Insect-flower Relationship in the Primary Beech Forest of Ashu, Kyoto: An Overview of the Flowering Phenology and the Seasonal Pattern of Insect Visits[1]

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Insect-flower Relationship in the Primary Beech Forest of Ashu, Kyoto: An Overview of the Flowering Phenology and the Seasonal Pattern of Insect Visits[1]

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ABSTRACT In 1984-1987 insect visitors to flowers were monthly or bimonthly surveyed on 91 plant species or 37 families in the primary beech forest of Ashu, Kyoto, Japan. Flowering season was 186 days from late April to early October. The number of plant species that concurrently bloomed was four to 11 species from May to mid August and it increased up to 19 in late August. The mean flowering period of a single plant species was 16 days. From April to August flowering periods were staggered among congeneric plant species, e. g., *Rubus*, *Hydrangea* and *Rhus*.

A total of 2459 individuals of 715 species in 11 orders of Insecta and two orders of Arachnoidea were collected. The most abundant order was Hymenoptera (39 % of individuals) and followed by Diptera (35 %) and Coleoptera (17 %). The number of species was highest in Diptera (41 %) and followed by Hymenoptera (26 %) and Coleoptera (19 %). The numbers of both species and individuals peaked in May and then gradually decreased in summer and autumn. There were six families, 13 genera and 66 species in Apoidea. Andrenidae and Halictidae were rich in the number of species. They were abundant in June and July but greatly decreased afterward. Apidae were abundant throughout the flowering season.

Cluster analysis separated 37 plant families into four groups: 16 families were mainly visited by Hymenoptera, four by Diptera, and two by Coleoptera. The other 15 families were visited by various insect groups. Flowers mainly visited by bees were further separated into Bombinae-, Xylocopinae-, Apinae-, Andrenidae-dominated plant families.

Flower preference was compared among insect orders and among families. The most preferred plant family was Saxifragaceae in Coleoptera and Hymenoptera, and it was Umbelliferae in Hemiptera and Diptera. Cerambycidae, Halictidae and Andrenidae preferred Saxifragaceae. Syrphidae and Colletidae preferred Umbelliferae, Xylocopinae and Nomadinae preferred Violaceae, Bombinae preferred Compositae and Apinae preferred Labiatae.

KEY WORDS flowering phenology／ anthophilous fauna／ floral host／ Kyoto／ primary beech forest

Introduction

Pollination communities are founded on the basis of both mutualism between plants and their pollinators and the competitively interacting systems of plants for pollinators and pollinators for floral resources (Waser & Real, 1979; Kevan & Baker, 1983; Feinsinger, 1987). The ideal design of studying the pattern of the community organization is study of both flowering phenology and the community structure of

[1]Contribution to the ecological and bioeconomical studies of the pollinator community in Kyoto Ⅱ.

flower-visiting animals on individual flower species: (1) Sampling should be made periodically with a quantitative method (Sakagami and Matsumura, 1967) in an primary vegetation where coevolutionary relationship has been formed (Heinrich, 1976). (2) All flower visitors and their floral hosts should be distinguished and identified. (3) Sampling is preferably continued at least for several years because the community structure of flower visiting animals sometimes greatly varies among years (Herrera, 1988). The above survey design, however, has not yet been adopted by any botanists and entomologists, due to difficulties both in quantitative sampling and identification of so diversed animal groups that compose flower visitors.

Following the above survey design, we made four-year periodical samplings of flower visiting insects in the primary beech forest of Ashu, Kyoto. This paper is a preliminary report of the survey and deals with the flowering phenology of 91 plant species, the community structure of flower-visiting insects, including bees and other all arthropods, and spectrum of floral hosts for flower visitors. The flowering phenology in this study can be compared to those of North America (Kochmer and Handel, 1986) and in Japan (Yumoto, 1986, 1987), and the community structure of the flower-visiting insects can be compared to bee communities studied in neotropical areas (Heithaus, 1979) and in temperate areas in North America (Moldenke, 1976), Brazil (Sakagami *et al.*, 1967) and Japan (Miyamoto, 1962; Sakagami and Matsumura, 1967; Matsumura and Munakata, 1969; Sakagami and Fukuda, 1973; Yamauchi *et al.*, 1974; Ikudome, 1978; Matsuura *et al.*, 1978; Nakamura and Matsumura, 1985). The emphasis, however, is laid on the pattern of community organization of flower-visiting insects in a primary forest ecosystem in the western Japan.

Study Site

The Kyoto University Forest of Ashu is located at the northeastern boundary of Kyoto Prefecture, neighboring with the Shiga and Fukui Prefectures (Fig. 1). The total area of this forest is 4000 ha, of which 1800 ha is left intact. At present, there are only two primary beech forests of which areas are $>$ 1000 ha in western Japan: Oodaigahara in Wakayama Prefecture and Ashu. The forest in Ashu embarks the Kamidani stream (Fig. 2), the uppermost of Yura River, and there are a few reed (*Phragmites japonica*) bogs along the stream. About 1800 ha area of the Ashu Forest is mostly covered with beeches (*Fagus crenata*), accompanied by *Chryptomeria japonica and Quercus crispula*. Along the Kamidani stream, horsechestnuts (*Aesculus turbinata*) form forests, in which *Pterocarya rhoifolia* and *Juglans mandshurica* scatter. A total of 880 species of vascular plant species (Pteridophyllum, 87 spp.; Gymnospermum, 13 spp.; and Angiospermum, 780 spp.) have been recorded from the Ashu forest (Okamoto, 1941; Watanabe, 1960).

The vegetation type of the Ashu forest is *Aucubo-Fagetum crenatae* (Miyawaki *et al.*, 1968). The Ashu forest contains the northern flora components, considering its

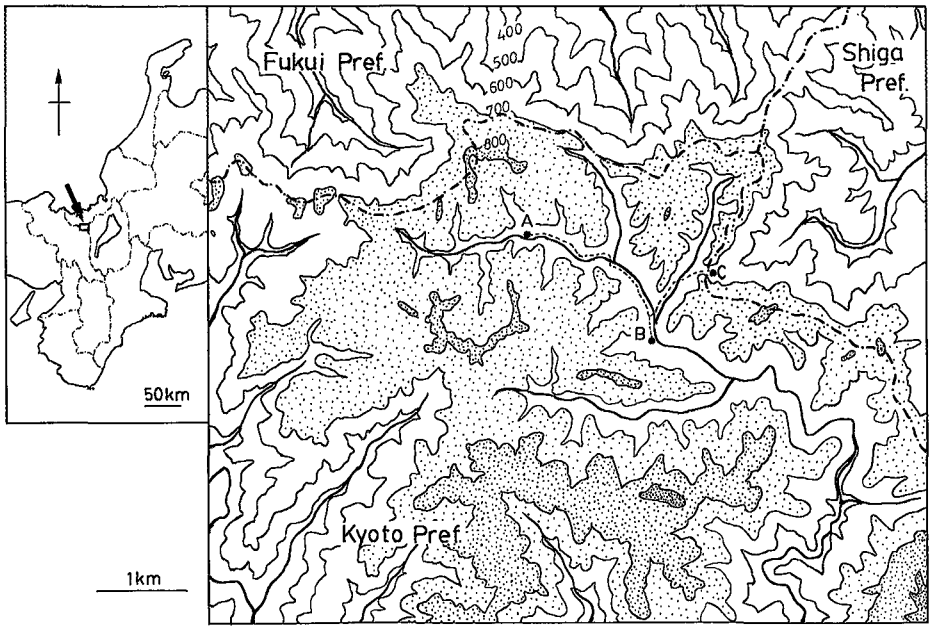

Fig. 1. The study area in Ashu, Kyoto and its location in the Kinki District, Japan (inset). The stream-side along A and B is Kamidani and that along B and C is Makuradani. Flower visitors were collected on flowering plants along C - B - A.

latitude (35° 20' N) and elevations (620-959 m), because heavy snowfall (> 2 m in maximum depth) brings a cool weather condition throughout the year (Fig. 3). Snowfall starts in December and snow remains until March. Rainfall is also abundant in the monsoon season, June and early July. The mean annual precipitation is 1869 mm and precipitation days are > 3 months a year. There are > 14 rainy days per month in the monsoon and September. August is a rather dry month between the two rainy season, although air temperature in August is 6 ℃ lower than that in Kyoto city (elevation = 60 m) because of higher elevations (600 - 700 m from sea level) and forest cover.

Methods

In a census day, one or two of us walked on the fixed route along the Kamidani stream and the Nodabata bog (along A - B in Fig. 1 and Fig. 2a). When we found flowering plants, we netted arthropod visitors for about 10 minutes per one location. In the first 8 minutes we caught only insects flying around and coming to flowers, avoiding harmful effects on flowers. In the last two minutes, we completely swept insects on and in the flowers. Hymenopterans and dipterans were netted mainly by the first 8 minutes and coleopterans and hemipterans by the latter sweeping. Due to this sampling method, samples may include various categories of insects; insects that collect

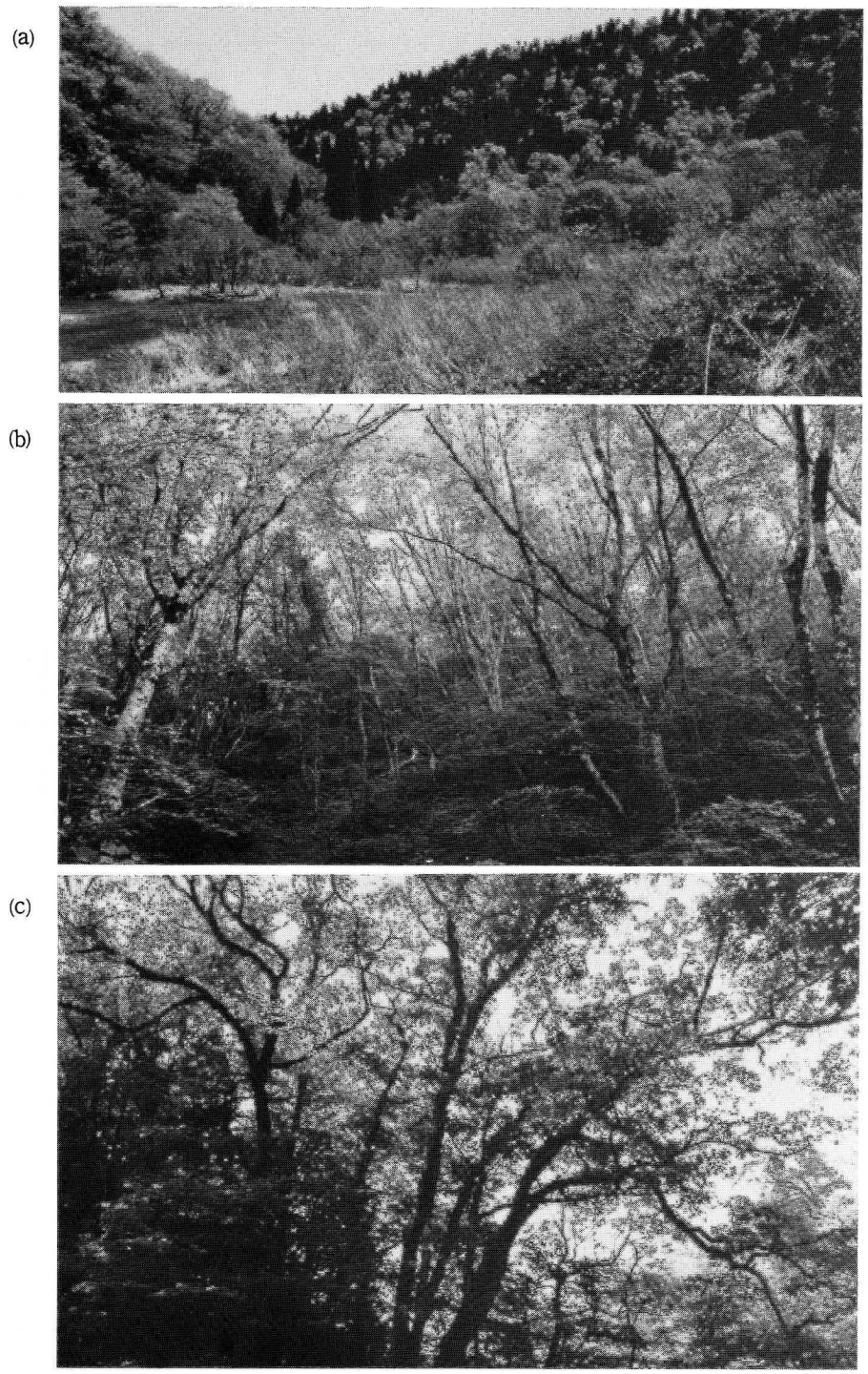

Fig. 2. Landscape of the beech forest along Kamidani stream. (a) Nodabata bog surrounded by *Fagus-Chryptomeria* mixed forests, (b) a beech forest near site C, (c) a *Quercus crispula* dominated forest near site A.

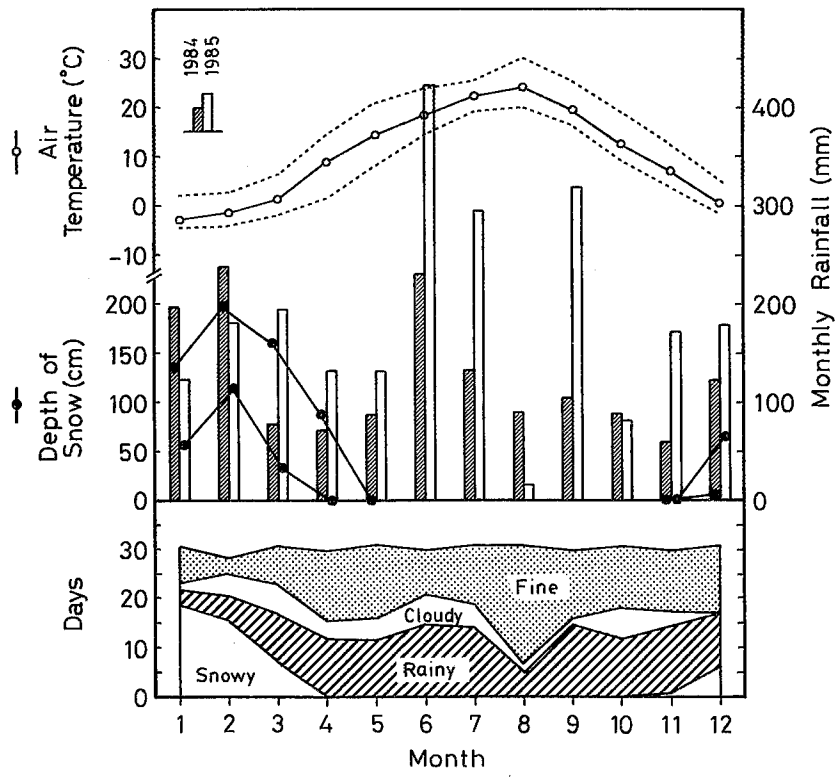

Fig. 3. Changes in climatic conditions in 1984 and 1985 : Mean (open circle), the average maximum and minimum (broken lines) of monthly air temperature, monthly rainfall (columns), the mean depth of snow (closed circle), and the weather conditions (the number of days per month). The daily maximum and minimum air temperature were 36.0 ℃ (Aug. 17, 1985) and −16.1 ℃ (Feb. 12, 1984) respectively. These data were obtained in the Ashu Research Forest (363 m above sea level), from Kyoto University Research Forest (1987).

nectar and pollen, predators that ambush flower visitors, phytophagous insects that feed on buds, flowers, fruits and leaves, or sack plant tissues, insect that just rest on and near flowers. These are distinguished by direct observations and so far known feeding types of respective groups. We use "flower-visitors" only for insects that collect nectar and pollen. They may include real pollinators, just rubbers and intermediates between the two. But these cannot be distinguished by the method employed in this study. Detailed studies that clarify effectiveness of flower visitors as pollen carriers for main plants are now being advanced by us (Kato, 1988; Kakutani *et al.*, 1989 and others).

We tried to find all the flowering plants along the cencus route, although some inconspicuous ones must be overlooked. After a bout of sampling at one location, we

counted the number of flowers or inflorescences and recorded the frequency distribution of 'flowering' stages (bud, blooming or fruit). Arthropod samples were separately preserved at each location.

We sampled at 8 to 43 day intervals, choosing fine weather, from April to October in four years from 1984. Sampling started between 9:00 and 10:00 h and it took up to six hours to finish the census, depending on an amount of flowers. Sampling dates are as follows:

1984: May 24, June 18, July 19. August 29, September 24.
1985: April 24, May 22, June 16, 27, July 16, August 3, September 15.
1986: May 5. 22. 23, June 5, 8, July 8, 31, August 25, September 24, October 10.
1987: May 29, June 8, July 15, 23, 31, September 1, 15, 27, October 26.

The flowering period of each plant species was estimated as the mean of the flowering period directly observed and the interval from the latest date at which flowering had not yet started to the earliest date at which flowering had finished.

All arthropod samples were pinned and labeled with the complete census data (date, locality and flower species). They are classified and identified at species level by specialists who are shown in Acknowledgments. Some portion of insects that are unidentified at present are coded in each of higher taxa (generally family). All the specimens are kept in Laboratory of Entomology, Faculty of Agriculture, Kyoto University. Statistical analyses were done by the SAS package in the Data processing Center, Kyoto University.

Results and Discussion

1. Studied plants

We collected arthropods on a total of 91 plant species (71 genera and 37 families, Table 1). These included 18 trees, 15 shrubs, seven annuals, two biennials, 46 perennials and three climbing perennials. Breeding systems were hermaphrodite in 79 plant species, monoecious in three, andromonoecious in one and dioecious in eight plant species. Ninety-eight % of plant species were native while there were two exotic species; *Prunus salicina* was planted by old woodcraftsmen about a century ago and *Stenactis annuus* was a weed that came from North America and naturalized along the road side since about 40 years ago.

The sampled 91 plant species included most conspicuous, common plant species, although sampling of high trees was not enough. Reanalyzing the vegetation tables of beech forests along the Kamidani Stream studied by Yoshimura (1965), we found that all canopy trees (d.b.h. $>$ 30 cm) of beech forests consisted of only four species, *Fagus crenata*, *Chryptomeria japonica*, *Quercus crispula* and *Betula grossa*. They were all anemophilous. On the other hand, there were several entomophilous species in subcanopy layer. The entomophilous subcanopy tree species which we missed sampling were as follows: *Hamamelis japonica*, *Sorbus alnifolia*, *Clethra barbinervis*, *Ilex macropoda*, *Acer mono*, *A. palmatum*, *A. sieboldianum*, *A. carpinifolium*, *Fraxinus*

Table 1. Plant species grouped at family level and arranged in phylogenetic order (based on Stebbins, 1974) with Japanese names, species codes, life forms, breeding systems and categories of regional origins. Numbers of insect species and individuals which were collected on flowers and diversity indices (H, H_{max}) are also shown.

FAMILY (Abbreviation) Code# Species	Japanese Names	Species Codes	Life Forms[1]	Breeding Systems[2]	Regional Origins[3]	No. of Insects Collected		H	H_{max}
						Species	Individuals		
MAGNOLIACEAE (MAG)									
1 *Magnolia salicifolia*	Tamushiba	Mag	T	H	N	1	4	0.00	0.00
BERBERIDACEAE (BER)									
2 *Epimedium grandiflorum*	Ikarisou	Epi	P	H	N	1	1	0.00	0.00
RANUNCULACEAE (RAN)									
3 *Anemone flaccida*	Nirinsou	Ane	P	H	N	10	16	2.10	2.30
FUMARIACEAE (FUM)									
4 *Corydalis lineariloba*	Yamaengosaku	Cor1	B	H	N	17	35	2.33	2.83
5 *Corydalis pallida*	Miyamakikeman	Cor2	P	H	N	18	34	2.67	2.89
FAGACEAE (FAG)									
6 *Castanea crenata*	Kuri	Cas	T	M	N	25	48	2.86	3.22
POLYGONACEAE (POL)									
7 *Antenoron filiforme*	Mizuhiki	Ant	P	H	N	1	1	0.00	0.00
8 *Bistorta tenuicaulis*	Harutoranoo	Bis	P	H	N	2	2	0.69	0.69
9 *Persicaria aestiva*	Unagitsukami	Per1	A	H	N	1	1	0.00	0.00
10 *Persicaria pubescens*	Bontokutade	Per2	A	H	N	10	17	2.17	2.30
11 *Persicaria senticosa*	Mamakonosirinugui	Per3	A	H	N	7	9	1.83	1.95
12 *Persicaria thunbergii*	Mizosoba	Per4	A	H	N	19	37	2.45	2.94
13 *Reynoutria japonica*	Itadori	Rey	P	D	N	12	14	2.44	2.48
STACHYURACEAE (STA)									
14 *Stachyurus praecox*	Kibushi	Stac	T	D	N	2	2	0.69	0.69
SYMPLOCACEAE (SYM)									
15 *Symplocos chinensis*	Sawafutagi	Sym	S	H	N	29	46	3.11	3.37
VIOLACEAE (VIO)									
16 *Viola grypoceras*	Tachitsubosumire	Vio1	P	H	N	1	1	0.00	0.00
17 *Viola kusanoana*	Ootachitsubosumire	Vio2	P	H	N	10	14	2.21	2.30
18 *Viola vaginata*	Sumiresaisin	Vio3	P	H	N	10	23	1.72	2.30
19 *Viola verecunda*	Tsubosumire	Vio4	P	H	N	12	23	2.09	2.48
SALICACEAE (SAL)									
20 *Salix gracilistyla*	Nekoyanagi	Sali	S	D	N	18	51	2.39	2.89
STYRACACEAE (STY)									
21 *Styrax japonica*	Egonoki	Sty	T	H	N	3	4	1.04	1.10
PRIMULACEAE (PRI)									
22 *Lysimachia clethroides*	Okatoranoo	Lys	P	H	N	16	20	2.69	2.77
ROSACEAE (ROS)									
23 *Agrimonia pilosa*	Kinmizuhiki	Agr	P	H	N	2	2	0.69	0.69
24 *Aruncus dioicus*	Yamabukishouma	Aru	P	H	N	5	11	1.29	1.61
25 *Geum japonicum*	Daikonsou	Geu	P	H	N	2	2	0.69	0.69
26 *Prunus incisa*	Kinkimamezakura	Pru1	T	H	N	18	48	2.17	2.89
27 *Prunus salicina*	Sumomo	Pru2	T	H	C	19	33	2.73	2.94
28 *Prunus Grayana*	Uwamizuzakura	Pru3	T	H	N	21	29	2.80	3.04
29 *Rosa multiflora*	Noibara	Ros1	S	H	N	3	4	1.04	1.10
30 *Rubus illecebrosus*	Baraichigo	Rub1	S	H	N	2	2	0.69	0.69

2. Flowering phenology

Flowering was observed from April 24 to October 26 in 1984-1987 (Fig. 4). From April to May, herbacious spring ephemerals, e.g. *Epimedium grandiflorum*, *Corydalis* spp. *Anemone flaccida*, concurrently bloomed on forest floors which were still uncovered by canopy trees (Fig. 5). In mid May canopy trees began to open leaves and then forest floors were covered to be dark. From mid May to June, shrubs bloomed sequentially at dark forest floors. In late May, horsechestnuts bloomed and attracted many anthophilous insects (Kakutani, unpub.), although only a few insects were collected or its flowers in this study. Flowering of tree and shrub species terminated before September and August, respectively. From late August many autumn herbs of Polygonaceae, Balsaminaceae, Labiatae and Compositae almost simultaneously started to bloom. The number of concurrently flowering autumn species was highest in late August (19 spp.) although it was less than 11 spp. before August.

The mean flowering period of a single plant species was 16.0 days (s.d. = 12.8, n = 91). The longest flowering period was 84 days in *Spuriopimpinella nikoensis*. There were no significant differences in the flowering period between any pairs of trees (mean ± s.d.: 16.7 ± 8.6), shrubs (18.9 ± 10.8) and herbs (16.1 ± 14.9) (t-test, $p>0.05$). From April to mid August, the seasonal replacement of flowering (Waser and Real, 1979) has been observed among plant species with the same life form, i.e.,

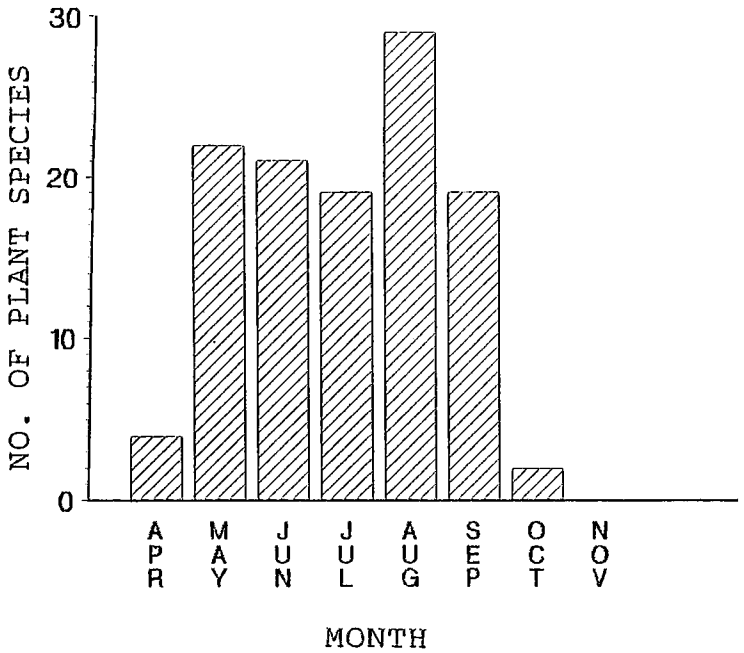

Fig. 4. Seasonal changes in the number of flowering plant species.

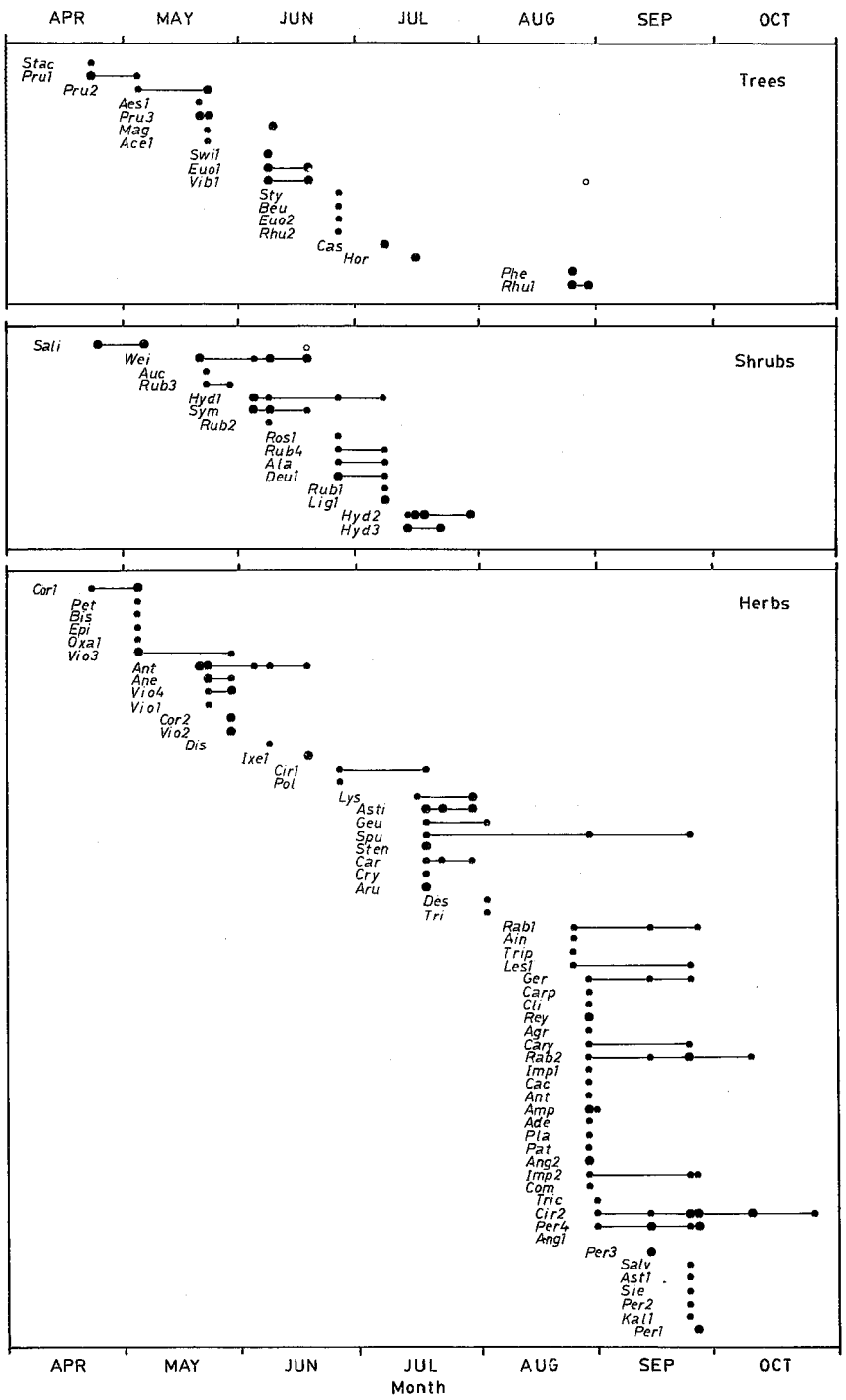

Fig. 5. Floweing phenology of 91 plant species, shown separately in trees, shrubs and herbs. Species codes are shown in Table 1. Small and large circles distinguish $<$ 10 and $\geqq$ 10 individuals of arthropod visitors collected on flowers.

trees, shrubs and herbacious plants (Fig. 5). Among species of the same genus, the seasonal replacement of flowering was also observed for *Corydalis*, *Prunus*, *Rubus*, *Hydrangea*, *Rhus* and *Cirsium*, but not for *Persicaria*, *Impatiens*, *Angelica* and *Rabdosia*. The latters were autumn bloomers.

3 Anthophilous fauna

3.1 Faunal make-up. A total of 2459 individuals were collected of 702 species in 11 orders of Insecta and 13 species in two orders of Arachnoidea. In Fig. 6, the number of species is plotted in octave, which is the logarithm of the number of individuals to base 2 (Preston, 1962; May, 1975). The line in Fig. 6 shows the truncated log normal distribution of species abundance. The total number of species of flower visitors in the study area is estimated to be 3394.

The relative number of species was highest in Diptera (41.2 %), followed by Hymenoptera (26.6 %), Coleoptera (18.8 %), Hemiptera (5.4 %) and Lepidoptera (2.1 %, Fig. 7). On the other hand, the relative abundance of individuals was highest in Hymenoptera (38.6 %), followed by Diptera (35.3 %), Coleoptera (17.7 %), Hemiptera (5.1 %) and Lepidoptera (1.3 %). As a result, the mean number of individuals per species was highest in Hymenoptera (5.0), followed by Hemiptera (3.2), Coleoptera (3.2), Diptera (2.9) and Lepidoptera (1.2).

3.2 Hemiptera and Lepidoptera. Fourteen families of Hemiptera were recorded,

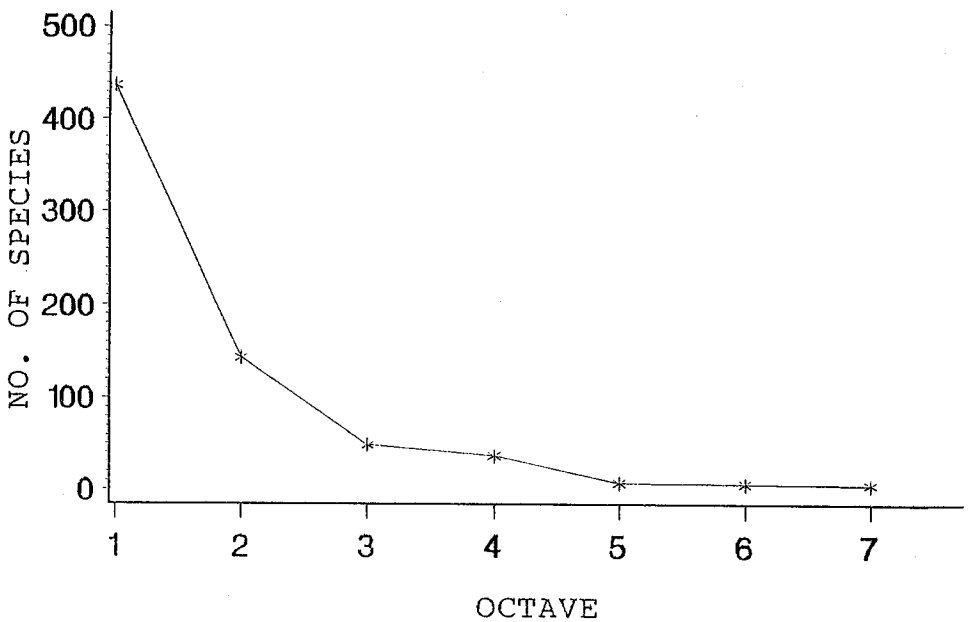

Fig. 6. The number of arthropod species plotted in the Preston's octave.

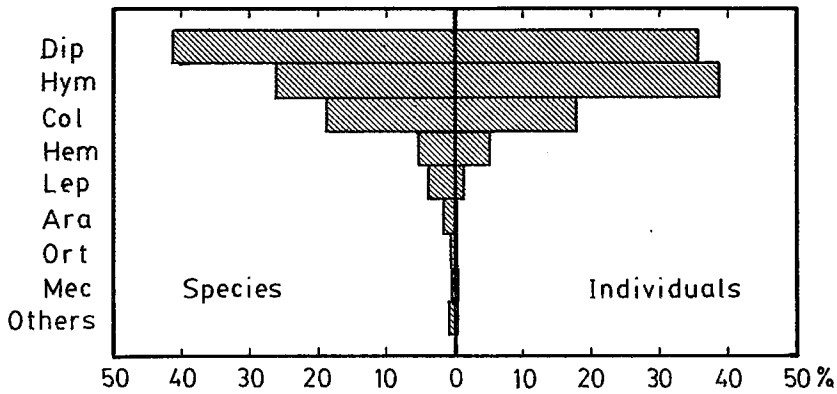

Fig. 7. The percentages of numbers of arthropod species (left) and numbers of arthropod individuals (right) in orders; Dip = Diptera, Hym = Hymenoptera, Col = Coleoptera, Hem = Hemiptera, Lep = Lepidoptera, Ara = Araneida, Ort = Orthoptera and Mec = Mecoptera.

of which two most dominant families were Miridae (39.7 % of the total number of individuals) and Deltocephalidae (29.4 %, Table 2). Most hemipterans were plant tissue suckers (99 %) and only Anthocoridae was predators for flower visitors.

Lepidopterous insects with long proboscis are typical nectar feeders but their relative abundance was low. Our samples only included diurnal species. The collection data of butterflies, which are one of the best studied insect groups are given below: *Choaspes benjaminii* (number of individuals = 1), *Parnara guttata* (3), *Parnassius glacialis* (1), *Pieris rapae* (1), *Celastrina argiolus* (1), *Japonica luter* (1) and *Vanessa indica* (1)

3.3 Diptera. Dipterous insects as flower visitors were basically nectar/pollen feeders (87.0 %) although some were predators (10.1 %, e.g., Empididae) or plant tissue feeders (2.9 %, e.g., Cecidomyiidae, Tephritidae and some Anthomyiidae). Syrphid flies are known to feed both pollen and nectar as complementary nutrient source (Haslet, 1989). The most dominant family was Syrphidae (26.2 % of the total number of individuals, Table 2). Out of 33 sampled syrphid genera, larval feeding types of 19 genera are reported by Owen and Gilbert (1989). Acoording to them, in our samples, nine genera were predators, one was a phytophage and eight were aquatic saprophages. Out of 58 sampled syrphid species (228 individuals), 17 species (77 individuals) were predators, 12 spp. (32) were phytophages and 10 spp. (72) were aquatic saprophages in larval stages (Table 4). The percentages of individuals in the three larval feeding types were 42, 18 and 40 %, respectively. This proportion of Syrphidae in our sample is quite similar to that of Malaise trap samples in England (Owen and Gilbert, 1989), although the species composition is different.

The next dominant dipterous families in Diptera were Calliphoridae (13.8 %), Anthomyiidae (10.6 %), Empididae (10.1 %), Clusiidae (9.1 %), Tachinidae (3.9 %), Chloropidae

Table 2. The numbers of arthropod species and individuals, the mean number of individuals per species and the number of plant species which were visited by each arthropod order. Only for Hemiptera, Lepidoptera, Diptera, Coleoptera and Hymenoptera, they are shown at family level. Superfamilies of Hymenoptera and subfamilies of Apoidea are also distinguished.

ORDER (Abbrev.) Family (Abbrev.)	No. of Arthropods			No. of Plant Species Visited
	Species	Individuals	Ind/Spp	
ARACHNOIDEA				
PHALANGIDA (Pha)	1	1	1.0	1
ARANEIDA (Ara)	12	12	1.0	5
INSECTA				
EPHEMEROPTERA (Eph)	1	1	1.0	1
PLECOPTERA (Ple)	2	4	2.0	3
ORTHOPTERA (Ort)	5	7	1.4	6
HEMIPTERA (Hem)	39	126	3.2	25
Pentatomidae (Pen)	6	9	1.5	9
Lygaeidae (Lyg)	2	4	2.0	2
Anthocoridae (Ant)	1	1	1.0	1
Miridae (Mir)	14	54	3.9	20
Cercopidae (Cer)	2	3	1.5	3
Tomaspididae (Tom)	1	1	1.0	1
Tettigellidae (Tet)	2	2	1.0	2
Evacanthidae (Eva)	1	1	1.0	1
Agalliidae (Aga)	1	1	1.0	1
Deltocephalidae (Del)	4	40	10.0	3
Derbidae (Der)	1	1	1.0	1
Achilidae (Ach)	1	1	1.0	1
Cixiidae (Cix)	2	6	3.0	4
Psyllidae (Psy)	1	2	2.0	2
NEUROPTERA (Neu)	1	1	1.0	1
MECOPTERA (Mec)	4	19	4.8	4
TRICHOPTERA (Tri)	3	4	1.3	3
LEPIDOPTERA (Lep)	28	33	1.2	16
Nepticulidae (Nep)	1	1	1.0	1
Heliozelidae (Hel)	3	4	1.3	4
Tischeriidae (Tis)	2	2	1.0	2
Tortricidae (Tor)	3	3	1.0	3
Gracillariidae (Gra)	2	2	1.0	2
Zygaenidae (Zyg)	1	1	1.0	1
Pyralidae (Pyr)	5	5	1.0	4
Hesperidae (Hes)	2	4	2.0	3
Papilionidae (Pap)	1	2	2.0	2
Pieridae (Pie)	1	1	1.0	1
Lycaenidae (Lyc)	3	3	1.0	3
Nymphalidae (Nym)	1	1	1.0	1
Geometiridae (Geo)	1	1	1.0	1
Epiplemidae (Epi)	1	1	1.0	1
Sphingidae (Sph)	1	2	2.0	2

Table 2. (continued)

ORDER (Abbrev.) Family (Abbrev.)	No. of Arthropods			No. of Plant Species Visited
	Species	Individuals	Ind/Spp	
DIPTERA	296	869	2.9	58
Mycetophilidae (Myc)	11	11	1.0	3
Cecidomyiidae (Cec)	5	10	2.0	4
Sciaridae (Sci)	9	11	1.2	4
Bibionidae (Bib)	4	5	1.2	3
Scatopsidae (Sca)	1	1	1.0	1
Psycodidae (Psy)	1	1	1.0	1
Tipulidae (Tip)	11	12	1.0	4
Chironomidae (Chi)	3	9	3.0	2
Ceratopogonidae (Cer)	3	5	1.7	3
Stratiomyiidae (Str)	2	3	1.5	3
Rhagionidae (Pha)	1	1	1.0	1
Asilidae (Asi)	1	1	1.0	1
Tabanidae (Tab)	1	1	1.0	1
Bombyliidae (Bom)	3	15	5.0	6
Acroceridae (Acr)	1	15	15.0	2
Empididae (Emp)	34	88	2.6	18
Dolichopodidae (Dol)	3	4	1.3	3
Lonchopteridae (Lon)	2	17	8.5	3
Phoridae (Pho)	1	4	4.0	1
Pipunculidae (Pip)	1	1	1.0	1
Syrphidae (Syr)	58	228	3.9	53
Conopidae (Con)	5	5	1.0	5
Tephiritidae (Tep)	5	5	1.0	5
Lauxaniidae (Lau)	10	18	1.8	7
Lonchaenidae (Lon)	5	5	1.0	4
Agromyzidae (Agr)	2	2	1.0	2
Drosophilidae (Dro)	5	5	1.0	3
Diastatidae (Dia)	1	1	1.0	1
Ephydridae (Eph)	7	7	1.0	5
Canaceidae (Can)	2	2	1.0	1
Chloropidae (Chl)	16	29	1.8	10
Clusiidae (Clu)	5	79	15.8	13
Scatophagidae (Sca)	1	3	3.0	2
Anthomyiidae (Ant)	27	92	3.4	15
Muscidae (Mus)	2	5	2.5	5
Tachinidae (Tac)	31	34	1.1	15
Phasiidae (Pha)	2	5	2.5	4
Calliphoridae (Cal)	6	120	20.0	10
Sarcophagidae (Sar)	8	9	1.1	6
COLEOPTERA	135	434	3.2	34
Carabidae (Car)	2	2	1.0	2
Silphidae (Sil)	1	1	1.0	1
Staphylinidae (Sta)	4	39	9.8	6
Scarabaeidae (Sca)	11	37	3.4	12
Elateridae (Ela)	10	29	2.9	23
Buprestidae (Bup)	2	3	1.5	3
Lampyridae (Lam)	2	3	1.5	2
Cantharidae (Can)	8	42	5.3	10

Table 2. (continued)

ORDER (Abbrev.) Family (Abbrev.)	No. of Arthropods			No. of Plant Species Visited
	Species	Individuals	Ind/Spp	
Lycidae (Lyc)	4	6	1.5	4
Dermestidae (Der)	1	1	1.0	1
Byturidae (Byt)	2	2	1.0	2
Melyridae (Mel)	1	2	2.0	2
Nitidulidae (Nit)	6	35	5.8	8
Cryptophagidae (Cry)	1	1	1.0	1
Coccinellidae (Coc)	3	3	1.0	2
Endomychidae (End)	1	1	1.0	1
Lagriidae (Lag)	3	17	5.7	7
Alleculidae (All)	1	2	2.0	1
Pyrochroidae (Pyr)	1	1	1.0	1
Mordellidae (Mor)	8	35	4.4	12
Scraptiidae (Scr)	1	1	1.0	1
Cephaloidae (Cep)	2	5	2.5	3
Oedemeridae (Oed)	8	25	3.1	7
Cerambycidae (Cer)	26	83	3.2	18
Chrysomelidae (Chr)	18	50	2.8	17
Attelabidae (Att)	2	2	1.0	2
Apionidae (Api)	1	1	1.0	1
Curculionidae (Cur)	5	5	1.0	4
HYMENOPTERA (Hym)	188	948	5.0	79
Thenthredinoidea	22	31	1.4	18
Tenthredinidae (Ten)	18	26	1.4	16
Argidae (Arg)	3	4	1.3	3
Cimibicidae (Cim)	1	1	1.0	1
Ichneumonoidea	60	62	1.0	24
Braconidae (Bra)	21	21	1.0	16
Ichneumonidae (Ich)	39	41	1.1	15
Chalchidoidea	8	8	1.0	7
Eulophidae (Eul)	1	1	1.0	1
Leucospidae (Leu)	1	2	2.0	1
Pteromalidae (Pte)	5	5	1.0	4
Eurytomidae (Eur)	1	1	1.0	1
Cynipoidea	2	2	1.0	2
Figitidae (Fig)	1	1	1.0	1
Cynipidae (Cyn)	1	1	1.0	1
Evanioidea	1	1	1.0	1
Aulacidae (Aul)	1	1	1.0	1
Proctotrupoidea	3	3	1.0	3
Diapriidae (Dia)	1	1	1.0	1
Proctotrupidae (Pro)	1	1	1.0	1
Platygasteridae (Pla)	1	1	1.0	1
Formicoidea	8	25	3.1	10
Formicidae (For)	8	25	3.1	10
Vespoidea	7	21	3.0	12
Eumenidae (Eum)	4	4	1.0	3
Vespidae (Ves)	3	17	5.7	9
Sphecoidea	11	28	2.5	12
Sphecidae (Sph)	11	28	2.5	12

Table 2. (continued)

ORDER (Abbrev.) Family (Abbrev.)	No. of Arthropods			No. of Plant Species Visited
	Species	Individuals	Ind/Spp	
Apoidea	69	766	11.1	73
Colletidae (Col)	3	43	14.3	10
Halictidae (Hal)	20	192	9.8	39
Andrenidae (And)	21	96	4.6	21
Megachilidae (Meg)	7	15	2.1	9
Anthophoridae (Ant)	11	104	9.5	33
Anthophorinae	2	3	1.5	3
Xylocopinae	5	93	18.5	25
Nomadinae	4	8	2.0	7
Apidae (Api)	7	316	45.1	55
Bombinae	5	209	41.8	50
Apinae	2	107	53.5	14
Total	715	2459	3.4	91

(3.3 %), Lauxaniidae (2.1 %), Lonchopteridae (2.0 %), Bombyliidae (1.7 %) and Acroceridae (1.7 %). Abundant dipterous species were *Stomorhina obsoleta* (Calliphoridae, the number of individuals = 112), an unidentified clusiid (68), *Eristalis cerealis* (Syrphidae, 55), *Melanostoma scalare* (Syrphidae, 32), an unidentified anthomyiid (17), *Lonchoptera* (Lonchopteridae, 16) and *Oligoneura itoi* (Acroceridae, 15).

3.4 Coleoptera. Most coleopterous insects were pollen feeders rather than nectar feeders (87.1 % of the total number of species), although some were predators (11.5 %, e.g., Carabidae, Cantharidae and Coccinellidae) or plant tissue feeders (1.4 %, e.g., Apionidae and Curculionidae). Dominant families were Cerambycidae (19.1 %), Chrysomelidae (11.5 %), Cantharidae (9.7 %), Staphylinidae (9.0 %), Scarabaeidae (8.5 %), Nitidulidae (8.1 %), Mordellidae (8.1 %), Elateridae (6.7 %), Oedemeridae (5.8 %) and Lagriidae (3.9 %) (Table 2). Abundant coleopterous species were *Eusphalerum parallelum* (Staphylinidae, 36 individuals), *Podabrus temporalis* (Cantharidae, 28), *Parastrangalis nymphula* (Cerambycidae, 17), *Eparaea* sp. (Nitidulidae, 16), *Anthromacra vipiclissima* (Lagriidae, 14), *Mordellistena* sp. (Mordellidae, 12), *Gamepenthes versipellis* (Elateridae, 11), *Mordellistena* sp. (Mordellidae, 10), *Anoploderomorpha excavata* (Cerambycidae, 10), *Idiostrangalis contracta* (Cerambycidae, 10), and *Leptura ochraeofasciata* (Cerambycidae, 10).

3.5 Hymenoptera. Hymenopterous insects were composed of 10 superfamilies (24 families). Dominant superfamilies were Apoidea (80.5 % of the total number of individuals), Ichneumonoidea (6.5 %), Tenthredinoidea (3.3 %), Sphecoidea (3.0 %), Formicoidea (2.6 %) and Vespoidea (2.2 %). Most species of Apoidea, except for cleptoparasitic bees, collected nectar and pollen for nutrition of their larvae. The other hymenopterous superfamilies were facultative nectar feeders. Cleptoparasitic bees feed on nectar for metabolic energy and pollen for egg production.

The sampled 763 individuals of Apoidea were classified into six families, nine

subfamilies, 13 genera and 66 species (Table 3). The number of bee species in Ashu is less than those in Sapporo (122 spp., Sakagami and Fukuda, 1973), Kibune (72 spp., Inoue *et al.*, 1990), Sasayama (69 spp., Miyamoto, 1962) and Kochi (68 spp., Ikudome, 1978) but more than those of the campus of Kyoto University in Kyoto city (62 spp., Kakutani *et al.*, 1990), Wakayama (48 spp., Matsuura *et al.*, 1974) and Gifu (51 spp., Yamauchi *et al.*, 1974). Fig 8 shows the number of bee species plotted in octave. This line shows the truncated upper 82.3 % of the log normal distribution. Thus, the total number of bee species was estimated to be 79. The number of species was highest in Andrenidae (30.3 % of the total number of species), followed by Halictidae (28.8 %), Megachilidae (10.6 %), Bombinae (7.6 %), Xylocopinae (6.1 %), Nomadinae (6.1 %), Colletidae (4.5 %), Anthophorinae (3.0 %) and Apinae (3.0 %). There were 20 andrenid bees in one genus, *Andrena*. The number of species in Andrenidae was similar among various localities. Halictid bees were consisted of two genera, *Lasioglossum* and *Sphecodes*. The former genus is divided into five subgenera, *Lasioglossum* (6 species), *Dialictus* (2 spp.), *Ctenonomia* (1 sp.), carinate *Evylaeus* (*Et*, 3 spp.) and carinaless *Evylaeus* (*El*. 6 spp.).

The number of species in Halictidae was less than only that in Sapporo (43 spp.) and was similar to those in the other localities cited above. The number of species in Megachilidae (6 spp.) was less than those in southern localities, e.g., Kochi (15 spp.) and Wakayama (12 spp.). Apidae was more abundant in Ashu than in the two southern localities.

In Ashu, eight bee species (12.1 % of the total number of species) were thought to be eusocial, i.e., five *Bombus*, two *Apis*, one *Lasioglossum* (*Lg.* (*Et.*) *duplex*). Seven species (10.6 %) were cleptoparasitic (one *Sphecodes*, two *Coelioxys* and four

Table 3. Relative abundance of bee genera.

Families	Subfamilies	Genera	Abbreviation	No. of Species	No. of Individuals		
					Female	Male	Total
Colletidae	Hylaeninae	*Hylaeus*	Hy	3	25	18	43
Halictidae	Halictinae	*Lassioglossum*	Lg	18	179	11	190
		Sphecodes	Sp	1	2	0	2
Andrenidae	Andreninae	*Andrena*	Ad	21	86	10	96
Megachilidae	Megachilinae	*Chalicodoma*	Ch	1	0	1	1
		Megachile	Mg	2	4	3	7
		Osmia	Os	2	0	5	5
		Coelioxys	Cx	1	1	0	1
Anthophoridae	Anthophorinae	*Tetralonia*	Tt	2	2	1	3
	Xylocopinae	*Ceratina*	Ct	4	67	26	93
	Nomadinae	*Nomada*	Nm	4	3	5	8
Apidae	Bombinae	*Bombus*	Bo	5	196[1]	13	209
	Apinae	*Apis*	Ap	2	107	0	107
Total				66	672	93	765

[1] Thirteen were queens and the others were workers.

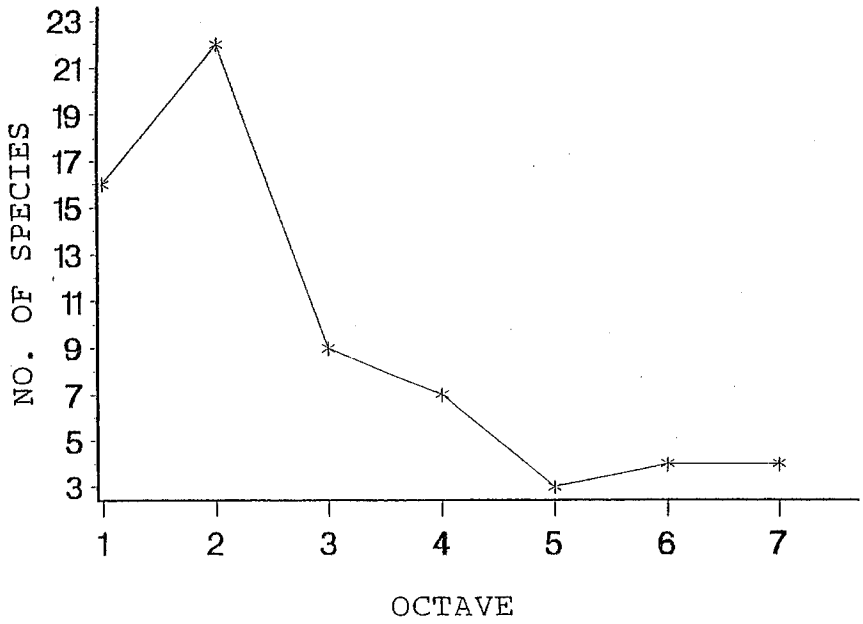

Fig. 8. The number of bee species plotted in Preston's octave.

Nomada). This relative frequency of cleptoparasitic bee species are comparable with those of the seven wild bee studies in the world (7.1-13.0 %, Heithaus, 1979).

Hives of *Apis mellifera* were set at 2 km east from the study site by beekeepers. The other bee species are all native. Among the bee faunas studied in various parts in Japan, the number of bee species common to Ashu was highest at Kibune (38 species, 57.6 %), followed by Sapporo (27 spp., 40.9 %), the campus of Kyoto University (26 spp., 39.4 %), Gifu (19 spp., 28.8 %), Kochi (14 spp., 21.2 %) and Wakayama (12 spp., 18.2 %).

Bombinae was most abundant (27.4 % of the total number of individuals), followed by Halictidae (25.2 %), Apinae (14.0 %), Andrenidae (12.6 %), Xylocopinae (12.2 %), Colletidae (5.6 %), Megachilidae (2.0 %), Nomadinae (1.0 %) and Anthophorinae (0.4 %). The bee community structure of Ashu was well characterized by the predominance of Apidae. Fig. 9 shows the relative abundance of 20 predominant species in terms of the percentages, with the 5 % and 95 % points (calculated with the method of Sakagami and Matsumura, 1967), arranged in the descending order of abundance. In the predominant 13 species, the lower 5 % point exceeded the reciprocal of 100 × the number of species, and the cumulative percentage reached 77. Of the six predominant species, four belonged to Apidae.

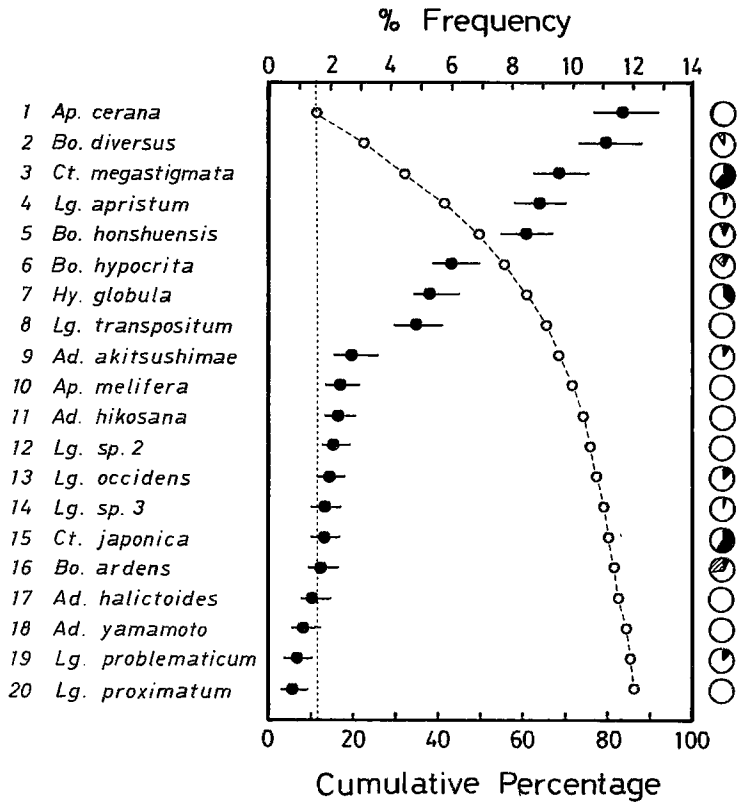

Fig. 9. Relative abundance of 20 predominant bee species shown by the occurrence probability method. Percentage ratio (the top scale) of each species is given by a solid circle with the fiducial limits (bar). Cummulative percentage curve (the bottom scale) is given by open circle. The vertical broken line is the reciprocal of the 100× number of the sampled species. Sex and caste ratio in each species are shown in a pie graph on the right side; white sector = female, black = male and shaded = queen. Abbreviations of the genera are shown in Table 3.

4. Phenology of flower visitors

4.1 Overview. The number of insect species peaked in May and gradually decreased afterward (Fig. 10). The percentage of dipterous species out of the total number of species collected per month was highest in May (56.1 %) and decreased afterward (June 34.0 %, September 40.9 %). The number of coleopterous species peaked in June. The percentage of coleopterous species increased from May (14.5 %) to July (19.7 %) but rapidly decreased in August (9.1 %) and September (3.6 %). The number of hymenopterous species peaked in June and afterward gradually decreased. The percentage of hymenopterous species was low in May (19.0 %) and increased up to 59 % in September.

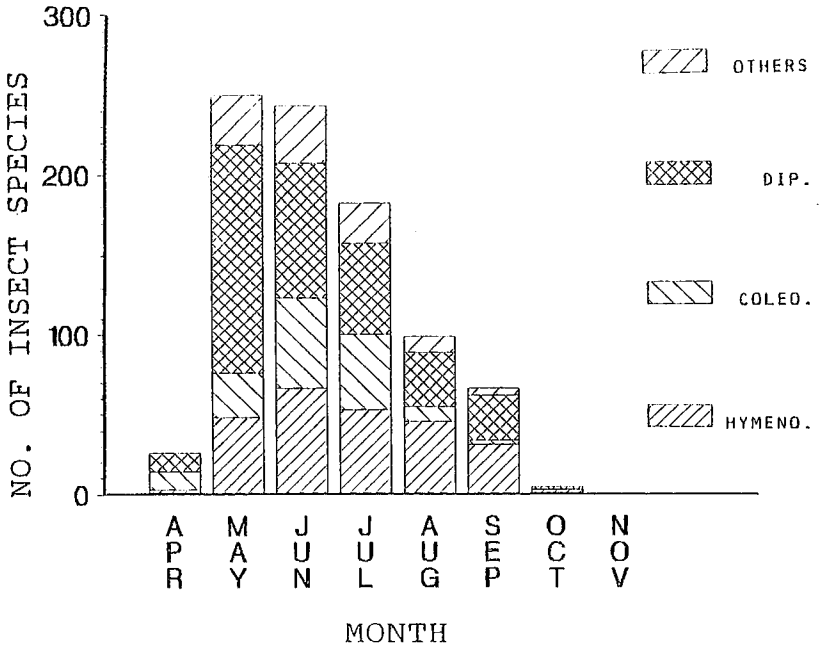

Fig. 10. Seasonal changes in numbers of arthropod species.

The number of individuals changed in the pattern similar to the number of species, although the former was higher in September than in August (Fig. 11). Predominance

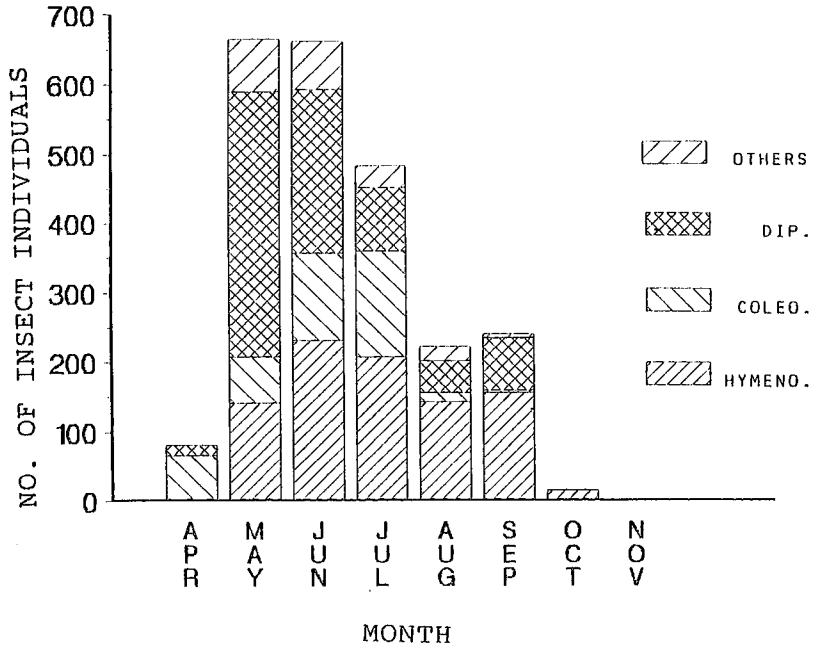

Fig. 11. Seasonal changes in numbers of arthropod individuals.

of Hymenoptera in the autumn flowering season was more obvious in the number of individuals than in the number of species.

4.2 Diptera. Seasonal activity patterns of the ten predominant dipterous families are shown in Fig. 12. Most families were active only from May to June, although Syrphidae, Anthomyiidae and Tachinidae were active from late April to late September. Bombyliidae was composed of one long-tongued spring species (*Bombylius major*) and two short-tongued autumn species (*Cephenius nitobei* and *C.* sp.). The most abundant species among all insects, *Stomorhina obsoleta* (Calliphoridae), appeared only from mid May to early June.

4.3 Coleoptera. Seasonal activity patterns of nine predominant coleopterous families are shown in Fig. 13. Nitidulidae and Chrysomelidae peaked in late April, Cantharidae did in May and others did from June to July. Only small numbers of

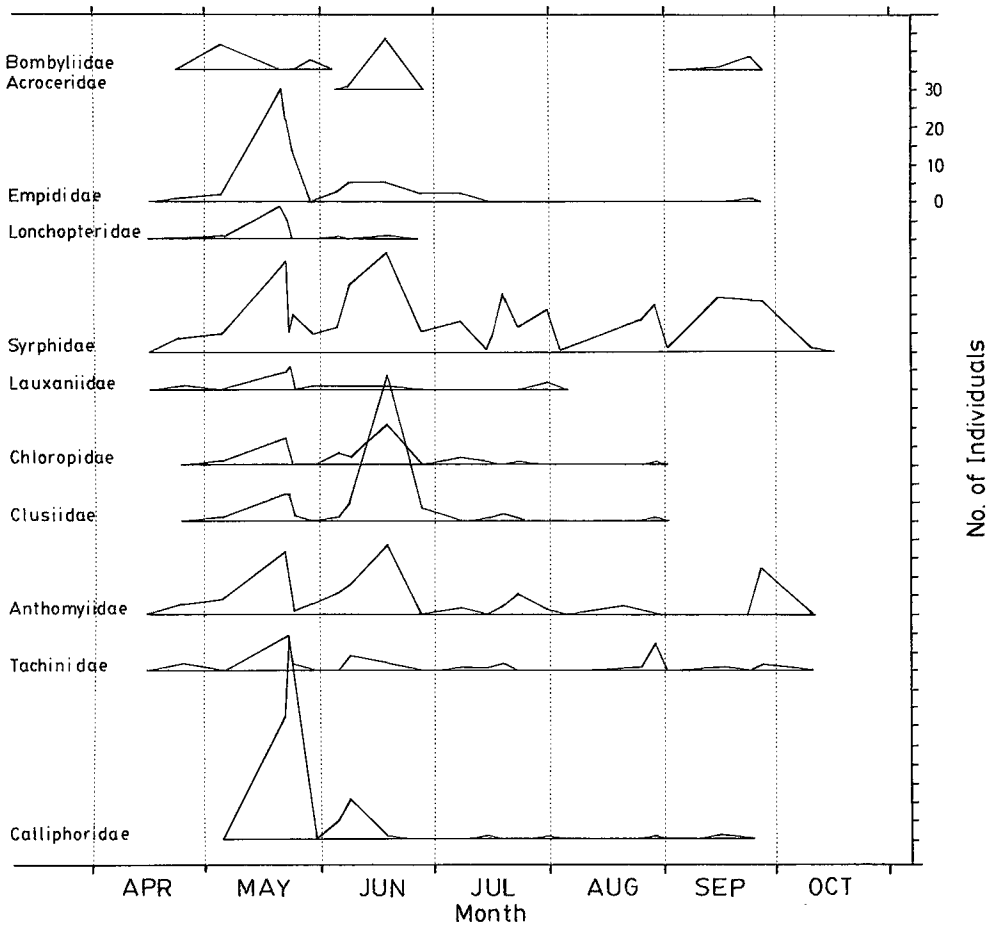

Fig. 12. Seasonal changes in numbers of individuals of the top 11 dipterous families.

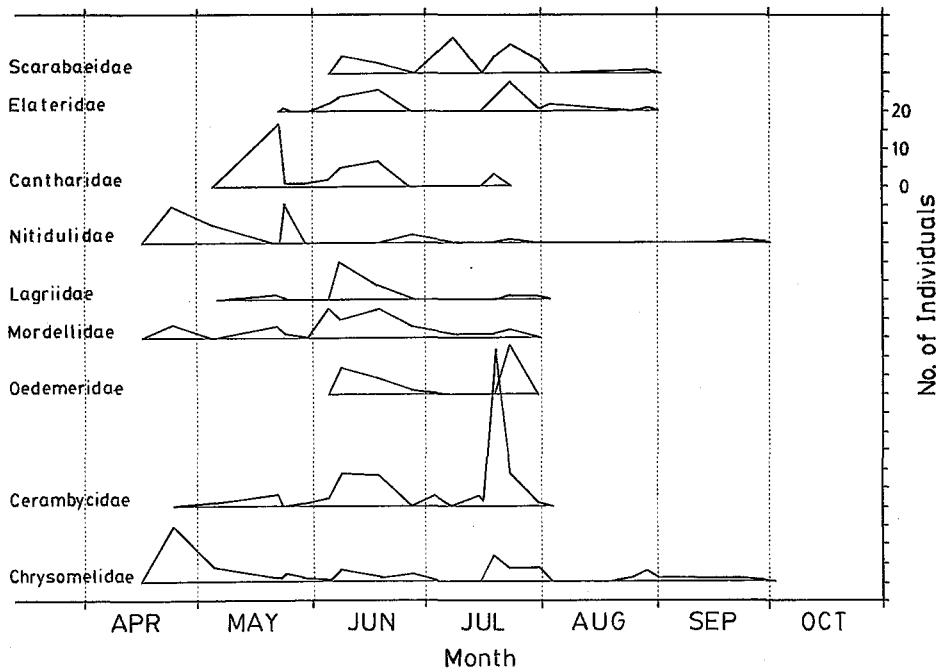

Fig. 13. Seasonal changes in numbers of individuals of the top nine coleopterous families.

coleopterous insects were active after August. The active periods of species of a pollen-feeding, predominant family, Cerambycidae, coincided well with the flowering time of the respective host species, e.g., *Weigela hortensis* (May to June), *Symplocos chinensis* (June), *Euonymus alatus* (June), *Hydrangea macrophylla* (July), *H. paniculata* (July), *Astilbe thunbergii* (July) and *Viburnum plicatum* (July). This active periods were basically similar to those at Shimashima-dani, Nagano Pref. (Kuboki, 1980). The number of species of *Pidonia* in Ashu was less than Shimashima-dani.

4.4 Hymenoptera. Phenology of six bee families (including 2 subfamilies) is shown in Fig. 14. In May, bee fauna was dominated by Andrenidae, Megachilidae (*Osmia*), Xylocopinae (*Ceratina*) and Bombinae. Most Halictidae and Andrenidae were active during a short period between early June and late July. In late August, colletid bees (*Hylaeus*) abruptly appeared when densities of other bees were low. After September, Bombinae and Apinae became predominant.

Fig. 15 shows seasonal changes in the numbers of individuals in 66 bee species.

1) Colletidae: *Hy. floralis*, *Hy. globula* and *Hy. nippon* appeared in June, July and August, respectively. Males of *Hy. globula* were abundant in late August on flowers of *Angelica* (Umbelliferae), probably for copulation.

2) Halictidae: Females of most species were active for a long period from May to July, although males appeared in late August and September. *Lg.* (*Et.*) *apristum*

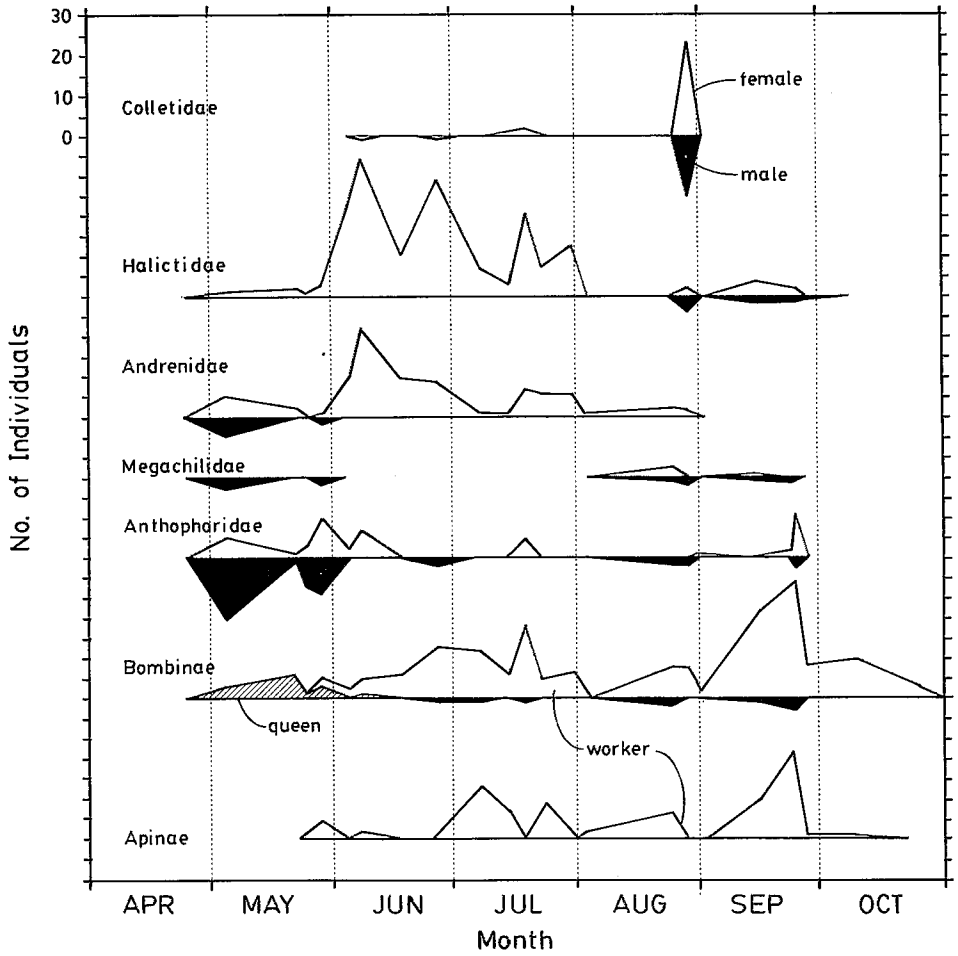

Fig. 14. Seasonal changes in numbers of individuals of individual bee families and subfamilies. Sex and caste are shown separately.

had the bimodal peaks in June and early August.

3) Andrenidae: All bees were active for $<$ 2 months, and activity peaked from April to June in 16 species (80 %), and in July and August in four species, *Ad. ishiharai*, *Ad. stellaria*, *Ad. omogoensis* and *Ad. dentata*.

4) Megachilidae: Two species of *Osmia* appeared in May but other five species of *Chalicodoma*, *Coelioxys* and *Megachile* appeared from August to September.

5) Anthophoridae: Two *Tetralonia* and three *Nomada* species appeared in May and June. Two species of *Ceratina*, *Ct. japonica* and *Ct. megastigmata*, showed prolonged bimodal patterns. The second peak in September is thought to be newly emerged adults.

6) Bombinae: Five *Bombus* species of four subgenera (*Bombus*, *Pyrobombus*,

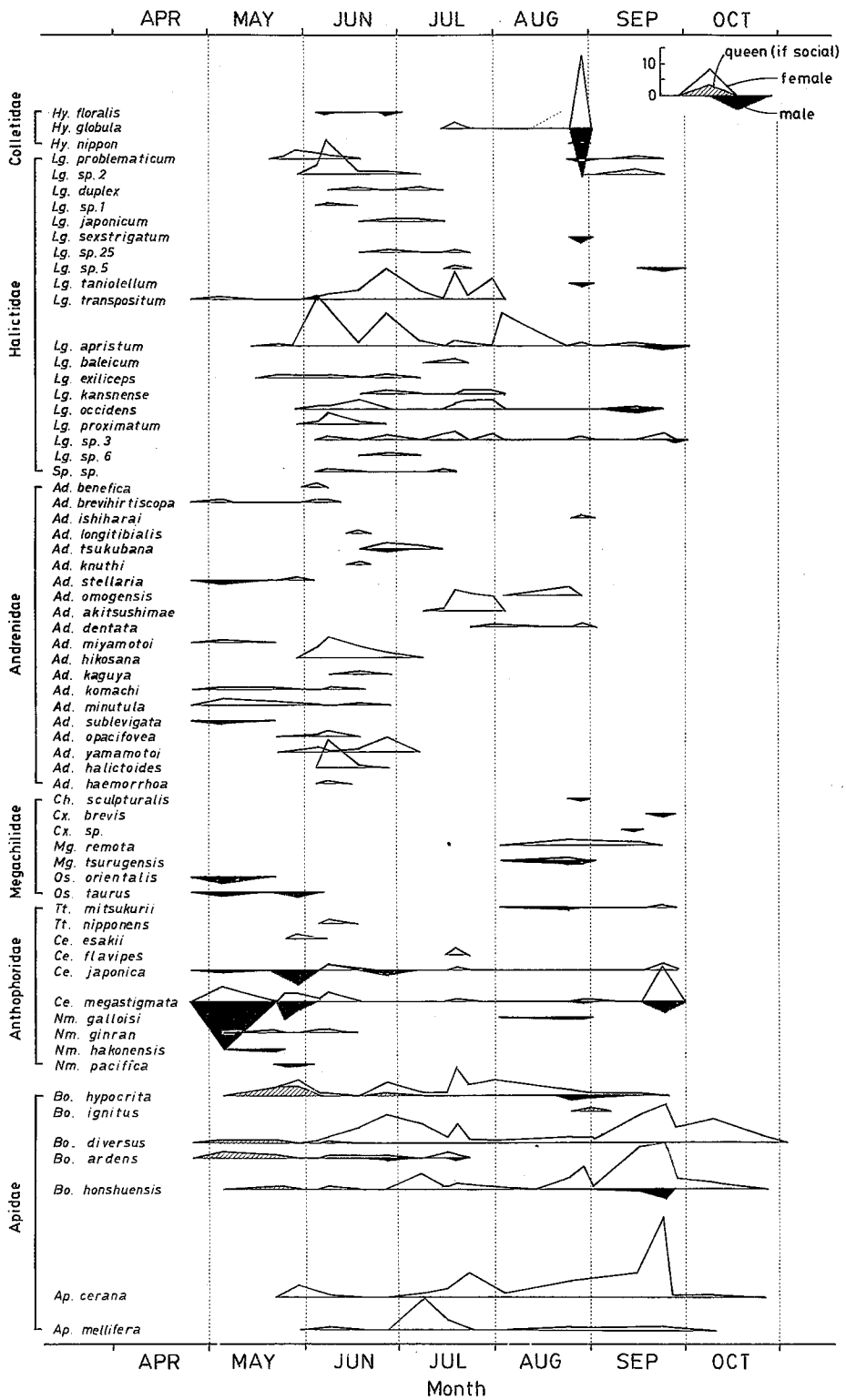

Fig. 15. Seasonal changes in numbers of individuals of the top 66 bee species.

Agrobombus and *Diversobombus*) were sampled. *Bo. ignitus*, however, is thought to be a fugitive species because only one new queen was collected on August 29. This species is common in the campus of Kyoto University. Active periods of the other four species started in early May. The active period of *Bo. ardens* was confined before summer. Males of *Bo. ardens* appeared from late June to middle July. In our samples, there were no new queens but copulation must occur in this period. Active periods terminated in September in *Bo. hypocrita*, in early October in *Bo. honshuensis* and in late October in *Bo. diversus*. *Bo. hypocrita* was more abundant than *Bo. diversus* and *Bo. honshuensis* in August, the latter two became more abundant than *Bo. hypocrita*.

7) Apinae: There were striking differences of phenological curves between *Ap. cerana* and *Ap. mellifera*. Native *Ap. cerana* was active from May to September and was especially abundant on flowers in late September. *Ap. mellifera* was active only in July in the study area, although at least one beekeeper stayed from May until the end of October (transportaion of hives to Kyushu for overwintering) at an apiary with about 200 hives, 2 km east to the study area. No wild colonies of *Ap. mellifera* were found in Japan because of severe attacks by vespid wasps, *Vespa mandarinia japonica* and *V. simillima xanthoptera* (Matsumura and Yamane, 1984; cf. North America, Seeley, 1985).

5. Anthophilous fauna on individual plant families

5.1 Analysis at insect order level. There was a great variation in anthophilous faunas among plant families (Fig. 16, Appendix 1). Patterns of their visits to individual plant families ware examined by cluster analysis (Fig. 17). Statistics were the percentages of individuals in respective insect orders. At a prediction ratio of about 0.75, 37 plant families were divided into two clusters, indicating that 75 % of the total sum of squared distances among all families can be explained by separation of the two clusters. Cluster 1 was separated from others by predominance of Hymenoptera (Fig. 17). The latter cluster was sub-divided into three clusters (Cluster 2-4) at a prediction ratio of 0.5. Plants of cluster 2 were predominated by Coleoptera (mainly Magnoliaceae, Salicaceae and Valerianaceae). Plants of cluster 3 were predominated by Diptera (mainly Stachyuraceae, Aceraceae, Berberidaceae and Polygonaceae). Fifteen families of cluster 4 were visited by various insect groups.

5.2 Analysis at bee family level. Patterns of bee visits to plant families (Fig. 18) were also analyzed by cluster analysis (Fig. 19). At a prediction ratio of 0.7, 33 plant families were divided into two clusters. Cluster 1 is Bombinae-dominated plants. The others were divided into four clusters (Cluster 2-5) at a prediction ratio of about 0.5. Plants of cluster 2 (four spring-flowering herbacious families)

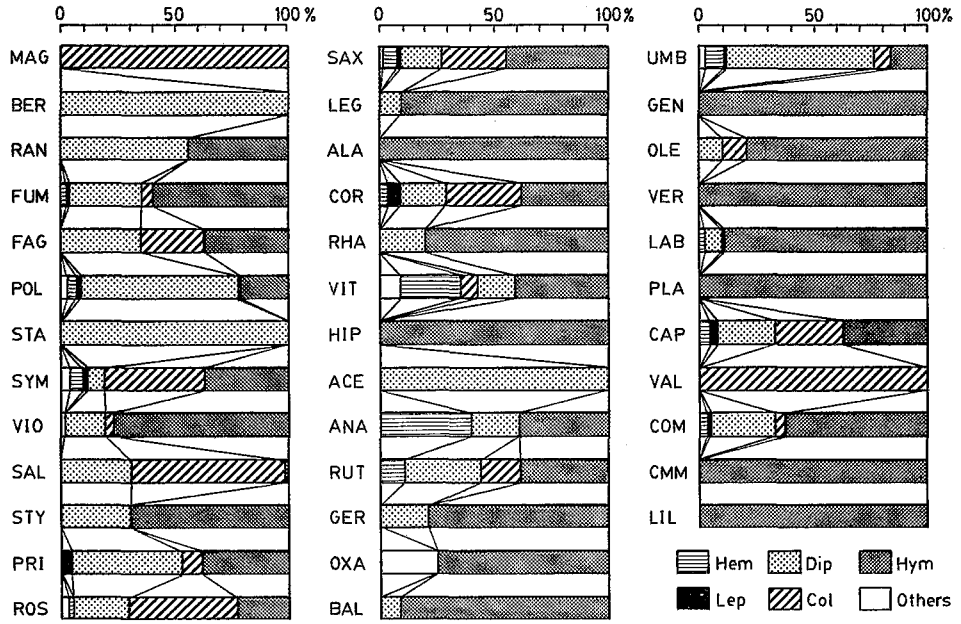

Fig. 16. Flower-visitor spectra (sorted by order) in 38 plant families. Plant family codes are shown in Table 1.

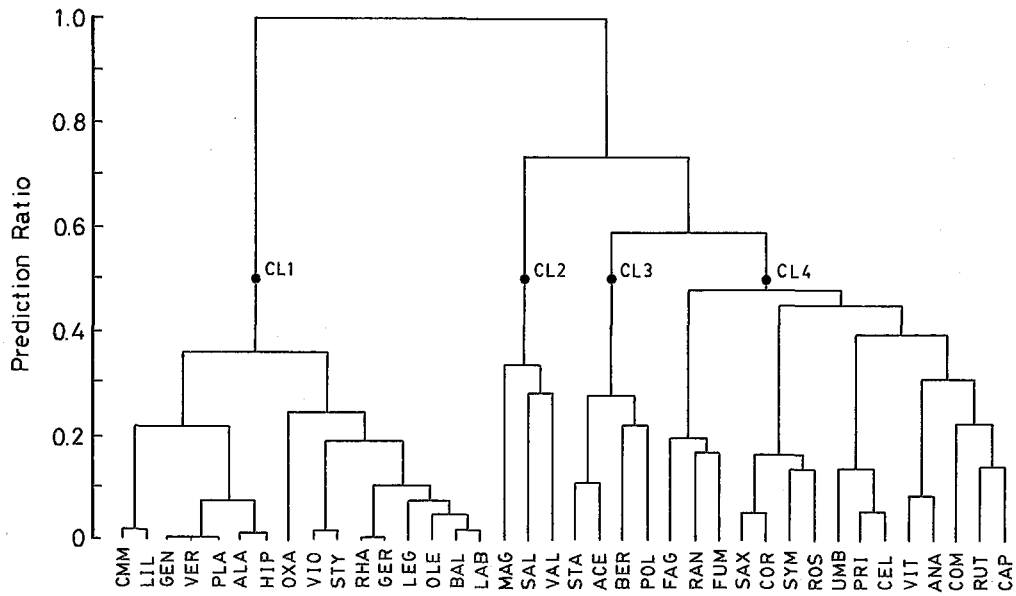

Fig. 17. Dendrogram of plant families, based on the flower visitor spectra shown in Fig. 16. Ward's method is used in cluster analysis. Plant family codes are shown in Table 1.

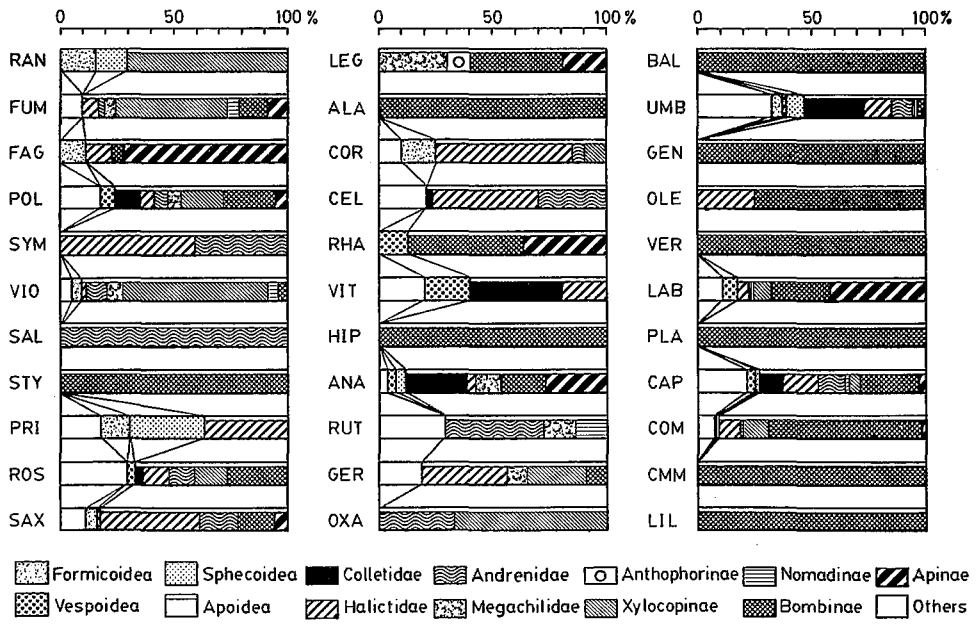

Fig. 18. Hymenopterous spectra (sorted by superfamilies, families and subfamilies as shown in Table 3) in 33 plant families.

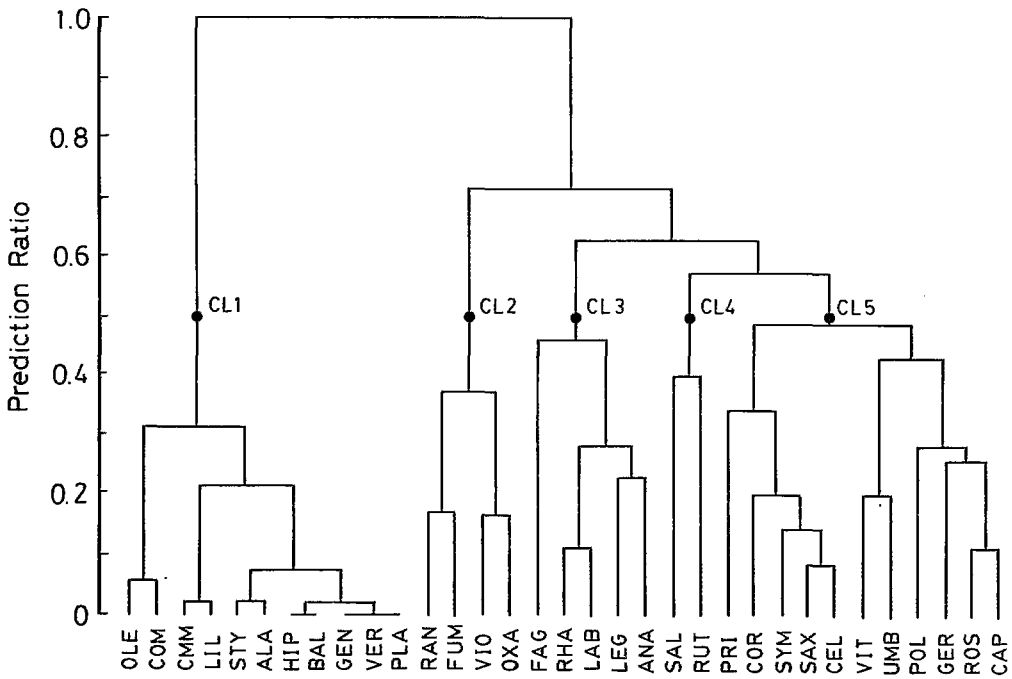

Fig. 19. Dendrogram of plant families, based on the hymenopterous spectra in Fig. 18. Ward's method is used in cluster analysis. Plant family codes are shown in Table 1.

was visited mainly by Xylocopinae. Plants of cluster 3 were frequently visited by Apinae. Cluster 4 (Salicaceae and Rutaceae) was separated from Cluster 5 by predominance of Andrenidae. Cluster 5 consisted of 11 families which were visited by various bee subfamilies. Out of the 11 families, Primulaceae, Cornaceae, Symplocaceae, Saxifragaceae and Celastraceae were frequently visited by Halictidae, and Vitaceae and Umbelliferae by Colletidae.

6. Floral hosts of anthophilous insects

6.1 General patterns. Floral hosts were compared among five dominant orders of anthophilous insects (Fig. 20). Saxifragaceae, Umbelliferae and Caprifoliaceae were predominantly utilized by all the five orders. The main host was Saxifragaceae in Lepidoptera, Coleoptera and Hymenoptera, and it was Umbelliferae in Hemiptera and Diptera. Special preferences were observed for Anacardiaceae in Hemiptera, for Cornaceae and Compositae in Lepidoptera, for Celastraceae in Diptera, for Salicaceae and Rosaceae in Coleoptera, for Labiatae and Compositae in Hymenoptera. Floral host species of each anthophilous species in Diptera, Coleoptera and Hymenoptera are listed in Appendix 2.

6.2 Floral hosts of Diptera. The main floral host families of Diptera were

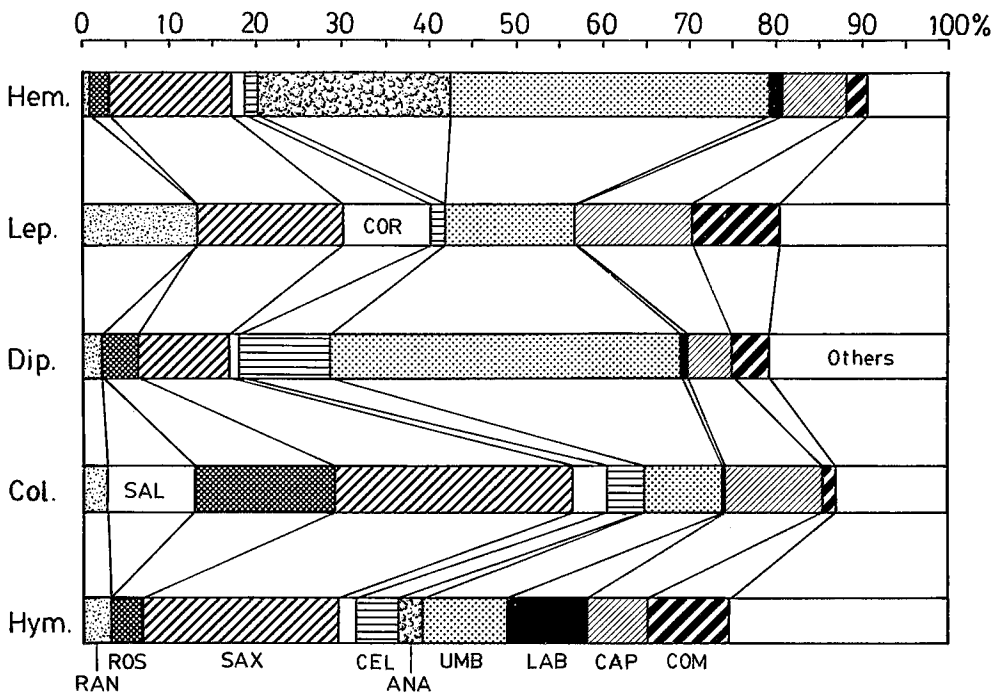

Fig. 20. Flower spectra (sorted by families) visited by the top five insect orders (in terms of individuals). Plant family codes are shown in Table 1.

Umbelliferae, Saxifragaceae and Celastraceae. The floral hosts of 19 genera of Syrphidae are shown in Table 4. The main floral host families were Saxifragaceae, Umbelliferae, Polygonaceae, Compositae, Rosaceae, Celastraceae, Caprifoliaceae and Ranunculaceae. Predominant genera, *Cheilosia*, *Eristalis*, *Melanostoma*, and *Sphaerophoria*, visited a wide variety of plant families. Floral hosts of Bombyliidae with a long proboscis were very different from other dipterous families and were rather similar to bees.

Table 4. The numbers of species and individuals of syrphid flies and the numbers of their visits to plant families (Plant family codes is shown in Table 1). Larval feeding types are shown as follows: PR - predator, PH - phytophage, SA - saprophage (Owen & Gilbert, 1989).

Genus	Larval feeding type	Month sampled[1]	No. of species	No. of individuals	Floral Host Families								
					RAN	POL	ROS	SAX	CEL	UMB	CAP	COM	Others
Allograpta	?	7-8	1	2	-	-	-	1	-	-	-	-	1
Baccha	PR	6-8	2	5	-	-	-	-	-	-	-	1	4
Cheilosia	PH	5-9	12	32	5	2	4	3	-	9	-	2	7
Chrystogaster	SA	5	1	1	-	-	1	-	-	-	-	-	-
Criorhina	SA	6	1	1	-	-	-	-	1	-	-	-	-
Dasysyrphus	PR	10	1	1	-	-	-	-	-	-	-	1	-
Didea	?	7	1	1	-	-	-	1	-	-	-	-	-
Epistotophe	?	9	1	4	-	3	-	-	-	-	-	1	-
Episyrphus	PR	5-9	1	9	-	1	-	5	2	1	-	-	-
Eristalis	SA	4-9	1	55	-	17	4	9	1	1	8	6	9
Eristalomya	?	6-9	1	9	-	1	1	1	-	-	-	5	1
Ferdinandea	SA	7	1	1	-	-	-	1	-	-	-	-	-
Helophilus	SA	7-9	1	7	1	2	-	-	-	-	-	2	2
latisma	?	7	3	4	-	-	-	3	-	-	-	-	1
Mashumyia	?	7-8	1	1	-	-	-	-	-	-	-	-	1
Megaspis	?	8-9	1	4	-	2	-	-	-	1	-	1	-
Melanostoma	PR	5-8	1	32	-	1	-	2	5	20	-	2	2
Meliscaeva	PR	7	1	1	-	-	-	1	-	-	-	-	-
Metasyrphus	PR	6	2	2	-	-	-	-	-	-	2	-	-
Microdon	?	6-7	2	3	-	1	-	-	-	1	-	1	-
Milesia	?	7	1	1	-	-	-	-	-	-	-	-	1
Neoascia	?	5	1	5	1	-	3	-	-	-	-	-	1
Paragus	PR	5-9	2	3	-	-	-	-	-	1	-	-	2
Pipiza	PR	5-9	2	4	-	-	-	-	-	3	-	-	1
Rhingia	SA	9	1	2	-	-	-	-	-	-	-	1	1
Sericomyia	?	7	1	1	-	-	-	1	-	-	-	-	-
Sphaerophoria	PR	6-8	2	14	-	-	-	4	1	1	-	3	5
Sphegina	?	5-7	4	9	-	-	-	4	-	2	-	-	3
Syritta	SA	7-8	1	2	-	-	-	-	-	-	-	-	2
Syrphus	PR	6	1	6	-	-	-	-	3	1	1	-	1
Takaomyia	?	6-7	1	2	-	-	-	1	-	-	-	-	1
Temnostoma	?	6	1	1	-	-	-	1	-	-	-	-	-
Xylota	SA	7	3	3	-	-	-	3	-	-	-	-	-
Total			58	228	7	30	13	41	13	41	11	26	46

[1] Month is denoted in numericals 1-12 for January - December.

A spring species *Bombylius major* visited Berberidaceae, Fumariaceae, Violaceae and Rosaceae, and an autumn species *Cephenius* spp. visited Labiatae.

6.3 Floral hosts of Coleoptera. Plant families that were most frequently utilized by Coleoptera were Saxifragaceae, Rosaceae, Caprifoliaceae, Salicaceae and Umbelliferae. Main reward of these plant families was pollen. Plant families utilized by ten predominant coleopterous families are shown in Table 5. Anthophilous staphylinid beetles frequently visited Rosaceae and Salicaceae. Saxifragaceae was preferred by Scarabaeidae, Elateridae, Nitidulidae, Mordellidae, Oedemeridae, Cerambycidae and Chrysomelidae. The predacious family, Cantharidae, preferred Cornaceae as ambush sites.

6.4 Floral hosts of Hymenoptera. Frequency distributions of the number of floral host species per bee species were compared among bee families (Fig. 21). Due to the insufficiency of sampling, species called 'oligolectic' below must include rare polylectic species. Twenty-nine bee species (44 %), one Colletidae, six Halictidae, 12 Andrenidae, five Megachilidae and five Anthophoridae, were collected on only one plant species. The mean number of floral host species per bee species was highest in Bombinae (17.7, excluding *Bo. ignitus*), followed by Apinae (7.5), Halictidae (3.8), Colletidae (3.6), Anthophoridae (2.2), Andrenidae (2.0) and Megachilidae (1.4).

Plant families that were most frequently visited by Hymenoptera were Saxifragaceae, Umbelliferae, Compositae, Labiatae, Caprifoliaceae, Celastraceae and Rosaceae. There was a great variation in flower preference among bee subfamilies (Fig. 22).

1) Colletidae: Preferred plant families, especially by *Hylaeus globula*, were Umbelliferae, Anacardiaceae and Caprifoliaceae.

2) Halictidae: Preferred plant families were Saxifragaceae, Cornaceae, Celastraceae, Umbelliferae, Symplocaceae, Caprifoliaceae and Compositae. Preference to Saxifragaceae in Ashu are quite different from the preference for Compositae at Sapporo

Table 5. The number of individuals of ten coleopterous families that were collected on flowers of respective plant families.

Families	Adult Feeding types[1]	Plant Families											
		MAG	FAG	SYM	SAL	ROS	SAX	COR	CEL	UMB	CAP	COM	Others
Staphylinidae	PO	-	-	-	15	21	-	-	-	1	1	-	1
Scarabaeidae	PO	-	10	2	-	2	12	-	2	1	2	4	2
Elateridae	PO	-	-	1	-	-	8	1	2	2	1	1	-
Cantharidae	PR	-	-	3	-	7	4	13	1	4	8	-	1
Nitidulidae	PO	4	-	-	1	8	10	-	-	-	-	1	-
Lagriidae	PO	-	-	2	-	-	1	6	-	1	6	-	1
Mordellidae	PO	-	1	7	3	1	7	2	1	4	9	-	-
Oedemeridae	PO	-	-	-	-	-	14	3	2	2	3	1	-
Cerambycidae	PO	-	1	5	-	3	46	2	5	1	9	-	1
Chrysomelidae	PO	-	-	-	1	15	16	-	1	2	3	-	6

[1]PO, pollen feeders; PR, predators for flower visitors.

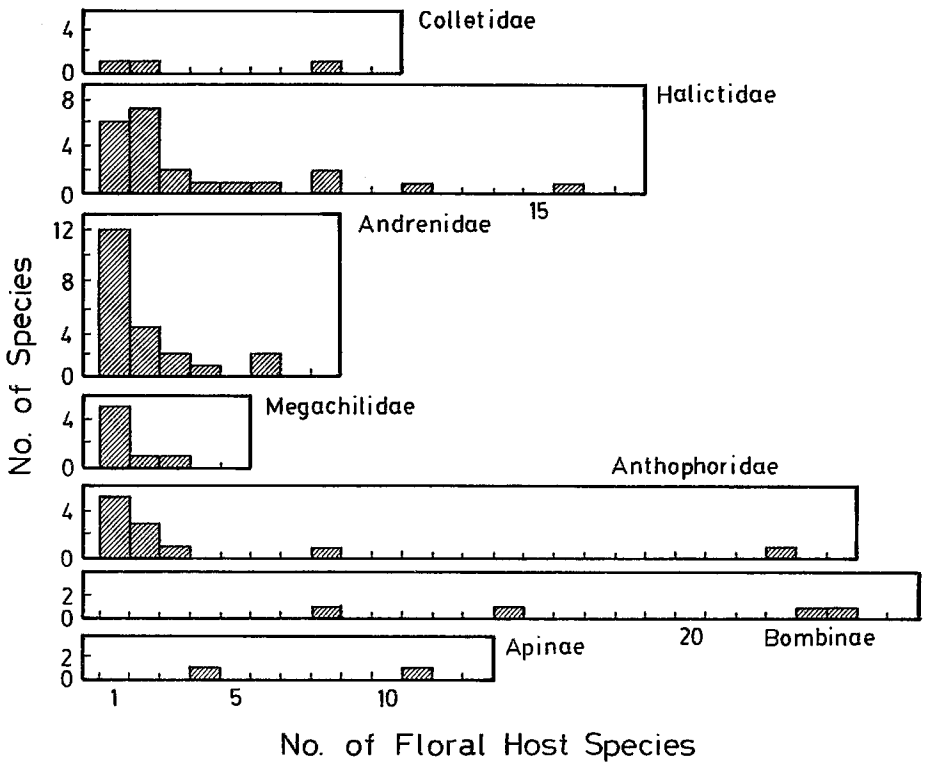

Fig. 21. Frequency distribution of the number of floral host species in each bee species, grouped at family and subfamily level.

(Sakagami and Fukuda, 1973) and that for Cruciferae at Kochi (Ikudome, 1978).

3) Andrenidae: General flower preference was very similar to that of Halictidae. Among oligolectic andrenid species, however, flower preferences were variable. Floral hosts for the twelve species that visited only one plant species (Fig. 21) were Fumariaceae (1 sp.), Violaceae (1), Salicaceae (1), Saxifragaceae (2), Celastraceae (1), Rutaceae (1), Umbelliferae (1), Caprifoliaceae (2) and Compositae (1), although some of them may be just due to a small sample size. Floral host species of most polylectic andrenids are variable among localities (Sakagami and Matsumura, 1967), but that of some oligolectic bees were stable. *Ad. halictoides* visited only Caprifoliaceae at Ashu (*Weigela hortensis*), Sapporo (*W. hortensis* and *Lonicera chrysantha*; Sakagami and Matsumura, 1967) and Hakodate (*W. hortensis* and *L. morrowii*; Matsumura and Munakata, 1969).

4) Megachilidae: *Osmia* visited Fumariaceae and Violaceae. *Chalicodoma* and *Megachile* visited Leguminosae and Anacardiaceae. Tight relationship between *Megachile* and Leguminosae is also reported at Sapporo (Sakagami and Fukuda, 1973) and Wakayama (Matsuura *et al.*, 1974).

5) Anthophoridae: Floral hosts of Anthophorinae, i.e., *Tetralonia*, were only

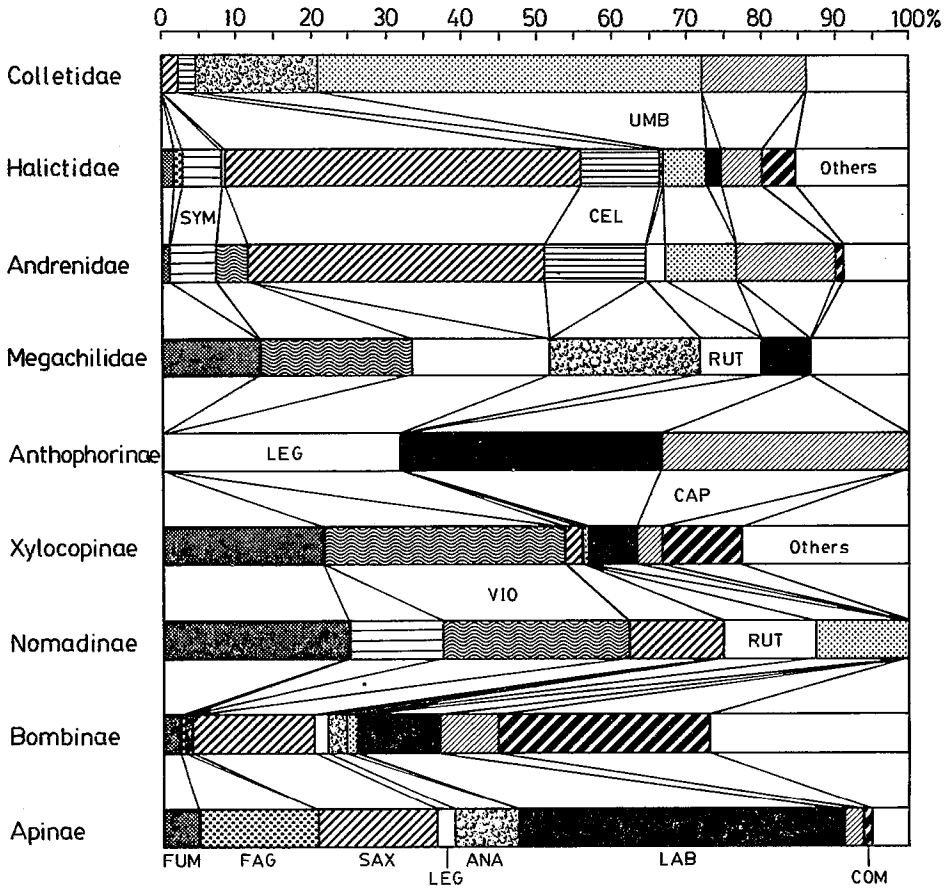

Fig. 22. Flower visiting spectra of bee families and subfamilies. Floral hosts are sorted by families. Plant family codes are shown in Table 1.

Leguminosae, Labiatae and Caprifoliaceae. Xylocopinae (*Ceratina*) and Nomadinae frequently visited Violaceae and Fumariaceae. Preference for Compositae were also detected in Xylocopinae which was abundant also in autumn.

6) Bombinae: There was an intimate relationship between Bombinae and Compositae, whereas Bombinae visited 25 plant families. The next preferred plant families were Saxifragaceae, Labiatae, Caprifoliaceae, Balsaminaceae, Rosaceae, Alangiaceae, Oleaceae, Anacardiaceae and Fumariaceae.

7) Apinae: Apinae also utilized many families, but main floral hosts were Labiatae, Saxifragaceae, Fagaceae, Anacardiaceae and Fumariaceae. Floral hosts of *Ap. mellifera* were completely coincided with those of *Ap. cerana* at plant family level.

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Appendix 1.

Insect visitors collected on 91 plant species in Ashu which are arranged following Stebbins (1974): species (family: order), sex and caste (F - females, M - males, W - workers, Q - queens, if indistinguishable, no code is added), date in the form of year + month + day, (number of individuals). Insects are arranged in the order of Table 2. Families and orders of insects are shown by abbreviation codes in Table 2. for unidentified species, Only codes (family name + species code number) are shown for unidentified species.

Magnoliaceae

Magnolia salicifolia
Epuraea sp. (Nit: Col) 840524 (4)

Berberidaceae

Epimedium grandiflorum
Bombylius major (Bom: Dip) F, 860505 (1)

Ranunculaceae

Anemone flaccida
EMPIDIDAE32 (Emp: Dip) 840524 (1); DOLICHOPODIDAE1 (Dol: Dip) 8705 29 (1); *Cheilosia* sp.8 (Syr: Dip) M, 840524 (1); *Cheilosia* sp.9 (Syr: Dip) F, 870529 (2); *Cheilosia* sp.14 (Syr: Dip) F, 840524 (2); *Neoascia* sp. (Syr: Dip) M, 870529 (1); EPHYDRIDAE19 (Eph: Dip) 840524 (1); *Empria quadrimaculata* (Ten: Hym) F, 870529 (1); BRACONIDAE31 (Bra: Hym) F, 840524 (1); *Ceratina megastigmata* (Ant: Hym) F, 840524 (1), M, 840524 (3), 870529 (1)

Fumariaceae

Corydalis lineariloba
Celastrina argiolus (Lyc: Lep) F, 860505 (1); *Bombylius major* (Bom: Dip) F, 860505 (3), M, 860505 (1); *Cheilosia* sp.11 (Syr: Dip) M, 850424 (2); *Paragus tibialis* (Syr: Dip) M, 860505 (1); CLUSIIDAE1 (Clu: Dip) 860505 (1); ANTHOMYIIDAE31 (Ant: Dip) M, 860505 (1); *Tachinus* sp. (Sta: Col) 860505 (1); *Loderus eversmanini obscurus* (Ten: Hym) F, 860505 (2); *Lasioglossum* (*Evylaeus*) *transpositum* (Hal: Hym) F, 860505 (1); *Andrena* (*Micrandrena*) *sublevigata* (And: Hym) M, 860505 (1); *Osmia orientalis* (Meg: Hym) M, 86 0505 (2); *Ceratina japonica* (Ant: Hym) M, 860505 (1); *Ceratina megastigmata* (Ant: Hym) F, 860505 (1), M, 860505 (12); *Nomada ginran* (Ant: Hym) F, 860505 (1); *Nomada hakonensis* (Ant: Hym) M, 860505 (1); *Bombus* (*Diversobombus*) *diversus diversus* (Api: Hym) Q, 860505 (1); *Bombus* (*Pyrobombus*) *ardens ardens* (Api: Hym) Q, 860505 (1)

Corydalis pallida
MIRIDAE18 (Mir: Hem) 870529 (1); CERCOPIDAE2 (Cer: Hem) 870529 (1); SCIARIDAE2 (Sci: Dip) 870529 (1); CHIRONOMIDAE5 (Chi: Dip) 870529 (6); CHIRONOMIDAE9 (Chi: Dip) 870529 (2); LAUXANIIDAE9 (Lau: Dip) 870529 (1); ANTHOMYIIDAE14 (Ant: Dip) M, 870529 (1); ANTHOMYIIDAE21 (Ant: Dip) F, 870529 (1); ANTHOMYIIDAE45 (Ant: Dip) 870529 (1); *Prothemus ciusianus* (Can: Col) 870529 (1); *Dinoptera minuta ticollis* (Cer: Col) 870529 (1); BRACONIDAE36 (Bra: Hym) M, 870529 (1); AULACIDAE1 (Aul: Hym) F, 870529 (1); *Lasioglossum* (*Dialictus*) *problematicum* (Hal: Hym) F, 870529 (2); *Ceratina japonica* (Ant: Hym) M, 870529 (3); *Ceratina megastigmata* (Ant: Hym) M, 870529 (3); *Bombus* (*Bombus*) *hypocrita hypocrita* (Api: Hym) Q, 870529 (3); *Apis cerana cerana* (Api: Hym) W, 870529 (4)

Fagaceae

Castanea crenata

EMPIDIDAE39 (Emp: Dip) 860708 (2); *Eristalis cerealis* (Syr: Dip) F, 860708 (1), M, 860708 (1); *Melanostoma scalare* (Syr: Dip) F, 860708 (1); *Sphaerophoria macrogaster* (Syr: Dip) F, 860708 (3); *Sphaerophoria menthastri* (Syr: Dip) M, 860708 (1); *Syritta pipiens* (Syr: Dip) M, 860708 (1); EPHYDRIDAE4 (Eph: Dip) 860708 (1); EPHYDRIDAE5 (Eph: Dip) 860708 (1); CHLOROPIDAE18 (Chl: Dip) 860708 (2); ANTHOMYIIDAE22 (Ant: Dip) F, 860708 (1); ANTHOMYIIDAE 25 (Ant: Dip) M, 860708 (1); TACHINIDAE21 (Tac: Dip) F, 860708 (1); *Ectinohoplia obducta* (Sca: Col) 860708 (6); *Nipponovalgus angusticollis* (Sca: Col) 860708 (1); *Oxycetonia jucunda* (Sca: Col) 860708 (1); *Popillia japonica* (Sca: Col) 860708 (2); *Dermestes haemorrhoidalis* (Der: Col) 860708 (1); *Mordellistena* sp. (Mor: Col) 860708 (1); *Chlorophorus japonicus* (Cer: Col) 860708 (1); *Formica japonica* (For: Hym) 860708 (2); *Lasioglossum* (*Carinate Evylaeus*) *duplex* (Hal: Hym) F, 860708 (1); *Lasioglossum* (*Evylaeus*) *japonicum* (Hal: Hym) F, 860708 (1); *Bombus* (*Bombus*) *hypocrita hypocrita* (Api: Hym) W, 860708 (1); *Apis cerana cerana* (Api: Hym) W, 860708 (2); *Apis mellifera* (Api: Hym) W, 860708 (11)

Poligonaceae

Antenoron filiforme

Melanostoma scalare (Syr: Dip) M, 840829 (1)

Bistorta tenuicaulis

Andrena (*Micrandrena*) *minutula* (And: Hym) M, 860505 (1); *Ceratina megastigmata* (Ant: Hym) M, 860505 (1)

Persicaria aestiva

Epistotophe shibakawae (Syr: Dip) F, 840924 (1)

Persicaria pubescens

Epistotophe shibakawae (Syr: Dip) M, 870927 (1); DROSOPHILIDAE11 (Dro: Dip) 870927 (1); DROSOPHILIDAE15 (Dro: Dip) 870927 (1); ANTHOMYIIDAE 12 (Ant: Dip) F, 870927 (3); ANTHOMYIIDAE16 (Ant: Dip) F, 870927 (2); ANTHOMYIIDAE25 (Ant: Dip) F, 870927 (2), M, 870927 (1); ANTHOMYIIDAE 3 (Ant: Dip) F, 870927 (2), M, 870927 (1); TACHINIDAE14 (Tac: Dip) F, 87 0927 (1); TACHINIDAE46 (Tac: Dip) 870927 (1); PROCTOTRUPIDAE1 (Pro: Hym) F, 870927 (1)

Persicaria senticosa

Eristalis cerealis (Syr: Dip) M, 870915 (3); *Eristalomya tenax* (Syr: Dip) M, 870915 (1); TACHINIDAE58 (Tac: Dip) F, 870915 (1); CALLIPHORIDAE5 (Cal: Dip) F, 870915 (1); *Bombus* (*Bombus*) *hypocrita hypocrita* (Api: Hym) W, 870915 (1); *Bombus* (*Diversobombus*) *diversus diversus* (Api: Hym) W, 870915 (1); *Apis cerana cerana* (Api: Hym) W, 870915 (1)

Persicaria thunbergii

Menida violacea (Pen: Hem) 840924 (1); ANTHOCORIDAE2 (Ant: Hem) 870901 (1); *Adelphocoris triannulatus* (Mir: Hem) 840924 (1); CECIDOMYIIDAE3 (Cec: Dip) 870901 (1); EMPIDIDAE22 (Emp: Dip) 840924 (1); PHORIDAE1 (Pho: Dip) 870901 (4); *Cheilosia* sp.12 (Syr: Dip) F, 870927 (1) *Cheilosia* sp. 7 (Syr: Dip) F, 850915 (1); *Epistotophe shibakawae* (Syr: Dip) M, 870927 (1); *Episyrphus balteatus* (Syr: Dip) F, 870901 (1); *Eristalis cerealis* (Syr: Dip) F, 840924 (1), 850915 (1), 870927 (3), M, 840924 (2), 850915 (2), 860924 (1), 870 927 (3); *Helophilus virgatus* (Syr: Dip) F, 850915 (1), 870927 (1); *Megaspis zonata* (Syr: Dip) F, 850915 (1), M, 850915 (1); ANTHOMYIIDAE3 (Ant: Dip) F, 870927 (1); SARCOPHAGIDAE5 (Sar: Dip) 850915 (1); *Nonartha cyaneum* (Chr: Col) 870901 (1); ICHNEUMONIDAE116 (Ich: Hym) F, 870927 (1); *Coelioxys* sp. (Meg: Hym) 850915 (1); *Ceratina megastigmata* (Ant: Hym) F, 840924 (1),

M, 840924 (1); *Bombus* (*Diversobombus*) *diversus diversus* (Api: Hym) W, 860924 (1)

Reynoutria japonica

ORTHOPTERA1 (Ort: Ort) 840829 (2); *Eurystylus coelestialium* (Mir: Hem) 840829 (1); PYRALIDAE5 (Pyr: Lep) 840829 (1); *Choaspes benjaminii* (Hes: Lep) F, 840829 (1); *Eristalis cerealis* (Syr: Dip) F, 840829 (1); *Imatisma dimorpha* (Syr: Dip) F, 840829 (1); TACHINIDAE30 (Tac: Dip) F, 840829 (1); BRACONIDAE17 (Bra: Hym) F, 840829 (1); *Vespa xanthoptera* (Ves: Hym) Q, 840829 (1); *Hylaeus globula* (Col: Hym) M, 840829 (2); *Lasioglossum* (*Evylaeus*) *apristum* (Hal: Hym) F, 840829 (1); *Bombus* (*Bombus*) *ignitus* (Api: Hym) Q, 840829 (1)

Stachyuraceae

Stachyurus praecox

Eristalis cerealis (Syr: Dip) M, 850424 (1); TACHINIDAE11 (Tac: Dip) 8504 24 (1)

Symplocaceae

Symplocos chinensis

PLECOPTERA10 (Ple: Ple) 860605 (1); MIRIDAE3 (Mir: Hem) 870608 (1); MECOPTERA2 (Mec: Mec) 860605 (2); MECOPTERA3 (Mec: Mec) 860605 (1); TISCHERIIDAE2 (Tis: Lep) 860605 (1); *Philopota nigroaenea* (Acr: Dip) M, 860608 (1); *Takaomyia sexmaculata* (Syr: Dip) M, 860605 (1); SCATOPHAGIDAE 1 (Sca: Dip) 860608 (1); *Phyllopertha irregularis* (Sca: Col) 860608 (1); *Sericania fuscolineata* (Sca: Col) 860608 (1); *Ganoxanthus pallidus* (Ela: Col) 860608 (1); *Podabrus temporalis* (Can: Col) 870608 (2); *Tremus cyanipennis* (Can: Col) 860605 (1); *Anthromacra viriclissima* (Lag: Col) 870608 (2); *Mordellistena* sp. (Mor: Col) 860605 (7); *Pidonia discoidalis* (Cer: Col) 840618 (1); *Pidonia signifera* (Cer: Col) 860605 (1); *Pidonia yamato* (Cer: Col) 870608 (1); *Pyrrhona laeticolor* (Cer: Col) 860605 (1); *Strangalomorpha tenuis* (Cer: Col) 870608 (1); *Lasioglossum* (*Dialictus*) sp.2 (Hal: Hym) F, 860608 (1); *Lasioglossum* (*Evylaeus*) *apristum* (Hal: Hym) F, 860605 (6), 860608 (2) *Sphecodes* sp.a *(Hal: Hym) 860608 (1);* Andrena (Andrena) brevihirtiscopa *(And: Hym) F, 860608 (1); Andrena* (*Micrandrena*) *hikosana* (And: Hym) F, 860605 (1), 8706 08 (1); *Andrena* (*Simandrena*) *opacifovea opacifovea* (And: Hym) F, 860605 (1), 870608 (1); *Andrena* (*Simandrena*) *yamamotoi* (And: Hym) F, 860605 (1); *Nomada ginran* (Ant: Hym) F, 860608 (1)

Violaceae

Viola grypoceras

Ceratina megastigmata (Ant: Hym) F, 840524 (1)

Viola kusanoana

MECOPTERA5 (Mec: Mec) 870529 (1); *Bombylius major* (Bom: Dip) F, 870 529 (2); EMPIDIDAE32 (Emp: Dip) 870529 (1); *Cheilosia* sp.14 (Syr: Dip) F, 870529 (1); *Athalia japonica* (Ten: Hym) M, 870529 (1); *Lasioglossum* (*Dialictus*) *problematicum* (Hal: Hym) F, 870529 (1); *Andrena* (*Euandrena*) *stellaria* (And: Hym) F, 870529 (1); *Ceratina japonica* (Ant: Hym) M, 870529 (2); *Ceratina megastigmata* (Ant: Hym) F, 870529 (2), M, 870529 (1); *Nomada pacifica* (Ant: Hym) M, 870529 (1)

Viola vaginata

Cheilosia sp.11 (Syr: Dip) M, 860505 (1); CHLOROPIDAE3 (Chl: Dip) 860505 (1); ANTHOMYIIDAE14 (Ant: Dip) M, 860505 (1); ANTHOMYIIDAE27 (Ant: Dip) M, 860505 (1); *Hemitaxonus japonicas* (Ten: Hym) M, 860505 (1);

ICHNEUMONIDAE96 (Ich: Hym) F, 860505 (1); *Andrena* (*Euandrena*) *stellaria* (And: Hym) M, 860505 (1); *Andrena* (*Micrandrena*) *komachi* (And: Hym) M, 860505 (2); *Osmia taurus* (Meg: Hym) M, 860505 (1), 870529 (1); *Ceratina megastigmata* (Ant: Hym) F, 860505 (1), M, 860505 (10), 870529 (1)

Viola verecunda

Bombylius major (Bom: Dip) F, 870529 (1); EMPIDIDAE31 (Emp: Dip) 840524 (1); TEPHRITIDAE3 (Tep: Dip) 870529 (1); *Zeugophora annulata* (Chr: Col) 870529 (1); CHRYSOMELIDAE14 (Chr: Col) 840524 (1); *Lasius niger* (For: Hym) 870529 (2); *Osmia taurus* (Meg: Hym) M, 870529 (1); *Ceratina esakii* (Ant: Hym) F, 870529 (2); *Ceratina japonica* (Ant: Hym) M, 870529 (1); *Ceratina megastigmata* (Ant: Hym) F, 840524 (1), M, 840524 (3), 870529 (5); *Nomada pacifica* (Ant: Hym) M, 840524 (1); *Bombus* (*Bombus*) *hypocrita hypocrita* (Api: Hym) Q, 870529 (2)

Salicaceae

Salix gracilistyla

CECIDOMYIIDAE6 (Cec: Dip) 860505 (5); CERATOPOGONIDAE1 (Cer: Dip) 850424 (3); EMPIDIDAE4 (Emp: Dip) 860505 (2); *Cheilosia* sp.4 (Syr: Dip) M, 850424 (1); *Neoascia* sp. (Syr: Dip) M, 860505 (1); ANTHOMYIIDAE31 (Ant: Dip) M, 850424 (1) NTHOMYIIDAE41 (Ant: Dip) M, 850424 (1); ANTHOMYIIDAE42 (Ant: Dip) 850424 (1); ANTHOMYIIDAE48 (Ant: Dip) 860505 (1); *Eusphalerum parallelum* (Sta: Col) 850424 (15); *Epuraea* sp. (Nit: Col) 850424 (8), 860505 (4); *Mordellina* sp. (Mor: Col) 850424 (3); *Dinoptera minuta ticollis* (Cer: Col) 860505 (1); CHRYSOMELIDAE31 (Chr: Col) 860505 (1); *Apoderus jekelii* (Att: Col) 860608 (1); CURCULIONIDAE8 (Cur: Col) 850424 (1); *Andrena* (*Hoplandrena*) *miyamotoi* (And: Hym) F, 860505 (1)

Styracaceae

Styrax japonica

Baccha maculata (Syr: Dip) M, 850627 (1); *Bombus* (*Diversobombus*) *diversus diversus* (Api: Hym) W, 850627 (1); *Bombus* (*Pyrobombus*) *ardens ardens* (Api: Hym) M, 850627 (2)

Primulaceae

Lysimachia clethroides

Parnara guttata (Hes: Lep) F, 850716 (1); SCIARIDAE4 (Sci: Dip) 860731 (1); PSYCODIDAE1 (Psy: Dip) 860731 (1); *Betasyrphus seraius* (Syr: Dip) F, 860731 (1); *Sphaerophoria menthastri* (Syr: Dip) M, 850716 (1), 860731 (2); CONOPIDAE1 (Con: Dip) 860731 (1); TEPHRITIDAE7 (Tep: Dip) 860731 (1); LAUXANIIDAE5 (Lau: Dip) 860731 (2); *Popillia japonica* (Sca: Col) 860731 (1); *Lagria nigricollis* (Lag: Col) 860731 (1); *Birka carinifrons* (Ten: Hym) M, 860731 (1); *Formica* sp. (For: Hym) 860731 (1); *Ammophila infesta* (Sph: Hym) M, 860731 (1); *Crabro* sp. (Sph: Hym) F, 860731 (1); *Sphex maidli* (Sph: Hym) F, 860731 (1); *Lasioglossum* (*Lasioglossum*) *kansuense* (Hal: Hym) F, 860731 (1); *Lasioglossum* (*Lasioglossum*) *occidens* (Hal: Hym) 860731 (1), F, 860731 (1)

Rosaceae

Agrimonia pilosa

Lasioglossum (*Dialictus*) *problematicum* (Hal: Hym) M, 840829 (1); *Bombus* (*Diversobombus*) *diversus diversus* (Api: Hym) W, 840829 (1)

Aruncus dioicus

MIRIDAE13 (Mir: Hem) 840719 (1); *Idiostrangalia contracta* (Cer: Col) 840719 (6); *Parastrangalis nymphula* (Cer: Col) 840719 (2); *Hylaeus globula* (Col: Hym) M, 840719 (1); *Ceratina japonica* (Ant: Hym) F, 840719 (1)

Geum japonicum

Lasioglossum (*Evylaeus*) *apristum* (Hal: Hym) F, 850803 (1); *Bombus* (*Thoracobombus*) *honshuensis* (Api: Hym) W, 840719 (1)

Prunus incisa

CERATOPOGONIDAE2 (Cer: Dip) 850424 (1); *Bombylius major* (Bom: Dip) F, 860505 (1), M, 860505 (1); EMPIDIDAE36 (Emp: Dip) 850424 (1); LAUXANIIDAE 9 (Lau: Dip) 850424 (1); TACHINIDAE37 (Tac: Dip) M, 850424 (1); *Eusphalerum parallelum* (Sta: Col) 850424 (19); *Epuraea* sp. (Nit: Col) 850424 (1); NITIDULIDAE 11 (Nit: Col) 850424 (1); *Nonartha cyaneum* (Chr: Col) 850424 (1); *Syreta adamsi* (Chr: Col) 850424 (9); *Tricholochmaea semifulva* (Chr: Col) 850424 (2), 860505 (1); CHRYSOMELIDAE24 (Chr: Col) 850424 (1); CHRYSOMELIDAE32 (Chr: Col) 850424 (2); BRACONIDAE20 (Bra: Hym) F, 850424 (1); CYNIPIDAE 1 (Cyn: Hym) F, 850424 (1); *Ceratina megastigmata* (Ant: Hym) M, 860505 (1); *Bombus* (*Pyrobombus*) *ardens ardens* (Api: Hym) Q, 860505 (1); *Bombus* (*Thoracobombus*) *honshuensis* (Api: Hym) W, 850424 (1)

Prunus salicina

ARANEIDA41 (Ara: Ara) 840524 (1); MIRIDAE10 (Mir: Hem) 840524 (1); AGALLIIDAE1 (Aga: Hem) 840524 (1); BIBIONIDAE1 (Bib: Dip) 840524 (2); EMPIDIDAE19 (Emp: Dip) 840524 (1); EMPIDIDAE33 (Emp: Dip) 840524 (1); EMPIDIDAE44 (Emp: Dip) 840524 (1); *Cheilosia* sp.12 (Syr: Dip) M, 860505 (1); *Eristalis cerealis* (Syr: Dip) M, 840524 (4); *Neoascia* sp. (Syr: Dip) M, 840524 (3); *Eusphalerum parallelum* (Sta: Col) 840524 (2); *Anostinus daimio* (Ela: Col) 840524 (1); *Epuraea* sp. (Nit: Col) 840524 (6); *Mordellistena* sp. (Mor: Col) 840524 (1); *Zeugophora annulata* (Chr: Col) 840524 (1); *Tenthredo fukaii* (Ten: Hym) 840524 (2); *Lasioglossum* (*Lasioglossum*) *exiliceps* (Hal: Hym) F, 840524 (1); *Andrena* (*Andrena*) *brevihirtiscopa* (And: Hym) F, 860 505 (2); *Ceratina megastigmata* (Ant: Hym) M, 860505 (1)

Prunus Grayana

ARANEIDA6 (Ara: Ara) 860522 (1); PLECOPTERA2 (Ple: Ple) 860522 (1); TRICHOPTERA11 (Tri: Tri) 860522 (1); CECIDOMYIIDAE1 (Cec: Dip) 860523 (1); SCATOPSIDAE1 (Sca: Dip) 860522 (1); TIPULIDAE10 (Tip: Dip) 860522 (1); CHIRONOMIDAE8 (Chi: Dip) 860523 (1); EMPIDIDAE27 (Emp: Dip) 8605 22 (1); EMPIDIDAE32 (Emp: Dip) 860522 (1); *Cheilosia* sp.12 (Syr: Dip) F, 860522 (1), M, 860522 (1); *Cheilosia* sp.6 (Syr: Dip) F, 860522 (1); *Chrystogaster brevicornis* (Syr: Dip) F, 860522 (1); LAUXANIIDAE15 (Lau: Dip) 860523 (1); LAUXANIIDAE9 (Lau: Dip) 860522 (1); CHLOROPIDAE23 (Chl: Dip) 860 522 (1); *Podabrus temporalis* (Can: Col) 860522 (4), 860523 (3); *Tenthredinidae* sp.1 (Ten: Hym) F, 860523 (2); BRACONIDAE40 (Bra: Hym) F, 860522 (1); ICHNEUMONIDAE109 (Ich: Hym) F, 860523 (1); ICHNEUMONIDAE73 (Ich: Hym) M, 860522 (1); PTEROMALIDAE9 (Pte: Hym) F, 860523 (1)

Rosa multiflora

Eristalomya tenax (Syr: Dip) F, 850627 (1); *Lasioglossum* (*Evylaeus*) *apristum* (Hal: Hym) F, 850627 (1); *Andrena* (*Simandrena*) *yamamotoi* (And: Hym) F, 850627 (2)

Rubus illecebrosus

Bombus (*Diversobombus*) *diversus diversus* (Api: Hym) W, 860708 (1); *Bombus* (*Thoracobombus*) *honshuensis* (Api: Hym) M, 860708 (1)

Rubus microphyllus

EMPIDIDAE25 (Emp: Dip) 860608 (1); *Phyllopertha irregularis* (Sca: Col) 860608 (1); *Sericania fulgida* (Sca: Col) 860608 (1); *Coraebus rusticanus* (Bup: Col) 860608 (1); *Byturus affinis* (Byt: Col) 860608 (1); CURCULIONIDAE10 (Cur: Col) 860608 (1); *Vespa xanthoptera* (Ves: Hym) 860608 (1); *Ceratina megastigmata* (Ant: Hym) F, 860608 (1)

Rubus palmatus

misella (Cer: Col) 840719 (2); *Agelastica coerulea* (Chr: Col) 840719 (3), 860731 (3); CHRYSOMELIDAE20 (Chr: Col) 870723 (2); *Arge nigrinodosa* (Ari: Hym) F, 860731 (1); ICHNEUMONIDAE120 (Ich: Hym) M, 870723 (1); ICHNEUMONIDAE 123 (Ich: Hym) F, 870723 (1); ICHNEUMONIDAE74 (Ich: Hym) F, 870723 (1); *Formica japonica* (For: Hym) 860731 (1), 870723 (1); *Paratrechina flavipes* (For: Hym) 870723 (1); *Cerceris carinalis* (Sph: Hym) M, 870723 (4); *Ectemnius* (*Cameronitus*) *radiatus* (Sph: Hym) F, 870723 (2); *Ectemnius* (*Hypocrabro*) *rubicola* (Sph: Hym) M, 860731 (1); *Rhopalum* (*Latrorhopalum*) *latronum* (Sph: Hym) M, 870723 (3); *Hylaeus globula* (Col: Hym) F, 840719 (1) *Lasioglossum* (*Evylaeus*) *apristum* (Hal: Hym) F, 870723 (1); *Lasioglossum* (*Lasioglossum*) *kansuense* (Hal: Hym) F, 870723 (1); *Lasioglossum* (*Lasioglossum*) *occidens* (Hal: Hym) F, 860731 (1); *Bombus* (*Thoracobombus*) *honshuensis* (Api: Hym) W, 860731 (1)

Cardiandra alternifolia

TORTRICIDAE2 (Tor: Lep) 860731 (1); *Episyrphus balteatus* (Syr: Dip) M, 860731 (1); *Imatisma abdominalis* (Syr: Dip) F, 860731 (1); CONOPIDAE8 (Con: Dip) 860731 (1); *Leptura ochraceofasciata* (Cer: Col) 840719 (1); *Agelastica coerulea* (Chr: Col) 860731 (1); ICHNEUMONIDAE122 (Ich: Hym) F, 860731 (1); *Rhopalum* (*Latrorhopalum*) *latronum* (Sph: Hym) M, 840719 (1); *Lasioglossum* (*Evylaeus*) *transpositum* (Hal: Hym) F, 840719 (1), 860731 (1), 870723 (2); *Lasioglossum* (*Lasioglossum*) sp.3 (Hal: Hym) F, 860731 (1); *Bombus* (*Pyrobombus*) *ardens ardens* (Api: Hym) W, 840719 (1); *Bombus* (*Thoracobombus*) *honshuensis* (Api: Hym) W, 840719 (1)

Deutzia crenata

Nysius sp. (Lyg: Hem) 850627 (1); MIRIDAE14 (Mir: Hem) 850627 (1); MIRIDAE 18 (Mir: Hem) 860708 (1); MIRIDAE4 (Mir: Hem) 850627 (1); *Eristalis cerealis* (Syr: Dip) F, 850627 (1), M, 850627 (1); *Sphaerophoria menthastri* (Syr: Dip) F, 850627 (1), M, 850627 (1); LUSIIDAE1 (Clu: Dip) 850627 (3); *Trachys saundersi* (Bup: Col) 850627 (1); *Epuraea* sp. (Nit: Col) 850627 (2); *Mordellistena* sp. (Mor: Col) 850627 (3); *Oedemeronia manicata* (Oed: Col) 850627 (1); *Parastrangalis nymphula* (Cer: Col) 860708 (2); *Nonartha cyaneum* (Chr: Col) 850627 (1); CHRYSOMELIDAE26 (Chr: Col) 850627 (1); *Asiemphytus albilabris* (Ten: Hym) 850627 (1); *Hylaeus floralis* (Col: Hym) M, 850627 (1); *Lasioglossum* (*Dialictus*) sp.2 (Hal: Hym) F, 850627 (1); *Lasioglossum* (*Evylaeus*) *japonicum*

(Hal: Hym) F, 850627 (1); *Lasioglossum* (*Evylaeus*) sp.25 (Hal: Hym) F, 850627 (1); *Lasioglossum* (*Evylaeus*) *transpositum* (Hal: Hym) F, 850627 (9); *Lasioglossum* (*Evylaeus*) *apristum* (Hal: Hym) F, 850627 (9); *Lasioglossum* (*Lasioglossum*) *exiliceps* (Hal: Hym) F, 850627 (1); *Lasioglossum* (*Lasioglossum*) *kansuense* (Hal: Hym) F, 850627 (1); *Lasioglossum* (*Lasioglossum*) sp.6 (Hal: Hym) F, 850627 (1); *Andrena* (*Calomelissa*) *tsukubana* (And: Hym) F, 850627 (2), 860708 (1), M, 850627 (2); *Andrena* (*Micrandrena*) *hikosana* (And: Hym) F, 850627 (2); *Andrena* (*Simandrena*) *yamamotoi* (And: Hym) F, 850627 (3); *Ceratina japonica* (Ant: Hym) M, 850627 (2); *Bombus* (*Bombus*) *hypocrita hypocrita* (Api: Hym) Q, 850627 (1), W, 850627 (3); *Bombus* (*Diversobombus*) *diversus diversus* (Api: Hym) Q, 850627 (1), W, 850627 (1)

Hydrangea hirta

ARANEIDA28 (Ara: Ara) 860605 (1); DELTOCEPHALIDAE4 (Del: Hem) 860605 (1); PSYLLIDAE1 (Psy: Hem) 860605 (1); TRICHOPTERA6 (Tri: Tri) 860605 (2); MYCETOPHILIDAE13 (Myc: Dip) 860605 (1); *Actina jezoensis* (Str: Dip) F, 860605 (1); EMPIDIDAE10 (Emp: Dip) 860605 (2); EMPIDIDAE27 (Emp: Dip) 860605 (1); LONCHOPTERIDAE1 (Lon: Dip) 860605 (1); *Episyrphus balteatus* (Syr: Dip) M, 870608 (1); *Eristalis cerealis* (Syr: Dip) M, 860605 (1); *Melanostoma scalare* (Syr: Dip) F, 860605 (1), M, 860605 (1); *Sphegina* sp.4 (Syr: Dip) M, 860605 (1); *Sphegina* sp.3 (Syr: Dip) F, 860605 (1); *Temnostoma fumosa* (Syr: Dip) F, 860605 (1); LAUXANIIDAE9 (Lau: Dip) 860605 (1); LONCHAEIDAE11 (Lon: Dip) 860605 (1); LONCHAEIDAE3 (Lon: Dip) 860605 (1); AGROMYZIDAE5 (Agr: Dip) 860605 (1); DROSOPHILIDAE19 (Dro: Dip) 860605 (1); CHLOROPIDAE11 (Chl: Dip) 860605 (1); CHLOROPIDAE2 (Chl: Dip) 860605 (1); CHLOROPIDAE28 (Chl: Dip) 860605 (1); CLUSIIDAE1 (Clu: Dip) 860605 (1); ANTHOMYIIDAE17 (Ant: Dip) F, 860605 (1); ANTHOMYIIDAE21 (Ant: Dip) F, 860605 (1); ANTHOMYIIDAE28 (Ant: Dip) F, 860605 (1), M, 860605 (1); ANTHOMYIIDAE31 (Ant: Dip) M, 860605 (1); ANTHOMYIIDAE38 (Ant: Dip) F, 860605 (5); ANTHOMYIIDAE44 (Ant: Dip) 860605 (1); *Ectophasia sinensis* (Pha: Dip) 860605 (1); *Ganoxanthus pallidus* (Ela: Col) 860605 (1); ELATERIDAE17 (Ela: Col) 860605 (1); *Micadocantharis japonica* (Can: Col) 860605 (1); *Mordellistena* sp. (Mor: Col) 860605 (1); BRACONIDAE44 (Bra: Hym) F, 860605 (1); ICHNEUMONIDAE33 (Ich: Hym) F, 850627 (1); *Lasioglossum* (*Dialictus*) sp.2 (Hal: Hym) F, 860605 (3); *Lasioglossum* (*Evylaeus*) *transpositum* (Hal: Hym) F, 850627 (1), 860708 (2); *Lasioglossum* (*Evylaeus*) *apristum* (Hal: Hym) F, 850627 (1), 860605 (10), 860708 (1), 870608 (1); *Andrena* (*Andrena*) *benefica* (And: Hym) F, 860605 (1); *Andrena* (*Andrena*) *brevihirtiscopa* (And: Hym) F, 860605 (1); *Andrena* (*Micrandrena*) *hikosana* (And: Hym) F, 860605 (3); *Andrena* (*Simandrena*) *yamamotoi* (And: Hym) F, 860605 (1); *Nomada ginran* (Ant: Hym) F, 860605 (1)

Hydrangea macrophylla

MIRIDAE13 (Mir: Hem) 840719 (2); CERCOPIDAE1 (Cer: Hem) 840719 (1); *Epotiocerus flexuosus* (Der: Hem) 840719 (1); ACHILIDAE1 (Ach: Hem) 840719 (1); RHAGIONIDAE1 (Rha: Dip) M, 840719 (1); *Tabanus iyoensis* (Tab: Dip) 840719 (1); *Cheilosia* sp.10 (Syr: Dip) F, 850716 (1); *Didea fasciata* (Syr: Dip) M, 860731 (1); *Episyrphus balteatus* (Syr: Dip) F, 840719 (1), M, 840719 (1), 860731 (1); *Ferdinandea cuprea* (Syr: Dip) M, 840719 (1); *Imatisma* sp. (Syr: Dip) F, 840719 (1); *Meluscaeva cinctella* (Syr: Dip) F, 840719 (1); *Microdon simplex* (Syr: Dip) M, 840719 (1); *Sericomyia japonica* (Syr: Dip) M, 840719 (1); *Takaomyia johannis* (Syr: Dip) M, 840719 (1); *Xylota coquilletti* (Syr: Dip) M, 840719 (1); *Xylota frontaris* (Syr: Dip) F, 840719 (1); *Xylota simplex* (Syr: Dip) M, 840719 (1); CLUSIIDAE1 (Clu: Dip) 840719 (2); *Graphomyia maculata* (Mus: Dip) M, 850716 (1); SARCOPHAGIDAE23 (Sar: Dip) 840719 (1); *Eucetonia roelofsi* (Sca: Col) 840719 (1); ELATERIDAE3 (Ela: Col) 840719 (2); ELATERIDAE8 (Ela: Col) 840719 (1), 860731 (1); *Athemellus insulsus* (Can: Col) 840719 (3); *Plateros* sp. (Lyc: Col) 840719 (1);

Mordellistena sp. (Mor: Col) 840719 (1); *Anoploderomorpha excavata* (Cer: Col) 840719 (8), 850716 (1); *Idiostrangalia contracta* (Cer: Col) 840719 (4); *Leptura ochraceofasciata* (Cer: Col) 840719 (8), 860731 (1); *Parastrangalis nymphula* (Cer: Col) 840719 (9); *Pidonia aegrota* (Cer: Col) 840719 (1); *Agelastica coerulea* (Chr: Col) 840719 (2); *Stenoluperus nipponensis* (Chr: Col) 840719 (1); *Zeugophora annulata* (Chr: Col) 840719 (1); ICHNEUMONIDAE48 (Ich: Hym) F, 840719 (1); CHNEUMONIDAE55 (Ich: Hym) F, 840719 (1); ICHNEUMONIDAE65 (Ich: Hym) F, 840719 (1); *Rhopalum* (*Latrorhopalum*) *latronum* (Sph: Hym) M, 840719 (1); *Lasioglossum* (*Evylaeus*) sp.25 (Hal: Hym) F, 840719 (4); *Lasioglossum* (*Evylaeus*) *transpositum* (Hal: Hym) F, 840719 (7), 860731 (6); *Lasioglossum* (*Evylaeus*) *apristum* (Hal: Hym) F, 840719 (2); *Lasioglossum* (*Evylaeus*) *baleicum* (Hal: Hym) F, 840719 (2); *Lasioglossum* (*Lasioglossum*) sp.3 (Hal: Hym) F, 840719 (3), 860731 (1), 870715 (2); *Andrena* (*Hoplandera*) *akitsushimae* (And: Hym) F, 840719 (6), 850716 (1), 860731 (2), M, 840719 (2); *Bombus* (*Bombus*) *hypocrita hypocrita* (Api: Hym) W, 840719 (9), 850716 (1), 860731 (3); *Bombus* (*Diversobombus*) *diversus diversus* (Api: Hym) W, 840719 (2), 860731 (1); *Bombus* (*Thoracobombus*) *honshuensis* (Api: Hym) W, 850716 (1); *Apis cerana cerana* (Api: Hym) W, 850716 (1); *Apis mellifera* (Api: Hym) W, 850716 (3)

Hydrangea paniculata

ARANEIDA8 (Ara: Ara) 870723 (1); EPHEMEROPTERA1 (Eph: Eph) 870715 (1); ORTHOPTERA3 (Ort: Ort) 850803 (1); *Pentatoma japonica* (Pen: Hem) 870715 (1); *Eurystylus coelestialium* (Mir: Hem) 870723 (2); CERCOPIDAE2 (Cer: Hem) 870715 (1); EVACANTHIDAE1 (Eva: Hem) 870723 (1); DELTOCEPHALIDAE 3 (Del: Hem) 870723 (1); NEUROPTERA4 (Neu: Neu) 870723 (1); TRICHOPTERA 15 (Tri: Tri) 870723 (1); HELIOZELIDAE6 (Hel: Lep) 870723 (1); *Parnara guttata* (Hes: Lep) M, 870723 (2); SPHINGIDAE3 (Sph: Lep) F, 870723 (1); *Pecticus tenebrifer* (Str: Dip) 860731 (1); PIPUNCULIDAE3 (Pip: Dip) 87072 3 (1); *Eristalis cerealis* (Syr: Dip) F, 860731 (1), 870723 (2), M, 870723 (1); *Eristalomya tenax* (Syr: Dip) F, 870723 (1); *Imatisma dimorpha* (Syr: Dip) M, 870723 (1); *Sphaerophoria menthastri* (Syr: Dip) M, 870715 (1); CONOPIDAE13 (Con: Dip) 870723 (1); TEPHRITIDAE12 (Tep: Dip) 870723 (1); LONCHAEIDAE8 (Lon: Dip) 870723 (1); CHLOROPIDAE17 (Chl: Dip) 870723 (1); CHLOROPIDAE9 (Chl: Dip) 870715 (1); CLUSIIDAE1 (Clu: Dip) 870715 (1); ANTHOMYIIDAE28 (Ant: Dip) F, 870723 (1); ANTHOMYIIDAE50 (Ant: Dip) M, 860731 (1), 870723 (4); *Graphomyia maculata* (Mus: Dip) M, 870723 (1); TACHINIDAE91 (Tac: Dip) 870715 (1); *Gymnosoma rotundatum* (Pha: Dip) 870715 (1); CALLIPHORIDAE5 (Cal: Dip) M, 870715 (1); *Blitopertha orientalis* (Sca: Col) M, 860731 (1); *Ectinohoplia obducta* (Sca: Col) 870723 (1); *Eucetonia roelofsi* (Sca: Col) 86 0731 (1); *Paratrichius doentzi* (Sca: Col) F, 860731 (1), 870723 (3), M, 870723 (1); *Gamepenthes versipellis* (Ela: Col) 850803 (2), 870723 (5); *Lucidina accensa* (Lam: Col) 870715 (1); *Cautires bourgeoisi* (Lyc: Col) 870723 (1); *Plateros* sp. (Lyc: Col) 870723 (2); *Carpophilus chalybeus* (Nit: Col) 870723 (1); NITIDULIDAE6 (Nit: Col) 870723 (6); *Antherophagus nigricornis* (Cry: Col) 870723 (1); *Mordellistena* sp. (Mor: Col) 870723 (2); *Xanthochroa ainu* (Oed: Col) 870723 (1); *Xanthochroa deformis* (Oed: Col) 870723 (2); *Xanthochroa luteipennis* (Oed: Col) 870723 (8); *Xanthochroa waterhousei* (Oed: Col) 870723 (2); *Anoploderomorpha excavata* (Cer: Col) 870723 (1); *Bhaphuma xenisca* (Cer: Col) 870723 (1); *Corymia succedanea* (Cer: Col) 870715 (1); *Japanostrangalia deutatipennis* (Cer: Col) 870723 (1); *Parastrangalis nymphula* (Cer: Col) 870715 (2), 870723 (1); *Schwarzerium quadricolle* (Cer: Col) 870723 (2); CHRYSOMELIDAE22 (Chr: Col) 870723 (1); CURCULIONIDAE3 (Cur: Col) 870723 (1); *Strombocerina koebelei* (Ten: Hym) M, 870723 (1); *Arge nipponensis* (Ari: Hym) M, 870723 (1); EULOPHIDAE1 (Eul: Hym) F, 870723 (1); PTEROMALIDAE10 (Pte: Hym) F, 870723 (1); PTEROMALIDAE6 (Pte: Hym) F, 870723 (1); PLATYGASTERIDAE1 (Pla: Hym) F, 870723 (1); *Formica japonica* (For: Hym) 860731 (1), 870723 (1); *Lasius niger* (For: Hym) 870723

(4); *Pristomyrmex punger* (For: Hym) 870723 (2); *Cerceris hortivaga* (Sph: Hym) M, 870723 (1); *Lasioglossum* (*Evylaeus*) *aff* (Hal: Hym) M, 870715 (1); *Lasioglossum* (*Evylaeus*) *apristum* (Hal: Hym) F, 850803 (10); *Lasioglossum* (*Lasioglossum*) *occidens* (Hal: Hym) F, 870723 (3); *Sphecodes* sp. (Hal: Hym) 870715 (1); *Andrena* (*Hoplandera*) *akitsushimae* (And: Hym) F, 860731 (3), 870723 (6); *Andrena* (*Hoplandera*) *dentata* (And: Hym) F, 850803 (1), 860731 (1); *Bombus* (*Bombus*) *hypocrita hypocrita* (Api: Hym) W, 860731 (2), 87072 3 (4); *Bombus* (*Diversobombus*) *diversus diversus* (Api: Hym) W, 870723 (1); *Bombus* (*Thoracobombus*) *honshuensis* (Api: Hym) W, 870715 (1); *Apis cerana cerana* (Api: Hym) W, 870715 (1), 870723 (8)

Leguminosae

Desmodium podocarpum
Baccha maculata (Syr: Dip) M, 850803 (1)
Lespedeza bicolor
Megachile remota sakagamii (Meg: Hym) F, 840924 (1), 860825 (2); *Tetralonia mitsukurii* (Ant: Hym) M, 860825 (1); *Bombus* (*Bombus*) *hypocrita hypocrita* (Api: Hym) W, 860825 (1); *Bombus* (*Diversobombus*) *diversus diversus* (Api: Hym) W, 860825 (1); *Bombus* (*Thoracobombus*) *honshuensis* (Api: Hym) W, 860825 (2)
Trifolium repens
Apis cerana cerana (Api: Hym) W, 850803 (2)

Alangiaceae

Alangium platanifolium
Bombus (Diversobombus) diversus diversus (Api: Hym) W, 850627 (3), 860708 (4)

Cornaceae

Aucuba japonica
Formica sp. (For: Hym) 840524 (1)
Cornus controversa
Menida scotti (Pen: Hem) 860608 (1); MIRIDAE3 (Mir: Hem) 860608 (1); NEPTICULIDAE1 (Nep: Lep) 860608 (1); HELIOZELIDAE1 (Hel: Lep) 860608 (1); TISCHERIIDAE1 (Tis: Lep) 860608 (1); SCIARIDAE10 (Sci: Dip) 860608 (1); SCIARIDAE9 (Sci: Dip) 860608 (1); *Eristalis cerealis* (Syr: Dip) M, 860 608 (2); *Syrphus vitripennis* (Syr: Dip) M, 860608 (1); CLUSIIDAE1 (Clu: Dip) 860608 (2); CLUSIIDAE4 (Clu: Dip) 860608 (1); TACHINIDAE61 (Tac: Dip) F, 860608 (1); TACHINIDAE79 (Tac: Dip) F, 860608 (1); *Pelatines striatipennis* (Sil: Col) 860608 (1); *Vuilletus viridissllis* (Ela: Col) 860608 (2); *Podabrus temporalis* (Can: Col) 860608 (1); *Anthromacra viriclissima* (Lag: Col) 860608 (5); *Macrolagria rufobrunnea* (Lag: Col) 860608 (1); *Mordellistena* sp. (Mor: Col) 860608 (2); *Oedemeronia manicata* (Oed: Col) 860608 (2); *Oncomerella venosa* (Oed: Col) 860608 (1); *Demonax transilis* (Cer: Col) 860608 (2); *Corymbas nipponica* (Ten: Hym) M, 860608 (1); *Zaraea fasciata* (Cim: Hym) F, 860608 (1); *Camponotus obscripes* (For: Hym) 860608 (1); *Formica* sp. (For: Hym) 860608 (1); *Lasioglossum* (*Ctenonomia*) sp.1 (Hal: Hym) F, 860608 (1); *Lasioglossum* (*Evylaeus*) *transpositum* (Hal: Hym) F, 860608 (1); *Lasioglossum* (*Evylaeus*) *apristum* (Hal: Hym) F, 860608 (5); *Lasioglossum* (*Lasioglossum*) *exiliceps* (Hal: Hym) F, 860608 (1); *Lasioglossum* (*Lasioglossum*) *occidens* (Hal: Hym) 860608 (1); *Lasioglossum* (*Lasioglossum*) *proximatum* (Hal: Hym) F, 860608 (2); *Andrena* (*Simandrena*) *opacifovea opacifovea* (And: Hym) F, 860608 (1); *Ceratina megastigmata* (Ant: Hym) F, 860608 (2)

Cornus kousa

Lasioglossum (*Lasioglossum*) sp.3 (Hal: Hym) F, 850627 (1)

Celastraceae

Euonymus alatus

Menida violacea (Pen: Hem) 840618 (1); TETTIGELLIDAE2 (Tet: Hem) 840618 (1); MECOPTERA2 (Mec: Mec) 840618 (2), 870608 (2); MECOPTERA4 (Mec: Mec) 870608 (1); MECOPTERA5 (Mec: Mec) 870608 (1); TORTRICIDAE4 (Tor: Lep) 870608 (1); MYCETOPHILIDAE2 (Myc: Dip) 840618 (1); *Choerades* sp. (Asi: Dip) 840618 (1); EMPIDIDAE25 (Emp: Dip) 860608 (1); *Criorhina japonica* (Syr: Dip) M, 860608 (1); *Episyrphus balteatus* (Syr: Dip) M, 840618 (2); *Eristalis cerealis* (Syr: Dip) M, 840618 (1); *Melanostoma scalare* (Syr: Dip) F, 840618 (4), 860608 (1); *Sphaerophoria menthastri* (Syr: Dip) M, 840618 (1) *Syrphus vitripennis* (Syr: Dip) F, 840618 (2), M, 840618 (1); LAUXANIIDAE16 (Lau: Dip) 860608 (1); LAUXANIIDAE2 (Lau: Dip) 840618 (1); AGROMYZIDAE 1 (Agr: Dip) 870608 (1); CANACEIDAE1 (Can: Dip) 840618 (1); CANACEIDAE 2 (Can: Dip) 840618 (1); CHLOROPIDAE10 (Chl: Dip) 860608 (1); CHLOROPIDAE 29 (Chl: Dip) 860608 (1); CLUSIIDAE1 (Clu: Dip) 840618 (42), 860608 (1); SCATOPHAGIDAE1 (Sca: Dip) 840618 (1), 860608 (1); ANTHOMYIIDAE21 (Ant: Dip) F, 840618 (2), 860608 (2); ANTHOMYIIDAE31 (Ant: Dip) M, 840618 (5), 860608 (1); ANTHOMYIIDAE34 (Ant: Dip) 840618 (2); ANTHOMYIIDAE 38 (Ant: Dip) F, 870608 (1); ANTHOMYIIDAE4 (Ant: Dip) M, 870608 (1); MUSCIDAE3 (Mus: Dip) M, 860608 (1); TACHINIDAE6 (Tac: Dip) 840618 (1); TACHINIDAE73 (Tac: Dip) F, 860608 (1); TACHINIDAE89 (Tac: Dip) 860608 (1); *Eucetonia roelofsi* (Sca: Col) 860608 (1); *Sericania fulgida* (Sca: Col) 840618 (1); *Actenicerom orphus nipponensis* (Ela: Col) 870608 (1); *Melanotus annosus* (Ela: Col) 840618 (2); *Prothemus ciusianus* (Can: Col) 870608 (1); *Xerasia variegata* (Byt: Col) 840618 (1); *Mordellistena* sp. (Mor: Col) 840618 (1); *Cephaloon pallensa* (Cep: Col) 840618 (2); *Oedemeronia lucidicollis* (Oed: Col) 860608 (1); *Oedemeronia manicata* (Oed: Col) 840618 (1); *Pidonia discoidalis* (Cer: Col) 840618 (1); *Pidonia puziloi* (Cer: Col) 840618 (1); *Pidonia signifera* (Cer: Col) 840618 (3); *Stenoluperus nipponensis* (Chr: Col) 840618 (1); *Strombocerina koebelei* (Ten: Hym) 840618 (1); BRACONIDAE45 (Bra: Hym) F, 860608 (1); ICHNEUMONIDAE115 (Ich: Hym) F, 870608 (1); ICHNEUMONIDAE88 (Ich: Hym) F, 870608 (1); ICHNEUMONIDAE94 (Ich: Hym) F, 860608 (1); EURYTOMIDAE1 (Eur: Hym) F, 840618 (1); *Ancistrocerus melanocerus* (Ves: Hym) M, 860608 (1); *Symmorphus cliens* (Ves: Hym) 840 618 (1); *Rhopalum* (*Latrorhopalum*) *latronum* (Sph: Hym) F, 840618 (1); *Hylaeus floralis* (Col: Hym) M, 860608 (1); *Lasioglossum* (*Dialictus*) sp.2 (Hal: Hym) F, 860608 (8); *Lasioglossum* (*Evylaeus*) *transpositum* (Hal: Hym) F, 860608 (1); *Lasioglossum* (*Evylaeus*) *apristum* (Hal: Hym) F, 840618 (1), 860608 (9); *Andrena* (*Andrena*) *longitibialis* (And: Hym) F, 840618 (1); *Andrena* (*Micrandrena*) *hikosana* (And: Hym) F, 840618 (4), 860608 (4); *Andrena* (*Micrandrena*) *kaguya* (And: Hym) F, 840618 (1); *Andrena* (*Micrandrena*) *komachi* (And: Hym) F, 860608 (1); *Andrena* (*Micrandrena*) *minutula* (And: Hym) F, 840618 (1); *Andrena* (*Simandrena*) *yamamotoi* (And: Hym) F, 840 618 (1)

Euonymus sieboldianus

EMPIDIDAE31 (Emp: Dip) 850627 (1); EMPIDIDAE32 (Emp: Dip) 850627 (1); SARCOPHAGIDAE4 (Sar: Dip) 850627 (1); *Lasioglossum* (*Lasioglossum*) sp. 3 (Hal: Hym) F, 850627 (1)

Rhamnaceae

Hovenia tomentella

Betasyrphus seraius (Syr: Dip) M, 850716 (1); *Milesia undulata* (Syr: Dip) M, 850716 (1); *Vespula schrenckii* (Ves: Hym) 850716 (1); *Bombus* (*Diversobombus*) *diversus diversus* (Api: Hym) W, 850716 (2); *Bombus* (*Pyrobombus*) *ardens ardens* (Api: Hym) M, 850716 (1), W, 850716 (1); *Apis cerana cerana* (Api: Hym) W, 850716 (3)

Vitaceae

Ampelopsis brevipedunculata

ORTHOPTERA1 (Ort: Ort) 840829 (1); *Eurystylus coelestialium* (Mir: Hem) 840829 (2); MIRIDAE15 (Mir: Hem) 840829 (1); *Psychostrophia melanargia* (Epi: Lep) 840829 (1); *Mashumyia ferdinandi* (Syr: Dip) M, 840829 (1); TEPHRITIDAE1 (Tep: Dip) 840829 (1); BRACONIDAE25 (Bra: Hym) F, 84 0829 (1); *Vespa xanthoptera* (Ves: Hym) W, 870901 (1); *Hylaeus globula* (Col: Hym) F, 840829 (1), M, 840829 (1); *Lasioglossum* (*Evylaeus*) *taniolellum* (Hal: Hym) M, 840829 (1)

Hippocastanaceae

Aesculus turbinata

Bombus (*Bombus*) *hypocrita hypocrita* (Api: Hym) Q, 850522 (1); *Bombus* (*Thoracobombus*) *honshuensis* (Api: Hym) Q, 850522 (1)

Aceraceae

Acer rufinerve

EMPIDIDAE31 (Emp: Dip) 840524 (5); LONCHAEIDAE4 (Lon: Dip) 840524 (1)

Anacardiaceae

Rhus javanica

Eurystylus coelestialium (Mir: Hem) 840829 (6); DOLICHOPODIDAE3 (Dol: Dip) 860825 (1); *Allograpta javana* (Syr: Dip) M, 860825 (1); *Eristalis cerealis* (Syr: Dip) F, 860825 (3); *Eristalomya tenax* (Syr: Dip) M, 860825 (1); CONOPIDAE11 (Con: Dip) 860825 (1); ANTHOMYIIDAE6 (Ant: Dip) F, 8608 25 (1); TACHINIDAE25 (Tac: Dip) F, 840829 (1); TACHINIDAE26 (Tac: Dip) M, 840829 (1); TACHINIDAE5 (Tac: Dip) F, 840829 (1); SARCOPHAGIDAE13 (Sar: Dip) 840829 (1); SARCOPHAGIDAE4 (Sar: Dip) 860825 (1); *Lasius niger* (For: Hym) 860825 (1); *Vespa xanthoptera* (Ves: Hym) W, 860825 (1); *Rhopalum* (*Latrorhopalum*) *latronum* (Sph: Hym) F, 860825 (1); *Hylaeus globula* (Col: Hym) F, 840829 (5), M, 840829 (2); *Chalicodoma sculpturalis* (Meg: Hym) M, 860825 (1); *Megachile tsurugensis* (Meg: Hym) M, 840829 (1), 860825 (1); *Bombus* (*Bombus*) *hypocrita hypocrita* (Api: Hym) M, 860825 (4), W, 860825 (1); *Apis cerana cerana* (Api: Hym) W, 860825 (6); *Apis mellifera* (Api: Hym) W, 860825 (1)

Rhus trichocarpa

MIRIDAE3 (Mir: Hem) 840618 (20); MIRIDAE7 (Mir: Hem) 840618 (1); *Lasioglossum* (*Evylaeus*) *transpositum* (Hal: Hym) F, 840618 (1)

Rutaceae

Phellodendron amurense

Eurystylus coelestialium (Mir: Hem) 860825 (1); *Cheilosia omogensis* (Syr: Dip) M, 860825 (2); *Sphaerophoria menthastri* (Syr: Dip) F, 860825 (1); *Syritta pipiens* (Syr: Dip) M, 860825 (1); CONOPIDAE15 (Con: Dip) 860825 (1);

ANTHOMYIIDAE50 (Ant: Dip) F, 860825 (1); TACHINIDAE15 (Tac: Dip) F, 860825 (1); *Eucetonia roelofsi* (Sca: Col) 860825 (1); *Harmonia axyridis* (Coc: Col) 860825 (1); CHRYSOMELIDAE17 (Chr: Col) 860825 (1); BRACONIDAE38 (Bra: Hym) F, 860825 (1); ICHNEUMONIDAE30 (Ich: Hym) F, 860825 (1); *Andrena* (*Habromellissa*) *omogensis* (And: Hym) F, 860825 (1), M, 860825 (2); *Megachile tsurugensis* (Meg: Hym) F, 860825 (1); *Nomada galloisi* (Ant: Hym) M, 860825 (1)

Geraniaceae

Geranium nepalense

Eristalis cerealis (Syr: Dip) F, 850915 (1); *Helophilus virgatus* (Syr: Dip) F, 850915 (1); *Pipiza inornata* (Syr: Dip) F, 850915 (1); *Tenthredo* sp. (Ten: Hym) 850915 (1); BRACONIDAE5 (Bra: Hym) F, 850915 (1); *Lasioglossum* (*Dialictus*) *problematicum* (Hal: Hym) F, 850915 (1); *Lasioglossum* (*Evylaeus*) sp.5 (Hal: Hym) M, 840924 (1); *Lasioglossum* (*Evylaeus*) *apristum* (Hal: Hym) F, 850915 (1); *Megachile tsurugensis* (Meg: Hym) M, 840924 (1); *Ceratina megastigmata* (Ant: Hym) F, 840924 (2), M, 840924 (2); *Bombus* (*Thoracobombus*) *honshuensis* (Api: Hym) W, 840829 (1)

Oxalidaceae

Oxalis griffithii

ORTHOPTERA10 (Ort: Ort) 860505 (1); *Andrena* (*Micrandrena*) *minutula* (And: Hym) F, 860505 (1); *Ceratina megastigmata* (Ant: Hym) M, 860505 (2)

Balsaminaceae

Impatiens noli-tangere

Bombus (*Diversobombus*) *diversus diversus* (Api: Hym) W, 840829 (1)

Impatiens textori

Rhingia laevigata (Syr: Dip) F, 860924 (1); *Bombus* (*Diversobombus*) *diversus diversus* (Api: Hym) W, 840924 (5), 860924 (2), 870927 (1); *Bombus* (*Thoracobombus*) *honshuensis* (Api: Hym) W, 840829 (1)

Umbeliferae

Angelica polymorpha

Formica japonica (For: Hym) 870901 (1); *Bombus* (*Bombus*) *hypocrita hypocrita* (Api: Hym) W, 870901 (1)

Angelica pubescens

Onomaus lautus (Mir: Hem) 840829 (1); PYRALIDAE2 (Pyr: Lep) 840829 (1) *Cheilosia omogensis* (Syr: Dip) F, 840829 (1), M, 840829 (2); *Megaspis zonata* (Syr: Dip) F, 840829 (1); *Melanostoma scalare* (Syr: Dip) M, 840829 (1); *Pipiza inornata* (Syr: Dip) F, 840829 (1); EPHYDRIDAE14 (Eph: Dip) 840829 (1); CHLOROPIDAE22 (Chl: Dip) 840829 (1); *Graphomyia maculata* (Mus: Dip) M, 840829 (1); TACHINIDAE14 (Tac: Dip) M, 840829 (1); TACHINIDAE45 (Tac: Dip) 840829 (1); TACHINIDAE65 (Tac: Dip) F, 840829 (1); *Ectophasia sinensis* (Pha: Dip) 840829 (2); CALLIPHORIDAE8 (Cal: Dip) M, 840829 (1); *Tachinus* sp. (Sta: Col) 840829 (1); *Eucetonia roelofsi* (Sca: Col) 840829 (1); *Trachys saundersi* (Bup: Col) 840829 (1); *Plateros* sp. (Lyc: Col) 840829 (1); *Arge nipponensis* (Ari: Hym) 840829 (1); *Arge similis* (Ari: Hym) 840829 (1); BRACONIDAE13 (Bra: Hym) F, 840829 (1); BRACONIDAE16 (Bra: Hym) F, 840829 (1); BRACONIDAE27 (Bra: Hym) F, 840829 (1); ICHNEUMONIDAE44 (Ich: Hym) M, 840829 (1); ICHNEUMONIDAE53 (Ich: Hym) F, 840829 (1); ICHNEUMONIDAE64 (Ich: Hym) F, 840829 (1); ICHNEUMONIDAE82 (Ich: Hym)

F, 840829 (1); PTEROMALIDAE3 (Pte: Hym) F, 840829 (1); DIAPRIIDAE1 (Dia: Hym) F, 840829 (1); *Vespa xanthoptera* (Ves: Hym) 840829 (1); *Ectemnuis rubicola nipponis* (Sph: Hym) M, 840829 (1); *Rhopalum* (*Latrorhopalum*) *latronum* (Sph: Hym) F, 840829 (2), M, 840829 (2); *Hylaeus globula* (Col: Hym) F, 840829 (11), M, 840829 (9); *Hylaeus nippon* (Col: Hym) M, 840829 (1); *Lasioglossum* (*Evylaeus*) *sexstrigatum* (Hal: Hym) M, 840829 (2); *Andrena* (*Andrena*) *ishiharai* (And: Hym) F, 840829 (3); *Andrena* (*Hoplandera*) *dentata* (And: Hym) F, 840829 (1); *Ceratina megastigmata* (Ant: Hym) M, 840829 (1); *Nomada galloisi* (Ant: Hym) M, 840829 (1); *Bombus* (*Bombus*) *hypocrita hypocrita* (Api: Hym) M, 840829 (1)

Anthriscus aemula

ARANEIDA17 (Ara: Ara) 860523 (1); ARANEIDA18 (Ara: Ara) 860523 (1); ARANEIDA19 (Ara: Ara) 860523 (1); ARANEIDA20 (Ara: Ara) 860522 (1); ARANEIDA21 (Ara: Ara) 860522 (1); ARANEIDA27 (Ara: Ara) 860522 (1); ARANEIDA34 (Ara: Ara) 860523 (1); ARANEIDA36 (Ara: Ara) 860523 (1); ARANEIDA39 (Ara: Ara) 860522 (1); PLECOPTERA10 (Ple: Ple) 860522 (2); *Elasmucha nipponica* (Pen: Hem) 860522 (1); MIRIDAE10 (Mir: Hem) 860522 (1); MIRIDAE20 (Mir: Hem) 860522 (1); MIRIDAE21 (Mir: Hem) 860522 (1); MIRIDAE3 (Mir: Hem) 860523 (1)灰ELTOCEPHALIDAE2 (Del: Hem) 870608 (1); DELTOCEPHALIDAE4 (Del: Hem) 860522 (16), 860523 (20); DELTOCEPHALIDAE 5 (Del: Hem) 860522 (1); CIXIIDAE1 (Cix: Hem) 860523 (1), 870608 (1); MECOPTERA2 (Mec: Mec) 860522 (2), 860523 (1); MECOPTERA4 (Mec: Mec) 860522 (1); MECOPTERA5 (Mec: Mec) 860522 (1), 860523 (4); HELIOZELIDAE1 (Hel: Lep) 860522 (1); PYRALIDAE9 (Pyr: Lep) 870608 (1); *Eulype hastata* (Geo: Lep) 870608 (1); MYCETOPHILIDAE10 (Myc: Dip) 860522 (1); MYCETOPHILIDAE11 (Myc: Dip) 860522 (1); MYCETOPHILIDAE12 (Myc: Dip) 860522 (1); MYCETOPHILIDAE14 (Myc: Dip) 860523 (1); MYCETOPHILIDAE 15 (Myc: Dip) 860523 (1); MYCETOPHILIDAE16 (Myc: Dip) 860523 (1); MYCETOPHILIDAE6 (Myc: Dip) 870608 (1); MYCETOPHILIDAE8 (Myc: Dip) 860523 (1); MYCETOPHILIDAE9 (Myc: Dip) 860522 (1); CECIDOMYIIDAE4 (Cec: Dip) 860523 (2); CECIDOMYIIDAE5 (Cec: Dip) 860522 (1); SCIARIDAE11 (Sci: Dip) 860522 (1), 860523 (1); SCIARIDAE12 (Sci: Dip) 840618 (2); SCIARIDAE13 (Sci: Dip) 860522 (1); SCIARIDAE3 (Sci: Dip) 860523 (1); SCIARIDAE7 (Sci: Dip) 860523 (1); BIBIONIDAE11 (Bib: Dip) 860522 (1); BIBIONIDAE4 (Bib: Dip) 860522 (1); TIPULIDAE12 (Tip: Dip) 860523 (1); TIPULIDAE14 (Tip: Dip) 860522 (1); TIPULIDAE17 (Tip: Dip) 860523 (1); TIPULIDAE18 (Tip: Dip) 860523 (1); TIPULIDAE2 (Tip: Dip) 840524 (1); TIPULIDAE20 (Tip: Dip) 860523 (1); TIPULIDAE21 (Tip: Dip) 860523 (1); TIPULIDAE3 (Tip: Dip) 840524 (1); TIPULIDAE9 (Tip: Dip) 860522 (1); CERATOPOGONIDAE4 (Cer: Dip) 860523 (1); *Actina jezoensis* (Str: Dip) M, 860523 (1); EMPIDIDAE1 (Emp: Dip) 860523 (1); EMPIDIDAE11 (Emp: Dip) 860523 (3); EMPIDIDAE13 (Emp: Dip) 860523 (3); EMPIDIDAE14 (Emp: Dip) 860523 (1); EMPIDIDAE15 (Emp: Dip) 860522 (4); EMPIDIDAE16 (Emp: Dip) 860522 (1), 860523 (1); EMPIDIDAE18 (Emp: Dip) 860523 (1); EMPIDIDAE2 (Emp: Dip) 860523 (1); EMPIDIDAE20 (Emp: Dip) 860522 (1); EMPIDIDAE21 (Emp: Dip) 860523 (1); EMPIDIDAE23 (Emp: Dip) 860522 (1); EMPIDIDAE24 (Emp: Dip) 860522 (1); EMPIDIDAE25 (Emp: Dip) 840524 (1), 840618 (1), 85 0522 (1); EMPIDIDAE27 (Emp: Dip) 860522 (2), 860523 (6); EMPIDIDAE28 (Emp: Dip) 860522 (2); EMPIDIDAE29 (Emp: Dip) 860522 (1); EMPIDIDAE3 (Emp: Dip) 860523 (1); EMPIDIDAE31 (Emp: Dip) 840524 (2); EMPIDIDAE32 (Emp: Dip) 860522 (6), 860523 (1); EMPIDIDAE38 (Emp: Dip) 870608 (1); EMPIDIDAE39 (Emp: Dip) 870608 (2); EMPIDIDAE45 (Emp: Dip) 860522 (2); EMPIDIDAE5 (Emp: Dip) 860523 (1); EMPIDIDAE6 (Emp: Dip) 860522 (2); EMPIDIDAE7 (Emp: Dip) 860522 (3); EMPIDIDAE8 (Emp: Dip) 860523 (1); EMPIDIDAE9 (Emp: Dip) 860522 (1); DOLICHOPODIDAE1 (Dol: Dip) 840618 (1); DOLICHOPODIDAE2 (Dol: Dip) 870608 (1); LONCHOPTERIDAE1 (Lon: Dip) 860522 (9), 860523 (5); LONCHOPTERIDAE2 (Lon: Dip) 860523 (1);

Cheilosia sp.1 (Syr: Dip) F, 860522 (1), 870608 (1); *Cheilosia* sp.5 (Syr: Dip) F, 860523 (1); *Cheilosia* sp.7 (Syr: Dip) F, 860523 (1), 870608 (1), M, 860522 (1); *Episyrphus balteatus* (Syr: Dip) F, 860522 (1); *Eristalis cerealis* (Syr: Dip) M, 870608 (1); *Melanostoma scalare* (Syr: Dip) F, 850522 (5), 860522 (3), 860523 (2), 870608 (2), M, 850522 (1), 860522 (5), 860523 (1); *Pipiza familiaris* (Syr: Dip) M, 860522 (2); *Sphaerophoria macrogaster* (Syr: Dip) F, 870608 (1); *Sphaerophoria menthastri* (Syr: Dip) M, 870608 (1); *Sphegina* sp.2 (Syr: Dip) M, 860522 (1); *Syrphus vitripennis* (Syr: Dip) F, 870608 (1); TEPHRITIDAE9 (Tep: Dip) 860522 (1); LAUXANIIDAE10 (Lau: Dip) 860523 (1); LAUXANIIDAE 11 (Lau: Dip) 860523 (1); LAUXANIIDAE12 (Lau: Dip) 860523 (1); LAUXANIIDAE13 (Lau: Dip) 860522 (1); LAUXANIIDAE14 (Lau: Dip) 860523 (1); LAUXANIIDAE9 (Lau: Dip) 860522 (3), 860523 (1); LONCHAEIDAE9 (Lon: Dip) 860522 (1); DIASTATIDAE2 (Dia: Dip) 860523 (1); EPHYDRIDAE2 (Eph: Dip) 870608 (1); EPHYDRIDAE28 (Eph: Dip) 860522 (1); CHLOROPIDAE23 (Chl: Dip) 860522 (2); CHLOROPIDAE24 (Chl: Dip) 860522 (1); CHLOROPIDAE 25 (Chl: Dip) 860522 (1); CHLOROPIDAE26 (Chl: Dip) 860522 (1); CHLOROPIDAE 28 (Chl: Dip) 860522 (1); CLUSIIDAE1 (Clu: Dip) 840524 (1), 860522 (2), 860523 (3); CLUSIIDAE2 (Clu: Dip) 860522 (4), 860523 (4); CLUSIIDAE3 (Clu: Dip) 860522 (1); ANTHOMYIIDAE12 (Ant: Dip) F, 860523 (1), M, 860523 (1); ANTHOMYIIDAE20 (Ant: Dip) F, 860523 (1); ANTHOMYIIDAE28 (Ant: Dip) F, 860522 (9), 860523 (1), M, 860522 (2); ANTHOMYIIDAE29 (Ant: Dip) 870608 (1); ANTHOMYIIDAE3 (Ant: Dip) F, 860523 (1); ANTHOMYIIDAE31 (Ant: Dip) M, 860522 (1); ANTHOMYIIDAE35 (Ant: Dip) M, 860522 (1); ANTHOMYIIDAE38 (Ant: Dip) 860522 (4), 860523 (3), F, 860522 (22), 860523 (48), 870608 (6), M, 860522 (7), 860523 (14), 870608 (2); ANTHOMYIIDAE4 (Ant: Dip) M, 860523 (2); ANTHOMYIIDAE42 (Ant: Dip) 860522 (1); ANTHOMYIIDAE43 (Ant: Dip) 860522 (1); ANTHOMYIIDAE46 (Ant: Dip) 870608 (1); ANTHOMYIIDAE 7 (Ant: Dip) M, 840524 (1), 860522 (1); ANTHOMYIIDAE8 (Ant: Dip) M, 860522 (1); *Graphomyia maculata* (Mus: Dip) M, 860522 (1); TACHINIDAE18 (Tac: Dip) F, 860522 (1); TACHINIDAE22 (Tac: Dip) F, 860523 (1); TACHINIDAE53 (Tac: Dip) F, 860522 (1); TACHINIDAE63 (Tac: Dip) F, 860522 (1); TACHINIDAE68 (Tac: Dip) F, 860523 (1); TACHINIDAE7 (Tac: Dip) F, 860522 (1); TACHINIDAE76 (Tac: Dip) F, 860522 (1); TACHINIDAE 85 (Tac: Dip) 860522 (1); TACHINIDAE88 (Tac: Dip) M, 860522 (1); TACHINIDAE89 (Tac: Dip) 860522 (1); TACHINIDAE90 (Tac: Dip) 860522 (1); CALLIPHORIDAE10 (Cal: Dip) F, 870608 (1), M, 870608 (1); CALLIPHORIDAE 6 (Cal: Dip) M, 860522 (1); SARCOPHAGIDAE11 (Sar: Dip) 860522 (1); SARCOPHAGIDAE21 (Sar: Dip) F, 860523 (1); SARCOPHAGIDAE26 (Sar: Dip) M, 860523 (1); *Ganoxanthus pallidus* (Ela: Col) 840618 (1); *Malthodes sulcicollis* (Can: Col) 860522 (2); *Podabrus temporalis* (Can: Col) 840524 (1), 860522 (10), 860523 (2); *Prothemus ciusianus* (Can: Col) 860522 (1), 860523 (1); ENDOMYCHIDAE2 (End: Col) 860523 (1); *Anthromacra viriclissima* (Lag: Col) 860522 (1); PYROCHROIDAE1 (Pyr: Col) 850522 (1); *Mordellistena* sp. (Mor: Col) 860522 (3), 870608 (1); *Oedemeronia manicata* (Oed: Col) 870608 (1); *Oncomerella venosa* (Oed: Col) 870608 (1); *Dere thoracica* (Cer: Col) 850522 (1); *Linoetis coeruleipennis* (Chr: Col) 870608 (1); *Stenoluperus nipponensis* (Chr: Col) 860523 (1); *Byctiscus puberulus* (Att: Col) 860522 (1); *Metialina* sp. (Cur: Col) 840524 (1); CURCULIONIDAE6 (Cur: Col) 840524 (1); *Aglaostigma neburosa* (Ten: Hym) 850522 (1); *Athalia japonica* (Ten: Hym) 850522 (1); *Pachyprotasis tanakai* (Ten: Hym) F, 860523 (1); BRACONIDAE26 (Bra: Hym) F, 860522 (1); BRACONIDAE41 (Bra: Hym) F, 860523 (1); ICHNEUMONIDAE 105 (Ich: Hym) M, 860523 (1); ICHNEUMONIDAE111 (Ich: Hym) F, 870608 (1); ICHNEUMONIDAE114 (Ich: Hym) F, 860523 (1); ICHNEUMONIDAE118 (Ich: Hym) M, 870608 (1); ICHNEUMONIDAE49 (Ich: Hym) F, 840524 (1); ICHNEUMONIDAE51 (Ich: Hym) F, 840618 (1); ICHNEUMONIDAE76 (Ich: Hym) M, 860522 (1); ICHNEUMONIDAE87 (Ich: Hym) M, 870608 (1); ICHNEUMONIDAE91 (Ich: Hym) F, 860523 (1); FIGITIDAE1 (Fig: Hym) F,

Tripterospermum japonicum

Bombus (*Thoracobombus*) *honshuensis* (Api: Hym) W, 860825 (1)

Oleaceae

Ligustrum obtusifolium

Helophilus virgatus (Syr: Dip) F, 860708 (1); *Colpodes aurelius* (Car: Col) 860708 (1); *Lasioglossum* (*Evylaeus*) *transpositum* (Hal: Hym) F, 860708 (1); *Lasioglossum* (*Evylaeus*) *apristum* (Hal: Hym) F, 860708 (1); *Bombus* (*Diversobombus*) *diversus diversus* (Api: Hym) W, 860708 (2); *Bombus* (*Thoracobombus*) *honshuensis* (Api: Hym) W, 860708 (4)

Verbenaceae

Caryopteris divaricata

Bombus (*Diversobombus*) *diversus diversus* (Api: Hym) W, 840924 (1); *Bombus* (*Thoracobombus*) *honshuensis* (Api: Hym) W, 840829 (1)

Labiatae

Clinopodium micranthum

Bombus (*Thoracobombus*) *honshuensis* (Api: Hym) W, 840829 (1)

Rabdosia longituba

Bombus (*Diversobombus*) *diversus diversus* (Api: Hym) W, 850915 (1), 87092 7 (1); *Bombus* (*Thoracobombus*) *honshuensis* (Api: Hym) W, 860825 (1)

Rabdosia trichocarpa

Carbula humerigera (Pen: Hem) 840924 (1); *Adelphocoris triannulatus* (Mir: Hem) 850915 (1); *Cephenius nitobei* (Bom: Dip) M, 850915 (1), 860924 (1); *Cephenius* sp. (Bom: Dip) M, 860924 (3); *Epistotophe shibakawae* (Syr: Dip) F, 870927 (1); *Paragus tibialis* (Syr: Dip) F, 850915 (1); *Ectophasia sinensis* (Pha: Dip) 850915 (1); *Monolepta pallidula* (Chr: Col) 840924 (1); *Taxonus fulvicornis* (Ten: Hym) 850915 (2); BRACONIDAE1 (Bra: Hym) M, 850915 (1); BRACONIDAE2 (Bra: Hym) F, 840924 (1); ICHNEUMONIDAE1 (Ich: Hym) F, 850915 (3); ICHNEUMONIDAE18 (Ich: Hym) M, 850915 (1); ICHNEUMONIDAE

37 (Ich: Hym) F, 840924 (1); ICHNEUMONIDAE38 (Ich: Hym) F, 840924 (1); *Stenodynerus tokyanus tokyanus* (Ves: Hym) 850915 (1); *Vespa xanthoptera* (Ves: Hym) W, 870915 (1), 870927 (2); *Vespula vulgaris* (Ves: Hym) 840829 (1); *Lasioglossum* (*Dialictus*) sp.2 (Hal: Hym) F, 850915 (1); *Lasioglossum* (*Lasioglossum*) *occidens* (Hal: Hym) M, 850915 (2); *Lasioglossum* (*Lasioglossum*) sp.3 (Hal: Hym) F, 860924 (1); *Coelioxys brevis* (Meg: Hym) M, 860924 (1); *Tetralonia mitsukurii* (Ant: Hym) F, 860924 (1); *Ceratina japonica* (Ant: Hym) F, 840924 (2); *Ceratina megastigmata* (Ant: Hym) F, 840924 (4); *Bombus* (*Thoracobombus*) *honshuensis* (Api: Hym) W, 840829 (1), 850915 (5), 860924 (6), 870915 (5); *Apis cerana cerana* (Api: Hym) W, 840924 (8), 850915 (5), 860924 (18), 861010 (1), 870915 (2); *Apis mellifera* (Api: Hym) W, 850915 (1), 860924 (1)

Salvia glabrescens

Bombus (*Diversobombus*) *diversus diversus* (Api: Hym) W, 840924 (1)

Plantaginaceae

Plantago asiatica

Bombus (*Thoracobombus*) *honshuensis* (Api: Hym) W, 840829 (1)

Caprifoliaceae

Viburnum plicatum

Menida violacea (Pen: Hem) 860608 (1); MIRIDAE3 (Mir: Hem) 840618 (1); TOMASPIDIDAE1 (Tom: Hem) 840829 (1); CIXIIDAE1 (Cix: Hem) 840618 (2); PSYLLIDAE1 (Psy: Hem) 840618 (1); TORTRICIDAE3 (Tor: Lep) 860608 (1); *Japonica luter* (Lyc: Lep) F, 840618 (1); EMPIDIDAE25 (Emp: Dip) 840618 (1); *Eristalis cerealis* (Syr: Dip) F, 840618 (2), M, 840618 (4); *Syrphus vitripennis* (Syr: Dip) M, 840618 (1); CLUSIIDAE1 (Clu: Dip) 840618 (3), 860608 (1); ANTHOMYIIDAE31 (Ant: Dip) M, 840618 (1), 860608 (1); TACHINIDAE49 (Tac: Dip) M, 840618 (1); CALLIPHORIDAE7 (Cal: Dip) M, 840618 (1); *Megalopaederus lewsi* (Sta: Col) 840618 (1); *Eucetonia roelofsi* (Sca: Col) 840618 (1); *Phyllopertha irregularis* (Sca: Col) 840618 (1); *Ganoxanthus pallidus* (Ela: Col) 840618 (1); *Podabrus temporalis* (Can: Col) 840618 (4); *Tremus cyanipennis* (Can: Col) 840618 (2); *dasytes vulgaris* (Mel: Col) 860608 (1); *Anthromacra viriclissima* (Lag: Col) 840618 (1), 860608 (2); *Mordellistena* sp. (Mor: Col) 840618 (7), 860608 (2); *Anaspis funagata* (Scr: Col) 860608 (1); CEPHALOIDAE2 (Cep: Col) 860608 (1); *Oedemeronia manicata* (Oed: Col) 840618 (2), 860608 (1); *Anaglyptus niponensis* (Cer: Col) 840618 (1); *Demonax transilis* (Cer: Col) 860608 (1); *Leptura arcuata* (Cer: Col) 860608 (1); *Stenocorus caeruleipennis* (Cer: Col) 840618 (1); APIONIDAE3 (Api: Col) 840618 (1); *Corymbas nipponica* (Ten: Hym) F, 860608 (1); BRACONIDAE18 (Bra: Hym) F, 840618 (1); BRACONIDAE28 (Bra: Hym) M, 840618 (1); ICHNEUMONIDAE 85 (Ich: Hym) F, 840618 (1); *Vespa xanthoptera* (Ves: Hym) 840829 (2); *Rhopalum* (*Latrorhopalum*) *latronum* (Sph: Hym) F, 840829 (1); *Hylaeus globula* (Col: Hym) F, 840829 (6); *Lasioglossum* (*Dialictus*) sp.2 (Hal: Hym) F, 860608 (1); *Lasioglossum* (*Evylaeus*) *transpositum* (Hal: Hym) F, 840618 (2); *Lasioglossum* (*Evylaeus*) *apristum* (Hal: Hym) F, 860608 (2); *Andrena* (*Micrandrena*) *hikosana* (And: Hym) F, 860608 (1)

Weigela hortensis

Menida violacea (Pen: Hem) 840618 (1); MIRIDAE8 (Mir: Hem) 840618 (1); CIXIIDAE1 (Cix: Hem) 840618 (1); GRACILLARIIDAE1 (Gra: Lep) 840618 (1); *Parnassius glacialis* (Pap: Lep) F, 860608 (1); BIBIONIDAE6 (Bib: Dip) 860608 (1); TIPULIDAE2 (Tip: Dip) 840618 (1); *Philopota nigroaenea* (Acr: Dip) M, 840618 (14); EMPIDIDAE19 (Emp: Dip) 840618 (3); *Eristalis cerealis* (Syr: Dip) M, 860608 (2); *Metasyrphus corollae* (Syr: Dip) F, 870608 (1);

Metasyrphus nintens (Syr: Dip) F, 870608 (1); *Microdon auricomus* (Syr: Dip) M, 840618 (1); CLUSIIDAE1 (Clu: Dip) 840618 (1); ANTHOMYIIDAE12 (Ant: Dip) F, 860608 (1); SARCOPHAGIDAE19 (Sar: Dip) M, 840618 (1); *Podabrus temporalis* (Can: Col) 870608 (1); *Prothemus ciusianus* (Can: Col) 840618 (1); *dasytes vulgaris* (Mel: Col) 840618 (1); *Anthromacra viriclissima* (Lag: Col) 840618 (3); *Cephaloon pallensa* (Cep: Col) 850522 (1); CEPHALOIDAE2 (Cep: Col) 840618 (1); *Japanostrangalia deutatipennis* (Cer: Col) 870608 (1); *Leptura aethiops* (Cer: Col) 870608 (1); *Pidonia signifera* (Cer: Col) 850522 (2), 86060 8 (1); *Linoetis coeruleipennis* (Chr: Col) 850522 (1), 860608 (2); *Ferusa* sp. (Ten: Hym) F, 840618 (1); *Strogylogaster lineata* (Ten: Hym) 840618 (1); *Tenthredo convagennata* (Ten: Hym) 840618 (1), M, 870608 (1); PTEROMALIDAE2 (Pte: Hym) F, 840618 (1); *Lasioglossum* (*Lasioglossum*) *exiliceps* (Hal: Hym) F, 860605 (1); *Lasioglossum* (*Lasioglossum*) *occidens* (Hal: Hym) 860605 (1); *Lasioglossum* (*Lasioglossum*) *proximatum* (Hal: Hym) F, 840618 (1), 860608 (1); *Lasioglossum* (*Lasioglossum*) sp.3 (Hal: Hym) F, 870608 (1); *Andrena* (*Stenomelissa*) *halictoides* (And: Hym) F, 840618 (1), 860608 (8), 870608 (2); *Andrena* (*Trachandrena*) *haemorrhoa japonibia* (And: Hym) F, 870608 (1); *Tetralonia nipponens* (Ant: Hym) F, 860608 (1); *Ceratina japonica* (Ant: Hym) F, 860608 (2); *Ceratina megastigmata* (Ant: Hym) F, 860605 (1); *Bombus* (*Bombus*) *hypocrita hypocrita* (Api: Hym) Q, 850522 (2), W, 860605 (2), 8606 08 (1), 870608 (1); *Bombus* (*Diversobombus*) *diversus diversus* (Api: Hym) Q, 850522 (1), W, 840618 (3), 860605 (1), 860608 (1); *Bombus* (*Pyrobombus*) *ardens ardens* (Api: Hym) Q, 850522 (2), W, 860608 (1); *Bombus* (*Thoracobombus*) *honshuensis* (Api: Hym) W, 860608 (1); *Apis cerana cerana* (Api: Hym) W, 860608 (1); *Apis mellifera* (Api: Hym) W, 870608 (1)

Valerianaceae

Patrinia villosa
Nonartha cyaneum (Chr: Col) 840829 (3)

Compositae

Adenocaulon himalaicum
Baccha maculata (Syr: Dip) M, 840829 (1); *Melanostoma scalare* (Syr: Dip) M, 840829 (1)

Ainsliaea acerifolia
Bombus (*Diversobombus*) *diversus diversus* (Api: Hym) W, 860825 (1)

Aster glehni
Menida violacea (Pen: Hem) 840924 (1); *Eristalis cerealis* (Syr: Dip) F, 860924 (1), M, 860924 (1); *Eristalomya tenax* (Syr: Dip) M, 860924 (1); *Helophilus virgatus* (Syr: Dip) F, 860924 (2); *Megaspis zonata* (Syr: Dip) F, 860924 (1); *Carpophilus chalybeus* (Nit: Col) 840924 (1); *Ceratina megastigmata* (Ant: Hym) F, 840924 (2); *Ceratina* sp. (Ant: Hym) 840924 (1)

Cacalia delphiniifolia
Eristalis cerealis (Syr: Dip) F, 840829 (1); CLUSIIDAE7 (Clu: Dip) 840829 (1); BRACONIDAE15 (Bra: Hym) F, 840829 (1); ICHNEUMONIDAE4 (Ich: Hym) F, 840829 (1); ICHNEUMONIDAE40 (Ich: Hym) M, 840829 (1); *Bombus* (*Bombus*) *hypocrita hypocrita* (Api: Hym) M, 840829 (1); *Bombus* (*Thoracobombus*) *honshuensis* (Api: Hym) W, 840829 (1)

Carpesium divaricatum
Lasioglossum (*Evylaeus*) *sexstrigatum* (Hal: Hym) M, 840829 (1)

Cirsium japonicum
Bombus (*Diversobombus*) *diversus diversus* (Api: Hym) W, 840719 (4), 85062 7 (2)

Cirsium kagamontanum

Vanessa indica (Nym: Lep) F, 860924 (1); TIPULIDAE7 (Tip: Dip) 861010 (1); *Dasysyrphus bilineatus* (Syr: Dip) F, 861010 (1); *Eristalis cerealis* (Syr: Dip) M, 870927 (2); *Rhingia laevigata* (Syr: Dip) M, 870927 (1); *Lasioglossum* (*Lasioglossum*) sp.3 (Hal: Hym) M, 870927 (1); *Ceratina megastigmata* (Ant: Hym) F, 840924 (1), 870901 (1); *Bombus* (*Diversobombus*) *diversus diversus* (Api: Hym) W, 840924 (2), 860924 (7), 861010 (8), 870915 (6), 870927 (3), 8710 26 (3); *Bombus* (*Thoracobombus*) *honshuensis* (Api: Hym) M, 840924 (3), 85 0915 (1), W, 850915 (2), 860924 (5), 861010 (2), 870901 (1), 870915 (1), 870927 (3), 871026 (1); *Apis cerana cerana* (Api: Hym) W, 870927 (1)

Ixeris dentata

外RTHOPTERA6 (Ort: Ort) 840618 (1); CIXIIDAE2 (Cix: Hem) 840618 (1); *Pieris rapae* (Pie: Lep) F, 840618 (1); SPHINGIDAE3 (Sph: Lep) F, 840618 (1); *Eristalomya tenax* (Syr: Dip) F, 840618 (1), M, 840618 (2); *Melanostoma scalare* (Syr: Dip) M, 840618 (1); *Sphaerophoria menthastri* (Syr: Dip) M, 840618 (3); CHLOROPIDAE20 (Chl: Dip) 840618 (1); CLUSIIDAE1 (Clu: Dip) 840618 (3); ANTHOMYIIDAE21 (Ant: Dip) F, 840618 (1); ANTHOMYIIDAE22 (Ant: Dip) M, 840618 (1); ANTHOMYIIDAE31 (Ant: Dip) F, 840618 (1), M, 840618 (2); *Melanotus annosus* (Ela: Col) 840618 (1); *Oedemeronia lucidicollis* (Oed: Col) 840618 (1); BRACONIDAE29 (Bra: Hym) F, 840618 (1); *Lasioglossum* (*Carinate Evylaeus*) *duplex* (Hal: Hym) F, 840618 (1); *Lasioglossum* (*Lasioglossum*) *occidens* (Hal: Hym) F, 840618 (3); *Andrena* (*Chlorandrena*) *Knuthi* (And: Hym) M, 840618 (1); *Bombus* (*Pyrobombus*) *ardens ardens* (Api: Hym) W, 840618 (1)

Kalimeris yomena

Cheilosia sp.7 (Syr: Dip) F, 860924 (1); *Eristalis cerealis* (Syr: Dip) F, 860924 (1); *Lasioglossum* (*Lasioglossum*) sp.3 (Hal: Hym) F, 860924 (1); *Ceratina megastigmata* (Ant: Hym) F, 860924 (1)

Petasites japonicus

Cheilosia sp.11 (Syr: Dip) F, 860505 (1)

Siegesbeckia orientalis

Lasioglossum (*Evylaeus*) *apristum* (Hal: Hym) M, 840924 (1)

Stenactis annuus

Nysius sp. (Lyg: Hem) 840719 (1); *Eristalomya tenax* (Syr: Dip) M, 840719 (1); ANTHOMYIIDAE25 (Ant: Dip) M, 840719 (2); *Blitopertha orientalis* (Sca: Col) F, 840719 (1), M, 840719 (3); *Eumenes rubronotatus* (Ves: Hym) 840719 (1); *Cerceris hortivaga* (Sph: Hym) M, 840719 (1); *Lasioglossum* (*Lasioglossum*) *occidens* (Hal: Hym) F, 840719 (1); *Ceratina flavipes* (Ant: Hym) F, 840719 (3); *Ceratina megastigmata* (Ant: Hym) F, 840719 (1)

Commelinaceae

Commelina communis

Bombus (*Thoracobombus*) *honshuensis* (Api: Hym) W, 840829 (1)

Liliaceae

Disporum sessile

Bombus (*Diversobombus*) *diversus diversus* (Api: Hym) Q, 860608 (1)

Polygonatum macranthum

Bombus (*Diversobombus*) *diversus diversus* (Api: Hym) W, 850627 (1)

Tricyrtis hirta

Bombus (*Diversobombus*) *diversus diversus* (Api: Hym) W, 870901 (1)

Appendix 2.

Plants visited by each insect species of three dipterous, four coleopterous and 13 hymenopterous families in Ashu. Each record is arranged in the following order: plant species name, sex and caste (F - females, M - males, Q - queens, W - workers), date in the form of year + month + day, and (the number of insect individuals).

DIPTERA

Bombyliidae

Bombylius major
Epimedium grandiflorum, F, 860505 (1); *Corydalis lineariloba*, F, 860505 (3), M, 860505 (1); *Viola kusanoana*, F, 870529 (2); *Viola verecunda*, F, 870529 (1); *Prunus incisa*, F, 860505 (1), M, 860505 (1)
Cephenius nitobei
Rabdosia trichocarpa, M, 850915 (1), 860924 (1)
Cephenius sp.
Rabdosia trichocarpa, M, 860924 (3)

Acroceridae

Philopota nigroaenea
Symplocos chinensis, M, 860608 (1); *Weigela hortensis*, M, 840618 (14)

Syrphidae

Allograpta javana
Astilbe thunbergii, M, 860731 (1); *Rhus javanica*, M, 860825 (1)
Baccha maculata
Styrax japonica, M, 850627 (1); *Desmodium podocarpum*, M, 850803 (1); *Adenocaulon himalaicum*, M, 840829 (1)
Betasyrphus seraius
Lysimachia clethroides, F, 860731 (1); *Hovenia tomentella*, M, 850716 (1)
Cheilosia omogensis
Phellodendron amurense, M, 860825 (2); *Angelica pubescens*, F, 840829 (1), M, 840829 (2)
Cheilosia sp.1
Anthriscus aemula, F, 860522 (1), 870608 (1)
Cheilosia sp.4
Salix gracilistyla, M, 850424 (1)
Cheilosia sp.5
Anthriscus aemula, F, 860523 (1)
Cheilosia sp.6
Astilbe thunbergii, F, 860731 (1), M, 840719 (1); *Prunus Grayana*, F, 860522 (1)
Cheilosia sp.7
Persicaria thunbergii, F, 850915 (1); *Anthriscus aemula*, F, 860523 (1), 87060 8 (1), M, 860522 (1); *Kalimeris yomena*, F, 860924 (1)
Cheilosia sp.8
Anemone flaccida, M, 840524 (1)
Cheilosia sp.9
Anemone flaccida, F, 870529 (2)
Cheilosia sp.10
Hydrangea macrophylla, F, 850716 (1)
Cheilosia sp.11
Corydalis lineariloba, M, 850424 (2); *Viola vaginata*, M, 860505 (1); *Petasites japonicus*, F, 860505 (1)
Cheilosia sp.12

Persicaria thunbergii, F, 870927 (1); *Prunus salicina*, M, 860505 (1); *Prunus Grayana*, F, 860522 (1), M, 860522 (1)

Cheilosia sp.14
Anemone flaccida, F, 840524 (2); *Viola kusanoana*, F, 870529 (1)

Chrystogaster brevicornis
Prunus Grayana, F, 860522 (1)

Criorhina japonica
Euonymus alatus, M, 860608 (1)

Dasysyrphus bilineatus
Cirsium kagamontanum, F, 861010 (1)

Didea fasciata
Hydrangea macrophylla, M, 860731 (1)

Epistotophe shibakawae
Persicaria aestiva, F, 840924 (1); *Persicaria pubescens*, M, 870927 (1); *Persicaria thunbergii*, M, 870927 (1); *Rabdosia trichocarpa*, F, 870927 (1)

Episyrphus balteatus
Persicaria thunbergii, F, 870901 (1); *Cardiandra alternifolia*, M, 860731 (1); *Hydrangea hirta*, M, 870608 (1); *Hydrangea macrophylla*, F, 840719 (1), M, 840719 (1), 860731 (1); *Euonymus alatus*, M, 840618 (2); *Anthriscus aemula*, F, 860522 (1)

Eristalis cerealis
Astilbe thunbergii, F, 860731 (1), 870723 (1); *Castanea crenata*, F, 860708 (1), M, 860708 (1); *Persicaria senticosa*, M, 870915 (3); *Persicaria thunbergii*, F, 840924 (1), 850915 (1), 870927 (3), M, 840924 (2), 850915 (2), 860924 (1), 870927 (3); *Reynoutria japonica*, F, 840829 (1); *Stachyurus praecox*, M, 850424 (1); *Prunus salicina*, M, 840524 (4); *Deutzia crenata*, F, 850627 (1), M, 850627 (1); *Hydrangea hirta*, M, 860605 (1); *Hydrangea paniculata*, F, 860731 (1), 870723 (2), M, 870723 (1); *Swida controversa*, M, 860608 (2); *Euonymus alatus*, M, 840618 (1); *Rhus javanica*, F, 860825 (3); *Geranium nepalense*, F, 850915 (1); *Anthriscus aemula*, M, 870608 (1); *Viburnum plicatum*, F, 840618 (2), M, 840 618 (4); *Weigela hortensis*, M, 860608 (2); *Aster glehni*, F, 860924 (1), M, 860 924 (1); *Cacalia delphiniifolia*, F, 840829 (1); *Cirsium kagamontanum*, M, 87 0927 (2); *Kalimeris yomena*, F, 860924 (1)

Eristalomya tenax
Persicaria senticosa, M, 870915 (1); *Rosa multiflora*, F, 850627 (1); *Hydrangea paniculata*, F, 870723 (1); *Rhus javanica*, M, 860825 (1); *Aster glehni*, M, 860 924 (1); *Ixeris dentata*, F, 840618 (1), M, 840618 (2); *Stenactis annuus*, M, 84 0719 (1)

Ferdinandea cuprea
Hydrangea macrophylla, M, 840719 (1)

Helophilus virgatus
Persicaria thunbergii, F, 850915 (1), 870927 (1); *Rubus palmatus*, M, 870529 (1); *Geranium nepalense*, F, 850915 (1); *Ligustrum obtusifolium*, F, 860708 (1); *Aster glehni*, F, 860924 (2)

Imatisma abdominalis
Cardiandra alternifolia, F, 860731 (1)

Imatisma dimorpha
Reynoutria japonica, F, 840829 (1); *Hydrangea paniculata*, M, 870723 (1)

Imatisma sp.
Hydrangea macrophylla, F, 840719 (1)

Mashumyia ferdinandi
Ampelopsis brevipedunculata, M, 840829 (1)

Megaspis zonata
Persicaria thunbergii, F, 850915 (1), M, 850915 (1); *Angelica pubescens*, F, 8 40829 (1); *Aster glehni*, F, 860924 (1)

Melanostoma scalare
Castanea crenata, F, 860708 (1); *Antenoron filiforme*, M, 840829 (1); *Hydrangea*

hirta, F, 860605 (1), M, 860605 (1); *Euonymus alatus*, F, 840618 (4), 860608 (1); *Angelica pubescens*, M, 840829 (1); *Anthriscus aemula*, F, 850522 (5), 860522 (3), 860523 (2), 870608 (2), M, 850522 (1), 860522 (5), 860523 (1); *Adenocaulon himalaicum*, M, 840829 (1); *Ixeris dentata*, M, 840618 (1)

Meluscaeva cinctella
Hydrangea macrophylla, F, 840719 (1)

Metasyrphus corollae
Weigela hortensis, F, 870608 (1)

Metasyrphus nintens
Weigela hortensis, F, 870608 (1)

Microdon auricomus
Weigela hortensis, M, 840618 (1)

Microdon simplex
Hydrangea macrophylla, M, 840719 (1); *Spuriopimpinella nikoensis*, F, 84071 9 (1)

Milesia undulata
Hovenia tomentella, M, 850716 (1)

Neoascia sp.
Anemone flaccida, M, 870529 (1); *Salix gracilistyla*, M, 860505 (1); *Prunus salicina*, M, 840524 (3)

Paragus jozanus
Cryptotaenia japonica, M, 840719 (1)

Paragus tibialis
Corydalis lineariloba, M, 860505 (1); *Rabdosia trichocarpa*, F, 850915 (1)

Pipiza familiaris
Anthriscus aemula, M, 860522 (2)

Pipiza inornata
Geranium nepalense, F, 850915 (1); *Angelica pubescens*, F, 840829 (1)

Rhingia laevigata
Impatiens textori, F, 860924 (1); *Cirsium kagamontanum*, M, 870927 (1)

Sericomyia japonica
Hydrangea macrophylla, M, 840719 (1)

Sphaerophoria macrogaster
Castanea crenata, F, 860708 (3); *Anthriscus aemula*, F, 870608 (1)

Sphaerophoria menthastri
Astilbe thunbergii, M, 870723 (1); *Castanea crenata*, M, 860708 (1); *Lysimachia clethroides*, M, 850716 (1), 860731 (2); *Deutzia crenata*, F, 850627 (1), M, 850 627 (1); *Hydrangea paniculata*, M, 870715 (1); *Euonymus alatus*, M, 840618 (1); *Phellodendron amurense*, F, 860825 (1); *Anthriscus aemula*, M, 870608 (1); *Ixeris dentata*, M, 840618 (3)

Sphegina sp.1
Astilbe thunbergii, F, 840719 (1), 860731 (1)

Sphegina sp.2
Anthriscus aemula, M, 860522 (1)

Sphegina sp.3
Hydrangea hirta, F, 860605 (1)

Sphegina sp.4
Hydrangea hirta, M, 860605 (1)

Syritta pipiens
Castanea crenata, M, 860708 (1); *Phellodendron amurense*, M, 860825 (1)

Syrphus vitripennis
Swida controversa, M, 860608 (1); *Euonymus alatus*, F, 840618 (2), M, 840618 (1); *Anthriscus aemula*, F, 870608 (1); *Viburnum plicatum*, M, 840618 (1)

Takaomyia johannis
Hydrangea macrophylla, M, 840719 (1)

Takaomyia sexmaculata
Symplocos chinensis, M, 860605 (1)

Temnostoma fumosa
Hydrangea hirta, F, 860605 (1)
Xylota coquilletti
Hydrangea macrophylla, M, 840719 (1)
Xylota frontaris
Hydrangea macrophylla, F, 840719 (1)
Xylota simplex
Hydrangea macrophylla, M, 840719 (1)

COLEOPTERA
Scarabaeidae

Blitopertha orientalis
Astilbe thunbergii, F, 870723 (1); *Hydrangea paniculata*, M, 860731 (1); *Stenactis annuus*, F, 840719 (1), M, 840719 (3)
Ectinohoplia obducta
Castanea crenata, 860708 (6); *Hydrangea paniculata*, 870723 (1)
Eucetonia roelofsi
Hydrangea macrophylla, 840719 (1); *Hydrangea paniculata*, 860731 (1); *Euonymus alatus*, 860608 (1); *Phellodendron amurense*, 860825 (1); *Angelica pubescens*, 840829 (1); *Viburnum plicatum*, 840618 (1)
Nipponovalgus angusticollis
Castanea crenata, 860708 (1)
Oxycetonia jucunda
Castanea crenata, 860708 (1)
Paratrichius doentzi
Hydrangea paniculata, F, 860731 (1), 870723 (3), M, 870723 (1)
Paratrichius septemdecimguttatus
Astilbe thunbergii, 870723 (1)
Phyllopertha irregularis
Symplocos chinensis, 860608 (1); *Rubus microphyllus*, 860608 (1); *Viburnum plicatum*, 840618 (1)
Popillia japonica
Astilbe thunbergii, 870723 (1); *Castanea crenata*, 860708 (2); *Lysimachia clethroides*, 860731 (1)
Sericania fulgida
Rubus microphyllus, 860608 (1); *Euonymus alatus*, 840618 (1)
Sericania fuscolineata
Symplocos chinensis, 860608 (1)

Cantharidae

Athemellus insulsus
Hydrangea macrophylla, 840719 (3)
Malthodes sulcicollis
Anthriscus aemula, 860522 (2)
Micadocantharis japonica
Hydrangea hirta, 860605 (1)
Podabrus temporalis
Symplocos chinensis, 870608 (2); *Prunus Grayana*, 860522 (4), 860523 (3); *Swida controversa*, 860608 (1); *Anthriscus aemula*, 840524 (1), 860522 (10), 860523 (2); *Viburnum plicatum*, 840618 (4); *Weigela hortensis*, 870608 (1)
Prothemus ciusianus
Corydalis pallida, 870529 (1); *Euonymus alatus*, 870608 (1); *Anthriscus aemula*, 860522 (1), 860523 (1); *Weigela hortensis*, 840618 (1)
Tremus cyanipennis

Symplocos chinensis, 860605 (1); *Viburnum plicatum*, 840618 (2)

Oedemeridae

Oedemeronia lucidicollis
Euonymus alatus, 860608 (1); *Ixeris dentata*, 840618 (1)
Oedemeronia manicata
Deutzia crenata, 850627 (1); *Swida controversa*, 860608 (2); *Euonymus alatus*, 840618 (1); *Anthriscus aemula*, 870608 (1); *Viburnum plicatum*, 840618 (2), 86 0608 (1)
Oncomerella venosa
Swida controversa, 860608 (1); *Anthriscus aemula*, 870608 (1)
Xanthochroa ainu
Hydrangea paniculata, 870723 (1)
Xanthochroa deformis
Hydrangea paniculata, 870723 (2)
Xanthochroa luteipennis
Hydrangea paniculata, 870723 (8)
Xanthochroa waterhousei
Hydrangea paniculata, 870723 (2)

Cerambycidae

Anaglyptus niponensis
Viburnum plicatum, 840618 (1)
Anoploderomorpha excavata
Hydrangea macrophylla, 840719 (8), 850716 (1); *Hydrangea paniculata*, 87072 3 (1)
Bhaphuma xenisca
Hydrangea paniculata, 870723 (1)
Chlorophorus japonicus
Astilbe thunbergii, 870723 (1); *Castanea crenata*, 860708 (1)
Corymia succedanea
Hydrangea paniculata, 870715 (1)
Demonax transilis
Swida controversa, 860608 (2); *Viburnum plicatum*, 860608 (1)
Dere thoracica
Anthriscus aemula, 850522 (1)
Dinoptera minuta ticollis
Corydalis pallida, 870529 (1); *Salix gracilistyla*, 860505 (1)
Idiostrangalia contracta
Aruncus dioicus, 840719 (6); *Hydrangea macrophylla*, 840719 (4)
Japanostrangalia deutatipennis
Hydrangea paniculata, 870723 (1); *Weigela hortensis*, 870608 (1)
Leptura aethiops
Weigela hortensis, 870608 (1)
Leptura arcuata
Viburnum plicatum, 860608 (1)
Leptura ochraceofasciata
Cardiandra alternifolia, 840719 (1); *Hydrangea macrophylla*, 840719 (8), 8607 31 (1)
Parastrangalis nymphula
Astilbe thunbergii, 840719 (1); *Aruncus dioicus*, 840719 (2); *Deutzia crenata*, 860708 (2); *Hydrangea macrophylla*, 840719 (9); *Hydrangea paniculata*, 87071 5 (2), 870723 (1)
Pidonia aegrota

Hydrangea macrophylla, 840719 (1)
Pidonia discoidalis
Symplocos chinensis, 840618 (1); *Euonymus alatus*, 840618 (1)
Pidonia puziloi
Euonymus alatus, 840618 (1)
Pidonia signifera
Symplocos chinensis, 860605 (1); *Euonymus alatus*, 840618 (3); *Weigela hortensis*, 850522 (2), 860608 (1)
Pidonia yamato
Symplocos chinensis, 870608 (1)
Pseudaosterna misella
Astilbe thunbergii, 840719 (2)
Pyrrhona laeticolor
Symplocos chinensis, 860605 (1)
Schwarzerium quadricolle
Hydrangea paniculata, 870723 (2)
Stenocorus caeruleipennis
Viburnum plicatum, 840618 (1)
Strangalomorpha tenuis
Symplocos chinensis, 870608 (1)
Xylotrechus ounelpennis
870723 (1)

HYMENOPTERA
TENTHREDINOIDEA
Tenthredinidae

Aglaostigma neburosa
Anthriscus aemula, 850522 (1)
Asiemphytus albilabris
Deutzia crenata, 850627 (1)
Athalia japonica
Viola kusanoana, M, 870529 (1); *Anthriscus aemula*, 850522 (1)
Birka carinifrons
Lysimachia clethroides, M, 860731 (1)
Corymbas nipponica
Swida controversa, M, 860608 (1); *Viburnum plicatum*, F, 860608 (1)
Empria quadrimaculata
Anemone flaccida, F, 870529 (1)
Ferusa sp.
Weigela hortensis, F, 840618 (1)
Hemitaxonus japonicas
Viola vaginata, M, 860505 (1)
Loderus eversmanini obscurus
Corydalis lineariloba, F, 860505 (2)
Pachyprotasis tanakai
Anthriscus aemula, F, 860523 (1)
Strogylogaster lineata
Weigela hortensis, 840618 (1)
Strombocerina koebelei
Hydrangea paniculata, M, 870723 (1); *Euonymus alatus*, 840618 (1)
Taxonus fulvicornis
Rabdosia trichocarpa, 850915 (2)
Tenthredinidae sp.
Prunus Grayana, F, 860523 (2)
Tenthredo convagennata

Weigela hortensis, 840618 (1), M, 870608 (1)
Tenthredo fukaii
Prunus salicina, 840524 (2)
Tenthredo sp.
Geranium nepalense, 850915 (1)

Argidae

Arge nigrinodosa
Astilbe thunbergii, F, 860731 (1)
Arge nipponensis
Hydrangea paniculata, M, 870723 (1); *Angelica pubescens*, 840829 (1)
Arge similis
Angelica pubescens, 840829 (1)

Cimbicidae

Zaraea fasciata
Swida controversa, F, 860608 (1)

FORMICOIDEA
Formicidae

Camponotus obscripes
Swida controversa, 860608 (1); *Anthriscus aemula*, 840618 (1)
Camponotus sp.
Anthriscus aemula, M, 860605 (1)
Formica japonica
Astilbe thunbergii, 860731 (1), 870723 (1); *Castanea crenata*, 860708 (2); *Hydrangea paniculata*, 860731 (1), 870723 (1); *Angelica polymorpha*, 870901 (1)
Formica sp.
Lysimachia clethroides, 860731 (1); *Aucuba japonica*, 840524 (1); *Swida controversa*, 860608 (1)
Lasius niger
Viola verecunda, 870529 (2); *Hydrangea paniculata*, 870723 (4); *Rhus javanica*, 860825 (1); *Anthriscus aemula*, 860523 (2)
Paratrechina flavipes
Astilbe thunbergii, 870723 (1)
Pristomyrmex punger
Hydrangea paniculata, 870723 (2)

VESPOIDEA
Eumenidae

Ancistrocerus melanocerus
Euonymus alatus, M, 860608 (1)
Eumenes rubronotatus
Stenactis annuus, 840719 (1)
Stenodynerus tokyanus tokyanus
Rabdosia trichocarpa, 850915 (1)
Symmorphus cliens
Euonymus alatus, 840618 (1)

Vespidae

Vespa xanthoptera

Reynoutria japonica, Q, 840829 (1); *Rubus microphyllus*, 860608 (1); *Ampelopsis brevipedunculata*, W, 870901 (1); *Rhus javanica*, W, 860825 (1); *Angelica pubescens*, 840829 (1); *Rabdosia trichocarpa*, W, 870915 (1), 870927 (2); *Viburnum plicatum*, 840829 (2)

Vespula schrenckii
Hovenia tomentella, 850716 (1)

Vespula vulgaris
Rabdosia trichocarpa, 840829 (1)

SPHECOIDEA

Sphecidae

Ammophila infesta
Lysimachia clethroides, M, 860731 (1)

Cerceris carinalis
Astilbe thunbergii, M, 870723 (4)

Cerceris hortivaga
Hydrangea paniculata, M, 870723 (1); *Stenactis annuus*, M, 840719 (1)

Crabro sp.
Lysimachia clethroides, F, 860731 (1)

Ectemnius (Cameronitus) radiatus
Astilbe thunbergii, F, 870723 (2)

Ectemnius (Hypocrabro) rubicola
Astilbe thunbergii, M, 860731 (1)

Ectemnuis radiatus
Spuriopimpinella nikoensis, F, 840829 (1)

Ectemnuis rubicola nipponis
Angelica pubescens, M, 840829 (1)

Rhopalum (Latrorhopalum) latronum
Astilbe thunbergii, M, 870723 (3); *Cardiandra alternifolia*, M, 840719 (1); *Hydrangea macrophylla*, M, 840719 (1); *Euonymus alatus*, F, 840618 (1); *Rhus javanica*, F, 860825 (1); *Angelica pubescens*, F, 840829 (2), M, 840829 (2); *Spuriopimpinella nikoensis*, F, 840829 (1); *Viburnum plicatum*, F, 840829 (1)

Sphex maidli
Lysimachia clethroides, F, 860731 (1)

APOIDEA

Colletidae

Hylaeus floralis
Deutzia crenata, M, 850627 (1); *Euonymus alatus*, M, 860608 (1)

Hylaeus globula
Astilbe thunbergii, F, 840719 (1); *Reynoutria japonica*, M, 840829 (2); *Aruncus dioicus*, M, 840719 (1); *Ampelopsis brevipedunculata*, F, 840829 (1), M, 840829 (1); *Rhus javanica*, F, 840829 (5), M, 840829 (2); *Angelica pubescens*, F, 8408 29 (11), M, 840829 (9); *Spuriopimpinella nikoensis*, M, 840829 (1); *Viburnum plicatum*, F, 840829 (6)

Hylaeus nippon
Angelica pubescens, M, 840829 (1)

Halictidae

Lasioglossum (Dialictus) problematicum
Corydalis pallida, F, 870529 (2); *Viola kusanoana*, F, 870529 (1); *Agrimonia*

pilosa, M, 840829 (1); *Geranium nepalense*, F, 850915 (1); *Anthriscus aemula*, F, 840524 (1), 870608 (1)

Lasioglossum (*Dialictus*) sp.2
Symplocos chinensis, F, 860608 (1); *Deutzia crenata*, F, 850627 (1); *Hydrangea hirta*, F, 860605 (3); *Euonymus alatus*, F, 860608 (8); *Rabdosia trichocarpa*, F, 850915 (1); *Viburnum plicatum*, F, 860608 (1)

Lasioglossum (*Ctenonomia*) sp.1
Swida controversa, F, 860608 (1)

Lasioglossum (carinaless *Evylaeus*) *japonicum*
Castanea crenata, F, 860708 (1); *Deutzia crenata*, F, 850627 (1)

Lasioglossum (carinaless *Evylaeus*) *sexstrigatum*
Angelica pubescens, M, 840829 (2); *Carpesium divaricatum*, M, 840829 (1)

Lasioglossum (carinaless *Evylaeus*) sp.25
Deutzia crenata, F, 850627 (1); *Hydrangea macrophylla*, F, 840719 (4)

Lasioglossum (*carinaless* Evylaeus) sp.5
Geranium nepalense, M, 840924 (1); *Spuriopimpinella nikoensis*, F, 840719 (1)

Lasioglossum (carinaless *Evylaeus*) *taniolellum*
Ampelopsis brevipedunculata, M, 840829 (1)

Lasioglossum (carinaless *Evylaeus*) *transpositum*
Corydalis lineariloba, F, 860505 (1); *Cardiandra alternifolia*, F, 840719 (1), 860731 (1), 870723 (2); *Deutzia crenata*, F, 850627 (9); *Hydrangea hirta*, F, 850627 (1), 860708 (2); *Hydrangea macrophylla*, F, 840719 (7), 860731 (6); *Swida controversa*, F, 860608 (1); *Euonymus alatus*, F, 860608 (1); *Rhus trichocarpa*, F, 840618 (1); *Anthriscus aemula*, F, 860605 (1); *Ligustrum obtusifolium*, F, 860708 (1); *Viburnum plicatum*, F, 840618 (2)

Lasioglossum (carinate *Evylaeus*) *duplex*
Castanea crenata, F, 860708 (1); *Ixeris dentata*, F, 840618 (1)

Lasioglossum (carinate *Evylaeus*) *apristum*
Astilbe thunbergii, F, 870723 (1); *Reynoutria japonica*, F, 840829 (1); *Symplocos chinensis*, F, 860605 (6), 860608 (2); *Geum japonicum*, F, 850803 (1); *Rosa multiflora*, F, 850627 (1); *Deutzia crenata*, F, 850627 (9); *Hydrangea hirta*, F, 850627 (1), 860605 (10), 860708 (1), 870608 (1); *Hydrangea macrophylla*, F, 840719 (2); *Hydrangea paniculata*, F, 850803 (10); *Swida controversa*, F, 860608 (5); *Euonymus alatus*, F, 840618 (1), 860608 (9); *Geranium nepalense*, F, 850915 (1); *Anthriscus aemula*, F, 860523 (1), 870608 (1); *Ligustrum obtusifolium*, F, 860708 (1); *Viburnum plicatum*, F, 860608 (2); *Siegesbeckia orientalis*, M, 840924 (1)

Lasioglossum (carinate *Evylaeus*) *baleicum*
Hydrangea macrophylla, F, 840719 (2)

Lasioglossum (*Lasioglossum*) *exiliceps*
Prunus salicina, F, 840524 (1); *Deutzia crenata*, F, 850627 (1); *Swida controversa*, F, 860608 (1); *Weigela hortensis*, F, 860605 (1)

Lasioglossum (*Lasioglossum*) *kansuense*
Astilbe thunbergii, F, 870723 (1); *Lysimachia clethroides*, F, 860731 (1); *Deutzia crenata*, F, 850627 (1)

Lasioglossum (*Lasioglossum*) *occidens*
Astilbe thunbergii, F, 860731 (1); *Lysimachia clethroides*, 860731 (1), F, 860731 (1); *Hydrangea paniculata*, F, 870723 (3); *Swida controversa*, 860608 (1); *Rabdosia trichocarpa*, M, 850915 (2); *Weigela hortensis*, 860605 (1); *Ixeris dentata*, F, 840618 (3); *Stenactis annuus*, F, 840719 (1)

Lasioglossum (*Lasioglossum*) *proximatum*
Swida controversa, F, 860608 (2); *Anthriscus aemula*, F, 860605 (1), 870608 (1); *Weigela hortensis*, F, 840618 (1), 860608 (1)

Lasioglossum (*Lasioglossum*) sp.3
Cardiandra alternifolia, F, 860731 (1); *Hydrangea macrophylla*, F, 840719 (3), 860731 (1), 870715 (2); *Benthamidia japonica*, F, 850627 (1); *Euonymus*

sieboldianus, F, 850627 (1); *Spuriopimpinella nikoensis*, F, 840829 (1); *Rabdosia trichocarpa*, F, 860924 (1); *Weigela hortensis*, F, 870608 (1); *Cirsium kagamontanum*, M, 870927 (1); *Kalimeris yomena*, F, 860924 (1)

Lasioglossum (*Lasioglossum*) sp.6
Deutzia crenata, F, 850627 (1)

Sphecodes sp.
Symplocos chinensis, 860608 (1); *Hydrangea paniculata*, 870715 (1)

Andrenidae

Andrena (*Andrena*) *benefica*
Hydrangea hirta, F, 860605 (1)

Andrena (*Andrena*) *brevihirtiscopa*
Symplocos chinensis, F, 860608 (1); *Prunus salicina*, F, 860505 (2); *Hydrangea hirta*, F, 860605 (1)

Andrena (*Andrena*) *ishiharai*
Angelica pubescens, F, 840829 (3)

Andrena (*Andrena*) *longitibialis*
Euonymus alatus, F, 840618 (1)

Andrena (*Calomelissa*) *tsukubana*
Deutzia crenata, F, 850627 (2), 860708 (1), M, 850627 (2)

Andrena (*Chlorandrena*) *Knuthi*
Ixeris dentata, M, 840618 (1)

Andrena (*Euandrena*) *stellaria*
Viola kusanoana, F, 870529 (1); *Viola vaginata*, M, 860505 (1)

Andrena (*Habromellissa*) *omogensis*
Phellodendron amurense, F, 860825 (1), M, 860825 (2)

Andrena (*Hoplandera*) *akitsushimae*
Hydrangea macrophylla, F, 840719 (6), 850716 (1), 860731 (2), M, 840719 (2); *Hydrangea paniculata*, F, 860731 (3), 870723 (6)

Andrena (*Hoplandera*) *dentata*
Hydrangea paniculata, F, 850803 (1), 860731 (1); *Angelica pubescens*, F, 840829 (1)

Andrena (*Hoplandrena*) *miyamotoi*
Salix gracilistyla, F, 860505 (1)

Andrena (*Micrandrena*) *hikosana*
Symplocos chinensis, F, 860605 (1), 870608 (1); *Deutzia crenata*, F, 850627 (2); *Hydrangea hirta*, F, 860605 (3); *Euonymus alatus*, F, 840618 (4), 860608 (4); *Anthriscus aemula*, F, 870608 (1); *Viburnum plicatum*, F, 860608 (1)

Andrena (*Micrandrena*) *kaguya*
Euonymus alatus, F, 840618 (1)

Andrena (*Micrandrena*) *komachi*
Viola vaginata, M, 860505 (2); *Euonymus alatus*, F, 860608 (1); *Anthriscus aemula*, M, 860522 (1)

Andrena (*Micrandrena*) *minutula*
Bistorta tenuicaulis, M, 860505 (1); *Euonymus alatus*, F, 840618 (1); *Oxalis griffithii*, F, 860505 (1); *Anthriscus aemula*, F, 860522 (1)

Andrena (*Micrandrena*) *sublevigata*
Corydalis lineariloba, M, 860505 (1)

Andrena (*Simandrena*) *opacifovea opacifovea*
Symplocos chinensis, F, 860605 (1), 870608 (1); *Swida controversa*, F, 860608 (1)

Andrena (*Simandrena*) *yamamotoi*
Symplocos chinensis, F, 860605 (1); *Rosa multiflora*, F, 850627 (2); *Deutzia crenata*, F, 850627 (3); *Hydrangea hirta*, F, 860605 (1); *Euonymus alatus*, F, 840618 (1); *Anthriscus aemula*, F, 870608 (1)

Andrena (Stenomelissa) halictoides
Weigela hortensis, F, 840618 (1), 860608 (8), 870608 (2)
Andrena (Trachandrena) haemorrhoa japonibia
Weigela hortensis, F, 870608 (1)
Andrena sp.
Anthriscus aemula, F, 860605 (1)

Megachilidae

Chalicodoma sculpturalis
Rhus javanica, M, 860825 (1)
Coelioxys breris
Rabdosia trichocarpa, M, 860924 (1)
Coelioxys sp.
Persicaria thunbergii, 850915 (1)
Megachile remota sakagamii
Lespedeza bicolor, F, 840924 (1), 860825 (2)
Megachile tsurugensis
Rhus javanica, M, 840829 (1), 860825 (1); *Phellodendron amurense*, F, 860825 (1); *Geranium nepalense*, M, 840924 (1)
Osmia orientalis
Corydalis lineariloba, M, 860505 (2)
Osmia taurus
Viola vaginata, M, 860505 (1), 870529 (1); *Viola verecunda*, M, 870529 (1)

Anthophoridae
Anthophorinae

Tetralonia mitsukurii
Lespedeza bicolor, M, 860825 (1); *Rabdosia trichocarpa*, F, 860924 (1)
Tetralonia nipponensis
Weigela hortensis, F, 860608 (1)

Xylocopinae

Ceratina esakii
Viola verecunda, F, 870529 (2)
Ceratina flavipes
Stenactis annuus, F, 840719 (3)
Ceratina japonica
Corydalis lineariloba, M, 860505 (1); *Corydalis pallida*, M, 870529 (3); *Viola kusanoana*, M, 870529 (2); *Viola verecunda*, M, 870529 (1); *Aruncus dioicus*, F, 840719 (1); *Deutzia crenata*, M, 850627 (2); *Rabdosia trichocarpa*, F, 8409 24 (2); *Weigela hortensis*, F, 860608 (2)
Ceratina megastigmata
Anemone flaccida, F, 840524 (1), M, 840524 (3), 870529 (1); *Corydalis lineariloba*, F, 860505 (1), M, 860505 (12); *Corydalis pallida*, M, 870529 (3); *Bistorta tenuicaulis*, M, 860505 (1); *Persicaria thunbergii*, F, 840924 (1), M, 840924 (1); *Viola grypoceras*, F, 840524 (1); *Viola kusanoana*, F, 870529 (2), M, 870529 (1); *Viola vaginata*, F, 860505 (1), M, 860505 (10), 870529 (1); *Viola verecunda*, F, 840524 (1), M, 840524 (3), 870529 (5); *Prunus incisa*, M, 860505 (1); *Prunus salicina*, M, 860505 (1); *Rubus microphyllus*, F, 860608 (1); *Rubus palmatus*, F, 840524 (1); *Swida controversa*, F, 860608 (2); *Geranium nepalense*, F, 8409 24 (2), M, 840924 (2); *Oxalis griffithii*, M, 860505 (2); *Angelica pubescens*, M, 840829 (1); *Rabdosia trichocarpa*, F, 840924 (4); *Weigela hortensis*, F, 860605 (1); *Aster glehni*, F, 840924 (2); *Cirsium kagamontanum*, F, 840924 (1), 8709

01 (1); *Kalimeris yomena*, F, 860924 (1); *Stenactis annuus*, F, 840719 (1)
Ceratina sp.
Aster glehni, 840924 (1)

Nomadinae

Nomada galloisi
Phellodendron amurense, M, 860825 (1); *Angelica pubescens*, M, 840829 (1)
Nomada ginran
Corydalis lineariloba, F, 860505 (1); *Symplocos chinensis*, F, 860608 (1); *Hydrangea hirta*, F, 860605 (1)
Nomada hakonensis
Corydalis lineariloba, M, 860505 (1)
Nomada pacifica
Viola kusanoana, M, 870529 (1); *Viola verecunda*, M, 840524 (1)

Apidae
Bombinae

Bombus (Bombus) hypocrita hypocrita
Corydalis pallida, Q, 870529 (3); *Castanea crenata*, W, 860708 (1); *Persicaria senticosa*, W, 870915 (1); *Viola verecunda*, Q, 870529 (2); *Deutzia crenata*, Q, 850627 (1), W, 850627 (3); *Hydrangea macrophylla*, W, 840719 (9), 850716 (1), 860731 (3); *Hydrangea paniculata*, W, 860731 (2), 870723 (4); *Lespedeza bicolor*, W, 860825 (1); *Aesculus turbinata*, Q, 850522 (1); *Rhus javanica*, M, 860825 (4), W, 860825 (1); *Angelica polymorpha*, W, 870901 (1); *Angelica pubescens*, M, 840829 (1); *Weigela hortensis*, Q, 850522 (2), W, 860605 (2), 860608 (1), 870608 (1); *Cacalia delphiniifolia*, M, 840829 (1)
Bombus (Bombus) ignitus
Reynoutria japonica, Q, 840829 (1)
Bombus (Diversobombus) diversus diversus
Corydalis lineariloba, Q, 860505 (1); *Persicaria senticosa*, W, 870915 (1); *Persicaria thunbergii*, W, 860924 (1); *Styrax japonica*, W, 850627 (1); *Agrimonia pilosa*, W, 840829 (1); *Rubus illecebrosus*, W, 860708 (1); *Deutzia crenata*, Q, 850627 (1), W, 850627 (1); *Hydrangea macrophylla*, W, 840719 (2), 860731 (1); *Hydrangea paniculata*, W, 870723 (1); *Lespedeza bicolor*, W, 860825 (1); *Alangium platanifolium*, W, 850627 (3), 860708 (4); *Hovenia tomentella*, W, 850716 (2); *Impatiens noli-tangere*, W, 840829 (1); *Impatiens textori*, W, 840924 (5), 860924 (2), 870927 (1); *Ligustrum obtusifolium*, W, 860708 (2); *Caryopteris divaricata*, W, 840924 (1); *Rabdosia longituba*, W, 850915 (1), 870927 (1); *Salvia glabrescens*, W, 840924 (1); *Weigela hortensis*, Q, 850522 (1), W, 840618 (3), 860605 (1), 860608 (1); *Ainsliaea acerifolia*, W, 860825 (1); *Cirsium japonicum*, W, 840719 (4), 850627 (2); *Cirsium kagamontanum*, W, 840924 (2), 860924 (7), 861010 (8), 870915 (6), 870927 (3), 871026 (3); *Disporum sessile*, Q, 860608 (1); *Polygonatum macranthum*, W, 850627 (1); *Tricyrtis hirta*, W, 870901 (1)
Bombus (Pyrobombus) ardens ardens
Corydalis lineariloba, Q, 860505 (1); *Styrax japonica*, M, 850627 (2); *Prunus incisa*, Q, 860505 (1); *Rubus parvifolius*, W, 850627 (1); *Cardiandra alternifolia*, W, 840719 (1); *Hovenia tomentella*, M, 850716 (1), W, 850716 (1); *Weigela hortensis*, Q, 850522 (2), W, 860608 (1); *Ixeris dentata*, W, 840618 (1)
Bombus (Thoracobombus) honshuensis
Astilbe thunbergii, W, 860731 (1); *Geum japonicum*, W, 840719 (1); *Prunus incisa*, W, 850424 (1); *Rubus illecebrosus*, M, 860708 (1); *Rubus palmatus*, Q, 840524 (1); *Rubus parvifolius*, W, 860708 (1); *Cardiandra alternifolia*, W, 840719 (1); *Hydrangea macrophylla*, W, 850716 (1); *Hydrangea paniculata*, W, 870715 (1); *Lespedeza bicolor*, W, 860825 (2); *Aesculus turbinata*, Q, 850522 (1);

Geranium nepalense, W, 840829 (1); *Impatiens textori*, W, 840829 (1); *Spuriopimpinella nikoensis*, W, 840924 (1); *Tripterospermum japonicum*, W, 860825 (1); *Ligustrum obtusifolium*, W, 860708 (4); *Caryopteris divaricata*, W, 840829 (1); *Clinopodium micranthum*, W, 840829 (1); *Rabdosia longituba*, W, 860825 (1); *Rabdosia trichocarpa*, W, 840829 (1), 850915 (5), 860924 (6), 870915 (5); *Plantago asiatica*, W, 840829 (1); *Weigela hortensis*, W, 860608 (1); *Cacalia delphiniifolia*, W, 840829 (1); *Cirsium kagamontanum*, M, 840924 (3), 850915 (1), W, 850915 (2), 860924 (5), 861010 (2), 870901 (1), 870915 (1), 870927 (3), 871026 (1); *Commelina communis*, W, 840829 (1)

Apinae

Apis cerana cerana

Corydalis pallida, W, 870529 (4); *Castanea crenata*, W, 860708 (2); *Persicaria senticosa*, W, 870915 (1); *Hydrangea macrophylla*, W, 850716 (1); *Hydrangea paniculata*, W, 870715 (1), 870723 (8); *Trifolium repens*, W, 850803 (2); *Hovenia tomentella*, W, 850716 (3); *Rhus javanica*, W, 860825 (6); *Rabdosia trichocarpa*, W, 840924 (8), 850915 (5), 860924 (18), 861010 (1), 870915 (2); *Weigela hortensis*, W, 860608 (1); *Cirsium kagamontanum*, W, 870927 (1)

Apis mellifera

Castanea crenata, W, 860708 (11); *Hydrangea macrophylla*, W, 850716 (3); *Rhus javanica*, W, 860825 (1); *Rabdosia trichocarpa*, W, 850915 (1), 860924 (1); *Weigela hortensis*, W, 870608 (1)