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**Drosophila Survey of Hokkaido, XXIV.
On Drosophila Collections of Six Localities
in the Southwestern Part of Hokkaido¹⁾²⁾**

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(With 1 Text-figure and 1 Table)

During a period from 1952 to 1963, our working group reported the results of drosophilid collections in the following localities of the southwestern part of Hokkaido; Imagane, Hanaishi, Oshoro, Otaru, Shioya, Yoichi, Hakodate, Shakotan, Taisei, Okushiri Isl, Oshima-Yoshioka and Toya, based on distributional and ecological surveys. In spite of a rather broad survey, the number of species and flies collected were relatively few. This paper reports collection records obtained in a period from 1964 to 1965 at six other localities.

The authors express their cordial thanks to Professor Sajiro Makino and Dr. Eizi Momma for their kind direction with valuable suggestions during the survey.

Localities and Methods of Collection: Collections of Dorosophilidae were made in the following six localities: (1) Matsumae, near the end of the Oshima Peninsula, from the 21st to the 23rd of July, 1964; (2) Esan, near the end of Esan Peninsula, from the 8th to the 10th of July, 1964; (3) Ohnuma, the northern side of Lake Ohnuma, from the 3rd to the 6th of August, 1965; (4) Gun-nai, about 25 km southern part of Suttu, from the 4th to the 6th of August, 1964; (5) Shakotan, about 7 km southwest from Bikuni of the Shakotan Peninsula, from the 30th of July to the 1st of August, 1965; and (6) Utasutsu, faced Suttu Bay, from the 25th to the 28th of July, 1965. The localities are shown in Figure 1.

Collections were made mostly by exposing fermenting fruits, together with incidental collections with net-sweeping on various kinds of grasses. Traps containing fermenting banana pieces to which water suspension of Baker's yeast (*Saccharomyces cerevisiae*) was added, were used in this survey with an exception at Shakotan where apple and tomato were used without addition of any yeast. Traps were placed in shady sites on the preceding day of collections, being suspended by strings from branches of trees or shrubs to keep at height of about 30-50 cm from the ground. The traps used in the collections were as follows: paper cups with a capacity of about 180 ml, dry-milk cans about 660 ml, those with about 1,000 ml or more in capacity. Those traps were covered with vinyl sacks. The flies in the vinyl sack were then transferred to glass vials containing 70% alcohol, took along to the laboratory, and they were examined under a binocular microscope. In the following four

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localities, Matsumae, Esan, Ohnuma and Gun-nai, flies were collected on three successive days, at one-hour-intervals from 4.00 a.m. to 7.00 p.m. In Ohnuma, incidental collections were also made in the morning on an additional day. In two other localities, Utsutsu and Shakotan, flies were occasionally caught with traps, and also by net-sweeping. Temperature, humidity, cloud amount and wind class were recorded at each place.

Table 1. Numerical data of Drosophilidae from six localities

Localities Dates Years Methods Species	Matsumae July 21-23 1964		Esan July 8-10 1964	
	Trap		Trap	
	♀ ♀	♂ ♂	♀ ♀	♂ ♂
<i>Amiota stylopyga</i>	—	—	—	—
<i>A. variegata</i>	1	0	—	—
<i>Microdrosophila cristata</i>	—	—	—	—
<i>Scaptomyza pallida</i>	—	—	—	—
<i>S. polygonia</i>	—	—	—	—
<i>S. okadai</i>	—	—	—	—
<i>Drosophila sexvittata</i>	—	—	—	—
<i>D. histrioides</i>	—	—	1	0
<i>D. coracina</i>	20	18	—	—
<i>D. sp. of fenestrarum group</i>	—	—	—	—
<i>D. bifasciata</i>	—	—	—	—
<i>D. suzukii</i>	1	0	—	—
<i>D. lutea</i>	0	1	—	—
<i>D. magnipectinata</i>	—	—	—	—
<i>D. auraria</i> race A	30	30	34	36
<i>D. auraria</i> race B	248	568	33	43
<i>D. auraria</i> race C	2	2	—	—
<i>D. brachynephros</i>	6	1	0	1
<i>D. nigromaculata</i>	63	41	2	0
<i>D. testacea</i>	6	4	1	0
<i>D. histrio</i>	—	—	—	—
<i>D. immigrans</i>	—	—	—	—
<i>D. pengi</i>	—	—	—	—
<i>D. virilis</i>	—	—	—	—
<i>D. ezoana</i>	1	4	—	—
<i>D. moriwakii</i>	3	3	—	—
<i>D. lacertosa</i>	191	178	5	0
<i>D. okadai</i>	1	0	—	—
<i>D. neokadai</i>	—	—	—	—
<i>D. sordidula</i>	—	—	—	—
<i>D. pseudosordidula</i>	—	—	—	—
<i>D. sp.</i>	—	—	—	—
Total	573	850	76	80

* The sample collected by fruit-traps contains incidental collections in the morning on p.m. for three successive days. ** Collections were made by E. Momma.

Results and Remarks

A total of 4,986 drosophilid flies was obtained in the present collections. The flies were represented by 29 species belong to 4 genera. They are summarized in Table 1. Most flies of the genus *Drosophila* were attracted to the fermenting fruits. However, no fly of the genus *Scaptomyza* was attracted to those fruits. All flies of

in the southwestern part of Hokkaido

Ohnuma* Aug. 3-6 1965		Gun-nai** Aug. 4-6 1964		Shakotan July 30-Aug. 1 1965		Utasutsu July 26-28 1965					
Trap		Net		Trap		Trap		Trap		Net	
♀ ♀	♂ ♂	♀ ♀	♂ ♂	♀ ♀	♂ ♂	♀ ♀	♂ ♂	♀ ♀	♂ ♂	♀ ♀	♂ ♂
—	—	—	—	—	—	0	1	—	—	—	—
—	—	—	—	5	0	—	—	—	—	—	—
—	—	1	0	—	—	—	—	—	—	—	—
—	—	9	16	—	—	—	—	—	—	36	30
—	—	0	3	—	—	—	—	—	—	1	1
—	—	—	—	—	—	—	—	—	—	1	2
—	—	—	—	0	1	—	—	—	—	—	—
—	—	—	—	1	1	—	—	—	—	—	—
79	97	—	—	52	30	7	4	—	—	—	—
—	—	1	0	1	1	—	—	—	—	—	—
11	8	—	—	—	—	4	5	—	—	—	—
—	—	—	—	1	1	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	1	0	—	—	—	—	—	—
67	119	1	0	—	—	20	30	6	3	—	—
275	424	0	2	277	349	17	31	28	47	1	2
3	7	—	—	—	—	—	—	1	1	—	—
18	17	—	—	14	8	—	—	—	—	—	—
40	35	3	2	65	35	—	—	30	15	1	0
68	30	—	—	18	3	30	34	5	2	—	—
6	5	—	—	3	1	1	1	—	—	—	—
9	18	—	—	—	—	—	—	—	—	—	—
2	0	—	—	—	—	—	—	—	—	—	—
1	0	—	—	—	—	—	—	—	—	—	—
1	0	—	—	0	2	2	1	1	0	—	—
4	3	—	—	27	22	9	7	—	—	—	—
36	45	—	—	163	96	12	8	39	46	—	—
2	0	—	—	36	32	3	4	0	1	—	—
—	—	—	—	—	—	—	—	1	2	—	—
79	60	—	—	2	4	—	—	—	—	—	—
6	7	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	1	0	—	—	—	—
707	875	15	23	666	586	106	126	111	117	40	35

the 6th of August, besides flies obtained at one hour intervals from 4.00 a.m. to 7.00

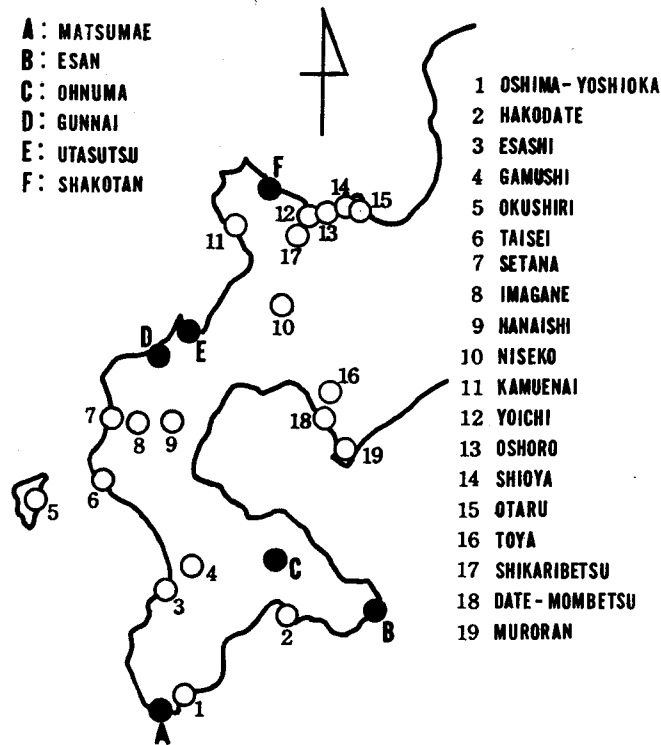


Fig. 1. Map of Southwestern Hokkaido, showing the localities of collections. A-F: six localities dealt with in the present survey. 1-19: nineteen localities where collections were made from 1950 to 1963.

the genus were obtained by net-sweeping on various kinds of vegetations.

(1) *Matsumae*: A total of 1,423 specimens was obtained which were represented by 12 species belonging to 2 genera. Most of them were *Drosophila auraria* race B (57.34%), *D. lacertosa* (25.93%), and *D. nigromaculata* (7.31%). Co-habitation of the three races of *D. auraria* was observed.

(2) *Esan*: A few number of flies, 156 specimens in total, was obtained. They were classified into 6 species of the genus *Drosophila*. Dominant species was *D. auraria* race B (48.72%) and race A (44.87%). Other species were very rare in occurrence. *Drosophila nigromaculata*, very common in Hokkaido, was very low in frequency in this area.

(3) *Ohnuma*: A total of 1,620 specimens belonging to 20 species which cover 3 genera was obtained. *Drosophila auraria* race B was the dominant species showing 43.27 per cent of the total specimens. Race A of *D. auraria*, *D. coracina* and *D. sordidula* were relatively high in frequency, represented by 11.54, 10.86

and 8.50 per cent, respectively. Cohabitation of the three races of *D. auraria* was observed. It was of interest to note that all known species of the *robusta* group in Japan, except *D. neokadai*, were collected in this area. They were *D. sordidula*, *D. lacertosa*, *D. pseudosordidula*, *D. moriwakii* and *D. okadai*. One female of *Microdrosophila crisatata* was collected by net-sweeping. This is only one species of the genus *Microdrosophila* recorded in Hokkaido. Most flies collected by net-sweeping were identified as *Scaptomyza pallida*. This is one of the cosmopolitan outdoor species. Mizuno (1952) recorded only one species, *D. auraria*, from this area.

(4) *Gun-nai*: A total of 1,252 specimens represented by 17 species belonging to 2 genera was collected by Dr. E. Momma. Among them, *D. auraria* race B was highest in frequency showing 50.00 per cent of the total specimens, and *D. lacertosa* ranked next showing 20.69 per cent. Four species of the *robusta* group appeared in this locality: they were *D. lacertosa*, *D. moriwakii*, *D. okadai* and *D. sordidula*. Race A and C of *D. auraria* were not observed. One female of *D. magnipunctinata* was obtained here. This is rare in Hokkaido.

(5) *Shakotan*: A total of 232 flies was attracted to fermented apple and tomato. They were divided into 2 genera containing 11 species. Though Takada (1958) reported 18 species belonging to 2 genera from this area, most species obtained in this collection were not included in his record. They were 8 species as follows: *Amiota stylopyga*, *Drosophila bifasciata*, *D. auraria* race B., *D. histrio*, *D. ezoana*, *D. moriwakii*, *D. okadai* and *D. sp.* Abundant species in this area were *D. auraria* race A (21.55%) and race B (20.69%), and *D. testacea* (27.59%). The *robusta* species group was represented by *D. lacertosa*, *D. moriwakii* and *D. okadai*. *Drosophila auraria* race C did not appear here. A male of *Amiota stylopyga*, a rare species in Japan, and also an unidentified female of the genus *Drosophila*, were obtained in this collection. No such species of the genus *Drosophila* has been recorded in Japan in the past.

(6) *Utasutsu*: A total of 303 specimens was assigned into 2 genera covering 10 species. Most of them were represented by *D. lacertosa* (28.05%) and *D. auraria* race B (25.74%). Cohabitation of the three races of *D. auraria* was observed in this locality. A few specimens of *D. neokadai* and *D. okadai* of the *robusta* group were captured together with relatively many flies of *D. lacertosa*. *Scaptomyza pallida* was predominant showing 21.78 per cent of the total collected by net-sweeping. Other species of the genus *Scaptomyza* collected were *S. polygonia* (2 specimens) and *S. okadai* (3 specimens).

Momma (1957) has reported that *D. auraria* is widely distributed in Japan with a dense population in southern Hokkaido. In the present collections this species was also predominant in all localities. Cohabitation of the three races of *D. auraria*, A, B and C, was ascertained in three localities. Among the three races, race B was remarkable in occurrence, and race C was rare. According to Kurokawa (1958), race A was abundantly found around areas of human habitations,

race B in the mountainous regions, and race C in the regions of intermediate between the above two. *Drosophila ezoana* belonging to the *virilis* group which is known as endemic to northern parts of Japan, especially in restricted sites such as wet places along small streams in mountain regions (Takada & Okada, 1958; Takada, 1958; Kaneko & Shima, 1962; Wakahama *et al.*, 1963). A few specimens of this species were collected from five localities in the present collections. The *robusta* species group was found to be relatively abundant in this survey with an exception of Esan. Among the species group, most of specimens were represented by *D. lacertosa* except at Ohnuma where *D. sordidula* was superior to *D. lacertosa*.

Summary

Summer collections of drosophilid flies were made in six localities, Matsumae, Esan, Ohnuma, Shakotan, Gun-nai, and Utasutsu in the southwestern part of Hokkaido. A total of 4,986 flies representing 29 species which belong to 4 genera was obtained mostly by the use of traps. They are summarized in Table 1. *Drosophila auraria* was predominant in all localities. Cohabitation of three races of *D. auraria*, A, B and C, was observed in Matsumae, Ohnuma and Utasutsu. The species of the *robusta* group were relatively abundant in number in this collection survey. *Drosophila lacertosa* showed the highest frequency in occurrence, with an exception at Ohnuma where *D. sordidula* was superior to *D. lacertosa*. A small number of *D. ezoana* belonging to the *virilis* group was obtained in the present survey. Flies belonging to *Microdrosophila* and *Scaptomyza* were generally collected by net-sweeping on various kinds of vegetations.

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