

Drosophilid Fauna of Sakha SSR, the East Siberia: A Preliminary Report

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1. Introduction

Little is known about the drosophilid flies of the East Siberia, although it is an important area for tracing the evolutionary process of some Nearctic species having derived from the Old World through Beringia and for studying adaptations to an extremely cold climate.

We have just started a Siberian *Drosophila* study in cooperation with the Biological Institute of Yakutsk, and preliminarily report here a total of 31 species, which belong to 9 genera and 2 subfamilies, from Sakha, the East Siberia.

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2. Collection Areas and Methods

Sakha with about 3.1 million km² is a cold territory characterized by huge taiga and arctic tundra. The faunal survey was made mostly in forests along the River Lena and the River Yana (Fig. 1). Fly collections were made by fermenting malt baits (Lakovaara et al., 1969) and by net sweeping on herbaceous plants and on mushrooms.

3. Results and Discussion

A total of 31 drosophilid species including two new and one undetermined species were obtained (see Appendix). In Tiksi, only a domestic species, *D. melanogaster*, was collected in a heated fruit shop. Seven species were obtained each in two localities, Zhgansk and Verkhoyansk, within the Arctic Circle. All

of them were collected by malt traps, except for *Scaptomyza pallida*, a herbage-feeder species, collected by net sweeping. In the further south, collections not only by malt traps but also on mushrooms and herbaceous plants yielded samples more abundant in number of species: 21 spp. in Yakutsk and 18 spp. in Olekminsk.

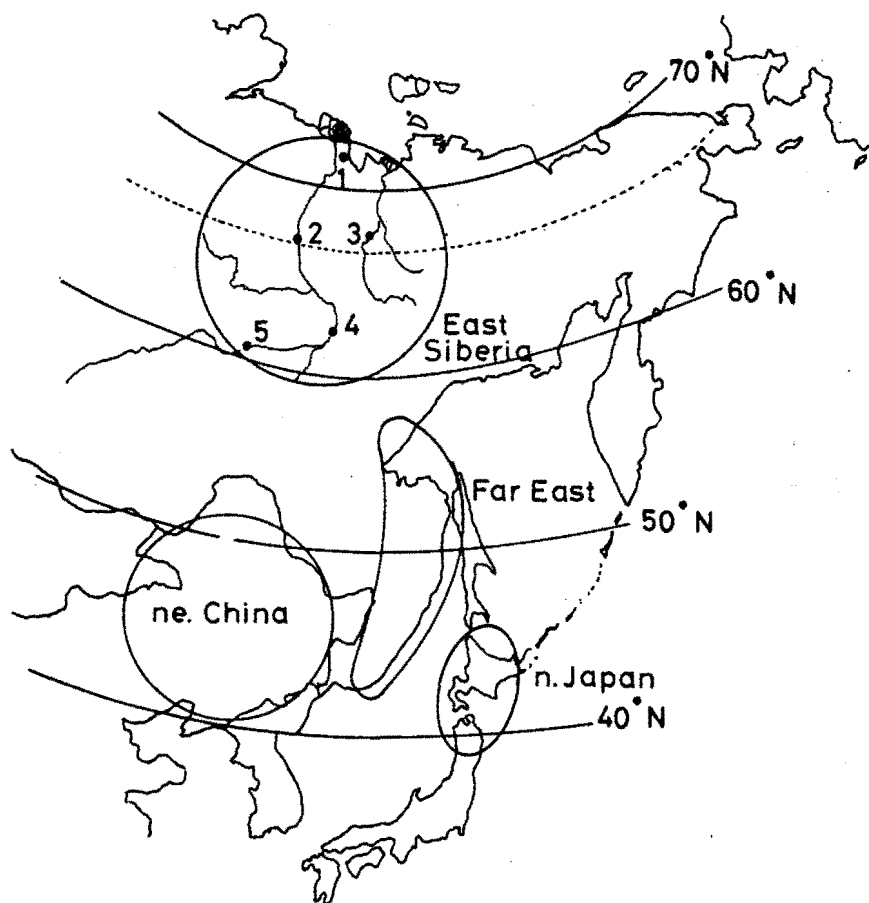


Fig. 1 Map of eastern Eurasia showing the collection sites in Sakha SSR and other districts given in the faunal comparison.

1: Tiksi. 2: Zhgansk. 3: Verkhoyansk. 4: Yakutsk. 5: Olekminsk.

The drosophilid fauna of the East Siberia was compared with those of four neighboring regions, based on the following data sources: Europe (101 spp.; Bachli and Rocha-Pite, 1981), Russian Far East (87 spp.; Sidorenko, 1990, 1993a, b, etc.), north-eastern China (87 spp.; Watabe et al., 1993; Sun and Toda, in press), and northern Japan (149 spp.; Okada, 1988; Toda, unpubl.). Faunal similarity between two regions was evaluated by Jaccard's coefficient of similarity (Udvardy, 1969): $S=c/(a+b-c)$, where c is the number of species common to both regions and a or b is

the number of species occurring in each region. The similarity matrix resulting from pair-wise calculations was then subjected to a cluster analysis.

Three regions, Russian Far East, north-eastern China and northern Japan, constitute a compact group in the dendrogram (Fig. 2), indicating that these Asian parts of Eurasia share many species in common. On the other hand, the East Siberia has a closer similarity in the species composition with Europe than with the three regions of eastern Eurasia.

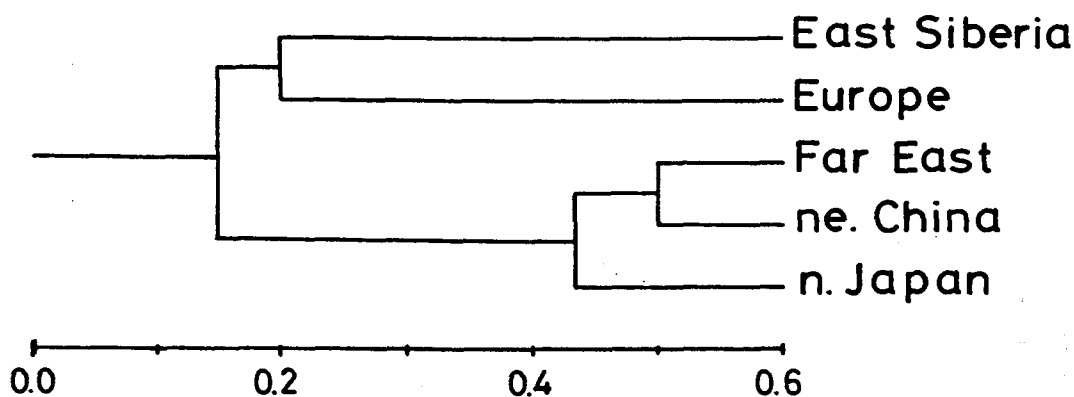


Fig. 2 Faunal comparison of drosophilid flies among five regions of the Palearctic Region, based on the Jaccard's coefficient similarity.

Furthermore, the faunas of five regions were compared with each other for the composition of chorological elements. The component species were classified into six elements for their geographic distribution patterns: HP) Holarctic or Palearctic, FE) Far Eastern, SJ) Sino-Japanese, EN) Endemic, C) Cosmopolitan, and O) others. In the composition of chorological elements, too, the East Siberia is more similar to Europe than to the other regions of eastern Eurasia (Fig. 3). Of the 31 drosophilid species recorded presently, 20 HPs and 4 Cs are commonly distributed in Europe, especially Scandinavia. On the other hand, the fauna of the East Siberia includes only 4 FEs and no SJ elements: FE elements are major components in cool temperate regions of eastern Eurasia, and SJ elements are distributed in warm temperate regions from Nepal to Japan through southern China.

In conclusion, the East Siberia possesses a close relation to Europe, especially Scandinavia, in the drosophilid biogeography.

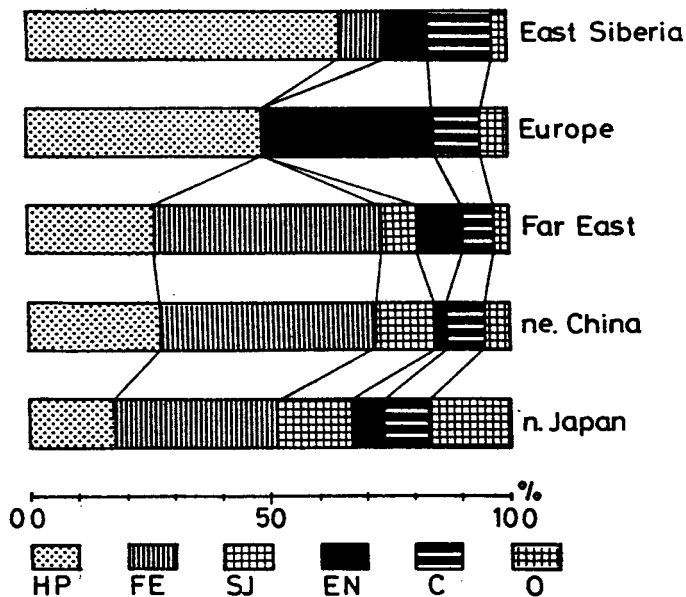


Fig. 3 Composition of chorological elements of five regions of the Palearctic Region.

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SUBFAMILY STEGANINAE

The Genus *Gitona* Meigen

1. *Gitona distigma* Meigen

Specimen examined. 1F(Female), Yakutsk, 9-18. vii. 1993, ex malt traps.

The Genus *Amiota* Loew

2. *Amiota (Amiota) neochungi* Takada, Beppu et Toda *Specimen examined.* 1M
(Male), Yakutsk, 9-18. vii. 1993, ex malt traps.

3. *Amiota (Phortica)* sp., like *conifera takadai*

Specimens examined. 3M, Olekminsk, 3. vii. 1993, from human eyes; 2M,
Olekminsk, 5. vii. 1993, from human eyes; 2M, 2F, Botanical Garden, Yakutsk,
7-22. vii. 1993, ex malt traps; 3M, 1F, Alas, Yakutsk, 11-17. viii. 1992, ex malt
traps; 1F, Alas, Yakutsk, 23-25. vii. 1992, ex. malt traps.

The Genus *Leucophenga* Mik

4. *Leucophenga (Neoleucophenga) quinquemaculipennis* Okada

Specimens examined. 1M, Alas, Yakutsk, 11-17. viii. 1993, ex malt traps; 1F,
Spaskayapad (Forest Station), Yakutsk, 8. vii. 1993, ex malt traps; 1F,
Spaskayapad, Yakutsk, 7-22. 1993, ex malt traps.

SUBFAMILY DROSOPHILINAE

The Genus *Scaptodrosophila* (Duda)

5. *Scaptodrosophila rufifrons* (Loew)

Specimens examined. 4M, 1F, Alas, Yakutsk, 11-17. viii. 1992, ex malt traps.

The Genus *Chymomyza* Czerny

6. *Chymomyza caudatula* Oldenberg

Specimens examined. 1M, 1F, Spaskayapad, Yakutsk, 7-9. vii. 1993, ex malt
traps.

7. *Chymomyza costata* (Zetterstedt)

Specimens examined. 1M, Zhgansk, 5. viii. 1992, ex malt traps; 2M, 5F, Verkhoyansk, 12-15. vii. 1993, ex malt traps; 8M, 14F, Alas, Yakutsk, 11-17. viii. 1992, ex malt traps; 14M, 4F, Spaskayapad, Yakutsk, 7-8. vii. 1993, ex malt traps; 10M, 10F, Spaskayapad, Yakutsk, 20-21. vii. 1993; 5M, 2F, Summer House, Yakutsk, 9-18. vii. 1993, ex malt traps; 9M, 11F, Olekminsk, 3-5. vii. 1993, ex malt traps and from timber piles; 1M, Shinsk near Lena Pirus, 12. viii. 1992, ex malt traps.

8. *Chymomyza distincta* (Egger)

Specimen examined. 1F, Olekminsk, 5. vii. 1993, ex malt traps.

9. *Chymomyza fuscimana* (Zetterstedt)

Specimens examined. 2F, Spaskayapad, Yakutsk, 8. vii. 1993, ex malt traps.

The Genus *Drosophila* Fallen

10. *Drosophila (Sophophora) alpina* Burla

Specimens examined. 1F, Zhgansk, 5. viii. 1992, ex malt traps; 6M, 5F, Verkhoyansk, 11-15. vii. 1993, ex malt traps.

11. *Drosophila (Sophophora) bifasciata* Pomini

Specimens examined. 5M, 5F, Alas, Yakutsk, 23-25. vii. 1992, ex malt traps; 96M, 89F, Alas, Yakutsk, 11-17. viii. 1992, ex malt traps; 80M, 44F, Spaskayapad, Yakutsk, 7-9. vii. 1993, ex malt traps and from tree trunks; 185M, 102F, Spaskayapad, Yakutsk, 20-21. vii. 1993, ex malt traps; 11M, 26F, Botanical Garden, Yakutsk, 19-22. vii. 1993, ex malt traps; 452M, 785F, Summer House, Yakutsk, 9-18. vii. 1993, ex malt traps; 2M, 1F, Olekminsk, 5. vii. 1993, ex malt traps.

12. *Drosophila (Sophophora) melanogaster* Meigen

Specimens examined. 1M, Tiksi, 16. vii. 1992, from fermenting fruits in the house; 45M, 33F, Yakutsk, 26. vii. 1992, from garbage in the house; 20M, 53F, Summer House, Yakutsk, 9-18. vii. 1993, ex malt traps; 1M, Shinsk, 12. viii. 1992, ex malt traps.

13. *Drosophila (Dorsilopha) busckii* Coquillett

Specimens examined. 5F, Alas, Yakutsk, 11-17. viii. 1992, ex malt traps; 5M, 5F, Summer House, Yakutsk, 9-18. vii. 1993, ex malt traps.

14. *Drosophila (Drosophila) ezoana* Takada et Okada
Specimens examined. 5M, 12F, Zhgansk, 30. vii.- 6. viii. 1992, ex malt traps;
 1M, 1F, Verkhoyansk, 11-15. vii. 1993, ex malt traps.
15. *Drosophila (Drosophila) littoralis* Meigen
Specimens examined. 1M, 2F, Zhgansk, 3-6. viii. 1992, ex malt traps; 1F,
 Olekminsk, 5. vii. 1993, ex malt traps.
16. *Drosophila (Drosophila) lummei* Hackman
Specimens examined. 14M, 13F, Zhgansk, 30. vii.-6. viii. 1992, ex malt traps;
 6M, 8F, Summer House, Yakutsk, 9-18. vii. 1993, ex malt traps.
17. *Drosophila (Drosophila) funebris* (Fabricius)
Specimens examined. 49M, 12F, Alas, Yakutsk, 11-17. viii. 1992, ex malt
 traps; 3M, 6F, Spaskayapad, Yakutsk, 26. vii. 1992, ex malt traps; 9M, 3F,
 Spaskayapad, Yakutsk, 7-9. vii. 1993, ex malt traps; 61M, 25F, Spaskayapad,
 Yakutsk, 20-22. vii. 1993, ex malt traps and from tree trunks; 2M, 1F, Botanical
 Garden, Yakutsk, 19-22. vii. 1993, ex malt traps and by net sweeping; 8M, 13F,
 Summer House, Yakutsk, 9-18. vii. 1993; 3M, 3F, Olekminsk, 2-5. vii. 1992, ex
 malt traps.
18. *Drosophila (Drosophila) immigrans* Sturtevant
Specimens examined. 1M, 1F, Summer House, Yakutsk, 9-18. vii. 1993, ex malt
 traps.
19. *Drosophila (Drosophila) phalerata* Meigen
Specimen examined. 1F, Olekminsk, 5. vii. 1993, ex malt traps.
20. *Drosophila (Drosophila) metakuntzei* Okada
Specimens examined. 3M, 3F, Verkhoyansk, 11-15. vii. 1993, ex malt traps;
 4M, 9F, Spaskayapad, Yakutsk, 7-9. vii. 1993, ex malt traps and from
 mushrooms; 4M, Spaskayapad, Yakutsk, 21. vii. 1993, ex malt traps.
21. *Drosophila (Drosophila) transversa* Fallen
Specimens examined. 1F, Zhgansk, 6. viii. 1992, ex malt traps; 2M, 1F,
 Verkhoyansk, 15. vii. 1993, ex malt traps; 1F, Alas, Yakutsk, 23-25. 1992, ex
 malt traps; 19M, 10F, Spaskayapad, Yakutsk, 7-9. vii. 1993, ex malt traps and
 from mushrooms; 38M, 24F, Spaskayapad, Yakutsk, 20-21. vii. 1993, ex malt
 traps and by net sweeping; 2M, 1F, Botanical Garden, 19-22. vii. 1993, ex malt
 traps; 26M, 19F, Olekminsk, 3-5. vii. 1993, ex malt traps, from mushrooms, and

by net sweeping.

22. *Drosophila (Drosophila) testacea* van Roser

Specimens examined. 1M, Spaskayapad, Yakutsk, 9. vii. 1993, ex malt traps; 2F, Summer House, Yakutsk, 9-18. vii. 1993, ex malt traps; 1F, Olekminsk, 5. vii. 1993, ex malt traps.

The Genus *Hirtodrosophila* Duda

23. *Hirtodrosophila subarctica* (Hackman)

Specimens examined. 1M, 2F, Zhgansk, 4-6. viii. 1993, ex malt traps; 8M, 11F, Verkhoyansk, 11-15. vii. 1993, ex malt traps; 2F, Spaskayapad, Yakutsk, 8-9. vii. 1993, ex malt traps and from tree trunks; 1M, 3F, Spaskayapad, Yakutsk, 20-21. vii. 1993, ex malt traps; 3M, 2F, Shinsk, 12. viii. 1993, ex malt traps.

The Genus *Lordiphosa* Basden

24. *Lordiphosa hexasticha* (Papp)

Specimens examined. 1M, 2F, Olekminsk, 3. vii. 1993, by net sweeping.

The Genus *Scaptomyza* Hardy

25. *Scaptomyza (Hemiscaptomyza) okadai* Hackman

Specimens examined. 2M, 3F, Olekminsk, 3. vii. 1993, by net sweeping.

26. *Scaptomyza (Hemiscaptomyza) unipunctum unipunctum* (Zetterstedt)

Specimens examined. 5M, 1F, Olekminsk, 1-3. vii. 1993, by net sweeping.

27. *Scaptomyza (Hemiscaptomyza) sp. 1., like unipunctum unipunctum*

Specimens examined. 14M, 23F, Olekminsk, 1-5. vii. 1993, by net sweeping; 2M, Spaskayapad, Yakutsk, 21. vii. 1993, by net sweeping.

28. *Scaptomyza (Parascaptomyza) pallida* (Zetterstedt)

Specimens examined. 1F, Verkhoyansk, 14. vii. 1993, by net sweeping; 1M, 1F, Spaskayapad, Yakutsk, 21. vii. 1993, by net sweeping; 2M, 1F, Olekminsk, 3-5. vii. 1993, by net sweeping.

29. *Scaptomyza (Scaptomyza) flava* Fallen

Specimens examined. 7F, Olekminsk, 1-3. vii. 1993, by net sweeping.

30. *Scaptomyza (Scaptomyza) polygonia* Okada

Specimens examined. 5M, 5F, Olekminsk, 3. vii. 1993, by net sweeping.

31. *Scaptomyza (Scaptomyza)* sp. SB1.

Specimen examined. 1F, Spaskayapad, Yakutsk, 21. vii. 1993, by net sweeping.

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