Gümüşhane University Journal of Science

GUFBD / *GUJS* (2024) 14(3): 793-808 doi: 10.17714/gumusfenbil.1421521 Research Article

Myrmecofauna (Hymenoptera: Formicidae) of Bozcaada Island of Türkiye

Türkiye Bozcaada'nın karınca (Hymenoptera: Formicidae) faunası

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• Received: 17.01.2024 • Accepted: 06.05.2024

Abstract

Ants, keystone organisms of the nature, show great diversity in the Mediterranean basin. In addition to the mainland, the islands of the Mediterranean countries have great importance and species diversity in terms of ants. In the present study, the ant fauna of Bozcaada, the third largest island of Türkiye was investigated. Ant specimens were collected from Bozcaada in 2018-2019 by means of the aspirator. As a result of evaluation of 700 ant samples collected from the island, 60 species belonging to 4 subfamilies and 22 genera were identified. Among these, the subfamily Ponerinae, 10 genera and 48 species were recorded for the first time for the ant fauna of Bozcaada. The ant faunas of the Greek islands Samos, Chios and Lesbos, which are located closer to the Turkish mainland than the Turkish islands, Bozcaada and Gökçeada were compared with the Bray-Curtis similarity analysis.

Keywords: Ant, Biodiversity, Bray-Curtis similarity analysis, Faunistic, Mediterranean Region

Öz

Doğanın kilit taşı canlıları olan karıncalar Akdeniz havzasında da oldukça çeşitlilik göstermektedir. Akdeniz ülkelerinin ana karalarının yanı sıra adaları da karıncalar açısından büyük önem ve tür çeşitliliğine sahiptir. Bu çalışmada Türkiye'nin üçüncü büyük adası olan Bozcaada'nın karınca faunası araştırılmıştır. Karıncalar Bozcaada'dan 2018-2019 yıllarında aspirator ile toplanmıştır. Çalışma kapsamında Bozcaada'dan toplanan 700 karınca örneğinin incelenmesi sonucunda 4 altfamilya ve 22 cinse ait 60 tür tespit edilmiştir. Bu kayıtlardan Ponerinae alt familyası, 10 cins ve 48 tür Bozcaada karınca faunasının ilk kayıtlarıdır. Türkiye anakarasına bazen Türk adalarından daha yakın olan 3 Yunan adası (Samos, Sakız ve Midilli), Bozcaada ve Gökçeada'nın karınca faunaları Bray-Curtis benzerlik analizi ile karşılaştırılmıştır.

Anahtar kelimeler: *Karınca, Biyolojik çeşitlilik, Bray-Curtis benzerlik analizi, Faunistik, Akdeniz Bölgesi*

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1. Introduction

Ants are known to be one of the keystone organisms with paramount importance for sustainability of terrestrial ecosystems of nature (Gibb et al., 2024). Although the tropical regions of the world are the most biodiverse regions in terms of myrmecofauna, the Mediterranean region is another important region regarding myrmecofaunal elements, not only in the countries of the mainland, but also in the islands of these countries (Scupola & Borowiec, 2023). A well-known example of this case is the Greek islands which are represented by 238 ant taxa, while the ant fauna of Greece as a whole is represented by 316 taxa (Scupola & Borowiec, 2023).

The studies on myrmecofauna of Türkiye dates back to the second half of the 19th century and a large number of studies have been carried so far. The studies of researchers, especially in the last two decades, identified many new species not only for Turkish, but also for the world myrmecofauna (Kiran et al., 2008; Karaman, 2012; Kiran & Karaman, 2012, 2020, 2021; Karaman & Aktaç, 2013; Karaman et al., 2015; Salata & Borowiec, 2015a, b, c; Seifert, 2016, 2019, 2020, 2023; Kiran et al., 2017; Karaman et al., 2017; Salata & Borowiec, 2017; Karaman & Kiran, 2018; Wagner et al., 2018; Salata et al., 2019; Kiran et al., 2021; Salata et al., 2021), On the other hand, despite these considerable studies in the mainland, studies on the ant fauna of Turkish islands are limited in number and are generally very old (Emery, 1870, 1905; Forel, 1906; Schkaff, 1924; Donisthorpe, 1950; Aras & Aktaç, 1992, 1994; Sert & Karaman, 2024). The studies of researchers are related to the İstanbul Prince Islands, where 7 species were recorded so far (Sert & Karaman, 2024). Aras and Aktaç investigated the ant fauna of Gökçeada and Bozcaada in 1992 and 1994, and recorded 34 and 26 ant taxa, respectively (Aras & Aktaç, 1992, 1994).

Recently, Sert and Karaman (2024) investigated the myrmecofauna of Gökçeada in detail and recorded 72 ant taxa. This latest study showed how the old studies are far from reflecting the true richness of the fauna of Turkish islands.

In this study, Bozcaada, the third largest island of Türkiye with a surface area of 36 km^2, was chosen as the study area and the myrmecofauna of the island was investigated in detail. In addition, the ant species diversity in the Turkish islands was compared with the Greek islands, whose ant fauna is well known.

2. Material and method

The material was collected from the Bozcaada Island in 2018-2019 by the second author. Ant specimens were mainly collected by hand collecting (direct sampling) method. The litter sifting method was also used in suitable habitats. The locality numbers, geographic coordinates, altitudes, habitat types and the sampling dates are presented in Table 1 and Figure 1. The results were represented as in the case of the example "1♀, 3♂♂, 1☭, 39☿☿; (B-12); EMTU 19/0658" in the results section. The expression "1♀, 3♂♂, 1☭, 39☿☿" shows the individual numbers representing each caste of the collected species from the study area. The symbols used in the results section correspond to ♀: queen, ♂: male, ☭: soldier, and ☿: worker. The cases when more than 50 workers were sampled from a single colony were denoted as the ☿☿ symbol. (B-12) indicates the locality number in Table 1 and Figure 1. EMTU stands for the Entomological Museum of Trakya University. 19/0658 indicates the species protocol number in the authors' database. The "*" symbol before the species name in the results section indicates that the species was formerly recorded by Aras and Aktaç (1994).

The photographs of ants were created using a Nikon D800e camera attached to 3.2× and 8× microscope objectives. The Helicon Focus software (Helicon Soft Ltd., Kharkiv Ukraine) was used to stack the photos. The map of the studied localities was prepared with Google Earth. The Bray-Curtis similarity test between Turkish and Greek Islands' ant fauna was performed by the BioDiversity Pro version 2 programme. The ant material is deposited in EMTU, Edirne, Türkiye.

Figure 1. Studied localities in Bozcaada Island

Table 1. Details of the studied localities in Bozcaada Island

Loc. no	Coordinates	Altitude	Habitat	Date
B-01	N 39.8344, E 26.0695	10 m.	Urban area	21.IV.2018
B-02	N 39.8010, E 26.0776	8 m.	Barren land	22.IV.2018
B-03	N 39.7915, E 26.0606	5 m.	*Astragalus* sp.	22.IV.2018
B-04	N 39.8135, E 26.0073	25 m.	Maquis	22.IV.2018
B-05	N 39.8358, E 26.0630	119 m.	Pasture + *Astragalus* sp.	18.V.2019
B-06	N 39.8424, E 26.0508	172 m.	Barren land	18.V.2019
B-07	N 39.8359, E 26.0273	45 m.	*Pinus brutia* forest	18.V.2019
B-08	N 39.8327, E 26.0413	59 m.	*Astragalus* sp.	18.V.2019
B-09	N 39.8315, E 26.0531	59 m.	*Astragalus* sp.	18.V.2019
B-10	N 39.8377, E 26.0678	56 m.	*P. brutia* forest	18.V.2019
B-11	N 39.8248 E 26.0750	34 m.	Maquis	19.V.2019
B-12	N 39.8203, E 26.0482	57 m.	*P. brutia* forest	19.V.2019
B-13	N 39.8203, E 26.0306	65 m.	*P. brutia* forest	19.V.2019
B-14	N 39.8220, E 26.0611	37 m.	Oak forest	19.V.2019
B-15	N 39.8145, E 26.0445	82 m.	*P. brutia* forest	19.V.2019
B-16	N 39.8073, E 26.0601	56 m.	Maquis	19.V.2019
B-17	N 39.8413, E 26.0358	2 m.	Sandhill	20.V.2019
B-18	N 39.7994, E 26.0397	17 m.	Maquis	20.V.2019

Table 1. Continued

Loc. no	Coordinates	Altitude	Habitat	Date
B-19	N 39.8134, E 26.0647	28 m.	Maquis	20.V.2019
B-20	N 39.8031, E 26.0750	21 m.	*P. brutia* forest + Maquis	20.V.2019
B-21	N 39.8108, E 26.0249	27 m.	*P. brutia* forest	20.V.2019
B-22	N 39.7594, E 26.0142	85 m.	Meadow	20.V.2019
B-23	N 39.8239, E 25.9916	11 m.	Maquis	21.V.2019
B-24	N 39.8284, E 26.0030	50 m.	*P. brutia* forest	21.V.2019
B-25	N 39.8258, E 26.0178	49 m.	*P. brutia* forest	21.V.2019
B-26	N 39.8160, E 26.0113	57 m.	*P. brutia* forest + Maquis	21.V.2019
B-27	N 39.8394, E 26.0016	26 m.	Meadow	21.V.2019
B-28	N 39.8264, E 25.9790	41 m.	*P. brutia* forest	25.IX.2019
B-29	N 39.8370, E 25.9861	23 m.	Sandhill	25.IX.2019
B-30	N 39.8357, E 25.9638	17 m.	Maquis + *Astragalus* sp.	26.IX.2019
B-31	N 39.8334, E 26.0017	44 m.	*P. brutia* forest	26.IX.2019
B-32	N 39.8205, E 26.0019	28 m.	*P. brutia* forest	26.IX.2019
B-33	N 39.7995, E 26.0795	33 m.	Maquis	26.IX.2019
B-34	N 39.8117, E 26.0537	61 m.	Olive orchard	27.IX.2019
B-35	N 39.8196, E 26.0259	65 m.	*P. brutia* forest	27.IX.2019
B-36	N 39.8030, E 26.0344	16 m.	*P. brutia* forest	27.IX.2019
B-37	N 39.8092, E 26.0751	30 m.	Urban area	28.IX.2019

3. Results

Family: FORMICIDAE

Subfamily: DOLICHODERINAE Forel

1. *Bothriomyrmex communista* Santschi, 1919
Material: 40☿☿; (B-12); EMTU 19/0658d, 19/0659.

2. *Tapinoma erraticum* (Latreille, 1798)
Material: 21☿☿; (B-12); EMTU 19/0672.

3. *Tapinoma simrothi* Krausse, 1911
Material: 1☿; (B-13); EMTU 19/0692b • 3♀♀, 33♂♂, 4☿☿; (B-21); EMTU 19/0694 • 3☿☿; (B-37); EMTU 19/0988b.

4. *Tapinoma* cf. *subboreale/festae*
Material: 10☿☿; (B-1); EMTU 18/7337a • 7☿☿; (B-4); EMTU 18/7351a • 42☿☿; (B-21); EMTU 19/0710.

Remarks: Aras and Aktaç (1994) recorded *Tapinoma nigerrimum* (Nylander, 1856) from Bozcaada. However, the species could not have been recorded in this study. *Tapinoma nigerrimum* distribution fact and its presence in Türkiye were clarified in Sert and Karaman (2024). See Sert and Karaman (2024) for more information.

Subfamily: FORMICINAE Latreille

5. *Camponotus aegaeus* Emery, 1915
Material: 33☿☿; (B-13); EMTU 19/0673b • 17☿☿; (B-15); EMTU 19/0638, 19/0641 • 8☿☿; (B-25); EMTU 19/0840b, 19/0849 • 1♀, 13☿☿; (B-28); EMTU 19/0861a • 17☿☿; (B-31); EMTU 19/0901, 19/0907 • 10♂♂, 37☿☿; (B-35); EMTU 19/0956 • 25☿☿; (B-36); EMTU 19/0968.

6. * *Camponotus aethiops* (Latreille, 1798)
Material: 37☿☿; (B-5); EMTU 19/0530, 19/0535 • 4☿☿; (B-7); EMTU 19/0563 • 1♀, 8☿☿; (B-9); EMTU 19/0583 • 5☿☿; (B-10); EMTU 19/0500d, 19/0520 • 6☿☿; (B-11); EMTU 19/0593 • 9☿☿; (B-12); EMTU 19/0651a • 25☿☿; (B-13); EMTU 19/0688 • 2☿☿; (B-15); EMTU 19/0634b • 9☿☿; (B-16); EMTU 19/0618d, 19/0629a • 3☿☿; (B-18); EMTU 19/0771 • 1☿; (B-19); EMTU 19/0754c • 1☿; (B-21); EMTU 19/0702 • 6☿☿; (B-22); EMTU 19/0714a • 4☿☿; (B-31); EMTU 19/0898 • 22☿☿; (B-34); EMTU 19/0937, 19/0940a.

7. *Camponotus baldaccii* Emery, 1908
Material: 1☿; (B-2); EMTU 18/7349b • 1☿; (B-3); EMTU 18/7350d • 13☿☿; (B-7); EMTU 19/0552 • 4☿☿; (B-8); EMTU 19/0569a • 1☿; (B-11); EMTU 19/0590b • 5☿☿; (B-12); EMTU 19/0656 • 8☿☿; (B-14); EMTU 19/0611 • 23☿☿; (B-15); EMTU 19/0640 • 15☿☿; (B-18); EMTU 19/0760 • 1♀; (B-19); EMTU 19/0754b • 6☿☿; (B-20); EMTU 19/0738 • 1♀, 12☿☿; (B-21); EMTU 19/0698, 19/0706 • 1☿; (B-22); EMTU 19/0722 • 38☿☿; (B-23); EMTU 19/0820 • 3☿☿; (B-24); EMTU 19/0801, 19/0804c • 10☿☿; (B-26); EMTU 19/0828 • 1♀, 5☿☿; (B-27); EMTU 19/0791c, 19/0796b, 19/0797 • 3♀♀, 12♂♂, 36☿☿; (B-29); EMTU 19/0879, 19/0880 • 6☿☿; (B-30); EMTU 19/0909 • 16☿☿; (B-31); EMTU 19/0903.

8. *Camponotus gestroi* Emery, 1878
Material: 1☿; (B-1); EMTU 18/7352b • 3☿☿; (B-2); EMTU 18/7348b • 2☿☿; (B-5); EMTU 19/0527 • 4☿☿; (B-6); EMTU 19/0540b, 19/0546b, 19/0549b • 6☿☿; (B-8); EMTU 19/0571a, 19/0572c, 19/0573 • 1♀, 30☿☿; (B-10); EMTU 19/0505, 19/0511a, 19/0516a • 1☿; (B-11); EMTU 19/0603a • 1☿; (B-12); EMTU 19/0655 • 3☿☿; (B-14); EMTU 19/0608b • 1☿; (B-15); EMTU 19/0635a • 1☿; (B-16); EMTU 19/0618a • 4☿☿; (B-18); EMTU 19/0767a • 1☿; (B-19); EMTU 19/0754a • 1☿; (B-20); EMTU 19/0737a.

9. *Camponotus kiesenwetteri* (Roger, 1859)
Material: 30☿☿; (B-12); EMTU 19/0661 • 30☿☿; (B-15); EMTU 19/0636 • ☿☿; (B-17); EMTU 19/0775a, 19/0779, 19/0789, 19/0980a • 3☿☿; (B-18); EMTU 19/0765 • 1♀, 22☿☿; (B-23); EMTU 19/0822b, 19/0823, 19/0824 • 11☿☿; (B-24); EMTU 19/0806 • 20☿☿; EMTU 19/0844 • 34☿☿; (B-26); EMTU 19/0830b, 19/0833a, 19/0836a • 5♀♀, 4♂♂, 35☿☿; (B-28); EMTU 19/0861b, 19/0866 • 15☿☿; (B-29); EMTU 19/0883 • 2♀♀, 6♂♂, 30☿☿; (B-31); EMTU 19/0897 • 9☿☿; (B-32); EMTU 19/0924a • 3♀♀, 12☿☿; (B-35); EMTU 19/0952, 19/0953, 19/0957a • 32☿☿; (B-36); EMTU 19/0967.

10. * *Camponotus lateralis* (Olivier, 1792)
Material: 4♀♀, 1♂, 43☿☿; (B-1); EMTU 18/7337b, 18/7345a • 2☿☿; (B-29); EMTU 19/0878b • 1☿; (B-34); EMTU 19/0940b • 15☿☿; (B-35); EMTU 19/0948.

11. *Camponotus lateralis* morph 2 sensu Seifert
Material: 1☿; (B-1); EMTU 18/7344g • 1☿; (B-4); EMTU 18/7351b • 22☿☿; (B-7); EMTU 19/0566 • 4☿☿; (B-8); EMTU 19/0574b • 1♀, 44☿☿; (B-10); EMTU 19/0521 • 1♀, ☿☿; (B-13); EMTU 19/0680a, 19/0685, 19/0687a, 19/0689 • 2♀♀, 14☿☿; (B-14); EMTU 19/0609a • ☿☿; (B-15); EMTU 19/0642, 19/0645 • 6♀♀, ☿☿; (B-17); EMTU 19/0774, 19/0777 • 1☿; (B-19); EMTU 19/0755 • 30☿☿; (B-20); EMTU 19/0733a • 1m; (B-22); EMTU 19/0725 • 4♀♀, 31☿☿; (B-23); EMTU 19/0822a • 18☿☿; (B-24); EMTU 19/0811 • 1♀, 47☿☿; (B-

25); EMTU 19/0841, 19/0843 • 7♂♂, ☿☿; (B-28); EMTU 19/0857, 19/0862a, 19/0867, 19/0873e • 1♀, 3♂♂, 19☿☿; (B-30); EMTU 19/0914a • 4♀♀, 7♂♂, ☿☿; (B-35); EMTU 19/0949, 19/0951, 19/0958 • 2♀♀, ☿☿; (B-36); EMTU 19/0962, 19/0965, 19/0970, 19/0977.

12. * *Camponotus piceus* (Leach, 1825)
Material: 5☿☿; (B-7); EMTU 19/0565 • 1☿; (B-8); EMTU 19/0571b • 5☿☿; (B-9); EMTU 19/0582 • 13☿☿; (B-12); EMTU 19/0658c • 2☿☿; (B-15); EMTU 19/0634c, 19/0635b • 2☿☿; (B-16); EMTU 19/0625 • 1☿; (B-20); EMTU 19/0730a • 14☿☿; (B-21); EMTU 19/0696a • 3☿☿; (B-22); EMTU 19/0716 • 1☿; (B-23); EMTU 19/0815b • 45☿☿; (B-24); EMTU 19/0810 • 3☿☿; (B-27); EMTU 19/0793 • 1☿; (B-34); EMTU 19/0934.

13. * *Camponotus samius* Forel, 1889
Material: 3☿☿; (B-7); EMTU 19/0564a • 14☿☿; (B-9); EMTU 19/0587, 19/0589 • 14☿☿; (B-12); EMTU 19/0665 • 8☿☿; (B-13); EMTU 19/0674, 19/0675 • 12☿☿; (B-15); EMTU 19/0633 • 20☿☿; (B-17); EMTU 19/0781a, 19/0785 • 1☿; (B-18); EMTU 19/0772 • 1☿; (B-22); EMTU 19/0724 • 4☿☿; (B-24); EMTU 19/0804a • 7☿☿; (B-25); EMTU 19/0846b • 15☿☿; (B-26); EMTU 19/0837 • 7☿☿; (B-28); EMTU 19/0858 • 2☿☿; (B-31); EMTU 19/0894 • 3☿☿; (B-32); EMTU 19/0924b • 13☿☿; (B-35); EMTU 19/0950 • 14☿☿; (B-36); EMTU 19/0961.

14. * *Camponotus sanctus* Forel, 1904
Material: 18☿☿; (B-30); EMTU 19/0919a.

15. * *Cataglyphis nodus* (Brullé, 1833)
Material: 3☿☿; (B-2); EMTU 18/7347f • 5☿☿; (B-5); EMTU 19/0539 • 3☿☿; (B-7); EMTU 19/0564b • 1☿; (B-8); EMTU 19/0578b • 1☿; (B-10); EMTU 19/0503 • 1☿; (B-12); EMTU 19/0671b • 1☿; (B-14); EMTU 19/0615b • 4☿☿; (B-15); EMTU 19/0646 • 3☿☿; (B-16); EMTU 19/0624a • 7♀♀, ☿☿; (B-17); EMTU 19/0782, 19/0784 • 1☿; (B-19); EMTU 19/0752 • 5☿☿; (B-21); EMTU 19/0703 • 2☿☿; (B-22); EMTU 19/0723b • 7☿☿; (B-23); EMTU 19/0826 • 1☿; (B-24); EMTU 19/0813 • 2☿☿; (B-26); EMTU 19/0829 • 5☿☿; (B-27); EMTU 19/0796a • 11☿☿; (B-29); EMTU 19/0874, 19/0876 • 7☿☿; (B-30); EMTU 19/0915 • 2☿☿; (B-31); EMTU 19/0905 • 1☿; (B-32); EMTU 19/0927.

16. *Colobopsis truncata* (Spinola, 1808)
Material: 12☿☿; (B-14); EMTU 19/0610 • 2♂♂, 11☿☿; (B-34); EMTU 19/094.

17. * *Lasius alienus* (Foerster, 1850)
Material: 5☿☿; (B-8); EMTU 19/0568b • 1☿; (B-21); EMTU 19/0711 • 2☿☿; (B-37); EMTU 19/0988a.

18. *Lasius schulzi* Seifert, 1992
Material: 3☿☿; (B-1); EMTU 18/7337c, 18/7344h.

Remarks: *Lasius brunneus* (Latreille, 1798) was recorded from Bozcaada by Aras and Aktaç (1994). In this study, since it is an arboricolous species, suitable microhabitats were investigated in detail, but *L. brunneus* could not be recorded. However, *L. schulzi*, which is morphologically similar to *L. brunneus* and has not yet been described in 1994, was recorded in this study. Thus, the material of Aras and Aktaç (1994) may refer to *L. schulzi*.

19. *Lasius turcicus* Santschi, 1921
Material: ☿☿; (B-1); EMTU 18/7345b • 6☿☿; (B-8); EMTU 19/0574a • 32☿☿; (B-13); EMTU 19/0679, 19/0680b • 37☿☿; (B-15); EMTU 19/0643a, 19/0648 • 2☿☿; (B-18); EMTU 19/0766 • ☿☿; (B-28); EMTU 19/0854, 19/0865, 19/0873a • 14☿☿; (B-29); EMTU 19/0882, 19/0884 • 9☿☿; (B-32); EMTU 19/0928b • ☿☿; (B-35); EMTU 19/0946 • 17☿☿; (B-36); EMTU 19/0974, 19/0978.

20. * *Lepisiota frauenfeldi* (Mayr, 1855)
Material: 2♀♀, 45☿☿; (B-1); EMTU 18/7339, 18/7344b • 2☿☿; (B-2); EMTU 18/7347c • 2♀♀, 28☿☿; (B-3); EMTU 18/7350a • 7☿☿; (B-5); EMTU 19/0522 • 11☿☿; (B-6); EMTU 19/0542b, 19/0547 • ☿☿; (B-7); EMTU 19/0557 • 2☿☿; (B-8); EMTU 19/0569b • 34☿☿; (B-10); EMTU 19/0500b, 19/0501, 19/0519d • 1♀, 25☿☿; (B-12); EMTU 19/0654, 19/0669 • 20☿☿; (B-13); EMTU 19/0681b, 19/0691 • 5☿☿; (B-14); EMTU 19/0614c • 8☿☿; (B-16); EMTU 19/0618b • 7♀♀, ☿☿; (B-17); EMTU 19/0784 • 13☿☿; (B-18); EMTU 19/0770 • 12☿☿; (B-19); EMTU 19/0757 • 10☿☿; (B-20); EMTU 19/0728a • 8☿☿; (B-21); EMTU 19/0699a • 9☿☿; (B-22); EMTU 19/0723a • 1☿; (B-23); EMTU 19/0817a • ☿☿; (B-24); EMTU 19/0808 • 1☿; (B-25); EMTU 19/0846a • 1☿; (B-27); EMTU 19/0791b • 46☿☿; (B-28); EMTU 19/0856b, 19/0871 • 9☿☿; (B-30); EMTU 19/0922 • 9☿☿; (B-32); EMTU 19/0926 • 6☿☿; (B-34); EMTU 19/0938 • 5☿☿; (B-36); EMTU 19/0971 • 9☿☿; (B-37); EMTU 19/0987.

21. *Plagiolepis pallescens* Forel, 1889
Material: 33☿☿; (B-2); EMTU 18/7347b • 12☿☿; (B-5); EMTU 19/0532 • 19☿☿; (B-8EMTU 19/0570 • 2☿☿; (B-10); EMTU 19/0513b, 19/0518 • 20☿☿; (B-11); EMTU 19/0604b, 19/0605a • 1☿; (B-12); EMTU 19/0658a • 1♀; ☿☿; (B-13); EMTU 19/0673a • 5☿☿; (B-14); EMTU 19/0609b • 13☿☿; (B-16); EMTU 19/0619, 19/0629b • ☿☿; (B-17); EMTU 19/0790b • ☿☿; (B-18); EMTU 19/0762 • 19☿☿; (B-19); EMTU 19/0747, 19/0748 • 1♀, 49☿☿; (B-20); EMTU 19/0728b, 19/0729, 19/0733b • 28☿☿; (B-23); EMTU 19/0814 • 37☿☿; (B-24); EMTU 19/0802 • 36☿☿; (B-25); EMTU 19/0839 • 7☿☿; (B-26); EMTU 19/0827a • 32☿☿; (B-28); EMTU 19/0872 • 11☿☿; (B-30); EMTU 19/0918 • ☿☿; (B-31); EMTU 19/0899 • 1☿; (B-32); EMTU 19/0925b • 1♀, ☿☿; (B-35); EMTU 19/0957b, 19/0959 • ☿☿; (B-36); EMTU 19/0963.

22. *Plagiolepis perperamus* Salata, Borowiec & Radchenko, 2018
Material: 3☿☿; (B-1); EMTU 18/7338b • 42☿☿; (B-7); EMTU 19/0550b, 19/0553 • 36☿☿; (B-9); EMTU 19/0580 • ☿☿; (B-12); EMTU 19/0662a, 19/0662b, 19/0666c • 8☿☿; (B-15); EMTU 19/0630 • 16☿☿; (B-22); EMTU 19/0713 • ☿☿; (B-27); EMTU 19/0791d, 19/0792 • 2☿☿; (B-34); EMTU 19/0935 • 3☿☿; (B-37); EMTU 19/0982a.

23. * *Plagiolepis pygmaea* (Latreille, 1798)
Material: 10☿☿; (B-12); EMTU 19/0650 • 4☿☿; (B-21); EMTU 19/0693.

24. *Proformica* sp._Bozcaada
Material: 1☿; (B-1); EMTU 18/7344a • 15☿☿; (B-2); EMTU 18/7347a • 1☿; (B-3); EMTU 18/7350e • 7☿☿; (B-21); EMTU 19/0707 • 11☿☿; (B-29); EMTU 19/0875 • 1♀; (B-30); EMTU 19/0913 • 1☿; (B-32); EMTU 19/0928c.

Remarks: Aras and Aktaç (1994) recorded *Proformica korbi* Emery, 1909 from Bozcaada. *Proformica korbi* is characterized by several long erect setae over the entire dorsum of the mesosoma in all worker castes (Borowiec et al., 2023). However, the major workers recorded in this study have one long, erect setea on pronotum and mesonotum, which is not consistent with the characteristics of the species. Additionally, first gaster tergite of *Proformica* Ruzsky, 1902 specimens in this study has sparse, decumbent pubescence, which differs with dense, decumbent pubescence in *P. korbi*. Therefore, the *Proformica* samples in this study are different from *P. korbi* and other known Turkish and Greek *Proformica* species. We therefore decided to present *Proformica* samples as *Proformica* sp._Bozcaada until the detailed studies carried out on this genus.

Subfamily: MYRMICINAE Lepeletier de Saint-Fargeau

25. *Aphaenogaster balcanica* (Emery, 1898)
Material: 43☿☿; (B-1); EMTU 18/7341a • 5☿☿; (B-2); EMTU 18/7347d • 2☿☿; (B-3); EMTU 18/7350b • 15☿☿; (B-5); EMTU 19/0524 • 18☿☿; (B-6); EMTU 19/0540a, 19/0543 • 1☿; (B-8); EMTU 19/0569c • 2☿☿; (B-10); EMTU 19/0500c • 1m; (B-11); EMTU 19/0603b • 3☿☿; (B-12); EMTU 19/0657 • 31☿; (B-13); EMTU 19/0678 • 2☿☿; (B-14); EMTU 19/0607 • 1☿; (B-15); EMTU 19/0649a • 3☿☿; (B-16); EMTU 19/0624b • 3☿☿; (B-19); EMTU 19/0744b • 1☿; (B-20); EMTU 19/0731b • 8☿☿; (B-21); EMTU 19/0700 • 2☿☿; (B-22); EMTU

19/0720b • 8☿☿; (B-23); EMTU 19/0817b • 2☿☿; (B-24); EMTU 19/0804b • 12☿☿; (B-25); EMTU 19/0845b, 19/0848 • 18☿☿; (B-26); EMTU 19/0833b • 8☿☿; (B-28); EMTU 19/0856a, 19/0862b • 3☿☿; (B-29); EMTU 19/0878a • 21☿☿; (B-30); EMTU 19/0916 • 1♂, 2☿☿; (B-31); EMTU 19/0891 • 1☿; (B-32); EMTU 19/0924c • 8☿☿; (B-34); EMTU 19/0939, 19/0955 • 1☿; (B-37); EMTU 19/0985b.

Remarks: *Aphaenogaster simonellii* Emery, 1894 could not have been recorded from Bozcaada. *Aphaenogaster simonellii* distribution fact and its presence in Türkiye were described in Sert and Karaman (2024). See Sert and Karaman (2024) for more information. All of the old *A. simonellii* records from Türkiye should refer to *A. balcanica* today.

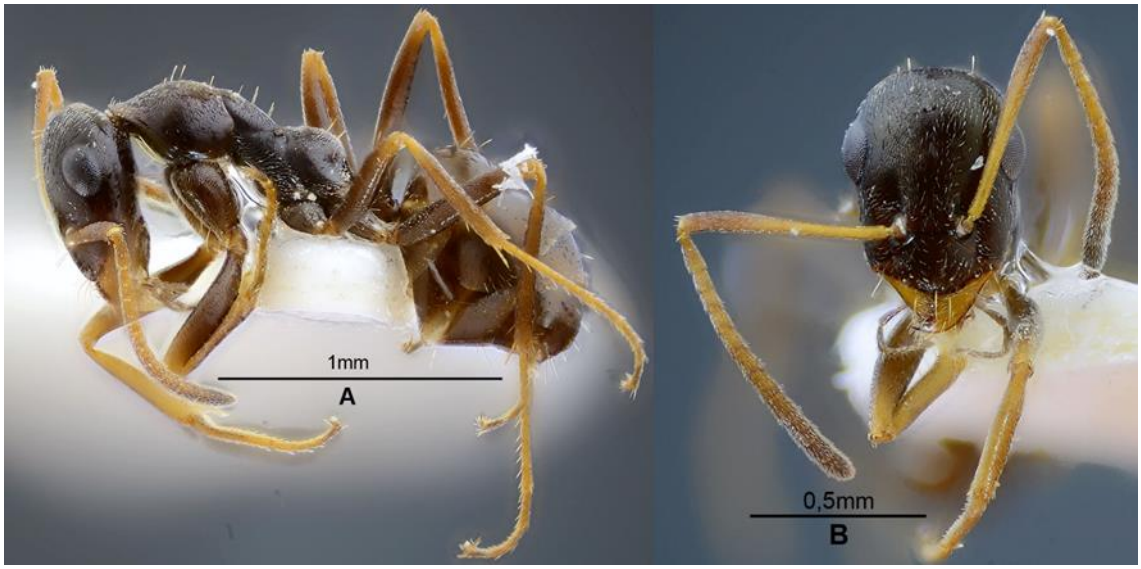

Figure 2. *Proformica sp._Bozcaada*, minor worker. A- Habitus, B- Head

Figure 3. *Proformica* sp._Bozcaada, major worker. A- Habitus, B- Head

26. *Aphaenogaster epirotes* (Emery, 1895)
Material: 1☿; (B-8); EMTU 19/0575 • 2☿☿; (B-10); EMTU 19/0507a, 19/0511c • 1☿; (B-12); EMTU 19/0666b • ☿☿; (B-15); EMTU 19/0644.

27. *Aphaenogaster festae* Emery, 1915
Material: 1♀, 48☿☿; (B-10); EMTU 19/0514 • 1♀, 34☿☿; (B-13); EMTU 19/0677, 19/0686 • ☿☿; (B-17); EMTU 19/0778 • 35☿☿; (B-18); EMTU 19/0764 • 8☿☿; (B-20); EMTU 19/0731a • 1☿; (B-25); EMTU 19/0842 • 2☿☿; (B-28); EMTU 19/0868b, 19/0873c.

28. *Aphaenogaster subterraneoides* Emery, 1881
Material: 1☿; (B-10); EMTU 19/0516b • 1☿; (B-11); EMTU 19/0601.
29. *Chalepoxenus muellerianus* (Finzi, 1922)
Material: 1♀; (B-12); EMTU 19/0667d.

30. *Crematogaster schmidti* (Mayr, 1853)
Material: 17☿☿; (B-1); EMTU 18/7344j • 2☿☿; (B-4); EMTU 18/7351c • 15☿☿; (B-7); EMTU 19/0554 • 19☿☿; (B-8); EMTU 19/0568a, 19/0572b • 27☿☿; (B-9); EMTU 19/0586 • 33☿☿; (B-10); EMTU 19/0506, 19/0510 • 2☿☿; (B-12); EMTU 19/0651b, 19/0652 • 43☿☿; (B-13); EMTU 19/0676 • 13☿☿; (B-14); EMTU 19/0608a • 2☿☿; (B-15); EMTU 19/0634a, 19/0643b • 27☿☿; (B-16); EMTU 19/0626 • 26☿☿; (B-17); EMTU 19/0776, 19/0980b • 48☿☿; (B-18); EMTU 19/0767b, 19/0769 • 20☿☿; (B-19); EMTU 19/0744c, 19/0746 • 14☿☿; (B-20); EMTU 19/0730b • 1☿; (B-21); EMTU 19/0696b • 12☿☿; (B-22); EMTU 19/0718 • 33☿☿; (B-23); EMTU 19/0818 • 20☿☿; (B-25); EMTU 19/0840a • 12☿☿; (B-26); EMTU 19/0832 • ☿☿; (B-27); EMTU 19/0799, 19/0805 • 2♀♀, ☿☿; (B-28); EMTU 19/0855, 19/0873d • 2♀♀, 24☿☿; (B-29); EMTU 19/0881, 19/0888 • 1♀, 1♂, 25☿☿; (B-30); EMTU 19/0912, 19/0914b, 19/0919b • 45☿☿; (B-31); EMTU 19/0896 • 41☿; (B-33); EMTU 19/0931 • 4☿☿; (B-34); EMTU 19/0942, 19/0945 • 13☿☿; (B-35); EMTU 19/0947 • 15☿☿; (B-36); EMTU 19/0964, 19/0979a • 2♀♀, 31♂♂, ☿☿; (B-37); EMTU 19/0990.

Remarks: *Crematogaster ionia* Forel, 1911 could not have been recorded from Bozcaada. *Crematogaster schmidti* and *C. ionia* distribution facts, similarity and their present taxonomic situation in Türkiye were described in Sert and Karaman (2024). See Sert and Karaman (2024) for more information. Thus, the record of *C. schmidti* from Bozcaada and absence of *C. ionia* is a logical finding.

31. * *Crematogaster sordidula* (Nylander, 1849)
Material: 20☿☿; (B-3); EMTU 18/7350c • 19☿☿; (B-6); EMTU 19/0544 • 3☿☿; (B-10); EMTU 19/0504b • 13☿☿; (B-15); EMTU 19/0639 • 28☿☿; (B-19); EMTU 19/0743a.

32. *Crematogaster sordidula aeolia* Forel, 1911
Material: 17♂♂, ☿☿; (B-10); EMTU 19/0519a • 10☿☿; (B-13); EMTU 19/0682 • 17☿☿; (B-17); EMTU 19/0781b • ☿☿; (B-18); EMTU 19/0763 • ☿☿; (B-23); EMTU 19/0821 • 40☿☿; (B-24); EMTU 19/0803 • 22☿☿; (B-25); EMTU 19/0845a • ☿☿; (B-26); EMTU 19/0838 • ☿☿; (B-28); EMTU 19/0860a • ☿☿; (B-31); EMTU 19/0904 • 8☿☿; (B-36); EMTU 19/0976.

33. *Messor hellenius* Agosti & Collingwood, 1987
Material: 1☿; (B-6); EMTU 19/0546a • 1☿; (B-7); EMTU 19/0550a • 7☿☿; (B-8); EMTU 19/0577, 19/0578a • 4☿☿; (B-10); EMTU 19/0507b, 19/0513a • 27☿☿; (B-11); EMTU 19/0599 • 17☿☿; (B-12); EMTU 19/0671a, 19/0692a • 4☿☿; (B-14); EMTU 19/0612a • 24☿☿; (B-14); EMTU 19/0614b, 19/0615a, 19/0617a • 7☿☿; (B-20); EMTU 19/0741 • ☿☿; (B-21); EMTU 19/0695b, 19/0701, 19/0704 • 14☿☿; (B-22); EMTU 19/0719.

Remarks: *Messor structor* (Latreille, 1798) could not have been recorded from Bozcaada. *Messor hellenius* which has recently been recorded from Türkiye and similar to *M. structor* and separated from *M. structor* with less longitudinal striation on the head, is recorded from Bozcaada. Thus, the *M. structor* record of Aras and Aktaç (1994) from Bozcaada could be *M. hellenius* which was not known from Türkiye in 1994.

34. *Messor luridus* Santschi, 1927
Material: 3☿☿; (B-1); EMTU 18/7344i, 18/7346b • 16☿☿; (B-11); EMTU 19/0590a, 19/0595, 19/0596a • 49☿☿; (B-12); EMTU 19/0658b, 19/0663 • 10☿☿; (B-19); EMTU 19/0750 • 30☿☿; (B-21); EMTU 19/0705 • 4☿☿; (B-22); EMTU 19/0717 • 32☿☿; (B-23); EMTU 19/0815a, 19/0819 • 22☿☿; (B-24); EMTU 19/0809 • 13☿☿; (B-27); EMTU 19/0791a • 1☿; (B-31); EMTU 19/0890b • 2☿☿; (B-32); EMTU 19/0928d • 32☿☿; (B-37); EMTU 19/0983, 19/0986, 19/0991.

35. *Messor oertzeni* Forel, 1910
Material: 1☿; (B-8); EMTU 19/0572a • 12☿☿; (B-11); EMTU 19/0602 • 8☿☿; (B-14); EMTU 19/0614a • 6☿☿; (B-21); EMTU 19/0709 • 9☿☿; (B-34); EMTU 19/0933.

36. *Messor varrialei* Emery, 1921
Material: ☿☿; (B-5); EMTU 19/0529.

Remarks: This species is similar to *M. sultanus* Santschi, 1917 morphologically. However, the geographic distribution of *M. sultanus* is not suitable to record this species from the western part of Türkiye. Thus, the *M. sultanus* record of Aras and Aktaç (1994) from Bozcaada should refer to *M. varrialei* which has a distribution range in the western part of Türkiye.

37. *Messor wasmanni* Krausse, 1910
Material: 17☿☿; (B-1); EMTU 18/7352a • 15☿☿; (B-2); EMTU 18/7347e • 1♀, 19☿☿; (B-5); EMTU 19/0526, 19/0534 • 48☿☿; (B-6); EMTU 19/0548 • 36☿☿; (B-7); EMTU 19/0551, 19/0559 • 23☿☿; (B-8); EMTU 19/0579 • 35☿☿; (B-10); EMTU 19/0500a, 19/0509 • 46☿☿; (B-11); EMTU 19/0597, 19/0600 • 23☿☿; (B-18); EMTU 19/0759, 19/0768 • 46☿☿; (B-19); EMTU 19/0742, 19/0756 • 23☿☿; (B-27); EMTU 19/0791f, 19/0798 • 28☿☿; (B-29); EMTU 19/0887 • 24☿☿; (B-31); EMTU 19/0892 • 8☿☿; (B-30); EMTU 19/0910 • 7☿☿; (B-33); EMTU 19/0929 • 20☿☿; (B-34); EMTU 19/0944 • 20☿☿; (B-37); EMTU 19/0984.

Remarks: This species is similar to *M. meridionalis* (André, 1883) morphologically. However, the geographic distribution of *M. meridionalis* was interpreted in Sert and Karaman (2024) and this species was excluded from Turkish ant list. Thus, the record of *M. wasmanni* from Bozcaada is normal and the old record of *M. meridionalis* from Bozcaada given by Aras and Aktaç (1994) should refer to this species.

38. *Monomorium monomorium* Bolton, 1987
Material: 8☿☿; (B-6); EMTU 19/0545a, 19/0549a • 42☿☿; (B-7); EMTU 19/0550e, 19/0556 • 8☿☿; (B-8); EMTU 19/0567 • 1☿; (B-9); EMTU 19/0584 • 37☿☿; (B-10); EMTU 19/0504a • 5☿☿; (B-11); EMTU 19/0596b, 19/0605b • 4☿☿; (B-15); EMTU 19/0649b • 2☿☿; (B-16); EMTU 19/0623, 19/0692e • 6☿☿; (B-17); EMTU 19/0775b • 1☿; (B-19); EMTU 19/0743b • 1☿; (B-25); EMTU 19/0850 • 3☿☿; (B-27); EMTU 19/0791e • 23☿☿; (B-28); EMTU 19/0859b.

39. *Myrmoxenus* cf. *kraussei*
Material: 1♀; (B-17); EMTU 19/0786b • 16☿☿; (B-36); EMTU 19/0975b.

40. *Oxyopomyrmex polybotesi* Salata & Borowiec, 2015
Material: 2☿☿; (B-13); EMTU 19/0692c • 9☿☿; (B-21); EMTU 19/0697b.

41. * *Pheidole* cf. *pallidula*
Material: 21♂, 35☿☿; (B-1); EMTU 18/7343 • 3♂♂, 13☿☿; (B-2); EMTU 18/7348a • 15☿☿; (B-5); EMTU 19/0537 • 1☿, 29☿☿; (B-7); EMTU 19/0550c, 19/0558 • 23☿☿; (B-8); EMTU 19/0568c, 19/0576 • 32☿☿, 28☿☿; (B-10); EMTU 19/0502 • 3☿☿ 27☿☿; (B-11); EMTU 19/0591 • 2☿☿, ☿☿; (B-12); EMTU 19/0660 • 1☿, 12☿☿; (B-13); EMTU 19/0683 • 3☿☿, 14☿☿; (B-14); EMTU 19/0616 • 20☿☿; (B-15); EMTU 19/0637, 19/0649c, 19/0981 • 10☿☿; (B-16); EMTU 19/0621 • 7☿☿, 38☿☿; (B-17); EMTU 19/0787, 19/0790a • 8☿☿, ☿☿; (B-18); EMTU 19/0761 • 3☿☿, 12☿☿; (B-19); EMTU 19/0751 • 21☿☿, 21☿☿; (B-20); EMTU 19/0732 • 5☿☿; (B-21); EMTU 19/0697a • 2☿☿, 17☿☿; (B-22); EMTU 19/0720a, 19/0721 • 1♀, 8☿☿, ☿☿; (B-23); EMTU 19/0816 • 1☿, 24☿☿; (B-24); EMTU 19/0807 • 27☿☿; (B-25); EMTU 19/0851 • 6s, 20☿☿; (B-26); EMTU 19/0827b, 19/0830a • 3☿☿, 27☿☿; (B-27); EMTU 19/0795 • 46☿☿; (B-28); EMTU 19/0859a, 19/0869 • 8☿☿, ☿☿; (B-29); EMTU 19/0877, 19/0886a • 4☿☿, 24☿☿; (B-30); EMTU 19/0917 • 1☿, 24☿☿; (B-31); EMTU 19/0890a, 19/0902, 19/0906 • 1☿, 9☿☿; (B-32); EMTU 19/0924d, 19/0925a • 2☿☿, 8☿☿; (B-33); EMTU 19/0930 • 2☿☿, 9☿☿; (B-34); EMTU 19/0941 • 6☿☿, 14☿☿; (B-36); EMTU 19/0969, 19/0979b • 2☿☿, 29☿☿; (B-37); EMTU 19/0985a, 19/0989.

42. *Solenopsis* cf. *fugax/lusitanica*
Material: 1☿; (B-13); EMTU 19/0690 • 2♂♂, 39☿☿; (B-28); EMTU 19/0868a.

43. *Solenopsis orbula* Emery, 1875
Material: 35☿☿; (B-10); EMTU 19/0515 • ☿☿; (B-15); EMTU 19/0632.

44. *Temnothorax aeolius* (Forel, 1911)
Material: 1☿; (B-1); EMTU 18/7344c • 1☿; (B-14); EMTU 19/0612b • 1☿; (B-15); EMTU 19/0634d • 1☿; (B-16); EMTU 19/0618c • 12☿☿; (B-20); EMTU 19/0734b, 19/0736 • 1☿; (B-22); EMTU 19/0714c.

45. *Temnothorax antigoni* (Forel, 1911)
Material: 1☿; (B-8); EMTU 19/0568d • 30☿☿; (B-10); EMTU 19/0511b, 19/0512 • 23☿☿; (B-17); EMTU 19/0786a • 1☿; (B-20); EMTU 19/0734a • 1♀, 24☿☿; (B-23); EMTU 19/0825a • 2♀♀, ☿☿; (B-26); EMTU 19/0834, 19/0835 • 1♀, 4☿☿; (B-28); EMTU 19/0873b • 2☿☿; (B-29); EMTU 19/0886b • 1☿; (B-35); EMTU 19/0960a.

46. *Temnothorax flavicornis* (Emery, 1870)
Material: 1☿; (B-7); EMTU 19/0550d • 3☿☿; (B-36); EMTU 19/0973b.

47. *Temnothorax recedens* (Nylander, 1856)
Material: 22☿☿; (B-36); EMTU 19/0975a.

48. *Temnothorax semiruber* (André, 1881)
Material: 13☿☿; (B-5); EMTU 19/0536 • 7☿☿; (B-7); EMTU 19/0560 • 20☿☿; (B-9); EMTU 19/0585 • 9☿☿; (B-11); EMTU 19/0604a • 6☿☿; (B-12); EMTU 19/0653, 19/0667c • 24☿☿; (B-16); EMTU 19/0622 • 1☿; (B-19); EMTU 19/0743c • 23☿☿; (B-20); EMTU 19/0727, 19/0735 • 2☿☿; (B-22); EMTU 19/0714b • 19☿☿; (B-31); EMTU 19/0895.

49 *Temnothorax strymonensis* Csősz, Salata & Borowiec, 2018
Material: 3☿☿; (B-29); EMTU 19/0886c.

50. *Tetramorium bellerophoni* Salata & Borowiec, 2017
Material: ☿☿; (B-11); EMTU 19/0598.

51. *Tetramorium* cf. *caespitum*
Material: 20☿☿; (B-6); EMTU 19/0542a • 39☿☿; (B-21); EMTU 19/0695a, 19/0699b, 19/0708 • 14☿☿; (B-28); EMTU 19/0863 • ☿☿; (B-30); EMTU 19/0908, 19/0911, 19/0921.

52. *Tetramorium diomedeum* Emery, 1908
Material: 1☿; (B-1); EMTU 18/7344e • 44☿☿; (B-2); EMTU 18/7349a • 21☿☿; (B-5EMTU 19/0531 • 28☿☿; (B-19); EMTU 19/0749 • 23☿☿; (B-20); EMTU 19/0726 • 11☿☿; (B-24); EMTU 19/0800.

53. *Tetramorium flavidulum* Emery, 1924
Material: 36☿☿; (B-9); EMTU 19/0581 • ☿☿; (B-22); EMTU 19/0715.

Remarks: Aras and Aktaç (1994) recorded *T. chefketi* Forel, 1911 from Bozcaada, but this species could not be recorded in this study. However, *T. flavidulum*, which is from the same species group, was recorded from Bozcaada.

54. *Tetramorium galaticum* Menozzi, 1936
Material: 21♂, ☿☿; (B-1); EMTU 18/7340, 18/7342 • ☿☿; (B-5); EMTU 19/0523 • 8☿☿; (B-11); EMTU 19/0592 • ☿☿; (B-19); EMTU 19/0745 • ☿☿; (B-33); EMTU 19/0932.

Remarks: Aras and Aktaç (1994) recorded *T. semilaeve* André, 1882 and *T. lucidula* Emery, 1909 from Bozcaada. Borowiec et al. (2015) stated that the true *T. semilaeve* is distributed in the western part of the Mediterranean region and that the type series of the species includes more than one species. Therefore, it is normal that the species is not found in Bozcaada. *Tetramorium galaticum* was a subspecies of *T. lucidula* in 1994, and Salata and Borowiec (2017) elevated this taxon to species level in 2017. Therefore, according to the current literature, the *T. lucidula* record of Aras and Aktaç (1994) should be attributed to *T. galaticum*.

55. *Tetramorium hippocratis* Agosti & Collingwood, 1987
Material: 1☿; (B-1); EMTU 18/7344f • 4☿☿; (B-2); EMTU 18/7347g • ☿☿; (B-5); EMTU 19/0533 • 6☿☿; (B-7); EMTU 19/0555 • 6☿☿; (B-8); EMTU 19/0572d • 15♂♂, ☿☿; (B-10); EMTU 19/0508, 19/0519b • 21☿☿; (B-12); EMTU 19/0664, 19/0668 • 1☿; (B-13); EMTU 19/0687b • 20☿☿; (B-14); EMTU 19/0613 • 1☿; (B-16); EMTU 19/0692d • 1☿; (B-31); EMTU 19/0893 • 2☿☿; (B-34); EMTU 19/0936 • 1☿; (B-36); EMTU 19/0973a • 6☿☿; (B-37); EMTU 19/0982b.

56. *Tetramorium hungaricum* Röszler, 1935
Material: 1☿; (B-18); EMTU 19/0758b • ☿☿; (B-28); EMTU 19/0864 • 11☿☿; (B-30); EMTU 19/0920.

57. *Tetramorium immigrans* Santschi, 1927
Material: ☿☿; (B-1); EMTU 18/7337d, 18/7338a, 18/7344d • 24☿☿; (B-37); EMTU 19/0992.

58. *Trichomyrmex dentigera* (Roger, 1862)
Material: 3☿☿; (B-6); EMTU 19/0545b.

59. *Trichomyrmex perplexus* (Radchenko, 1997)
Material: 17☋☋, 3☿☿; (B-6); EMTU 19/0541 • 1☿; (B-8); EMTU 19/0571c • 5☋☋, 5☿☿; (B-10); EMTU 19/0500e, 19/0519c • 8☿☿; (B-16); EMTU 19/0628a.

Subfamily: PONERINAE Lepeletier de Saint-Fargeau

60. *Ponera coarctata* (Latreille, 1802)
Material: 1♀; (B-17); EMTU 19/0788.

4. Discussion

In this study, a total of 700 ant material obtained during the field studies conducted in 2018-2019 in Bozcaada were examined and 60 ant taxa belonging to 4 subfamilies and 22 genera were identified. From these results, the Ponerinae subfamily and 10 genera (*Bothriomyrmex* Emery, 1869, *Colobopsis* Mayr, 1861, *Chalepoxenus* Menozzi, 1923, *Monomorium* Mayr, 1855, *Myrmoxenus* Ruzsky, 1902, *Oxyopomyrmex* André, 1881, *Ponera* Latreille, 1804, *Solenopsis* Westwood, 1840, *Temnothorax* Mayr, 1861 and *Trichomyrmex* Mayr, 1865) are new records for Bozcaada ant fauna. Although no new taxa could be identified for the Turkish ant fauna among the recorded taxa, 47 of the 60 taxa, excluding 13 species (*Camponotus aethiops*, *C. lateralis*, *C. piceus*, *C. sanctus*, *C. samius*, *Cataglyphis nodus*, *Crematogaster sordidula*, *Lasius alienus*, *Lepisiota frauenfeldi*, *Messor oertzeni*, *Pheidole* cf. *pallidula*, *Plagiolepis pygmaea*, *Tetramorium* cf. *caespitum*) previously recorded by Aras and Aktaç (1994) are new records for Bozcaada ant fauna.

13 of the 26 ant species identified by Aras and Aktaç (1994) could not be recorded in this study. The reasons for why 11 of these species could not be detected in this study were discussed under the relevant species of the Results section. The other two species are *Formica cunicularia* Laterille, 1798 and *Formica gagates* Laterille, 1798. Aras and Aktaç (1994) recorded one worker of *Formica cunicularia* from Tuzburnu and *Formica gagates* from Sulubahçe province of Bozcaada indicating that the nests of these species could not be sampled by Aras and Aktaç (1994). These two localities were thoroughly investigated in this study for at least two and a half hours to find these two *Formica* species, but no samples of these species could be found. *Formica gagates* has a whole body black color and is very similar to the major workers of the genus *Proformica*. Thus, this record might be a major worker *Proformica* which was recorded from seven different localities in this study. The other species that could not be recorded in this study, *Formica cunicularia*, is a very common species in open rural and urban areas of mainland of Türkiye. However, although the Tuzburnu and other 36

localities were investigated in detail, specimens of this species could not be recorded. This result suggests that the species may have been transported to the island from the mainland and failed to settle, or its presence on the island has disappeared due to ecological conditions and/or competition with other species. In addition, representatives of the *Formica* genus do not have a distribution also in Gökçeada and Samos Islands which have similar conditions with Bozcaada and very close to the mainland of Türkiye (Scupola & Borowiec, 2023; Sert & Karaman, 2024). This information provides evidence that the *Formica* record of Aras and Aktaç (1994) could be considered a suspicious record.

Lepisiota frauenfeldi was recorded from all 12 habitats surveyed and determined as the species with the highest ecological valence. *Aphaenogaster balcanica* and *Messor wasmannii* had the second highest ecological valance, each recorded from 10 habitats, after *L. frauenfeldi*. Among the 12 habitats studied, the red pine forest is the most speciose habitat with 51 taxa. Nine species that could not be found from the red pine forest are *Lasius alienus*, *L. schulzi*, *Messor oertzeni*, *M. varrialei*, *Tapinoma subboreale/festae*, *Temnothorax strymonensis*, *Tetramorium bellerophoni*, *T. galaticum*, and *T. immigrans*. Although red pine forest is not the dominant habitat in Bozcaada island, many species have been recorded from this habitat, since red pine forest hosts many different microhabitats for different ant species to occupy.

Recently, Scupola and Borowiec (2023) summarized the ant species numbers of Greek islands and showed that the myrmecofauna of 15 Greek islands are well studied. The number of known ant species from these islands and their surface areas are as follows: Crete (8336 km^2) 99 species, Euboea (Evia, Eubea) (3684 km^2) 70 species, Lesbos (1633 km^2) 61 species, Rhodes (1401km^2) 81 species, Chios (842 km^2) 39 species, Kefalonia (Cephalonia) (781km^2) 74 species, Corfu (593 km^2) 68 species, Samos (477 km^2) 71 species, Naxos (430 km^2) 35 species, Zakynthos (406 km^2) 48 species, Kos (387 km^2) 49 species, Thassos (380 km^2) 58 species, Andros (380 km^2) 19 species, Karpathos (324 km^2) 60 species, Lefkada (303 km^2) 21 species. According to the above data, although the surface area of the islands other than Crete and Rhodes is much larger than the Turkish islands, the number of known ant species is similar to the Turkish islands. Of these islands, Lesbos, Chios and Samos are very close to the Anatolian part of Türkiye, among which Samos is only one km away from Turkish mainland and is closer than Bozcaada and Gökçeada. These Greek islands are 45, 23 and 13 times larger than Bozcaada and 5.65, 2.89 and 1.65 times larger than Gökçeada, respectively. When the Turkish islands are compared to these Greek islands in terms of surface area and number of known ant species, it can be clearly seen that the Turkish islands host much more ant species than the Greek islands, despite their smaller surface area. This difference may be due to the fact that while many localities have been investigated in Turkish islands, the Greek islands have not been sampled in much detail as the Turkish islands. For example, while 37 different localities were investigated over the 36 km^2 Bozcaada, and 73 different localities over the 289 km^2 Gökçeada, 25 different localities were investigated in the 476 km^2 Samos. As a result of these interesting data obtained, it can be clearly said that the detection of the ant fauna of each island should be investigated in detail, otherwise the true species richness may not be fully revealed. Furthermore, Borowiec et al. (2022) mentioned that the temperature reached to 40°C in June in Greek islands and to obtain more accurate results, these islands should be investigated in the spring months when the temperature values are lower and the ants are more active. This statement is also valid for Turkish Islands and to reach exact ant biodiversity in these islands, it is very important to study ant fauna in appropriate dates.

The similarities between the Turkish islands and the Greek islands, which are very close to the Turkish mainland, are examined in terms of known ant species by the Bray-Curtis similarity analysis. The analysis revealed that Bozcaada and Gökçeada are the most similar islands with a rate of 62% (Figure 4 and Table 2). Among the Greek islands included in the analysis, Bozcaada and Gökçeada are most similar to Samos, with rates of 48% and 51%, respectively. This is an expected result for Samos island which is very close to Turkish mainland than Bozcaada and Gökçeada islands and also is the well studied Greek island among the analysed islands. The least similarity of the Turkish islands was found to be with the island of Chios, with a rate of 36% and 37.8%, respectively. This result may be due to the ant fauna of Chios is not studied well and only 36 ant species are known from the island. It is thought that this low similarity outcome will change when the ant fauna of Chios island is well inverstigated and the number of species known from the island increases accordingly.

The data obtained from this study indicated that there is a need to investigate the ant fauna of the islands in detail in order to fully understand the ant fauna of Türkiye. Moreover, many probably new species are waiting to be detected and described.

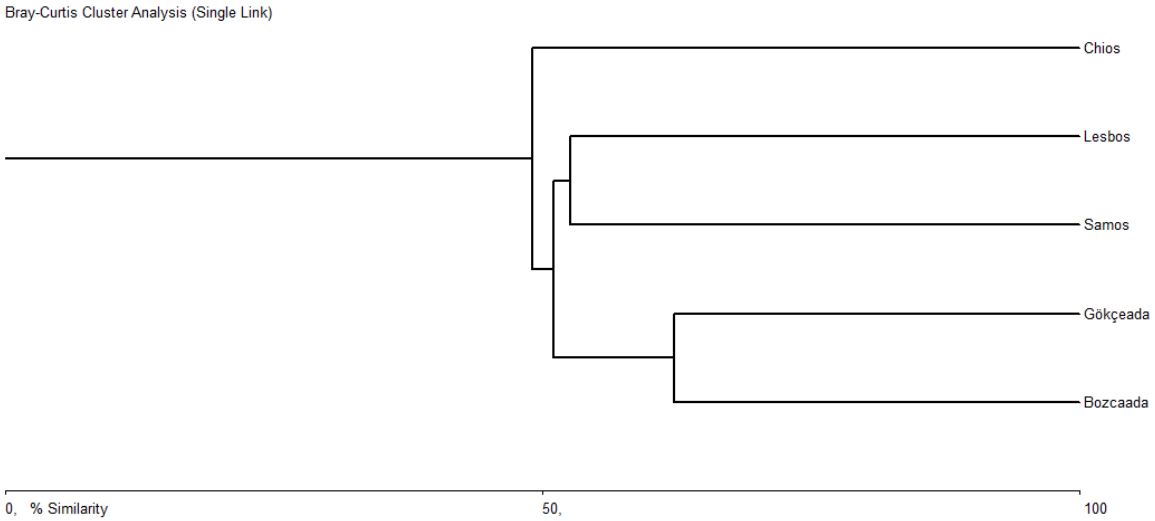

Figure 4. Dendrogram of Bray-Curtis similarity analysis for Turkish and Greek Islands

Table 2. Turkish and Greek Islands Bray-Curtis similarity analysis results

Step	**Clusters**	**Distance**	**Similarity**	**Joined 1**	**Joined 2**
1	4	37.7777786	62.2222214	1	2
2	3	47.3684196	52.6315804	3	4
3	2	48.965519	51.034481	1	3
4	1	50.9090919	49.0909081	1	5
Similarity Matrix					
	Bozcaada	**Gökçeada**	**Samos**	**Lesbos**	**Chios**
Bozcaada	*	62.2222	47.7612	47.1545	36
Gökçeada	*	*	51.0345	50.7463	37.8378
Samos	*	*	*	52.6316	49.0909
Lesbos	*	*	*	*	36.3636
Chios	*	*	*	*	*

Acknowledgement

We would like to thank Kadri KIRAN (Trakya University) for his help of preparation of the ant photographs. This paper was produced from part of MSc thesis of Nermin TOPTAŞ. This study was financially supported by Trakya University, Scientific Research Projects Coordination Unit (TUBAP) with the number 2019-179.

Author contribution

Author Contributions: Concept: N.T., C.K., Design: N.T., C.K., Execution: N.T., C.K., Material supplying: C.K., Data acquisition: N.T., C.K., Data analysis/interpretation: N.T., C.K., Writing: N.T., C.K., Critical review: C.K.

Declaration of ethical code

The authors of this article declare that the materials and methods used in this study do not require ethics committee approval and/or legal-special permission.

Conflicts of interest

The authors declare that there is no conflict of interest.

References

Aras, A., & Aktaç, N. (1992). Gökçeada karınca faunası hakkında ön araştırma. *11th National Congress of Biology*, Elazığ.

Aras, A., & Aktaç, N. (1994). Bozcaada Karınca Faunası. *12th National Congress of Biology*, Edirne.

Borowiec, L., Galkowski, C., & Salata, S. (2015). What is *Tetramorium semilaeve* André, 1883? (Hymenoptera, Formicidae). *ZooKeys, 512*, 39-62. https://doi.org/10.3897/zookeys.512.10006

Borowiec, L., Lebas, C., & Salata, S. (2022). Notes on ants (Hymenoptera: Formicidae) from three northern Aegean islands–Lemnos, Samothraki and Thasos. *Annals of the Upper Silesian Museum in Bytom Entomology, 31*(10), 1-14. http://doi.org/10.5281/zenodo.7346453

Borowiec, L., van Delft, J. P. L., van Delft J. J. C. W., & Salata, S. (2023). Five ant species (Hymenoptera: Formicidae) new to the Greek fauna with notes on ants from Greek Thrace. *Annals of the Upper Silesian Museum in Bytom Entomology Newsletter, 32*(08), 1-13. https://doi.org/10.5281/zenodo.10101028

Donisthorpe, H. (1950). A first instalment of the ants of Turkey. *Annals and Magazine of Natural History, (12)*3, 1057-1067.

Emery, C. (1870). Studi mirmecologici. *Bullettino della Società Entomologica Italiana, 2*, 193-201.

Emery, C. (1905). Le forme paleartiche del *Camponotus maculatus* F. *Rendiconto delle Sessioni della R. Accademia delle Scienze dell'Istituto di Bologna, (n.s.) 9*, 27-44.

Forel, A. (1906). Fourmis d'Asie mineure et de la Dobrudscha récoltées par M. le Dr. Oscar Vogt et Mme Cécile Vogt, Dr. méd. *Annales de la Société Entomologique de Belgique, 50*, 187-190.

Gibb, H., Contos, P., Photakis, M., Okey, I., Dunn, R. R., Sanders, N. J., & Jones, M. M. (2024). Morphological Strategies in Ant Communities along Elevational Gradients in Three Mountain Ranges. *Diversity*, 16, 48. https://doi.org/10.3390/d16010048

Karaman, C. (2012). *Camponotus ruseni* n. sp. (Hymenoptera: Formicidae) – A Putative Second Parasitic Species of the Genus *Camponotus* Mayr. *Journal of the Kansas Entomological Society*, *85*(4), 309-317. https://doi.org/10.2317/0022-8567-85.4.309

Karaman, C., & Aktaç, N. (2013). Descriptions of Four New Species of *Camponotus* Mayr (Hymenoptera: Formicidae), with a Key for the Worker Caste of the *Camponotus* of Turkey. *Journal of the Kansas Entomological Society*, *86*(1), 36-56. https://doi.org/10.2317/JKES120516.1

Karaman, C., Kiran, K., Aksoy, V., & Çamlıtepe, Y. (2015). First Record of the South European Rare Parasitic Ant Species *Camponotus universitatis* Forel (Hymenoptera, Formicidae) in Asia. *Journal of the Entomological Research Society, 17*(1), 45-49.

Karaman, C., Kiran, K., Aksoy, V., & Çamlıtepe, Y. (2017). A new species of the genus *Camponotus* (Mayr) (Hymenoptera, Formicidae) from Turkey. *Turkish Journal of Zoology, 41,* 998-1004. https://doi.org/10.3906/zoo-1704-20

Karaman, C., & Kiran, K. (2018). New Tramp Ant Species for Turkey: *Tetramorium lanuginosum* Mayr (Hymenoptera: Formicidae). *Trakya University Journal of Natural Sciences, 1*9(1), 51-54. https://doi.org/10.23902/trkjnat.340008

Kiran, K., Aktaç, N., & Tezcan, S. (2008). Three new species of ants, genus *Aphaenogaster* (Hymenoptera: Formicidae) from Turkey. *Biologia* 63 (5): 689-695. https://doi.org/10.2478/s11756-008-0123-y

Kiran, K., & Karaman, C. (2012). First annotated checklist of the ant fauna of Turkey (Hymenoptera: Formicidae). *Zootaxa, 3548*, 1-38. https://doi.org/10.11646/zootaxa.3548.1.1

Kiran, K., Karaman, C., Lapeva-Gjonova, A., & Aksoy, V. (2017). Two new species of the "ultimate" parasitic ant genus *Teleutomyrmex* KUTTER, 1950 (Hymenoptera: Formicidae) from the Western Palaearctic. *Myrmecological News, 25*, 145-155. https://doi.org/10.25849/myrmecol.news_025:145

Kiran, K., & Karaman, C. (2020). Additions to the Ant Fauna of Turkey (Hymenoptera, Formicidae). *Zoosystema, 42*(18), 285-329. https://doi.org/10.5252/zoosystema2020v42a18

Kiran, K., & Karaman, C. (2021). Ant fauna (Hymenoptera: Formicidae) of Central Anatolian Region of Turkey. *Turkish Journal of Zoology, 45*(3), 161-196. https://doi.org/10.3906/zoo-2008-6

Kiran, K., Karaman, C., & Heinze, J. (2021). First Record of the Inquiline Ant *Leptothorax kutteri* Buschinger, 1965 from Turkey. *Sociobiology, 68*(3), e7224. https://doi.org/10.13102/sociobiology.v68i3.7224

Salata, S., & Borowiec, L. (2015a). Redescription of *Crematogaster cypria* Santschi, 1930, new status, with description of two new related species from Greece and Turkey (Hymenoptera, Formicidae). *Zookeys, 550*, 59-77. https://doi.org/10.3897/zookeys.505.9566

Salata, S., & Borowiec, L. (2015b). A taxonomic revision of the genus *Oxyopomyrmex* André, 1881 (Hymenoptera: Formicidae*). Zootaxa, 4025*(1), 1-66. https://doi.org/10.11646/zootaxa.4025.1.1

Salata, S., & Borowiec, L. (2015c). Redescription of *Temnothorax antigoni* (Forel, 1911) and description of its new social parasite *Temnothorax curtisetosus* sp. n. from Turkey (Hymenoptera, Formicidae). *Zookeys, 523*, 129-148. https://doi.org/10.3897/zookeys.523.6103

Salata, S., & Borowiec, L. (2017). Species of *Tetramorium semilaeve* complex from Balkans and Western Turkey, with Description of Two New Species of (Hymenoptera: Formicidae: Myrmicinae). *Annales Zoologici (Warszawa), 67*(2), 279-313. https://doi.org/10.3161/00034541ANZ2017.67.2.008

Salata, S., Loss, A.C., Karaman, C., Kiran, K., & Borowiec, L. (2019). Review of the *Camponotus kiesenwetteri* group (Hymenoptera, Formicidae) in the Aegean with the description of a new species. *Zookeys, 899*, 85-107. https://doi.org/10.3897/zookeys.899.46933

Salata, S., Karaman, C., Kiran, K., & Borowiec, L. (2021). Review of the *Aphaenogaster splendida* species-group (Hymenoptera: Formicidae). *Annales Zoologici, 71*, 297-343. https://doi.org/10.3161/00034541ANZ2021.71.2.008

Schkaff, B. (1924). Formiche di Costantinopoli. *Bollettino della Societa Entomologica Italiana, 56*, 90-96.

Scupola, A., & Borowiec, L. (2023). Ants (Hymenoptera Formicidae) of Greek islands: where we are. In M. Masseti (Ed.), *Life on Islands 2. Zoological diversity of the Aegean Archipelago* (pp. 185-231).

Seifert, B. (2016). Inconvenient hyperdiversity – the traditional concept of "*Pheidole pallidula*" includes four cryptic species (Hymenoptera: Formicidae). *Soil Organisms, 88*(1), 1-17. https://doi.org/10.5281/zenodo.270253

Seifert, B. (2019). A taxonomic revision of the members of the *Camponotus lateralis* species group (Hymenoptera: Formicidae) from Europe, Asia Minor and Caucasia. *Soil Organisms, 91*(1), 7-32. https://doi.org/10.25674/SO-91-1-02

Seifert, B. (2020). A taxonomic revision of the Palaearctic members of the subgenus *Lasius* s. str. (Hymenoptera, Formicidae). *Soil Organisms, 92*(1), 15-86. https://doi.org/10.25674/so92iss1pp15

Seifert, B. (2023). A revision of the Palaearctic species of the ant genus *Cardiocondyla* Emery 1869 (Hymenoptera: Formicidae). *Zootaxa, 5274*, 1-64. https://doi.org/10.11646/zootaxa.5274.1.1

Sert, E., & Karaman, C. (2024). Myrmecofauna (Hymenoptera, Formicidae) of Gökçeada Island, Türkiye. *Sakarya University Journal of Science, 28*(2), 392-409.

Wagner, H. C., Karaman, C., Aksoy, V., & Kiran, K. (2018). A mixed colony of *Tetramorium immigrans* Santschi, 1927 and the putative social parasite *Tetramorium aspina* sp.n. (Hymenoptera: Formicidae). *Myrmecological News, 28*, 25-33. https://doi.org/10.25849/myrmecol.news_028:025