

Synopsis of Andrena (Micrandrena) of Japan (Hymenoptera, Andrenidae) Part II

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Synopsis of *Andrena (Micrandrena)* of Japan (Hymenoptera, Andrenidae) Part II*

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In this paper (Part II) four species of *Andrena (Micrandrena) minutula* group of Japan are treated, including a new species, *Andrena (Micrandrena) hirashimai*. A key is presented for the Japanese species of *Micrandrena*.

8. *Andrena (Micrandrena) minutula* (Kirby)

Mellita minutula Kirby, 1802, Monogr. apum Angl. 2: 161, female and male.

Andrena minutula Illiger, 1806, Magaz. f. Insectenk., 5: 72; Dalla Torre, 1896, Cat. Hym., 10: 138; Perkins, 1914, Ent. Mag. London, 50: 73 (male) and 75 (female); Stoeckert, 1930, In Schmiedeknecht, Hym. nord-u. mitteleurop.: 905 (female), 952 and 955 (male); Stoeckert, 1933, Deut. ent. Zeitschr., 1932: 129; Stoeckert, 1954, Abh. Bayerischen Akad. Wiss., Neue Folge, (65): 27.

Andrena (Andrenella) minutula Hedicke, 1933, Mitt. zool. Berlin, 19: 210.

Andrena (Micrandrena) minutula Warncke, 1967, Eos, 43: 288; Warncke, 1968: Mem. Est. Mus. 2001. Univ. Coimbra, (307): 59.

This is the first record of this species from Japan. It is widely distributed in Japan and prefers to visit the flowers of *Brassica napus* L.

This species closely resembles *Andrena kaguya* Hirashima. It is primarily separated from *kaguya* by the process of labrum larger and rectangular (smaller, round or triangular in *kaguya*) and the mesoscutum weakly tessellate and weakly shiny, with a little roughened punctures, which are stronger and closer than in *kaguya* (densely tessellate with indistinct, sparse punctures in *kaguya*).

This species has two generations a year in Europe. It seems very probable, however, it flies in spring, once a year, in Japan.

I treated this species A. (*Micrandrena*) sp. 1 in my previous paper (Tadauchi, 1982).

Distribution : Japan (Hokkaido, Honshu, Shikoku, and Kyushu) (Fig. 43), north and central Europe, Russia, and China.

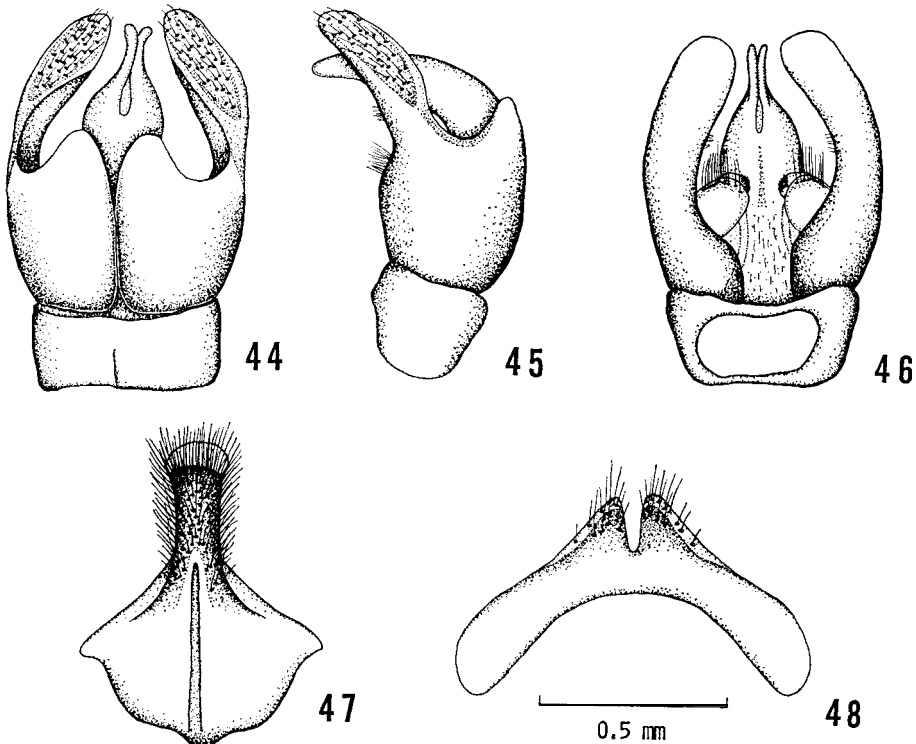
Floral records: This species has been collected on 45 plants. Cruciferae : *Brassica napus* L. (285 females and 12 males) ; *B. oleracea* var. *capitata* L. (1 fe-

* Contribution from the Entomological Laboratory, Faculty of Agriculture, Kyushu University, Fukuoka (Ser. 3, No. 176).



Fig. 43. Map showing the distribution of *Andrena* (*Micrandrena*) *minutula* (Kirby) based on the present study.

male) ; *B.* sp. (1 female) ; *Capsella bursa-pastoris* Medic. (5 females and 1 male) ; *Raphanus sativus* var. *hortensis* Backer (4 females). Compositae : *Ixeris stolonifera* A. Gray (4 females) ; *I. dentata* Nakai (4 females) ; *Picris hieracioides* subsp. *japonica* Krylr. (1 female) ; *Taraxacum japonicum* Koidz. (12 females and 1 male) ; *T. officinale* Weber (1 female) ; *Lapsana apogonoides* Maxim. (4 females) ; *Cirsium japonicum* DC. (2 females) ; *Hieracium umbellatum* L. (1 female). Rosaceae : *Potentilla kleiniana* subsp. *anemonefolia* Murata (30 females and 5 males) ; *P. dickinsii* Fr. et Sav. (2 females and 2 males) ; *P. fragarioides* var. *major* Maxim. (166 females) ; *P. freyniana* Borum. (2 females and 1 male) ; *Fragaria ananassa* Duch. (33 females and 1 male) ; *Photinia glabra* Maxim. (1 female) ; *Spiraea cantoniensis* Lour. (8 females) ; *Chaenomeles japonica* Lindl. (21 females) ; *Rubus microphyllus* L. (1 female) ; *R. hirsutus* Thunb. (5 females) ; *Sorbus alnifolia* C. Koch (15 females) ; *Prunus yedoensis* Matsum. (3 females and 1 male) ; *P. persica* Batsch. (4 females) ; *Malus pumila* Mill. (5 females) ; *Pyrus pyrifolia* var. *culta* Nakai (4 females). Salicaceae : *Salix* sp. (2 females and 4 males). Leguminosae : *Astragalus sinicus* L. (9 females) ; *Trifolium repens* L. (1 female) ; *Cytisus scoparius* Link (1

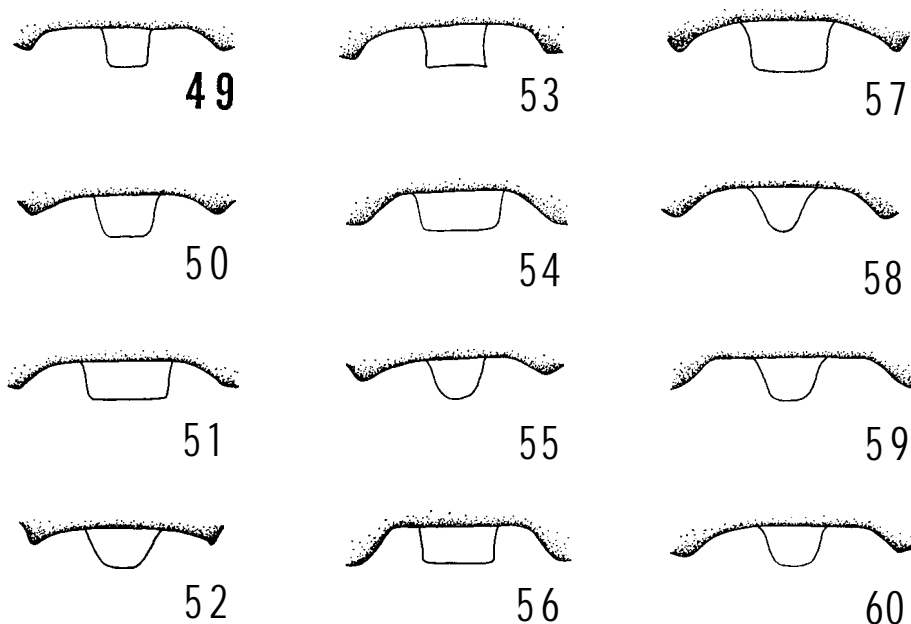


Figs. 44-48. Genital capsule and associated structures of *Andrena* (*Micrandrena*) *minutula* (Kirby), **44:** dorsal view of genital capsule, **45:** lateral view of the same, **46:** ventral view of the same, **47:** 7th sternum, **48:** 8th sternum.

female). Ranunculaceae : *Ranunculus japonicus* Thunb. (4 females) ; *R. scleratus* L. (1 female) ; *R.* sp. (4 females). Caprifoliaceae : *Lonicera japonica* Thunb. (1 female). Elaeagnaceae : *Elaeagnus umbellata* Thunb. (1 female). Scrophulariaceae : *Mazus miquelii* Makino (1 female). Caryophyllaceae : *Stellaria media* Villars (2 females) ; *Malachium aquaticum* Fries (1 female). Umbelliferae : *Cryptotaenia canadensis* subsp. *japonica* Hand.-Mzt. (2 females) ; *Torilis japonica* DC. (2 females). Aceraceae : *Acer* sp. (16 females). Ericaceae : *Rhododendron* sp. (1 female) ; *Enkianthus perulatus* Schneid. (1 female).

Flight records: Females have been taken from late March to mid June (most in late April) in Kyushu, and in early June in Hokkaido. Males have been collected from mid March to early May (most in late April) in Kyushu, and in late May in Hokkaido.

Specimens examined: I have examined a total of 925 females and 104 males from Hokkaido, Honshu, Shikoku, and Kyushu. Some records are cited as follows : HOKKAIDO : 2 males, Hakodateyama, Hakodate, 27. v. 1973 (M. Munakata) ; 2 females, Mt. Daisengen, Oshima, 8. vi. 1980 (M. Munakata). HONSHU : 5 females, Nishihiranai, Aomori Pref., 30. v. 1976 (O. Tadauchi) ; 27 females,

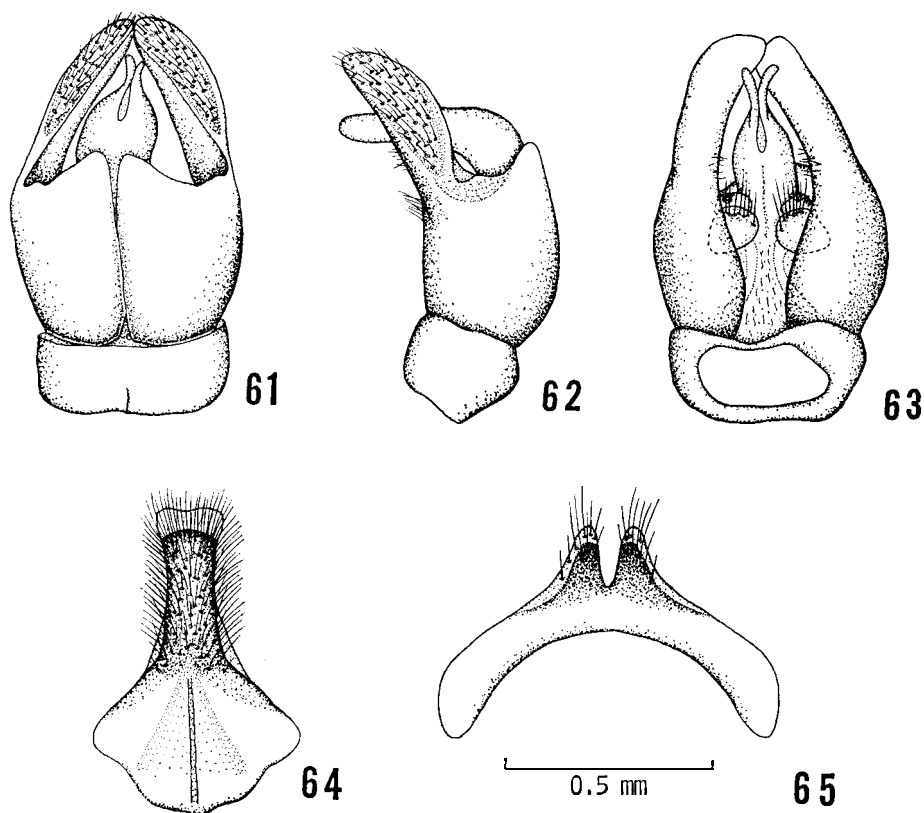


Figs. 49-60. The shapes of the process of labrum in the females of Japanese *Micrandrena*, 49: *hikosana*, 50: *falsificissima*, 51: *komachi*, 52: *subleuigata*, 53: *brassicae*, 54: *munakatai*, 55: *hanedai*, 56: *minutula*, 57: *subopaca* (summer specimens), 58: *subopaca* (autumnal specimens), 59: *kaguya*, 60: *hirashimai*, new species.

Moriko, Nasu, Tochigi Pref., 22. v. 1975 (O. Tadauchi) ; 3 males, Yorii, Saitama Pref., 21. iii. 1971 (T. Nanbu) ; 141 females and 1 male, Magome, Yamaguchi, Nagano Pref., 15. v. 1975 (O. Tadauchi); 10 females, Otsuki, Ohno, Fukui Pref., 21. iv. 1968 (Y. Haneda) ; 22 females, Kabuto, Seki, Mie Pref., 13. v. 1975 (O. Tadauchi) ; 14 females, Kinosaki, Hyogo Pref., 27. iv. 1975 (O. Tadauchi); 19 females and 6 males, Imanishi, Saijo, Hiroshima Pref., 15. iv. 1975 (O. Tadauchi). SHIKOKU : 3 females, Tosayama, Kochi Pref., 25. iv. 1976 (S. Ikudome) ; 1 female, Kaminada, Futami, Ehime Pref., 19. iv. 1975 (O. Tadauchi). KYUSHU: 18 females, Hikosan, Fukuoka Pref., 5. v. 1973 (O. Tadauchi) ; 27 females, Seta, Ozu, Kumamoto Pref., 9. iv. 1976 (O. Tadauchi) ; 33 females and 1 male, Yoshimatsu, Kagoshima Pref., 4. iv. 1976 (O. Tadauchi).

9. *Andrena* (*Micrandrena*) *subopaca* Nylander

Andrena subopaca Nylander, 1848, Notis. Saellsk. faun. fl. Fenn. Forh., 1: 221, female and male; Perkins, 1914, Ent. Mag. London, 50: 73 (male) and 75 (female); Alfken, 1929, Arkiv f. Zoologi, 20A(16): 7; Stoeckhert, 1930, In Schmiedeknecht, Hym. nord-u.mittel-europ.: 905 (female) and 954 (male) ; Stoeckhert, 1933, Deut. ent. Zeitschr., 1932: 129; Yasumatsu, 1940-41, Peking Nat. Hist. Bull., 15: 280; Stoeckhert, 1954, Abh. Bayerischen Akad. Wiss., Neue Folge, (65) : 27.



Figs. 61-65. Genital capsule and associated structures of *Andrena (Micrandrena) subopaca* Nylander, 61: dorsal view of genital capsule, 62: lateral view of the same, 63: ventral view of the same, 64: 7th sternum, 65: 8th sternum.

Melitta parvula Kirby, 1802, Monogr. apum Angl., 2: 162.

Andrena parvula Illiger, 1806, Magaz. f. Insectenk., 5: 72; Dalla Torre, 1896, Cat. Hym., 10: 145.

Andrena (Andrenella) subopaca Hedicke, 1933, Mitt. zool. Berlin, 19: 210.

Andrena (Micrandrena) subopaca Warncke, 1967, Eos, 43: 311; Warncke, 1968, Mem. Est. Mus. Zool. Univ. Coimbra, (307) : 59.

This species closely resembles *Andrena kaguya* Hirashima. It is separated from *kaguya* by the process of labrum larger, the clypeus less tessellate with weak punctures, the apical transverse groove of pronotum notched in the middle, the pronotum with an indication of weak, longitudinal, median line which is originated from the notch stated above, the mesoscutum more punctate, the hairs on the thorax slightly reddish brown (whitish in *kaguya*), and the larger size.

According to the collecting data in Japan, this species occurs in mountainous to sub-mountainous regions in Hokkaido and central Honshu. Although

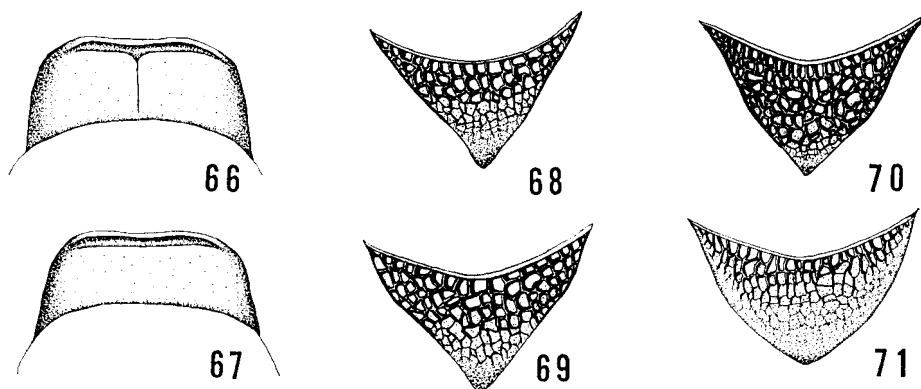
this species was recorded by Tosawa (1932) from Osaka, in Japan, it seems for me to belong to *kaguya* in view of the locality. Therefore this is a real record of this species from Japan. The flying season of this species is relatively later, from June to August.

Distribution: Japan (Hokkaido and central Honshu) (Fig. 77), Kuril Is. (Kunashiri Is., Etorofu Is.), north and central Europe, central Asia, and Kamchatka.

Floral records: A total of 130 females and 9 males have been collected on 23 plants. Compositae: *Taraxacum officinale* Weber (24 females and 7 males); *Solidago virgaurea* subsp. *leiocarpa* Hulten (3 females); *Chrysanthemum leucanthemum* L. (8 females); *Sonchus brachyotus* DC. (1 female); *Lactuca raddeana* var. *elata* Kitam. (2 females); *Anaphalis margaritacea* Benth. et Hook. (2 females). Rosaceae: *Potentilla fragarioides* var. *major* Maxim. (1 female); *Fragaria yezoensis* Hara (8 females); *Spiraea miyubei* Koidz. (1 female); *S. salicifolia* L. (5 females); *Gerum pentapetalum* Makino (1 female); *Sorbus commixta* Hedl. (2 females); *Sorbaria sorbifolia* var. *stellipila* Maxim. (4 females); *Aruncus dioicus* var. *tenuifolius* Hara (37 females). Cruciferae: *Barbarea vulgaris* R. Br. (18 females and 1 male). Umbelliferae: *Angerica ursina* Maxim. (5 females); *Heracleum duke* Fisch. (1 female); *Anthriscus sylvestris* subsp. *aemula* Kitam. (2 females and 1 male); *Conioselinum filicinum* Hara (1 female); *Coelopleurum lucidum* var. *gmelinii* Hara (1 female). Leguminosae: *Trifolium repens* L. (1 female). Polygonaceae: *Polygonum sachalinense* Fr. Schm. (1 female). Commelinaceae: *Commelina communis* L. (1 female).

Flight records: Females have been taken from early June to early August in Hokkaido, and late July to late August in Honshu. Males have been taken from early June to early August in Hokkaido. I examined a short series of autumnal specimens (from late August to mid November) collected in central Honshu. It may have two generations a year.

Specimens examined: I have examined a total of 308 females and 20 males from Hokkaido, central Honshu and the Kuril Is. Some records are cited as follows: HOKKAIDO: 14 females, Rausu-Seseki, Shiretoko, 16. vi. 1984 (O. Tadauchi); 1 female, Habomai, Nemuro, 28. vii. 1984 (O. Tadauchi); 26 females and 3 males, Tokachi-mitsumata, Kamishihoro, 12. vi. 1984 (O. Tadauchi); 7 females, Mikuni-toge, Mt. Daisetsu, 27. vii. 1984 (O. Tadauchi); 5 females, Kyushu Univ. Forests, Ashoro, 12. vii. 1984 (O. Tadauchi); 32 females, Kawakami, near Honbetsu, Tokachi, 17-27. vii. 1953 (Y. Hirashima); 10 females and 2 males, Ashoro, Tokachi, 3-4. vii. 1960 (N. Nakao); 5 females and 3 males, Yukomanbetsu, Mt. Daisetsu, 23-25. vii. 1955 (Y. Hirashima); 41 females, Yukomanbetsu, Mt. Daisetsu, 22. vii. 1967 (H. Fukuda); 53 females and 1 male, Aizankei, Mt. Daisetsu, 30. vii.-3. viii. 1955 (Y. Hirashima). HONSHU: 10 females, Karuizawa, Nagano Pref., 27. vii. 1952 (R. Ishikawa); 2 females, Shirahone, Nagano Pref., 19. vii. 1956 (S. Kimoto); 1 female, Yarisawa, Nagano Pref., 6. vii. 1964 (A. Nakanishi); 1 female, Kamikochi, Nagano Pref., 4. viii. 1957 (R. Ishikawa); 1 female, Nakabusa Spa, Nagano Pref., 23. vii. 1931 (Ohbayashi); 1 female, Kirigamine, Nagano Pref., 20. vii. 1970 (K. Kanmiya); 1 female, Shibunoyu, Mt. Yatsugatake, Nagano Pref., 9-11. vii. 1968 (F. & R. Ishi-



Figs. 66-71. The dorsal views of the pronotum in the two closely resembled species, *Andrena* (*Micrandrena*) *subopaca* Nylander (66) and *A. (M.) kaguya* Hirashima (67) and the enclosures of the propodeum in the Japanese minutula-group (68-71), 68: *minutula* (Kirby), 69: *subopaca* Nylander, 70: *kaguya* Hirashima, 71: *hirashimai*, new species.

kawa) ; 1 female, Yashajin-toge, Yamanashi Pref., 8. viii. 1974 (O. Tadauchi); 1 female, Midagahara, Mts. Tateyama, Toyama Pref., 2. viii. 1981 (K. Baba) ; 4 females, Mt. Haku, Ishikawa Pref., 2. viii. 1962 (A. Nakanishi) ; 3 females, Mt. Haku, Ishikawa Pref., 2. viii. 1957 (Y. Haneda) ; 1 female, Mt. Haku, Ishikawa Pref., 1. viii. 1961 (I. Togashi).

Variation: I examined 13 females collected from late August to mid November in central Honshu. They differ from the specimens collected in summer in having the process of labrum very small. However, they show the apical transverse groove of the pronotum notched in the middle and the pronotum with an indication of weak median line.

10. *Andrena* (*Micrandrena*) *kaguya* Hirashima

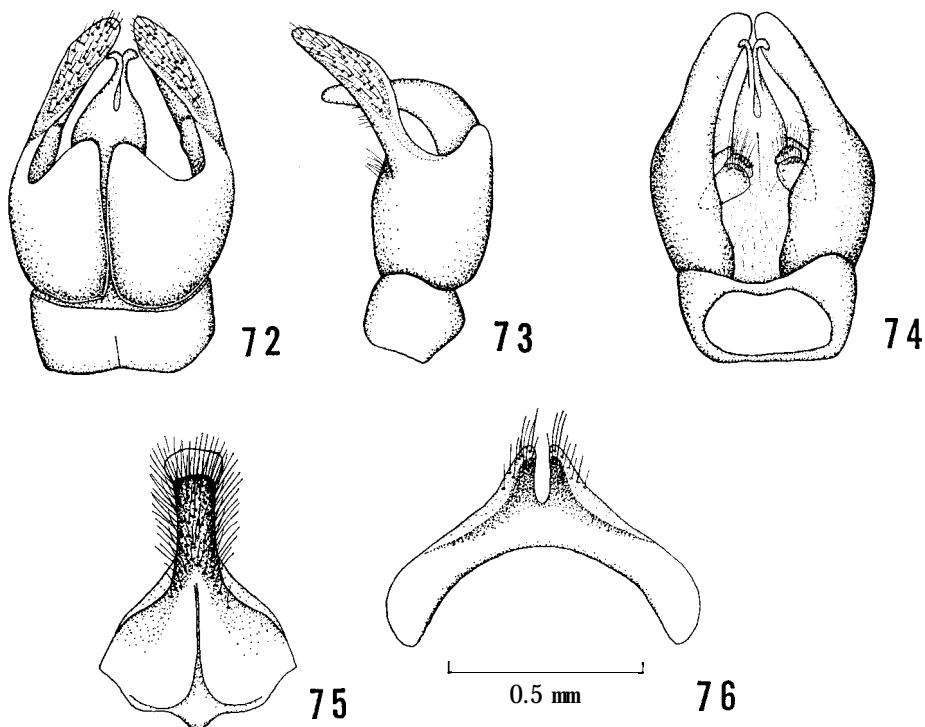
Andrena (*Micrandrena*) *kaguya* Hirashima, 1965, J. Fac. Agr., Kyushu Univ., 13: 467, female and male; Hirashima, 1966, J. Fac. Agr., Kyushu Univ., 14: 95 and 117.

This is one of the most common species of *Micrandrena* in Japan. It has three closely resembled species, *minutula* (Kirby), *subopaca* Nylander, and *hirashimai*, n. sp., in this area. These species can be separable by the characters given in the key.

It occurs in all over Japan and prefers to visit the flowers of *Brassica napus* L., *Salix* spp., and *Acer* spp.

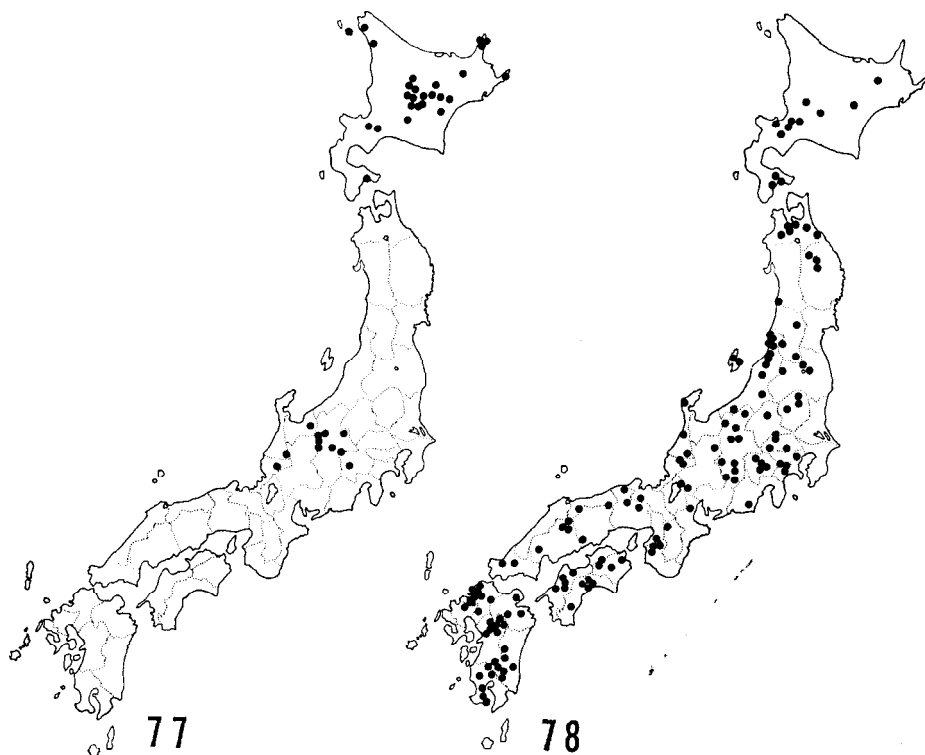
Distribution: Japan (Hokkaido, Honshu, Sado Is., Shikoku, Kyushu). (Fig. 78)

Floral records: This species has been collected on 58 plants. Cruciferae: *Brassica napus* L. (1,803 females and 63 males) ; *B. rapa* var. *glabra* Kitam. (1 male) ; *B. chinensis* L. (1 female) ; *B. pekinensis* Pupr. (15 females and 6 males) ; *B. sp.* (4 females) ; *Raphanus sativus* var. *hortensis* Backer (28 females) ; *Capsella*



Figs. 72-76. Genital capsule and associated structures of *Andrena* (*Micrandrena*) *kaguya* Hirashima, 72: dorsal view of genital capsule, 73: lateral view of the same, 74: ventral view of the same, 75: 7th sternum, 76: 8th sternum.

bursa-pastoris Medic. (3 females and 4 males) ; *Cardamine flexuosa* With (1 female and 1 male) ; *C. Zeucantha* O. E. Schulz (1 female) ; *Barbarea orthoceras* Ledeb. (2 females). Rosaceae: *Prunus mume* Sieb. et Zucc. (2 females and 3 males) ; *P. jamasakura* Sieb. (8 females and 1 male) ; *P. persica* Batsch. (25 females) ; *P. armeniaca* L. (8 females and 3 males) ; *P. sargentii* Rehd. (8 females) ; *P. yedoensis* Matsum. (64 females and 4 males) ; *P. salicina* Lindl. (1 female and 2 males) ; *Potentilla kleiniana* subsp. *anemonefolia* Murata (5 females and 1 male) ; *P. dickinsii* Fr. et Sav. (1 male) ; *P. fragarioides* var. *major* Maxim. (3 females and 1 male) ; *Photinia glabra* Maxim. (1 female) ; *Spiraea cantoniensis* Lour. (2 females) ; *Malus halliana* Koehne (1 female) ; *M. pumila* Mill. (33 females) ; *Rosa davurica* Pallus (1 female) ; *Rubus hirsutus* Thunb. (1 male) ; *R. microphyllus* L. (2 females) ; *Chaenomeles japonica* Lindl. (9 females) ; *Pyrus pyrifolia* var. *culta* Nakai (23 females) ; *Sorbus alnifolia* C. Koch (29 females) ; *Filipendula multijuga* var. *yezoensis* Hara (2 females). Leguminosae : *Trifolium repens* L. (1 female) ; *Wisteria floribunda* DC. (1 female) ; *Cercis chinensis* Bunge (1 female) ; *Astragalus sinicus* L. (25 females). Salicaceae : *Salix gracilistyla* Miq. (5 females and 2 males) ; *S. matsudana* forma *tortuosa* Rehd. (1 female) ; *Salix* spp. (18 females and 60 males). Rutaceae : *Citrus unshiu* Marc. (3 females) ; *Poncirus trifoliata* Rafin. (1 female). Caryophyllaceae : *Mala-*



Figs. 77-78. Maps showing the distribution of *Andrena* (*Micrandrena*) *subopaca* Nylander (77) and *A.* (*Micrandrena*) *kaguya* Hirashima (78) based on the present study. A square indicates the type locality.

chiumaquaticum Fries (1 male); *Stellaria media* Villars (14 females). Celastraceae: *Euonymus alatus* Sieb. (3 females). Caprifoliaceae: *Weigela hortensis* Koch. (1 female and 1 male). Ranunculaceae: *Ranunculus* sp. (1 female); *R. japonicus* Thunb. (1 male); *Anemone raddeana* Regel (2 females). Saxifragaceae: *Deutzia crenata* Sieb. et Zucc. (1 female). Ericaceae: *Pieris japonica* D. Don (13 females and 11 males); *Enkianthus perulatus* Schneid. (3 females). Aceraceae: *Acer palmatum* var. *palmatum* Thunb. (53 females and 4 males). Compositae: *Youngia japonica* DC. (1 female); *Taraxacum japonicum* Koidz. (15 females); *T. officinale* Weber (22 females); *Ixeris stolonifera* A. Gray (21 females); *Chrysanthemum leucanthemum* L. (1 male); *Lapsana apogonoides* Maxim. (5 females and 1 male). Liliaceae: *Gagea lutea* Ker-Gawl. (3 females).

Flight records: Females have been taken from early March to late May in Kyushu and from late April to late June in Hokkaido. Males have been collected from early March to mid May in Kyushu, and early to late May in Hokkaido.

Specimens examined: I have examined 2,566 females and 459 males from Hokkaido, Honshu, Sado Is., Shikoku, and Kyushu. Some records from other

than those from Kyushu are cited as follows. HOKKAIDO: 10 females, Kussharoko, Teshikaga, 26. v. 1984 (O. Tadauchi) ; 3 females, Nopporo, 25. vi. 1971 (H. Fukuda) ; 2 males, Onuma, 3. v. 1957 (M. Munakata). HONSHU: 7 females, Kuriyagawa, Iwate Pref., 19. v. 1968 (Y. Maeta); 42 females, Moriko, Nasu, Tochigi Pref., 13. v. 1975 (O. Tadauchi) ; 8 females, Ohno, Fukui Pref., 11. v. 1968 (Y. Haneda) ; 56 females, Masumizu, Mt. Daisen, Tottori Pref., 26. iv. 1975 (O. Tadauchi). SADO IS.: 2 females, Suizu, Ryozu, 10. v. 1980 (K. Baba). SHIKOKU: 54 females, Taisho, Kochi Pref., 16. iv. 1976 (O. Tadauchi) ; 6 females and 10 males, Godaisan, Kochi Pref., 12. iii. 1976 (S. Ikudome).

11. *Andrena (Micrandrena) hirashimai*, new species

This new species is a close relative of *Andrena kaguya* Hirashima and *Andrena subopaca* Nylander. However, it is separable from *kaguya* and the related species by the combination of the following characters, i. e., the larger size (6.5-7.0 mm), the clypeus less convex with relatively distinct punctures, the process of labrum small and round apically, the apical transverse groove of the pronotum not notched in the middle, the mesoscutum less tessellate with relatively distinct and close punctures, the propodeal enclosure wrinkled only basally, widely granulate apically, the lateral fringes of the metasomal terga poorly developed, and the male head and thorax with blackish hairs. This species occurs in the Amami-Oshima Is. and the Okinawa-Honto Is. It has been collected on the flowers of *Brassica napus* L.

Female : Length 6.5-7.0 mm.

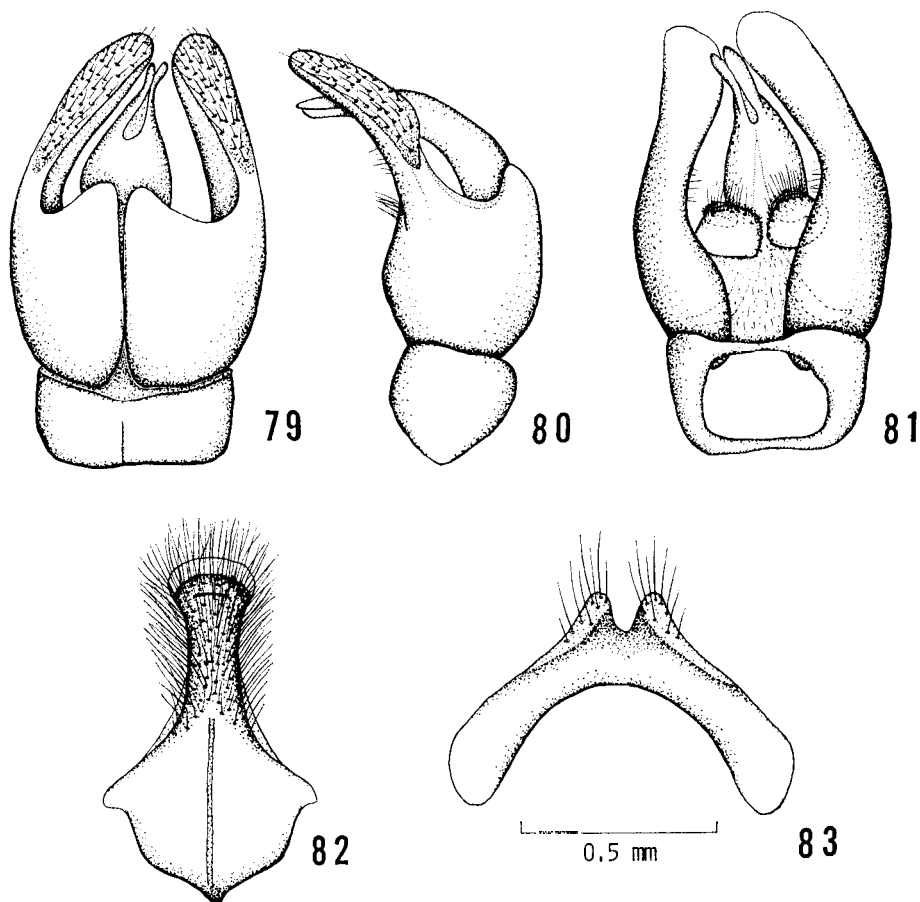
Integumental color: Flagellar segments beneath 3-10 blackish brown; posterior margins of terga narrowly reddish brown.

Pubescence: Hairs on body rather short; hairs on head whitish, sparse, without brown ones; facial fovea brownish above, paler below; mesoscutum with dull whitish to pale yellowish hairs; metasomal tergum 1 with sparse, whitish hairs, only laterally; posterior margins of metasomal terga 2-3 with lateral fringes, poorly developed; caudal fimbria pale brownish.

Structure: Process of labrum small and apical margin round as in *kaguya*; clypeus less convex than in *kaguya*, densely tessellate, scattered with weak punctures, dull; facial fovea with upper end occupying more than one half of ocellular space, short, and with lower end not reaching basal margin of clypeus; genal area narrower than eye seen in profile; apical transverse groove of pronotum not notched in the middle; mesoscutum less tessellate and more distinctly punctate, with closer punctures than in *kaguya*; propodeal enclosure poorly indicated, wrinkled only basally, widely granulate apically (wrinkled nearly all over in *kaguya*) ; mesepisternum shagreened anteriorly, densely tessellate posteriorly; metasomal terga tessellate, impunctate ; posterior depressions of metasomal terga weakly indicated.

Male : Length 5.0-6.0 mm.

Integumental color: Flagellar segments 3-11 beneath blackish brown ; veins



Figs. 79-83. Genital capsule and associated structures of *Andrena* (*Micrandrena*) *hirashimai*, new species, 79: dorsal view of genital capsule, 80: lateral view of the same, 81: ventral view of the same, 82: 7th sternum, 83: 8th sternum.

and stigma blackish brown.

Pubescence: Hairs on head and thorax blackish; hairs on clypeus short, pale brownish, sparse; antennal region with much blackish hairs, mesoscutum with sparse, blackish hairs; metasomal terga 2-4 nearly without lateral fringes; tergum 6 with sparse, brownish white hairs.

Structure: Clypeus less convex, weakly tessellate with more or less distinct punctures; flagellum 1 as long as 3, which are slightly longer than 2; genal area much narrower than eye seen in profile; mesoscutum less tessellate, with more distinct and closer punctures than in *kaguya*; propodeal enclosure wrinkled basally, weakly granulate apically; metasomal terga densely tessellate, impunctate basally, very weakly tessellate and weakly shiny apically; posterior depressions of terga 2-3 well indicated; genitalia and associated structures as illustrated (Figs. 79-83).

Distribution: Japan (Amami-Oshima Is., Okinawa-Honto Is.).

Floral record: Seventeen females were collected on *Brassica napus* L. in the Amami-Oshima Is. by O. Tadauchi.

Flight records: Females have been taken from late March to mid April, and males from late March to early April.

Type material: Holotype female (Type No. 2511, Kyushu Univ.), Shinmura, Amami-Oshima, 22. iii. 1973 (O. Tadauchi). Paratypes: Amami-Oshima Is.: 7 females, same data as holotype; 6 females, Yakukatsu, 24. iii. 1973 (O. Tadauchi); 1 female, Cape Ayamaru, 26. iii. 1973 (O. Tadauchi); 1 female, Yuwan, 23. iii. 1973 (O. Tadauchi); 1 female, Takeu, 23. iii. 1973 (O. Tadauchi); 11 females, Shinmura, 2. iv. 1958 (M. Takahashi); 2 females, Shinmura, 1. iv. 1958 (M. Takahashi); 1 female, Yuwan, 5. iv. 1958 (M. Takahashi); 3 females, Shinmura, 4-5. iv. 1956 (S. Miyamoto).

Specimens examined other than the types: AMAMI-OSHIMA IS.: 1 female, Koniya, 2. iv. 1954 (R. Ishikawa); 1 female, Hatsuno, 12. iv. 1976 (H. Makihara); 1 female, Hatsuno, 18. iv. 1974 (H. Makihara); 1 male, Shinmura, 25. iii. 1954 (T. Mohri); Amami-Oshima, collector is not available: 3 females, 23. iii. 1958, 1 female, 27. iii. 1958, 5 females, 31. iii. 1958, 1 female and 1 male, 2. iv. 1958, 7 females and 7 males, 4. iv. 1958, 1 female, 5. iv. 1958. OKINAWA-HONTO IS.: Yonaha, 5. iv. 1979 (Y. Shono).

Type depository: The type is preserved in the collection of the Entomological Laboratory, Faculty of Agriculture, Kyushu University.

This species is named for the honor of Prof. Yoshihiro Hirashima of Kyushu University, to whom I am much obliged for his special interest, inspiring enthusiasm and helpful suggestions.

KEY TO JAPANESE SPECIES OF *Micrandrena*

Females

1. Metasomal tergum 1 punctate, nearly smooth and shiny to weakly tessellate 2
- Metasomal tergum 1 impunctate, weakly to densely tessellate 4
2. Metasomal terga 2-4 polished, scattered with microscopical, fine punctures; facial fovea separated from eye margin by a wide, shiny space; mesoscutum nearly smooth to very weakly tessellate with sparse, small punctures; propodeum with one half of enclosure wrinkled basally, granulate apically; mesepisternum very weakly tessellate, shiny *hikosana*
- Metasomal terga 2-4 tessellate, at least on basal portions; propodeal enclosure strongly wrinkled all over 3
3. Flagellar segments 4-10 ferruginous; posterior depressions of metasomal terga well indicated; process of labrum small, as long as broad; metasomal sterna without distinct, white fringes; summer to autumnal species; Hokkaido and central Honshu *falsificissima*
- Flagellar segments blackish; posterior depressions of metasomal terga weakly indicated; process of labrum large, nearly rectan-

- gular ; metasomal sterna with distinct, white fringes; spring species *komachi*
4. Propodeal enclosure slightly rugose only basally, widely granulate apically; mesoscutum finely tessellate, dull; scutellum with very sparse hairs *sublevigata*
- Propodeal enclosure widely wrinkled basally 5
5. Mesepisternum smooth to weakly tessellate, shiny ; mesoscutum nearly smooth to weakly tessellate *brassicae*
- Mesepisternum densely tessellate 6
6. Mesoscutum weakly roughened, weakly tessellate, shiny, with close, distinct punctures 7
- Mesoscutum densely tessellate, dull, with weak, sparse punctures 9
7. Propodeal enclosure strongly wrinkled all over; process of labrum large, rectangular ; spring species ; Hokkaido to central Honshu *munakatai*, n. sp.
- Propodeal enclosure wrinkled basally, granulate apically 8
8. Process of labrum small, as long as broad, round apically ; clypeus strongly convex; metasomal tergum 1 very weakly tessellate, shiny; dorsal face of propodeum shagreened; head and thorax with short, yellowish hairs; summer to autumnal species; Hokkaido and central Honshu *hanedai*, n. sp.
- Process of labrum large, rectangular; clypeus less convex; metasomal tergum 1 densely tessellate, dull; dorsal face of propodeum roughened; head and thorax with whitish hairs *minutula*
9. Apical transverse groove of pronotum notched in the middle; pronotum with an indication of weak longitudinal, median line which is originated from the notch stated above; process of labrum large; thorax with slightly reddish brown hairs; large size, about 7.0 mm; summer species; mountainous to sub-mountainous regions in Hokkaido and central Honshu *subopaca*
- Apical transverse groove of pronotum not notched in the middle; pronotum without longitudinal, median line; process of labrum small; spring species 10
10. Propodeal enclosure wrinkled all over; metasomal terga with lateral fringes, well developed; clypeus well convex, densely tessellate, with an indication of indistinct punctures, smaller, 6.0-6.5 mm; Japan proper *kaguya*
- Propodeal enclosure weakly wrinkled basally, granulate apically ; metasomal terga with lateral fringes poorly developed; clypeus less convex, weakly tessellate, with weak punctures; larger, 6.5-7.0 mm; Amami-Oshima Is. and Okinawa-Honto Is. *hirashimai*, n. sp.

Males

1. Metasomal tergum 1 punctate, nearly smooth and shiny, or weakly tessellate 2

- Metasomal tergum 1 impunctate, densely tessellate 6
- 2. Metasomal sterna 2-5 with white, distinct fringes; hairs on clypeus silvery, quite dense, downy; propodeal enclosure well defined, strongly wrinkled all over; mesoscutum closely and strongly punctate *komachi*
- Metasomal sterna 2-5 without white, distinct fringes 3
- 3. Flagellar segments 2-11 beneath ferruginous; propodeal enclosure well defined, strongly wrinkled all over; clypeus closely and strongly punctate; summer to autumnal species *falsificissima*
- Flagellar segments 2-11 beneath brown to blackish 4
- 4. Hairs on clypeus dense, downy; mesepisternum with an indication of roughened punctures ; clypeus roughened, dull ; spring species *hikosana*
- Hairs on clypeus very sparse, short; summer species 5
- 5. Propodeal enclosure well defined, wrinkled all over ; lateral fringes of metasomal terga 2-3 well developed; hairs on head and thorax dull white ; clypeus less convex ; mesepisternum weakly tessellate *brassicae*, 2nd generation
- Propodeal enclosure not well defined, granulate apically; lateral fringes of metasomal terga 2-3 poorly developed; hairs on head and thorax yellowish ; clypeus strongly convex ; mesepisternum densely tessellate *hanedai*, n. sp.
- 6. Propodeal enclosure nearly granulate all over or rugose only basally; hairs on sterna irregular in length, not arranged in a fringe *sublevigata*
- Propodeal enclosure widely wrinkled basally 7
- 7. Hairs on head and thorax black or brown 8
- Hairs on head and thorax whitish, without brownish hairs 9
- 8. Propodeum with one third of enclosure wrinkled, widely granulate apically ; metasomal terga nearly without lateral fringe; mesoscutum densely tessellate, dull ; mesepisternum densely tessellate; clypeus weakly tessellate; Amami-Oshima Is. and Okinawa-Honto Is. *hirashimai*, n. sp.
- Propodeum with two thirds of enclosure wrinkled; metasomal terga 2-3 with lateral fringes of appressed, white hairs; mesepisternum weakly tessellate, weakly shiny; clypeus weakly tessellate; Japan proper *brassicae*, 1st g.
- 9. Mesoscutum weakly roughened, with distinct, roughened punctures; hairs on clypeus dense 10
- Mesoscutum densely tessellate without distinct, roughened punctures; hairs on clypeus sparse 11
- 10. Propodeal enclosure well defined, strongly wrinkled all over *munakatai*, n. sp.
- Very similar to the preceding, but propodeal enclosure not well defined, granulate apically *minutula*
- 11. Clypeus densely tessellate, with indistinct punctures ; smaller, 5.0 mm; spring species *kaguya*

Table 1. Summary of floral records for the Japanese species of *Andrena* (*Micrandrena*). The numbers show as follows: the former indicates the number of plant species in the family; the latter above in parentheses indicates the number of females collected, and the below that of males collected.

Plant		Records of <i>Andrena</i> (<i>Micrandrena</i>)										
Family		<i>hikosana</i>	<i>falsificissima</i>	<i>komachi</i>	<i>sublevigata</i>	<i>brassicae</i>	<i>munakatai</i>	<i>hanedai</i>	<i>minutula</i>	<i>subopaca</i>	<i>kaguya</i>	<i>hirashimai</i>
Rosaceae	9	(58)		5(233)	13(22)	22(24)	5(141)		15(300)	8(59)	21(227)	
Compositae	3	(8)		2(4)	4(87)	13(308)	3(9)	2(2)	8(29)	6(40)	6(64)	
Cruciferae	3	(253)		3(23)	6(533)	14(2573)	1(2)		5(296)	1(18)	10(1858)	1(17)
Leguminosae	1	(1)		1(6)	1(2)	3(6)			3(11)	1(1)	4(28)	
Geraneaceae	1	(1513)		1(1)	6(388)	5(83)	1(1)		1(2)		3(24)	
Aceraceae	1	(165)							1(16)		1(53)	
Umbelliferae	1	(1)	2(11)			10(221)	1(2)	3(20)	2(4)	5(10)		
Ranunculaceae	1	(2)		1(1)	2(2)	4(18)			3(9)		3(3)	
Saxifragaceae	1	(2)						1(1)			1(1)	
Ericaceae	1	(110)									1(3)	
Serophulariaceae					1(0)							
Caryophyllaceae					1(1)	2(7)	1(1)		2(3)		2(14)	
Caprifoliaceae					1(1)	1(1)			1(1)		1(1)	
Labiatae					1(1)							
Liliaceae					1(6)	1(2)					1(3)	
Scrophulariaceae						1(0)			1(0)			
Fagaceae						1(7)						
Cornaceae						1(0)						
Guttiferae						1(2)						
Ericaceae						2(0)			2(2)		2(16)	
Garaniaceae								1(3)				
Elaeagnaceae									1(1)			
Polygonaceae						1(2)				1(0)		
Commelinaceae										1(1)		
Rutaceae											2(4)	
Violaceae	1	(1)										
Berberidaceae						1(1)						
Totals	23	(517)	2(11)	13(268)	37(1043)	83(3473)	12(156)	7(26)	45(675)	23(130)	58(2299)	1(17)

- Very similar to the preceding, but basal half of clypeus weakly tessellate, shiny, with weak punctures; larger, 5.5-6. Omm; summer species; mountainous to sub-mountainous regions in Hokkaido and central Honshu *subopaca*

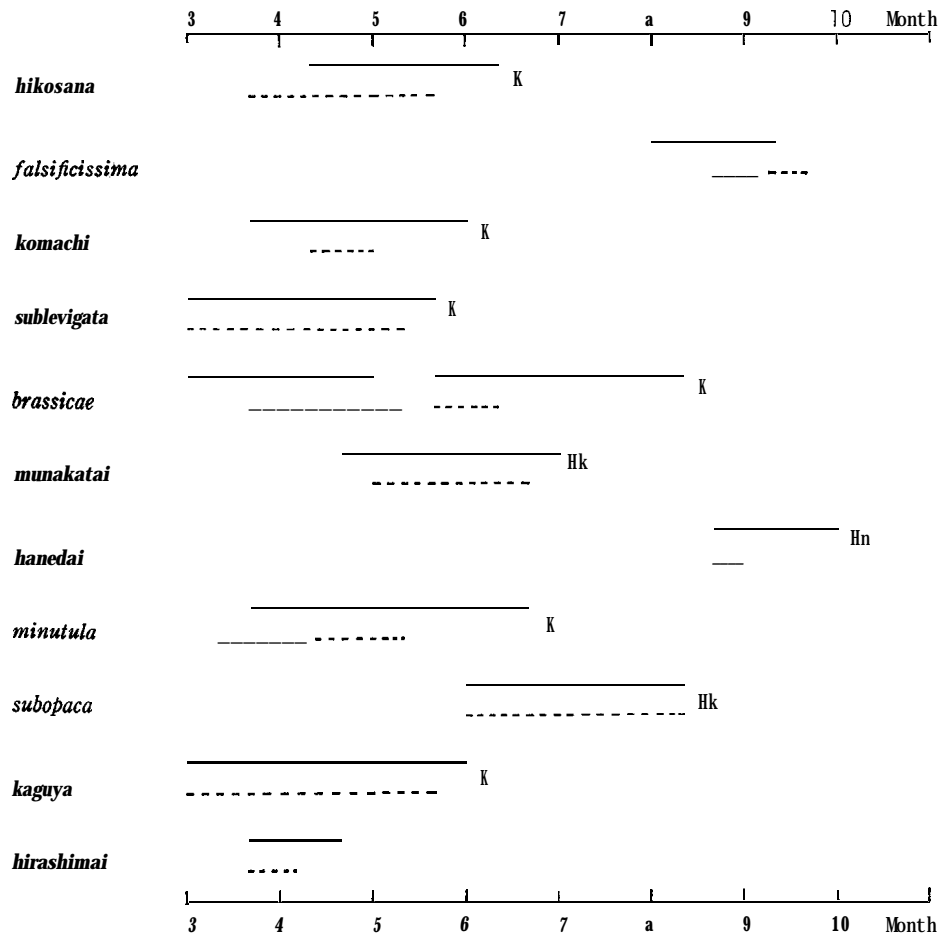


Fig. 84. Flight records for the eleven Japanese species of *Andrena* (*Micrandrena*). A straight line indicates female and dashed one male. K: Kyushu, Hn : central Honshu, HK : Hokkaido.

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