

Bees of the Genus *Colletes* (Hymenoptera, Colletidae) from Central Asia Collected by the Kyushu University Expeditions

Kuhlmann, Michael
Department of Entomology, The Natural History Museum

<https://doi.org/10.5109/16145>

出版情報 : ESAKIA. 49, pp.15-20, 2009-12-21. Entomological Laboratory, Faculty of Agriculture,
Kyushu University
バージョン :
権利関係 :

Bees of the Genus *Colletes* (Hymenoptera, Colletidae) from Central Asia Collected by the Kyushu University Expeditions

Michael KUHLMANN

*Department of Entomology, The Natural History Museum, Cromwell Road, London
SW7 5BD, UK.*

Abstract. In the years 2000 to 2004 the Kyushu University Expeditions to Kazakhstan, Kyrgyzstan and western China collected 238 specimens of the bee genus *Colletes*, representing 19 species. The hitherto unknown female of *C. arsenjevi* Kuhlmann, 2006 is described.

Key words: taxonomy, Hymenoptera, Colletidae, *Colletes*, Kazakhstan, Kyrgyzstan, China.

Introduction

The Mediterranean Basin and Central Asia are the most important centres of bee diversity in the Palaearctic region (Michener 1979), with the latter being the least known. This especially applies to the largely unexplored bee fauna of western China. The *Colletes* fauna of Central Asia was first studied by Kuhlmann (2005), who listed 67 species with a considerable number of them only known from very few records or the type only. For this reason I was happy to have the opportunity to study fresh material collected by five expeditions of the Kyushu University from 2000 to 2004 as part of the project "Field Studies of Wild Bee Fauna and Pollination Biology for Combating Desertification and Planting Campaign in Asian Arid Areas" (Tadauchi 2005).

The goal of this short report is to deal with the bees of the genus *Colletes* collected by the Kyushu University expeditions in Kazakhstan, Kyrgyzstan and China and to describe the previously unknown female of *C. arsenjevi* Kuhlmann, 2006. In total, 238 specimens were collected, representing 19 species. For China, Kazakhstan and Kyrgyzstan, respectively, the following species are recorded for the first time: China: *C. arsenjevi*, *C. fodiens kirgisticus* Radoszkowski, 1868, *C. morawitzi* Noskiewicz, 1936, *C. similis* Schenck, 1853 and *C. wahrmani* Noskiewicz, 1959. Kazakhstan: *C. cinerascens* Morawitz, 1894. Kyrgyzstan: *C. annejohnae* Kuhlmann, 2003.

Species recorded

nigricans species group

Colletes eous Morice, 1904

Colletes eous Morice, 1904 – Morice 1904: 43-44.

Colletes cecrops Morice, 1904 – Morice 1904: 44-45.

Colletes porosicus Strand, 1921 – Strand 1921: 306-307.

Colletes illyricus Noskiewicz, 1936 – Noskiewicz 1936: 120-123.

Colletes dimidiatus eous Morice, 1904 – Warncke 1978: 339.

Specimens examined. [KAZAKHSTAN] 1♂, Ul'ken-Kaindy, Jabagly, 1800m, 5. ix. 2002 (R. Miyanaga).

Distribution. Portugal, Spain, France, Italy, Tunisia, Hungary, Croatia, Yugoslavia, Bulgaria, Greece, Turkey, Ukraine, Russia, Armenia, Azerbaijan, Kazakhstan, Kyrgyzstan, Tadzhikistan, Turkmenistan, Uzbekistan, Iran, India.

caspicus species group

Colletes anceps Radoszkowski, 1891

Colletes anceps Radoszkowski, 1891 – Radoszkowski 1891: 256.

Colletes caspicus anceps Radoszkowski, 1891 – Warncke 1978: 334-335.

Specimens examined. [CHINA] 1♀, East of Jerminay, Altay Prov., Xinjiang Uygur Aut. Reg., 1300m, 28. viii. 2002 (A. Dawut).

Distribution. Russia, Kazakhstan, Kyrgyzstan, Tadžikistan, Turkmenistan, Uzbekistan, Iran, Pakistan, China.

***Colletes morawitzi* Noskiewicz, 1936**

Colletes morawitzi Noskiewicz, 1936 – Noskiewicz 1936: 173-177.

Specimens examined. [CHINA] 1♀, near Sayram Lake, Ili Prov., Xinjiang Uygur Aut. Reg., 1970m, 25. viii. 2002 (R. Miyanaga); 1♂, East of Jerminay, Altay Prov., Xinjiang Uygur Aut. Reg., 1300m, 28. viii. 2002 (O. Tadauchi).

Distribution. Azerbaijan, Kazakhstan, Kyrgyzstan, Tadžikistan, Turkmenistan, Uzbekistan, Afghanistan. First record for China.

Floral record. *Melilotus suaveolens*.

squamosus species group

***Colletes wahrmani* Noskiewicz, 1959**

Colletes wahrmani Noskiewicz, 1959 – Noskiewicz 1959: 43-45.

Specimens examined. [CHINA] 1♂, Fukang, Changji Prov., Xinjiang Uygur Aut. Reg., 520m, 22. viii. 2002 (R. Muraö).

Distribution. Turkey, Kazakhstan, Turkmenistan, Uzbekistan, Pakistan, Mongolia. First record for China.

Floral record. *Tamarix* sp.

mixtus species group

***Colletes annejohnae* Kuhlmann, 2003**

Colletes annejohnae Kuhlmann, 2003 – Kuhlmann 2003: 727.

Specimens examined. [KAZAKHSTAN] 4♀, East of Taraz, Jambel Prov., 600m, 3. ix. 2002 (O. Tadauchi, R. Muraö). [KYRGYZSTAN] 1♀, Issyk-ata, 1300m, 22. viii. 2003 (O. Tadauchi).

Distribution. Kazakhstan. First record for Kyrgyzstan.

Floral record. *Tamarix* sp.

***Colletes kozlovi* Friese, 1913**

Colletes kozlovi Friese, 1913 – Friese 1913: 59.

Specimens examined. [KAZAKHSTAN] 2♂, East of

Taraz, Jambel Prov., 600m, 3. ix. 2002 (O. Tadauchi); 4♂, Kenen, near Otar, Jambel Prov., 20. viii. 2003 (O. Tadauchi). [CHINA] 4♀21♂, Fukang, Changji Prov., Xinjiang Uygur Aut. Reg., 520m, 22. viii. 2002 (R. Muraö, A. Dawut, O. Tadauchi); 2♂, Kuitun City, Ili Prov., Xinjiang Uygur Aut. Reg., 530m, 24. viii. 2002, (O. Tadauchi).

Distribution. Russia, Kazakhstan, Kyrgyzstan, Turkmenistan, Uzbekistan, Mongolia, China.

Floral record. *Tamarix* sp.

roborovskyi species group

***Colletes roborovskyi* Friese, 1913**

Colletes roborovskyi Friese, 1913 – Friese 1913: 59.

Specimens examined. [KAZAKHSTAN] 2♂, Big Almaty Lake, Almaty Prov., 1360m, 1. ix. 2002 (O. Tadauchi, R. Muraö); 3♀, Chilik, 3. ix. 2002 (R. Muraö). [KYRGYZSTAN] 3♀1♂, Issyk-ata, near Bishkek, 1650m, 22. viii. 2003 (O. Tadauchi).

Distribution. Turkey, Russia, Georgia, Azerbaijan, Kazakhstan, Kyrgyzstan, Tadžikistan, Turkmenistan.

arenarius species group

***Colletes arenarius* Morawitz, 1876**

Colletes arenarius Morawitz, 1876 – Morawitz 1876: 263-264.

Specimens examined. [KAZAKHSTAN] 1♂, Kogam, near Otrar, S. Kazakhstan Prov., 250m, 31. v. 2003 (O. Tadauchi).

Distribution. Kazakhstan, Tadžikistan, Turkmenistan, Uzbekistan.

flavicornis species group

***Colletes alicularis* Noskiewicz, 1936**

Colletes alicularis Noskiewicz, 1936 – Noskiewicz 1936: 260-264.

Specimens examined. [KAZAKHSTAN] 1♀2♂, NW of Tatti, Muyunkum desert, 562 – 325m, 15. v. 2004 (O. Tadauchi); 4♂, NW of Tatti, Muyunkum desert, Jambul Prov., 562m, 15. v. 2004 (R. Muraö).

Distribution. Kazakhstan, Tadžikistan, Turkmenistan.

***Colletes flavicornis* Morawitz, 1876**

Colletes flavicornis Morawitz, 1876 – Morawitz 1876: 267-268.

Specimens examined. [KAZAKHSTAN] 2♀20♂, Lake Charbinskoe, Chordara, Wof Tashkent, 180m, 30.iv. 2004 (O. Tadauchi, R. Murao); 3♂, Wof Kamsomolskoe, Kyzylkum desert, 1. v. 2004 (O. Tadauchi); 1♀, NW of Tatti, Muyunkum desert, 562 – 325m, 15. v. 2004 (O. Tadauchi); 1♂, NW of Tatti, Muyunkum desert, Jambul Prov., 562m, 15. v. 2004 (R. Murao).

Distribution. Kazakhstan, Turkmenistan, Uzbekistan.

***fodiens* species group**

***Colletes fodiens kirgiscus* Radoszkowski, 1868**

Colletes fodiens kirgiscus Radoszkowski, 1868 – Radoszkowski 1868: 77-78.

Specimens examined. [KAZAKHSTAN] 1♂, near Sternjak, Kokchetav District, 20. vii. 2002 (V. Kazenas, A. Jdanko, V. Rascheev); 2♀, near Sternjak, Kokchetav District, 25. vii. 2002 (V. Kazenas, A. Jdanko, V. Rascheev). [KYRGYZSTAN] 2♀, Arashan, near Karakol, E of Lake Issik-Kol, 1850m, 25. viii. 2004 (O. Tadauchi). [CHINA] 1♀, East of Jeminay, Altay Prov., Xinjiang Uygur Aut. Reg., 1300m, 28. viii. 2002 (O. Tadauchi).

Distribution. Turkey, Kazakhstan, Kyrgyzstan, Iran, Pakistan, Mongolia. First record for China.

Floral record. *Chondrilla* sp.

***Colletes similis* Schenck, 1853**

Colletes similis Schenck, 1853 (nec Robertson, 1904, nec Jørgensen, 1912) – Schenck 1853: 172.

Colletes picistigma Thomson, 1872 – Thomson 1872: 165-166.

Specimens examined. [KAZAKHSTAN] 3♂, Fabrighini, Almaty Pref., 850m, 26. v. 2000 (O. Tadauchi); 1♀1♂, Jabagly, S. Kazakhstan Prov., 1080m, 4. ix. 2002 (R. Murao); 13♂, Ul'ken-Kaindy, Jabagly, 1800m, 5. ix. 2002 (O. Tadauchi); 1♂, Aksu Valley, 950m, 6. ix. 2002 (R. Miyanaga); 2♀1♂, Jabagly, S. Kazakhstan Prov., 1080m, 7. ix. 2002 (O. Tadauchi). [CHINA] 1♀, East of Jeminay, Altay Prov., Xinjiang Uygur Aut. Reg., 1300m, 28. viii. 2002 (R. Miyanaga).

Distribution. Ireland, Great Britain, Portugal, Spain, Norway, Sweden, Netherlands, Belgium, France, Denmark, Germany, Switzerland, Austria, Finland, Poland, Czech Republic, Hungary, Italy, Slovenia, Yugoslavia, Romania, Greece, Morocco, Algeria, Tunisia, Cyprus, Syria, Israel, Jordan, Ukraine, Russia, Turkey, Georgia, Armenia, Azerbaijan, Kazakhstan, Kyrgyzstan, Tadžikistan, Turkmenistan,

Iran. First record for China.

Floral records. *Achillea* sp., *Mentha asiatica*, Compositae gen. et sp., Leguminosae gen. et sp., Umbelliferae gen. et sp.

***Colletes tuberculatus* Morawitz, 1894**

Colletes tuberculatus Morawitz, 1894 – Morawitz 1894: 80-81.

Colletes daviesanus tuberculatus Morawitz, 1894 – Warncke 1978: 349-350.

Specimens examined. [KAZAKHSTAN] 1♀, Big Almaty Lake, Almaty Prov., 1600 – 1850m, 28. viii. 2004 (O. Tadauchi).

Distribution. Ukraine, Turkey, Georgia, Kazakhstan, Kyrgyzstan, Tadžikistan, Turkmenistan, Uzbekistan, Iran, Pakistan.

***senilis* species group**

***Colletes mlokoszewiczi* Radoszkowski, 1891**

Colletes mlokoszewiczi Radoszkowski, 1891 – Radoszkowski 1891: 254.

Colletes brevicornis Perez, 1903 (nec Robertson, 1897) – Perez 1903: 226-227.

Colletes brachycerus Swenk, 1906 – Swenk 1906: 44.

Specimens examined. [KAZAKHSTAN] 1♀20♂, Uzenagash, Almaty Pref., 28. v. 2000 (D. Ahmatjan); 4♀4♂, Degeres, Almaty Pref., 850m, 28. v. 2000 (D. Ahmatjan); 2♂, Kurday, Almaty Pref., 880m, 28. v. 2000 (D. Ahmatjan); 11♀32♂, Nogaibay, Almaty Pref., 780m, (D. Ahmatjan, O. Tadauchi); 2♀, Jabagly, S. Kazakhstan Prov., 1080m, 4. ix. 2002 (R. Murao); 1♂, Aksu Valley, 950m, 6. ix. 2002 (R. Miyanaga). [KYRGYZSTAN] 2♂, Bishkek City, 27. v. 2000 (D. Ahmatjan); 1♂, Issyk-ata, 1300m, 27. v. 2000 (D. Ahmatjan); 1♀9♂, Krasnayarichika, 800m, 27. v. 2000 (O. Tadauchi); 1♀, Bishkek, 28. v. 2000 (D. Ahmatjan).

Distribution. Portugal, Spain, France, Switzerland, Austria, Czech Republic, Slovakia, Hungary, Italy, Croatia, Yugoslavia, Romania, Bulgaria, Greece, Turkey, Ukraine, Russia, Georgia, Azerbaijan, Kazakhstan, Kyrgyzstan, Tadžikistan, Turkmenistan, Uzbekistan.

Floral records. *Achillea* sp., *Brassica* sp., *Dianthus* sp., *Trifolium repens*, Compositae gen. et sp., Umbelliferae gen. et sp.

clypearis* species group**Colletes cinerascens* Morawitz, 1894**

Colletes cinerascens Morawitz, 1894 – Morawitz 1894: 80.

Specimens examined. [KAZAKHSTAN] 1♀2♂, Ul'ken-Kaindy, Jabagly, 1800m, 5. ix. 2002 (O. Tadauchi).

Distribution. Kyrgyzstan, Tadžikistan, Mongolia. First record for Kazakhstan.

***Colletes floralis* Eversmann, 1852**

Colletes floralis Eversmann, 1852 – Eversmann 1852: 46.

Colletes montanus Morawitz, 1876 – Morawitz 1876: 262-263.

Colletes suecica Auvillius, 1903 – Auvillius 1903: 214-215.

Colletes kudiensis Cockerell, 1924 – Cockerell 1924: 594-595.

Colletes yasumatsui Hirashima & Ikudome, 1989 – Ikudome 1989: 109-117.

Specimens examined. [KAZAKHSTAN] 1♂, Big Almaty Lake, Almaty Prov., 2000 – 2050m, 1. ix. 2002 (R. Muraó); 4♂, Ul'ken-Kaindy, Jabagly, 1800m, 5. ix. 2002 (O. Tadauchi, R. Miyanaga); 2♂, Kashi-Kaindy, Jabagly, 1700 – 1800m, 5.ix.2002 (O. Tadauchi, R. Miyanaga); 1♀, Aksu Valley, 950m, 6. ix. 2002 (R. Miyanaga); 1♀, Jabagly, S. Kazakhstan Prov., 1080m, 7. ix.2002 (O. Tadauchi).

Distribution. Spain, Ireland, Great Britain, France, Norway, Sweden, Germany, Switzerland, Austria, Italy, Finland, Poland, Czech Republic, Hungary, Greece, Turkey, Belarus, Russia, Georgia, Kazakhstan, Kyrgyzstan, Tadžikistan, Iran, Mongolia, India, Japan.

Floral records. *Tamarix* sp., Compositae gen. et sp.

***Colletes jankowskyi* Radoszkowski, 1891**

Colletes jankowskyi Radoszkowski, 1891 – Radoszkowski 1891: 253-254.

Colletes ventralis Perez, 1903 – Perez 1903: 225.

Colletes ventraliformis Cockerell, 1924 – Cockerell 1924: 595-596.

Specimens examined. [CHINA] 2♀, Xiangshan Park, Beijing, 20. viii. 2002 (R. Muraó).

Distribution. Russia, Tadžikistan, Mongolia, China.

marginatus* species group**Colletes chengtehensis* Yasumatsu, 1935**

Colletes chengtehensis Yasumatsu, 1935 – Yasumatsu 1935: 1-2, 35-36, Plate 1.

Colletes pallescens Noskiewicz, 1936 – Noskiewicz 1936: 468-469.

Colletes tsunekii Yasumatsu, 1948 – Yasumatsu 1946(1948): 19.

Colletes marginatus pallescens Noskiewicz, 1936 – Warncke 1978: 358.

Specimens examined. [KAZAKHSTAN] 2♂, Fabrichini, Almaty Pref., 850m, 26. v. 2000 (O. Tadauchi); 1♂, Kemertogan, Almaty Pref., 26. v. 2000 (D. Ahmatjan); 1♀, Uzenagash, Almaty Pref., 28. v. 2000 (D. Ahmatjan); 1♂, Almaty city, Almaty Pref., 29. v. 2000 (D. Ahmatjan); 2♀, Kenen, near Otar, Jambel Prov., 20. viii. 2003 (O. Tadauchi). [CHINA] 1♂, Kuitun City, Ili Prov., Xinjiang Uygur Aut. Reg., 530m, 24. viii. 2002 (O. Tadauchi); 1♀1♂, Jeminay County, Altay Prov., Xinjiang Uygur Aut. Reg., 27. viii. 2002 (R. Miyanaga).

Distribution. Austria, Hungary, Romania, former Yugoslavia, Greece, Ukraine, Russia, Georgia, Azerbaijan, Kazakhstan, Kyrgyzstan, Turkmenistan, Uzbekistan, Iran, Mongolia, China.

Floral records. *Brassica* sp., *Trifolium repens*, Leguminosae gen. et sp.

succinctus* species group**Colletes arsenjevi* Kuhlmann, 2006**

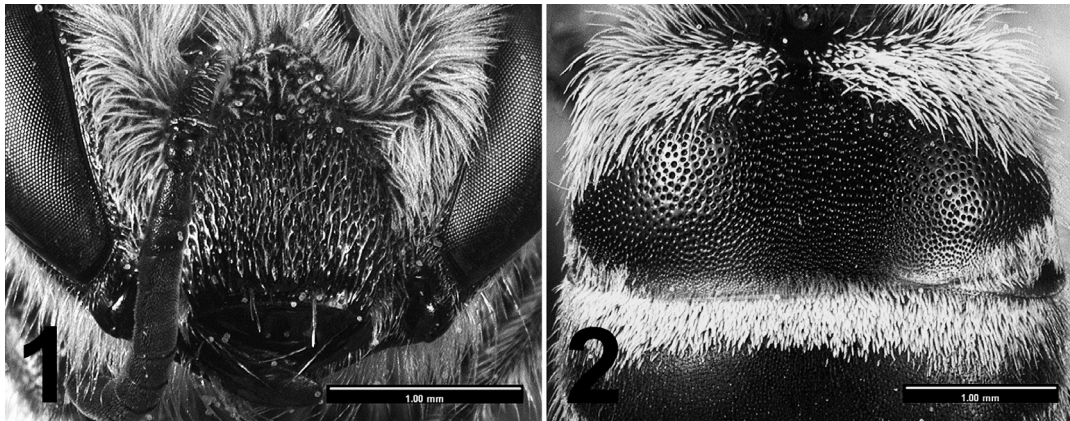
(Figs. 1, 2)

Colletes arsenjevi Kuhlmann, 2006 – Kuhlmann & Quest 2006: 2-4.

Specimens examined. [CHINA] 1♂, Jeminay County, Altay Prov., Xinjiang Uygur Aut. Reg., 27. viii. 2002 (R. Muraó); 2♀2♂, East of Jeminay, Altay Prov., Xinjiang Uygur Aut. Reg., 1300m, 28. viii. 2002 (R. Muraó, A. Dawut, O. Tadauchi).

Females of this species were collected for the first time. Because of the close resemblance of *C. arsenjevi* and the well known *C. brevigena* Noskiewicz, 1936 the description is limited to the differences between both species.

Diagnosis. In general morphology and especially in the diagnostically important sculpturing of the clypeus (Fig. 1), the punctation of T1 (Fig. 2) and the width of



Figs. 1-2. *Colletes arsenjevi* female. 1, clypeus. 2, punctation and pilosity of tergum 1.

apical tergal hair bands (Fig. 2), *C. arsenjevi* is identical with *C. brevigena*. The females of both species only differ in the diameter of punctures on the scutal disk, with the largest punctures of *C. arsenjevi* being about twice the diameter of those in *C. brevigena*. The unknown female of *C. standfussi* Kuhlmann, 2003 might resemble *C. arsenjevi* because the male of the former has a similarly coarse punctation of T1, but the apical tergal hair bands are narrower.

Neither the known distribution ranges of *C. brevigena* nor *C. standfussi* (only known from the type locality in NE Greece) overlap with that of *C. arsenjevi*.

Remarks. The apical tergal hair bands of the males of *C. arsenjevi* from western China are slightly broader than in specimens from Mongolia and the Russian Far East.

Distribution. Russia, Mongolia. First record for China.

Acknowledgement

I am very much indebted to Dr. Osamu Tadauchi, Fukuoka, for his generous permission to study the *Colletes* bees collected by the Kyushu University Expeditions. Special thanks to Andrew Polaszek for preparing the photographs and Gavin Broad for proof-reading the manuscript.

References

Aurivillius, C. 1903. Svensk Insektfauna. 13. Hymenoptera. 1. Gaddsteklar. Aculeata. *Ent. Tidskr.*, **24**: 129-218.
 Cockerell, T. D. A. 1924. Descriptions and records of bees. - *C. Ann. Mag. Nat. Hist.*, (9) **13**: 594-606.
 Eversmann, E. 1852. Fauna Hymenopterologica Volgo-Uralensis. *Bull. Soc. Nat. Moscou*, **25**: 1-137.
 Friese, H. 1913. Vorläufige Diagnosen von neuen Bienenarten,

die von den Expeditionen Roborovsky-Kozlov (1893-95) und von Kozlov (1899-1901) aus Centralasien mitgebracht wurden und im Zoologischen Museum der Kaiserl. Akademie der Wissenschaften in St. Petersburg aufbewahrt werden. *Ann. Mus. Zool. Acad. Imp. Sci. St.-Petersbourg*, **18**: 59-61.

Ikdome, S. 1989. A revision of the family Colletidae of Japan (Hymenoptera: Apoidea). *Bull. Inst. Minami-kyushu Reg. Sci.*, **5**: 43-314.
 Jørgensen, P. 1912. Revision der Apiden der Prov. Mendoza, Republica Argentina (Hym.). *Zool. Jb. Syst.*, **32**: 89-162.
 Kuhlmann, M. 2003. Zur Kenntnis paläarktischer Bienen der Gattung *Colletes* Latr. mit Beschreibung neuer Arten (Hymenoptera: Apidae: Colletinae). *Linzer biol. Beitr.*, **35**: 723-746.
 Kuhlmann, M. 2005. Faunistik und Zoogeographie der Bienenart *Colletes* Latreille 1802 (Hymenoptera: Apidae: Colletinae) in Mittelasien. *Linzer biol. Beitr.*, **37**: 1353-1396.
 Kuhlmann, M. & M. Quest 2006. A new species of the bee genus *Colletes* Latreille, 1802 (Hymenoptera: Colletidae) from the Russian Far East and Mongolia. *Far Eastern Ent.*, **157**: 1-4.
 Michener, C. D. 1979. Biogeography of the bees. *Annl. Miss. Bot. Gard.*, **66**: 277-347.
 Morawitz, F. 1876. Bienen (Mellifera). II. Andrenidae. In Fedtschenko, A. P. (ed.). Reisen in Turkestan I. *Izv. imp. Obshch. Ljubit. Estest. Antrop. Etnog.*, **21**: 161-303. 3 plates. (In Russian).
 Morawitz, F. 1894. Supplement zur Bienenfauna Turkestans. *Hor. Soc. Ent. Rossicae*, **28**: 1-87.
 Morice, F. D. 1904. Illustrations of the male terminal segments and armatures in thirty-five species of the hymenopterous genus *Colletes*. *Tr. R. Ent. Soc. London*, **1904**: 25-63. Plates VI-IX.
 Noskiewicz, J. 1936. Die paläarktischen *Colletes*-Arten. *Pr. Nauk. Wyd. Tow. Nauk. Lwowie*, **3**: 1-531.
 Noskiewicz, J. 1959. Weitere Beiträge zur Kenntnis der paläarktischen Arten der Gattung *Colletes* Latr. (Hym., Apidae). *Polskie Pismo ent.*, **29**: 35-53.
 Pérez, J. 1903. Espèces nouvelles de mellifères. *Proc. verb. Soc. linn. Bordeaux*, **58**: 78-93, 208-236.

- Radoszkowski, O. 1868. Matériaux pour servir à l'étude des insectes de la Russie. *Hor. Soc. Ent. Rossicae*, **5**: 73-90.
- Radoszkowski, O. 1891. Révision des armatures copulatrices des mâles du genre *Colletes*. *Hor. Soc. Ent. Rossicae*, **25**: 249-260.
- Robertson, C. 1897. North American bees – descriptions and synonyms. *Tr. Acad. Sci. St. Louis*, **7**: 315-356.
- Robertson, C. 1904. Synopsis of Anthophila. *Can. Ent.*, **36**: 37-43.
- Schenck, A. 1853. Nachtrag zu der Beschreibung nassauischer Bienenarten. *Jb. Ver. Naturkde. Herzogthum Nassau*, **9**: 88-306.
- Strand, E. 1921. Apidologisches, insbesondere über paläarktische *Halictus*-Arten, auf Grund von Material des Deutschen Entomologischen Museums. *Arch. Naturgesch.*, **87A**: 305-322.
- Swenk, M. H. 1906. New bees of the genus *Colletes*. *Can. Ent.*, **38**: 39-44.
- Tadauchi, O. 2005. Field studies on wild bee fauna and pollination biology for combating desertification and planting campaigns in Asian arid areas: A report for the year 2000 to 2004. *Esakia*, (45): 1-8.
- Thomson, C. G. 1872. *Hymenoptera Scandinaviae, Tom II. (Apis Lin.)*. Berling, Lund.
- Warncke, K. 1978. Über die westpaläarktischen Arten der Bienengattung *Colletes* Latr. (Hymenoptera, Apoidea). *Polskie Pismo ent.*, **48**: 329-370.
- Yasumatsu, K. 1935. Insect of Jehol (VIII)—Order Hymenoptera (II), Superfamily Apoidea. *Report of the first scientific expedition to Manchoukuo under the leadership of Shigeyasu Tokunaga, June – October 1933. Section V, Division I, Part XII, Article*, **67**: 1-47, 7 tables.
- Yasumatsu, K. 1946/1948. Hymenoptera Aculeata collected by Mr. K. Tsuneki in North China and Inner Mongolia. III. Apoidea. 1. *Mushi*, **17**: 19-26.