

Myrmecofauna (Hymenoptera, Formicidae) of the yew-boxwood grove (Western Caucasus, Russia)

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Abstract. The data on the fauna and biotopic distribution of ants (Hymenoptera, Formicidae) in the yew-boxwood grove of the Caucasian State Natural Biosphere Reserve are presented. A total of 27 ant species were identified, belonging to 17 genera of 4 subfamilies (*Dolichoderinae*, *Ponerinae*, *Formicinae*, and *Myrmicinae*). The genera – *Lasius* F. and *Temnothorax* Mayr are the richest and include 5 species each. For the yew-boxwood grove, all species of ants are presented for the first time.

Introduction

Yew-boxwood grove – Is a small area of mixed deciduous forests of the Black Sea coast of the Caucasus with an area of 300 hectares, which is located 20 km south of Sochi (Krasnodar Territory). This territory is part of the Caucasian State Natural Biosphere Reserve and is isolated from the main territory. The investigated areas are located on the right and left banks of the river Khosta on the spurs of Mount Bolshoiy Akhun. The altitude interval of the terrain ranges from 40 to 520 m above sea level. The climate of the region is warm and humid. The average annual air temperature is + 14.5°C, the average annual precipitation is 1350 mm. The soil cover of the yew-boxwood grove is represented by humus-calcareous leached soils formed on Upper Cretaceous limestones with typical karst phenomena, an abundance of steep cliffs, sheer walls, and limestone slabs outcrops on the soil surface ([1]). According to the floristic zoning of the Caucasus ([2, 3]), the territory of the yew-boxwood grove belongs to the Tuapse-Adler floristic region.

The ant fauna of the yew-boxwood grove has not been specially studied. The literature contains only fragmentary information about some species of ants from the vicinity of the city of Sochi and Khosta. So, M.D. Ruzsky ([4, 5]) gives 10 species of ants, a little later V.A. Karavaiev in his works ([6, 7, 8, 9, 10]) indicates the finding of 7 species, and K.V. Arnoldi gives ([11]) one species – *Ponera coarctata* (Latreille, 1802). We could not find any other information concerning the ants fauna of the yew-boxwood grove in the literature, so the goal was set to study the species composition and biotopic distribution of ants in this area.

Materials and methods

The basis for writing this work was the material collected by us in 2018–2019 on the territory of a yew-boxwood grove, as well as collection by pitfall traps – Y. Chumachenko and A. Bibin (2016–2017).

In total, more than 2500 specimens of ants were collected. Most of the collected material is stored in 96% ethanol. All material was identified by the first author (Z. Yusupov) and is kept in the collection preserved of the Tembotov Institute of Ecology of Mountain Territories of Russian Academy of Science.

The collection of the material was carried out according to standard methods: manual collection using an exhaustor, the use of pitfall traps, and sifting.

Results and discussion

Currently, 27 species of ants belonging to 17 genera of 4 subfamilies (*Dolichoderinae*, *Ponerinae*, *Formicinae*, and *Myrmicinae*) have been reliably recorded for the yew-boxwood grove. The richest genus are *Lasius* F. (5 species) and *Temnothorax* Mayr (5 species). Some species from the genera – *Lasius* F., *Myrmica* Latr., and *Tetramorium* Mayr, require verification of their taxonomic status. According to our data, about 35 species of ants can be found on the territory of the yew-boxwood grove. Below is an annotated list of registered ant species.

Family Formicidae Latreille, 1802

Subfamily **Ponerinae** Lepeletier de Saint-Fargeau, 1835

1. *Hypoponera eduardi* (Forel, 1894).

Materials: 1 ♀, 43.530917°N, 39.877217°E, h = 102 m a.s.l., on rocky outcrops, 8.X.2019 (Z. Yusupov).

Distribution: Southern Europe, Canary Islands, North Africa, Caucasus, Transcaucasia, Asia Minor, Iran, Middle East ([12]).

Subfamily **Dolichoderinae** Forel, 1878

2. *Dolichoderus quadripunctatus* (Linnaeus, 1771)

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Materials: 2 w, beech-yew forest, 25.III.–6.VI.2017, pitfall traps (Y. Chumachenko); 1 w, 43.529667°N, 39.875300°E, h = 98 m a.s.l., hornbeam-ash forest, in the undergrowth, 9.V.2018 (Z. Yusupov); 2 w, 43.529467°N, 39.873583°E, h = 63 m a.s.l., maple-hornbeam forest, on a tree, 20.V.2019 (Z. Yusupov); 1 w, 43.530444°N, 39.869306°E, h = 190 m a.s.l., S slope, oak forest, on logs, 5.X.2019 (Z. Yusupov); 2 w, 1 ♀, 43.530917°N, 39.877217°E, h = 102 m a.s.l., on the trees, 8.X.2019 (Z. Yusupov).

Distribution: Central and Southern Europe, center and south of Eastern Europe, Caucasus, Transcaucasia, Asia Minor, south of Western Siberia, Tien Shan, Altai ([13-16]).

Subfamily **Formicinae** Latreille, 1809

3. *Camponotus fallax* (Nylander, 1856).

Materials: 1 w, beech-yew forest, 25.III.–6.VI.2017, pitfall traps (Y. Chumachenko); 2 w, in the same place, 17.VI.–31.VII.2017, pitfall traps (Y. Chumachenko).

Distribution: Europe, northwest Africa, Caucasus, Transcaucasia, Asia Minor, northwest Kazakhstan, Western Siberia ([17-19], [13-16]).

4. *Colobopsis truncata* (Spinola, 1808).

Materials: 1 w, 43.530917°N, 39.877217°E, h = 102 m a.s.l., on a tree, 8.X.2019 (Z. Yusupov).

Distribution: Central and Southern Europe, northwest Africa, Moldova, southern Ukraine, Caucasus, Asia Minor, Middle East, Kopetdag ([20, 16, 14, 15]).

5. *Formica cunicularia* Latreille, 1798.

Materials: 14 w, at the office building, 20.V.2013 (M. Karmokov); 3 w, 43.530333°N, 39.877806°E, h = 93 m a.s.l., on rocky outcrops, 21.V.2019 (Z. Yusupov).

Distribution: Europe, Caucasus, Transcaucasia, Asia Minor, south of Western Siberia, eastern Kazakhstan ([21], [13-15], [22]).

6. *Lasius brunneus* (Latreille, 1798).

Materials: 6 w, 43.530917°N, 39.877217°E, h = 102 m a.s.l., on the tree, 8.X.2019 (Z. Yusupov).

Distribution: Europe (north to south Sweden, Norway and England), Caucasus, Transcaucasia, Asia Minor, Middle East, Iran ([13, 16, 23, 14, 15]).

7. *Lasius emarginatus* (Olivier, 1792).

Materials: 12 w, boxwood, 29.VII.–10.IX.2016, pitfall traps (Y. Chumachenko); 12 w, in the same place, 10.IX.–4.X.2016, pitfall traps (Y. Chumachenko); 133 w, beech-yew forest, 25.III.–6.VI.2017, pitfall traps (Y. Chumachenko); 104 w, in the same place, 6–17.VI.2017, pitfall traps (Y. Chumachenko); 44 w, 3 ♀, in the same place, 17.VI.–31.VII.2017, pitfall traps (Y. Chumachenko); 22 w, 43.531983°N, 39.874217°E, h = 147 m a.s.l., ash-linden forest, in the undergrowth, 9.V.2018 (Z. Yusupov); 11 w, 43.529667°N, 39.875300°E, h = 98 m a.s.l., hornbeam-ash forest, in the undergrowth, 9.V.2018 (Z. Yusupov); 3 w, 43.530444°N, 39.869306°E, h = 190 m a.s.l., S slope, oak forest, in the litter, 5.X.2019 (Z. Yusupov); 1 w, 43.530917°N, 39.877217°E, h = 102 m a.s.l., on a tree, 8.X.2019 (Z. Yusupov).

Distribution: South and Central Europe, Caucasus, Transcaucasia, Asia Minor ([13, 23], [14-16]).

8. *Lasius neglectus* Van Loon, Boomsma et Andrasfalvy, 1990.

Materials: 48 w, river bank Khosta, above the floodplain terrace, nest under the bark of rotting wood, 27.IX.2018 (Z. Yusupov); 1 w, 43.530444°N, 39.869306°E, h = 190 m a.s.l., S slope, oak forest, in the litter, 5.X.2019 (Z. Yusupov).

Distribution: Europe, Caucasus, Transcaucasia, Iran, Asia Minor and Central Asia ([23-25], [14-16], [26]).

9. *Lasius* sp. 1.

Materials: 14 w, 43.530917°N, 39.877217°E, h = 102 m a.s.l., linden-ash forest, on the leaves of linden undergrowth, 19.V.2019 (Z. Yusupov); 4 w, 43.530444°N, 39.869306°E, h = 190 m a.s.l., S slope, oak forest, in the litter and on logs, 5.X.2019 (Z. Yusupov).

Remarks. This species is very similar to *L. niger*, but differs from it in the absence of erect hairs on the scape and in the presence of only 1-2 hairs on the tibia.

10. *Lasius* sp. 2.

Materials: 2 w, 43.530444°N, 39.869306°E, h = 190 m a.s.l., S slope, oak forest, in the litter and on logs, 5.X.2019 (Z. Yusupov); 3 w, 43.530917°N, 39.877217°E, h = 102 m a.s.l., on rocky outcrops, 8.X.2019 (Z. Yusupov).

Remarks. This species is similar to *L. tapinomoides* described from Greece ([27]).

11. *Nylanderia colchica* (Pisarski, 1960).

Materials: 15 w, 29.VII.–10.IX.2016, boxwood, pitfall traps (Y. Chumachenko); 10 w, in the same place, 10.IX.–4.X.2016, pitfall traps (Y. Chumachenko); 1 w, 1 ♀, beech-yew forest, 6–17.VI.2017, pitfall traps (Y. Chumachenko); 1 w, in the same place, 17.VI.–31.VII.2017, pitfall traps (Y. Chumachenko); 1 w, 43.529667°N, 39.875300°E, h = 98 m a.s.l., hornbeam-ash forest, in the undergrowth, 9.V.2018 (Z. Yusupov); 14 w, 44 ♂, river bank Khosta, above the floodplain terrace, nest in rotting wood, 27.IX.2018 (Z. Yusupov); 144 w, 1 ♀, in the same place, nest in the soil, 27.IX.2018 (Z. Yusupov); 47 w, 8 ♂, in the same place, nest in the litter, 27.IX.2018 (Z. Yusupov); 1 w, 43.530917°N, 39.877217°E, h = 102 m a.s.l., on a tree, 8.X.2019 (Z. Yusupov); 11 w, 43.528133°N, 39.876017°E, h = 32 m a.s.l., linden-beech forest, in the undergrowth, 8.X.2019 (Z. Yusupov).

Distribution: Western Caucasus and Western Transcaucasia ([28, 13]). It is also possible to be in the northeastern part of Turkey.

12. *Nylanderia flavipes* (Smith, 1874).

Materials: 15 w, 29.VII.–10.IX.2016, boxwood, pitfall traps (Y. Chumachenko); 3 w, in the same place, 10.IX.–4.X.2016, pitfall traps (Y. Chumachenko); 25 w, 1 ♀, 1 ♂, beech-yew forest, 25.III.–6.VI.2017, pitfall traps (Y. Chumachenko); 8 w, in the same place, 6–17.VI.2017, pitfall traps (Y. Chumachenko); 12 w, in the same place, 17.VI.–31.VII.2017, pitfall traps (Y. Chumachenko); 3 ♀, 15 ♂, 43.530917°N, 39.877217°E, h = 102 m a.s.l., linden-ash forest, on the log, 8.V.2018 (Z. Yusupov); 1 w, 1 ♀, 43.531983°N, 39.874217°E, h = 147 m a.s.l., ash-linden forest, on the ground, 9.V.2018 (Z. Yusupov); 5 w, 43.529667°N,

39.875300°E, h = 98 m a.s.l., hornbeam-ash forest, in the undergrowth, 9.V.2018 (Z. Yusupov); 22 w, 8 ♀, 8 ♂, in the same place, nest in the soil, 9.V.2018 (Z. Yusupov); 20 w, 7 ♀, 20 ♂, 43.529250°N, 39.875667°E, h = 101 m a.s.l., hornbeam forest, nest in the soil, in the litter, 9.V.2018 (Z. Yusupov); 91 w, 6 ♂, 43.528133°N, 39.876017°E, h = 32 m a.s.l., linden-beech forest, nest in the soil, in the litter, 26.IX.2018 (Z. Yusupov).

Distribution: China, Korea, Russia (Kuril Islands), Japan. Introduced to the USA ([29, 30]).

13. *Plagiolepis pallelescens* Forel, 1889.

Materials: 3 w, 43.530444°N, 39.869306°E, h = 190 m a.s.l., S slope, oak forest, in the litter, 5.X.2019 (Z. Yusupov).

Distribution: Central Europe, Italy, Balkans, Greece, steppe and forest-steppe of Eastern Europe, Caucasus, Transcaucasia, Kazakhstan, Central Asia, Crimea ([31, 32, 13]).

14. *Prenelepis nitens* (Mayr, 1853).

Materials: 140 w, 1 ♀, beech-yew forest, 25.III.–6.VI.2017, pitfall traps (Y. Chumachenko); 2 w, 43.529467°N, 39.873583°E, h = 63 m a.s.l., maple-hornbeam forest, on a tree, 20.V.2019 (Z. Yusupov); 19 w, 43.528133°N, 39.876017°E, h = 32 m a.s.l., linden-beech forest, in the undergrowth, 8.X.2019 (Z. Yusupov).

Distribution: Part of Central and Eastern Southern Europe, Asia Minor, Caucasus Black Sea coast ([16]).

Subfamily **Myrmicinae** Lepeletier de Saint-Fargeau, 1835

15. *Aphaenogaster subterranea* (Latreille, 1798).

Materials: 31 w, 1 ♀, 4 ♂, boxwood, 29.VII.–10.IX.2016, pitfall traps (Y. Chumachenko); 16 w, in the same place, 10.IX.–4.X.2016, pitfall traps (Y. Chumachenko); 58 w, beech-yew forest, 25.III.–6.VI.2017, pitfall traps (Y. Chumachenko); 30 w, in the same place, 6–17.VI.2017, pitfall traps (Y. Chumachenko); 20 w, in the same place, 17.VI.–31.VII.2017, pitfall traps (Y. Chumachenko); 4 w, 43.529667°N, 39.875300°E, h = 98 m a.s.l., hornbeam-ash forest, on the ground, 9.V.2018 (Z. Yusupov); 57 w, 43.529250°N, 39.875667°E, h = 101 m a.s.l., hornbeam forest, nest under the bark of a fallen tree, 9.V.2018 (Z. Yusupov); 3 w, 43.529467°N, 39.873583°E, h = 63 m a.s.l., maple-hornbeam forest, on a tree, 20.V.2019 (Z. Yusupov); 45 w, 4 ♀, 43.530333°N, 39.877806°E, h = 93 m a.s.l., rocky outcrops, nest in the soil, under a stone, 5.X.2019 (Z. Yusupov); 1 w, 43.530917°N, 39.877217°E, h = 102 m a.s.l., on a tree, 8.X.2019 (Z. Yusupov).

Distribution: Southern and Central Europe, Asia Minor, Middle East, Caucasus, Transcaucasia ([33, 34], [13–16]).

16. *Crematogaster schmidtii* (Mayr, 1853).

Materials: 1 w, 29.VII.–10.IX.2016, boxwood, pitfall traps (Y. Chumachenko); 1 w, beech-yew forest, 25.III.–6.VI.2017, pitfall traps (Y. Chumachenko); 3 w, 43.529667°N, 39.875300°E, h = 98 m a.s.l., hornbeam-ash forest, in the undergrowth, 9.V.2018 (Z. Yusupov); 1 ♀, 43.530333°N, 39.877806°E, h = 93 m a.s.l., rocky

outcrops, 30.IX.2018 (Z. Yusupov); 2 w, 43.529467°N, 39.873583°E, h = 63 m a.s.l., maple-hornbeam forest, on a tree, 20.V.2019 (Z. Yusupov); 29 w, 43.530917°N, 39.877217°E, h = 102 m a.s.l., on a tree, 8.X.2019 (Z. Yusupov).

Distribution: Austria, Hungary, Romania, Italy, Balkans, Greece, Asia Minor, Caucasus, Iran, Kopetdag ([16]).

17. *Myrmecina graminicola* (Latreille, 1802).

Materials: 1 w, boxwood, 29.VII.–10.IX.2016, pitfall traps (Y. Chumachenko); 2 w, in the same place, 10.IX.–4.X.2016, pitfall traps (Y. Chumachenko); 29 w, beech-yew forest, 25.III.–6.VI.2017, pitfall traps (Y. Chumachenko); 1 w, in the same place, 6–17.VI.2017, pitfall traps (Y. Chumachenko); 1 w, 43.529667°N, 39.875300°E, h = 98 m a.s.l., hornbeam-ash forest, on the ground, 9.V.2018 (Z. Yusupov); 8 w, 43.530917°N, 39.877217°E, h = 102 m a.s.l., linden-ash forest, nest in the soil, in the litter, 26.IX.2018 (Z. Yusupov); 2 w, 43.530917°N, 39.877217°E, h = 102 m a.s.l., on a tree and on rocky outcrops, 8.X.2019 (Z. Yusupov).

Distribution: Europe, northwest Africa, Middle East, Asia Minor, Caucasus, Transcaucasia ([13, 35], [14–16]).

18. *Myrmica ruginodis* Nylander, 1846.

Materials: 1 w, beech-yew forest, 25.III.–6.VI.2017, pitfall traps (Y. Chumachenko).

Distribution: Transpalearctic species, distributed from the Atlantic to the Pacific Ocean, including Japan; in the south of Europe lives in intrazonal, humid stations and in the mountains ([36–38], [13, 39, 40], [14–16]).

19. *Myrmica* sp.

Materials: 4 w, boxwood, 29.VII.–10.IX.2016, pitfall traps (Y. Chumachenko); 6 w, beech-yew forest, 25.III.–6.VI.2017, pitfall traps (Y. Chumachenko); 6 w, 1 ♀, in the same place, 6–17.VI.2017, pitfall traps (Y. Chumachenko); 8 w, in the same place, 17.VI.–31.VII.2017, pitfall traps (Y. Chumachenko); 4 w, 43.529667°N, 39.875300°E, h = 98 m a.s.l., hornbeam-ash forest, on the ground, 9.V.2018 (Z. Yusupov); 1 ♀, 43.530917°N, 39.877217°E, h = 102 m a.s.l., linden-ash forest, in the litter, 26.IX.2018 (Z. Yusupov); 24 w, 1 ♀, 43.529467°N, 39.873583°E, h = 63 m a.s.l., maple-hornbeam forest, nest in the litter, 20.V.2019 (Z. Yusupov).

Remarks. This species belongs to the *scabrinodis*-group. Very similar to *M. specioides*, but distinguished by significantly longer spines of propodeum.

20. *Solenopsis fugax* (Latreille, 1798).

Materials: 149 w, 3 ♂, river bank Khosta, above the floodplain terrace, nest in the soil, next to the nest *Lasius neglectus*, 27.IX.2018 (Z. Yusupov); 121 w, 11 ♀, 43.530333°N, 39.877806°E, h = 93 m a.s.l., rocky outcrops, nest in soil, between rock slabs, nuptial flight, 30.IX.2018 (Z. Yusupov).

Distribution: Southern and Central Europe (north to southern Sweden), south and center of Eastern Europe (north to Estonia), northwest Africa, Asia Minor, Middle East, Afghanistan, Caucasus, Transcaucasia,

south of Western Siberia, Kazakhstan, Central Asia ([41], [13-15]).

21. *Stenammina debile* (Smith, 1874).

Materials: 1 w, 2 ♀, boxwood, 10.IX.–4.X.2016, pitfall traps (Y. Chumachenko); 8 w, beech-yew forest, 25.III.–6.VI.2017, pitfall traps (Y. Chumachenko); 6 w, in the same place, 6–17.VI.2017, pitfall traps (Y. Chumachenko).

Distribution: Europe, Caucasus, Transcaucasia ([16]).

22. *Temnothorax affinis* (Mayr, 1855).

Materials: 1 w, beech-yew forest, 6–17.VI.2017, pitfall traps (Y. Chumachenko); 2 w, 43.531983°N, 39.874217°E, h = 147 m a.s.l., ash-linden forest, in the undergrowth, 9.V.2018 (Z. Yusupov); 1 w, 43.529467°N, 39.873583°E, h = 63 m a.s.l., maple-hornbeam forest, on the bush, 20.V.2019 (Z. Yusupov).

Distribution: Europe, Caucasus, Transcaucasia ([42, 43], [13-16]).

23. *Temnothorax braueri* (Ruzsky, 1905).

Materials: 1 w, boxwood, 29.VII.–10.IX.2016, pitfall traps (Y. Chumachenko); 1 w, beech-yew forest, 25.III.–6.VI.2017, pitfall traps (Y. Chumachenko); 2 w, in the same place, 6–17.VI.2017, pitfall traps (Y. Chumachenko); 1 w, in the same place, 17.VI.–31.VII.2017, pitfall traps (Y. Chumachenko); 1 w, 43.531983°N, 39.874217°E, h = 147 m a.s.l., ash-linden forest, in the undergrowth, 9.V.2018 (Z. Yusupov); 23 w, 43.529667°N, 39.875300°E, h = 98 m a.s.l., hornbeam-ash forest, in the undergrowth, 9.V.2018 (Z. Yusupov); 2 w, 43.530917°N, 39.877217°E, h = 102 m a.s.l., linden-ash forest, on bushes, 19.V.2019 (Z. Yusupov); 9 w, 43.529467°N, 39.873583°E, h = 63 m a.s.l., maple-hornbeam forest, on the bush, 20.V.2019 (Z. Yusupov); 27 w, 43.530333°N, 39.877806°E, h = 93 m a.s.l., on rocky outcrops, 21.V.2019 (Z. Yusupov); 54 w, 1 ♀, in the same place, nest in the soil, in the crack of the rock, 21.V.2019 (Z. Yusupov); 12 w, 43.530444°N, 39.869306°E, h = 190 m a.s.l., S slope, oak forest, on logs, 5.X.2019 (Z. Yusupov); 6 w, 43.530917°N, 39.877217°E, h = 102 m a.s.l., on a tree and on rocky outcrops, 8.X.2019 (Z. Yusupov).

Distribution: Western Caucasus and Transcaucasia ([5, 44, 45, 43]).

24. *Temnothorax crasecundus* Seifert et Csösz, 2015.

Materials: 6 w, beech-yew forest, 25.III.–6.VI.2017, pitfall traps (Y. Chumachenko); 2 w, in the same place, 6–17.VI.2017, pitfall traps (Y. Chumachenko); 1 w, in the same place, 17.VI.–31.VII.2017, pitfall traps (Y. Chumachenko); 4 w, 43.529467°N, 39.873583°E, h = 63 m a.s.l., maple-hornbeam forest, on the bush, 20.V.2019 (Z. Yusupov).

Distribution: Southern Europe, southern Eastern Europe, Caucasus, Transcaucasia, Asia Minor ([46]).

25. *Temnothorax tuberum* (Fabricius, 1775).

Materials: 3 w, boxwood, 10.IX.–4.X.2016, pitfall traps (Y. Chumachenko); 4 w, beech-yew forest, 6–17.VI.2017, pitfall traps (Y. Chumachenko); 62 w, 1 ♀, 43.530333°N, 39.877806°E, h = 93 m a.s.l., rocky outcrops, nest in the crack of the rock, 21.V.2019 (Z. Yusupov); 107 w, 1 ♀, in the same place, 21.V.2019

(Z. Yusupov); 4 w, 43.530444°N, 39.869306°E, h = 190 m a.s.l., S slope, oak forest, in litter, 5.X.2019 (Z. Yusupov); 28 w, 43.530917°N, 39.877217°E, h = 102 m a.s.l., on a tree and on rocky outcrops, 8.X.2019 (Z. Yusupov).

Distribution: Europe, Caucasus, Transcaucasia, Asia Minor, south of Western Siberia, northern Kazakhstan, Tien Shan, Altai ([43], [13-16]).

26. *Temnothorax unifasciatus* (Latreille, 1798).

Materials: 114 w, 43.530333°N, 39.877806°E, h = 93 m a.s.l., rocky outcrops, nest in the crack of the rock, 30.IX.2018 (Z. Yusupov); 11 w, 43.530444°N, 39.869306°E, h = 190 m a.s.l., S slope, oak forest, on logs, 5.X.2019 (Z. Yusupov); 14 w, 43.530917°N, 39.877217°E, h = 102 m a.s.l., on a tree and on rocky outcrops, 8.X.2019 (Z. Yusupov).

Distribution: Europe, Morocco, Caucasus, Transcaucasia, Asia Minor, Kopetdag ([16]).

27. *Tetramorium* cf. *caespitum* (Linnaeus, 1758).

Materials: 97 w, 43.530333°N, 39.877806°E, h = 93 m a.s.l., rocky outcrops, nest in the soil, on rocky outcrops, 30.IX.2018 (Z. Yusupov); 1 w, 43.530917°N, 39.877217°E, h = 102 m a.s.l., on a tree, 8.X.2019 (Z. Yusupov).

Remarks. Given the difficulty in identification ants of the *caespitum*-group, we designate this taxon here as close to *T. caespitum*.

In the zoogeographic aspect, the ant fauna of the yew-boxwood grove has a mixed character. As can be seen from Table 1, is dominated European-Caucasian (30.5%) and Mediterranean (26%) species, but also present European-West Siberian (13%), Trans-Palaeartic (4.3%), Balkan-Caucasian (4.3%) and East-Asian (4.3%) species. In addition, given that this region of the Greater Caucasus belongs to the Colchics floristic region, with original and distinctive flora and fauna, the Colchian species proper are also present among the ants – *Nylanderia colchica* and *Temnothorax braueri*.

For a long time, the Black Sea coast of the Caucasus was an introduction place for many plant species, and most likely, along with the planting material, two invasive species were introduced there – *Lasius neglectus* and *Nylanderia flavipes*. The first species has a native range in the mountains of Central Asia ([26]), but at the same time it was introduced in many regions of Europe, the Caucasus, Transcaucasia, Iran, and Asia Minor ([23-25], [14-16]). The second species is native to East Asia (China, Korea and Japan) including for the Russian Far East (Kuril Islands) ([30]). Currently, this species has been introduced to the United States, Iran, and also in some European countries ([29]).

In relation to the humidity, mesoxerophiles (51.8%) and mesohygrophiles (40.7%) predominate, which is associated with the climatic conditions of the study area, where a humid climate prevails, but the amount of precipitation is unevenly distributed over the months, i.e. along with very rainy months, there are also present relatively dry periods. In addition, the region is also characterized by "physical dryness" associated with

outcrops of limestone, which almost everywhere in the yew-boxwood grove. In relation to the temperature in the ants' fauna of the yew-boxwood grove, mesothermo-thermophiles (59%) and thermophiles (26%) dominate, which is quite explainable by the high heat supply of this region. The predominant group of ant biomorphs in the fauna of the yew-boxwood grove are herpetobionts-zoonecrophagous (44.4%), but considering that almost the entire study area is occupied by forest cenoses, it is natural that dendro- and stratobionts-zoophagous are also most abundantly represented (29.6% and 22.2 % respectively).

Table 1. Zoogeographical and ecological classifications of the ant species of yew-boxwood grove. Zoogeographical and ecological characteristics (relation to humidity, to temperature), given according to W. Czechowski et al. ([15]), biomorphs – according to G.M. Dlussky ([47]). Zoogeographical elements: BC – Balkano-Caucasian, BM – boreo-montane, C – Colchics, EA – East-Asian, EC – Euro-Caucasian, EWS – Euro-West-Siberian, MD – Mediterranean, NP – North-Palaeartic, T – Tethyan. Ecological elements: relation to humidity (ranges of requirements): hyg–mes – hygro-mesohygrophile, mes – mesohygrophile, mes–xer – mesohygro-xerophile; relation to temperature (ranges of requirements): oli–mte – oligo-mesothermophile, mte – mesothermophile, mte–ter – mesothermo-thermophile, ter – thermophile.

№	Species	Zoogeographical elements	Humidity requirements	Temperature requirements
1	<i>A. subterranea</i>	MD	mes	mte
2	<i>Ca. fallax</i>	EWS	mes	ter
3	<i>Co. truncata</i>	MD	mes–xer	ter
4	<i>Cr. schmidti</i>	MD	mes–xer	ter
5	<i>D. quadripunctatus</i>	EWS	mes	mte–ter
6	<i>F. cunicularia</i>	EWS	mes–xer	mte–ter
7	<i>H. eduardi</i>	MD	hyg–mes	mte–ter
8	<i>L. brunneus</i>	EC	mes	mte–ter
9	<i>L. emarginatus</i>	EC	mes–xer	mte–ter
10	<i>L. neglectus</i>	MD	mes–xer	mte–ter
11	<i>L. sp. 1.</i>	?	mes–xer	mte–ter
12	<i>L. sp. 2.</i>	?	mes–xer	mte–ter
13	<i>Myr. graminicola</i>	EC	mes	mte–ter
14	<i>My. ruginodis</i>	NP	hyg–mes	oli–mte
15	<i>My. sp.</i>	?	mes	mte–ter
16	<i>N. colchica</i>	C	mes	mte–ter
17	<i>N. flavipes</i>	EA	mes	mte–ter
18	<i>Pl. pallescens</i>	T	mes–xer	ter
19	<i>Pr. nitens</i>	MD	mes–xer	ter
20	<i>So. fugax</i>	T	mes–xer	ter
21	<i>St. debile</i>	EC	mes	mte
22	<i>T. affinis</i>	EC	mes–xer	ter
23	<i>T. brauneri</i>	C	mes	mte–ter
24	<i>T. crasecundus</i>	BC	mes–xer	mte–ter
25	<i>T. tuberum</i>	EWS	mes	mte
26	<i>T. unifasciatus</i>	EC	mes–xer	mte–ter
27	<i>Tet. cf. caespitum</i>	?	mes–xer	mte–ter

Most of the species such as – *Aphaenogaster subterranea*, *Camponotus fallax*, *Colobopsis truncata*, *Dolichoderus quadripunctatus*, *Lasius brunneus*, *L. emarginatus*, *Myrmecina graminicola*, *Myrmica ruginodis*, *Stenamma debile*, *Temnothorax affinis*, *T. crasecundus*, *T. tuberum*, and *T. unifasciatus* are widespread throughout the Caucasus. Others, *Hypoponera eduardi*, *Nylanderia colchica*, *Prenolepis nitens*, and *Temnothorax brauneri*, are known only in the Western Caucasus. All of the above species are associated either with forest phytocenoses or with shrub vegetation with a well-developed litter.

In general, it can be said that the ant fauna of the yew-boxwood grove, excluding the invasive species, is autochthonous, which is confirmed by the presence of Colchis endemics.

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