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Vertical Distribution of Ants (Hymenoptera: Formicidae) in Ganos (Işık) Mountains

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ABSTRACT

This research was studied vertically in 200 m sections in different habitats of the Ganos Mountains, at altitudes from sea level to 924 m. During the research, material was collected from 31 different localities and 10 different habitats, and 23 genera and 66 species belonging to 4 subfamilies (Ponerinae, Myrmicinae, Dolichoderinae, Formicinae) were identified. Of the 66 species identified, 3 (Aphaenogaster ovaticeps, Messor minor, Carebara oertzeni) are new records for the Turkish fauna, and 3 species [Messor ebeninus Santschi, 1927, Tapinoma simrothi Krausse, 1911, Proformica striaticeps (Forel, 1911)] are new records for the Thrace Region. In vertical studies conducted on the southern and northern slopes of the Ganos Mountains, the number of species was found to be low at altitudes between 0-200 m (24 species), reaching the highest numerical value between 200-800 m (47 species), and at altitudes from 800 m to the summit the number of species decreased again (26 species).

Keywords: Ganos Mountains; Hymenoptera: Vertical distribution; Formicidae

Ganos (Işık) Dağları Karıncalarının (Hymenoptera: Formicidae) Vertikal Dağılımları

ÖZ

Bu araştırma, Ganos Dağları'nın farklı habitatlarında, deniz seviyesinden 924 m'ye kadar olan yüksekliklerde 200 m'lik kesitler halinde vertikal olarak çalışılmıştır. Araştırma sırasında 31 farklı lokalite ve 10 farklı habitattan materyal toplanmış olup 4 altfamilya (Ponerinae, Myrmicinae, Dolichoderinae, Formicinae)'ya ait 23 cins ve 66 tür tespit edilmiştir. Tespit edilen 66 türden 3'ü (Aphaenogaster ovaticeps, Messor minor, Carebara oertzeni) Türkiye faunası için, 3 tür [Messor ebeninus Santschi, 1927, Tapinoma simrothi Krausse, 1911, Proformica striaticeps (Forel, 1911)] ise Trakya Bölgesi için yeni kayıtlardır. Ganos Dağları'nın güney ve kuzey yamaçlarında yürütülen vertikal çalışmalarda 0-200 m arasındaki yükseltilerde tür sayısının düşük olduğu (24 tür), 200-800 m arasında en yüksek sayısal değere ulaştığı (47 tür), 800 m'den zirveye kadar olan yükseltilerde ise tür sayısının tekrar azaldığı (26 tür) tespit edilmiştir.

Anahtar Kelimeler: Ganos Dağları; Hymenoptera; Vertikal dağılım; Formicidae

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1. INTRODUCTION

Since the Thrace Region is located in the area where the Mediterranean, European-Siberian and Irano-Turanian floristic regions meet, its natural vegetation shows very different characters. This region has a rich potential in terms of natural vegetation due to differences in climate, topography and geological structure [1]. Ganos Mountains, one of the important natural areas of the Thrace Region, are very important for the region with their biodiversity. Although it falls into the region where Balkan, Central European and auxin elements are dominant in terms of flora, there are maquis and pseudomaquis elements on the foothills of the mountain overlooking the Marmara Sea.

Regional studies on species diversity and vertical distribution of ants started in our country in the 1970s [2]. The species identified in these studies were evaluated in terms of taxonomic, faunistic and biogeographical aspects, and it was observed that there was a decrease in the number of ant species depending on altitude. In our country, vertical studies following Aktaç [2] and aiming to explain the distribution of ants depending on altitude are still quite limited. Examples of these studies are Aktaç [3]'s "Vertical Distributions of Ants in the Eastern Anatolia Region", Kıran and Aktaç [4]'s "Vertical Distributions of Samanlı Mountains Ants", Karaman and Aktaç [4]'s "Vertical Distributions of Kaz Mountains Ants". ” can be given as an example. To date, no study has been conducted on the vertical distribution of ants in Turkish Thrace, except for the "Research on the Forest Ant Fauna of the Thrace Region" study, which includes the Istranca Mountains of Çamlitepe and Aktaç [5].

As a result of this research, it will be possible to compare the vertical data obtained in the moderately high Ganos Mountains in Turkish Thrace, which has a rich species diversity, with the data in both Anatolia and Europe. In addition, the data to be obtained will be of particular importance in terms of determining the geographical elements represented by the species. By comparing the compositions of the detected species in various habitats, determining the altitudes where ant species that prefer different altitudes can encounter and coexist, it will be determined which altitude is the most suitable transition zone. In the research, the species with the highest and lowest ecological valence will be determined. The research will also identify possible new species for the scientific world and new records for Turkey, contributing to our country's ant fauna and biodiversity.

2. MATERIAL AND METHOD

The research material was collected by working vertically in different habitats in the sub-regions of the Ganos Mountains (moist forests area on the Ganos Mountains, Güzelköy-Işıklar section, Ganos Mountains dry forests area, Maki and Pseudomaki area) within the borders of Tekirdağ province. Vertical studies were carried out from sea level to the top of the Ganos Mountains and were studied in 200 m sections. In collecting

the material, the periods when the ants were active were taken into consideration and field studies were carried out between April and October. Nests were used as the basis for collecting materials. In cases where nests could not be identified, individual samples were collected from outside the nest. Smaller specimens were caught with the help of an infiltrator, and larger ones were caught by hand. The collected material was placed in glass tubes containing 70% alcohol in the field. Samples from the castes (female, male, worker, soldier) in the nests identified on land rotation were attached to pointed triangular labels with a special water-soluble adhesive and pinned to dry material, allowing them to be examined from all angles in order to be identified and kept as museum material. The remaining samples were turned into stock material in tubes containing a mixture of 70% alcohol + glycerin (100cc 70% alcohol + 20cc glycerin).

In determining the species, resources covering research on Turkish ants and faunistic studies conducted in countries geographically adjacent to Turkey were used. In addition, Aktaç's collection of ants from Turkey and neighboring countries was used as comparison material.

The research area is shown on the map to indicate the distribution of the species (Figures 1, 2.), and the researched localities, their altitudes, research dates and habitats are presented in tables (Table 1); The identified species and the zoogeographic elements they represent are listed (Table 5, Figure 4). Additionally, the distribution of species according to habitats is shown in Table 4.

Research material is kept in the Department of Biology, Faculty of Science, Trakya University.

Figure 1: Location of the research area within the Thrace Region.

Figure 2: Localities investigated in the Ganos Mountains
(The number on the figure refer to the sequence numbers of the localities shown in Table 1)

Table 1: Researched localities, altitudes, dates and habitats.

Loc No	Locality	Altitude	Date	Habitat
1	Ormanlı Village	225-265 m.	21.06.2013	Mixed Forest (Hairy Oak, Hornbeam)
2	Ormanlı Village Ridges	340-365 m.	21.06.2013	Dense Hornbeam Forest
3	Ormanlı Village Ridges	650-675 m.	02.07.2013	Mixed Forest (Horbeam, Linden, Oak
4	Ormanlı Village Ridges	714 m.	02.07.2013	Oak Forest
5	Ormanlı Village Ridges (summit)	924 m.	02.07.2013	Young Oak forest
6	Beyoğlu Village	250-340 m.	18.07.2013	sycamore
7	Sırtbey Village	200 m.	18.07.2013	Anthropogenic Steppe
8	Tatarlı Village	300 m.	11.09.2013	Mixed Forest (Oak, Hornbeam)
9	Yeniköy-Işıklar Village	536 m.	11.09.2013	Young Oak Forest
10	Between Bulgur Village/ Palamut Village	450 m.	16.09.2013	Young Oak Forest
11	Between Bulgur Village/ Palamut Village	572 m.	16.09.2013	Roadside
12	Hoşköy	214-230 m.	24.04.2014	Olive Grove and Bushes
13	Güzelköy	400-425 m.	24.04.2014	Roadside
14	Güzelköy	652-725 m.	24.04.2014	Mixed Forest (Young Oak-Horbeam)
15	Gaziköy	200-235 m.	25.04.2014	Sparse Plane Tree
16	Mursallı Village	225-375 m.	25.04.2014	Mixed Forest (Oak - Hornbeam)
17	Gaziköy	900-915 m.	26.04.2014	Stony Area
18	Uçmakdere	625-680 m.	26.04.2014	Young Hornbeam Forest
19	Uçmakdere	380-420 m.	26.04.2014	Mixed Forest (Oak, Hornbeam)
20	Uçmakdere	200-230 m.	26.04.2014	Sparse Shrubs and Stony
21	Yeniköy	200-600 m.	27.04.2014	Stony Area
22	Bulgur-Palamut ridges	625 m.	17.06.2014	Mixed Forest, Coppice
23	Bulgur-Palamut ridges	917 m.	17.06.2014	Oak forest
24	Dağ Yenicesi (Kartaltepe)	870 m.	18.06.2014	Oak forest
25	Dağ Yenicesi (Kartaltepe	600 m.	18.06.2014	Linden bowl
26	Gölcük Village	154 m.	19.06.2014	Plane trees, oak trees
27	Mursallı Village	400 m.	01.10.2014	Oak trees
28	Yayaköy	400 m.	01.10.2014	Plane trees, oak trees
29	Yörgüç Village	410 m.	01.10.2014	Plane trees
30	Beyoğlu Village	410 m.	02.10.2014	Mixed Forest (Plane, Oak, Linden)
31	Beyoğlu Village	600 m.	02.10.2014	Mixed Forest (Horbeam, Oak)

3. RESULT AND DISCUSSION

Within the scope of this research, the heights of the Ganos (Işıklar) Mountains from sea level to 924 m were studied vertically. The research was carried out in 31 localities and 10 different habitats among these altitudes, and as a result of the research, 23 genera from 4 subfamilies (Ponerinae, Myrmicinae, Dolichoderinae, Formicinae) and 66 species belonging to these genera were identified (Figure 3, Table 3.). Of the species identified, 31 belong to the Myrmicinae and 30 to the Formicinae subfamilies. These two subfamilies are the subfamilies with the widest distribution and the most species in Turkey. From the other two subfamilies, 3 species in Dolichoderinae and 2 species in Ponerinae were recorded. These two subfamilies are by few species throughout Türkiye [8].

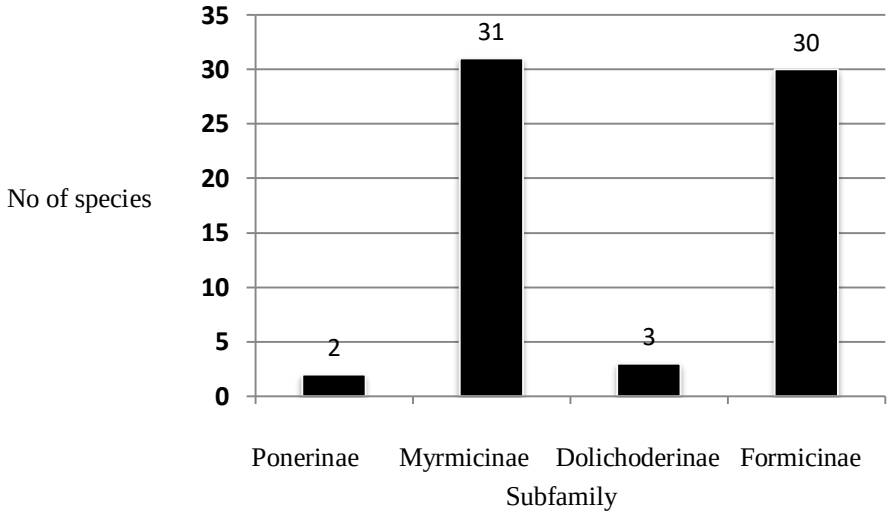

Figure 3: Distribution of ant species detected in the Ganos Mountains into subfamilies.

Three of the identified species (*Aphaenogaster ovaticeps, Messor minor, Carebara oertzeni*) are new records for the Turkish fauna. Additionally, 3 species (*M. ebeninus, Tapinoma simrothi, Proformica striaticeps*) were recorded for the first time from Turkish Thrace, indicating their locality. Considering the general geographical distribution of new records for the Turkish fauna, it is an expected result that they are found in our research area. Records of *M. ebeninus*, one of the species listed without locality in Turkish Thrace, are available from Agosti & Collingwood [9] and Radchenko [10]; The record for *P. striaticeps* belongs to Collingwood & Heatwole [11], and the record for *Tapinoma simrothi* as "Minor Asia" belongs to Collingwood [12]. In later studies, *M. ebeninus* was known from Greece [13], *P. striaticeps* from Bulgaria [14] and Greece [13]. According to the distribution of *T.simrothi* in "Asia Minor", their presence in Turkish Thrace has been confirmed.

The richest genera in terms of number of species in the region are; They are Camponotus (8 species), Lasius (8 species), Tetramorium (7 species) and Messor (7 species). This situation is consistent with the distribution throughout Thrace [15]. The genera and species represented by a single species are *Ponera coarctata Emery, 1898, Hypoponera eduardi (Forel, 1894), Cardiocondyla elegans Emery, 1869, Pheidole pallidula (Nylander, 1849), Solenopsis fugax (Latreille, 1798), Carebara oertzeni (Forel, 1886), Dolichoderus quadripunctatus (Linnaeus, 1771), Polyergus rufescens (Latreille, 1798), Lepisiota frauenfeldi (Mayr, 1855), Prenolepis nitens (Mayr, 1853).* Among the genera represented by a single species, *Ponera, Hypoponera, Carabera, Dolichoderus, Prenolepis* and *Polyergus* are known from Turkey with a single species so far [8]. The fact that other genera (*Pheidole, Cardiocondyla, Solenopsis and Lepisiota*) are represented by a single species can be explained by the fact that the research area is local and our study is vertical.

Considering the habitat preferences of the species detected in the research area, it was determined that the habitat containing the most species was mixed forest with 54 species. 54 of a total of 66 species (~82%) have been recorded in this habitat. This habitat is followed by oak forest with 37 species (~ 56%), and stream banks - plane trees with 30 species (~ 45%). The habitats containing the fewest species are shrub and stony areas with 9 species (~ 14%) and anthropogenic steppe with 8 species (12%) (Table 4).

The distribution of ant species in a certain habitat depends on a mosaic of various abiotic and biotic factors, and each of these factors can affect the distribution separately or together [16]. Species diversity is dominant in the mentioned habitats, first of all, a large part of the Ganos Mountains is covered with forest cover containing different types of tree communities, it contains mostly omnivorous species in terms of feeding regimes, the species have developed hunting abilities, they can feed on the nectar secreted by Homopters that are common in these areas. This can be explained by their ability to benefit from extrafloral nectar secretions in the forest area [17; 18]. The presence of few species in anthropogenic steppe and stony-shrub areas can be explained by the human impact of such habitats being turned into degraded habitats by destroying forests and opening settlements [19].

When the distribution of the species detected in the research area according to habitats was evaluated, the same species was not found in all 10 habitats studied. The most tolerant species according to habitat preferences are; *Pheidole pallidula, Crematogaster schmidti, Tetramorium forte, Plagiolepis pallescens, P. pygmaea, Camponotus aethiops,* found in 8 of 10 habitats, and *Messor structor, Tetramorium caespitum and T.chefketi,* found in 7 habitats. From studies conducted globally; It is known that *Pheidole, Crematogaster and Camponotus* are defined as the most common genera, and *Messor, Tetramorium and Plagiolepis* are also common genera. The fact that *Pheidole, Plagiolepis and Tetramorium* species are small in size and exist in small colonies is an important factor in their adaptation to various debris and soil. On

the other hand, characteristics of *Messor* and *Camponotus* species such as being large in size, containing a large number of individuals in their colonies, being aggressive, and having a territorial area can be explained as reasons for their tolerance [20]. The species found only in one habitat are *Ponera coarctata, Myrmica scabrinodis, Aphaenogaster balcanica, A. ovaticeps, A. simonelli, Aphaenogaster subterraneoides, Messor structor aegeaus, Cardiocondyla elegans, Crematogaster ionia, Carabera oertzeni, Dolichoderus quadripunctatus, Proformica kobachidzei, Camponotus truncatus. , Lasius fuliginosus , L. myops, Formica sanguinea, Polyergus rufescens* species. Of these species, *P. coarctata, D. quadripunctatus, Camponotus truncatus* are species with special habitat preferences. It is completely coincidental that other species are found in only one habitat. It is possible that they can be found in more than one habitat in more intensive quantitative studies. Apart from these numerical limits, being found in numerically different habitats can also be explained by the ability of species to adapt to different ecological conditions [21].

It is seen that the research region is represented by: Holarctic, Palearctic, Western Palearctic, European Siberia, Turan-Mediterranean-Europe, Europe-Caucasus, Europe, Mediterranean, Eastern Mediterranean, Balkan, Balkan-Anatolia, Anatolia - Caucasus and Anatolia. The majority of the fauna consists of Mediterranean elements (30 species), Palearctic elements (14 species) and Endemic elements (9 species). Other elements are represented by 1-8 species (Table 5., Figure 4). This situation is also compatible with the findings of Lapeva-Gjonova and Kiran [22] in the Istranca Mountains and [23] in the Kaz Mountains. The dominance of the Mediterranean climate in the region has caused most of the species to consist of the Mediterranean species complex. On the other hand, the paleoecological history and other local features of the region also affected this distribution and played an important role in the remarkable formation of endemism.

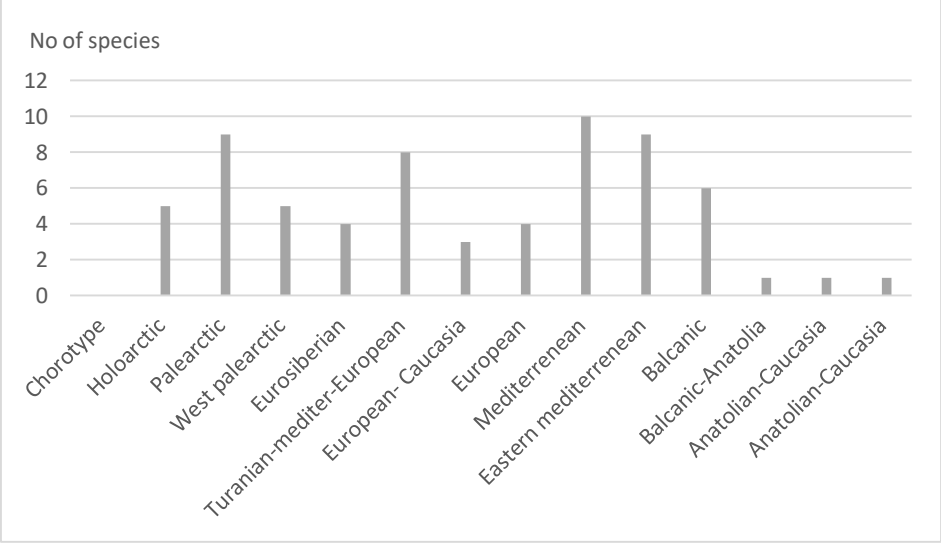

Figure 4: Distribution of species according to their chorotypes

Vertical studies in the region were carried out from both the south and north of the Ganos Mountains, from sea level to the top of the mountain (924 m). When the data obtained at every 200 m are evaluated, it is seen that the number of species is low at 0-200 m (24 species, 36.36%), peaks between 200-800 m (~ 47 species, 71.21%), and decreased again at 800 m. (26 species, 39.39%, Table 2.). This situation is parallel to the results of vertical distribution studies conducted with ants [3, 23, 6, 4, 24, 25] both in our country and in other countries.

Table 2: Distribution of species detected in Ganos Mountains according to altitude

Altitude	No of species	Percentage (%)
0-200	24	36.36
200-400	49	74.24
400-600	48	74.72
600-800	45	68.18
800 -924	26	39.39

Our research region shows anthropogenic steppe and occasionally maquis and pseudomaquis characteristics at altitudes up to 200 m. It is seen that at altitudes up to 200-800 m, the mixed forest feature of deciduous trees is dominant, and at altitudes above 800 m, there are occasional mountain meadows, shrubs and rocky areas. In other words, Ganos Mountains has 3 different vegetation zones. The small number of species found at altitudes up to 0-200 m may be associated with habitat degradation such as the conversion of formerly forested habitats at this altitude into anthropogenic steppes and opening them up to settlement and industry [19]. The altitudes of 200-800m, where the number of species is highest, are mixed forest areas dominated by deciduous trees. The high habitat productivity in these elevations and this vegetation structure [26, 27] and the variability of food resources [28] can be explained by the presence of logs and logs from trees abandoned to rot as nesting places, and the abundance of crumbs that we can define as trash [29]. The decrease in the number of species in the areas from 800 m up to the summit is possible due to the fact that forest areas are sometimes replaced by stony areas, the food sources of omnivorous species decrease and omnivorous species are replaced by carnivorous species.

When the ant fauna of the Ganos Mountains is evaluated as a whole, the 66 species that can be identified constitute a remarkable 40.49% of the 163 taxa recorded in Turkish Thrace to date. In addition, our research contributed to our country's ant biodiversity with the 3 species recorded for the first time in Turkey.

Table 3: Species found in Ganos Mountains.

Subfamily: PONERINAE LEPELETIER

Hypoponera eduardi (Forel, 1894)
Ponera coarctata (Latreille, 1802)

Subfamily: MYRMICINAE (LEPELETIER)
Myrmica scabrinodis Nylander, 1846
Myrmica ruginodis Nylander, 1846
Aphaenogaster balcanica (Emery, 1898)
Aphaenogaster ovaticeps (Emery, 1898) ******
Aphaenogaster simonelli Emery, 1894
Aphaenogaster subterranea (Latreille, 1798)
Aphaenogaster subterraneoides Emery, 1881
Messor caducus (Victor, 1839)
Messor ebeninus (Santschi, 1927)*****
Messor meridionalis (Andre, 1883)
Messor minor (Andre, 1883)******
Messor oertzeni Forel, 1910
Messor structor (Latreille, 1798)
Messor structor subsp. *aegeaus* Santschi, 1926
Pheidole pallidula (Nylander, 1849)
Cardiocondyla elegans Emery, 1869
Crematogaster ionia Forel, 1911
Crematogaster schmidti (Mayr, 1853)
Crematogaster sordidula (Nylander, 1849)
Solenopsis fugax (Latreiile, 1798)
Temnothorax parvulus (Schenck, 1852)
Temnothorax recedens (Nylander, 1856)
Temnothorax unifaciatus (Latreille, 1798)
Tetramorium caespitum (Linnaeus, 1758)
Tetramorium chefketi Forel, 1911
Tetramorium ferox Ruzsky, 1903
Tetramorium forte Forel, 1904
Tetramorium hippocratis Agosti & Collingwood, 1987
Tetramorium lucidulum Emery, 1909
Tetramorium semilaeve Andre, 1883
Carebara oertzeni (Forel, 1886)******

Subfamily: DOLICHODERINAE FOREL

Dolichoderus quadripunctatus (Linnaeus, 1771)
Tapinoma erraticum (Latreille, 1798)
Tapinoma simrothi Krausse, 1911*****

Subfamily: FORMICINAE WHEELER

Plagiolepis pallescens Forel, 1889
Plagiolepis pygmaea (Latreille, 1798)
Plagiolepis taurica Lomnicki, 1925
Lepisiota frauenfeldi (Mayr, 1855)
Proformica kobachidzei Arnoldi, 1968
Proformica striaticeps Forel, 1911 *****
Camponotus (Tanaemyrmex) aethiops (Latreille, 1798)
Camponotus (Myrmentoma) dalmaticus (Nylander, 1849)
Camponotus (Myrmentoma) gestroi Emery, 1878
Camponotus (Myrmentoma) lateralis (Olivier, 1792)

Camponotus (Myrmentoma) piceus (Leach, 1825)
Camponotus (Tanaemyrmex) samius Forel, 1889
Camponotus (Tanaemyrmex) sanctus Forel, 1904
Camponotus (Colobopsis) truncatus (Spinola, 1808)
Prenolepis nitens (Mayr, 1853)
Lasius (Lasius) alienus (Foerster, 1850)
Lasius (Cautolasius) flavus (Fabricius, 1782)
Lasius (Dendrolasius) fuliginosus (Latreille, 1798)
Lasius (Chtonolasius) meridionalis (Bondroit, 1920)
Lasius (Cautolasius) myops Forel, 1894
Lasius (Lasius) neglectus Van Loon, Boomsma & Andrasfalvy, 1990
Lasius (Lasius) paralienus Seifert, 1992
Lasius (Chtonolasius) umbratus (Nylander, 1846)
Formica cunicularia Latreille, 1758
Formica fusca Linnaeus, 1758
Formica sanguinea Latreille, 1798
Polyergus rufescens (Latreille, 1798)
Cataglyphis aenescens (Nylander, 1849)
Cataglyphis nodus (Brulle, 1833)
Cataglyphis viaticoides (Andre, 1881)
**** New records for Turkey**
*** New records for Turkish Thrace**

Table 4: Distribution of species obtained from Ganos Mountains according to habitats

Species \ Habitat	Anthropogenic steppe	Shrub-Stony	Streamside and Plane Tree	Gürgen Ormanı	Linden trees	Mixed forest	Oak forest	Stony	Roadside	Olive Grove-Shrub	No of habitats where each species is found
Hypoponera eduardi			●			●					2
Ponera coarctata						●					1
Myrmica ruginodis				●		●	●			●	4
Myrmica scabrinodis						●					1
Aphaenogaster balcanica										●	1
Aphaenogaster ovaticeps						●					1
Aphaenogaster simonellii		●									1
Aphaenogaster subterranea				●	●	●	●	●			5
Aphaenogaster subterraneoides						●					1
Messor caducus						●		●			2
Messor ebeninus				●		●					2
Messor meridionalis			●	●		●	●		●		5
Messor minör			●	●		●			●	●	5
Messor oertzeni			●	●		●	●		●		5
Messor structor	●		●	●		●	●	●	●		7
Messor structor aegeaus			●								1
Pheidole pallidula		●	●	●		●	●	●	●	●	8
Cardiocondyla elegans		●									1
Crematogaster ionia			●								1
Crematogaster schmidti		●	●	●	●	●	●		●	●	8
Crematogaster sordidula						●	●				2
Solenopsis fugax					●	●	●				3
Temnothorax parvulus						●	●				2
Temnothorax recedens						●			●		2
Temnothorax unifasciatus						●	●				2
Tetramorium caespitum		●	●	●	●	●	●	●			7
Tetramorium chefketi			●	●	●	●	●	●	●		7
Tetramorium ferox			●	●	●	●	●		●		6
Tetramorium forte			●	●	●	●	●	●	●	●	8
Tetramorium hippocratis						●	●	●		●	4

Tetramorium lucidulum			●	●		●		●			**4**
Tetramorium semilaeve						●	●	●			**3**
Carebara oertzeni						●					**1**
Dolichoderus quadripunctatus					●						**1**
Tapinoma erraticum			●	●		●	●	●			**5**
Tapinoma simrothi			●				●				**2**
Plagiolepis pallescens		●	●	●		●	●	●	●	●	**8**
Plagiolepis pygmaea	●		●	●		●	●	●	●	●	**8**
Plagiolepis taurica			●			●					**2**
Lepisiota frauenfeldi			●	●		●	●	●	●		**6**
Proformica kobachidzei	●										**1**
Proformica striaticeps	●		●			●					**3**
Camponotus aethiops	●		●	●	●	●	●	●		●	**8**
Camponotus dalmaticus					●	●					**2**
Camponotus gestroi	●					●					**2**
Camponotus lateralis					●	●	●		●		**4**
Camponotus piceus		●				●	●			●	**4**
Camponotus samius				●		●					**2**
Camponotus sanctus			●			●	●		●		**4**
Camponotus truncatus										●	**1**
Prenolepis nitens		●				●		●		●	**4**
Lasius alienus		●	●	●		●	●			●	**6**
Lasius flavus						●	●				**2**
Lasius fuliginosus						●					**1**
Lasius meridionalis						●	●				**2**
Lasius myops							●				**1**
Lasius neglectus	●		●			●	●				**4**
Lasius paralienus			●			●	●			●	**4**
Lasius umbratus			●		●	●	●		●		**5**
Formica cunicularia			●			●	●	●		●	**5**
Formica fusca					●	●					**2**
Formica sanguinea					●						**1**
Polyergus rufescens							●				**1**
Cataglyphis aenescens	●		●			●					**3**
Cataglyphis nodus			●	●	●	●	●		●		**6**
Cataglyphis viaticoides						●	●		●		**3**
Total number of species for each habitat	**8**	**9**	**30**	**22**	**15**	**54**	**37**	**17**	**18**	**16**	

Table 5: List of ant species representing different chorotypes in the Ganos Mountains

Holoarctic
Tetramorium caespitum
Solenopsis fugax
Lasius flavus
Lasius myops
Lasius alienus

Palearctic
Tetramorium forte
Carabera oertzeni
Plagiolepis pallescens
Plagiolepis taurica
Lasius fuliginosus
Lasius umbratus
Lasius meridionalis
Formica fusca
Formica sanguinea

West palearctic
Ponera coarctata
Aphaenogaster subterranea
Tetramorium ferox
Tapinoma erraticum
Formica cunicularia

European-Siberian
Myrmica scabrinodis
Myrmica ruginodis
Temnothorax recedens
Dolichoderus quadripuntatus

Turanian-Mediterrenean-European
Cremastogaster schmidti
Camponotus aethiops
Camponotus gestroi
Camponotus lateralis
Camponotus truncatus
Camponotus piceus
Camponotus dalmaticus
Cataglyphis aenescens

European-Caucasia
Temnothorax parvulus
Temnothorax unifasciatus
Proformica striaticeps

European
Plagiolepis pygmaea
Lasius neglectus
Lasius paralienus
Polyergus rufescens

Mediterrenean
Hypoponera eduardi
Messor structor
Messor minor
Crematogaster sordidula
Pheidole pallidula
Tetramorium semilaeve
Cardiocondyla elegans
Lepisiota frauenfeldi
Prenolepis nitens
Camponotus sanctus

Eastern Mediterrenean
Aphenogaster ovaticeps
Messor caducus
Messor ebeninus
Crematogaster ionia
Tetramorim chefketi
Tetramorium lucidulum
Tapinoma simrothi
Cataglyphis nodus
Cataglyphis viaticoides

Balcanic
Aphaenogaster simonelii
Aphaenogaster balcanica
Aphaenogaster subterranoides
Messor meridionalis
Messor structor aegeaus
Messor oertzeni

Balcanic-Anatolian
Camponotus samius

Anatolian-Caucasia
Proformica kobachidzei

Anatolian
Tetramorium hippocratis

CONFLICT OF INTEREST STATEMENT

There is no conflict of interest among the authors.

CONTRIBUTIONS OF AUTHORS

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