

New and little-known bees of the genus *Hylaeus* Fabricius, 1793 (Hymenoptera, Colletidae) from the Caucasus region

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Abstract

New records on 32 species of the genus *Hylaeus* Fabricius, 1793 (Hymenoptera: Colletidae) from the Caucasus region are presented. *Hylaeus alievi* Dathe & Proshchalykin, **sp. nov.** is described from Azerbaijan. Eight species are newly recorded from the Caucasus: *Hylaeus araxanus* (Warncke, 1981), *H. excelsus* (Alfken, 1936), *H. intermedius* Förster, 1871, *H. iranicus* Dathe, 1980, *H. kotschius* (Warncke, 1981), *H. oblitus* (Warncke, 1972), *H. soror* (Pérez, 1903), and *H. trifidus* (Alfken, 1936). In addition, ten species are newly recorded for Armenia, nine for Azerbaijan, four for Russia, and one for Georgia. An updated checklist of the 54 species of *Hylaeus* so far known from the Caucasus region is provided.

Keywords

Anthophila, Apiformes, fauna, new records, new species, Palaearctic

Introduction

The present study is the preliminarily last part of a series of papers dealing with the bees of the genus *Hylaeus* Fabricius, 1793 from the territory of the former Soviet Union (Proshchalykin and Dathe 2012, 2016a, 2016b; Dathe and Proshchalykin 2017,

2018; Proshchalykin 2017). Currently about 100 species are known from this area, but the *Hylaesus* fauna of the Caucasus region is particularly understudied.

The Caucasus region is a mountain area lying between the Black Sea and the Caspian Sea, representing part of the natural boundary between Europe and Asia. Geographically it is usually considered part of Western Asia, adjacent to northeastern Turkey and northwestern Iran. The northern edge of the Caucasus is known as the Ciscaucasus and the southern portion as the Transcaucasus. The Ciscaucasus contains the large majority of the Greater Caucasus Mountain range, also known as the Major Caucasus mountains. It includes the southern part of European Russia (Krasnodar Territory, Stavropol Territory, Adygea Republic, Karachay-Cherkessia Republic, Ingushetia Republic, Kabardino-Balkaria Republic, North Ossetia Republic – Alania, Chechnya Republic, and Dagestan Republic) and northern parts of Georgia and Azerbaijan. The Transcaucasus is bordered in the north by Russia, in the west by the Black Sea and Turkey, in the east by the Caspian Sea, and in the south by Iran. It includes the Caucasus Mountains and surrounding lowlands. All Armenia, Azerbaijan (excluding the northern parts) and Georgia (excluding the northern parts) are part of the South Caucasus (Kuhlmann and Proshchalykin 2016).

So far 45 *Hylaesus* species were recorded from the Caucasus (Ciscaucasus – 24; Transcaucasus – 45) (Dathe 1980a; Aliev 1986; Skhirtladze 2003; Kirkitadze and Japoshvili 2015; Ascher and Pickering 2021). Some *Hylaesus* records from Azerbaijan [*H. duckei* (Alfken, 1905), *H. rinki* (Gorski, 1852), *H. diplonymus* (Schulz, 1906) = *H. taeniolatus* Förster, 1871, *H. absolutus* (Gribodo, 1894) and *H. gazagnairei* (Vachal, 1891)] published by Aliev (1986) and Maharramov et al. (2015) are problematic, and these data are not included in the inventory list of Caucasian *Hylaesus* (Table 1).

Only two species of *Hylaesus* (*H. ibex* Morawitz, 1877 and *H. rugicollis* Morawitz, 1874) have been described on the basis of specimens from the Caucasus region by Morawitz (1874, 1877), but the discovery of a number of other species can be expected.

Based on a study of specimens in various collections, we here record specimen data of 32 species of *Hylaesus*, some of them rarely collected and little-known, with one species described as new, and nine species recorded from the Caucasus region for the first time. Including published records, a total of 54 species are now known from this region (Ciscaucasus – 30; Transcaucasus – 53) (Table 1).

Materials and methods

The results presented in this paper are based on 675 specimens newly collected in the Caucasus region and currently housed in the Zoological Institute, Russian Academy of Sciences (St. Petersburg, Russia, **ZISP**); Federal Scientific Center of the East Asia Terrestrial Biodiversity, Far Eastern Branch of Russian Academy of Sciences (Vladivostok, Russia, **FSCV**); Senckenberg Deutsches Entomologisches Institut (Müncheberg, Germany, **SDEI**) and Institute of Bioresources of Nakhchivan Branch of National Academy of Sciences of Azerbaijan (Nakhchivan, Azerbaijan, **IBNA**).

Here we use the following abbreviations for collectors:

KA	Kh. Aliyev;	VL	V. Loktionov;
MM	M. Maharramov;	VR	V. Rikhter;
MO	M. Mokrousov;	VZ	V. Zaitsev.
MP	M. Proshchalykin;		

The records are first sorted alphabetically according to the countries, and then chronologically according to the locality.

For the species distribution, we use the following terms from a European perspective:

Asia minor	Turkey (Asian part);
Near East	Arab states (especially Syria, Lebanon, Jordan, Iraq and Iran), Israel;
Middle East	Afghanistan, Pakistan;
Central Asia	Kazakhstan, Uzbekistan, Turkmenistan, Kyrgyzstan, Tajikistan;
Far East	Russian Far East; Mongolia, China and Japan are mentioned separately.

For detailed synonymy see Dathe and Proshchalykin (2018) and Özbek and Dathe (2020).

The specimens were studied with a stereomicroscope Olympus SZX12, the photos taken with a Leica Application Suite vs. 4.12. The stacks of digital images were processed using Helicon Focus 7.6.4.

List of species

1. *Hylaeus (Abrupta) cornutus* Curtis, 1831

Material examined. AZERBAIJAN: **Nakhichevan AR**, Shakhbuz, Shakhbuzkend, 22.VII.2018, (1 ♀), MP, KA, MM [FSCV]; Shakhbuz, Kolani, 24.VII.2018, (1 ♀), MP, KA, MM [FSCV]; Shakhbuz, Zarnatun, 24–25.VII.2018, (2 ♀, 2 ♂); idem, 18.VI.2019, (1 ♀), MP, KA, MM [FSCV]; Gahab, 12.VI.2019, (1 ♀), MP, KA, MM [FSCV]; Julfa, Daridagh, 16.VI.2019, (2 ♀, 1 ♂), MP, KA, MM [FSCV/IBNA]; Julfa, Gulistan, 16.VI.2019, (1 ♀, 5 ♂), MP, KA, MM [FSCV].

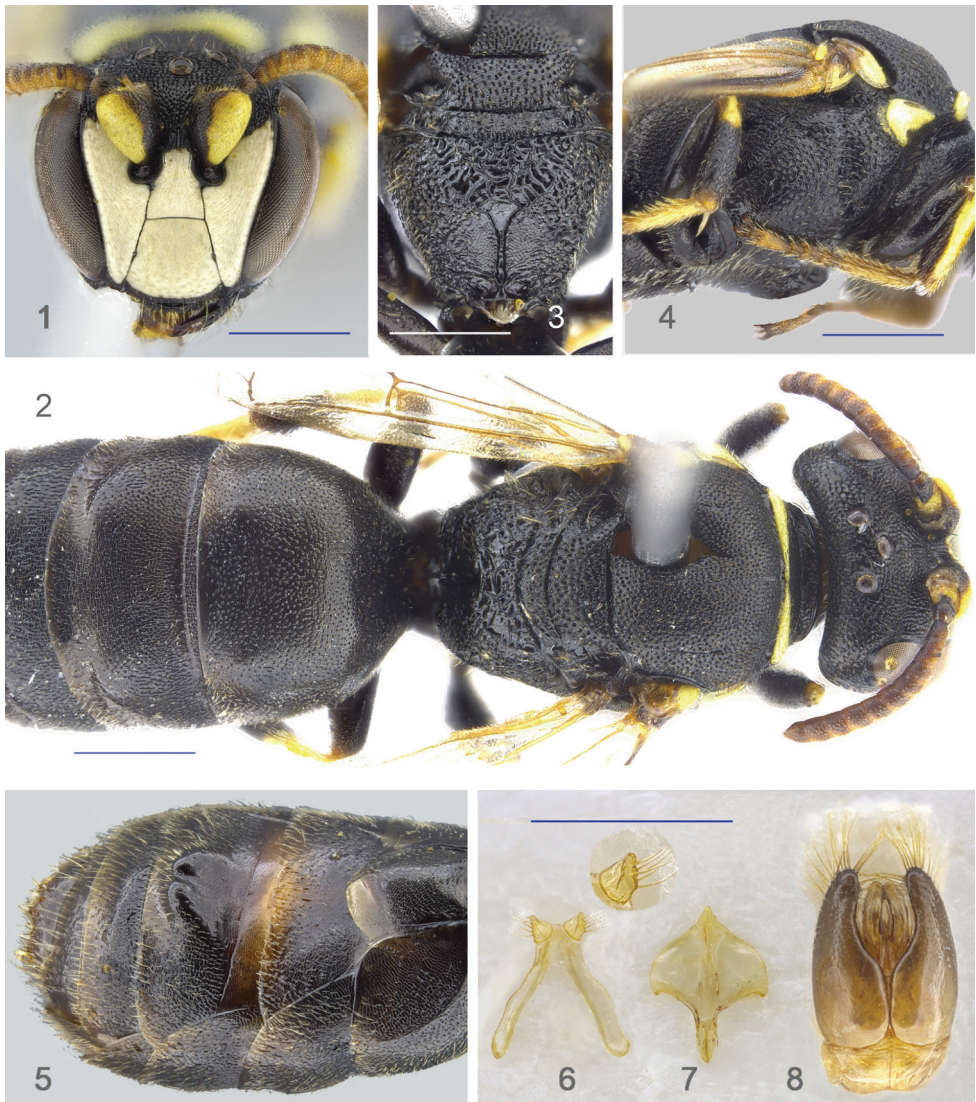
Distribution. Mediterranean to Central Asia.

2. *Hylaeus (Dentigera) alievi* Dathe & Proshchalykin, sp. nov.

<http://zoobank.org/ED9CA3D4-E406-495F-838C-1075F2AFF0FB>

Figures 1–8

Material examined. *Holotype*: ♂, AZERBAIJAN: **Nakhchevan Autonomous Republic**, Shakhbuz, Zarnatun, 39°31'N, 45°46'E, 1550 m, 18.VI.2019, M. Proshchalykin, Kh.



Figures 1–8. *Hylaetus (Dentigera) alievi* Dathe & Proshchalykin, sp. nov., holotype, male **1** head, frontal view **2** habitus, dorsal view **3** propodeum **4** mesopleuron **5** metasterna with bicuspid transverse callus on S3 **6** sternum **7** sternum **8** copulatory capsule. Scale bars: 0.5 mm.

Aliyev, M. Maharramov [FSCV]. **Paratypes:** ibid. 14.VI.2019 (4 ♂), 18.VI.2019 (3 ♂), 24.–25.VII.2018 (1 ♂); Sharur, Akhura 39°33'N, 45°13'E, 1640 m, 13.VI.2019 (4 ♂); Shakhbuz, Gizil Gishlag, 39°28'N, 45°35'E, 1460 m, 19.VI.2019 (1 ♂); leg. M. Proshchalykin, Kh. Aliyev, M. Maharramov [FSCV/SDEI].

Diagnosis. This is a small species of the *brevicornis* group with a short head. In the species of this group (Dathe 1980b: 232; Michener 2007: 204) the metasomal terga are distinctly shagreen and densely punctate; particularly characteristic is the genital capsule

of males with curved penis valves with basal tooth in dorsal view (Fig. 8). This male is hardly separable using conventional characters from similar species with a strongly thickened scape and blunt bicuspid transverse callus on S3. However, the peculiar shape of apical lobes of S7, with long bristles, is unique in the group. The female is unknown.

Description. Male. Number of specimens: 14. Total length 4.3–4.9 (mean 4.60) mm, wing length 2.7–3.3 (3.10) mm. — Head (Figs 1, 2) proportions: head length to width ratio 0.87–0.94 (mean 0.91), upper face width to lower face width ratio 1.42–1.59 (1.49); outline rounded-trapezoid. Pilosity short and sparse. Scapes black, laterally with expanded bright yellow area; strongly dilated, scape length to width ratio 1.22–1.59 (1.49). Flagella relatively short, blackened above, yellow below. Mask complete, white, side patch expanded beyond upper margin of scape base, pointed toward orbits. Foveae faciales short, close to the upper margin of the eye. Clypeus length to width ratio 1.11–1.21 (1.16); surface flat, silky-shiny, shagreen with shallow, sparse punctation, anterior margin black. Supraclypeal area white, black on the tip only, transition to the frons fluid. Frons and vertex shagreen with subcontiguous fine punctation; posterior of vertex punctured more coarsely and sparsely. Genae streaked with elongated punctation; occiput rounded; malae very narrow. Labrum black, the bifid mandibles black with brown tips. — Mesosoma (Figs 2–4). Oval, rounded; pilosity reduced, thorax and propodeum sparsely short-haired, also on underside. Coloration black, pronotum with yellow strip that can be narrowly interrupted in the middle, pronotal lobes (calli) totally, tegulae on anterior half yellow. Pronotum somewhat expanded, anterior margin narrow in the middle, dorsolateral angles blunt. Mesonotum (Fig. 2) shagreen, hardly shiny, punctation moderate, dense; scutellum posteriorly with coarser and more scattered punctation; mesopleura (Fig. 4) with punctation somewhat more disperse, anterior margin rounded. Legs black, with yellow anterior surface of foretibiae, base and tips of other tibiae as well as basitarsi, and white second tarsomere; remaining tarsomeres blackened; wings clear, venation brown. Propodeum (Fig. 3) rounded; basal area sharply net-wrinkled, shiny, laterally demarcated by a row of meshes; lateral areas finely wrinkled, matt; terminal area with finely sculptured surface, glossy, propodeal furrow narrow. — Metasoma (Figs 2, 5) cylindrical, coloration black. T1 strongly shagreen, matt with dull lustre, punctation fine, close; T2 and following terga more finely and densely punctate; lateral parts of terga with narrow fringes of cilia. S3 with an obliquely raised bicuspid transverse callus (Fig. 5). Terminalia (Figs 6–8): S7 with triangular apical lobes, laterally with six distinct long bristles on each lobus; S8 rhombiform, weakly sclerotized, apically with only a short, obtusely angled tip; genital capsule of the normal template; penis valves of brevicornis scheme, but only slightly curved and quite close together, in dorsal view shorter than the gonoforcpes.

Female. Unknown.

Etymology. We dedicate the new species to our friend and colleague Dr. Khalid Ali Aliyev (1949–2019) in his honorable memory. He added significantly to the knowledge of the bee fauna of Transcaucasia and was actively involved in the expeditions which yielded the material assessed here.

Distribution. Azerbaijan (Nakhichevan AR).

3. *Hylaeus (Dentigera) breviceps* Morawitz, 1876

Material examined. ARMENIA: Erevan, Berdadzor River, Zoo, 16.VI.1959, (2 ♀), VR [ZISP]; AZERBAIJAN: **Nakhichevan AR**, Shakhbuz, Kechili, 22.VII.2018, (3 ♂), MP, KA, MM [FSCV]; Shakhbuz, Zarnatun, 24–25.VII.2018, (19 ♀), MP, KA, MM [FSCV/IBNA]; idem, 14.VI.2019, (3 ♂), MP, KA, MM [FSCV]; Julfa, Milakh, 27.VII.2018, (1 ♂), MP, KA, MM [FSCV]; RUSSIA: **Dagestan Rep.**, 6 km SW of Gubden vill., 25.VI.2018, (1 ♀), MP, VL, MO [FSCV]; near Kufa vill., 6 km NW of Rutul, 1.VII.2018, (11 ♂), MP, VL, MO [FSCV].

Distribution. Caucasus, Central Asia, China.

Remarks. *Hylaeus araxanus* is herein recorded from Russia (Dagestan Rep.) and Armenia for the first time.

4. *Hylaeus (Dentigera) imparilis* Förster, 1871

Material examined. ARMENIA: Erevan, 14–20.VIII.1962, (4 ♂); idem, 8.IX.1962, (1 ♂), VR [ZISP]; AZERBAIJAN: **Nakhichevan AR**, Shakhbuz, Shakhbuzkend, 22.VII.2018, (3 ♂), MP, KA, MM [FSCV]; Shakhbuz, Kechili, 22.VII.2018, (4 ♀), MP, KA, MM [FSCV]; Shakhbuz, Zarnatun, 24–25.VII.2018, (25 ♀, 15 ♂); idem, 14.VI.2019, (3 ♀, 3 ♂); idem, 18.VI.2019, (2 ♀, 1 ♂), MP, KA, MM [FSCV/IBNA]; Julfa, Gazanchi, 27.VII.2018, (1 ♀), MP, KA, MM [FSCV]; Julfa, Milakh, 27.VII.2018, (1 ♀, 2 ♂), MP, KA, MM [FSCV]; Ordubad, Aghdara, 28.VII.2018, (4 ♀), MP, KA, MM [FSCV]; Ordubad, Nurgut, 29.VII.2018, (1 ♀), MP, KA, MM [FSCV]; Shakhbuz, Shakhbuzkend, 30.VII.2018, (1 ♀, 1 ♂), MP, KA, MM [FSCV]; Gahab, 12.VI.2019, (1 ♀), MP, KA, MM [FSCV]; Sharur, Akhura, 13.VI.2019, (3 ♀, 2 ♂), MP, KA, MM [FSCV/IBNA]; Julfa, Gulistan, 16.VI.2019, (1 ♀, 1 ♂), MP, KA, MM [FSCV]; Julfa, Dize, 20.VI.2019, (1 ♀), MP, KA, MM [FSCV]; RUSSIA: **Dagestan Rep.**, Derbent, 28–29.VI.2018, (1 ♀), MP, VL, MO [FSCV].

Distribution. West Palaearctic, Circum-Mediterranean, Asia Minor, Iran.

Remarks. *Hylaeus imparilis* is herein recorded from Russia (Dagestan Rep.) and Armenia for the first time.

5. *Hylaeus (Dentigera) intermedius* Förster, 1871

Material examined. ARMENIA: Erevan, Berdadzor River, Zoo, 16.VI.1959, (1 ♀), VR [ZISP]; Ekhegnadzorsky distr., Kavushug, 12.VII.1959, (1 ♀), VR [ZISP]; Erevan, 14–20.VIII.1962, (1 ♀), VR [ZISP]; Megri, 16.VIII.1959, (2 ♀), VR [ZISP]; AZERBAIJAN: **Nakhichevan AR**, Shakhbuz, Shakhbuzkend, 22.VII.2018, (1 ♂), MP, KA, MM [FSCV]; Shakhbuz, Zarnatun, 24–25.VII.2018, (2 ♀, 3 ♂); idem, 14.VI.2019, (3 ♀, 1 ♂); idem, 18.VI.2019 (2 ♀, 1 ♂), MP, KA, MM [FSCV]; Ordubad, Aghdara, 28.VII.2018, (5 ♀, 3 ♂); idem, 17.VI.2019, (1 ♀), MP, KA, MM [FSCV/IBNA]; Sharur, Akhura, 13.VI.2019, (10 ♂), MP, KA, MM [FSCV]; RUSSIA: **Dagestan Rep.**,

22 km SW of Terekli-Mekteb, 21.VI.2018, (2 ♀), MP, VL, MO [FSCV]; near Talgi vill., 25.VI.2018, (1 ♀), MP, VL, MO [FSCV].

Distribution. Central Europe, Circum-Mediterranean and Black Sea countries.

Remarks. *Hylaeus imparilis* is herein recorded from the Caucasus (Russia, Armenia, Azerbaijan) for the first time.

6. *Hylaeus (Dentigera) kabri* Förster, 1871

Material examined. Armenia: Erevan, 12.VI.1961, (1 ♀); idem, 14–20.VIII.1962, (2 ♀, 1 ♂); idem, 8.IX.1962, (1 ♂), VR [ZISP]; **AZERBAIJAN: Nakhichevan AR,** Shakhbuz, Shakhbuzkend, 22.VII.2018, (3 ♀), MP, KA, MM [FSCV]; Shakhbuz, Kechili, 22.VII.2018, (1 ♀), MP, KA, MM [FSCV]; Shakhbuz, Kolani, 24.VII.2018, (1 ♀), MP, KA, MM [FSCV]; Shakhbuz, Zarnatun, 24–25.VII.2018, (26 ♀, 6 ♂); idem, 14.VI.2019, (12 ♀, 19 ♂); idem, 18.VI.2019, (16 ♂), MP, KA, MM [FSCV/IBNA]; Ordubad, Aghdara, 28.VII.2018, (3 ♂), MP, KA, MM [FSCV]; Ordubad, Nurgut, 29.VII.2018, (1 ♀), MP, KA, MM [FSCV]; Sharur, Akhura, 13.VI.2019, (2 ♀, 1 ♂), MP, KA, MM [FSCV]; Julfa, Teyvaz, 15.VI.2019, (1 ♀), MP, KA, MM [FSCV].

Distribution. Western Europe to Iran; Mediterranean and Black Sea countries.

Remarks. *Hylaeus kabri* is herein recorded from Armenia for the first time.

7. *Hylaeus (Dentigera) pallidicornis* Morawitz, 1876

Material examined. AZERBAIJAN: Nakhichevan AR, Shakhbuz, Shakhbuzkend, 22.VII.2018, (9 ♀); idem, 30.VII.2018, (2 ♀), MP, KA, MM [FSCV]; Shakhbuz, Kechili, 22.VII.2018, (1 ♀), MP, KA, MM [FSCV]; Shakhbuz, Kolani, 24.VII.2018, (1 ♀), MP, KA, MM [FSCV]; Shakhbuz, Zarnatun, 24–25.VII.2018, (3 ♀); idem, 18.VI.2019, (2 ♂), MP, KA, MM [FSCV/IBNA]; Julfa, Gulistan, 26.VII.2018, (1 ♀), MP, KA, MM [FSCV]; Julfa, Milakh, 27.VII.2018, (1 ♀), MP, KA, MM [FSCV]; Babek, Sirab, 10.VI.2019, (1 ♀), MP, KA, MM [FSCV]; Sharur, Akhura, 13.VI.2019, (1 ♀, 2 ♂), MP, KA, MM [FSCV]; Julfa, Daridagh, 16.VI.2019, (1 ♀, 1 ♂), MP, KA, MM [FSCV]; Ordubad, Aghdara, 17.VI.2019, (1 ♂), MP, KA, MM [FSCV].

Distribution. Ukraine, Southern Russia, Caucasus, Central Asia, China.

Remarks. *Hylaeus pallidicornis* is herein recorded from Azerbaijan for the first time.

8. *Hylaeus (Hylaeus) angustatus* (Schenck, 1861)

Material examined. RUSSIA: Dagestan Rep., 22 km SW of Terekli-Mekteb, 21.VI.2018, (1 ♂), MP, VL, MO [FSCV]; near Talgi vill., 25.VI.2018, (1 ♀, 1 ♂), MP, VL, MO [FSCV]; near Kufa vill., 6 km NW of Rutul, 1.VII.2018, (1 ♂), MP, VL, MO [FSCV].

Distribution. Palaearctic (North Africa, Asia Minor, Caucasus, Near East, Central Asia, China, Siberia).

9. *Hylaeus (Hylaeus) araxanus* (Warncke, 1981)

Material examined. ARMENIA: Erevan, Berdadzor River, Zoo, 16.VI.1959, (1 ♀), VR [ZISP]; AZERBAIJAN: Nakhichevan AR, Shakhbuz, Shakhbuzkend, 22.VII.2018, (2 ♀, 1 ♂), MP, KA, MM [FSCV]; Shakhbuz, Zarnatun, 24–25.VII.2018, (2 ♀, 1 ♂), MP, KA, MM [FSCV]; Ordubad, Nurgut, 29.VII.2018, (1 ♀), MP, KA, MM [FSCV].

Distribution. Asia Minor, Caucasus, Iran, Central Asia.

Remarks. *Hylaeus araxanus* is herein recorded from the Caucasus (Armenia, Azerbaijan) for the first time.

10. *Hylaeus (Hylaeus) communis* Nylander, 1852

Material examined. ARMENIA: Erevan, 14–20.VIII.1962, (3 ♂), VR [ZISP]; AZERBAIJAN: Nakhichevan AR, Shakhbuz, Kechili, 22.VII.2018, (3 ♂), MP, KA, MM [FSCV]; Shakhbuz, Kolani, 24.VII.2018, (1 ♀), MP, KA, MM [FSCV]; Shakhbuz, Zarnatun, 24–25.VII.2018, (1 ♂); idem, 18.VI.2019, (2 ♂), MP, KA, MM [FSCV]; Julfa, Bayahmad, 27.VII.2018, (1 ♂), MP, KA, MM [FSCV]; Ordubad, Aghdara, 28.VII.2018, (3 ♂), MP, KA, MM [FSCV/IBNA]; Sharur, Akhura, 13.VI.2019, (2 ♂), MP, KA, MM [FSCV]; RUSSIA: Dagestan Rep., near Talgi vill., 25.VI.2018, (1 ♂), MP, VL, MO [FSCV].

Distribution. Holarctic.

11. *Hylaeus (Hylaeus) kotschisus* (Warncke, 1981)

Material examined. ARMENIA: Ashtarak, Kasakh River, 25.V.1961, (1 ♂), VR [ZISP]; AZERBAIJAN: Nakhichevan AR, Ordubad, Aghdara, 28.VII.2018, (1 ♀, 1 ♂), MP, KA, MM [FSCV]; Ordubad, Nurgut, 29.VII.2018, (5 ♀, 1 ♂), MP, KA, MM [FSCV/IBNA]; RUSSIA: Dagestan Rep., near Kufa vill., 6 km NW of Rutul, 1.VII.2018, MP, VL, MO [FSCV].

Distribution. East Mediterranean, Caucasus, Asia Minor.

Remarks. *Hylaeus kotschisus* is herein recorded from the Caucasus (Russia, Armenia, Azerbaijan) for the first time.

12. *Hylaeus (Hylaeus) leptcephalus* (Morawitz, 1871)

Material examined. ARMENIA: Megri, 16.VIII.1959, (1 ♀), VR [ZISP]; Erevan, 14–20.VIII.1962, (1 ♂), VR [ZISP]; AZERBAIJAN: Nakhichevan AR, Shakhbuz, Zarnatun, 24–25.VII.2018, (2 ♂); idem, 18.VI.2019, (1 ♂), MP, KA, MM [FSCV]; Julfa, Bayahmad, 27.VII.2018, (1 ♀), MP, KA, MM [FSCV]; Julfa, Milakh, 27.VII.2018, (1 ♀, 1 ♂), MP, KA, MM [FSCV]; Julfa, Gazanchi, 15.VI.2019, (1 ♂), MP, KA, MM [FSCV];

RUSSIA: Dagestan Rep., 20 km W of Makhachkala, Barkhan Sarykum, 23–24.VI.2018, (1 ♂), MP, VL, MO [FSCV]; near Talgi vill., 25.VI.2018, (1 ♂), MP, VL, MO [FSCV].

Distribution. Palaearctic (Europe, Asia Minor, Caucasus, Iran, Central Asia).

13. *Hylaeus (Hylaeus) moricei* (Friese, 1898)

Material examined. **ARMENIA:** Erevan, 14–20.VIII.1962, (♀, ♂), VR [ZISP]; **AZERBAIJAN: Nakhichevan AR,** Julfa, Bayahmad, 27.VII.2018, (1 ♂), MP, KA, MM [FSCV]; Julfa, Milakh, 27.VII.2018, (1 ♀, 1 ♂), MP, KA, MM [FSCV]; Ordubad, Aghdara, 28.VII.2018, (1 ♀, 1 ♂), MP, KA, MM [FSCV]; Sharur, Akhura, 13.VI.2019, (1 ♀), MP, KA, MM [FSCV]; Julfa, Gulistan, 16.VI.2019, (2 ♀, 1 ♂), MP, KA, MM [FSCV/IBNA]; **RUSSIA: Dagestan Rep.**, 8 km SE of Staroterechnoe vill., 19.VI.2018, (5 ♀), MP, VL, MO [FSCV].

Distribution. North Africa, Europe, Asia Minor, Caucasus, Iran, Central Asia.

14. *Hylaeus (Hylaeus) oblitus* (Warncke, 1972)

Material examined. **AZERBAIJAN: Nakhichevan AR,** Julfa, Gulistan, 16.VI.2019, (1 ♀, 1 ♂), MP, KA, MM [FSCV].

Distribution. Caucasus, Central Asia, Mongolia, China.

Remarks. *Hylaeus oblitus* is herein recorded from the Caucasus (Azerbaijan) for the first time.

15. *Hylaeus (Hylaeus) scutellaris* Morawitz, 1874

Material examined. **ARMENIA:** Megri, 16.VIII.1959, (1 ♀), VR [ZISP]; **AZERBAIJAN: Nakhichevan AR,** Julfa, Milakh, 27.VII.2018, (1 ♂); idem, 15.VI.2019, (1 ♀), MP, KA, MM [FSCV]; Shakhbuz, Zarnatun, 14.VI.2019, (1 ♀), MP, KA, MM [FSCV]; Julfa, Gulistan, 16.VI.2019, (4 ♂), MP, KA, MM [FSCV/IBNA]; **Russia: Dagestan Rep.**, 3 km SW of Novoterechnoe vill., 20.VI.2018, (1 ♀), MP, VL, MO [FSCV]; 20 km W of Makhachkala, Barkhan Sarykum, 26.VI.2018, (1 ♀), MP, VL, MO [FSCV].

Distribution. Southeastern Europe, Caucasus, Asia Minor, Middle East and Central Asia.

16. *Hylaeus (Hylaeus) tardus* (Warncke, 1981)

Material examined. **AZERBAIJAN: Nakhichevan AR,** Shakhbuz, Shakhbuzkend, 22.VII.2018, (2 ♀), MP, KA, MM [FSCV]; Shakhbuz, Zarnatun, 24–25.

VII.2018, (4 ♀, 1 ♂), MP, KA, MM [FSCV/IBNA]; Babek, Sirab, 10.VI.2019, (1 ♂), MP, KA, MM [FSCV]; Babek, 3 km NE of Sirab, 21.VI.2019, (1 ♀), MP, KA, MM [FSCV].

Distribution. Caucasus, Asia Minor, Iran.

17. *Hylaeus (Hylaeus) trifidus* (Alfken, 1936)

Material examined. ARMENIA: Megri, 16.VIII.1959, (3 ♀), VR [ZISP]; Erevan, 14–20.VIII.1962, (5 ♂), VR [ZISP]; AZERBAIJAN: **Nakhichevan AR**, Shakhbuz, Zarnatun, 24–25.VII.2018, (3 ♂), MP, KA, MM [FSCV].

Distribution. East Mediterranean, Caucasus, Asia Minor.

Remarks. *Hylaeus trifidus* is herein recorded from the Caucasus (Armenia, Azerbaijan) for the first time.

18. *Hylaeus (Koptogaster) punctulatus* Smith, 1842

Material examined. AZERBAIJAN: **Nakhichevan AR**, Sharur, Akhura, 13.VI.2019, (1 ♂), MP, KA, MM [FSCV]; Shakhbuz, Zarnatun, 14.VI.2019, (1 ♂), MP, KA, MM [FSCV].

Distribution. West Palaearctic, Asia Minor.

19. *Hylaeus (Lambdopsis) dilatatus* (Kirby, 1802)

Material examined. AZERBAIJAN: **Nakhichevan AR**, Shakhbuz, Zarnatun, 24–25.VII.2018, (1 ♂), MP, KA, MM [FSCV]; Ordubad, Nurgut, 29.VII.2018, (1 ♂), MP, KA, MM [FSCV]; RUSSIA: **Dagestan Rep.**, Derbent, 28–29.VI.2018, (1 ♂), MP, VL, MO [FSCV].

Distribution. North Africa, Europe, Asia Minor, Caucasus, Central Asia.

20. *Hylaeus (Paraprosopis) lineolatus* (Schenck, 1861)

Material examined. ARMENIA: Erevan, 12.VI.1961, (1 ♀); idem, 14–20.VIII.1962, (1 ♂), VR [ZISP]; Megri, 6.VIII.1959, (1 ♂), VR [ZISP]; AZERBAIJAN: **Nakhichevan AR**, Shakhbuz, Batabat, 24.VII.2018, (1 ♀), MP, KA, MM [FSCV]; Shakhbuz, Zarnatun, 24–25.VII.2018, (2 ♀, 3 ♂); idem, 14.VI.2019, (4 ♀, 6 ♂); idem, 18.VI.2019, (1 ♀, 1 ♂), MP, KA, MM [FSCV]; Julfa, Goydara, 26.VII.2018, (1 ♀), MP, KA, MM [FSCV]; Ordubad, Aghdara, 28.VII.2018, (4 ♀, 2 ♂); idem, 17.VI.2019, (1 ♂), MP, KA, MM [FSCV/IBNA]; Ordubad, Nurgut, 29.VII.2018, (1 ♂), MP, KA, MM [FSCV]; Shakhbuz, Kechili, 19.VI.2019, (1 ♀), MP, KA, MM [FSCV]; Sharur, Akhura, 13.VI.2019, (1 ♀, 1 ♂), MP, KA, MM [FSCV]; Julfa, Milakh, 15.VI.2019, (1 ♀),

MP, KA, MM [FSCV]; **RUSSIA: Dagestan Rep.**, 20 km W of Makhachkala, Barkhan Sarykum, 23–24.VI.2018, (2 ♂), MP, VL, MO [FSCV]; near Talgi vill., 25.VI.2018, (1 ♀), MP, VL, MO [FSCV]; Derbent, 28–29.VI.2018, (2 ♀), MP, VL, MO [FSCV].

Distribution. North Africa, Europe, Asia Minor, Caucasus, Near East, Central Asia.

Remarks. *Hylaeus lineolatus* is herein recorded from Armenia for the first time.

21. *Hylaeus (Paraprosopis) sinuatus* (Schenck, 1853)

Material examined. **AZERBAIJAN: Nakhichevan AR**, Shakhbuz, Kechili, 22.VII.2018, (1 ♀, 2 ♂), MP, KA, MM [FSCV]; Shakhbuz, Zarnatun, 24–25.VII.2018, (1 ♀, 1 ♂), MP, KA, MM [FSCV]; Ordubad, Nurgut, 29.VII.2018, (1 ♀), MP, KA, MM [FSCV]; **Georgia:** Bashiya from S to Verkhny Omalo, 18.VII.1959, (3 ♀, 25 ♂), VZ [ZISP].

Distribution. Europe, Russia, Asia Minor, Iran.

22. *Hylaeus (Paraprosopis) soror* (Pérez, 1903)

Material examined. **ARMENIA:** Erevan, Berdadzor River, Zoo, 16.VI.1959, (4 ♀, 4 ♂); idem, 14–20.VIII.1962, (1 ♀, 4 ♂), VR [ZISP]; Ashtarak, Kasakh River, 25.V.1961, (1 ♂), VR [ZISP]; **AZERBAIJAN: Nakhichevan AR**, Sharur, Akhura, 13.VI.2019, (4 ♂), MP, KA, MM [FSCV/IBNA]; Julfa, Gazanchi, 15.VI.2019, (1 ♀), MP, KA, MM [FSCV].

Distribution. West Palaearctic, Asia Minor.

Remarks. *Hylaeus soror* is herein recorded from the Caucasus (Armenia, Azerbaijan) for the first time.

23. *Hylaeus (Paraprosopis) styriacus* Förster, 1871

Material examined. **AZERBAIJAN: Nakhichevan AR**, Shakhbuz, Kechili, 22.VI. 2018, (4 ♀), MP, KA, MM [FSCV]; Ordubad, Nurgut, 29.VII.2018, (2 ♀), MP, KA, MM [FSCV/IBNA]; Shakhbuz, Zarnatun, 14.VI.2019, (1 ♀, 1 ♂), MP, KA, MM [FSCV].

Distribution. Europe, West Asian Russia, Asia Minor, Caucasus, Near Asia, Iran.

24. *Hylaeus (Prosopis) excelsus* (Alfken, 1936)

Material examined. **AZERBAIJAN: Nakhichevan AR**, Shakhbuz, Zarnatun, 18.VI.2019, (1 ♂), MP, KA, MM [FSCV]; Shakhbuz, Badamli, 19.VI.2019, (3 ♂), MP, KA, MM [FSCV].

Distribution. Asia Minor, Near East, Caucasus, Iran.

Remarks. *Hylaeus excelsus* is herein recorded from the Caucasus (Azerbaijan) for the first time.

25. *Hylaeus (Prosopis) hyrcanius* Dathe, 1980

Material examined. ARMENIA: Megri, 16.VIII.1959, (6 ♂), VR [ZISP]; Ashtarak, Kasakh River, 25.V.1961, (1 ♀), VR [ZISP]; RUSSIA: **Dagestan Rep.**, 8 km SE of Staroterechnoe vill., 19.VI.2018, (2 ♀), MP, VL, MO [FSCV]; 20 km W of Makhachkala, Barkhan Sarykum, 26.VI.2018, (1 ♀), MP, VL, MO [FSCV].

Distribution. Caucasus, Iran.

Remarks. *Hylaeus hyrcanius* is herein recorded from Armenia for the first time.

26. *Hylaeus (Prosopis) meridionalis* Förster, 1871

Material examined. AZERBAIJAN: **Nakhichevan AR**, Shakhbuz, Batabat, 24.VII.2018, (1 ♂), MP, KA, MM [FSCV]; Babek, 3 km NE of Sirab, 10.VI.2019, (1 ♂), MP, KA, MM [FSCV]; Babek, Payiz, 11.VI.2019, (1 ♂), MP, KA, MM [FSCV]; Sharur, Akhura, 13.VI.2019, (1 ♀), MP, KA, MM [FSCV]; Ordubad, Aghdara, 17.VI.2019, (1 ♂), MP, KA, MM [FSCV]; Shakhbuz, Kechili, 19.VI.2019, (5 ♂), MP, KA, MM [FSCV/IBNA]; RUSSIA: **Dagestan Rep.**, Izberbash, 27.VI.2018, MP, VL, MO [FSCV].

Distribution. Southern West Palaearctic, Caucasus, Central Asia.

27. *Hylaeus (Prosopis) rugicollis* Morawitz, 1874

Material examined. AZERBAIJAN: **Nakhichevan AR**, Shakhbuz, Shakhbuzkend, 22.VII.2018, (4 ♀), MP, KA, MM [FSCV]; Shakhbuz, Zarnatun, 24–25.VII.2018, (1 ♀), MP, KA, MM [FSCV]; Julfa, Gazanchi, 27.VII.2018, (2 ♀), MP, KA, MM [FSCV]; Babek, Payiz, 11.VI.2019, (1 ♀), MP, KA, MM [FSCV]; Goynuk, 12.VI.2019, (1 ♂), MP, KA, MM [FSCV]; Julfa, Milakh, 15.VI.2019, (1 ♀), MP, KA, MM [FSCV]; Julfa, Teyvaz, 15.VI.2019, (1 ♀), MP, KA, MM [FSCV]; Babek, 3 km NE of Sirab, 21.VI.2019, (1 ♀), MP, KA, MM [FSCV].

Distribution. Southeast Europe, Southwest Russia, Asia Minor, Near East, Caucasus, Iran, Central Asia.

28. *Hylaeus (Prosopis) signatus* (Panzer, 1798)

Material examined. AZERBAIJAN: **Nakhichevan AR**, Ordubad, Aghdara, 28.VII.2018, (1 ♂), MP, KA, MM [FSCV]; Babek, Sirab, 10.VI.2019, (8 ♂), MP, KA, MM [FSCV]; Babek, 3 km NE of Sirab, 12.VI.2019, (1 ♀), MP, KA, MM [FSCV]; Gahab, 12.VI.2019, (1 ♂), MP, KA, MM [FSCV]; Julfa, Daridagh, 16.VI.2019, (6 ♀), MP, KA, MM [FSCV]; Shakhbuz, Zarnatun, 18.VI.2019, (1 ♂), MP, KA, MM [FSCV]; Julfa, 5 km N of Dize, 20.VI.2019, (1 ♂), MP, KA, MM [FSCV]; RUSSIA: **Dagestan**

Rep., near Talgi vill., 25.VI.2018, (1 ♂), MP, VL, MO [FSCV]; near Kufa vill., 6 km NW of Rutul, 1.VII.2018, (2 ♀, 2 ♂), MP, VL, MO [FSCV].

Distribution. North Africa, Europe, Asia Minor, Caucasus, Central Asia.

29. *Hylaeus (Prosopis) variegatus* (Fabricius, 1798)

Material examined. ARMENIA: Ekhegnadzorsky distr., Kavushug, 12.VII.1959, (1 ♀), VR [ZISP]; Shaumyansky distr., Parakar, 3.VII.1981, (1 ♀), VR [ZISP]; AZERBAIJAN: **Nakhichevan AR**, Shakhbuz, Zarnatun, 24–25.VII.2018, (2 ♀, 2 ♂); idem, 14.VI.2019, (3 ♀, 8 ♂); idem, 18.VI.2019, (3 ♂), MP, KA, MM [FSCV]; Ordubad, Aghdara, 28.VII.2018, (2 ♂), MP, KA, MM [FSCV]; Ordubad, Nurgut, 29.VII.2018, (1 ♀, 1 ♂), MP, KA, MM [FSCV]; Sharur, Akhura, 13.VI.2019, (1 ♂), MP, KA, MM [FSCV]; Julfa, Gazanchi, 15.VI.2019, (5 ♂), MP, KA, MM [FSCV]; Julfa, Gulistan, 16.VI.2019, (3 ♂), MP, KA, MM [FSCV]; Ordubad, Aghdara, 17.VI.2019, (23 ♂), MP, KA, MM [FSCV]; GEORGIA: Bashiya from S to Verkhny Omalo, 18.VII.1959, (1 ♀), VZ [ZISP].

Distribution. Transpalearctic, from North Africa to Russian Far East, including Mongolia and China.

30. *Hylaeus (Prosopis) variolaris* Morawitz, 1876

Material examined. AZERBAIJAN: **Nakhichevan AR**, Sharur, Akhura, 13.VI.2019, (1 ♂), MP, KA, MM [FSCV]; Shakhbuz, Zarnatun, 18.VI.2019, (1 ♂), MP, KA, MM [FSCV].

Distribution. Caucasus, Asia Minor.

31. *Hylaeus (Spatulariella) iranicus* Dathe, 1980

Material examined. RUSSIA: **Dagestan Rep.**, Derbent, 28–29.VI.2018, (1 ♀), MP, VL, MO [FSCV]; near Kufa vill., 6 km NW of Rutul, 1.VII.2018, (2 ♀), MP, VL, MO [FSCV].

Distribution. Caucasus, Asia Minor, Iran.

Remarks. *Hylaeus iranicus* is herein recorded from Russia (Dagestan Rep.) for the first time.

32. *Hylaeus (Spatulariella) longimacula* (Alfken, 1936)

Material examined. ARMENIA: Erevan, Berdadzor River, Zoo, 16.VI.1959, (3 ♀); idem, 14–20.VIII.1962, (1 ♀, 5 ♂), VR [ZISP]; Ashtarak, Kasakh River, 25.V.1961, (1 ♀), VR [ZISP]; AZERBAIJAN: **Nakhichevan AR**, Shakhbuz, Kechili, 22.VII.2018, (1 ♀), MP, KA, MM [FSCV]; Babek, Sirab, 10.VI.2019, (2 ♀), MP, KA, MM [FSCV];

Table I. Checklist of the *Hylaeus* bees of the Caucasus.

No.	<i>Hylaeus</i> species	Ciscaucasus	Transcaucasus		
			Armenia	Azerbaijan	Georgia
1	<i>H. alievi</i> Dathe & Proshchalykin, sp. nov.			●	
2	<i>H. angustatus</i> (Schenck, 1861)	○●	○	○	○
3	<i>H. annulatus</i> (Linnaeus, 1758)			○	○
4	<i>H. araxanus</i> (Warncke, 1981)		●	●	
5	<i>H. armeniacus</i> (Warncke, 1981)		○	○	
6	<i>H. bifasciatus</i> (Jurine, 1807)			○	○
7	<i>H. breviceps</i> Morawitz, 1876	●	●	○●	
8	<i>H. brevicornis</i> Nylander, 1852	○		○	○
9	<i>H. clypearis</i> (Schenck, 1853)			○	○
10	<i>H. communis</i> Nylander, 1852	○	○	○	○
11	<i>H. confusus</i> Nylander, 1852	○	○	○	○
12	<i>H. cornutus</i> Curtis, 1831	○	○	○●	○
13	<i>H. difformis</i> (Eversmann, 1852)	○		○	○
14	<i>H. dilatatus</i> (Kirby, 1802)	○●	○	○●	○
15	<i>H. euryscapus</i> Förster, 1871			○	○
16	<i>H. excelsus</i> (Alfken, 1936)		○	●	
17	<i>H. gibbus</i> Saunders, 1850	○		○	○
18	<i>H. gracilicornis</i> (Morawitz, 1867)	○		○	
19	<i>H. gredleri</i> Förster, 1871	○		○	
20	<i>H. hungaricus</i> (Alfken, 1905)				○
21	<i>H. hyalinatus</i> Smith, 1842	○	○	○	○
22	<i>H. hyrcanius</i> Dathe, 1980	○●	●	○	
23	<i>H. ibex</i> Morawitz, 1877		○		○
24	<i>H. imparilis</i> Förster, 1871	●	●	○●	
25	<i>H. incongruus</i> Förster, 1871	○			○
26	<i>H. intermedius</i> Förster, 1871	●	●	●	
27	<i>H. inanicus</i> Dathe, 1980	●			
28	<i>H. kabri</i> Förster, 1871		●	○●	
29	<i>H. kotschisus</i> (Warncke, 1981)	●	●	●	
30	<i>H. leptcephalus</i> (Morawitz, 1871)	○●	○●	○●	○
31	<i>H. lineolatus</i> (Schenck, 1861)	○●	●	○●	○
32	<i>H. longimacula</i> (Alfken, 1936)		○●	○●	●
33	<i>H. meridionalis</i> Förster, 1871	○●		○●	
34	<i>H. moricei</i> (Friese, 1898)	○●	○●	○●	
35	<i>H. nigratus</i> (Fabricius, 1798)			○	○
36	<i>H. oblitus</i> (Warncke, 1972)			●	
37	<i>H. pallidicornis</i> Morawitz, 1876	○		●	
38	<i>H. pectoralis</i> Förster, 1871			○	
39	<i>H. pfankuchi</i> (Alfken, 1919)		○		
40	<i>H. pictipes</i> Nylander, 1852				○
41	<i>H. pictus</i> (Smith, 1853)			○	
42	<i>H. punctatus</i> (Brullé, 1832)			○	
43	<i>H. punctulatisimus</i> Smith, 1842	○		○●	○
44	<i>H. rugicollis</i> Morawitz, 1874	○	○	○●	
45	<i>H. scutellaris</i> Morawitz, 1874	○●	○●	○●	
46	<i>H. scutellatus</i> (Spinola, 1838)			○	
47	<i>H. signatus</i> (Panzer, 1798)	●		○●	○
48	<i>H. sinuatus</i> (Schenck, 1853)	○		○●	○●
49	<i>H. soror</i> (Pérez, 1903)		●	●	
50	<i>H. styriacus</i> Förster, 1871	○	○	○●	○
51	<i>H. tardus</i> (Warncke, 1981)			○●	
52	<i>H. trifidus</i> (Alfken, 1936)		●	●	
53	<i>H. variegatus</i> (Fabricius, 1798)	○	○●	○●	○●
54	<i>H. variolaris</i> Morawitz, 1876			○●	
Total:		30	27	48	26
				53	

White circles – published records (Dathe 1980a; Aliev 1986; Skhirtladze 2003; Kirkitadze and Japoshvili 2015; Ascher and Pickering 2021); black circles – current data.

Sharur, Akhura, 13.VI.2019, (2 ♀, 9 ♂), MP, KA, MM [FSCV]; Shakhbuz, Zarnatun, 14.VI.2019, (1 ♀, 6 ♂); idem, 18.VI.2019, (1 ♀, 5 ♂), MP, KA, MM [FSCV]; **GEORGIA:** Tbilisi, 10.VI.1959, (2 ♀), VZ [ZISP]; Bashiya from S to Verkhny Omalo, 18.VII.1959, (2 ♂), VZ [ZISP].

Distribution. North Africa, Asia Minor, Caucasus, Near East, Central Asia.

Remarks. *Hylaeus longimacula* is herein recorded from Georgia for the first time.

Conclusion

In total, 54 species of *Hylaeus* are recorded from the Caucasus (Table 1). This is a comparable number to the Iranian fauna – 52 species (Ascher and Pickering 2021), but distinctly less in comparison with the adjacent fauna of Turkey – 86 species (Özbek and Dathe 2020), and Central Asia – 70 species (Dathe and Proshchalykin 2018). The real number of species of *Hylaeus* in the Caucasus may be at least one third more. Further studies will certainly reveal many species new not only to Caucasian fauna but also to science.

It would be worthwhile to examine the Caucasus more closely also with regard to its zoogeographic features. From the genus *Hylaeus*, various elements of the Western Palaearctic, Near East and Central Asian faunas come together here. Genetic evidence from various animal groups had shown that glacial refugia existed in the Caucasus, from which parts of the Western Palaearctic were colonised postglacially, similarly to colonisation of large areas of Eastern Europe from the Ciscaucasus (Schmitt 2020).

We provide new information in support of this view (Table 1). Besides widespread Palaearctic species such as *Hylaeus communis*, *H. angustatus*, *H. moricei* or *H. variegatus*, representatives from the Mediterranean and Near East such as *H. imparilis*, *H. meridionalis*, *H. lineolatus*, *H. longimacula*, as well as Central Asian species such as *H. breviceps*, *H. oblitus* or *H. hungaricus* were found in the area. All this points to an intermediate character of the Caucasian fauna between several zoogeographical regions. However, a detailed faunistic analysis of the genus *Hylaeus* in the Caucasus is not yet possible, since a considerable number of its members apparently remains unrecorded for this area. This is also shown by the relatively numerous new records, eight for the Caucasus alone – *H. araxanus* (Warncke, 1981), *H. excelsus* (Alfken, 1936), *H. intermedius* Förster, 1871, *H. iranicus* Dathe, 1980, *H. kotschisus* (Warncke, 1981), *H. oblitus* (Warncke, 1972), *H. soror* (Pérez, 1903), and *H. trifidus* (Alfken, 1936) – as well as for individual countries, with ten species new for Armenia, nine for Azerbaijan, four for Russia, and one for Georgia.

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