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Carrion Beetle (Coleoptera, Silphidae) Fauna of Hokkaido University Tomakomai Experiment Forest, Northern Japan, with a Note on the Habitat Preference of a Geotrupine Species, *Geotrupes laevistriatus* (Coleoptera, Scarabaeidae)

By

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and Nobuyo YOSHIDA**

北海道大学苫小牧地方演習林のシデムシ相
—附：同演習林におけるセンチコガネの環境選好性について—

片倉晴雄・園田美幸・吉田信代

Abstract

The silphid beetle fauna of Hokkaido University Tomakomai Experiment Forest was studied during June to September, 1983, using carrion-baited pitfall traps.

1) A total of 1,908 individuals belonging to twelve species in two subfamilies were collected. The following five species were dominant: Silphinae: *Silpha perforata venatoria, Eusilpha japonica*; Nicrophorinae: *Nicrophorus quadripunctatus, N. maculifrons, Ptomascopus morio.*

2) *N. quadripunctatus* and *E. japonica* preferred forests, *P. morio* did relatively open habitats, and *N. maculifrons* and *S. perforata venatoria* were rather eurytopic.

3) The carrion beetle fauna of Tomakomai Experiment Forest was compared with those of two previously studied localities in Hokkaido, i. e., Kamiotoineppu and Ishikari. The structures of the carrion beetle assemblages were remarkably different among the three localities, though, at the present, the cause of these differences was not clear.

4) The gross habitat preference of a geotrupine species, *Geotrupes laevistriatus*, was given as an appendix to the present study.

Keywords: Silphid beetles, Tomakomai Experiment Forest, habitat preference, *Geotrupes laevistriatus*.

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Introduction

The beetles belonging to the family Silphidae are commonly called carrion beetles because of their common occurrence on vertebrate carcasses. They are certainly one of the most important groups of carrion communities, probably next only to fly maggots, in the north temperate zone. In separate papers, we reported the faunal make-up and some related aspects of carrion beetles in two remote and ecologically different localities in Hokkaido: namely, the northern inland region in Kamiotoineppu (KATAKURA and FUKUDA, 1975) and the southern coastal plain in Ishikari (KATAKURA and UENO, in press). As the third report of this series, the present paper deals with the faunal make-up of carrion beetles and microdistribution of the dominant species in Hokkaido University Tomakomai Experiment Forest, based on the survey made in 1983. Further, the carrion beetle assemblages of this and the two previously studied localities are briefly compared. In addition, the gross habitat preference of a geotrupine species, *Geotrupes laevistriatus* MOTSCHULSKY, that was exceptionally abundant in the experiment forest, was given as an appendix.

Area Studied and Methods

Hokkaido University Tomakomai Experiment Forest is located on the southern outskirt of Mt. Tarumae, an active volcano, situated at the southern part of Hokkaido. It vegetationally belongs to the northern border of the cool temperate deciduous broad-leaved forest, but now various species of coniferous trees are afforested. As for undergrowth plants, this forest is characterized by the paucity of bamboo grasses that are dominant in most other areas in Hokkaido. A total of fifteen trap sites were set in various types of environments as follows (cf. Fig. 1):

A~E: Natural deciduous broad-leaved forest. The tree species were more diverse, and trees were more dense and taller in A~C than in D and E. *Quercus mongolica, Acer mono,* and *Cercidiphyllum japonicum* were dominant in A~C, whereas *Ulmus davidiana* and *Quercus mongolica* in D and E. Dominant undergrowth plants were ferns (*Dryopteris* spp.).

F: Secondary oak forest. *Quercus mongolica* was predominant. Undergrowth mainly ferns and *Schizandra chinensis.*

G: A small bareland with sandy soil. Approximately 100 m^2.

H: Margin of a bush near the site G. The bush included young *Betula platyphylla* and *Quercus mongolica.*

I: Afforested larch forest (*Larix leptolepis,* about 15 m high) with admixture of young shoots of *Ulmus davidiana* and *Acer mono.*

J: Margin of a natural broad-leaved deciduous forest near a human habitation. *Ulmus davidiana* and *Cercidiphyllum japonicum* were dominant in the forest.

K, L, O: Grassland. The site O was situated near human habitations, and the soil was more clayey than any other trap site.

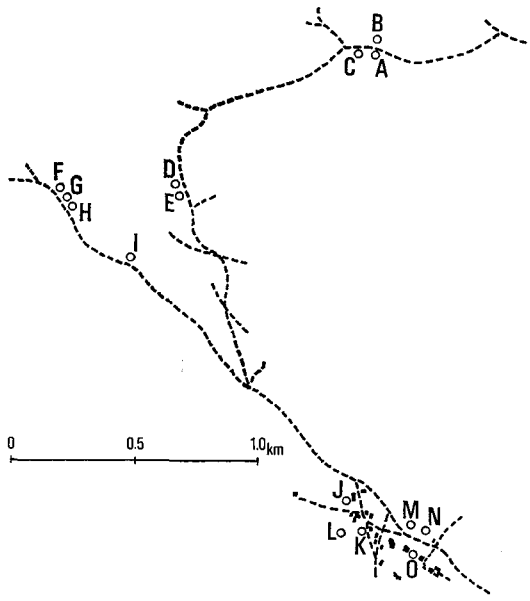

Fig. 1. The positions of the fifteen trap sites (A~O) at the study area. Dashed lines: Forestry roads and paths. Spots on the lower right part: Human habitations.

M, N: Margin of a sandy soiled parking place facing a larch forest. The site N was nearer to the forest than M.

The beetles were collected by polyethylene pitfall traps, 2,000 cc volume, 8.5 cm caliber and 24 cm deep, by using about 70~80 g of minced chicken meat or pork as bait, and with a 50 : 50 solution of water and ethylene glycol in the bottom (cf. NEWTON and PECK, 1975). At each site two pitfall traps were installed at an interval of 5 m. The samplings were made four times from June to September in 1983 as follows: 1) June 21~28; 2) July 15~22; 3) August 11~18; 4) September 9~16. On each sampling, traps were left for a week and removed on the eighth day. Unfortunately, some traps near the human habitations were damaged by vertebrate scavengers, probably foxes, in the first sampling (June 21~28). In order to avoid such interference, traps were covered with wire nets (about 3 cm mesh) after the second sampling. Climatic conditions of this area have been recorded at the meteorological observatory of Tomakomai Experiment Forest (Fig. 2). In the surveyed year, the precipitation was larger and it was cooler in June and July, especially the former, than ordinary years.

Results and Discussion

1. Faunal make-up

During this study, a total of 1,908 adult beetles belonging to two families and twelve species listed below were obtained (also cf. Table 1). In the following list, the total number is given first followed by the monthly totals (♂♂/♀♀) for each

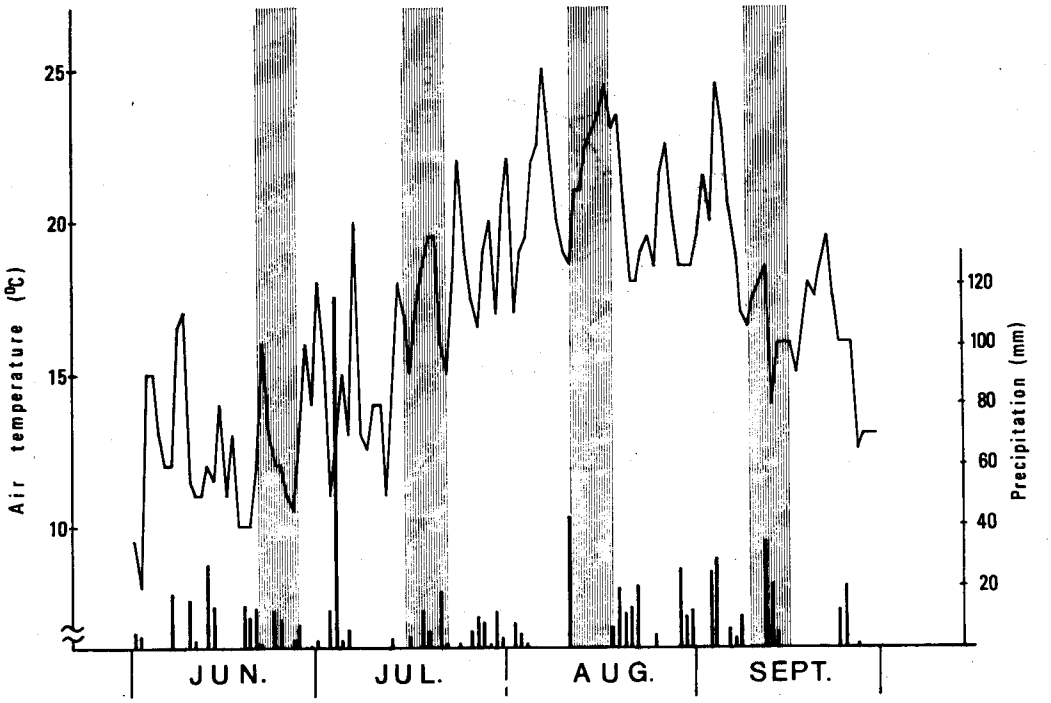

Fig. 2. Climatic conditions of the study area from June to September, 1983. (Cited by the courtesy of Tomakomai Experiment Forest.) Solid line: The fluctuation of air temperatures obtained at 9:00 each day. Bars: Precipitations. The surveyed periods are hatched.

species. Dates of samplings are as follows: VI) June 21～28; VII) July 15～22; VIII) August 11～18; IX) September 9～16. The collection records at the trap sites in each sampling are given in parentheses.

SILPHINAE

1. *Phosphuga atrata* (LINNÉ). 1 (♀): VIII (C).
2. *Thanatophilus lapponicus* (HERBST). 16 (9♂♂7♀♀): VII (K 2/2, O 7/5).
3. *Thanatophilus sinuatus* (LINNÉ). 3 (2♂♂1♀): VI 1/0 (O); VII 1/1 (O).
4. *Silpha perforata venatoria* HAROLD. 735 (438♂♂297♀♀): VI 39/43 (A 0/1, B 0/1, C 1/2, D 3/7, E 13/10, F 1/2, H 9/8, I 12/12); VII 60/66 (A 0/1, B 4/3, C 1/2, D 5/5, E 10/8, F 2/6, G 0/1, H 9/3, I 23/26, K 0/1, L 1/1, N 5/8, O 0/1); VIII 325/173 (A 10/2, B 6/2, C 10/6, D 51/16, E 56/22, F 10/2, G 1/4, H 33/17, I 66/66, J 10/2, K 1/1, L 22/7, M 1/6, N 40/18, O 8/2); IX 14/15 (C 0/2, D 1/1, E 4/0, F 4/1, H 0/1, I 1/7, L 0/1, N 4/1, O 0/1).
5. *Oiceoptoma subrufum* (LEWIS). 1 (♀): VIII (A).
6. *Eusilpha japonica* (MOTSCHULSKY). 336 (241♂♂95♀♀): VII 33/26 (A 1/1, B 3/0, C 1/2, D 2/2, E 8/7, F 6/5, G 2/1, H 6/2, I 1/1, K 1/1, L 1/1, N 1/1, O 0/2); VIII 200/47 (A 5/2, B 9/1, C 14/2, D 57/14, E 55/9, F 3/1, G 1/1, H 32/7, I 4/1, L 6/4, N 11/5, O 3/0); IX 8/22 (A 0/1, B 0/1, C 3/1, D 2/10, E 2/5, F 0/2, H 0/1,

L 1/0, O 0/1).

NICROPHORINAE

7. *Ptomascopus morio* KRAATZ. 191 (92♂♂99♀♀): VII 42/47 (C 1/1, D 1/1, E 1/0, G 0/2, I 2/2, J 5/6, K 5/4, L 14/12, M 0/1, N 4/5, O 9/13); VIII 44/43 (B 1/1, C 1/2, D 3/5, E 3/1, G 1/1, H 0/3, I 2/2, J 16/16, K 2/1, L 1/3, M 0/2, N 5/2, O 9/4); IX 6/9 (B 0/1, C 0/1, G 1/0, I 0/1, J 4/0, L 1/6).

8. *Nicrophorus concolor* KRAATZ. 1 (♂): VII (B).

9. *Nicrophorus maculifrons* KRAATZ. 54 (21♂♂33♀♀): VI 4/0 (C 1/0, E 2/0, I 1/0); VII 1/8 (A 0/1, C 0/1, D 0/3, E 0/1, G 1/1, L 0/1); VIII 16/24 (A 0/1, B 0/2, D 4/6, E 4/3, G 6/3, I 0/2, K 1/1, L 1/3, M 0/3); IX 0/1 (H).

10. *Nicrophorus quadripunctatus* KRAATZ. 566 (296♂♂270♀♀): VI 7/7 (A 1/0, B 1/0, C 1/2, D 0/1, E 2/1, F 1/1, G 0/1, I 1/0, O 0/1); VII 137/104 (A 15/12, B 12/6, C 24/14, D 35/30, E 27/22, F 8/8, G 0/1, H 3/0, I 7/6, J 2/2, K 1/0, L 0/1, N 2/1, O 1/1); VIII 82/54 (A 20/11, B 11/6, C 17/9, D 9/8, E 9/8, F 4/4, G 0/1, H 3/2, I 9/5); IX 70/105 (A 11/15, B 9/7, C 11/16, D 15/19, E 10/25, F 4/6, H 2/1, I 1/6, J 0/5, L 2/3, M 1/1, N 4/1).

11. *Nicrophorus investigator* ZETTERSTEDT. 3 (♂♂): VIII (D 2/0, E 1/0).

12. *Nicrophorus vespilloides* HERBST. 1 (♂): VII (G).

Dominant species were *Silpha perforata venatoria* and *Eusilpha japonica* in Silphinae and *Nicrophorus quadripunctatus*, *N. maculifrons* and *Ptomascopus morio* in Nicrophorinae (Table 1). The other seven species were rare. The activity of carrion beetles appeared to be relatively low due to the cool and rainy weather

Table 1. Relative abundance of species of Silphidae trapped during June to September in 1983 in Hokkaido University Tomakomai Experiment Forest. Scientific names followed UENO et al. (1985)

Silphinae	
Silpha perforata venatoria HAROLD	735
Eusilpha japonica (MOTSCHULSKY)	336
Thanatophilus lapponicus (HERBST)	16
T. sinuatus (LINNÉ)	3
Phosphuga atrata (LINNÉ)	1
Oiceoptoma subrufum (LEWIS)	1
Nicrophorinae	
Nicrophorus quadripunctatus KRAATZ	566
Ptomascopus morio KRAATZ	191
Nicrophorus maculifrons KRAATZ*	54
N. investigator ZETTERSTEDT	3
N. vespilloides HERBST	1
N. concolor KRAATZ	1

* *N. karafutonis* KÔNO is treated as a synonym for *N. maculifrons* (cf. KAMIMURA et al. 1964).

conditions during the first sampling in June, when many traps were severely damaged by vertebrate scavengers as mentioned above. Consequently, the results obtained by the first sampling were fragmentary and preliminary. Therefore, only the data from the second to fourth samplings, which are summarized in Table 2, were used in the following analyses and discussion.

2. Clustering of the sampling sites

Based on the data given in Table 2, the faunal similarities between sampling sites were estimated with the C_π index (KIMOTO, 1967):

$$C_\pi = \frac{2\sum_i n_{ij} \cdot n_{ij'}}{(\sum \pi_j^2 + \sum \pi_{j'}^2) N_j \cdot N_{j'}}, \quad \sum \pi_j^2 = \frac{\sum_i n_{ij}^2}{N_j^2}, \quad \sum \pi_{j'}^2 = \frac{\sum_i n_{ij'}^2}{N_{j'}^2},$$

where N_j and $N_{j'}$ are the total numbers of beetles captured at site j and j', respectively, and n_{ij} and $n_{ij'}$ are the numbers of individuals of the species i at site j and j'. Based on the C_π values thus obtained, all the trap sites were clustered by means of UPGMA (unweighted pair-group method using arithmetic averages) (SNEATH and SOKAL, 1973). The result of clustering is given in Fig. 3. The trap sites were classified into the following four types:

Type 1: Broad-leaved deciduous forest. Sites A, B, C, D, E, F.
Type 2: Forest margin and afforested larch forest. H, I, M, N.
Type 3: Bareland. G.
Type 4: Grassland near the human habitation. J, K, L, O.

Species diversity for each trap site was calculated with the following formula (MORISITA, 1967),

$$\beta_j = \frac{N_j(N_j-1)}{\sum_i n_{ij}(n_{ij}-1)}.$$

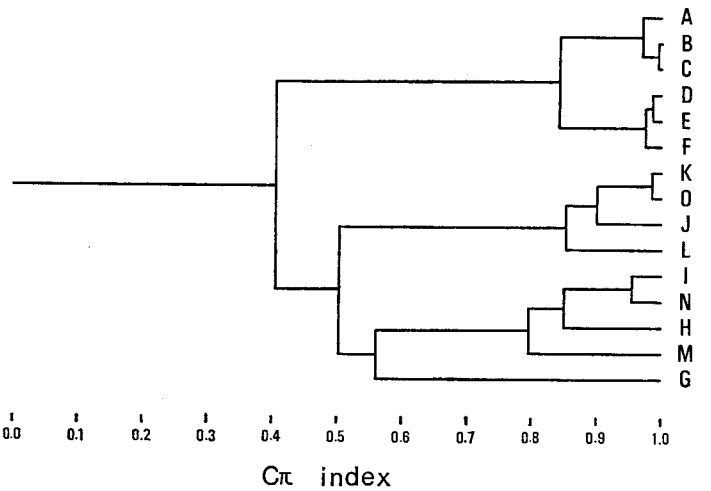

Fig. 3. The UPGMA clustering of trap sites based on the faunal similarities estimated by C_π index.

Table 2. Microdistribution of the carrion beetles in Hokkaido University Tomakomai Experiment Forest studied in 1983. N_i: total number of individuals of each species. N_j: total number of individuals trapped at each site. β_j: diversity index

Species	Trap site and type of habitat															N_i
	1						2				3	4				
	A	B	C	D	E	F	I	N	H	M	G	L	J	K	O	
P. atrata	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
T. lapponicus	0	0	0	0	0	0	0	0	0	0	0	0	0	4	12	16
T. sinuatus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
S. p. venatoria	13	15	21	79	100	25	189	76	63	7	6	32	12	3	12	653
O. subrufum	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
E. japonica	10	14	23	87	86	17	7	18	48	0	5	13	0	2	6	336
P. morio	0	3	6	10	5	0	9	16	3	3	5	37	47	12	35	191
N. concolor	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
N. maculifrons	2	2	1	13	8	0	2	0	1	3	11	5	0	2	0	50
N. quadripunctatus	85	51	91	116	101	34	34	7	11	2	2	6	9	1	2	552
N. investigator	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	3
N. vespilloides	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
N_j	111	86	143	307	301	76	241	117	126	15	30	93	68	24	69	1,807
β_j	1.65	2.48	2.22	3.45	3.30	2.86	1.57	2.16	2.51	3.75	4.78	3.38	1.93	3.68	3.07	

The calculated values of diversity were given in the bottom row of Table 2. The value was highest in site G and lowest in I. Although the difference of the diversity between habitat types classified above was not so clear, the habitat types may be arranged in the descending order of diversity as Type 3>Type 4>Type 1≒Type 2. Although the trap sites classified as types 3 and 4 were described as bareland and grassland, respectively, they all were adjacent to the forest and could be regarded as ecotonal, including both forest and openland elements. Relatively higher species diversity of these habitat types was apparently resulted from such ecotonal nature.

3. Spatial distribution of dominant species

The pattern of spatial distribution was considerably different according to the species of the beetles (Tables 2, 3). Among the dominant species, *S. perforata venatoria* was common in the forests and their margin, being most numerous at site I, the afforested *Larix* forest. *E. japonica* was numerous in the natural broad-leaved forest, especially at sites D and E. *P. morio* preferred grassland near the human habitations. *N. maculifrons* was relatively numerous at sites D and E in the natural broad-leaved forest and site G, the bareland near the broad-leaved forest. *N. quadripunctatus* definitely preferred the natural broad-leaved forest. In summary, *N. quadripunctatus* was most tightly associated with the forest environment among the dominant species examined here, followed by *E. japonica*. *S. perforata venatoria* and *N. maculifrons* may be eurytopic, exploiting both the forest and adjacent open habitats. Only *P. morio* can be regarded as mainly exploiting open habitats. Of the rarer species, *Thanatophilus* species seemed to prefer the open habitats under the influence of human activities. In order to estimate the similarity in spatial distribution among the five dominant silphids, COLWELL and FUTUYMA's niche overlap (r) (1971) was calculated:

$$r_{ii'}=1-\frac{1}{2}\sum_j d_j k|p^*_{ij}-p^*_{i'j}|,\quad p^*_{ij}=\frac{n_{ij}}{N^*_i},\quad N^*_i=\sum_j d_j k n_{ij},$$

$$d_j=\frac{\delta_j}{\sum_j \delta_j},\quad \delta_j=\frac{N_j(\log N_j-\log N)-\sum_i n_{ij}\log(n_{ij}/N_i)}{\sum_j N_j\log N_j-N\log N},\quad k=10{,}000.$$

Table 3. Habitat preference of silphid beetles in Tomakomai Experiment Forest, expressed by the number of individuals per trap site in each hibitat type. Based on the data in Table 2

Species	Type of habitat				Modified total
	1. Forest	2. Forest margin	3. Bareland	4. Grassland	
S. p. venatoria	42.17 (28.8%)	83.75 (57.1)	6.00 (4.1)	14.75 (10.0)	146.67
E. japonica	39.50 (58.1)	18.25 (26.8)	5.00 (7.4)	5.25 (7.7)	68.00
P. morio	4.00 (8.1)	7.75 (15.6)	5.00 (10.1)	32.75 (66.2)	49.50
N. maculifrons	4.33 (23.3)	1.50 (8.1)	11.00 (59.2)	1.75 (9.4)	18.58
N. quadripunctatus	79.67 (79.9)	13.50 (13.6)	2.00 (2.0)	4.50 (4.5)	99.67

N is the total number of all the collected beetles, N_i is the total number of individuals of the species i, and n_{ij} is the number of individuals of species i at site j. The niche overlap with respect to the habitat (Table 4) was large among two forest species, *E. japonica* and *N. quadripunctatus*, and one rather eurytopic species, *N. maculifrons*, whereas small between *P. morio*, an open habitat species, and the other four species. *S. p. venatoria*, the top dominant species in the surveyed area, was eurytopic and the degree of niche overlap with other species was moderate. Naturally, however, the values given in Table 4 do not necessary represent the actual intensity of interaction between the species. The species pair with a larger niche overlap in this table may be segregated from each other in other dimensions of the niche space, or the resource might be so fertile that more than one species can share it without competitive interaction. Silphid beetles have specialized in various ways to exploit vertebrate carcasses, that are scattered, ephemeral and unpredictable food resources. Hence, they are suitable for the study of resource partitioning and interspecific interaction among coexisting closely related taxa (cf. ANDERSON, 1982; KATAKURA and UENO, in press). Since the present study treated only one major dimension of niche space, more intensive studies on other major dimensions of niche, i. e. temporal distribution and food habits, must be indispensable to clarify the dynamics of the resource partitioning by dominant species of silphid beetles in Tomakomai Experiment Forest.

Table 4. Niche overlaps in habitat types of five dominant species of silphid beetles in Tomakomai Experiment Forest. Spv: *S. perforata venatoria*; Ej: *E. japonica*; Pm: *P. morio*; Nm: *N. maculifrons*. Further explanations in text

	Spv	Ej	Pm	Nm
E. japonica	0.453			
P. morio	0.320	0.296		
N. maculifrons	0.400	0.625	0.330	
N. quadripunctatus	0.454	0.592	0.232	0.576

4. Comparison of faunal make-up of Silphidae among Tomakomai Experiment Forest, Ishikari Coast, and Kamiotoineppu

We previously reported the faunal make-up of carrion beetles in Kamiotoineppu in the northern Hokkaido (KATAKURA and FUKUDA, 1975) and that on the Ishikari Coast in the southwestern Hokkaido (KATAKURA and UENO, in press). Based on the results given in these and the present papers, the faunal make-up of Silphidae in the three localities in Hokkaido was briefly compared below (Table 5). In all three localities, approximately a dozen of silphid species including nearly equal number of silphines and nicrophorines were recorded. Further, the species composition was not so drastically different among localities. Out of a total of sixteen silphid species recorded, eleven species were collected from two or three localities. Of the rest five species, only two, *E. japonica* in Tomakomai and *N. tenuipes* in Kamio-

Table 5. Synopsis of carrion beetle faunae in three different localities in Hokkaido, northern Japan

	Tomakomai	Ishikari*	Kamiotoineppu**
Total no. of individuals	1,807	1,182	1,927
Silphinae	1,009 (55.8%)	343 (29.0)	121 (6.3)
Nicrophorinae	798 (44.2)	839 (71.0)	1,806 (93.7)
Total no. of species	12	12	11
Silphinae	6	7	6
Nicrophorinae	6	5	5
Silphinae			
S. p. venatoria	653 (64.8)	221 (64.4)	21 (17.4)
E. japonica	336 (33.3)	—	—
T. lapponicus	16 (1.6)	9 (2.6)	—
T. sinuatus	2 (0.1)	80 (23.3)	22 (18.2)
P. atrata	1 (0.1)	13 (3.8)	2 (1.6)
O. subrufum	1 (0.1)	3 (0.9)	5 (4.1)
O. thoracicum	—	16 (4.7)	64 (52.9)
N. nigricornis	—	1 (0.3)	—
N. asiaticus	—	—	7 (5.8)
Nicrophorinae			
N. quadripunctatus	552 (69.2)	378 (45.1)	493 (27.3)
P. morio	191 (23.9)	16 (1.9)	—
N. maculifrons	50 (6.3)	232 (27.6)	560 (31.0)
N. investigator	3 (0.4)	1 (0.1)	329 (18.2)
N. vespilloides	1 (0.1)	212 (25.3)	360 (19.9)
N. concolor	1 (0.1)	—	—
N. tenuipes	—	—	64 (3.6)

* KATAKURA and UENO (in press)

** KATAKURA and FUKUDA (1975)

toineppu, were relatively numerous and characterized the silphid assemblage of respective locality. The most striking local differences were found in the relative abundance in the numbers of individuals between two subfamilies: namely, in Tomakomai, Silphinae outnumbered Nicrophorinae though the number of individuals was not so different between them; on the Ishikari Coast, Silphinae was less than a half of Nicrophorinae; and in Kamiotoineppu, Silphinae occupied only one tenth of silphid beetles collected. Dominant species were also different locally. In Tomakomai, *S. perforata venatoria* and *N. quadripunctatus* were two predominant species followed by *E. japonica*, *P. morio* and *N. maculifrons*. On the Ishikari Coast, *N. quadripunctatus* was top dominant and three other species, *N. maculifrons*, *N. vespilloides* and *S. perforata venatoria*, were second dominant with similar numbers of individuals. *T. sinuatus* was also relatively common on the Ishikari Coast.

Contrary to these two localities where dominant species included both silphines and nicrophorines, dominant species in Kamiotoineppu were four species of nicrophorines, *N. maculifrons*, *N. quadripunctatus*, *N. vespilloides* and *N. investigator*. Another species of *Nicrophorus*, *N. tenuipes*, and a silphine species, *O. thoracicum* followed the four dominant nicrophorines. Thus, the carrion beetle fauna was revealed to be considerably different among the three localities in the relative abundance in the number of individuals of two subfamilies and kind of dominant species. At the present, however, nature of these differences is not yet clear. As mentioned above, these three localities are not only geographically distant, but also considerably different ecologically: Kamiotoineppu is situated at the northern part of Hokkaido where the primary vegetation is the cool temperate mixed forest, whereas Tomakomai Experiment Forest and Ishikari Coast are at the southern part of Hokkaido, where the primary vegetation is the cool temperate broad-leaved deciduous forest rather than the mixed one. Further, the sampling sites in Kamiotoineppu were chosen among various types of forests and an adjacent pasture, those in Tomakomai among various types of forests and their margin including human habitations, and those in Ishikari among coastal grasslands, an oak forest and at abandoned openlands at the rear of the forest. Although these eco-geographic differences among localities must be responsible for the difference in their silphid faunae, further eco-geographical studies would be needed before we can adequately interprete the characteristics of carrion beetle assemblages described above.

Appendix. Habitat preference of *Geotrupes laevistriatus* in Tomakomai Experiment Forest

In addition to various species of silphid beetles, a geotrupine species, *Geotrupes laevistriatus* MOTSCHULSKY, is commonly collected by carrion-baited pitfall traps though the collected number is generally not so large. During the present study, however, this species was collected in a great number. Based on this data, the gross habitat preference of this species is described below. The collection records of adult specimens of *G. laevistriatus* in Hokkaido University Tomakomai Experiment Forest in 1983 were as follows:

Geotrupes laevistriatus MOTSCHULSKY. 1,172 (677♂♂495♀♀): VI 71/59 (A 14/12, B 6/7, C 17/9, D 5/10, E 12/7, F 9/8, G 0/2, H 4/1, I 4/2, O 0/1); VII 171/122 (A 24/10, B 38/27, C 24/17, D 14/12, E 15/17, F 22/17, G 2/2, H 9/5, I 10/7, J 1/0, M 0/1, N 12/5, O 0/2); VIII 203/132 (A 28/23, B 41/13, C 27/23, D 7/11, E 22/13, F 34/11, G 0/1, H 16/16, I 16/14, J 2/0, L 3/0, M 1/1, N 6/6); IX 232/182 (A 40/33, B 26/26, C 30/31, D 17/18, E 48/39, F 28/14, G 0/1, H 9/6, I 25/7, L 1/1, M 3/2, N 5/4).

Combining the collection records during July to September, the site preference of *G. laevistriatus* is summarized below following the classification of habitat types based on the similarity of silphid assemblages given in the text (cf. Table 2).

Trap site and type of habitat															
1						2				3	4			
A	B	C	D	E	F	I	N	H	M	G	L	J	K	O
158	171	152	79	154	126	6	61	79	3	0	5	8	38	2

Clearly, this species prefers woodland, most individuals being collected amid the forest (the habitat type 1) and the forest margin (type 2). This result is consistent with our general impression on the habitat preference of this species. For example, one of us (N. Y.) could not find this species at a pasture in the vicinity of Sapporo during a three year census of dung beetles, nevertheless this species was common in the adjacent woody environments.

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要　　約

北海道大学苫小牧地方演習林のシデムシ相を，1983年6月～9月に，腐肉トラップを用いて調査した。

1) 2亜科12種に属する合計1908個体が採集された。優占種は以下の5種であった。

シデムシ亜科：ヒラタシデムシ，オオヒラタシデムシ。

モンシデムシ亜科：ヨツボシモンシデムシ，マエモンシデムシ，コクロシデムシ。

2) ヨツボシモンシデムシとオオヒラタシデムシは林の中を好み，コクロシデムシは，比較的開けた環境に多かった。マエモンシデムシとヒラタシデムシは林内と開けた環境の両方から得られた。

3) 苫小牧地方演習林のシデムシ相を，石狩浜と上音威子府のシデムシ相と比較した。この3地域間には，シデムシ相の内容に顕著なちがいがみられたが，その原因は明らかではない。

4) シデムシ類の採集の際に，同時に多数得られたセンチコガネの環境選好性を付記した。