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To the knowledge of the bee genus *Colletes* Latreille, 1802 (Hymenoptera: Apoidea: Colletidae) of Dagestan, Russia

© M.Yu. Proshchalykin¹, M. Kuhlmann²
© М.Ю. Прощалыкин¹, М. Кульманн²

¹Federal Scientific Center of the East Asia Terrestrial Biodiversity, Russian Academy of Sciences, Far East Branch, 100 let Vladivostoku Avenue, 159, Vladivostok 690022 Russia. E-mail: proshchalikin@biosoil.ru
²Zoological Museum of Kiel University, Hegewischstraße, 3, Kiel D-24105 Germany. E-mail: mkuhlmann@zoolmuseum.uni-kiel.de


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Introduction

The Republic of Dagestan is the southernmost region of Russia located in the North Caucasus. The geographical situation, landscape diversity and the Caspian Sea create a diverse climate in Dagestan. The republic comprises five climatic and a number of geographical zones: from the sub-tropical Caspian lowland at twenty eight meters below the level of the world ocean up to the more than four thousand meters high snowly peaks of the Caucasus. Local summers are warm and long. Average winter temperature is 0–5 °C, average summer temperature is +25 °C [Maslov et al., 1957]. There are currently about 400 species of bees known from Dagestan [Proshchalykin, Astafurova, 2017], although this is undoubtedly a gross underrepresentation due to sparse sampling that has been done on the fauna, and new records and species are frequently discovered [Proshchalykin, Dathe, 2017; Proshchalykin et al., 2017; Fateryga, 2017; Fateryga et al., 2019]. Among the bees of Dagestan, the genus *Colletes* Latreille, 1802 is one of the least-studied genera.

The genus *Colletes* currently includes more than 500 described species with an estimated total of about 700 species [Kuhlmann, Proshchalykin, 2011] from most continents except Antarctica, Australia, and parts...
of Southeast Asia and Madagascar [Michener, 2007; Kuhlmann, 2014]. In recent years significant progress has been made towards a better knowledge of species of Colletes from Russia [Kuhlmann, Proshchalykin, 2011, 2014; Proshchalykin, Kuhlmann, 2012, 2015a]. Currently 45 species are known from this country [Proshchalykin, 2017a, b], but the Colletes fauna of the North Caucasus region including Dagestan is particularly understudied.

Hitherto, Colletes caspicus Morawitz, 1874 has been described from Dagestan, and in total only nine species have been recorded for this region [Morawitz, 1874; Skhirtdlez, 1984; Kuhlmann, Proshchalykin, 2014, 2016]. Based on a comprehensive study of specimens mainly collected in Dagestan and additional specimens from the collection of the Zoological Institute of the Russian Academy of Sciences, (St Petersburg, Russia), we here list 22 species of the genus Colletes, with six species newly recorded from Russia (C. asiaticus Kuhlmann, 1999, C. dorsalis Morawitz, 1888, C. edentulus Noskiewicz, 1936, C. hethiticus Warncke, 1978, C. uralensis Noskiewicz, 1936, and C. wollmanni Noskiewicz, 1936) and seven species newly recorded for Dagestan (C. brevigena Noskiewicz, 1936, C. carinatus Radoszkowski, 1891, C. eous Morice, 1904, C. floralis Eversmann, 1852, C. fodiens (Fourcroy, 1785), C. maidi Noskiewicz, 1936, and C. tuberculatus Morawitz, 1893). In total 51 Colletes species are now known from Russia.

The number of Dagestanian Colletes species is supposed to be at least one fourth higher than known so far. We expect that several species that are known from neighboring Azerbaijan, Georgia or North Caucasus regions of Russia also occur in Dagestan, such as C. hakkari Kuhlmann, 2002, C. morawitzi Noskiewicz, 1936, C. nasutus Smith, 1853, C. penulatus Noskiewicz, 1936, C. rubellus Noskiewicz, 1936, C. subnitiens Noskiewicz, 1936, or C. warnckeii Kuhlmann, 2002.

Additionally, a new lectotype is designated here for Colletes caspicus Morawitz, 1874 to avoid any confusion about the status and diagnosis of type specimens.

**Material and methods**

The results presented in this paper are based on 162 specimens mainly collected in 2017–2018 in various localities of Dagestan. We have used the following abbreviations for collectors: MM – M.V. Mokrousov; MP – M.Yu. Proshchalykin; YA – Yu.V. Astafurova; VL – V.M. Loktionov; and for collections in which specimens are deposited: FSCV – Federal Scientific Center of the East Asia Terrestrial Biodiversity of the Far Eastern Branch of the Russian Academy of Sciences (Vladivostok, Russia); OLBL – Biologizeum des Oberösterreichischen Landesmuseum (Linz, Austria); RCMK – Research collection of M. Kuhlmann (Kiel, Germany); ZISP – Zoological Institute of the Russian Academy of Sciences (St Petersburg, Russia).

The definition of species groups in Colletes follows Noskiewicz [1936] and Kuhlmann et al. [2009]. Hard brackets are used when information is added to specimen label information (e.g., geographical coordinates). The distribution of species generally follow that of Proshchalykin [2017a, b] and Proshchalykin and Kuhlmann [2018]. New distribution records are marked with an asterisk *.

**Colletes nigricans group**

**Colletes eous Morice, 1904**


**Material.** 1♂ (ZISP), 3 km NW Primorskoye, Samur Reserve, 41°52’00”N / 48°33’23”E, 6.06.2017 (MM); 3♂ (FSCV, ZISP), 20 km W Makhachkala, Barkhan Sarykum, 43°36’/N / 47°14’13”E, 23–24, 26.06.2018 (MP, VL, MM, YA); 1♀, 1♂ (FSCV), near Talgi vill., 42°52’35”N / 47°26’24”E, 25.06.2018 (MP, VL, MM); 3♂ (FSCV, ZISP), 6 km NW Rutul, near Kufa vill., 41°33’55”N / 47°21’43”E, 10.07.2018 (MP, VL, MM, YA).

**Distribution.** Russia (North Caucasus, including Dagestan*), European part, Crimea*; North Africa, Europe, Georgia, Azerbaijan, Turkey, Lebanon, Iran, Central Asia, India.

**Colletes carinatus group**

**Colletes radoszkowski Morawitz, 1884**


**Material.** 2♂ (FSCV, RCMK), near Talgi vill., 42°52’35”N / 47°26’24”E, 25.06.2018 (MP, VL, MM, YA).

**Distribution.** Russia (North Caucasus*, Crimea*); Europe, Caucasus, Central Asia.

**Colletes hylaeiformis group**

**Colletes hylaeiformis Eversmann, 1852**

Colletes hylaeiformis Eversmann, 1852: 45, ♀, ♂ (lectotype: ♀♀, designated Proshchalykin, 2017a: 32, Lower Volga region, Russia); 4♀, 2♂ (FSCV, ZISP), Derbent, 42°5’54”N / 48°17’17”E, 28–29.06.2018 (MP, VL, MM); 1♀, 1♂ (FSCV, near Talgi vill., 42°52’35”N / 47°26’24”E, 25.06.2018 (MP, VL, MM, YA).

**Distribution.** Russia (North Caucasus, including Dagestan*), European part, Crimea*; Europe, Georgia, Azerbaijan, Kazakhstan, Uzbekistan, Tajikistan.

**Colletes caspicus group**

**Colletes anceps Radoszkowski, 1891**


**Distribution.** Russia (Dagestan); Turkey, Central Asia, Iran, Afghanistan, Pakistan, China.

**Colletes caspicus Morawitz, 1874**

Remark. In an earlier paper [Proshchalykin, Kuhllmann, 2015b: 544] we erroneously designated a lectotype of *C. caspicus*. The species was described based on specimens collected in Derbent, a town in southern Dagestan. There was only a single female of *C. caspicus* in ZISP bearing a handwritten label by F. Morawitz that was collected in Fan ("Фану"). We assumed that this meant a place in or near Derbent. However, it turned out that Fan was a river in Tajikistan and that the label "12" meant the date of collection of this specimen (June 12, 1870) during the A. Fedchenko expedition to Turkestán. The actual collecting site of this specimen was Peti village at Fan River, 39°20'N / 68°30'E. Thus, the specimen designated by us was not a syntype and hence the lectotype designation was not valid according to International Code of Zoological Nomenclature [1999] article 74.2.

In the Warncke collection at the OLBL, we now found a single female *C. caspicus* with handwritten labels by F. Morawitz “Derbent.” and “caspicus Ἄ. F. Mor.” that represents a genuine syntype and is here designated as the lectotype instead.

Distribution. Russia (North Caucasus, European part, Crimea, Urals, Siberia); Europe, Georgia, Azerbaijan, Central Asia, Iran, China.

*Colletes maidli* Noskiewicz, 1936

*Colletes maidli* Noskiewicz, 1936: 166–168, ♀, ♂ (syntypes: 15♂, 2♀, Italy, Spain, Syria, Azerbaijan).

Material. 2♂, 1♀ (FSCV/ZISP), 13 km NE Kobuiebi, 44°26′35″N / 44°41′31″E, 18.06.2018 (MP, VL, MM, YA); ♀ (FSCV), 8 km SE Staroderechoe village, 43°47′34″/ 47°31′39″E, 19.06.2018 (MP, VL, MM); 1♀ (FSCV), 3 km SW Novoterechnoe village, 43°59′44″N / 47°19′35″E, 20.06.2018 (MP, VL, MM); ♀ (FSCV), 22 km SW Terekli-Mekteb, 44°23′35″N / 45°38′56″E, 21.06.2018 (MP, VL, MM); ♀ (FSCV), 20 km W Makhakhkala, Barkhan Sarykum, 43°03′36″N / 47°14′13″E, 23–24, 26.06.2018 (MP, VL, MM); ♂ (FSCV), near Talgi village, 42°23′35″N / 47°26′24″E, 25.06.2018 (MP, VL, MM); ♂ (FSCV), 6 km SE Novokavakent, 42°21′29″N / 48°02′34″E, 27.06.2018 (MP, VL, MM); ♂ (FSCV), Derbent, 42°5′54″N / 48°17′17″E, 26–29, 26.06.2018 (MP, VL, MM).

Distribution. Russia (North Caucasus, including Dagestan*, European part, Crimea, Arals, Siberia); Europe, Turkey, Azerbaijan, Iran, Kazakhstan, Kyrgyzstan, Pakistan, Mongolia.

*Colletes squamosus group*

*Colletes wollmanni* Noskiewicz, 1936


Material. 2♂ (ZISP), 10 km W Aglowa, Kamyschaki River valley, 41°54′29″N / 48°13′59″E, 21.08.2017 (MM); ♀ (FSCV), same locality, 29.06.2018 (MP, VL, MM); ♂, ♀ (FSCV), 20 km W Makhakhkala, Barkhan Sarykum, 43°3′36″N / 47°14′13″E, 23–24, 26.06.2018 (MP, VL, MM); ♀ (FSCV, ZISP), near Talgi village, 42°52′35″N / 47°26′24″E, 25.06.2018 (MP, VL, MM, YA).

Distribution. Russia (Dagestan*)*; Azerbaijan, Iran, Pakistan, Central Asia, China.

*Colletes mixtus group*

*Colletes koslovi* Friese, 1913


Material. 3♀, 2♂ (ZISP), Aleksandr Nevskiy station, Kuzlyar [43°51′N / 46°34′E], 11.06.1927 (Ostrov); 2♂ (ZISP), 3 km NW Primorsky, Samur Reserve, 41°52′0″N / 48°33′23″E, 6.06.2017 (MM); 1♀ (FSCV), 23 km N Kobuiebi, 44°36′4″N / 46°52′5″E, 17.06.2018 (MP, VL, MM); 2♀, 3♂ (FSCV), 13 km NE Kobuiebi, 44°26′35″N / 47°31′31″E, 18.06.2018 (MP, VL, MM); 5♂ (FSCV), Kuhllmann, 44°23′55″N / 46°32′29″E, 18.06.2018 (MP, VL, MM); 1♀ (FSCV), 22 km SW Terekli-Mekteb, 44°23′55″N / 45°38′56″E, 21.06.2018 (MP, VL, MM); ♂ (FSCV), 6 km SE Novokavakent, 42°21′29″N / 40′25″E, 27.06.2018 (MP, VL, MM); 3♀ (FSCV), 10 km W Aglowa, Kamyschaki River valley, 41°54′29″N / 48°13′59″E, 29.06.2018 (MP, VL, MM).

Distribution. Russia (North Caucasus, European part); Azerbaijan, Central Asia, Kazakhstan, China, Mongolia.

*Colletes fodiens group*

*Colletes edentulus* Noskiewicz, 1936


Material. 7♂ (FSCV), 6 km NW Rutul, near Kufa village, 41°33′55″N / 47°21′43″E, 1.07.2018 (MP, VL, MM).

Distribution. Russia (Dagestan*); Caucasus, Turkey, Turkmenistan.

*Colletes fodiens* Fourcroy, 1785

*Apis fodiens* Fourcroy, 1785: 444, ♀ (syntypes: ♀♀, northern France).

Material. 4♂ (FSCV), 6 km NW Rutul, near Kufa village, 41°33′55″N / 47°21′43″E, 1.07.2018 (MP, VL, MM).

Distribution. Russia (North Caucasus, including Dagestan*, European part, Arals, Siberia); Europe, Turkey, Azerbaijan, Iran, Kazakhstan, Kyrgyzstan, Pakistan, Mongolia.

*Colletes similis* Schenck, 1853

*Colletes similis* Schenck, 1853: 172, ♀ (syntypes: ♂♂, Germany); Kuhllmann, Proshchalykin, 2014: 217 (Sovetskoe, Avarskoe Koisui River).

Distribution. Russia (North Caucasus, European part, Crimea, Arals, Siberia); North Africa, Europe, Caucasus, Turkey, Syria, Jordan, Israel, Central Asia, China.

*Colletes tuberculatus* Morawitz, 1893


Material. 1♀ (FSCV), 20 km W Makhakhkala, Barkhan Sarykum, 43°3′36″N / 47°14′13″E, 23–24, 26.06.2018 (MP, VL, MM); 1♀ (FSCV), 6 km NW Gudvin village, 25.06.2018, 42°32′40″N / 47°29′59″E (MP, VL, MM); 1♂ (FSCV), Derbent, 42°5′54″N / 47°17′17″E, 28–29, 26.06.2018 (MP, VL, MM); 1♀ (FSCV), 6 km NW Rutul, near Kufa village, 41°33′55″N / 47°21′43″E, 1.07.2018 (MP, VL, MM).

Distribution. Russia (North Caucasus*, European part, Crimea); North Africa, Europe, Georgia, Armenia, Turkey, Jordan, Israel, Pakistan, Central Asia.

*Colletes sentis group*

*Colletes molossowiczii* Radozowski, 1891

Colletes clypearis group

Colletes asiasiticus Kuhlmann, 1999


Material. Russia (North Caucasus, European part, Crimea, Urals); Europe, Georgia, Azerbaijan, Turkey, Central Asia.

Distribution. Russia (North Caucasus, European part, Crimea, Urals); Europe, Georgia, Azerbaijan, Turkey, Central Asia.

Colletes clypearis group

Colletes asiasiticus Kuhlmann, 1999


Material. Russia (North Caucasus, European part, Crimea, Urals); Europe, Georgia, Azerbaijan, Turkey, Central Asia.

Distribution. Russia (North Caucasus, European part, Crimea, Urals); Europe, Georgia, Azerbaijan, Turkey, Central Asia.

Colletes floralis Eversmann, 1852

Material.

Colletes floralis Eversmann, 1852: 46, ♂♀, (lectotype: ♂♀, designated by Proshchalykin, Astafurova, 2016: 4, Spasskoe, Orenburg Region, Russia).

Material. 1♂ (FSCV), 6 km NW Rutul, near Kufa vill., 41°33′55″N / 47°21′43″E, 1.07.2018 (MP, VL, MM).

Distribution. Russia (Dagestan)*, Azerbaijan, Turkey, Iran, Turkmenistan.

Colletes succinctus brevigena


Material. 3♂ (FSCV, RCMK), near Talgi vill., 42°52′35″N / 47°26′24″E, 25.06.2018 (MP, VL, MM).

Distribution. Russia (North Caucasus*, Crimea); Europe, Turkey, Azerbaijan, Iran.

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Material. 8♂, 4♀ (FSCV), 6 km NW Rutul, near Kufa vill., 41°33′55″N / 47°21′43″E, 1.07.2018 (MP, VL, MM).

Distribution. Russia (North Caucasus, European part, Crimea); North Africa, Europe, Caucasus, Turkey, Syria, Iran, Tajikistan, Kyrgyzstan.

Colletes albacusculatus group

Colletes albacusculatus (Lucas, 1849)

Material. 1♂ (FSCV), 6 km NW Rutul, near Kufa vill., 41°33′55″N / 47°21′43″E, 1.07.2018 (MP, VL, MM).

Distribution. Russia (Dagestan)*; Caucasus, Turkey, Central Asia, Iran.

Colletes uralensis group

Colletes uralensis Noskiewicz, 1936

Material. Russia (North Caucasus, European part, Crimea, Urals, Siberia, Far East); Georgia, Turkey, Iran, Central Asia, India, Mongolia, Japan.

Material.


Material. 1♂ (RCMK), 20 km W Makhachkala, Barkhan Sarykum, 43°0′36″N / 47°14′13″E, 31.05.2017 (MM).

Distribution. Russia (Dagestan)*; Kazakhstan, Tajikistan, China.