejeon	Aug. '58, Aug. '59, July '61
23. Sapsi Is.	Aug. '59
24. Mt. Kyelyong	May, Aug. '57, May–Nov. '58, June–Oct. '59, July, Aug., Sept., Oct. '60
25. Daecheon	Aug. '58, Aug., Sept. '59
26. Boryong	Sept. '58
27. Mt. Chilkap	Sept. '58, Aug. '59
28. Sangju	Aug. '58
29. Kongju	Sept., Oct., Nov. '56, Apr.–Nov. '57, Apr.–Nov. '58, May–Oct. '59, June–Oct. '60
30. Mt. Sokli	Oct. '57, Aug. '58, July '59, May, July '60
31. Hongseong	July, Aug. '59
32. Cheongju	Sept. '58
33. Yesan	July '58, Aug. '63
34. Munkyeong	Aug. '58
35. Mt. Undal	July '60
36. Seosan	Sept. '58
37. Asan	Sept., Oct. '58, Oct. '59
38. Mt. Baekma	Sept. '58
39. Jincheon	Aug. '59
40. Dangjin	Aug., Sept. '59
41. Anseong	Sept. '58, Aug. '63
42. Hambak	July '63

Key to Korean species of the genus *Leucophenga*

1. Carina flat. Arista with dorsal rays only *L. (Trichiaspiphenga) argentosa* Okada.
Carina developed. Arista with both dorsal and ventral rays 2
2. Arista with numerous ventral rays *L. (Leucophenga)* sp. from Mt. Jukyeop.
Arista with few ventral rays 3
3. Wings without distinct black markings 4
Wings with distinct black markings 7
4. Palpi black or dark brown 5
Palpi yellowish 6
5. Abdominal spots confluent with the black bands on 3-5 tergites. *L. (L.) concilia* Okada (part).
Abdominal spots separated from each other *L. (L.) magnipalpis* Duda.
6. Knee-joints of the middle and hind legs not black *L. (L.) maculata* (Dufour).
Knee-joints of the middle and hind legs black. 3-5 tergites with distal black bands laterally broaden to reach the anterior margins *L. (L.) concilia* Okada (part).
7. Wings with black spots at the tip of radius₄₊₅ *L. (L.) quinquemaculata* Strobl.
Black spot at the tip of radius₂₊₃ extending below to reach radius₄₊₅
..... *L. (L.) ornata* Wheeler.

Key to Korean species of the genus *Microdrosophila*

1. Distal costal incision exceedingly deep, about 1/4 or more as deep as the length of the first costal section between the two costal breakages *M. (Oxystyloptera) matsudairai* Okada.
Distal costal incision not exceedingly deep, about 1/5 or less as deep as the length of the first costal section 2
2. Mesopleuron with a distinct black longitudinal stripe... *M. (Microdrosophila) purpurata* Okada.
Mesopleuron without black longitudinal stripe 3
3. Acrostichal hairs in 10-12 irregular rows, egg-guide exceedingly elongated
..... *M. (M.) urashimae* Okada.
Acrostichal hairs in about 8 rows, egg-guide not exceedingly elongated
..... *M. (M.) fuscata* Okada.

Key to Korean species of the genus *Mycodrosophila*

1. Posterior crossveins clouded 2
Posterior crossveins clear 3
2. Wings hyaline, clouds on crossveins are narrow *M. japonica* Okada.
Wings slightly fuscous, clouds on crossveins are wide *M. shikokuana* Okada.
3. Caudal black bands of proximal abdominal tergites interrupted at middle 4
Caudal black bands of proximal abdominal tergites non-interrupted at middle 5
4. Humeral bristles 2, small. Preapicals on all three tibiae. 5x-index about 1.1
..... *M. poecilogastra* (Loew).
Humeral bristles 3, long. Preapicals on the hind tibia. 5x-index about 1.7
..... *M. koreana* Lee & Takada.
5. Black spot below distal costal break large, reaching media *M. basalis* Okada.
Black spot below distal break small, not extending below radius₂₊₃ *M. splendida* Okada.

2. Body about 3.0 mm. Costal-index about 3.0. Egg-guide lobes with numerous minute bristles all over the surface.....*D. (P.) puncticeps* Okada.
Body about 2.0 mm. Costal index about 2.0. Egg guide lobes with about 13 marginal teeth..
.....*D. (P.)* sp. from Hongseong.
3. Front black. Acrostichal hairs in 8 rows.....*D. (P.) coracina* Kikkawa & Peng.
Front dark reddish brown. Acrostichal hairs in 6 rows.....*D. (P.) rufifrons* Loew.

Key to Korean species of the subgenus *Sophophora*

1. Blackish species.....*D. (S.) bifasciata* Pomini.
Yellowish species..... 2
2. *Orb*₂ minute, 1/5 as long as *orb*₁..... 3
*Orb*₂ larger, about 1/3 or more of *orb*₁..... 5
3. Palpus with only one prominent setae.....*D. (S.) rugripunctinata* Okada.
Palpus with a few prominent setae..... 4
4. Abdominal black bands interrupted at middle.....*D. (S.) clarofinis* Lee.
Abdominal black bands not interrupted at middle.....*D. (S.) nipponica* Kikkawa & Peng
5. Palpus with a few prominent setae.....*D. (S.) melanogaster* Meigen.
Palpus with only one prominent setae..... 6
6. Acrostichal hairs in 6 rows..... 7
Acrostichal hairs in 8 rows..... 8
7. Costal-index about 2.0, 5x-index about 2.0.....*D. (S.) auraria* Peng.
Costal-index about 2.8, 5x-index about 4.0.....*D. (S.)* sp. from Mt. Sulak.
8. C 3-bristles on basal 1/2. Sex-combs extend beyond tips of the tarsal joints themselves....
.....*D. (S.) ficusphila* Kikkawa & Peng.
C 3-bristles on basal 1/3. Sex-combs not extend beyond tips of the tarsal joints themselves... 9
9. Costal-index about 3.5. Male wings apically with black spots...*D. (S.) sasakii* (Matsumura).
Costal-index about 2.0. Male wings without black spots.....*D. (S.) lutea* Kikkawa & Peng.

Key to Korean species of the subgenus *Drosophila*

1. Body yellowish or yellowish brown..... 2
Body blackish or dark brown.....15
2. Abdominal tergites with black spots..... 3
Abdominal tergites without spots, but often with bands..... 8
3. Abdominal black spots not finely demarcated, confluent with each other to become a medially interrupted cross band, with its anterior margin undulated...*D. (D.) kumzei* Duda (part).
Abdominal black spots finely demarcated, not or only slightly confluent with each other.... 4
4. Crossveins clouded..... 5
Crossveins clear..... 6
5. Wings-tip clouded.....*D. (D.) nigromaculata* Kikkawa & Peng.
Wings-tip clear.....*D. (D.) takadai* Lee.
6. Abdominal spots large, slightly confluent with each other. Aedeagus with a long apical recurved process, egg-guide with quadrate tip and waved upper margin.....*D. (D.) unispina* Okada.
Abdominal spots smaller, usually isolated from each other. Aedeagus without long apical recurved process, egg-guide with rounded tip and straight upper margin..... 7

7. Aedeagus straight and with a strong medio-ventral claw. Egg-guide with broad tip and short upper margin.....*D. (D.) brachynephros* Okada.
Aedeagus rectangularly curved at middle and with a minute medio-ventral claw. Egg-guide with narrower tip and longer upper margin.....*D. (D.) angularis* Okada.
8. Fore femur with a longitudinal row of minute spinules on its inner surface*D. (D.) immigans* Sturtevant.
Fore femur without such spinules 9
9. Presutural acrostichal bristles present.....*D. (D.) testacea* van Roser.
Presutural acrostichal bristles absent 10
10. Or_2 1/3 or less the length of or_1 11
 Or_2 over 3/4 the length of or_1 12
11. 5x-index about 1.0, crossveins clouded.....*D. (D.) kuntzei* Duda (part).
5x-index about 2.7, crossveins clear*D. (D.) tenuicauda* Okada.
12. 3rd costal section with heavy bristles on its basal 1/4 or less 13
3rd costal section with heavy bristles on its basal 1/2. 14
13. Arista with about 8 branches. Abdominal bands interrupted in mid-dorsal.....*D. (D.) bizonata* Kikkawa & Peng.
Arista with about 10 branches. Abdominal bands non-interrupted in mid-dorsal but paler..
.....*D. (D.)* sp. from Mt. Soyo.
14. 2 long sternopleurals.....*D. (D.) histrio* Meigen.
3 long sternopleurals.....*D. (D.) sternopleuralis* Okada & Kurokawa.
15. Palpus with only one prominent bristles.....*D. (D.) virilis* Sturtevant.
Palpus with a few prominent bristles..... 16
16. Body length about 2.3 mm. Costal-index about 2.2*D. (D.) pengi* Okada & Kurokawa.
Body length about 3.5 mm or more. Costal-index about 3.0 or more..... 17
17. Posterior crossveins slightly clouded, genital arch black, anterior and posterior margin or lower portion symmetrically convex, clasper with invariably 9 teeth arranged in a straight row.....*D. (D.) cheda* Tan, Hsu & Sheng.
Crossveins clear..... 18
18. 3rd costal section with heavy bristles on its basal 3/5-3/4, genital arch black, paler below, anterior margin of lower portion slightly concave, clasper with about 12 black teeth arranged in a shallowly concave row*D. (D.) lacertosa* Okada.
3rd costal section with heavy bristles on its basal 1/3-2/5, genital arch brownish black, anterior and posterior margin of lower portion symmetrically convex, clasper with about 10 black teeth arranged in deeply concave row.....*D. (D.) sordidula* Kikkawa & Peng.

IV. Species descriptions

Stegana (stegana) sp. from Mt. Sulak

Female : Body about 4.0 mm, yellowish brown. Head yellowish brown, eye dark red and bare. Front about 1/3 as broad as head width. Arista with about 17 branches including a fork, about 7 below it. Palpus orange yellow, with few setae. Carina reddish brown, high

and narrow. Cheek yellowish brown, about $1/6$ as broad as the greatest diameter of eye. orb_2 slightly shorter than orb_1 . Only one prominent oral bristle.

Mesonotum yellowish brown, acrostichal hairs in about 10 irregular rows. Anterior scutellar bristles divergent. Thoracic pleura yellow, with two prominent black longitudinal stripe. Sterno-index about 0.8. Legs yellow, preapicals on all tibiae, apicals on middle.

Wings black and broad. The 3rd costal section with about 9 wart-like bristles. Costal-index about 2.2; 4v-index about 1.9; 4c-index about 1.0; 5x-index about 1.0. C 3-bristles on basal $1/2$. Halteres yellow. Abdomen yellowish brown, posterior margin and lateral sides of each tergites black. 9 tergites prominently orange.

Egg-guides (Fig. 1, A) with lobes fused to each other at base, hairy, and with a few bristles.

Specimens examined : 1 ♀, Mt. Sulak. 29 July, 1963

Feeding habits : Net sweeping on grasses.

Relationships : Belongs to the subgenus *Stegana*.

Leucophenga (Leucophenga) ornata Wheeler

Takada & Lee : 1958. Annot. Zool. Jap., 31: 113—116.

Wheeler : 1959. Univ. Texas Publ., 5914: 184.

Remarks : This species was reported as *L. (L.) ornatipennis* (de Meijère) by Takada & Lee (1958).

Leucophenga (Leucophenga) sp. from Mt. Jukyeop

Female : Body about 4.5 mm. Yellowish brown. Eyes bare, dark red. Arista with about 26 long and short branches including a small fork, about 11 below it. Palpus large, with one long apical and two shorter marginal setae. Only one prominent oral bristle. Carina low, broaden below. Cheek yellowish brown, and very narrow, about $1/14$ as broad as the greatest diameter of eye.

Mesonotum and scutellum blackish brown. Acrostichal hairs in 10 rows. Halteres yellow. Thoracic pleura blackish brown. Sterno-index about 0.8. Legs yellow, preapicals on all three tibiae, apicals on all three tibiae. Wings dark, especially along costa. Crossveins clouded. Costal-index about 5.0; 4v-index about 1.6; 4c-index about 0.6; 5x-index about 1.6. C 3-bristles on basal $2/5$. Abdomen with tergites flat, silvery white, with black longitudinal band on each lateral side, and each tergites with caudal black band, which reached to forward at middle. Abdominal sternites yellow.

Egg-guides (Fig. 1, B). Lobes greyish yellow, proximally fused to each other, and with several long and numerous fine hairs.

Mesonotum and scutellum metallic black, pleura black. Humerals 2. Acrostichal hairs in 6 rows. Sterno-index about 0.6. Legs dark yellow, fore femur basally black, and a row of black short teeth of generic character on middle. Preapicals on all three tibiae, apicals on middle. Wings hyaline, veins yellow. Crossveins clear. Costal-index about 0.9; 4v-index about 2.1; 4c-index about 1.7; 5x-index about 3.2. 3rd costal section with heavy bristles on its basal 4/5. Halteres white. Abdominal tergites glossy black, somewhat purplish. Sternites with black and quadrate.

Specimens examined : 1 ♀. Mt. Kyelyong, Aug., 1957

Feeding habits : Attracted to fruit-baits.

Relationships : Belongs to the genus *Liodrosophila*.

Liodrosophila castanea Okada & Chung

Okada & Chung : 1960, Akitu Vol. IX

Remarks : Egg (Fig. 2, B) with 4 long filaments. Pupa (Fig. 2, A) dark brown, anterior spiracle with straight stems, and with about 23 long branches. Posterior spiracles are closed.

Scaptomyza (Parascaptomyza) pallida (Zetterstedt)

Zetterstedt : 1847. Dipt. Scandinaviae 6: 2571.

Duda : 1921. Ver. f. schles. Ins. 13: 64.

Okada : 1956. Gihodo Co., Tokyo. 68—69.

Takada & Lee : 1958. Annot. Zool. Jap., 31: 113—116.

Hackman : 1959. Acta Zool. Fenn. 97: 3—73.

Remarks : This species was reported as *Parascaptomyza disticha* (Duda) by Takada & Lee (1958). This species was abundantly collected by net sweeping at various localities in Korea.

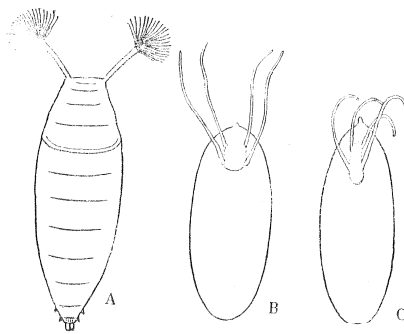


Fig. 2. A. Pupa of *Liodrosophila castanea*
 B. Egg of *L. castanea*
 C. Egg of *Mycodrosophila koreana*

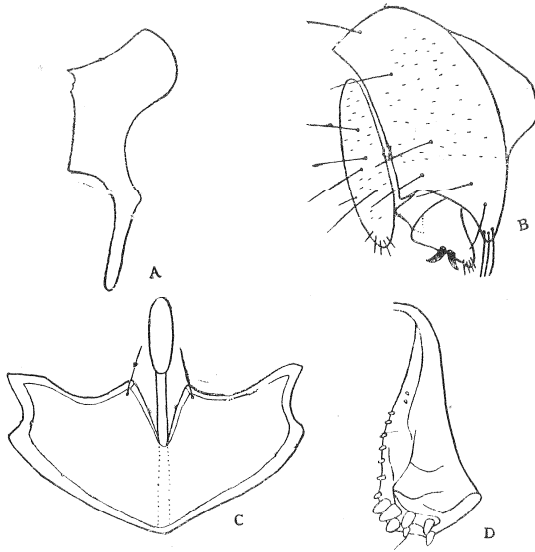


Fig. 3. *Drosophila magnidentata* Lee.

A. Aedeagus (lateral aspect). C. Phallic organs (ventral aspect).
 B. Periphallallic organs (lateral aspect). D. Egg-guide.

Clasper with 2 stout black teeth on the distal margin and with several hairs. Anal plate white, oblong, tapering below, with about 5 hairs, and separated from the genital arch.

Phallic organs (Fig. 3, C) : Aedeagus pale yellow, broad, and curved dorsad. Ventral fragma pale yellow, broader than long. Anterior paramere minute, with a few sensilla. Novasternum pale yellow, with a long seta. P. I. —1. 7.

Egg-guides (Fig. 3, D) : Lobe yellowish brown, with 14 reddish brown teeth, and with 3 distal teeth. Basal isthmus brown and long.

Feeding habits : Net sweeping on grasses.

Relationships : Closely allied to *D. raridentata* Okada & Chung, but differs from it in the shapes of periphallallic and phallic organs. This species seems to be a member of subgenus *Dichaetophora*, chiefly judging from the fact that the longitudinal axis of the eye is anteroventrally oblique to the body axis and that the length of the anterior dorsocentrals is approximately half length of the posterior ones.

Distribution : Mt. Jukyeop, Kyongki Province.

Drosophila (Lordiphosa) sp.

Okada : 1956. Gihodo Co., Tokyo, 69—71.

Takada & Lee : 1958. Annot. Zool. Jap., 31 : 113—116.

Basden : 1961. Beiträge zur Entomologie 11: 186.

Remarks : This species was reported by Takada & Lee (1958) as *Scaptomyza apicalis* Hardy. This species seems to be a member of subgenus *Lordiphosa* Basden, chiefly judging from the facts of the arista with 2 or 3 ventral branches, the 4 rowed acrostichal hairs, and the darkened thoracic pleura. The author collected 64 specimens by net sweeping in Korea.

distance of dorsocentral bristles slightly shorter than twice the length distance. Anterior scutellars divergent. Sterno-index about 0.2.

Legs yellow. Preapicals on all three tibiae, apicals on middle. Proximal two joints of fore tarsi of male with combs of about 14 and 13 black teeth respectively.

Wings hyaline, veins yellow, and crossveins clear. Costal-index about 2.5; 4v-index about 1.8; 4c-index about 0.9; 5x-index about 1.6. C 1-bristles 2, subequal in size. 3rd costal section with heavy bristles on its basal 1/3. Halteres greyish yellow.

Abdominal tergites yellow, with brownish black bands broadly interrupted at middle of tergites.

Periphallallic organs: Genital arch pale yellow, broad, upper portion with about 5 long hairs, lower portion with about 13 long hairs. Clasper broad, pale yellow, with about 10 black teeth occupying about 1/2 length of distal margin clasper itself, about 10 upright setae on the inner surface and with about 3 fine hairs on the edge of distal margin. Anal plate pale yellow, separated from genital arch, prolonged at lower anterior tip, and with about 25 hairs as well as a stout greyish yellow process at the lower end.

Phallic organs (Fig. 4): Aedeagus bifid, apically rounded and hairy. Anterior paramere pale brown, triangular, and fused to novasternum. Posterior parameres fused to become

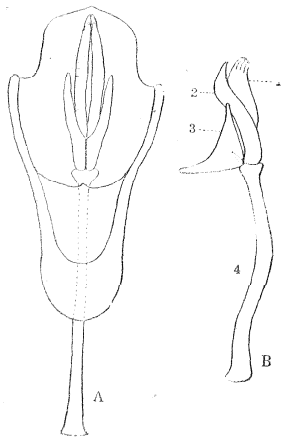


Fig. 4. *Drosophila (Sophophora) clarofinis* Lee

A. Phallic organs (ventral aspect)

B. Phallic organs (lateral aspect)

1. aedeagus, 2. hook-like process present at the

lateral side of aedeagus, 3. anterior paramere,

4. basal apodeme of aedeagus.

a plate and laterally connected to the long lateral arms of novasternum. A pair of elongate hook-like process present at the lateral sides of aedeagus, basally connected with the apodeme of aedeagus. Ventral fragma pale yellow, and triangular. P. I—0.5.

Egg-guides: Lobe narrow, pale yellow, marginally yellow, apically rounded, and with about 12 marginal and 2 discal black teeth. Basal isthmus short and narrow.

Feeding habits: Net sweeping on grasses, and attracted to fruit-baits

with 4 small indistinct dark patches.

Peripheral organs (Fig. 5, C) : Genital arch yellow, apically tapering, and with about 7 hairs; Clasper with about 10-12 teeth in a row, and about 17-20 secondary teeth arranged in a few rows. Anal plate with about 35 long hairs.

Phallic organs (Fig. 5, A) : Aedeagus dark brown, rectangularly curved dorsad, and bilobed at tip. Anterior paramere with a few sensilla apically. Posterior paramere obscure. Novasternal plate circular, and with a fine submedian spine. Ventral fragma semielliptic and broadly rounded at tip. P. I. —1.0.



Fig. 5. *Drosophila takadae* Lee

- | | |
|--|---------------|
| A. Phallic organs (ventral aspect). | D. Egg-guide. |
| B. Aedeagus (lateral aspect). | E. Egg. |
| C. Peripheral organs (lateral aspect). | F. Pupa. |

Egg-guides (Fig. 5, D) : Lobe yellowish orange, broadly rounded at tip, with about 18 teeth. Basal isthmus short and narrow.

Eggs (Fig. 5, E) : Egg with 3 filaments, median one thicker than lateral ones.

Pupae (Fig. 5, F) : Yellowish brown, anterior spiracles with about 12 branches, posterior spiracles are divergent.

Feeding habits : Attracted to fruit-baits.

Relationships : Belongs to the *quinaria* section of the subgenus *Drosophila*. Distinctly different from *D. brachynephros* Okada, *D. angularis* Okada and *D. unispina* Okada, in the color pattern of the abdominal tergites and in the shapes of phallic organs.

Distribution : Daekwanryung Kangwon Province.

Drosophila (Drosophila) sp. from Soyo

Female : Body about 2.6 mm, yellowish brown. Eye red pubescent. Arista with about 10 branches including a fork, 2 below it. Palpus yellowish grey, with about few bristles. Front about half as broad as head-width. Carina broad and high. Cheek yellowish brown, about 1/6 as broad as the greatest diameter of eye. *Orb*₂ minute, about 1/5 of *orb*₁. *Orb*₂ rather stout, subequal.

Mesonotum and scutellum brown. Humeral bristle 2, acrostichal hairs in 6 rows. Cross distance of dorsocentral bristle about half the length distance. Thoracic pleura blackish brown. Sterno-index about 0.7. Halteres yellow.

Legs yellow. Preapicals on all three tibiae. Apicals on middle. Wings hyaline, crossveins clouded. Costal-index about 3.8; 4v-index about 1.7; 4c-index about 0.7; 5x-index about 1.2. C 1-bristles 2, C 3-bristles on basal about 1/6. Abdominal tergites yellowish brown, with black bands, The bands paler at middle.

Egg-guides (Fig. 1, F) : Lobe broad, yellowish orange, upper margin much swollen, and with about 23 marginal and 4 discal short orange teeth. Basal isthmus short and narrow.

Specimens examined : 1 ♀, Mt. Soyo. 20 Oct., 1962

Feeding habits : Net sweeping on grasses.

Relationships : Belongs to the *quinaria* group of the subgenus *Drosophila*.

Drosophila (Drosophila) pengi Okada & Kurokawa

Kikkawa & Peng : 1938. Jap. Jour. Zool., 7 : 507—552.

Okada & Kurokawa : 1957. Kontyu, Vol. 25.

Takada & Lee : 1958. Annot. Zool. Jap., 31 : 113—116.

Remarks : *Drosophila pengi* was described as a new species by Okada & Kurokawa (1957). This species was tentatively referred by Takada & Lee (1958) to *Drosophila melanissima* of Kikkawa & Peng.

V. Geographical distribution and feeding habits

The data extending from 1956 to 1963 at 54 localities inclusive are summarized in the Table 2. A total of 94,115 specimens of Drosophilidae have been obtained in collections. They represent 65 species belonging to 8 genera. They are as follows : genus *Stegana* (one species), genus *Amiota* (2 species), genus *Leucophenga* (7 species), genus *Microdrosophila* (4 species), genus *Mycodrosophila* (6 species), genus *Liodrosophila* (2 species), genus *Scap-*

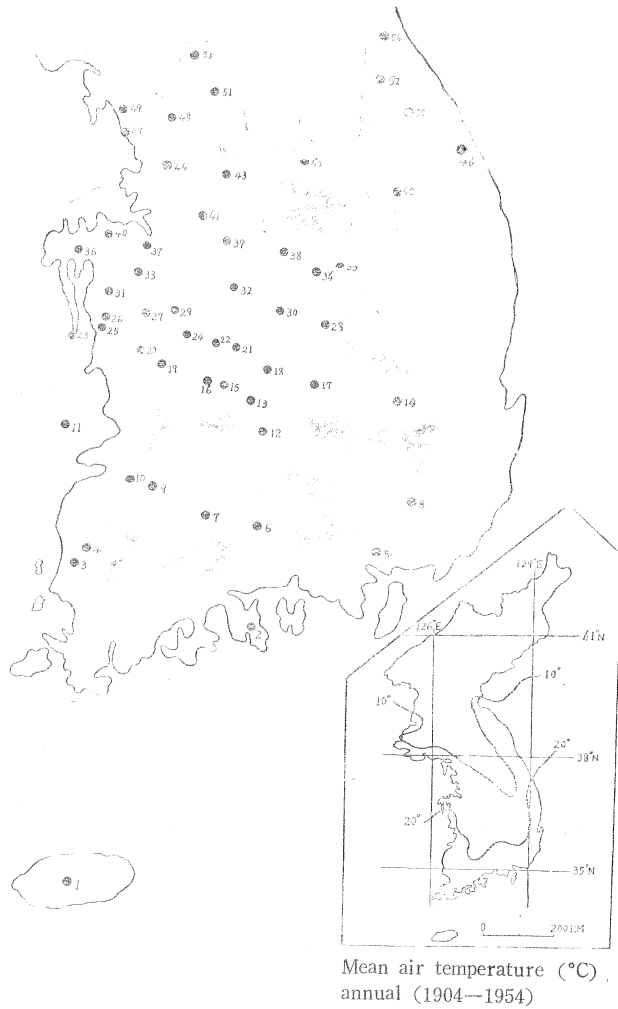


Fig. 6. Localities where collections were made.

- | | | | | |
|-----------------|-----------------|----------------|------------------|------------------|
| 1. Quelpart Is. | 2. Yeosu | 3. Hampyong | 4. Mt. Bulkap | 5. Masan |
| 6. Mt. Chiri | 7. Namwon | 8. Milyang | 9. Mt. Naejang | 10. Jeongeup |
| 11. Seonyu Is. | 12. Mt. Deokyu | 13. Muju | 14. Mt. Palkong | 15. Keumsan |
| 16. Mt. Daedun | 17. Kimcheon | 18. Yeongdong | 19. Nonsan | 20. Buyeo |
| 21. Okcheon | 22. Daejeon | 23. Sapsi Is. | 24. Mt. Kyelyong | 25. Daecheon |
| 26. Boryong | 27. Mt. Chilkap | 28. Sangju | 29. Kongju | 30. Mt. Sokli |
| 31. Hongseong | 32. Cheongju | 33. Yesan | 34. Munkyeong | 35. Mt. Undal |
| 36. Seosan | 37. Asan | 38. Mt. Baekma | 39. Jincheon | 40. Dangjin |
| 41. Anseong | 42. Hambaek | 43. Icheon | 44. Suwon | 45. Wonju |
| 46. Samcheok | 47. Incheon | 48. Yongdungpo | 49. Kimpo | 50. Dackwanryung |
| 51. Mt. Jukyep | 52. Mt. Ohdai | 53. Mt. Soyo | 54. Mt. Sulak | |

Table 2. Numerical data of *Drosophila* species obtained at 54 localities from 1956 to 1963

Species	1	2	3	4	5	6	7	8	9	10	11	12	13
<i>Amiota alboguttata</i>	.	.	.	.	.	.	.	.	.	.	.	.	.
<i>A. variegata</i>	.	4	.	.	.	3	.	.	6	.	.	.	21
<i>Leucophenga argentosa</i>	.	.	.	.	.	.	.	.	.	.	.	1	12
<i>L. magnipalpis</i>	.	.	.	.	.	.	.	.	.	.	.	.	.
<i>L. concilia</i>	.	.	.	.	.	6	.	.	.	.	.	1	12
<i>L. maculata</i>	.	.	.	.	.	.	.	.	.	.	.	.	.
<i>L. quinquemaculata</i>	.	.	.	.	.	.	.	.	.	.	.	2	13
<i>L. ornata</i>	.	.	.	.	.	.	.	.	.	.	.	.	.
<i>Microtrosophita fuscata</i>	.	.	.	.	.	16	.	.	.	.	.	.	6
<i>M. purpurata</i>	.	26	.	.	.	.	.	.	.	.	.	.	.
<i>M. urashimae</i>	.	.	.	.	.	2	.	.	.	.	.	.	2
<i>M. matsudairai</i>	.	7	.	.	2	652	.	.	.	.	.	16	45
<i>Mycodrosophila basalis</i>	.	.	.	.	.	.	.	.	.	.	.	.	.
<i>M. japonica</i>	.	.	.	.	.	.	.	.	.	.	.	.	3
<i>M. koreana</i>	.	.	.	.	.	.	.	.	.	.	.	.	22
<i>M. poecilogastra</i>	.	.	.	.	.	.	.	.	.	.	.	.	12
<i>M. shikokuana</i>	.	.	.	.	.	.	.	.	.	.	.	.	.
<i>M. splendida</i>	.	.	.	.	.	.	.	.	.	.	.	.	4
<i>Liodrosophila castanea</i>	3	.	.	.	.	4	.	.	.	.	.	3	172
<i>Scaptomyza graminum</i>	2	.	.	.	.	17	.	7	.	.	.	18	24
<i>S. pallida</i>	27	3	.	4	.	505	31	60	20	.	.	66	761
<i>Drosophila raridentata</i>	.	.	.	.	.	1	.	.	.	.	.	.	.
<i>D. magnidentata</i>	.	.	.	.	.	.	.	.	.	.	.	.	.
<i>D. sexvittata</i>	.	.	.	.	.	.	.	.	.	.	.	.	.
<i>D. trilineata</i>	.	.	.	.	.	.	.	.	.	.	.	.	.
<i>D. quadrivittata</i>	.	.	.	.	.	.	.	.	.	.	.	.	.
<i>D. nokogiri</i>	.	.	.	.	.	.	.	.	.	.	.	.	.
<i>D. histrioides</i>	1	.	.	.	.	.	.	.	.	.	.	.	.
<i>D. busckii</i>	5	2	3	.	.	7	.	3	.	12	.	.	45
<i>D. coracina</i>	12	10	1	3	.	21	10	21	2	6	.	4	78
<i>D. rufifrons</i>	.	.	.	.	.	.	.	.	.	.	.	.	.
<i>D. puncticeps</i>	.	.	.	.	.	.	.	.	.	.	.	.	.
<i>D. bifasciata</i>	.	.	.	.	.	.	.	.	.	.	.	3	18
<i>D. suzukii</i>	19	92	.	.	.	12	6	27	3	14	.	13	382
<i>D. lutea</i>	.	.	.	.	1	.	.	.	.	.	.	.	5
<i>D. melanogaster</i>	52	11	22	142	33	4	25	55	52	10	3	.	98
<i>D. ficusphila</i>	.	.	.	.	.	.	.	.	.	.	.	.	.
<i>D. nipponica</i>	.	.	.	.	.	19	.	13	.	.	.	.	57
<i>D. clarofinis</i>	.	.	.	.	.	8	.	.	.	.	.	.	103
<i>D. magnipectinata</i>	.	.	.	.	.	.	.	.	.	.	.	.	.
<i>D. auraria</i> (A,B&C race)	718	163	41	6	20	1282	120	1122	27	45	1	158	5672
<i>D. brachynephros</i>	.	4	6	30	.	59	6	10	4	.	.	20	187
<i>D. angularis</i>	14	24	3	3	7	14	3	78	11	8	1	14	120
<i>D. unispina</i>	.	9	.	.	.	3	.	1	.	.	.	4	36
<i>D. takadai</i>	.	.	.	.	.	.	.	.	.	.	.	.	.
<i>D. nigromaculata</i>	3	1	.	6	2	14	7	28	1	3	.	16	592
<i>D. kumtzei</i>	.	.	.	.	.	.	.	.	.	.	.	.	.
<i>D. testacea</i>	.	2	.	.	.	.	4	.	.	.	.	.	8
<i>D. bizonata</i>	8	3	.	2	2	33	10	1	2	6	.	7	40
<i>D. histrio</i>	.	2	.	.	.	6	.	.	.	.	.	2	31
<i>D. sternopleuralis</i>	1	.	.	.	.	2	.	.	.	.	.	.	7
<i>D. tenuicauda</i>	.	.	.	.	.	.	.	.	.	.	.	.	.
<i>D. immigrans</i>	26	4	2	4	.	4	.	.	.	.	.	.	3
<i>D. pengi</i>	.	.	.	.	.	.	.	.	.	.	.	.	.
<i>D. virilis</i>	259	32	31	.	8	11	8	41	3	22	.	.	53
<i>D. lacertosa</i>	13	10	.	.	.	.	.	13	.	.	.	4	163
<i>D. cheda</i>	4	.	.	.	.	.	.	.	.	.	.	.	.
<i>D. sordidula</i>	.	.	.	.	.	.	.	.	.	.	.	.	.
Unnamed species	.	.	.	.	.	.	.	.	.	.	.	2	11
Total	1167	409	109	200	75	2705	230	1480	131	126	5	354	8818

Species	31	32	33	34	35	36	37	38	39	40	41	42	43
<i>Aniola alboguttata</i>
<i>A. variegata</i>	58	.	.	.	10	.	.	.	.	.	.	.	51
<i>Leucophenga argentosa</i>
<i>L. magnipalpis</i>	1	.	.	.	.	.	.
<i>L. concilia</i>
<i>L. maculata</i>	1	.	.	.	.	.	.
<i>L. quinque maculata</i>	3	.	.	.	.	.	.
<i>L. ornata</i>
<i>Microdrosophila fuscata</i>
<i>M. purpurata</i>	3	.	.	.	.
<i>M. urashimae</i>
<i>M. matsudairai</i>	4	.	.	.	.	.	.	.	.
<i>Mycodrosophila basalis</i>
<i>M. japonica</i>
<i>M. koreana</i>	8	.	.	.	.	.	3	.	.	.	5	.	.
<i>M. poecilogastra</i>
<i>M. shikokuana</i>
<i>M. splendida</i>
<i>Liodrosophila castanea</i>	2	.	.	.	.	.	.	.	.
<i>Scaptomyza graminum</i>
<i>S. pallida</i>	25	6	.	3	15	7	11	28	17	58	2	4	2
<i>Drosophila raridentata</i>
<i>D. magnidentata</i>
<i>D. sexvittata</i>	1	.	.	.	.	.	.
<i>D. trilineata</i>
<i>D. quatrivittata</i>
<i>D. nokogiri</i>
<i>D. histrioides</i>
<i>D. busckii</i>	1
<i>D. coracina</i>	.	7	.	3	63	2	.	.	.	2	.	1	4
<i>D. rufifrons</i>	380	.	.	.	6	.	2	.	.	.	.	.	5
<i>D. puncticeps</i>
<i>D. bifasciata</i>	2	.	.	.	.	.
<i>D. sukukii</i>	.	.	.	21	269	6	31	4	.	2	.	10	103
<i>D. lutea</i>
<i>D. melanogaster</i>	20	.	1	12	.	18	3	.	.	86	.	24	5
<i>D. ficusphila</i>
<i>D. nipponica</i>	3	.	.	21	.	.
<i>D. clarofinis</i>
<i>D. magnipectinata</i>
<i>D. auraria</i> (A, B & C race)	26	52	55	61	1592	71	16	3	5	160	27	68	134
<i>D. branchynephros</i>	.	2	.	2	4	3	6	2	3	.	.	14	91
<i>D. angularis</i>	36	20	6	7	12	6	41	.	.	4	7	2	310
<i>D. unispina</i>
<i>D. takadai</i>
<i>D. nigromaculata</i>	.	11	1	1	3	6	4	2	1	2	36	4	45
<i>D. kuntzei</i>
<i>D. testacea</i>	3	.	.	.	.	.	12
<i>D. bizonata</i>	.	2	.	.	.	.	.	.	.	.	.	.	24
<i>D. histrio</i>
<i>D. sternopleuralis</i>	2	.	.
<i>D. tenuicauda</i>
<i>D. timnigrans</i>	1
<i>D. pengi</i>	51	.	.	.	.	.	7	.	.	.	.	.	.
<i>D. virilis</i>	.	12	.	.	.	10	.	.	.	2	.	.	.
<i>D. lacertosa</i>	12	.	1	9	3	.	54	.	.	.	.	1	6
<i>D. cheda</i>	1	.	.	.	.	.	.	.	10
<i>D. sordidula</i>
Unnamed species	1	.	.	.	.	.	.	.	.	.	.	.	.
Total	617	112	64	119	1984	129	187	44	29	316	100	128	804

43. Icheon	Sept. '62
44. Suwon	Aug. '63
45. Wonju	July '63
46. Samcheok	July '63
47. Incheon	Sept. '63
48. Yongdungpo	Oct. '61, May-Nov. '62, May-Nov. '63
49. Kimpo	July '63
50. Daekwanryung	Aug. '62, July '63
51. Mt. Jukyeop	May-Nov. '60
52. Mt. Ohdai	July '58
53. Mt. Soyo	Oct. '62
54. Mt. Sulak	July '59, July '63

III. Key to the Korean species of Drosophilidae

Key to Korean genera of family Drosophilidae

1. Discal and 2nd basal cells separated. 2
 Discal and 2nd basal cells confluent. 3
2. Yellowish brown species. *Stegana* Meigen. (*Stegana* sp. from Mt. Sulak.).
 Blackish species. *Amiola* Loew.
3. Orb_2 nearly as long as orb_3 *Leucophenga* Mik.
 Orb_2 much shorter than orb_3 4
4. Mesonotum strongly convex. 5
 Mesonotum not strongly convex. 6
5. Fore femora with a row of short stout teeth. *Liodrosophila* Duda.
 Fore femora without a row of short stout teeth. *Mycodrosophila* Oldenberg.
6. Orb_2 microtrichia-like. 3rd costal section with heavy bristles on the entire or nearly entire length. *Microdrosophila* Malloch.
 Orb_2 distinct, not microtrichia-like. 3rd costal section with heavy bristles less on the basal 4/5. 7
7. Acrostichal hairs in 2 or 4 rows. *Scaptomyza* Hardy.
 Acrostichal hairs usually in 6 or 8 rows. *Drosophila* Fallén.

Key to Korean species of the genus *Amiola*

- Body about 2.7 mm. Mesonotum without dark spots, humeral and subalar regions white. ...
 *A. (Amiola) alboguttata* (Wahlberg).
- Body about 4.5 mm. Mesonotum with dark spots, humeral and subalar regions not white. ...
 *A. (Phortica) variegata* (Fallén).

Key to Korean species of the genus *Liodrosophila*

- Mesonotum glossy castaneous brown, scutellum dark brownish black. Costal-index about 1.4
 *L. castanea* Okada & Chung.
 Mesonotum and scutellum metallic black. Costal-index about 0.9. *L. sp.* from Mt. Kyelyong.

Key to Korean species of the genus *Scaptomyza*

- Acrostichal hairs in 2 rows. *S. pallida* (Zetterstedt).
 Acrostichal hairs in 4 rows. *S. graminum* (Fallén).

Key to Korean subgenera of the genus *Drosophila*

1. Preapicals prominent only on the hind tibiae 2
 Preapicals prominent on all three tibiae 3
2. The longest axis of eye nearly rectangular to body axis *Hirtodrosophila* Duda.
 The longest axis of eye exceedingly oblique to body axis.
 *Dorsilopha* Sturtevant. (*D. busckii* Coquillett.).
3. Prescutellars present. *Paradrosophila* Duda.
 Prescutellars absent. 4
4. Body slender, eye somewhat pentagonal. Mesonotum narrower than head in width.
 *Dichaetophora* Duda.
 Body not slender, eye round. Mesonotum not narrower than head in width. 5
5. Abdominal black bands usually not interrupted at middle. *Sophophora* Sturtevant.
 Abdominal black bands usually interrupted at middle. 6
6. Acrostichal hairs in 4 rows. *Lordiphosa* Basden. (*D. sp.*).
 Acrostichal hairs in 6 or 8 rows. *Drosophila* Fallén.

Key to Korean species of the subgenus *Dichaetophora*

- Arista with 7 branches, 1 below. Thoracic pleura with 3 diffuse longitudinal black stripes.
 Acrostichals in 6 rows. *D. (D.) raridentata* Okada & Chung.
 Arista with 9 branches, 2 below. Thoracic pleura with 2 longitudinal black stripes. Acrostichals in 4-6 irregularly rows. *D. (D.) magnidentata* Lee.

Key to Korean species of the subgenus *Hirtodrosophila*

1. Mesonotum without prominent dark stripes 2
 Mesonotum with prominent dark stripes 3
2. Abdominal dark bands not interrupted at middle. *D. (H.) nokogiri* Okada.
 Abdominal dark bands interrupted at middle. *D. (H.) histrioides* Okada & Kurokawa.
3. Mesonotum with 3 broad longitudinal black stripes *D. (H.) trilineata* Chung.
 Mesonotum with paired longitudinal black stripes. 4
4. Mesonotum with 4 broad black stripes *D. (H.) quadrivittata* Okada.
 Mesonotum with 6 narrow black stripes. *D. (H.) sexvittata* Okada.

Key to Korean species of the subgenus *Paradrosophila*

1. Body yellowish. 2
 Body blackish. 3

Specimens examined : 1♀, Mt. Jukyeop, Kyongki Province. Aug, 1960

Feeding habits : Net sweeping on grasses.

Relationships : Belongs to the subgenus *Leucophenga*.

Mycodrosophila koreana Lee & Takada

Lee & Takada : 1959. Annot. Zool., Japon., Vol. 32, No.2.

Remarks : Egg (Fig. 2, C) with 4 long filaments, but failed to breed on standard *Drosophila media* in the laboratory.

Feeding habits : Net sweeping on fungus and attracted fruit-baits.

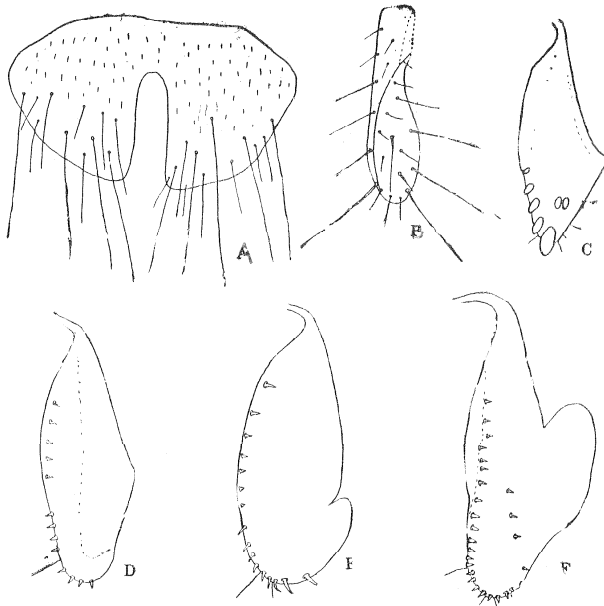


Fig. 1. Egg-guides.

- A. *Stegana (Stegana)* sp. from Mt. Sulak.
 B. *Leucophenga (Leucophenga)* sp. from Mt. Jukyeop.
 C. *Drosophila varidentata* from Mt. Chiri.
 D. *D. (Paradrosophila)* sp. from Hongseong.
 E. *D. (Sophophora)* sp. from Mt. Sulak.
 F. *D. (Drosophila)* sp. from Mt. Soyo.

Liodrosophila sp. from Mt. Kyelyong

Female : Body about 2 mm, glossy bluish black, with mesonotum highly convex, with black abdomen. Head slightly broader than thorax. Eye dark red. Antenna dark brown. Arista with about 10 long branches including a large fork, 2 below it. Palpus dark brown, with a long apical and a few shorter marginal setae. Ocellar triangle black. Carina high and short. Cheek brownish black, about 1/10 as broad as the greatest diameter of eye. Occiput black. *Orb*₂ quite minute. *Or*₂ about 1/4 the length of vibrissa.

Drosophila raridentata Okada & Chung

Okada & Chung : 1960, Akitu Vol. IX

Tokumitsu : 1963, D. I. S., 37.

Remarks : *Drosophila (Drosophila) raridentata* was described as a new species based on a single male fly collected from Mt. Sulak in Korea (Okada and Chung, 1960). Egg-guide was described by Tokumitsu (1963) based on females collected in Japan. The author obtained a single female (the egg-guide figured in Fig. 1.) by net sweeping in July 1959 from Mt. Chiri and collected 12 specimens (6 ♀♀ 6 ♂♂) by net sweeping in July 1963 from Mt. Sulak. This species seems to be a member of subgenus *Dichaetophora*, chiefly judging from the fact that the longitudinal axis of the eye is anteroventrally oblique to the body axis and that the length of the anterior dorsocentrals is approximately half length of the posterior ones.

Drosophila (Dichaetophora) magnidentata Lee

Lee : 1964. Kor. Jour. Zool., Vol. 7 (in press)

Male and female : Body about 2.0-2.2 mm, yellowish brown. Longitudinal axis of the eye anteroventrally oblique to the body axis. Eye red, oval and somewhat pentagonal, roughly pubescent. Antenna with 2nd joint yellow, 3rd brown and exceedingly broaden below. Arista with about 9 branches including a fork, 2 below it. Palpus yellow, oval, with one prominent subapical seta and a few shorter ventral setae. Ocellar triangle brownish black. Periorbits paler than front, not reaching frontal margin, and with a few short hairs arranged along eye margin. Front broad, flat, greyish brown, slightly narrower than half the head width at the level of ocellars. Slightly narrowing below, and with a few prominent frontal hairs. Face yellowish, flat, carina flat. Cheek yellowish grey, about 1/5 as broad as the greatest diameter of eye. orb_2 about 1/3 length of orb_1 , orb_3 as long as orb_1 and situated inside orb_2 , which is much nearer to orb_3 than to orb_1 . Vibrissa stout very long.

Mesonotum yellowish brown, narrower than head in width, and exceedingly flat at side view. Scutellum yellowish brown. Thoracic pleura yellowish brown, with two longitudinal black stripes. 2 long humerals, subequal in length. Acrostichals in 4-5 irregularly rows. Anterior dorsocentrals approximately half length of posterior ones, cross distance of dorsocentrals over 1.5 times the length distance. Anterior scutellars divergent, less than half length of posterior ones, situated nearer to the base of scutellum than to the posterior scutellars. Sterno-index about 0.4. Legs yellow. Preapicals on all three tibiae, apicals on middle. Wings hyaline. Costal-index about 2.0; 4v-index about 2.8; 4c-index about 1.6; 5x-index about 3.3. First costal section with 2 stout apical bristles, 3rd costal section with heavy bristles on its basal about 2/5. Halteres yellow, stem with a black patch on its anterior margin. Abdominal tergites brownish yellow, with black caudal band on each tergites. Abdominal sternites white.

Periphallallic organs (Fig. 3, B) : Genital arch broad, upper and below portion narrowing and white, middle portion black, upper margin with about 3 and lower margin about 6 hairs.

Drosophila trilineata Chung

Chung : 1960. Kor. Jour. Zool., 3: 41-44.

Remarks : *Drosophila (Drosophila) trilineata* was described as a new species by Chung (1960). This species seems to be a member of subgenus *Hirtodrosophila*, chiefly judging from the facts of the arista with a single ventral branch, preapicals prominent only on the hind tibia and the shapes of phallic organ, periphallic organ and egg-guides.

Drosophila (Paradrosophila) sp. from Hongseong

Female : Body about 2.0 mm, yellowish. Antenna blackish yellow. Arista with about 8 branches including a fork, 2 below it. Front yellowish red, about 1/4 as broad as head width. Eye red, with fine pale piles. Ocellar triangle yellow. Cheek yellowish red, about 1/10 the greatest diameter of eye. Orb_2 about 2/5 or less of orb_1 . Carina yellow, high and narrow. Palpus reddish yellow, with about three prominent setae. Or_2 minute with only one very long oral bristle.

Mesonotum pale orange yellow, unicolorous. Scutellum pale yellow. Thoracic pleura yellow, with one black longitudinal stripe. Humeral bristle 2, subequal and long. 2 long prescutellar bristles present. Acrostichal hairs in 8 rows. Sterno-index about 0.6. Legs orange yellow. Apicals on fore and middle tibiae, preapicals on all three tibiae. Wings transparent. Costal-index about 1.6; 4v-index about 2.5; 4c-index about 1.5; 5x-index about 2.5. C 1-bristles 2, subequal. C 3-bristles on basal about 3/4. Halteres yellow. Abdomen yellow, with black and narrow caudal band on each tergites, The band is laterally curved forward to reach anterior margin. Abdominal sternites brownish yellow, quadrate.

Egg-guides (Fig. 1, D) : Lobe yellowish, rounded at tip, with about 13 marginal teeth. Basal isthmus narrow.

Specimens examined : 1 ♀. Hongseong, Chungnam Province. 15 July, 1959

Feeding habits : Net sweeping on grasses.

Relationships : Belongs to the subgenus *Paradrosophila*.

Drosophila (Sophophora) clarofinis Lee

Lee : 1959. Kor. Jour. Zool., Vol. II. No. 2.

Male and female : Body yellow, about 1.8 mm in length. Eyes red, with rough piles. Antenna yellow. Arista with about 8 branches including a small fork, 2 below it. Palpus yellow, narrow, and with a few prominent bristles. Ocellar triangle and periorbits yellow. Front yellow, about half as broad as head width. Clypeus yellow. Cheeks yellow, about 1/4 as broad as the greatest diameter of eye. Carina broad and flat. Orb_2 minute, about 1/5 size of the first. Or_2 about 2/3 size of vibrissa. Occiput yellowish brown. Vertex yellow.

Mesonotum and scutellum yellow. Thoracic pleura yellow. Humeral bristles 2, upper shorter. Acrostichal hairs in 4-6 somewhat irregular rows. No prescutellar bristles. Cross

Distribution : Korea; Mt. Chiri, Muju, Daecheon, Boryong, Kongju, Mt. Sokli, Dae-kwanryung, Mt. Soyo.

Drosophila (Sophophora) sp. from Mt. Sulak

Female : Body yellowish grey, about 2.2 mm. Eye red, with rough piles. Antenna yellow, 3rd joint darker. Arista with about 9 branches including a small fork, 2 below it. Palpus yellowish, narrow, and with only one long apical bristles. Ocellar triangle and periorbits yellow. Front yellow, about half as broad as head width. Cheek yellowish orange, about 1/8 as broad as the greatest diameter of eye. Carina yellow, low and flat. *Orb*₂ about 1/3 *orb*₁. *Or*₂ weak, 1/3 or less length of vibrissa.

Mesonotum and scutellum yellowish brown. Thoracic pleura reddish yellow, humerals 2. Acrostichal hairs in 6 rows. Sterno-index about 0.4. Halteres yellow. Legs yellow. Preapicals on all three tibiae, apicals on fore and middle.

Wings hyaline. Costal-index about 2.8; 4v-index about 3.3; 4c-index about 1.5; 5x-index about 4.0. C 1-bristles 2, C 3-bristles on basal about 2/5. Abdominal tergites yellow, with black caudal bands. Abdominal sternites quadrate, yellow.

Egg-guides : (Fig. 1, E) Lobe yellow, apically rounded, with about 16 marginal teeth.

Specimens examined : 1 ♀, Mt. Sulak, Kangwon Province. 12 July, 1963

Feeding habits : Attracted to fruit-baits.

Relationships : Belongs to the subgenus *Sophophora*.

Drosophila (Drosophila) takadai Lee

Lee : 1964. Kor. Jour. Zool. Vol. 7 (in press)

Male and female : Body about 2.8 mm, yellowish brown. Eye pubescent. Arista with about 8-9 branches including a fork, 2 below it. Palpus yellowish grey, with about 2 prominent bristles. Front about half as broad as head-width. Carina broad and high. Cheek yellowish brown, about 1/4 as broad as the greatest diameter of eye. *Orb*₂ minute, about 1/5 length of *orb*₁. *Or*₂ about 4/5 vibrissa.

Mesonotum yellowish brown. Humerals 2, acrostichals in 6 rows. Cross distance of dorsocentrals about half the length distance. Anterior scutellars slightly divergent. Sterno-index about 0.5. Halteres yellow.

Legs yellow. Preapicals on all three tibiae. Apicals on middle. Wings hyaline, crossveins clouded. Costal-index about 3.0; 4v-index about 1.5; 4c-index about 0.9; 5x-index about 1.0. C 1-bristles 2, unequal in size and thickness. 3rd costal section with heavy bristles on its basal about 2/5.

Abdominal tergites yellowish brown, with obscure band interrupted at middle. The band

tomyza (2 species), and genus *Drosophila* (41 species). The genus *Drosophila* are included 7 subgenera such as subgenus *Dichaetophora* (2 species), subgenus *Lordiphosa* (one species), subgenus *Hirtodrosophila* (5 species), subgenus *Dorsilopha* (one species) subgenus *Paradrosophila* (4 species), subgenus *Sophophora* (10 species) and subgenus *Drosophila* (18 species).

Also, a great number of flies belonging to subgenera *Sophophora* and *Drosophila* were founded with frequency of about 56.2 per cent and about 30.5 per cent of 94, 115, respectively.

Among 65 species of Drosophilidae enlisted here 11 species are proved to be endemic to Korea. They are as follows; *Stegana* sp. from Mt. Sulak, *Leucophenga* sp. from Mt. Jukyeop, *Liodrosophila castanea*, *Liodrosophila* sp. from Mt. Kyelyong, *Drosophila magnidentata*, *D. trilineata*, *D. (Paradrosophila)* sp. from Hongseong, *D. clarofinis*, *D. (Sophophora)* sp. from Mt. Sulak, *D. takadai* and *D. (Drosophila)* sp. from Mt. Soyo.

The author's collected area covered 54 localities including 6 localities by the other investigators such as Quelpart Island, Mt. Chiri, Seoul area, Kwangneung area, Mt. Ohdai and Mt. Sulak.

From 1956 to 1957, a total of 42 species of Drosophilidae including 23 species new to the Korean fauna were collected at Mt. Kyelyong, Kongju and Mt. Sokli (Makino, Takada and Lee 1957, Takada and Lee 1958).

A total of 34 species of Drosophilidae have been recorded from Quelpart Island (Chung 1955, 1958, Chung et al 1956, Paik and Kim 1957, Kang et al 1959). The author made the capture of a total of 1,167 flies involving 17 species as shown in Table 2 at Quelpart Island. One species of these species, *Liodrosophila castanea* can be added to the fauna of Quelpart Island.

A total of 19 species of Drosophilidae, including *D. transversa* complex and several other unidentified species have been collected at Mt. Chiri (Chung et al 1956, Paik and Kim 1957). The author made the capture of a total of 2,705 flies involving 25 species at Mt. Chiri. Among these species, 15 species can be added to the fauna of Mt. Chiri. They are as follows: *Leucophenga concilia*, *Microdrosophila fuscata*, *M. urashimae*, *M. matsudairai*, *Liodrosophila castanea*, *Drosophila varidentata*, *D. lusckii*, *D. melarogaster*, *D. nipponica*, *D. clarofinis*, *D. brachycephros*, *D. angularis*, *D. unistina*, *D. sterropleuralis* and *D. virilis*.

A total of 20 species of Drosophilidae, including a species of unidentified species have been collected from Seoul area (Chungryangri, Sekumjung, Jungneung, Mt. Bukhan, Mt. Bulam, Hongneung) by Kikkawa and Peng (1938), Kang et al (1958) and Chung (1958). The author made the capture of a total of 5,153 flies involving 19 species as shown in Table 2 at Yongdungpo (Seoul) from 1961 to 1963. Among these species, 7 species can be added to the fauna of Seoul area. They are as follows: *Microdrosophila purpurata*, *Mycodrosophila koreana*, *M. poecilogastra*, *Drosophila coracina*, *D. rufifrons*, *D. sukukii* and *D. jengi*.

A total of 62 species of Drosophilidae have been recorded from Kwangneung area (Paik and Kim 1957, Chung 1958, Kang et al 1958, 1959, 1962). The author made the

14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
.
3	.	7	1	.	2	2	1	5	.	252	.	.	.	.	20	6
.	3	.	.	10	.	.	.	.	36	.
.	4	7
.	11	.	.	.	.	.	.
.	8	.	.	.	.	2	.
.	7	.	.	.	.	2	5
.	6
.	42	.	.	.	.	14	.
.	12	.	.	.	.	24	5
.	4	.	.	54	.	.	.	.	.	.
.	2	.	.	.	.	.	.	.	.	.
.	55	.	.	.	.	.	.	.	25	.
.	8	.	.	.	.	.	.	.	.	.
.	3	.	.	.	.	.	.	.	.
.	35	2	4	.	.	35	4
.	36	.	.	.	.	29	21
88	7	28	12	18	52	61	2	50	.	490	.	18	14	5	1230	134
.
5
.
.	4
.	72	.	.	.	.	26	23
.	.	.	1	.	.	.	.	.	.	316	.	.	.	.	74	2
62	.	3	11	.	8	7	5	11	.	1924	.	.	3	4	899	59
3	28	.	.	.	.	12	1
.
.	186	.	.	.	.	.	3
47	.	.	129	55	.	14	.	26	.	1018	.	.	.	44	218	14
2	.	.	2	.	.	.	.	.	.	140	.	.	.	.	11	.
5	22	.	.	29	16	5	.	42	6	420	26	.	.	3	810	4
18	5
.	480	22
.	5	3	.	.	14	14
.	8
586	17	69	574	665	47	225	10	157	15	6570	53	180	218	56	12652	1870
22	.	.	15	10	.	24	.	21	.	722	.	68	7	.	205	142
31	.	11	4	6	3	70	20	61	.	3086	5	108	25	5	832	110
6	312	.	.	.	.	15	62
.
18	2	7	.	.	4	.	.	17	.	126	.	.	9	.	3519	105
.
.	410	.	.	.	.	32	45
14	.	4	3	15	2	6	.	4	.	3308	.	4	.	.	143	71
3	212	.	.	.	.	5	39
6	44	.	.	.	.	6	18
.	13
.	.	.	1	.	.	.	.	.	.	14	.	.	.	.	18	7
.	5	.	.	.	36	.	.	.	.	21	2
.	20	14	.	21	4	146	.	.	.	.	64	20
5	4	3	.	.	.	8	.	.	.	1809	.	.	27	.	161	6
.	210	.	.	.	.	3	2
1	.	.	5	.	.	.	.	.	.	94	.	.	.	.	41	2
.	19	.	.	.	.	6	14
925	52	132	758	800	154	515	42	410	25	22179	91	484	294	117	21688	2875

44	45	46	47	48	49	50	51	52	53	54	Total	Collecting methods or feeding habits
.	5	.	.	.	14	S, E
.	.	5	.	10	.	12	523	3	1	90	1094	F, S, T, E
.	3	14	1	.	2	84	F, S
.	8	.	.	12	32	F, S
.	3	33	F, S
.	8	.	.	9	28	S
.	3	.	.	.	35	S
.	2	.	.	.	.	8	S
.	22	S
.	.	.	.	9	.	2	7	1	.	61	165	S
.	4	S
.	2	769	F, S
.	58	M
.	5	M
.	.	.	.	18	.	.	4	.	.	.	140	F, M
.	.	.	.	8	.	.	2	.	.	.	30	M
.	2	.	.	.	2	M
.	7	M
.	2	1	267	F, S
.	12	3	25	3	194	S
.	.	32	12	19	.	3	213	.	11	256	4410	S
.	12	13	S
.	2	.	.	.	2	S
.	127	.	.	1	134	F, S
.	16	.	.	.	16	S
.	18	.	.	.	18	S
.	10	.	.	.	14	F, S
.	20	19	7	.	26	194	F, S, S
.	.	.	3	36	28	21	10	2	.	3	574	F, S, G, T
.	.	.	3	18	16	2	16	104	3	35	3443	F, S, G, T
.	.	.	.	4	.	.	.	209	.	.	650	F, T
.	1	.	1	S
.	54	11	1	.	37	315	F, T
.	.	8	12	176	.	414	511	17	3	39	3759	F, S, T
.	48	.	.	.	209	F, S, T
25	20	.	137	234	58	3	20	9	12	2	2584	F, G
.	5	F, S
.	2	44	679	F, S
.	1	3	.	11	.	162	F, S
.	8	F, S
82	36	309	122	4053	708	554	2444	87	62	1118	45184	F, S, G
.	.	3	1	165	.	38	721	8	2	53	2680	F, S
2	.	3	4	242	2	31	2472	10	4	186	8174	F, S
.	9	137	.	.	97	691	F, S
.	26	.	.	.	.	26	F
14	1	7	2	119	.	73	24	6	3	7	4852	F, S, G, T
.	16	6	.	.	16	38	F
.	8	23	2	.	14	563	F, S
.	.	7	10	12	3	18	599	12	.	58	4433	F, S, G, T
.	21	486	1	.	67	875	F, T
.	86	F, S
.	1	4	6	24	S
.	11	9	.	.	12	116	F, S, T
.	.	.	.	5	.	5	1558	.	.	.	1690	F, T
.	.	.	50	8	24	23	6	11	.	.	907	F, G
.	.	2	.	10	4	97	151	3	.	159	2734	F, S, G, T
.	16	.	.	.	235	F, S, T
.	.	.	.	9	.	1	392	.	.	.	556	F, S, T
.	4	.	7	6	70	F
123	57	379	371	5153	829	1482	10957	185	128	2468	94115	

- Drosophila (Drosophila) unisnipa* Okada, 1956
Drosophila (Drosophila) sp. from Mt. Soyo
 testacea species-group Sturtevant, 1942
Drosophila (Drosophila) testacea van Roser, 1940
 bizonata species-group Tan, Hsu, & Sheng, 1949
Drosophila (Drosophila) bizonata Kikkawa & Peng, 1938
 ungrouped species
Drosophila (Drosophila) histrio Meigen, 1830
Drosophila (Drosophila) sternopleuralis Okada & Kurokawa, 1957
Drosophila (Drosophila) tenuicauda Okada, 1956
 immigrans species-group Sturtevant, 1942
Drosophila (Drosophila) immigrans Sturtevant, 1921
 virilis section Hsu, 1949
 melanica species-group Sturtevant, 1942
Drosophila (Drosophila) pengi Okada & Kurokawa, 1957
 virilis species-group Sturtevant, 1942
Drosophila (Drosophila) virilis Sturtevant, 1916
 robusta species-group Sturtevant, 1942
Drosophila (Drosophila) cheda Tan, Hsu, & Sheng, 1949
Drosophila (Drosophila) lacertosa Okada, 1956
Drosophila (Drosophila) surditulu Kikkawa & Peng, 1938

VII. Summary

1. The collections of drosophilid flies were made at 54 localities of Korea during a period ranging from September 1956 to November 1963, resulting in the capture of a total of 94,115 flies involving 65 species belong to 8 genera.
2. Keys to Korean members of the Drosophilidae are given to discriminate genera, subgenera, and species.
3. Six unnamed species are described, together with supplementary notes of certain species.
4. Geographical distribution of drosophilid flies in Korea are recorded, together with the feeding habits of adult flies.
5. A list Korean species collected by the author is arranged after the current system.

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- Kang, Y.S., and Lee, H.Y. 1961. On a new species, *Drosophila macromaculata* sp. nov. Kor. Jour. Zool., 4 : 29-31. (in Korean).
- Kikkawa, H., and Peng, F.T. 1938. *Drosophila* specise of Japan and adjacent localities. Jap. Jour. Zool., 7 : 507-552.
- Kim, K.W., and Paik, Y.K. 1957. Keys to species of Family Drosophilidae occurring in South Korea. D.I.S., 31 : 125-129.
- Kim, K.W. 1963. Drosophilidae of Tolsan Island, Korea. D.I.S. 38 : 73.
- Kurokawa, H. 1956 Two types of *Drosophila auraria* Peng. Population genetics. Baihukan co., Tokyo, Japan. 03-05. (in Japanese).
- Kurokawa, H. 1956. Comparative studies on some characteristics of three races of *Drosophila auraria*. Annot. Zool. Jap., 29 : 225-233.
- Lee, T.J. 1959. On a new species, *Drosophila clarofinis* sp. nov. Kor. Jour. Zool., 2 : 43-45.
- Lee, T.J. 1962. Ecological studies of *Drosophila* populations in Korea. Kor. Jour. zool., 5 : 13-20.
- Lee, T.J. 1963. Genetic analysis of the polymorphism of color pattern in *D. auraria*. D.I.S., 37 : 97-98.
- Lee, T.J. 1964. New and unrecorded species of Drosophilidae in Korea. Kor. Jour. Zool., 7 : (in press).
- Lee, T.J., and Takada, H. 1959. On *Mycodrosophila koreana* sp. nov. from South Korea. Annot. Zool. Jap., 32 : 94-96.
- Makino, S., Takada, H., and Lee, T.J. 1957. Drosophilidae from Kongju in South Korea. D.I.S., 31 : 133.
- Mather, W.B. 1955. The genus *Drosophila* (Diptera) in Eastern Queensland. I. Taxonomy. Aust. Jour. Zool., 3 : 545-582.
- Mather, W.B. 1960. Additions to the *Drosophila* fauna of Australia. Univ. Queensland, 1:229-239.
- Momma, E. 1957. *Drosophila* survey of Hokkaido V. Distribution and habitats of drosophilid flies. Jour. Fac. Sci. Hokkaido Univ. VI. Zool., 13 : 93-98.
- Momma, E., Suzuki, and Makino, S. 1953. Drosophilidae feeding and breeding on fungi. D.I.S., 27 : 103-104.
- Momma, E., and Takada, H. 1954. *Drosophila* survey of Hokkaido I. Description of a new species, *Drosophila alboralis* sp. nov. (subgenus *Hirtodrosophila*). Annot. Zool. Jap. 27 : 97-101.
- Moriwaki, D., Okada, T., and Kurokawa, H. 1952. Two types of *D. auraria*. D.I.S. 26 : 112.
- Nakayama, S., and Okamoto, D. 1940. Catalogue of the insect injurious upon fruit trees in Korea. Annal. Agric. Exp. St. Govt., Chosen, 12 : 195-274.
- Okada, T. 1954. Fungus-feeding drosophilid flies in Japan. Jour. Applied Zool., 19 : 78-82.
- Okada, T. 1954. Comparative morphology of the drosophilid flies. I. Phallic organs of the *melanogaster* group. Kontyu, 22 : 36-45.
- Okada, T. 1955. Comparative morphology of the drosophilid flies. II. Phallic organs of the subgenus *Drosophila*. Kontyu, 23 : 97-104.
- Okada, T. 1956. Systematic study of Drosophilidae and allied families of Japan. Gihodo Co., (Tokyo) : 1-183.

capture of a total of 10,957 flies involving 43 species at Mt. Jukyeop (Kwangneung area) from May to November 1960. Among these species, 8 species can be added to the fauna of Kwangneung area. They are as follows: *Leucophenga quinque-maculata*, *Leucophenga* sp. from Mt. Jukyeop, *Microdrosophila purpurata*, *Microdrosophila koreana*, *Drosophila magnidentata*, *D. rufifrons*, *D. clarofinis*, and *D. pengi*.

A total of 19 species of Drosophilidae, including 3 species of unidentified species have been collected at Mt. Ohdai by Chung (1958). The author made the capture of a total of 185 flies involving 19 species at Mt. Ohdai in July 1958. Among these species, 7 species can be added to the fauna of Mt. Ohdai. They are as follows: *Leucophenga argentosa*, *Microdrosophila purpurata*, *D. busckii*, *D. melanogaster*, *D. nigromaculata*, *D. tenuicauda*, and *D. virilis*.

A total of 24 species of Drosophilidae, including 3 species of unidentified species have been collected at Mt. Sulak by Chung and Rho (1959). The author made the capture of a total of 2,468 flies involving 35 species at Mt. Sulak in July 1959 and July 1963. Among these species, 17 species can be added to the fauna of Mt. Sulak. They are as follows: *Stegana* sp., *Leucophenga argentosa*, *L. magnipalpis*, *L. concilia*, *L. maculata*, *Microdrosophila purpurata*, *M. matsudairai*, *Liodrosophila castanea*, *Scaptomyza graminum*, *D. (Loridiphosa)* sp., *D. busckii*, *D. nipponica*, *D. (Sophophora)* sp., *D. nigromaculata*, *D. bizonata*, *D. tenuicauda*, and *D. immigrans*.

In the collection for this survey, the following species were captured in northern localities more than in southern localities: *Microdrosophila purpurata*, *D. histriodes*, *D. bifasciata*, *D. unispina*, *D. takadai*, *D. kuntzei*, *D. testacea*, *D. histrio* and *D. tenuicauda*. And the following species were found in the high altitudes more than in the low altitudes: *D. histriodes*, *D. bifasciata*, *D. unispina*, *D. testacea*, *D. bizonata* and *D. histrio*. This fact suggests that these habitats are in the high altitudes or northern localities of Korea.

The following species were captured in southern localities more than in northern localities: *Microdrosophila matsudairai*, *Liodrosophila castanea*, *D. lutea* and *D. sternopleuralis*. This fact suggests that these habitats are in southern localities of Korea.

The widely distributed species in Korea are *Amiota variegata*, *Scaptomyza pallida*, *D. busckii*, *D. coracina*, *D. sukukii*, *D. melanogaster*, *D. nipponica*, *D. auraria*, *D. angularis*, *D. brachyneptros*, *D. unispina*, *D. nigromaculata*, *D. bizonata*, *D. immigrans*, *D. virilis*, *D. lacertosa* and *D. sordidula*. Among these species mentioned above, *D. busckii*, *D. melanogaster*, *D. immigrans* and *D. virilis* which are domestic species were captured near the human-habitations. *D. auraria* was most predominant with frequency of 48 per cent of the total number of 94,115, and widely distributed in Korea. This species divided into three races (A, B, and C race) mainly by forms of phallic organs and egg-guides (Moriwaki et al

1952, Okada 1954, Kurokawa 1956). In natural population, A race was abundant in low altitude places, while the B race was abundant in high altitude places as pointed out by Takada (1954). In addition, natural populations of *D. auraria* are polymorphic with regard to the intensity and extension of the pigmentation in the abdominal tergites. The female shows two forms of color pattern, dark and light, on the sixth to the ninth tergites. On the other hand, all the males have the black color pattern irrespective of their genic compositions. As a result of breeding tests on the A race of *D. auraria*, these two forms are produced by a set of allelic genes dark and light, located on an autosome. Both forms have been found in various Korean populations, the light form (about 75 per cent) being always commoner than the dark form (about 25 per cent). The light form, however, is less common in the northern localities. The number of the light form increases relatively in southern localities and decreases relatively in northern localities (Lee 1963). In the collection for this survey, the following species were captured in small number: *Amiota alboguttata* (Mt. Jukyeop; 5 specimens, Mt. Sulak; 9 specimens), *Leucophenga ornata* (Mt. Sokli; 6 specimens, Daekwanryung; 2 specimens), *Microdrosophila fuscata* (Mt. Chiri; 16 specimens, Muju; 6 specimens), *M. washimae* (Mt. Chiri; 2 specimens, Muju; 2 specimens), *Mycodrosophila japonica* (Muju; 3 specimens, Buyeo; 2 specimens), *M. shikokuana* (Mt. Jukyeop; 2 specimens), *M. splendida* (Muju; 4 specimens, Buyeo; 3 specimens), *D. rari-dentata* (Mt. Chiri; one specimen, Mt. Sulak; 12 specimens), *D. magnidentata* (Mt. Jukyeop; 2 specimens), *D. trilineata* (Mt. Jukyeop; 16 specimens), *D. quadrivittata* (Mt. Jukyeop; 18 specimens), *D. nokogiri* (Mt. Sokli; 4 specimens, Mt. Jukyeop; 10 specimens), *D. puncticeps* (Mt. Soyo; one specimen), *D. ficusphila* (Mt. Sokli; 5 specimens) and *D. magnipectinata* (Mt. Sokli; 8 specimens).

The author enumerates 6 different kinds of collecting methods as the standards of analysing the feeding habits referred to Okada (1956): **F** (fruits), **S** (sweeping), **G** (garbage), **T** (tree-blood), **M** (fungi) and **E** (human eye). Out of 65 total species collected 39 species (about 60%) have been obtained at fruit-traps, 49 species (about 75%) by sweeping, 8 species (about 12%) in garbages, 15 species (about 23%) on the tree-bloods, 6 species (about 9%) at fungi and 2 species (about 3%) around human eyes. Among the 65 species, the following 6 species such as *Amiota variegata* (**FSTE**), *D. busckii* (**FSGT**), *D. coracina* (**FSGT**), *D. nigromaculata* (**FSGT**), *D. bizonata* (**FSGT**) and *D. lacertosa* (**FSGT**) were captured by the four methods out of six different methods, which shows those species have widely ranged feeding habits. Among the 65 species, the following 6 species such as *D. suzukii* (**FST**), *D. lutea* (**FST**), *D. auraria* (**FSG**), *D. immigrans* (**FST**), *D. cheda* (**FST**) and *D. sordidula* (**FST**) were captured by the three methods. 24 species are ranged in two methods such as one **SE**, 16 **FS**, one **FM**, 2 **FG**, and 4 **FT**. Out of 65 total species

collected 29 species were captured by the single method such as 20 S, 5 M, and 4 F.

Species belonging to genera *Stegana*, *Amiota*, *Leucophenga*, *Microdrosophila*, *Scaptomyza* and most of species of subgenus *Hirtodrosophila* were captured mainly by net sweeping on various grasses. Especially, *Scaptomyza pallida* was abundantly collected by net sweeping at various localities. Species belonging to the genus *Mycodrosophila* were captured mainly on various kinds of fungus by net sweeping. A small number of *D. busckii*, *D. coracina*, *D. melanogaster*, *D. auraria*, *D. nigromaculata*, *D. bizonata*, *D. virilis* and *D. lacertosa* were found in garbages near the human habitations. A large number of *A. variegata*, *D. rufifrons* and *D. pengi* were collected on the oak trees such as *Quercus variabilis*, *Quercus acutissima* and *Quercus aliena* by net sweeping at Hongseong and Mt. Jukyeop. It seems the above three species are alive together on the oak trees and that therefore they have the same feeding habits. Most of species belonging to subgenera *Sophophora* and *Drosophila* were captured mainly at fruit-traps, except *D. puncticeps*, *D. nipponica* and *D. temicauda*.

VI. A list of species of Drosophilidae in Korea

Subfamily Steganinae

Genus *Stegana* Meigen, 1830

Subgenus *Stegana* Wheeler, 1959

Stegana (*Stegana*) sp. from Mt. Sulak

Genus *Amiota* Loew, 1862

Subgenus *Amiota* Loew, 1862

Amiota (*Amiota*) *alboguttata* (Whalberg, 1838)

Subgenus *Phortica* Schiner, 1862

Amiota (*Phortica*) *variegata* (Fallén, 1823)

Genus *Leucophenga* Mik, 1886

Subgenus *Trichiasiphenga* Duda, 1924

Leucophenga (*Trichiasiphenga*) *argentosa* Okada, 1956

Subgenus *Leucophenga* Mik, 1886

Leucophenga (*Leucophenga*) *concilia* Okada, 1956

Leucophenga (*Leucophenga*) *maculata* (Dufour, 1839)

Leucophenga (*Leucophenga*) *magnipalpis* Duda, 1924

Leucophenga (*Leucophenga*) *quinquemaculata* Strobl, 1893

Leucophenga (*Leucophenga*) *ornata* Wheeler, 1959

Leucophenga (*Leucophenga*) sp. from Mt. Jukyeop

Subfamily Drosophilinae

Genus *Microdrosophila* Malloch, 1921

Subgenus *Microdrosophila* Malloch, 1921

Microdrosophila (*Microdrosophila*) *fuscata* Okada, 1960

Microdrosophila (*Microdrosophila*) *purpurata* Okada, 1956

Microdrosophila (*Microdrosophila*) *urashimae* Okada, 1960

Subgenus *Oxystyloptera* Okada, 1960

Microdrosophila (*Oxystyloptera*) *matsudairai* Okada, 1960

Genus *Mycodrosophila* Oldenberg, 1914

Mycodrosophila *basalis* Okada, 1956

Mycodrosophila *japonica* Okada, 1956

Mycodrosophila *koreana* Lee & Takada, 1959

Mycodrosophila *poecilogastra* (Loew, 1874)

Mycodrosophila *shikokuana* Okada, 1956

Mycodrosophila *splendida* Okada, 1956

Genus *Liodrosophila* Duda, 1922

Liodrosophila *castanea* Okada & Chung, 1960

Liodrosophila sp. from Mt. Kyelyong

Genus *Scaptomyza* Hardy, 1843

Subgenus *Scaptomyza* Hardy, 1849

Scaptomyza *graminum* (Fallén, 1823)

Subgenus *Parascaptomyza* Duda, 1924

Scaptomyza *pallida* (Zetterstedt, 1847)

Genus *Drosophila* Fallén, 1823

Subgenus *Dichaetophora* Duda, 1940

Drosophila (*Dichaetophora*) *magnidentata* Lee, 1964

Drosophila (*Dichaetophora*) *raridentata* Okada & Chung, 1960

Subgenus *Lordiphosa* Basden, 1961

Drosophila (*Lordiphosa*) sp.

Subgenus *Hirtodrosophila* Duda, 1923

Drosophila (*Hirtodrosophila*) *histrioides* Okada & Kurokawa, 1957

Drosophila (*Hirtodrosophila*) *nokogiri* Okada, 1956

Drosophila (*Hirtodrosophila*) *quadrivittata* Okada, 1956

Drosophila (*Hirtodrosophila*) *sexvittata* Okada, 1956

Drosophila (*Hirtodrosophila*) *trilineata* Chung, 1960

Subgenus *Dorsilopha* Sturtevant, 1939

Drosophila (*Dorsilopha*) *busckii* Coquillett, 1901

- Subgenus *Paradrosophila* Duda, 1924
- Drosophila* (*Paradrosophila*) *coracina* Kikkawa & Peng, 1938
- Drosophila* (*Paradrosophila*) *puncticeps* Okada, 1956
- Drosophila* (*Paradrosophila*) *rufifrons* Loew, 1873
- Drosophila* (*Paradrosophila*) sp. from Hongseong
- Subgenus *Sophophora* Sturtevant, 1939
- obscura* species-group Sturtevant, 1942
- obscura* species-subgroup Patterson & Wheeler, 1949
- Drosophila* (*Sophophora*) *bifasciata* Pomini, 1940
- melanogaster* species-group Sturtevant, 1942
- suzukii* series Okada, 1954
- suzukii* species-subgroup Hsu, 1949
- Drosophila* (*Sophophora*) *suzukii* (Matsumura, 1931)
- melanogaster* series Okada, 1954
- takahashii* species-subgroup Hsu, 1949
- Drosophila* (*Sophophora*) *lutea* Kikkawa & Peng, 1938
- melanogaster* species-subgroup Hsu, 1949
- Drosophila* (*Sophophora*) *melanogaster* Meigen, 1830
- ficuspshila* species-subgroup Okada, 1954
- Drosophila* (*Sophophora*) *ficuspshila* Kikkawa & Peng, 1938
- montium* series Okada, 1954
- nipponica* species-subgroup Okada, 1954
- Drosophila* (*Sophophora*) *clarofinis* Lee, 1959
- Drosophila* (*Sophophora*) *magnipectinata* Okada, 1956
- Drosophila* (*Sophophora*) *nipponica* Kikkawa & Peng, 1938
- montium* species-subgroup Hsu, 1949
- Drosophila* (*Sophophora*) *auraria* Peng, 1937
- Drosophila* (*Sophophora*) sp. from Mt. Sulak
- Subgenus *Drosophila* Fallén, 1823
- quinaria* section Hsu, 1949
- quinaria* species-group Sturtevant, 1942
- Drosophila* (*Drosophila*) *angularis* Okada, 1956
- Drosophila* (*Drosophila*) *brachynephros* Okada, 1956
- Drosophila* (*Drosophila*) *nigromaculata* Kikkawa & Peng, 1938
- Drosophila* (*Drosophila*) *kuntzei* Duda, 1924
- Drosophila* (*Drosophila*) *takadai* Lee, 1964

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IX. References

- Basden, E.B. 1952. Some Drosophilidae (Diptera) of the British Isles. Ent. Mon. Mag., 88 : 200-201.
- Basden, E.B. 1954. The distribution and biology of Drosophilidae (Diptera) in Scotland, including a new species of *Drosophila*. Trans. Royal Soc. Edinburgh, 62 : 603-654.
- Basden, E.B. 1957. Japanese Drosophilidae (Diptera) : A review. Ent. Mon. Mag., 93 : 208-211.
- Basden, E.B. 1961. Type collections of Drosophilidae (Diptera) 1. The Strobl collection. Beiträge zur Entomologie, 11 : 160-224.
- Burla, H. 1948. Die Gattung *Drosophila* in der Schweiz., Rev. Suiss. de Zool., 55 : 272-279.
- Burla, H. 1951. Systematik, Verbreitung und Oekologie der *Drosophila*-arten der Schweiz. Rev. Suiss. de Zool., 58 : 23-175.
- Burla, H. 1954. Zur kenntnis der Drosophiliden der elfenbeinküste. Rev. Suiss. de Zool., 61 : 1-128.
- Burla, H. 1956. Die Drosophilidengattung *zygothrica* und ihre beziehung zur *Drosophila* untergattung *Hirtodrophila*. Mitt. Zool. Mus. Berlin, 32 : 190-321.
- Chung, Y.J. 1955. Collection of wild *Drosophila* on Quelpart Island, Korea. D.I.S., 29 : 111.
- Chung, Y.J., Paik, Y.K., Kim D.U., and Kim, K.W. 1956. Further information regarding Drosophilid species in Korea. D.I.S., 30 : 110-111.
- Chung, Y.J. 1958. Drosophilid survey of ten localities, South Korea. Kor. Jour. Zool., 1 : 33-37.
- Chung, Y.J. 1959. Drosophilid survey of Mt.Sulak. Kor. Jour. Zool., 2 : 37-42.
- Chung, Y.J. 1959. Drosophilid survey of Huksan Island. Annual Report Kor. culture Research Institute, Ewha women's Univ. 1 : 391-398.
- Chung, Y.J. 1960. On a new species *Drosophila trilineata* sp.nov. Kor. Jour. Zool., 3 : 41-44.
- Da Cunha, A.B., Dobzhansky, Th., and Sokoloff, A. 1951. On food preference of sympatric species of *Drosophila*. Evolution, 5 : 97-101.
- Dobzhansky, Th. and Pavan, C. 1943. Studies on Brazilian species of *Drosophila*. Bol. Fac. Filos Cien. Sao Paulo No.36, Biol. Geral., 4 : 7-72.
- Hsu, T.C. 1949. The external genital apparatus of the male Drosophilidae in relation to systematics. Univ. Tex. Publ., 4920 : 80-142.
- Kang, Y.S., Chung, O.K., and Lee, H.Y. 1958. Drosophilidae species of Seoul and adjacent localities (1). Kor. Jour. Zool., 1 : 57-58. (in Korean).
- Kang, Y.S., Chung, O.K., and Lee, H.Y. 1959. Studies on the classification and the living conditions of Drosophilidae in Korea (2). Kor. Jour. Zool., 2 : 61-65. (in Korean).
- Kang, Y.S., Chung, O.K., and Lee, H.Y. 1960. Studies on the classification and the living conditions of Drosophilidae in Korea (3). Kor. Jour. Zool., 3 : 5-8. (in Korean).

- Okada, T. 1960. On the Japanese species of the genus *Amiola* Loew (Diptera, Drosophilidae). *Mushi*, 34 : 89-102.
- Okada, T. 1960. The genus *Microdrosophila* malloch from Japan (Diptera, Drosophilidae). *Kontyu*, 28 : 211-222.
- Okada, T. 1962. Bleeding sap preference of the drosophilid flies. *Jap. Jour. Applied Ent. Zool.*, 6 : 216-229.
- Okada, T. 1964. New and unrecorded species of Drosophilidae in the Amami island, Japan. *Kontyu*, 32 : 105-115.
- Okada, T., and Chung, Y.J. 1960. Three species of Drosophilidae from South Korea. *Akitu*, 9 : 25-30.
- Okada, T., and Kurokawa, H. 1957. New or little known species of Drosophilidae of Japan (Diptera). *Kontyu*, 25 : 2-12.
- Okada, T., and Lee, H.Y. 1961. A new species of *Hirtodrosophila* from South Korea. *Akitu*, 10 : 20-22.
- Paik, Y.K. 1958. Seasonal changes in *Drosophila* populations at the two adjacent areas in Korea. Commemoration theses for the sixtieth birth day of Dr. Chang Choon Woo. 209-227.
- Paik, Y.K., and Kim, W.K. 1957. Identification of a few uncertain species of *Drosophila* reported in D.I.S. 30. *D.I.S.*, 31 : 151.
- Paik, Y.K., and Kim, K.W. 1957. Local key to species of Drosophilidae collected so far in South Korea. *D.I.S.*, 31 : 153.
- Patterson, J.T. 1943. The Drosophilidae of the Southwest. *Univ. Texas Publ.* 4313 : 7-216.
- Patterson, J.T., and Mainland, G. B. 1944. The Drosophilidae of Mexico. *Univ. Texas Publ.*, 4445 : 9-101.
- Patterson, J.T., and Stone, W.S. 1952. Evolution in the genus *Drosophila*. New York, The Macmillan Co., 610 pp.
- Patterson, J.T., and Wagner, R.P. 1943. Geographical distribution of species of the genus *Drosophila* in United States and Mexico. *Univ. Texas Publ.*, 4313 : 217-281.
- Patterson, J.T., and Wheeler, M.R. 1942. Description of new species of the subgenera *Hirtodrosophila* and *Drosophila*. *Univ. Texas Publ.*, 4213 : 67-109.
- Patterson, J.T., and Wheeler, M.R. 1949. Catalogue of described species belonging to the genus *Drosophila*, with observations on their geographical distribution. *Univ. Texas Publ.*, 4920 : 207-233.
- Peng, F.T. 1937. On some species of *Drosophila* from China. *Annot. Zool. Japon.*, 16 : 20-27.
- Sturtevant, A.H. 1942. The classification of the genus *Drosophila*, with descriptions of nine species. *Univ. Texas Publ.*, 4213 : 5-51.
- Takada, H. 1954. Two types of *D. auraria*, with special regard to the difference in distribution by altitude. *Jap. Jour. Genet.*, 29 : 109-113. (in Japanese with English résumé)
- Takada, H. 1957. Some collections of *Drosophila* in Hokkaido through traps using fermenting fruits. *Jap. Jour. Zool.*, 66 : 206-212. (in Japanese with English résumé).
- Takada, H. 1958. *Drosophila* survey of Hokkaido X. Drosophilidae from several localities of Hokkaido. *Jour. Fac. Scie. Hokkaido Univ. IV. Zool.*, 14 : 120-127. (in Japanese with English résumé).
- Takada, H. 1959. *Drosophila* survey of Hokkaido IX. On *Drosophila okadadai* sp. nov. with supplementary notes on the female of *Scaptomyza polygonia* Okada. *Annot. Zool. Jap.*

- 32 : 152-155.
- Takada, H. 1960. *Drosophila* survey of Hokkaido XIII. Some remarkable or rare species of *Drosophila* from the southern most area in the Hidaka mountain range. Annot. Zool. Jap., 33 : 188-195.
- Takada, H., and Lee, T.J. 1958. A preliminary survey of the Drosophilidae from Kongju and its adjacent localities, South Korea. Annot. Zool. Jap., 31 : 113-116.
- Takada, H., and Okada, T. 1958. *Drosophila* survey of Hokkaido VI. A new species of the *virilis* group of the genus *Drosophila* (Diptera). Jap. Jour. Zool., 12 : 133-137.
- Takada, H., and Okada, T. 1960. *Drosophila* survey of Hokkaido XI. A new species of *Drosophila* (*Sophophora*) from Japan. Annot. Zool. Jap., 33 : 142-145.
- Tan, C.C., Hsu, T.C., and Sheng, T.C. 1949. Known *Drosophila* species in China with descriptions of twelve new species. Univ. Texas Publ., 4920 : 196-206.
- Wheeler, M.R. 1949. Taxonomic studies on the Drosophilidae. Univ. Texas Publ., 4920 : 157-195.
- Wheeler, M.R. 1957. Taxonomic and distributional studies of nearctic and neotropical Drosophilidae. Univ. Texas Publ., 5721 : 79-114.
- Wheeler, M.R. 1959. A nomenclatural study of the genus *Drosophila*. Univ. Texas Publ., 5914 : 181-205.
- Wheeler, M.R. 1960. A new subgenus and species of *Stegana* Meigen. Ent. Soc. Washington, 62 : 109-111.
- Wheeler, M.R., and Takada, H. 1963. A revision of the American species of *Mycodrosophila* (Diptera: Drosophilidae). Ann. Entomol. Soc. Amer., 56 : 392-399.