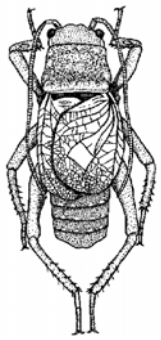

Far Eastern Entomologist

Дальневосточный энтомолог

Journal published by Far East Branch
of the Russian Entomological Society
and Laboratory of Entomology,
Institute of Biology and Soil Sciences,
Vladivostok

Number 95: 1-17 ISSN 1026-051X December 2000

THE BUMBLE-BEES (HYMENOPTERA, APIDAE, BOMBINAE) OF THE KURIL ISLANDS

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The distribution of fourteen *Bombus* species and two *Psithyrus* species throughout 26 Kuril Islands is given. *B. pseudoligusticus* Skorikov, 1925, **stat. n.** is considered as good species. *B. ardens sakagamii* Tkalců is newly recorded for the Russia, *B. balteatus balteatus* Dahlbom and *B. sichelii sichelii* Radoszkowski are newly recorded for the Kuril Islands. The bumble-bees are firstly collected on the follow islands: Anuchina, Tanfil'eva, Iurii, Zelenyi, Polonskogo, Brat Chirpoev, Yankicha, Ryponkicha Matua, Ekarma, Kharimkotan, Makanrushi, Antsiferova. The distribution data of the bumble-bees on other islands is enlarged. The list of the food plants (61 species of 20 families) visited by bumble-bees is given firstly for the Kuril Islands. The most visited plants are *Cirsium*, *Senecio* (Asteraceae), *Trifolium*, *Hedysarum, Lathyrus* (Fabaceae), *Rosa rugosa* (Rosaceae), *Pedicularis*, *Pennellianthus* (Scrophulariaceae). The biotic patterns of Kuril Island bumble-bees are discussed.

KEY WORDS: Hymenoptera, *Bombus, Psithyrus*, taxonomy, food plants, distribution, Kuril Islands.

А. С. Лелей, А. Н. Купянская. Шмели (Hymenoptera, Apidae, Bombinae) Курильских островов // Дальневосточный энтомолог. 2000. N 95. С. 1-17.

Дается распространение 14 видов *Bombus* и 2 видов *Psithyrus* на 26 Курильских островах. *B. pseudoligusticus* Skorikov, 1925, **stat. n.** рассматривается как

самостоятельный вид. Впервые для фауны России указывается *B. ardens sakagamii* Tkalců, а для Курильских островов – *B. balteatus balteatus* Dahlbom и *B. sichelii sichelii* Radoszkowski. Шмели впервые собраны на островах Анучина, Танфильева, Юрий, Зеленый, Полонского, Брат Чирпоев, Янкича, Рыпонкича, Матуа, Экарма, Харимкотан, Маканруши, Анциферова. Сведения о распространении шмелей на других островах значительно расширены. Впервые для Курильских островов приводится список посещаемых шмелями кормовых растений (61 вид из 20 семейств). Наиболее посещаемые растения - *Cirsium*, *Senecio* (Asteraceae), *Trifolium*, *Hedysarum, Lathyrus* (Fabaceae), *Rosa rugosa* (Rosaceae), *Pedicularis*, *Pennellianthus* (Scrophulariaceae). Обсуждаются особенности распространения шмелей на Курильских островах.

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INTRODUCTION

In spite of that bumble-bees on the Kuril Islands are one of the numerous insect groups and important plant pollinators here, their study is not sufficient. Based on the material collected on seven main islands in 1961-1964 by Russian entomologists (G. O Krivolutskaya, Z. A. Konovalova, A. N. Kupianskaya, N. A. Azarova, S. P. Safronova - total 177 specimens) seventeen *Bombus* species (really eleven ones) and one *Psithyrus* species were recorded for the Kuril Islands (Krivolutskaya, 1973). Based on the material collected by Japanese entomologists in 1925-1940 (K. Doi, S. Iwata, H. Kono, S. Kuwayama, I. Masaki, S. Matsumura, Y. Sugihara, S. Sumiyama, K. Takahashi, M. Tatewaki, T. Uchida - total 451 specimens) eleven *Bombus* species were recorded for thirteen Kuril Islands (Kuwayama, 1967; Ito & Sakagami, 1980).

This paper based on excellent material collected by N. N. Konakov in 1946, reidentified material (mentioned above) collected in 1961-1964 and later by Russian entomologists and vast material collected by the participants of International Kuril Island Project (IKIP) in 1996-2000 (A. S. Lelej, S. Yu. Storozhenko, B. K. Urbain, D. E. Stevenson). The material (more that 2600 specimens) deposited in the Institute of Biology and Soil Sciences, Russian Academy of Sciences, Vladivostok. Next acronyms are used for the collectors: AB - A. Yu. Berezantsev, AK - A. N. Kupianskaya, AL - A. S. Lelej, GK - G. O. Krivolutskaya, NA - N. A. Azarova, NK - N. N. Konakov, SS - S. Yu. Storozhenko, VK - V. N. Kuznetsov, ZK - Z. A. Konovalova. New records in the distribution section are asterisked (*). The symbol "☿" is used for the workers in the material.

LIST OF THE SPECIES

1. *Bombus* (*Bombus*) *florilegus* Panfilov, 1956

= *Bombus terrestris* var. *japonica* Friese, 1909, nom. preocc., non Dalla Torre, 1890.

= *Bombus florilegus* Panfilov, 1956: 1334 (syntypes - Iturup, Naioka, VII 1948, N. Konakov), (Iturup, Simushir); Tkalců, 1962: 92 (Iturup); Sakagami & Ishikawa, 1969: 167 (Iturup, Simushir).

= *Bombus* (*Bombus*) *japonicus*: Kuwayama, 1967: 210 (Shikotan, Kunashir, Iturup, Urup, Simushir, Onekotan, Paramushir, Shumshu, Atlasova); Krivolutskaya, 1973: 149 (Shikotan, Kunashir, Iturup, Urup, Simushir).

= *Bombus* (*Bombus*) *florilegus*: Ito & Sakagami, 1980: 24 (Shikotan, Kunashir, Iturup, Urup, Chirpoi, Simushir, Ketoi, Rasshua,Onekotan); Kupianskaya, 1995: 559, 569 (Kurils).

SPECIMENS EXAMINED. ANUCHINA: 19.VIII 1998, 3☿ (AL, SS). TANFIL'EVA: 17.VIII 1963, 1♀ (GK).; 19.VIII 1998 (AL, SS). IURII: 20.VIII 1998, 2☿ (AL, SS). ZELENY: 20.VIII 1998, 1♀, 10☿ (AL, SS). SHIKOTAN: Shikotan Bay, 6.VI 1946, 2♀ (NK); Shikotan-yama, 9, 10.VI 1946, 3♀ (NK); Svobodnaya River 13.VI 1946, 1♀ (NK); Malokuril'skoe, 21.VIII 1963, 3☿ (GK); Krai Sveta Cape, 27.VIII 1963, 1♀, 2☿ (GK) and 14.VIII 1973, 1☿ (Zheltonozhko); Tserkovnaya Bay, 14.VIII 1998, 10☿ (AL, SS); Gorobets Bay, 18.VIII 1998, 7☿ (AL, SS). KUNASHIR: Golovnino, 2.VII 1946, 2♀ (NK); 7.VIII 1961, 6☿ (AK); 10, 11. VIII 1975, 3☿ (AB); 7.IX 1976, 1☿ (VK); Dubovoye, 6.VIII 1980, 1☿ (SS); 7 km S Lagunnoye Lake, 15.VIII 1989, 1☿ (AL); Stolbchatyi Cape, 6.VII 1975, 1☿ (Basarukin). ITURUP: Drakon Cape, 2.VIII. 1998, 2☿ (AL, SS); Medvezh'ya Bay, 5.VIII 1998, 28☿ (AL, SS); Slavnaya Bay, 6.VIII 1998, 11☿ (AL, SS); Blagodatnoye Lake, 7, 8.VIII 1946, 24☿ (NK); 1.VIII 1998, 1♀, 2♂, 4☿ (AL, SS); Reidovo, 3.VIII 1963, 1☿ (GK); 5 km N Reidovo, 18.VIII 1996, 1♂, 4☿ (AL); 30.VII 1997, 2♀, 9☿ (AL, SS); 7 km W Reidovo, 29.VII 1997, 3♀, 3☿ (AL); Kuibyshevka, 13, 16, 23, 27. VIII 1946, 7♂, 15☿ (NK); Kuibyshevskii Bay, 13.VIII 1999, 7☿ (AL, SS); Goryachie Klyuchi, 14.VII 1963, 7☿ (GK); Kuibyshevo-Peschanyi, 23.VIII 1961, 1w (AK); Kasatka Bay, 30, 31.VII 1998, 1♂, 10☿ (AL, SS); Kurilsk, 8.VIII 1946, 1☿ (NK); 18.VIII 1961, 1☿ (AK); 3.VII 1963, 2☿ (GK); Kurilka River, 1.VII 1963, 2☿ (GK); Atsonupuri volcano, 13, 14.VIII 1975, 3☿ (VK, Lafer); Dobroye Nachalo Bay, 10, 14.VIII 1998, 34♂, 11☿ (AL, SS); Lesozavodsk, 19.VII 1963, 2☿ (GK, Krylov); Roka Bay, 29.VII1998, 8♂, 6☿ (AL, SS); Dozorny Bay, 10.VIII 1998, 3☿ (AL, SS). URUP: Tokotan Lake, 16, 16.VII 1946, 6♀, 2☿ (NK); Dai-Santo-San [Desantnaya Mt.], 25.VII 1946, 3♀, 1☿ (NK); Mishima Wan [Novokuril'skaya Bay], 20.VII, 3.VIII 1946, 13♀, 8☿ (NK); Shishiwa Saki [Tigrovyi Cape], 22.VII 1946, 1♀ (NK); Podgorny, 8, 11, 13.VIII 1963, 1♀, 8☿ (GK, NA); Ukromnaya Bay, 20.VIII 1996, 2☿ (AL); Kama River, 21.VIII 1996, 6☿ (AL). BRAT CHIRPOEV: 20.VIII 1997, 1♀, 3☿ (AL, SS). CHIRPOI: Peschanaya Bay, 10.VIII 1999, 1♀, 26☿ (AL, SS). SIMUSHIR: Skalisty, 8, 9.IX 1964, 4☿ (GK, NA, ZK); Broutona Bay, 8.VIII 1999, 5♀, 57☿ (AL, SS). KETOI: Diana Bay, 6.VIII 1999, 16☿ (AL, SS). YANKICHA: 1.VIII 1997, 15☿ (AL, SS); 5.VIII 1999, 11♀ (AL, SS). RYPONKICHA: 2.VIII 1997 (AL, SS). RASSHUA: Malen'kaya

Bay, 4.VIII 1999, 3♀, 48☿ (AL, SS). MATUA: 15.VIII 1996, 1♂, 1♀, 1☿ (AL).

DISTRIBUTION. Russia: Kuril Islands (*Anuchina, *Tanfil'eva, *Iurii, *Zelenyi, Shikotan, Kunashir, Iturup, Urup, *Brat Chirpoev, Chirpoi, Simushir, Ketoi, *Yankicha, *Ryponkicha, Rasshua, *Matua). - Japan (eastern Hokkaido).

REMARKS. The bumble-bees of subgenus *Bombus* Latreille, 1802 collected during IKIP expeditions in Onekotan belong to *B. lucorum albocinctus* only.

2. *Bombus* (*Bombus*) *lucorum albocinctus* Smith, 1854

= *Bombus albocinctus* F. Smith, 1854: 397 (type locality - Kamchatka).

= *Terrestribombus lucorum albocinctus*: Bischoff, 1930: 4.

= *Bombus* (*Bombus*) *albocinctus*: Krivolutskaya, 1973: 149 (Paramushir); Kupianskaya, 1995: 559, 569 (Paramushir, Shumshu).

= *Bombus* (*Bombus*) *lucorum albocinctus*: Ito & Sakagami, 1980: 27 (Simushir, Ketoi, Rasshua, Shiashkotan, Onekotan, Paramushir, Shumshu, Atlasova); Ito & Kuranishi, 2000: 284 (Paramushir, Shumshu).

SPECIMENS EXAMINED. POLONSKOGO: 21.VIII 1998, 11☿ (AL, SS). ITURUP: 5 km N Reidovo, 19.VIII 1996, 5☿ (AL). SIMUSHIR: Dushnaya Bay, 9.VIII 1999, 6☿ (AL, SS). KETOI: Diana Bay, 6.VIII 1999, 4☿ (AL, SS). RASSHUA: Malen'kaya Bay, 4.VIII 1999, 6☿ (AL, SS). MATUA: Dvoinaya Bay, 14, 15. 1996, 1♂, 51☿ (AL); 3.VIII 1999, 1♀, 2♂, 57☿ (AL, SS). SHIASHKOTAN: 11, 12.VIII 1996, 25☿ (AL); 2.VIII 1999, 3♀, 17☿ (AL, SS). EKARMA: North coast, 10.VIII 1996, 12☿ (AL); 1.VIII 1999, 1♀, 3☿ (AL). KHARIMKOTAN: 8.VIII 1996, 8☿ (AL). ONEKOTAN: Rezvy Stream, 7.VIII 1996, 1♀, 21☿ (AL); Terrasny Cape, 9.VIII 1996, 2♀, 13☿ (AL); Nemo Bay, 4.VIII 1996, 23, 24.VII 1999, 13♀, 12☿ (AL, SS). MAKANRUSHI: 18.VIII 1997, 5♂, 15☿ (AL, SS). ANTSIFEROVA: 15.VIII 1997, 1☿ (D. Stevenson). PARAMUSHIR: Severo-Kurilsk, 16, 21.VII 1964, 4♀ (AK, GK, ZK); 1, 4, 5, 11.VIII 1997, 8♀, 28☿ (AL, SS); Savushkino, 22.VII 1964, 1♀ (ZK); Kozyrevsk, 29.VII 1964, 1♀ (ZK); Shelekhovo, 10.VIII 1964, 2♀, 4☿ (AK, ZK); 13.VIII 1997, 1♀, 1☿ (AL, SS); Krasheninnikova Bay, 14.VIII 1997, 4♀, 13☿ (AL, SS); Vasil'eva Bay, 3.VIII 1996, 16.VIII 1997, 2♀, 10☿ (AL, SS); Tukharka Bay, 17.VIII 1997, 11☿ (AL, SS); Rifovaya Bay, 30.VII 1999, 9♀, 3☿ (AL, SS). SHUMSHU: Pochtareva Cape, 7.VIII 1997, 5♀, 15☿ (AL, SS); Yaugich Cape, 8.VIII 1997, 4♀, 11☿ (AL, SS); Bol'shoye Lake, 9.VIII 1997, 1♀ (AL, SS). ATLASOVA: East coast, 12.VIII 1997, 25.VII 1999, 5♀, 13☿ (AL, SS).

DISTRIBUTION. Russia: Khabarovskii krai, Magadanskaya oblast, Kamchatka including Koryakskii okrug, Sakhalin, Kuril Islands (*Polonskogo, *Iturup, Simushir, Ketoi, Rasshua, *Matua, Shiashkotan, *Ekarma, *Kharimkotan, Onekotan, *Makanrushi, *Antsiferova, Paramushir, Shumshu, Atlasova). - North Korea (Kim & Ito, 1987).

3. *Bombus* (*Bombus*) *hypocrita sapporoensis* Cockerell, 1911

=*Bombus sapporoensis* Cockerell, 1911: 641 (type locality: Sapporo [Hokkaido]).

= *Bombus* (*Bombus*) *hypocrita*: Kuwayama, 1967: 210 (Shikotan); Krivolutskaya, 1973: 149 (Kunashir); Kupianskaya, 1995: 559, 568 (South Kurils).

= *Bombus* (*Bombus*) *sapporoensis*: Krivolutskaya, 1973: 148 (Shikotan, Kunashir).

= *Bombus* (*Bombus*) *hypocrita sapporoensis*: Ito & Sakagami, 1980: 29 (Shikotan, Kunashir).

SPECIMENS EXAMINED. SHIKOTAN: 16.VI 1946, 3♀ (NK). KUNASHIR: Tyatya volcano, 1.VIII 1975, 1 ☿ (AK); Dlinnoye Lake, 28.VII 1998, 1♂ (B. Urbain); Yuzhno-Kurilsk, 3.VIII 1980, 2♀ (AL); Serebryanka River, 1.VI 1946, 3♀ (NK); Kislaya River, 21.VIII 1989, 1☿ (AL); 11.VIII 1998, 2☿ (AL); Lesnaya River, 18.VIII 1989, 1☿ (AL); Goryachii Plyazh, 29.VI 1946, 3☿ (NK); Lagunnoe Lake, 23.VI 1946, 1♀ (NK); 26.VIII 1975, 3☿ (AB); 12, 15.VIII 1989, 4☿ (AL, Sidorenko); 17 km S Yuzhno-Kurilsk, 3.X 1982, 1☿ (Basarukin); 22.VIII 1998, 6♂, 26☿ (AL, SS); Mendeleyevo, 28.VI, 5.VII 1946, 1♀, 1☿ (NK); 27.VIII 1974, 1☿ (Kirpichnikova); 2, 3, 6.VIII 1975, 6☿ (AB); 13, 27.VIII 1975, 2☿ (AK); 21.IX 1976, 1♀ (VK); 29.VII 1982, 2☿ (VK); Aliger Lake, 11.VIII 1998, 6☿ (SS); Stolbchaty Cape, 6.VII 1976, 1☿ (Basarukin); Tret'yakovo, 20.VIII 1980, 2☿ (AL); Peschanoye Lake, 30.VIII 1975. 1f, 1☿ (AB); 17.VIII 1980, 1☿ (AL); 6.VIII 1989, 1☿ (AL); Alyokhino, 29, 30.VI, 2.VIII 1962, 5♀, 2☿ (Safronova); 16.VIII 1975, 5☿ (AB); 25.VIII 1975, 2☿ (Kautin); 19.VIII 1999, 2♂, 14☿ (AL, SS); Sernovodsk-Alyokhino, 31.VII 1961, 1☿ (GK); Sernovodsk, 8.VIII 1975, 3☿ (AB); Golovnina volcano, 19, 20.VIII 1975 , 2☿ (AB); Golovnino, 9-11.VIII 1975, 19☿ (AB); Dubovoye, 8.VIII 1980, 1☿ (AL). ITURUP: Dobroye nachalo Bay, 22.VIII 1996, 1☿ (AL); Kasatka Bay, 31.VII 1998, 1☿ (AL, SS).

DISTRIBUTION. Russia: South of Primorskii krai, South Sakhalin, Kuril Islands (Shikotan, Kunashir, *Iturup). - Japan (Hokkaido), Korea, North-East China.

4a. *Bombus (Pyrobombus) beaticola moshkarareppus* Sakagami et Ishikawa, 1969

= *Bombus* (*Pyrobombus*) *beaticola moshkarareppus* Sakagami & Ishikawa, 1969: 176 (holotype - Reine, Nukabira, Hokkaido, 4-5.VII 1957) (Kunashir, Shikotan); Ito & Sakagami, 1980: 31 (Kunashir); Kupianskaya, 1995: 560, 569 (Kunashir).

= *Bombus* (*Pratobombus*) sp. 1: Krivolutskaya, 1973: 149 (Kunashir).

SPECIMENS EXAMINED. KUNASHIR: Lagunnoye Lake, 26.VIII 1975, 1☿ (AB); 9 km S Yuzhno-Kurilsk, 28.VII 1997, 1♀ (AL); Kislaya River, 27.VII 1989, 1☿ (AL); the same place, 11.VIII 1998, 1♂, 3☿ (AL); Mendeleyevo, 6.VIII 1975, 1☿ (AB); Stolbchaty Cape, 4.VII 1975, 1☿ (AB); 30.VII 1982, 1☿ (VK); Alyokhino, 14.VIII 1980, 1☿ (AL); Sernovodsk, 8.VIII 1975, 2☿ (AB); Golovnina volcano, 10.VIII 1980, 2♂, 1☿ (AL).

DISTRIBUTION. Russia: Kuril Islands (Kunashir). - Japan (Hokkaido).

REMARKS. The specimens recorded from Shikotan belong to *B. beaticola shikotanensis*.

4b. *Bombus* (*Pyrobombus*) *beaticola shikotanenesis* Ito et Sakagami, 1980

= *Bombus* (*Pyrobombus*) *beaticola shikotanenesis* Ito & Sakagami, 1980: 32 (holotype - ♀, Kiritoshi, Notoro, Shikotan, 30.VII 1940) (Shikotan); Kupianskaya, 1995: 560 (Shikotan).

= *Bombus* (*Pratobombus*) sp. 2: Krivolutskaya, 1973: 149 (Shikotan).

SPECIMENS EXAMINED. SHIKOTAN: Otradnaya Bay, 12.VIII 1998, 1☿ (AL); Tserkovnaya Bay, 14, 16.VIII 1998, 1♀, 10☿ (AL); Delfin Bay, 15.VIII 1998, 1☿ (AL, SS); Gorobets Bay, 18.VIII 1998, 11☿ (AL, SS); Zvezdnaya Bay, 16.VIII 1998, 1♀, 2☿ (AL, SS).

DISTRIBUTION. Russia: Kuril Islands (Shikotan).

5. *Bombus* (*Pyrobombus*) *ardens sakagamii* Tkalců, 1962

= *Bombus* (*Pyrobombus*) *ardens sakagamii* Tkalců, 1962: 93 (holotype - ♀, Sapporo, 21.IV 1959; Washitani et al., 1997: 24 (Hokkaido).

SPECIMENS EXAMINED. KUNASHIR: Dlinnoye Lake, 28.VII 1999, 3☿ (AL, SS); Lagunnoye Lake, 23, 24.VI 1946, 5☿ (NK); Serebryanka River, 21.VI 1946, 1☿ (NK); Mendeleyevo, 28.VII, 5.VII 1946, 3☿ (NK); Goryachii Plyazh, 29.VI, 9.VII 1946, 3☿ (NK); Kislaya River, 11.VIII 1998, 1♂ (AL); Alyokhino-Golovnina volcano, 3.VII 1946, 1☿ (NK).

DISTRIBUTION. *Russia: Kuril Islands (Kunashir). - Japan (Hokkaido).

6. *Bombus* (*Pyrobomus*) *oceanicus* Friese, 1909

= *Bombus pratorum* var. *oceanicus* Friese, 1909: 675 (type locality - Japan, Jesso [Hokkaido]).

= *Pyrobombus oceanicus*: Tkalců, 1965: 2 (Hokkaido).

= *Bombus* (*Pyrobombus*) sp.: Kuwayama, 1967: 210.

=*Bombus* (*Pratobombus*) *jonellus*: Krivolutskaya, 1973: 149 (Paramushir); Kupianskaya, 1995: 561, 569 (North Kurils).

= *Bombus* (*Pratobombus*) sp. 3: Krivolutskaya, 1973: 149 (Urup).

= *Bombus* (*Pyrobomus*) *oceanicus*: Ito & Sakagami, 1980: 33 (Iturup, Urup, Chirpoi, Paramushir, Atlasova); Kupianskaya, 1995: 561, 569 (Iturup); Ito & Kuranishi, 2000: 285 (Paramushir).

SPECIMENS EXAMINED. ITURUP: Blagodatnoye Lake, 8.VIII 1946, 1♂, 6☿ (NK); 1.VIII 1998, 1♀, 1☿ (AL, SS); Katamon, 11.VIII 1946, 1♂, 1☿ (NK); Teyetsu, 12.VIII 1946, 1☿ (NK); Teyetsu Bay, 13.VIII 1946, 1♂, 11☿ (NK); Ionopuri, 13.VIII 1946, on *Lobelia sessifolia*, 2♂ (NK); Sopochny, 27.VIII 1946, 4 ☿ (NK); Atsonupuri, 18.VIII 1975, 1 ☿ (Plutenko); 5 km N Reydovo, 30.VII 1997, 3☿ (AL, SS); Roka Bay, 29.VII 1998, 1♀, 13♂, 18☿ (AL, SS); Dracon

Cape, 2.VIII 1998, 5 ☿ (AL, SS); Eugeniya Cape, 3.VIII 1998, 2♀, 3☿ (AL, SS); Medvezh'ya Bay, 5.VIII 1998, 7☿, (AL, SS); Slavnaya Bay, 6.VIII 1998, 1☿ (AL, SS); Dobroye Nachalo Bay, 10, 14.VIII 1998, 10♀, 29♂, 22☿ (AL, SS); Kuibyshevskii Bay, 20.VIII 1997, 2☿ (AL, SS). URUP: 31.VIII 1952, 1♀ (O. Tokareva); Tokotan Lake, 16, 17.VII 1946, 12☿ (NK); Dai-Santo-San [Desantnaya Mt.], 25.VII 1946, 3☿ (NK); Ukromnaya Bay, 20. VIII 1996, 13☿ (AL); Kama River, 21.VIII 1996, 2☿ (AL). BRAT CHIRPOEV: 20.VIII 1997, 1♀, 7☿ (AL, SS). CHIRPOI: Peschanaya Bay, 10.VIII 1999, 7♂, 44☿ (AL, SS). RYPONKICHA: 2.VIII 1997, 1☿ (AL, SS). ANTSIFEROVA: 15.VIII 1997, 2 ☿ (AL, SS). PARAMUSHIR: Shelekhovo, 10.VIII 1964, 1♀, 1☿ (GK); 4 km SE Severo-Kurilsk, 1.VIII 1996, 1♀, 1☿ (AL); 5 km S Severo-Kurilsk, 11.VIII 1997, 1♀, 6☿ (AL, SS); Krasheninnikova Bay, 14.VIII 1998, 4☿ (AL, SS); Vasil'eva Bay, 15.VIII 1998, 2 ☿ (AL, SS); Tukharka Bay, 17.VIII 1997, 1♀, 6☿ (AL, SS); Rifovaya Bay, 30.VII 1999, 8♀ (AL, SS). SHUMSHU: Pochtareva Cape, 7.VIII 1997, 1♀, 19☿ (AL, SS); Yaugich Cape, 8.VIII 199, 1♀, 25☿ (AL, SS); Bol'shoye Lake, 9.VIII 1997, 31.VII 1999, 1♀, 3☿ (AL, SS). ATLASOVA: East coast, 12.VIII 1997, 25.VII 1999, 1♀, 11☿ (AL, SS).

DISTRIBUTION. Russia: Kuril Islands (Iturup, Urup, *Brat Chirpoev, Chirpoi, *Ryponkicha, *Antsiferova, Paramushir, Shumshu, *Atlasova). - Japan (Hokkaido).

REMARKS. We re-examined two specimens from Paramushir identified by D. V. Panfilov as *B. jonellus* (Kirby, 1802) which have been recorded under this name by G. Krivolutskaya (1973) and found that they belong to the *B. oceanicus*, widely distributed throughout Kuril Islands.

7a. *Bombus* (*Pyrobombus*) *hypnorum calidus* Erichson, 1851

= *Pratobombus hypnorum klutschianus* Bischoff, 1930: 2 (type locality - Kamchatka, Klutschi).

= *Bombus* (*Pyrobombus*) *hypnorum calidus*: Kuwayama, 1967: 210 (South Kurils, Onekotan).

= *Bombus* (*Pyrobombus*) *hypnorum klutschianus*: Ito & Sakagami, 1980: 37 (Onekotan); Kupianskaya, 1995: 560, 569 (North Kurils).

SPECIMENS EXAMINED. KHARIMKOTAN: 8.VIII 1996, 1♂, 16☿ (AL). ONEKOTAN: Nemo Bay, 23, 24.VII 1999, 3♀, 8☿ (AL, SS); Rezvy Stream, 7.VIII 1996, 1♀, 8☿ (AL). MAKANRUSHI: 18.VIII 1997, 1♀, 12♂, 67☿ (AL, SS).

DISTRIBUTION. Russia: middle of European part, Ural, Buryatiya, Amurskaya oblast, Khabarovskii krai, Primorskii krai, Magadanskaya oblast, Kamchatka, Sakhalin, Kuril Islands (*Kharimkotan, Onekotan, *Makanrushi, *Paramushir, *Shumshu). - North Korea (Ito, 1985).

7b. *Bombus* (*Pyrobombus*) *hypnorum koropokkrus* Sakagami et Ishikawa, 1972

= *Bombus* (*Pyrobombus*) *hypnorum insularis* Sakagami & Ishikawa, 1969: 180, nom. praeocc. non Friese, 1924 (holotype - Reine, Jozankei near Sapporo [Hokkaido], V 1950).

= *Bombus* (*Pyrobombus*) *hypnorum koropokkrus* Sakagami & Ishikawa, 1972: 610, new name for *insularis*.

= *Bombus* (*Pratobombus*) *hypnorum calidus*: Krivolutskaya, 1973: 148 (Kunashir).

= *Bombus* (*Pyrobombus*) *hypnorum koropokkrus*: Ito & Sakagami, 1980: 37 (Kunashir); Kupianskaya, 1995: 560, 569 (South Kurils).

SPECIMENS EXAMINED. KUNASHIR: Serebryanka River, 21.VI 1946, 2♀ (NK); Lagunnoye Lake, 23.VI 1946, 2♀ (NK); 17 km S Yuzhno-Kurilsk, 26.VII, 22.VIII 1998, 10♀, 33♂, 6☿ (AL, SS); Kislaya River, 11.VIII 1998, 18♂, 5☿ (AL); Aliger Lake, 11.VIII 1998, 1♀, 5♂, 6☿ (SS); Tret'yakovo, 22.VI 1984, 2☿ (Makarkin); Stolbchaty Cape, 11.VIII 1989, 2☿ (AL).

DISTRIBUTION. Russia: Kuril Islands (Kunashir). - Japan (Hokkaido).

8. *Bombus* (*Diversobombus*) *diversus tersatus* Smith, 1869

= *Bombus* (*Diversobombus*) *diversus* subsp.: Kuwayama, 1967: 210 (Kunashir)

= *Bombus* (*Diversobombus*) *atrocaudatus*: Krivolutskaya, 1973: 148 (Kunashir).

= *Bombus* (*Diversobombus*) *diversus tersatus*: Sakagami & Ishikawa, 1969: 183 (Kunashir); Ito & Sakagami, 1980: 38 (Kunashir).

= *Bombus* (*Diversobombus*) *diversus*: Kupianskaya, 1995: 565, 574 (South Kurils).

SPECIMENS EXAMINED. KUNASHIR: Dlinnoye Lake, 28.VII 1998, 2☿ (AL, SS); 17 km S Yuzhno-Kurilsk, 22.VIII 1998, 6☿ (AL, SS); Lagunnoye Lake, 23.VI 1946, 6♀ (NK); Mendeleyevo, 5.VII 1946, 1♀ (NK); 4.VIII 1975, 1♀ (AB); Sernovodsk, 29, 30.VIII 1961, 2♀ (AK, GK); Tret'yakovo, 20.VIII 1980, 1☿ (AL); Alyokhino, 29.VI, 10.VIII 1962, 1♀, 1☿ (ZK, Safronova); 19.VIII 1999, 1☿(AL, SS); Kosmodem'yanskoye, 28.VIII 1964, 2E, 2 D (NA, GK, ZK); Stolbchaty Cape, 1.VIII 1982, 1♀ (VK); Golovnino, 2.VII 1946, 1♀, 1☿ (NK); Dubovoye, 15.VI 1984, 1♀ (Makarkin); Vinai, 24.VII 1974, 1☿ (Lehr).

DISTRIBUTION. Russia: South Sakhalin, Kuril Islands (Kunashir). - Japan (Hokkaido).

9. *Bombus* (*Megabombus*) *yezoensis* Matsumura, 1932

= *Bombus* (*Hortobombus*) *tersatus*: Kuwayama, 1967: 210 (Shikotan).

= *Bombus* (*Hortobombus*) *yezoensis*: Kuwayama, 1967: 210, part. (Shikotan); Krivolutskaya, 1973: 148 (Kunashir, Shikotan).

= *Bombus* (*Hortobombus*) *tichenkoi*: Krivolutskaya, 1973: 148, part. (Kunashir).

SPECIMENS EXAMINED. Kunashir: Dlinnoye Lake, 28.VII 1998, 1♀ (AL, SS);Mendeleyevo, 23.VI, 5.VII 1946, 4♀ (NK); Stolbchaty Cape, 11.VIII 1989, 1☿ (AL); 17 km S Yuzhno-Kurilsk, 26.VII, 22.VIII 1998, 2☿ (AL, SS).

DISTRIBUTION. Russia: Kuril Islands (?Shikotan, Kunashir). - North-East China, Japan (Hokkaido).

REMARKS. All records of *B. yezoensis* from Paramushir (Kuwayama, 1967; Krivolutskaya, 1973) belong to *B. pseudoligusticus*.

10. *Bombus* (*Megabombus*) *pseudoligusticus* Skorikov, 1925, stat. n.

= *Hortobombus tichenkoi* var. *pseudoligusticus* Skorikov, 1925: 116 (holotype -♀, Karaginskii Island [Kamchatka]).

= *Bombus* (*Hortobombus*) *tersatus kurilensis* Sakagami, 1954: 92 (holotype - Paramushir, Noda-Bay, 1926), synonymized with *tichenkoi* by Ito & Sakagami (1980).

= *Bombus* (*Hortobombus*) *yezoensis*: Kuwayama, 1967: 210, part. (Paramushir).

= *Bombus* (*Hortobombus*) *tichenkoi*: Krivolutskaya, 1973: 148, part. (Paramushir).

= *Bombus* (*Megabombus*) *tichenkoi*: Ito & Sakagami, 1980: 39 (Paramushir, Shumshu); Ito & Kuranishi, 2000: 286 (Paramushir, Shumshu).

SPECIMENS EXAMINED. PARAMUSHIR: 5 km N Severo-Kurilsk, 4, 11.VIII 1997, 8♀, 5☿ (AL, SS); Shelekhovo, 13.VIII 1997, 2☿ (AL, SS); Krasheninnikova Bay, 14.VIII 1997, 3☿ (AL, SS); Vasil'eva Bay, 3.VIII 1996, 15, 16.VIII 1997, 13♀, 2♂, 7☿ (AL, SS); Tukharka Bay, 17.VIII 1997, 6☿ (AL, SS); Rifovaya Bay, 30.VII 1999, 11 ♀, 1 ☿ (AL, SS). SHUMSHU: Pochtareva Cape, 7.VIII 1997, 3♀, 18☿ (AL, SS); Yaugich Cape, 8.VIII 1997, 2♀, 4☿ (AL, SS); Bol'shoye Lake, 9.VIII 1997, 8♀, 1☿ (AL, SS); 31.VII 1999, 15♀, 3☿ (AL, SS). ATLASOVA: East coast, 25.VII 1999, 1☿ (AL, SS).

DISTRIBUTION. Russia: Kamchatka (Karaginskii Il.), Kuril Islands (Paramushir, Shumshu, *Atlasova).

REMARKS. *B tichenkoi* var. *pseudoligusticus* differs from the nominative form by the lacking of yellowish hairs on gastral terga, by wider black band on mesonotum. We regard these forms as the separate species. The holotype of *pseudoligusticus* has been compared with the holotype and paratypes of *B. tersatus kurilensis* by Ito & Sakagami (1980). Probably, the holotype of *pseudoligusticus* has the MS label var. *karaginensis* [under this name it was mentioned by Ito & Sakagami (1980)], but valid name for this species is *pseudoligusticus*. On our request Dr. Yu.A. Pesenko (St. Petersburg) could not find the holotype of *B. tichenkoi* var. *pseudoligusticus* in the collection of Zoological Institute (where the A. S. Skorikov's type material is deposited) for the checking of the labels and informed us that *karaginensis* absent among the numerous published and MS A.S. Skorikov's names in *Bombus* (pers. comm. Yu.A. Pesenko). The specimens of *B. tichenkoi* recorded from Kunashir (Krivolutskaya, 1973) belong to *B. yezoensis*.

11a. *Bombus* (*Thoracobombus*) *schrencki kuwayamai* Sakagami et Ishikawa, 1969

= *Bombus* (*Agrobombus*) *schrencki* subsp. 2: Kuwayama, 1967: 210 (Kunashir).

= *Bombus* (*Agrobombus*) *schrencki kuwayamai* Sakagami & Ishikawa, 1969: 164 (holotype from Kunashir) (Kunashir, Iturup, Urup).

= *Bombus* (*Agrobombus*) *schrencki*: Krivolutskaya, 1973: 149 (Kunashir).

=*Bombus* (*Thoracobombus*) *schrencki kuwayamai*: Ito & Sakagami, 1980: 40 (Kunashir); Kupianskaya, 1995: 563, 571 (Kunashir).

SPECIMENS EXAMINED. KUNASHIR: Dlinnoye Lake, 28.VII 1998, 27♀ (AL, SS); Lagunnoye Lake, 23.VI 1946, 1♀, 1☿ (NK); 26.VIII 1975, 1☿ (AB);

15.VIII 1989, 1☿ (AL); Yuzhno-Kurilsk, 3.VIII 1980, 2☿ (AL, AK); 26, 27.VII 1989, 2☿ (AL); 17 km S Yuzhno-Kurilsk, 3.X 1982, 1☿ (Basarukin); 22.VIII 1998, 3☿ (AL, SS); 17.VIII 1999, 1♂, 1☿ (AL); Goryachii Plyazh, 9.VII 1946, 1♀ (NK); Serebryanka River, 21.VI 1946, 1♀ (NK); Tret'yakovo, 3, 20.VIII 1989, 5☿ (AL); Stolbchaty Cape, 4.VII 1975, 1☿ (Basarukin); 11.VIII 1989, 1☿ (AL); Sernovodsk, 29.VII 1961, 1☿ (GK); 8.VIII 1975, 2☿ (AB); Alyokhino, 3.VII 1946, 2☿ (NK); 29.VI 1961, 2☿ (GK, Safronova); 27.VIII 1964, 1☿ (ZK); 25.VIII 1975, 1☿ (AK); 19.VIII 1999, 1♂, 25☿ (AL, SS); Golovnia volkano, 10.VIII 1980, 2☿ (AL); Golovnino, 2.VII 1946, 4♀ (NK); 7.VII 1961, 4☿ (AK, GK); 10, 11.VIII 1975, 3☿ (AB); Dubovoye, 14.VI 1975, 2♀ (Makarkin); 9.IX 1976, 2☿ (VK); 7.VIII 1980, 1☿ (AL); 15.VI 1984, 1♀ (Makarkin).

DISTRIBUTION. Russia: Kuril Islands (Kunashir).

11b. *Bombus* (*Thoracobombus*) *schrencki konakovi* Panfilov, 1956

= *Bombus* (*Adventoribombus*) *konakovi* Panfilov, 1956: 1330 (holotype - ♂, Iturup, Kurilsk, 8.IX 1946, on *Solidago* sp., N. Konakov)

= *Bombus* (*Agrobombus*) *schrencki* subsp. 1: Kuwayama, 1967: 210 (Shikotan, Iturup).

= *Bombus* (*Adventoribombus*) *konakovi*: Krivolutskaya, 1973: 149 (Shikotan, Iturup).

= *Bombus* (*Thoracobombus*) *schrencki konakovi*: Ito & Sakagami, 1980: 41 (Shikotan, Iturup, Urup).

SPECIMENS EXAMINED. TANFIL'EVA: 19.VIII 1998, 52☿ (AL, SS). IURII: 20.VIII 1998, 5☿ (AL, SS). ZELENYI: 20.VIII 1998, 1♂, 6☿ (AL). POLONSKOGO: 21.VIII 1998, 7☿ (AL, SS). SHIKOTAN: Shikotan Bay, 6, 8.VI 1946, 3♀ (NK); Shikotan Mt., 10.VI 1946, 2♀, 1♂, 1☿ (NK); Svobodnaya River, 12.VI 1946, 3♀ (NK); Anama, 13.VI 1946, 2♀ (NK); Krai Sveta Cape, 14, 15.VIII 1975, 2☿ (AK); Malokuril'skoye, 216 24.VIII 1963, 4☿ (NA, GK); Otradnaya Bay, 12.VIII 1998, 1☿ (AL, SS); Tserkovnaya Bay, 14.VIII 1998, 1♀, 40☿ (AL, SS); Delfin Bay, 15.VIII 1998, 9☿ (AL, SS); Zvezdnaya Bay, 16.VIII 1998, 6☿ (AL, SS); Gorobets Bay, 18.VIII 1998, 6☿ (AL, SS). ITURUP: Kurilsk, 8, 25.VIII 1946, 11☿ (NK); 20.VIII 1961, 1☿ (AK); 30.VI, 5.VIII 1963, 2☿ (NA, GK); Blagodatnoye Lake, 8.VIII 1946, 5☿ (NK); 1.VIII 1998, 2♀, 10☿ (AL, SS); Teyetsu, 13.VIII 1946, 1♂, 3☿ (NK); Kuibyshevo, 19, 20, 23.VIII 1946, 2♂, 8☿ (Vorob'ev, NK); Kuibyshevskii Bay, 13.VIII 1999, 1♀, 15☿ (AL, SS); Tooro, 26, 27.VIII 1946, 3☿ (NK); Sopochny, 4☿ (NK); Lesozavodsk, 19, 21.VII 1963, 5☿ (NA, Krylov); Reydovaya River, 30.VIII 1946, 1♂, 3☿ (NK); Reydovo, 3.VIII 1963, 1☿ (NA); 18, 19.VIII 1996, 30.VII 1997, 4♀, 20☿ (AL, SS); Dobroye nachalo Bay, 25.VIII 1975, 1☿ (SS); 22, 23.VIII 1996, 10.VIII 1998, 14.VIII 1999, 3♀, 1♂, 48☿ (AL, SS); Burevestnik, 8.VIII 1975, 1☿ (Plutenko); Atsonupuri volcano, 14.VIII 1975, 4☿ (Plutenko); Kasatka Bay, 30, 31.VII 1998, 2♀, 1♂, 7☿ (AL, SS); Drakon Cape, 2.VIII 1998, 3☿ (AL, SS); Eugeniya Cape, 3.VIII 1998, 4♀, 5☿ (AL, SS); Slavnaya Bay, 6.VIII 1998, 1♀,

15☿ (AL, SS); Medvezh'ya Bay, 5.VIII 1998, 1♀, 4☿ (AL, SS). URUP: Tokotan Lake, 17.VII 1946, 3♀ (NK); Mishima Wan [Novokuril'skaya Bay], 19.VII 1946, 1♀ (NK); Trechzuby, 26.VII 1946, 1♀ (Tereshenkov); Kama River, 21.VIII 1996, 1♀, 3☿ (AL).

DISTRIBUTION. Russia: Kuril Islands (*Tanfil'eva, *Iurii, *Zelenyi, *Polonskogo, Shikotan, Iturup, Urup).

12. *Bombus* (*Thoracobombus*) *pseudobaicalensis* Vogt, 1911

= *Bombus* (*Thoracobombus*) *pseudobaicalensis*: Ito & Sakagami, 1980: 42 (Kunashir).

SPECIMENS EXAMINED. KUNASHIR: 17 km S Yuzhno-Kurilsk, 22.VIII 1998, 1☿ (AL, SS); Tret'yakovo, 20.VIII 1980, 1☿ (AL); Stolbchaty Cape 10.VIII 1989, ☿ (AL); Alyokhino, 19.VIII 1999, 1☿ (AL, SS); Dubovoye, 10.VIII 1975 1♀, 1☿ (AK).

DISTRIBUTION. Russia: South Siberia, Amurskaya oblast', Primorskii krai, Sakhalin, Kuril Islands (Kunashir). - Japan (Hokkaido, North Honshu), North Korea, North China, Mongolia.

13. *Bombus* (*Alpinobombus*) *balteatus balteatus* Dalhbom, 1832

SPECIMENS EXAMINED. SHUMSHU: Pochtareva Cape, 7.VIII 1997, 2☿ (AL, SS).

DISTRIBUTION. Circumpolar Holarctic species. Russia: Chukotka including Wrangel Il., Kamchatka, Kuril Islands (*Shumshu), Magadanskaya oblast', Khabarovskii krai, mountains of Siberia.

14. *Bombus* (*Melanobombus*) *sichelii sichelii* Radoszkowski, 1859

= *Bombus sichelii* Radoszkowski, 1859: 481, ♀ (type locality - Kamchatka).

SPECIMENS EXAMINED. SHUMSHU: Pochtareva Cape, 7.VIII 1997, 1♀, 1☿ (AL, SS); Yaugich Cape, 8.VIII 1997, 11☿ (AL, SS).

DISTRIBUTION. Russia: Magadanskaya oblast', Kamchatka, Khabarovskii krai, Amurskaya oblast', North of Primorskii krai, Sakhalin, Kuril Islands (*Shumshu), Transbaicalia, Siberia, Caucasus, forest zone of European part. - North Korea, North-East China, Mongolia, mountains of Middle and South Europe.

15. *Psithyrus* (*Fernaldaepsithyrus*) *flavidus frisoni* Popov, 1931

= *Psithyrus* (*Fernaldaepsithyrus*) *flavidus frisoni* Popov, 1931: 199 (type locality - Kamchatka, Karaginskii Islad)

= *Psithyrus* (*Fernaldaepsithyrus*) *flavidus frisoni*: Sakagami, 1950: 80 (Paramushir).

SPECIMENS EXAMINED. PARAMUSHIR: 5 km N Severo-Kurilsk, 4.VIII 1997, 3♀, 1♂ (AL, SS). SHUMSHU: Yaugich Cape, 8.VIII 1997, 3♀ (AL, SS).

DISTRIBUTION. Russia: Kamchatka including Karaginskii Il., Kuril Islands (Paramushir, *Shumshu).

16. *Psithyrus* (*Ashtonipsithyrus*) *bohemicus* Seidl, 1837

= *Psithyrus* (*Ashtonipsithyrus*) *bohemicus*: Sakagami, 1950: 80 (Urup).

= *Psithyrus* (*Ashtonipsithyrus*) *bohemicus*: Krivolutskaya, 1973: 149 (Paramushir, Shumshu); Kupianskaya, 1995: 576, 579 (Kuril Islands).

SPECIMENS EXAMINED. URUP: Tokotan Lake, 16.VII 1946, 1♀ (NK). PARAMUSHIR: Severo-Kurilsk, 16.VII 1964, 1♀ (AK); 21.VII 1964, 1♀ (NA); 4, 11.VIII 1997, 13♀ (AL, SS); Shelekhovo, 11.VIII 1964, 1♀ (GK); Vasil'eva Bay, 6.VIII 1997, 1♀, 3♂ (AL, SS); Rifovaya Bay, 30.VII 1999, 7♀ (AL, SS). SHUMSHU: Pochtareva Cape, 7.VIII 1997, 4♀ (AL, SS); Yaugich Cape, 8.VIII 1997, 3♀, 1♂ (AL, SS); Bol'shoye Lake, 31.VII 1999, 13♀ (AL, SS).

DISTRIBUTION. Russia: Magadanskaya oblast', Kamchatka, Khabarovskii krai, Amurskaya oblast', Primorskii krai, Sakhalin, Kuril Islands (Urup, Paramushir, Shumshu), Transbaicalia, South Siberia, Altai, Caucasus, European part. - North-East China, Mongolia, Tian-Shan, Pamir, Kashmir, Turkey, Europe.

BIOGEOGRAPHY

The distribution data of bumble-bees throughout Kuril Islands are summarized in Table 1. The bumble-bee fauna of Southern Kurils [limited northwards by deep strait Bussol (2659 m)] related with Hokkaido one (11 species) and has 10 joint species. Nine species are known for Kunashir. But even in this island the warm-like species are distributed southwards Yuzhno-Kurilsk (*B. yezoensis, B. beaticola moshkarareppus, B. pseudobaicalensis*). Northwards of Kunashir the number of the bumblee-bee species is reduced: Iturup - seven, Urup - four, Chirpoi and Brat Chirpoev - two. Five species inhabit Shikotan and only two - other small islands of Habomai. The bumble-bee fauna of Northern Kurils [limited southwards by deep strait Kruzenshterna (1945 m)] related with Kamchatka fauna (17 species) and has seven joint species. Eight species are distributed on Shumshu, six - on Paramushir. The number species is reduced to the south: three on Onekotan, two on Antsiferova, Makanrushi and Kharimkotan, one on Ekarma and Shiashkotan. The Middle Kurils has the poorest bumble-bee fauna (one or two species on each islands). These islands are the zone of coexistent of *B. florilegus* (common in the South Kurils) and *B. lucorum albocinctus* (common in the Northern Kurils).

The distribution of bumble-bees within island strongly depends of vegetation. In the islands with the forest the bumble-bees are abundant on the meadow near seashore. The can penetrate to the forest along the road and trail and practically absent under forest canopy. On the islands without forest the bumble-bees spread more or less uniform.

Distribution of bumble-bees in the Kuril Islands **Table 1**

N	Species or subspecies	Islands																									
		AU	TA	IU	ZE	PO	SH	KU	IT	UR	BC	CI	SI	KE	YA	RY	RA	MA	SA	EK	KH	ON	MK	AN	PA	SU	AT
1.	*Bombus florilegus*	N	N	N	N	-	**	*	**	**	N	**	**	**	N	N	**	N	-	-	-	?*	-	-	-	-	-
2.	*Bombus lucorum albocinctus*	-	-	-	-	N	-	-	N	-	-	-	**	**	-	-	**	N	**	N	N	**	N	N	**	**	**
3.	*Bombus hypocrita sapporoensis*	-	-	-	-	-	*	**	N	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4a.	*Bombus beaticola moshkarareppus*	-	-	-	-	-	-	**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4b.	*Bombus beaticola shikotanensis*	-	-	-	-	-	**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5.	*Bombus ardens sakagamii*	-	-	-	-	-	-	N	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6.	*Bombus oceanicus*	-	-	-	-	-	-	-	**	**	N	**	-	-	-	N	-	-	-	-	-	-	-	N	**	N	**
7a.	*Bombus hypnorum calidus*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N	**	N	-	N	N	-
7b.	*Bombus hypnorum koropokkrus*	-	-	-	-	-	-	**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8.	*Bombus diversus tersatus*	-	-	-	-	-	-	**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9.	*Bombus yezoensis*	-	-	-	-	-	?*	**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10.	*Bombus pseudoligusticus*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11a	*Bombus schrencki kuwayamai*	-	-	-	-	-	-	**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**	**	N	-
11b	*Bombus schrencki konakovi*	-	N	N	N	N	**	-	**	**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12.	*Bombus pseudobaicalensis*	-	-	-	-	-	-	**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13.	*Bombus balteatus balteatus*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14.	*Bombus sichelii sichelii*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N	-	-
15.	*Psithyrus flavidus frisoni*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N	-	-
16.	*Psithyrus bohemicus*	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**	N	-	-
	total	1	2	2	2	2	5	9	5	4	2	2	2	2	1	2	2	2	1	1	2	3	2	2	6	8	3

Abbreviations. Islands: AN - Antsiferova, AT - Atlasova, AU - Anuchina, BC - Brat Chirpoev, CH - Chirpoi, EK - Ekarma, IT - Iturup, IU - Iurii, KE - Ketoi, KH - Kharimkotan, KU - Kunashir, MA - Matua, MK - Makanrushi, ON - Onekotan, PA - Paramushir, PO - Polonskogo, RA - Rasshua, RY - Ryponkicha, SA - Shiashkotan, SH - Shikotan, SI - Simushir, SU - Shumshu, TA - Tanfil'eva, UR - Urup, YA - Yankicha, ZE - Zelenyi. *Records*: * - previous (non-IKIP) expeditions, ** - previous, confirmed by IKIP expeditions, N - new for island from IKIP expeditions, ? - questionable.

FOOD PLANTS

On the Kuril Islands the bumble-bees visited for the food 61 plant species from 20 families (Table 2). The most visited plants are *Cirsium*, *Senecio* (Asteraceae), *Trifolium*, *Hedysarum, Lathyrus* (Fabaceae), *Geranium erianthum* (Geraniaceae), *Rosa rugosa* (Rosaceae), *Pedicularis*, *Pennellianthus* (Scrophulariaceae). Many plant species from different families are registered for the *B. florilegus* and *B. lucorum albocinctus*, which are widely distributed and most abundant species. These species as the ones of subgenus *Pyrobombus* have the mouthparts with shorter tongue and they can use the pollen and nectar from the flowers of plants of families Asteraceae, Apiaceae, Ericaceae, Geraniaceae as Fabaceae and Scrophulariaceae also. The bumble-bees of subgenus *Thoracobombus* Dalla Torre, 1880, which have medial length tongue, definitely prefer the Fabaceae plants. *B.* (*Megabombus*) *pseudoligusticus* has the mouth parts with very long tongue and use the pollen and nectar from *Iris*, *Delphinium*, *Thermopsis*, *Lathyrus* flowers, which are rarely visited by other *Bombus* species.

When the several bumble-bee species coexist in one site they usually visited different plants. On the small volcanic island Chirpoi (without forest) both bumble-bee species (*B. florilegus* and *B. oceanicus*) which inhabit this island occur from the seashore to the volcano top (691 m). Near seashore both species visited seven grass species (mainly *Cirsium kamtschaticum*) but became more abundant in tundra zone. Upper island part and volcano top occupied by volcanic pebbles where the rare plants of *Pennellianthus frutescens* and *Campanula lasiocarpa* are growing. The first plant visited by *B. oceanicus*, the second plant - by *B. florilegus*.

The bumble-bees visited flowering plants from early morning to late evening not only in sunny days, but in cloudy and foggy time also (in the latter cases the number is decreased). The number of bumble-bees strongly depends of climatic patterns. In 1998 (August 22), when the August was cold with high humidity, we can see the hundreds bumble-bees of seven species near the hot springs (Kunashir, 17 km south of Yuzhno-Kurilsk). In 1999 (August 17) at the same place, when the August was warm and dry, we collected four bumble-bee specimens of two species only.

ACKNOWLEDGEMENTS

We are grateful for many peoples (see Introduction), who collected the bumble-bees in the Kuril Islands, Dr. M. Ito (Sapporo, Japan) for the providing us by valuable references, Dr. Yu. A. Pesenko (St. Petersburg) for the clarifying of the valid name for *B. pseudoligusticus*, Dr. V.Yu. Barkalov (Vladivostok) and S. Gage (Seattle, USA) for the identification of some plants.

The work described here was supported in part by the International Programs Division and Biological Sciences Directorate (Biotic Surveys and Inventories

Table 2

Food plants of bumble-bees in the Kuril Islands

N	Species of plants	Species or subspecies of bumblebees													
		1	2	3	4a	4b	6	7a	7b	9	10	11a	11b	12	16
	Apiaceae														
1.	*Angelica gmelinii* (DC) M. Pimen.	+	+	-	-	-	-	-	-	-	-	-	-	-	-
2.	*Heracleum lanatum* Michx.	+	-	-	-	-	-	-	-	-	-	-	-	-	-
3.	*Glenia littoralis* Fr. Schmidt ex Miq.	+	-	-	-	-	-	-	-	-	-	-	-	-	-
4.	*Ligusticum scoticum* L.	+	-	-	-	-	-	-	-	-	-	-	-	-	-
	Alliaceae														
5.	*Allium ochotense* Prokh.	+	-	-	-	-	+	-	-	-	-	-	+	-	-
	Araliaceae														
6.	*Aralia cordata* Thunb.	-	-	-	+	-	-	-	+	-	-	-	-	-	-
	Asteraceae														
7.	*Cirsium kamtschaticum* Ledeb.ex DC	+	+	+	-	+	+	+	-	+	+	+	+	-	+
8.	*Senecio pseudoarnica* Less.	+	+	-	-	-	+	+	+	-	-	-	+	-	-
9.	*Senecio cannabifolius* Less.	+	+	-	-	-	-	+	-	-	-	-	-	-	-
10.	*Saussurea kurilensis* Tatew.	-	-	-	-	-	+	-	-	-	-	-	-	-	-
11.	*Ligularia hodgsonii* Hook. fil.	+	-	-	-	-	+	-	-	-	-	+	-	-	-
12.	*Leontodon autumnalis* L	+	+	-	-	-	-	-	-	-	-	-	-	-	-
13.	*Cacalia robustaTolm.*	+	-	-	-	-	+	-	+	-	-	-	-	-	-
14.	*Eupatorium glehnii* Fr. Schmidt et Trautv.	-	-	+	+	-	-	-	+	-	-	-	-	-	-
15.	*Taraxacum ketojense* Tatew.et Kitam.	+	-	-	-	-	-	-	-	-	-	-	-	-	-
16.	*Picris kamtschatica* Ledeb.	+	-	-	-	-	-	-	-	-	-	-	-	-	-
17.	*Ptarmica speciosa* DC	+	-	-	-	-	-	-	-	-	-	-	-	-	-
18.	*Saussurea riederi* Herd.	-	-	-	-	-	+	-	-	-	-	-	-	-	-
19.	*Taraxacum ceratoforum* (Ledeb.) DC	+	+	-	-	-	-	-	-	-	-	-	-	-	-
	Boraginaceae														
20.	*Mertensia maritima* (L.) S.F. Gray	+	+	-	-	-	+	-	-	-	+	-	-	-	-
21.	*Mertensia pubescens* (Roem. et Schult.) DC	-	+	-	-	-	-	-	-	-	-	-	-	-	-
	Campanulaceae														
22.	*Adenophora triphylla* Thunb.	+	-	-	-	-	+	-	-	-	-	-	+	-	-
23.	*Campanula lasiocarpa* Cham.	+	-	-	-	-	-	-	-	-	-	-	-	-	-
24.	*Campanula chamissonis* Fed.	-	+	-	-	-	-	+	-	-	-	-	-	-	-
	Clusiaceae														
25.	*Hypericum kamtschaticum* Ledeb.	+	-	-	-	-	-	-	-	-	-	-	-	-	-
	Ericaceae														
26.	*Rhododendron aureum* Georgi	-	-	-	-	-	-	+	-	-	-	-	-	-	-
27.	*Rhododendron camtschaticum* Pall.	+	+	-	-	-	-	+	-	-	-	-	-	-	-
28.	*Vaccinium vitis-idaea* (L.)	-	+	-	-	-	-	-	-	-	+	-	-	-	+
29.	*Vaccinium uliginosum* L.	-	+	-	-	-	-	-	-	-	-	-	-	-	-
	Fabaceae														
30.	*Trifolium repens* L.	+	+	+	-	-	+	-	+	+	-	-	+	-	-
31.	*Trifolium pacificum* Bobr.	-	-	-	-	-	-	-	-	-	-	-	+	-	-
32.	*Trifolium pratense* L.	+	-	-	-	-	-	-	-	-	-	-	+	-	-
33.	*Hedysarum sachalinense* B.Fedtsch.	-	-	-	-	-	+	-	-	-	-	-	+	-	-
34.	*Hedysarum confertum* (N.S. Pavlova)	+	+	-	-	-	+	-	-	-	-	-	-	-	-
35.	*Astragalus frigidus* (L.) A. Gray	-	+	-	-	-	-	-	-	-	-	-	-	-	-
36.	*Lathyrus japonicus* Willd.	-	+	-	-	-	-	+	-	-	+	-	+	+	-
37.	*Thermopsis lupinoides* (L.) Link.	-	+	-	-	-	-	-	-	-	+	-	-	-	-
38.	*Vicia cracca* L.	+	-	-	-	-	-	-	+	-	-	-	+	+	-

Table 2 (continued)

N	Species of plants	Species or subspecies of bumblebees													
		1	2	3	4a	4b	6	7a	7b	9	10	11a	11b	12	16
	Gentianaceae														
39.	*Swertia tetrapetala* (Pall.)	+	-	-	-	+	+	-	-	-	-	-	+	-	-
	Geraniaceae														
40.	*Geranium erianthum* DC	+	+	-	-	-	+	+	-	-	+	-	-	-	-
	Hemerocallidaceae														
41.	*Hemerocallis esculenta* Koidz.	-	-	-	-	-	-	-	-	-	-	-	+	-	-
	Iridaceae														
42.	*Iris setosa* Pall. ex Link.	-	-	-	-	-	+	-	-	-	+	-	-	-	-
	Lamiaceae														
43.	*Prunella asiatica* L.	+	-	-	-	-	-	-	-	-	-	-	-	-	-
44.	*Scutellaria strigillosa* Hemsl.	+	-	-	-	-	-	-	-	-	-	-	-	-	-
	Lobeliaceae														
45.	*Lobelia sessifolia* Lamb.	-	-	-	-	-	+	-	-	-	-	-	-	-	-
	Onargaceae														
46.	*Chamaenerion angustifolium* L.	+	-	-	-	-	-	-	-	-	-	-	+	-	-
	Ranunculaceae														
47.	*Delphinium brachycentrum* Ledeb.	-	-	-	-	-	-	-	-	-	+	-	-	-	-
48.	*Trollius miyabei* Sipl.	+	-	-	-	-	-	-	-	-	-	-	-	-	-
	Rosaceae														
49.	*Filipendula camtschatica* (Pall.) Maxim.	+	+	-	-	-	+	-	-	-	+	-	-	-	-
50.	*Rosa rugosa* Thunb.	+	+	-	-	+	+	-	-	-	-	-	+	-	-
51.	*Sanguisorba tenuifolia* Fisch. ex Link.	+	-	-	-	-	-	-	-	-	-	-	+	-	-
52.	*Sorbus sambucifolia* Cham. et Schlecht.	-	+	-	-	-	+	+	-	-	-	-	-	-	+
	Salicaceae														
53.	*Salix udensis* Trautv. et Mey.	-	+	-	-	-	-	-	-	-	-	-	-	-	+
	Scrophulariaceae														
54.	*Linaria japonica* Miq.	-	-	+	-	-	-	-	-	-	-	-	-	-	-
55.	*Pedicularis verticillata* L.	-	+	-	-	-	-	-	-	-	-	-	-	-	-
56.	*Pedicularis resupinata* L.	+	-	-	-	+	-	-	-	-	-	-	+	-	-
57.	*Pedicularis chamissonis* Stev.	+	+	-	-	-	-	+	-	-	+	-	-	-	-
58.	*Pedicularis oederi* Vahl	-	+	-	-	-	-	-	-	-	-	-	-	-	-
59.	*Pennellianthus frutescens* (Lamb.)	-	+	-	-	-	+	+	-	-	-	-	-	-	-
60.	*Rhinanthus minor* L.	+	-	-	-	-	-	-	-	-	-	+	-	-	-
61.	*Scrophularia grayana* Maxim.et Kom.	+	-	-	-	-	-	-	-	-	-	-	-	-	-

Remarks. The numbers of species and subspecies of bumble-bees in the head of table correspond to those in the Table 1.

Program) of the U.S. National Science Foundation, Grants Nos. DEB-9400821 and DEB-9505031, Theodore W. Pietsch, principal investigator; and by the Japan Society for the Promotion of Science, Grant No. BSAR-401, Kunio Amaoka, principal investigator.

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