

Yoshio Ohada
Department of Biology
Faculty of Science
Tokyo Metropolitan University
Setagaya-Ku, Tokyo, JAPAN

✓ DROSOPHILID SURVEY OF MT. SUL-AK (KANG-WON PROVINCE)

Chung, Yong Jai and Rho, Bun Jo

(Department of Biology, Ewha Womans University)

田
岡
博
七

著
者
謹
呈

Reprinted from

THE KOREAN JOURNAL OF ZOOLOGY

Vol. 11, No. 2

December, 1959

DROSOPHILID SURVEY OF MT. SUL-AK (KANG-WON PROVINCE)

CHUNG, Yong Jai and RHO, Bun Jo

(Department of Biology, Ewha Womans University)

雪岳山の 초파리 分布調査

鄭 塔 載 · 盧 粉 祚

(梨花女子人學校 · 師人 · 生物學科)

(Received Dec. 7, 1959)

摘 要

1. 著者들이 1959年 7月 14일부터 22일까지에 江原道 雪岳山の 9 個所 即 壯水台, 十二탕골, 百潭寺, 五歲庵, 水廉洞, 鳳頂庵, 伽야洞, 馬等嶺, 및 神興寺에서 主要 복숭아 trap法과 sweeping法으로 採集한 Drosophilidae는 4屬 4亞屬 22種 512個體였다.
2. *D. auraria*, *D. testacea*, *D. brachynephros*, *D. sexivittata*, *D. unispina*, *D. bifasciata*, *Amiota variegata*, *D. angularis* 및 *D. histrio*가 多數 採集되었으며 *Mycodrosophila*屬과 *Chymomyza*屬의 種은 本 採集에서 볼 수 없었고 다른곳에서 흔히 잡히는 *D. bizonata*, *D. nigromaculata*도 採集되지 않았다.
3. *D. sexivittata*, *D. testacea*의 Polymorphism, *D. brachynephros*, *D. angularis*, *D. unispina*의 區別, *D. lacertosa*와 *Amiota variegata*의 crossvein, *A. alboguttata*의 genitalia, *D. histrio*의 abdominal band 및 crossvein C₃ bristle 問題를 檢討했다.
4. *D. kuntzei*는 韓國産 Drosophilidae 目錄에 새로 添加할 未記錄種이며 未知種 3種 即 *A. (A.) sp.*, *D. (D.) sp.*, *D. (S.) sp. like helvetica* BURLA의 檢討를 銳意 進行中에 있다.

During the past several years, investigations into the taxonomical, distributional and ecological features of drosophilid flies in Korea have brought considerable progress by Kikkawa & Peng(1938), Chung (1955), Chung *et al*(1953), Kim & Paik(1959), Takada & Lee(1953), Kang *et al*(1958), Chung (1953) and Lee(1959). Such studies have resulted in a considerable accumulation of data contributing to drosophilid science on the basis of population genetics and cytotaxonomy.

The present authors collected and examined drosophilid flies for a period from 14th to 22nd July, 1959 in the following 9 areas of Mt. Sul-Ak(Kang-Won Province): Chang-Soo-Dai, Sibi-Tang-Gol, Paik-Tam Temple, Oh-Se-Am, Soo-Ryum-Dong, Bong-Jung-Am, Ka-Ya-Dong, Ma-Deung-Ryung and Sin-Heung Temple. The present collection was made by using traps baited with fermenting peaches and by sweeping on grasses, mushrooms and garbages; the result is shown in the capture of 512 drosophilids involving 22 species.

The authors are specially grateful to Dr. Okada Toyohi of Tokyo Metropolitan University, Japan, for his invaluable advices and helpfulness given in the identification of some species and to Dr. E. B. Basden of Edinburgh University, Great Britain, and Mr. Takada Haruo of Otaru Fishery High School, Japan, for their many helpful suggestions.

The present collecting journey was made in company with the expedition group of Mt. Sul-Ak, the alpinists of Ewha Womans University. Here the authors needs must express their cordial thanks to all

the members of expedition.

Considerations about drosophilid fauna of Mt. Sul-Ak.

As Table-1 shows, 512 of drosophilid flies involving 4 genera, 4 subgenera, 22 species were obtained at 9 different areas of Mt. Sul-Ak. Species, obtained 30 or more in number are *D. auraria*(85 in total) *D. testacea*(72), *D. brachynephros*(72), *D. sexivittata*(38), *D. unispina*(36), *D. bifasciata*(34), *Amiota variegata*(34), *D. angularis*(31) and *D. histrio*(30). To classify the flies of *D. auraria* according to its three types, the composition was as follows: Type-A 6, Type-B 67, Type-C 12. This fact suggests, as Kurokawa(1956), Okada(1956) and Takada(1954) did, that Type-B is abundant at remote localities far from human habitations. Species belonging to Genus *Mycodrosophila* and to Genus *Chymomyza* were not appeared in the present collection; the latter, what is more, has not appeared in Korean drosophilid fauna so far.

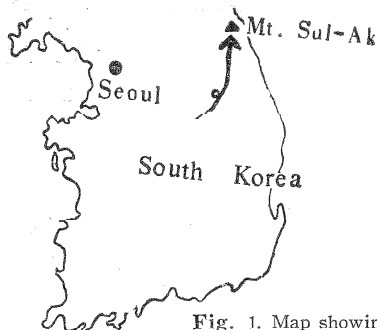


Fig. 1. Map showing Mt. Sul-Ak where the present collection was made.

Table 1. Drosophilid Flies Obtained from Mt. Sul-Ak(Kang-Won Province)

Species	Areas*									Total	Collecting Methods**
	1	2	3	4	5	6	7	8	9		
<i>Amiota (Amiota) alboguttata</i>	•	3	•	•	•	•	•	•	•	3	S
<i>A. (Phortica) variegata.</i>	•	11	8	10	•	•	•	•	5	34	T, S, Sm
<i>Leucophenga (Leucophenga) quinque-maculipennis</i>	1	•	•	•	•	•	•	•	•	1	T
<i>Scaptomyza disticha</i>	•	•	1	•	•	1	•	•	1	3	T, Sm
<i>Drosophila (Hirtodrosophila) alboralis</i>	•	•	•	1	•	1	•	•	•	2	T
<i>D. (H.) sexivittata</i>	•	•	5	•	6	•	1	26	•	38	T, S, Sm
<i>D. (H.) histrioides</i>	2	•	4	2	1	•	•	•	1	10	T, S, Sm
<i>D. (Paradrosophila) coracina</i>	1	•	13	•	•	•	•	1	4	19	T, Sm
<i>D. (Sophophora) bifasciata</i>	•	•	•	28	4	1	1	1	•	34	T, Sm
<i>D. (S.) suzukii</i>	•	•	6	4	•	•	•	•	•	10	T
<i>D. (S.) melanogaster</i>	•	•	1	•	•	•	•	•	•	1	S
<i>D. (S.) auraria (Type A)</i>	2	•	2	2	•	•	•	•	•	6	T, Sm
_____ (Type B)	25	•	11	30	•	•	•	•	1	67 ⁸⁵	T, S, Sm
_____ (Type C)	2	•	2	7	•	•	•	•	1	12	T, Sm
<i>D. (Drosophila) brachynephros</i>	22	•	9	26	•	•	•	•	15	72	T, S, Sm
<i>D. (D.) angularis</i>	14	•	8	1	•	•	•	•	8	31	T, S, Sm
<i>D. (D.) unispina</i>	7	•	9	7	2	3	•	•	8	36	T, S, Sm
<i>D. (D.) Kuntzei</i>	2	•	2	1	•	•	•	•	•	5	T, Sm
<i>D. (D.) testacea</i>	8	•	5	47	1	2	1	•	8	72	T, S, Sm
<i>D. (D.) histrio</i>	14	•	2	9	•	2	•	•	3	30	T, S, Sm
<i>D. (D.) lacertosa</i>	2	•	2	9	•	•	•	•	•	13	T, Sm
<i>D. (S.) sp. like helvetica</i>	•	•	•	11	•	•	•	•	•	11	T
<i>A. (A.) sp.</i>	•	1	•	•	•	•	•	•	•	1	S
<i>D. (D.) sp.</i>	•	•	1	•	•	•	•	•	•	1	Sm

Total : 512

* Areas* 1. Chang-Soo-Dai. 2. Sibi-Tang-Gol. 3. Paik-Tam Temple. 4. Oh-Se-Am. 5. Soo-Ryum-Dong.
6. Bong-Jung-Am. 7. Ka-Ya-Dong. 8. Ma-Deung-Ryung. 9. Sin-Heung Temple.

** Collecting methods: T—trapping S—sweeping on grasses. Sm—sweeping on mushrooms.

Only one species of Genus *Leucophenga* (*L. quinqueaculipennis*) and also one species of Genus *Scaptomyza* (*S. disticha*) were obtained. *D. bizonata* and *D. nigromaculata* which have been commonly collected in other localities in Korea were not captured in the present collection. Most members of *D. bifasciata* captured in the present collection were blackish and only 2 were yellowish. The indoor collections were not undertaken in the present collections. Such a domestic species as *D. melneogaster* or *D. virilis* was very little or not at all shown in the Table-1. However, a female of *D. melanogaster* was captured around Paik-Tam Temple by sweeping, not by trapping. The authors, doubtful whether it be the species, examined closely expecting of it to be *D. simulans*. But it turned out to be *D. melanogaster* betraying the expectation. Of the 3 species belonging to *quinaria* species-group, *D. brachynephros* was abundantly collected far more than the other 2 species (*D. angularis* and *unisipina*). The members of *robusta* species-group listed in the Korean drosophilid fauna are *D. lacertosa*, *D. cheda*, *D. sordidula* and *D. moriwakii*. In the present collection, only *D. lacertosa* was obtained. The authors, therefore, are led to regard that *D. lacertosa* is the most dominant species in members of *robusta* species-group in Korea.

Some remarks for certain species

D. sexivittata and *D. testacea*, collected abundantly in the present collection and have been collected in the various localities of Korea. They exhibit considerable polymorphisms. Some of *D. sexivittata* have yellow mesonotum with distinct 3 pairs of narrow black longitudinal stripes as the original description shows (Okada, 1956), but in some, stripes especially outermost ones are so indistinct that they are apt to be mistaken for *D. quadrivittata*. The coloration and band pattern of *D. testacea* show much variations intraspecifically—some are dark brown; some, yellow; and some, intermediate. Dr. Okada and Mr. Takada informed the senior author in their private letters that Japanese species of *D. sexivittata* and *D. testacea* show also considerable polymorphisms. As far as the present authors are concerned with the classification of *D. brachynephros*, *D. angularis* and *D. unispina*, morphological differences of the above 3 species with respect to general external features especially abdominal patch patterns seem to be not clear-cut on account of their variations. The senior author sent a letter of inquiry about the fact mentioned above to Dr. Okada, the original describer of the above 3 species. He also approved of the above fact in his reply. The authors classified them mainly by phallic organs and periphallal organs of males and egg-guides of females. *D. transversa* FALLEN was not captured in the present collection; furthermore, it has not yet appeared in drosophilid collections. Which the authors were concerned so far. Crossveins of Korean *Amiota variegata* are fuscous, but they are clear in the figure of its wing in Okada's work (1956). Dr. Okada stated that his description was wrong in his letter to the senior author. And also Dr. Basden had indicated this point. Male genitalia (periphallal organs) of Korean *Amiota alboguttata* are slightly different from those of Japanese. The comparison of Korean species with European ones was not undertaken. This is said to be pending species in Europe. This species should be brought under sharp discussion. In the original description of *D. lacertosa* (Okada, 1956), crossveins are clear, but they are weakly fuscous in the species obtained in the present collection. This fact should be examined thoroughly in the nearest future. According to Kikkawa & Peng's, description on *D. insirio*, crossveins are clear, but in Korean species, it is weakly fuscous and also the fact that abdominal tergite bands are, in some members of the species, different between male and female, is contrary to Kikkawa & Peng's description. Intraspecific variations of C-3 bristles are considerable.

D. Kuntzei obtained in the present collection is new to the Korean drosophilid fauna. *Amiota* (*Amiota*) sp. (see Fig. 2①) differs distinctly from *A. (A.) alboguttata*. It resembles *A. (A.) stylopyga* WAKAHAMA & OKADA in the general feature of male genitalia and teeth-number of clasper, being quite different from which in clasper shape and others. The present species also resembles *A. (A.) kingstoni* WHEELER in clasper shape, but is quite different from it in the teeth-number of clasper and others. Dr. OKADA indicated that the present species has not yet appeared in Japanese drosophilid fauna in his reply to the senior author's letter of inquiry about the species. The authors think that this species seems to be new to science. Then, it will be the third member of the Genus *Amiota* from Korea. Up to the recent days, the following 2 species, *A. (A.) alboguttata* and *A. (P.) variegata* have been recorded from various localities in Korea by several investigators of the Korean drosophilid fauna. *D. (D.)* sp. (see Fig. 2②) is closely allied to *D. acutissima* OKADA from Japan in general external features, but differs distinctly from it in having only four teeth of clasper. The authors have not yet examined such a characteristic feature of clasper as the present one, as far as the authors dealt with specimens or literatures of drosophilid species. Dr. Okada agreed with the author's opinions. The present species, therefore, seems to be new to science. *D. (S.)* sp. like *helvetica* BURLA shows close resemblance to *D. (S.)* sp. cf. *helvetica* figured and described by Okada (1956) from Japan. Only slight difference seem to be the number of clasper teeth. Both sexes of the species are being minutely examined by the authors. The authors are making an exhaustive study of the above three species, *A. (A.)* sp., *D. (S.)* sp. like *helvetica* BURLA with the kind suggestions and invaluable advices of Dr. Okada. The result will be reported in the near future.

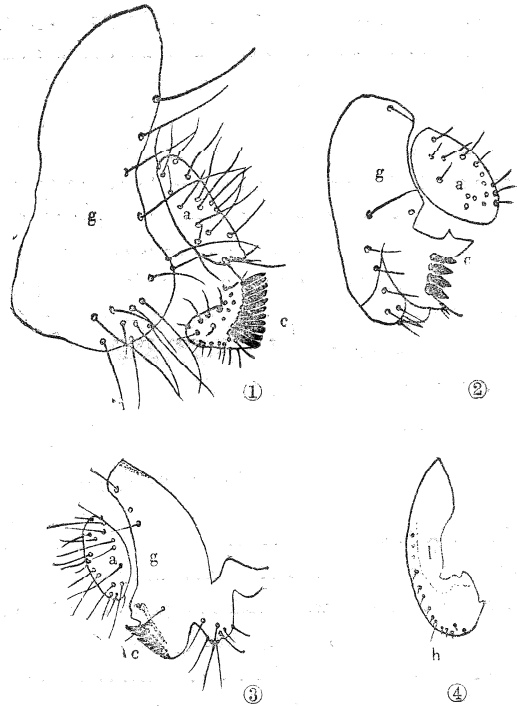


Fig. 2 ① *Amiota* sp. periphallic organ; ② *Drosophila* (*Drosophila*) sp., periphallic organ; ③ *Drosophila* (*Sophophora*) sp. like *helvetica* BURLA, periphallic organ; ④ *ibid.*, egg-guide. a anal plate; c. clasper g. genital arch; h. subterminal hair; l. lobe.

SUMMARY

Collections of drosophilid flies were undertaken at nine areas of Mt. Sul-Ak (Kang-Won Province), Chang-Soo-Dai, Sibi-Tang-Gol, Paik-Tam Temple, Oh-Se-Am, Soo-Ryum-Dong, Bong-Jung-Am, Ka-Ya-Dong, Ma-Deung-Ryung and Sin-Heung Temple, from 14th to 22nd, July 1959 by trapping and sweeping. Data obtained from the collections are presented in Table 1 in this paper.

A total of 512 specimens was obtained. They were classified into 22 species of Drosophilidae as Table 1 shows. Among them the following species were found to be abundant in occurrence:

D. auraria, *D. testacea*, *D. brachynephros*, *D. sexvittata*, *D. unispina*, *D. bifasciata*, *Amiota variegata*, *D. angularis* and *D. histrio*. Species belonging to Genera *Chymomyza* and *Mycodrosophila* were not appeared in the present collection.

Some remarks for the following species were given: *D. sexivittata*, *D. testacea*, *D. brachynephros*, *D. angularis*, *D. unispina*, *Amiota variegata*, *A. alboguttata*, *D. lacertosa* and *D. histrio*.

D. kuntzei found in the present collection is new to the Korean drosophilid fauna.

Amiota (A.) sp., *D.* (D.) sp. and *D.* (S.) sp. like *helvetica* BURLA are being examined exhaustively by the authors and the result will be reported soon.

REFERENCES

- Basden, E. B. 1952, Some Drosophilidae (Diptera) of the British Isles. Ent. Month. Mag. 88 : 200-201
- _____ & D.G. Harnden 1956, Drosophilidae (Diptera) within the Arctic circle II. The Edinburgh University Expedition to Sub-arctic Norway, 1953. Royal Ento. Soci. 108(5) : 147-162
- _____ 1957, Japanese Drosophilidae (Diptera) : A review. Ent. Month. Mag. XCIII : 208-211.
- Burla, H. 1954, Zur Kenntnis der Drosophiliden der Elfenbeinküste (Französisch West-Afrika). Rev. Suisse de zool. 61 : 1-218.
- _____ 1956, Die Drosophiliden Gattung *Zygothrica* und ihre Beziehung *Hirtodrosophila*. Mitteilung. zool. Muse. in Berlin. 32(2) : 190-321.
- Chung, Y. J. 1955, Drosophilid flies from Korea. D.I.S. 29 : 111
- _____ et al 1956, Report on Drosophilid Collections from Korea. D.I.S. 30 : 110-111
- _____ 1958, Drosophilid survey of ten localities, South Korea. Korean Jour. Zool 1(2) : 33-37.
- Hsu, T.C. 1949, The external genital apparatus of male Drosophilidae in relation to systematics. Univ. Texas Publ. 4920 : 80-142.
- Kang, Y.S. et al 1958, Drosophilidae species of Seoul and adjacent localities. Korean Jour. Zool. 1(2) : 57-58 (in Korean).
- Kikkawa, H. & F. T. Peng 1938, *Drosophila* species of Japan and adjacent localities. Jap. Jour. Zool. 7 : 507-552.
- Kim, K. W. & Y.K. Paik 1957, key to the species of Genera of Family Drosophilidae occurring in South Korea. D.I.S. 31 : 125.
- Kurokawa, H. 1952, Sexual isolation between 2 types of *Drosophila auraria* PENG. Jap. Jour. Genet. 27 : 225 (in Japanese).
- _____ 1956, Two types of *Drosophila auraria* PENG. Population Genetics. 93-95, Baihukang co., Tokyo, Japan (in Japanese).
- _____ 1956, Comparative studies on some characteristics of three races of *Drosophila auraria*. Annot. Zool. Jap. 29(4) : 225-233.
- _____ 1958, On 3 races of *Drosophila auraria* PENG. Bulletin of the Biogeographical Society of Japan. 20(1) : 1-3.
- Lee, T. J. & H. Takada 1959, On *Mycodrosophila koreana* sp. nov. from South Korea. Annot. Zool. Jap. 32(2) : 94-96.
- Momma, E. & H. Takada 1954, *Drosophila* survey of Hokkaido I. Description of a new species, *D. alboralis* sp. nov. Annot. Zool. Jap. 37(2) : 97-101.
- Ohba, S. 1956, Seasonal variation of some species of *Drosophila*. Population genetics. 88-90, Baihukang co., Tokyo, Japan (in Japanese).
- Okada, T. 1954, Comparative morphology of the drosophilid flies. I. Phallic organs of the *melanogaster* group. Kontyu. 22 : 36-45.
- _____ 1955, Comparative morphology of the drosophilid flies. II. Phallic organs of the subgenus *Drosophila*. Kontyu. 23 : 97-104.

- _____ & H. Kurokawa 1956, New or little known species of Drosophilidae of Japan (Diptera). Kontyu. 25 : 2-12.
- _____ 1956, Systematic study of Drosophilidae and allied families of Japan. Gihodo co., Tokyo, Japan.
- Paik, Y. K. & K. W. Kim 1957, Local key to the Family Drosophilidae in South Korea. D. I. S. 31 : 153.
- Takada, H, 1954, Two types of *D. auraria*, with special regard to the difference in distribution by altitude. Jap. Jour. Genet. 29 : 109-113.
- _____ 1957, some collections of *Drosophila* in Hokkaido through traps using fermenting fruits. Jap. Jour. Zool. 66(4) : 206-212 (in Japanese).
- _____ 1958, *Drosophila* survey of Hokkaido X. Drosophilidae from several localities of Hokkaido. Jour. Fac. Scie. Hokkaido Univ. Zool. 14(1) : 120-127.
- _____ & T. Okada 1958, *Drosophila* survey of Hokkaido VI. A new species of the virilis group of the genus *Drosophila* (diptera). Jap. Jour Zool. 12(2) : 133-137.
- _____ & T. J. Lee 1958, A preliminary survey of the Drosophilidae from Kongju and its adjacent localities, South Korea. Annot. Zool. Jap. 31 : 113-116.
- _____ 1959, *Drosophila* survey of Hokkaido IX. On *Drosophila okadai* sp. nov. with supplementary notes on the females of *Scaptomyza polygonia* Okada. Annot. Zool. Jap. 32 : 152-155.
- Tan, C. C. *et al* 1949, Known *Drosophila* species in China with descriptions of twelve new species. Univ. Teas. Publ. 4920 : 196-206.
- Wakahama, K. & T. Okada 1953, *Drosophila* survey of Hokkaido VIII. Description of a new species of the Genus *Amiota* (Drosophilidae) from Japan. Annot Zool. Jap. 31(2) : 109-112.
- Wheeler, M. R. 1949, Taxonomic studies on Drosophilidae. Univ. Texas Publ. 4920 : 157-195.