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The Vertical Distribution of the Ant Fauna (Hymenoptera: Formicidae) of the Samanlı Mountains, Turkey

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A b s t r a c t : In this study, ant fauna of the Samanlı Mountains has been investigated vertically between 100-1600m. Materials were collected from 58 localities and 20 different habitats between 1996-2004 years. 28 genera and 81 species belonging to 4 subfamilies (Ponerinae, Myrmicinae, Dolichoderinae, Formicinae) were determined. Three of these species (*Strongylognthus huberi*, *Lasius platythorax*, *Lasius psammophilus*) are new record for Turkey.

K e y w o r d s : ants, vertical distribution, Samanlı Mountains, Turkey.

Introduction

In order to evaluate the wide distribution of the ants in the world, it is necessary to perform detailed studies to determine the associations between the species distribution and ecological factors. In this respect, as well as the horizontal distributions, the vertical distributions are studied in notable levels. For example, there are records from the high mountain systems, as on the Alps at 3000m, on the Himalayas at 4800m (WEBER 1943), and on the Kitadake and Maehodake Mountains at 3190m (DLUSSKY 1967).

The studies dealing with taxonomical and faunal evaluations of Turkish ants do not involve any detailed vertical distributions until early 1980s. Only 15 species record of (DONISTHORPE 1950) is known from Bursa-Uludağ at 1950m altitude. After the record mentioned, the study of which is performed in the eastern region of Turkey is known as the most detailed work in order to determine the vertical distribution of the taxa. In the study of (AKTAÇ 1988), records of 86 species from the altitudes between 800m and 4000m are given.

Moreover, nearly all of the studies involving Western Anatolia such as those have been performed in Marmara Region deals with horizontal distributions (FOREL 1895, 1906, 1911; SANTSCHI 1921, 1934; SCHKAFF 1924; DONISTHORPE 1950; BARONI URBANI 1964; BAŞ 1973). The records from the Istranca Mountains in Turkish Thrace involve only the study of (ÇAMLITEPE & AKTAÇ 1987) who reported 49 species up to 1031m altitude.

Since the vertical distribution surveys in Western Anatolia have been very limited in number, the present study aimed to investigate the vertical distribution of the ant fauna of the Samanlı Mountains in Marmara Region. In this way, the data obtained from Western Anatolia will be able to compared to those that have already been gathered from Eastern

Anatolia Region. Thus, the results will contribute to vertical distribution along with general geographic distribution of the ant fauna of the area studied.

Material and methods

The study materials were collected from the Samanlı Mountains between 1996 and 2004. The identification of the specimens were performed by comparing with AKTAÇ collections belonging to Turkish and regional ants.

The altitude, types of habitat, sampling dates of the study localities and latitude-longitude were shown in Table 1 and Figure 1. The distribution of the species according to the altitude is shown in Table 2. The numbers given for each species in the materials section represent the localities as in Table 1.

The study material is kept at Biology Department of Trakya University.

Table 1: Sampling localities of the study area on the Samanlı Mountains.

Loc No:	Locality	Coordinates	h. (m)	Habitat	Date
1.	Bursa–İznik	N40° 25' E29° 43'	110-460	Bushes, fruit gardens, maquis, wasteland.	30.04/02-04.06.1996/ 26.08.1996
2.	" – " –Çampınar Village	N40° 24' E29° 43'	420	Olives	30.04.1996
3.	" – " –Tacir Village	N40° 31' E29° 44'	360-645	Brookside, bushes, maquis, meadow, oak forest, pine forest, wasteland, wheat land	19/21.06.1996
4.	" – " –Elbeyli Town	N40° 29' E29° 43'	140-500	Maquis, pine forest, pseudo-maquis, wheat land	20.6.1996/ 09.08.1997
5.	" – " –İnikli Village	N40° 29' E29° 43'	150-525	Maquis, pine forest, wasteland,	21/22.06.1996
6.	" – " –Candarlı Village	N40° 32' E29° 50'	860-910	Mixed forest, Oak forest	22.06.1996
7.	" – " –Gürmüzlü Village	N40° 30' E29° 45'	515-705	Brookside, mixed forest, oak forest, pasture.	22.06.1996
8.	" – " –Kırıntı Village	N40° 33' E29° 52'	790-825	Pine forest	25.06.1996
9.	" – " –Kutluca Village	N40° 34' E29° 51'	810-935	Beech forest, meadow, mixed forest, pasture, pine forest	25.06.1996
10.	" – " –Elmalı Village	N40° 31' E29° 53'	780	Pasture, pine forest,	26.06.1996
11.	" – " –İhsaniye Village	N40° 27' E29° 49'	340-750	Brookside, maquis, mixed forest, pasture, wasteland	26.06/26.08.1996
12.	" – " –Sansarak Village	N40° 29' E29° 49'	735-755	Mixed forest, wasteland	26.06.1996
13.	" – " –Mecidiye Village	N40° 34' E29° 41'	630-640	Mixed forest, oak forest	28.06.1996
14.	" – " –Orhaniye Village	N40° 30' E29° 39'	220-285	Olives	28.06.1996
15.	" – " –Osmaniye Village	N40° 36' E29° 41'	840-920	Oak forest, pine forest	28.06.1996
16.	" – " –Sarıağıl Village	N40° 33' E29° 40'	570	Oak forest	28.06.1996
17.	" – " –Sultaniye Village	N40° 36' E29° 44'	810	Mixed forest	28.06.1996

Loc No:	Locality	Coordinates	h. (m)	Habitat	Date
18.	" – " –Süleymaniye Village	N40° 34' E29° 41'	440	Oak forest	28.06.1996
19.	" – " –Mahmudiye Village	N40° 33' E29° 28'	340	Brookside	02.07.1996
20.	" – " –Yörükler Village	N40° 32' E29° 37'	375-425	Oak forest	02.07.1996
21.	" – " –Çakırca Village	N40° 28' E29° 39'	235-310	Brookside, maquis, olives	05.07.1996
22.	" – " –Bayındır Village	N40° 32' E29° 32'	215-355	Oak forest	06.07.1996
23.	" – " –Boyalıca Town	N40° 29' E29° 33'	200-300	Oak forest, olives	06.07.1996
24.	" – " –Kırkharman Village	N40° 35' E29° 45'	385-420	Brookside, poplar area	07.07.1996/ 09-10.08.1997
25.	" – " –Sarısu Village	N40° 34' E29° 47'	665-940	Beech forest, brookside, meadow, mixed forest, pasture, poplar area, wheat land	07.07.1996/ 09.08.1997
26.	" – " –Hacıosman Village	N40° 33' E29° 51'	725-860	Meadow, oak forest	29.08.1996/ 09.08.1997
27.	" – " –Özekdere Village	N40° 33' E29° 53'	1000-1015	Elm forest	29.08.1996
28.	Yalova–Armutlu	N40º 31' E28º 49'	100-200	Olives, pine forest	29.07.1998
29.	" – " – Mecidiye Village	N40º 31' E28º 53'	550	Mixed forest	29.07.1998
30.	Bursa–Orhangazi–Hamzalı Village	N40° 31' E29° 15'	250-300	Pine forest	31.07.1998
31.	" – " –Yeniköy Village	N40° 32' E29° 21'	450-950	Ash forest, beech forest, pine forest, wasteland	31.07.1998
32.	İzmit–Karamürsel– Avcı Village	N40° 36' E29° 34'	200	Mixed forest	05.08.1998
33.	" – " –Kızderbent Village	N40° 33' E29° 31'	150	Brookside	05.08.1998
34.	" – " – Senaiye Village	N40° 37' E29° 41'	650-850	Brookside, mixed forest	05/16.08.1998
35.	" – " – Tahtalı Village	N40° 34' E29° 38'	500	Oak forest	05.08.1998
36.	Bursa–Orhangazi–Mahmudiye Village	N40° 33' E29° 28'	700	Beech forest, wheat land	06.08.1998
37.	" – " –Üreğil Village	N40° 31' E29° 24'	480	Oak forest	06.08.1998
38.	Yalova–Altınova–Ahmediye Village	N40º 38' E29º 27'	250	Oak forest	06.08.1998
39.	" – " –Aktoprak Village	N40º 34' E29º 28'	450	Oak forest	06.08.1998
40.	" – Esadiye Village	N40º 34' E29º 17'	200	Beech forest	11.08.1998
41.	Bursa–Gemlik–Şahinyurdu Village	N40° 28' E29° 12'	400-950	Beech forest, maquis, oak forest, wasteland	12.08.1998
42.	" – " –Narlı Village	N40° 28' E29° 01'	100-350	Pine forest	14.08.1998
43.	Yalova–Armutlu–Esenköy Village	N40º 37' E28º 57'	500-600	Mixed forest, chestnut forest, oak forest	14/15.08.1998
44.	" – " –Hayriye Village	N40º 30' E28º 57'	500-520	Maquis, mixed forest, Oak forest	14/15.08.1998
45.	İzmit–Gölcük–Hamidiye Village	N40° 39' E29° 49'	450	Chestnut forest	16.08.1998

Loc No:	Locality	Coordinates	h. (m)	Habitat	Date
46.	" – " –İrşadiye Village	N40° 38' E29° 47'	750	Beech forest	16.08.1998
47.	Adapazarı–Pamukova–Ağaççılar Village	N40° 32' E30° 07'	750	Olives	17.08.1998
48.	" – " –Ahiler Village	N40° 27' E30° 00'	530	Pine forest	17.08.1998
49.	" – " –Kemaliye Village	N40° 31' E30° 00'	650	Pine forest	17.08.1998
50.	Bilecik–Osmaneli–Yeşilçimen Village	N40° 26' E29° 53'	380	Pine forest	17.08.1998
51.	Adapazarı–Pamukova–Eskiyayla Village	N40° 33' E30° 07'	950-1600	Alpine meadow, mixed forest, rocky place	20.08.1998
52.	" – " –Keltepe	N40° 33' E30° 07'	1350-1550	Beech forest, Pine forest	29.08.2004
53.	" –Sapanca–Erdemli Village	N40° 38' E30° 13'	590	Beech forest	29.08.2004
54.	" –Sapanca–Muradiye Village	N40° 40' E30° 14'	380	Beech forest, meadow	29.08.2004
55.	İzmit–Derbent–Karaçayır Village	N40° 40' E30° 01'	830	Mixed forest,	29.08.2004
56.	" – " –Serindere Village	N40° 39' E30° 00'	560	Poplar area	29.08.2004
57.	" – " –Sultaniye Village	N40° 36' E30° 05'	930-1150	Pine forest, oak forest	29.08.2004
58.	" – " –Yuvacık Village	N40° 41' E29° 58'	500	Meadow	29.08.2004

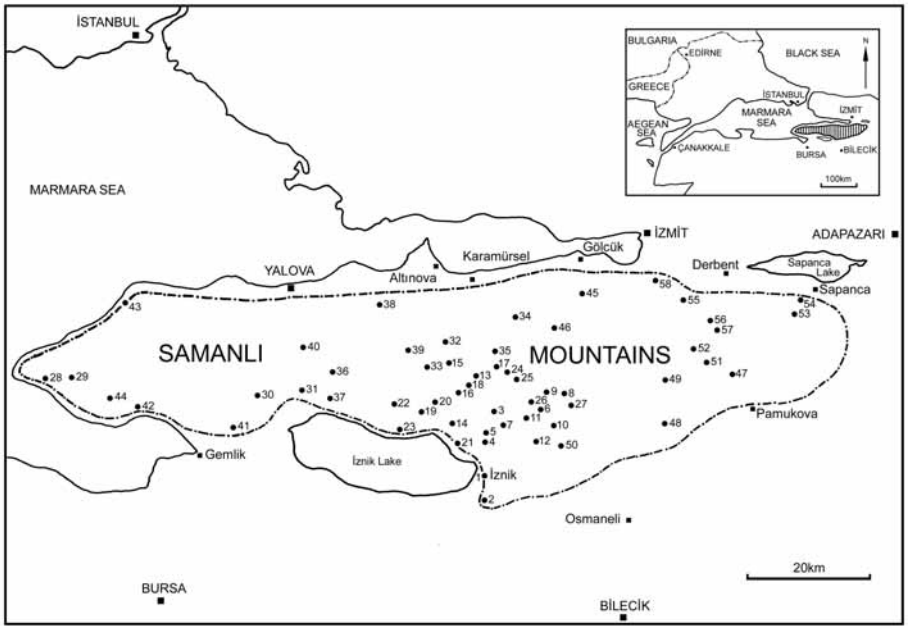

Fig. 1: Map indicating the sampling sites on the Samanlı Mountains (Numbers in the map indicate localities, which are described in the Table 1).

Results

Subfamily P o n e r i n a e

***Ponera coarctata* (LATREILLE 1802)**

M a t e r i a l e x a m i n e d : **1**, 3☿☿; **35**, ☿; **37**, 2☿☿; **44**, 11☿☿; **50**, ♀, 3☿☿; **53**, ☿; **56**, 30☿☿; **57**, 4☿☿; **58**, ☿.

R e m a r k s : Under olive tree and under stones in bushes.

***Proceratium melinum* (ROGER 1860)**

M a t e r i a l e x a m i n e d : **47**, ♂.

R e m a r k s : Male was caught under olive tree.

Subfamily M y r m i c i n a e

***Myrmica rugulososcabrinodis* KARAWAJEW 1929**

M a t e r i a l e x a m i n e d : **31**, ☿☿; **52**, 18♀♀, 16♂♂, ☿☿; **55**, ♀, 24☿☿.

R e m a r k s : Nests are generally found under stones and inside soil.

***Myrmica ruginodis* NYLANDER 1846**

M a t e r i a l e x a m i n e d : **27**, 3♀♀, ♂, ☿☿; **51**, 5☿☿.

R e m a r k s : Nests are found under stones, inside soil and dead trees.

***Myrmica sabuleti* MEINERT 1860**

M a t e r i a l e x a m i n e d : **14**, 2☿☿; **34**, 10☿☿; **35**, ☿☿; **46**, 10☿☿; **51**, 2♂♂, 17☿☿.

R e m a r k s : Nests are found under stones, inside trees branch and decayed trees.

***Aphaenogaster subterranea* (LATREILLE 1798)**

M a t e r i a l e x a m i n e d : **3**, ☿☿; **7**, ☿☿; **11**, ☿☿, ♀; **15** ☿☿; **18**, ☿☿; **22**, ☿☿; **23**, ☿☿; **24**, 3♀♀, ♂, ☿☿; **26**, ☿☿, ♀; **28**, 10☿☿; **30**, ☿☿; **31**, ☿☿; **32**, 3♂♂, 5☿☿; **33**, ♀; **34**, 2☿☿; **35**, 5♀♀, ♂♂, ☿☿; **37**, ♀, 2♂♂, ☿☿; **38**, 11☿☿; **39**, ☿☿; **40**, ♀, 42☿☿; **41**, ♂, 26☿☿; **43**, 7♂♂, 59☿☿; **44**, 2♀♀, 5♂♂, 37☿☿; **51**, ♂, 7☿☿; **53**, ♀, 7☿☿; **54**, 2☿☿; **56**, 5♀♀, 3♂♂, ☿☿; **57**, ♂, 5☿☿.

R e m a r k s : Nests are generally found under stones, inside tree barks and humid soils in humid parts of the forests.

***Stenamma westwoodii* WESTWOOD 1839**

M a t e r i a l e x a m i n e d : **19**, 23☿☿; **40**, ♀; 3☿☿.

R e m a r k s : Nests are under big stone.

***Messor structor* (LATREILLE 1798)**

M a t e r i a l e x a m i n e d : **1**, ☿☿; **3**, ☿☿; **11**, 5☿☿; **21**, ☿☿; **24**, 2☿☿; **25**, ☿; **33**, ☿; **41**, 11☿☿; **47**, 5☿☿.

R e m a r k s : Nests are found under stones in bushes, in soft soils near wheat lands.

***Messor caducus* (MOTSCHULSKY 1839)**

M a t e r i a l e x a m i n e d : **1**, ☿☿; **2**, 13☿☿; **3**, ☿☿; **4**, 7☿☿; **5**, ☿☿; **11**, ☿☿; **14**, ☿☿; **20**, ☿☿; **23**, ☿☿; **30**, ☿; **37**, 7☿☿; **41**, 4☿☿; **44**, 8☿☿.

R e m a r k s : Nests are found under the large stones and on the soil surface.

***Messor oertzeni* FOREL 1910**

M a t e r i a l e x a m i n e d : **41**, 7☿☿; **55**, 2☿☿; **57**, 10☿☿; **53**, 20☿☿.

R e m a r k s : Nests are found under stone.

***Pheidole pallidula* (NYLANDER 1848)**

M a t e r i a l e x a m i n e d : **1**, ♂, ☿☿, ♃♃; **2**, ☿☿, ♃♃; **3**, 2☿☿; **4**, ♀♀, ♂♂, ☿☿, ♃♃; **5**, 5♀♀, ♂, ☿☿, ♃♃; **7**, 9☿☿; **11**, ♀♀, ☿☿, ♃♃; **14**, 13☿☿; **16**, 6☿☿; **19**, 9☿☿; **21**, 8☿☿; **22**, ☿; **23**, 30☿☿; **28**, ☿☿, 3♃♃; **30**, 27☿☿; **31**,☿; **32**, 10☿☿; **35**, 6☿☿; **41**, 5♂♂, ☿☿, 9♃♃; **42**, ☿☿, ♃♃; **43**, 4☿☿; **47**, ☿; **48**,☿; **49**, 6☿☿; **50**, 19☿☿; **57**, 4☿☿.

R e m a r k s : Nests are found under the stones.

***Cardiocondyla elegans* EMERY 1869**

M a t e r i a l e x a m i n e d : **4**, ☿; **14**, ☿.

R e m a r k s : Workers were caught under the stones in olive lands and maquis.

***Cardiocondyla bulgarica* FOREL 1892**

M a t e r i a l e x a m i n e d : **33**, 3☿☿.

R e m a r k s : Workers were caught nearby the stream in a willow area.

***Monomorium monomorium* BOLTON 1987**

M a t e r i a l e x a m i n e d : **33**, 5☿☿.

R e m a r k s : Workers were caught nearby the stream in a willow and poplar area.

***Crematogaster scutellaris* (OLIVIER 1791)**

M a t e r i a l e x a m i n e d : **3**, ☿☿; **7**, ☿☿; **11**, ☿☿; **13**, ☿; **21**, ☿☿; **23**, ☿☿; **25**, ☿☿; **28**, ☿☿; **31**, ☿☿; **32**, ☿☿; **33**, ☿☿; **34**, ☿; **35**, ☿; **37**, ☿☿; **38**, ♀, 2☿☿; **39**, ☿☿; **41**, 3☿☿; **42**, ☿☿; **43**, ☿☿; **44**, ☿☿; **47**, ☿☿; **48**, ☿☿; **49**, ☿☿; **50**, ☿☿; **51**, ☿☿; **56**, 27☿☿; **58**, 25☿☿.

R e m a r k s : Nests are generally found inside decayed trees, under tree barks and under stones.

***Crematogaster ionia* FOREL 1911**

M a t e r i a l e x a m i n e d : **1**, ☿; **4**, 4♂♂; ☿☿; **5**, ☿☿; **42**, 18☿☿; **47**, 10♀♀, 10☿☿.

R e m a r k s : Nests are under stones, on pine and olive trees.

***Crematogaster sordidula* (NYLANDER 1848)**

M a t e r i a l e x a m i n e d : **1**, ☿☿; **2**, ♂♂, ☿☿; **3**, ☿☿; **4**, 11♀♀, ♂♂, ☿☿; **5**, 11♀♀, 7♂♂, ☿☿; **11**, 2☿☿; **16**, ♂; **20**, ☿☿; **21**, ☿☿; **28**, ☿☿; **41**, ♀, ☿; **44**, ☿; **49**, 36☿☿.

R e m a r k s : Nests are under stones and in the soil.

***Solenopsis fugax* (LATREILLE 1798)**

M a t e r i a l e x a m i n e d : **14**, ☿☿; **25**, ☿☿; **26**, ☿☿; **28**, ☿☿; **30**, ☿☿; **31**, ☿☿; **35**, 13☿☿; **37**, 3☿☿; **41**, 28♀♀, 3♂♂, ☿☿; **49**, ☿; **55**, 5♂♂, ☿☿; **57**, ☿☿; **58**, 14♀♀, 2♂♂, ☿☿.

R e m a r k s : Nests are found under stones, bottom of the trees and plant roots.

***Leptothorax affinis* MAYR 1855**

M a t e r i a l e x a m i n e d : **1**, ☿☿.

R e m a r k s : Nest is under the mosses.

***Leptothorax nylanderi* (FOERSTER 1850)**

M a t e r i a l e x a m i n e d : **10**, ☿☿; **25**, ☿☿; **27**, ♀♀, ☿☿; **31**, ♂♂, ☿☿; **35**, ☿☿; **36**, ♀, 7♂♂, 17☿☿; **39**, ♀; **41**, 8♀♀, 9♂♂, 24☿☿; **43**, ♀, 6♂♂, ☿☿; **44**, ♀, ♂, 4☿☿; **50**, ♀; **51**, ♀, 8♂♂, 44☿☿.

R e m a r k s : Nests are generally found under tree barks and inside dead trees.

***Leptothorax semiruber* ANDRÉ 1881**

M a t e r i a l e x a m i n e d : **2**, ☿☿; **16**, ♀, ♂♂, ☿☿; **35**, 21☿☿; **37**, 4☿☿; **41**, ☿; **42**, ☿; **48**, ☿, ☿☿.

R e m a r k s : Under the stones and soil.

***Leptothorax tuberum* (FABRICIUS 1775)**

M a t e r i a l e x a m i n e d : **1**, 2☿☿; **30**, ☿☿; **32**, ☿☿; **34**, ☿; **37**, ☿; **38**, ♀, ☿☿; **42**, ♀, ☿☿; **43**, ♀, 36☿☿; **45**, 27☿☿; **48**, 14☿☿; **49**, 37☿☿; **51**, ♀, ☿☿.

R e m a r k s : Nests are under the stones.

***Leptothorax unifasciatus* (LATREILLE 1798)**

M a t e r i a l e x a m i n e d : **9**, 7☿☿; **11**, ♀, ☿☿; **18**, 8♀♀, 3♂♂, ☿☿; **22**, ♀, ☿☿; **25**, 4♀♀, ♂, ☿☿; **26**, ☿☿; **28**, ☿; **30**, ☿☿; **34**, ☿☿; **38**, 10☿☿; **39**, 39☿☿; **41**, 4☿☿; **43**, 17☿☿; **45**, 21☿☿; **57**, ♀, ☿☿.

R e m a r k s : Nests are under stones, inside tree barks and under the mosses.

***Leptothorax muscorum* (NYLANDER 1846)**

M a t e r i a l e x a m i n e d : **51**, 2♂♂, 23☿☿.

R e m a r k s : Inside Oak trees barks.

***Leptothorax bulgaricus* FOREL 1892**

M a t e r i a l e x a m i n e d : **30**, ☿☿; **31**, ☿; **33**, ♀, ☿☿; **38**, 54☿☿; **47**, 5☿☿.

R e m a r k s : Inside tree barks and decayed trees.

***Leptothorax parvulus* (SCHENCK 1852)**

M a t e r i a l e x a m i n e d : **34**, 2♀♀, 2☿☿; **39**, 22♀♀, 17♂♂, 17☿☿; **44**, 5♀♀, 7♂♂, 27☿☿; **45**, 7☿☿; **51**, 7☿☿.

R e m a r k s : On the tree trunks and inside tree branch.

***Leptothorax recedens* (NYLANDER 1856)**

M a t e r i a l e x a m i n e d : **30**, ♀, ☿☿; **35**, ☿☿.

R e m a r k s : Inside tree barks and mosses.

***Leptothorax luteus* FOREL 1874**

M a t e r i a l e x a m i n e d : **35**, ♂, ☿☿; **38**, ♀, 6☿☿; **39**, 33☿☿; **41**, 3♀♀, 64☿☿; **44**, 28☿☿; **48**, 14☿☿; **49**, ♀, 29☿☿.

R e m a r k s : Inside tree branches.

***Leptothorax nadigi* KUTTER 1925**

Material examined: **51**, ☿.

R e m a r k s : Worker was caught on the stone.

***Leptothorax exilis* EMERY 1869**

M a t e r i a l e x a m i n e d : **41**, ☿; **51**, ☿.

R e m a r k s : Workers were caught on the trees.

***Epimyrma kraussei* EMERY 1915**

M a t e r i a l e x a m i n e d : **47**, 6♀♀, ☿.

R e m a r k s : Under olive tree.

***Myrmecina graminicola* (LATREILLE 1802)**

M a t e r i a l e x a m i n e d : **19**, 19☿☿; **28**, ☿; **40**, 2♀♀, ☿☿.

R e m a r k s : Under the stone and in the soil.

***Tetramorium caespitum* (LINNAEUS 1758)**

M a t e r i a l e x a m i n e d : **1**, 2☿☿; **3**, 10☿☿; **5**, ☿☿; **12**, 4☿☿; **21**, ☿; **23**, ♀, ☿☿; **25**, ☿☿; **28**, ☿☿; **29**, 2☿☿; **34**, ☿☿; **35**, ☿; **38**, ☿☿; **41**, 5☿☿.

R e m a r k s : Nests are generally found under the stones.

***Tetramorium semilaeve* ANDRÉ 1882**

M a t e r i a l e x a m i n e d : **2**, ☿☿; **3**, 2☿☿; **5**, 2☿☿; **6**, ☿; **11**, ☿; **28**, ☿☿; **32**, 6☿☿; **41**, ☿☿; **50**, 16☿☿.

R e m a r k s : Nests are under the stones.

***Tetramorium forte* FOREL 1904**

M a t e r i a l e x a m i n e d : **1**, ☿☿; **3**, ☿☿; **4**, ☿☿; **5**, 7♂♂, ☿☿; **13**, 2☿☿; **17**, ☿☿; **19**, 10☿☿; **25**, 10☿☿; **27**, 3☿☿; **33**, ☿☿; **34**, 2☿☿; **39**, 16☿☿; **52**, 30☿☿; **54**, 22☿☿; **57**, ☿☿.

R e m a r k s : Under the stones, bottom of the trees, in the soil and dead tree trunks.

***Tetramorium lucidulum* MENOZZI 1933**

M a t e r i a l e x a m i n e d : **1**, ☿; **2**, ☿, ☿☿; **4**, ☿☿; **28**, ☿; **35**, 14☿☿; **42**, 2☿☿; **44**, ☿☿.

R e m a r k s : Under the stones and in the soil.

***Tetramorium chefketi* FOREL 1911**

M a t e r i a l e x a m i n e d : **3**, ☿☿; **9**, ☿☿; **11**, 10☿☿; **18**, 3☿☿; **26**, ☿; **31**, ☿☿; **34**, ☿☿; **36**, ☿; **43**, 25☿☿; **47**, 2☿☿; **51**, 21☿☿; **52**, 3☿☿; **57**, 3☿☿.

R e m a r k s : Under the stones and bottom of the trees.

***Tetramorium ferox* RUZSKY 1903**

M a t e r i a l e x a m i n e d : **29**, 5☿☿; **31**, 4☿☿; **34**, ☿; **37**, ☿; **38**, ☿; **39**, 15☿☿; **47**, 28☿☿.

R e m a r k s : Under the stones.

***Tetramorium goniommoide* POLDI 1979**

Material examined: **51**, 2☿☿.

R e m a r k s : Under the stone.

***Strongylognthus huberi* FOREL 1874**

M a t e r i a l e x a m i n e d : **47**, ☿.

R e m a r k s : *S. huberi*, which has distribution from Switzerland, Pyrenees, Apennines, Alps and Iberian peninsula (FOREL 1874; EMERY 1909; CONSANI 1947; BERNARD 1968) and moreover south Russia, Uzbekistan (RUZSKY 1896), is different from the other species of *S. huberi* group recorded from Turkey by having more punctuated-reticulate microsculpture of workers' dorsum of petiol and postpetiols. Host of the only one worker taken from cultivated olive area couldn't be found. By expanding the study in the locality, nests of *Tetramorium ferox* and *T. chefketi* were found but no parasitic species were found in these nests. New record for Turkey.

Subfamily D o l i c h o d e r i n a e

***Liometopum microcephalum* (PANZER 1798)**

M a t e r i a l e x a m i n e d : **3**, 3☿☿, ☿☿; **24**, ☿☿.

R e m a r k s : Nests are found on tree trunks.

***Tapinoma erraticum* (LATREILLE 1798)**

M a t e r i a l e x a m i n e d : **3**, ☿; **11**, 2☿☿; **12**, ☿☿; **15**, ☿☿; **27**, 2☿☿; **29**, ☿☿; **31**, ☿☿; **34**, 6☿☿; **41**, ☿; **51**, 6☿☿; **52**, ☿; **57**, ☿☿.

R e m a r k s : Nests are under the stones, and in the soil.

***Bothriomyrmex meridionalis* (ROGER 1863)**

M a t e r i a l e x a m i n e d : **13**, 2☿☿, ♂♂, ☿☿.

R e m a r k s : Under the smaller stones.

***Bothriomyrmex corsicus* SANTSCHI 1923**

M a t e r i a l e x a m i n e d : **3**, 4☿☿.

R e m a r k s : Under the smaller stones.

***Dolichoderus quadripunctatus* (LINNÉ 1771)**

M a t e r i a l e x a m i n e d : **32**, ☿☿; **33**, ☿; **38**, 8☿☿; **39**, ☿.

R e m a r k s : Inside trees branch.

Subfamily F o r m i c i n a e

***Plagiolepis pygmaea* (LATREILLE 1798)**

M a t e r i a l e x a m i n e d : **1**, ☿☿; **3**, ☿☿; **5**, 3☿☿, ☿☿; **11**, 3♂♂, ☿☿; **12**, 4☿☿; **15**, ☿☿; **17**, 2☿☿, ☿☿; **28**, 4☿☿, ☿☿; **31**, ☿☿; **32**, 6☿☿; **34**, 24☿☿; **35**, ♂, 37☿☿; **37**, ♂, ☿☿; **39**, 18☿☿; **48**, ☿☿; **54**, 41☿☿; **58**, 45☿☿.

R e m a r k s : Under the stones.

***Plagiolepis taurica* SANTSCHI 1920**

M a t e r i a l e x a m i n e d : **1**, ☿, ☿☿; **2**, 11☿☿; **3**, ☿☿; **4**, ☿☿, ♂♂, ☿☿; **5**, ☿☿, 12♂♂, ☿☿; **14**, 11☿☿; **15**, ☿; **19**, 15☿☿; **21**, ☿☿; **28**, 2☿☿; **30**, ☿☿; **31**, 2☿☿; **42**, 2☿☿; **48**, 22☿☿; **49**, ☿; **51**, 42☿☿; **54**, ☿; **57**, 24☿☿.

R e m a r k s : According to some biometric measurements this species is known as *P. vindobonensis* in an old literature. BERNARD 1968 determined *P. vindobonensis* as a synonym of *P. pygmaea*. KUTTER 1977, ARNOL'DI & DLUSSKY 1978 and AGOSTI & COLLINGWOOD 1987a-b have accepted *P. vindobonensis* as species level because of the II. funiculus segment is shorter than the III. segment in the workers of this species and

vertex is concave which are different than those are in *P. pygmaea*. Later, RADCHENKO 1989, 1996 synonymies *P. vindobonensis* with *P. taurica*. Our specimens belonging to *P. taurica* also exhibit comparable similarities. This species has been recorded from the Balkans and Europe, but it was first time reported from Turkey.

Nests are found under the stones and bottom of the trees.

***Plagiolepis pallescens* FOREL 1889**

M a t e r i a l e x a m i n e d : **5**, ♂♂, ☿☿; **29**, 6☿☿; **33**, ☿☿; **36**, 8☿☿; **37**, 2☿☿; **39**, ☿☿; **42**, ☿☿; **50**, 6☿☿.

R e m a r k s : Under the stones and in the soil.

***Lepisiota frauenfeldi* (MAYR 1855)**

M a t e r i a l e x a m i n e d : **1**, ☿☿; **3**, ♀, ♂♂, ☿☿; **5**, ☿☿; **14**, ☿☿; **20**, ☿☿; **21**, ☿☿; **23**, ☿☿; **28**, ☿; **29**, ☿☿; **30**, ☿☿; **41**, 3☿☿; **42**, ♀, 3☿☿; **44**, ☿☿; **47**, ☿☿; **48**, ☿☿; **50**, ☿☿.

R e m a r k s : Nests under the smaller stones, workers on the rocks.

***Camponotus aethiops* (LATREILLE 1798)**

M a t e r i a l e x a m i n e d : **1**, ☿☿; **3**, ♀, ♂, ☿☿; **4**, ☿☿; **7**, 5☿☿; **11**, 6♂♂, ☿☿; **14**, 8☿☿; **19**, ♂; **20**, 6☿☿; **22**, ♀, 3♂♂, ☿☿; **27**, ♀, ♂; **28**, ☿☿; **29**, ☿☿; **30**, ☿☿; **31**, ☿; **34**, ♀, 2☿☿; **35**, ☿; **36**, ☿☿; **38**, ☿☿; **42**, ☿☿; **43**, 4☿☿; **44**, ☿☿; **48**, ☿☿; **50**, 14☿☿; **51**, ☿☿; **55**, 5☿☿.

R e m a r k s : Nests under the stones, in the soil and workers on the flowering plants.

***Camponotus samius* FOREL 1888**

M a t e r i a l e x a m i n e d : **1**, 21☿☿; **3**, 8☿☿; **5**, 2♀♀, 6♂♂, 20☿☿; **21**, 5☿☿; **28**, 4☿☿; **35**, 5☿☿; **42**, 2☿☿; **47**, 9☿☿; **48**, ☿☿; **50**, 6☿☿.

R e m a r k s : Nests under the big stones and in the soil.

***Camponotus piceus* (LEACH 1825)**

M a t e r i a l e x a m i n e d : **1**, 4☿; **5**, ☿☿; **11,** ♀, 4♂♂, ☿☿; **14**, 10☿☿; **21**, ☿☿; **22**, 8☿; **23**, ☿; **28**, 13☿☿; **29**, ☿☿; **30**, 7☿☿; **31**, ♀, 4☿☿; **32**, ☿☿; **33**, ☿☿; **34**, ☿☿; **35**, ☿☿; **37**, ♀, 18☿☿; **41**, 3☿☿; **42**, ☿☿; **47**, ☿☿; **48**, ☿☿; **49**, ☿☿; **50**, ♀, ☿☿; **51**, ☿☿; **55**, 2☿☿.

R e m a r k s : Nests under the stones and in the soil. Workers on the trees.

***Camponotus aegaeus* EMERY 1915**

M a t e r i a l e x a m i n e d : **1**, 3☿☿; **4**, ☿☿; **5**, ☿; **28**, ☿; **42**, 6☿☿; **47**, 4☿☿; **48**, 2☿☿; **49**, 3☿☿; **50**, 10☿☿.

R e m a r k s : Nests under the stones, workers on the plants.

***Camponotus lateralis* (OLIVER 1791)**

M a t e r i a l e x a m i n e d : **1**, 3♀♀, ☿☿; **3**, 2☿☿; **4**, ☿☿; **5**, ☿☿; **28**, 8☿☿; **30**, 7☿☿; **32**, ♀, ☿☿; **35**, 2♀♀, ☿☿; **38**, 9☿☿; **41**, 7☿☿; **43**, 2☿☿; **47**, ♀, 2☿☿; **48**, ☿☿; **50**, ☿.

R e m a r k s : Nests under the stones and under the tree barks.

***Camponotus sanctus* FOREL 1904**

M a t e r i a l e x a m i n e d : **1**, ♀, 3♂♂, ☿☿; **4**, 7☿☿; **5**, 6☿☿; **42**, 5☿☿.
R e m a r k s : Nests are under the stones.

***Camponotus gestroi* EMERY 1878**

Material examined: **2**, 14☿☿.
R e m a r k s : Nests are in the soil.

***Camponotus dalmaticus* (NYLANDER 1849)**

M a t e r i a l e x a m i n e d : **28**, ☿☿; **42**, 36☿☿.
R e m a r k s : Nests are under the stones.

***Camponotus baldaccii* EMERY 1908**

M a t e r i a l e x a m i n e d : **23**, 8☿☿.
R e m a r k s : Nests are under the stones.

***Camponotus fallax* (NYLANDER 1856)**

M a t e r i a l e x a m i n e d : **38**, 23☿☿; **51**, ♀.
R e m a r k s : Inside trees branch.

***Camponotus candiotes* EMERY 1894**

M a t e r i a l e x a m i n e d : **41**, 2☿☿; **44**, 2♂♂, 10☿☿.
R e m a r k s : Inside tree branches.

***Colobopsis truncatus* (SPINOLA 1808)**

M a t e r i a l e x a m i n e d : **38**, 2♀♀, 4☿☿; **47**, 2♀♀, 8☿☿.
R e m a r k s : Inside tree branches.

***Lasius brunneus* (LATREILLE 1798)**

M a t e r i a l e x a m i n e d : **11**, ☿; **36**, ☿☿; **28**, 6☿☿; **34**, ☿☿; **43**, ☿☿; **44**, ☿☿; **46**, ☿☿; **51**, ☿☿.
R e m a r k s : Generally nests are inside decayed trees.

***Lasius niger* (LINNAEUS 1758)**

M a t e r i a l e x a m i n e d : **1**, ☿☿; **6**, ☿☿; **8**, ☿☿; **51**, ♀, 9☿☿.
R e m a r k s : Nests in soft soil on the bottom of the trees.

***Lasius platythorax* SEIFERT 1991**

M a t e r i a l e x a m i n e d : **52**, ☿.

R e m a r k s : *L. platythorax* which has distribution in whole Europe including Norway taigas in north and west Siberia, differs morphologically and ecologically from sibling species "*L. niger*" also known to have distribution from Turkey. Morphologically *L. platythorax* workers have scarce and long haired clypeus; the erect hairs on antennal scapus are denser and longer; mesopropodeal impression is shallower, sometimes smooth; dorsum of propodeum is more conical; erect hairs of body are relatively more dense and long. Ecologically *L. platythorax* live in more moistured places and in all types of forests and fogs. They avoid from the areas open and effected by human. However *L. niger* live in more or less dry habitats, open areas, near cities and show sinantropic tendency, avoid shady, dense forests and fogs (SEIFERT 1991). Our specimen, showing great similarities to SEIFERT's original description, was found at 1350m in dense beech forest and far away from human.

***Lasius emarginatus* (OLIVIER 1791)**

M a t e r i a l e x a m i n e d : **25**, ☿☿.

R e m a r k s : Nests are under the stones.

***Lasius alienus* (FOERSTER 1850)**

M a t e r i a l e x a m i n e d : **3**, ☿☿; **6**, 6☿☿; **7**, ☿☿; **15**, ♀; **18**, ☿☿; **31**, 4☿☿; **32**, ☿☿; **34**, ☿; **35**, ☿☿; **36**, 10☿☿; **38**, ☿☿; **39**, 4☿☿; **40**, ☿☿; **51**, ☿☿; **52**, 2♀♀, ♂♂, ☿☿; **54,** 22☿☿; **56**, 33☿☿; **57**, ♀, ☿☿.

R e m a r k s : Nests under the stones, in the soils and plant roots. Workers on the plants and trees.

***Lasius paralienus* SEIFERT 1992**

M a t e r i a l e x a m i n e d : **9**, ☿☿; **12**, ☿☿; **25**, ☿☿; **26**, ☿☿; **36**, 14☿☿.

R e m a r k s : Nests are under the stones, in the soil.

***Lasius psammophilus* SEIFERT 1992**

M a t e r i a l e x a m i n e d : **57**, 35☿☿.

R e m a r k s : This species, a new record for Turkey, is known middle and north Europe. SEIFERT 1992 reported single specimens showing similarities with *L. psammophilus* from Turkey but he founded risky to state their existence because of not having nest series and habitat note. That the species exist in Turkey gained certainty with our study. As it is known to be the most dominant species of the sandy areas, it is a suprising result to gaind *L. psammophilus* from an oak stick in a dense oak forest at 930m high.

***Lasius turcicus* SANTSCHI 1921**

M a t e r i a l e x a m i n e d : **1**, ♀, ☿☿; **2**, ☿☿; **6**, ☿☿; **7**, 2☿☿; **9**, ☿☿; **13**, ☿☿; **24**, ☿☿; **25**, ☿☿; **27**, 2☿☿; **28**, ☿; **31**, 7☿☿; **33**, ☿☿; **36**, 10☿☿; **39**, 25☿☿; **41**, 18☿☿; **43**, 6☿☿; **44**, 7☿☿; **45**, 3☿☿; **46**, 8☿☿; **51**, 7☿☿; **53**, 7♀, ☿☿; **55**, 10☿☿; **58**, 6☿☿.

R e m a r k s : Nests inside dead trees.

***Lasius umbratus* (NYLANDER 1846)**

M a t e r i a l e x a m i n e d : **1**, ☿☿; **8**, ☿☿; **9**, ☿☿; **10**, ☿☿; **25**, ☿☿; **36**, 36♂♂, 6☿☿.

R e m a r k s : Nests are under the stones, in the soils and inside tree barks with mossy.

***Lasius flavus* (FABRICIUS 1782)**

M a t e r i a l e x a m i n e d : **51**, 20☿☿.

R e m a r k s : Nests are under the soil.

***Lasius fuliginosus* (LATREILLE 1798)**

M a t e r i a l e x a m i n e d : **9**, ☿☿; **51**, 7☿☿.

R e m a r k s : Nests are under the stones and inside the trees. Workers on the trees.

***Prenolepis nitens* (MAYR 1853)**

M a t e r i a l e x a m i n e d : **55**, 13☿☿; **57**, 4☿☿.

R e m a r k s : Workers were caught on the trees.

***Formica cunicularia* LATREILLE 1758**

M a t e r i a l e x a m i n e d : **6**, 4☿☿; **7**, 8☿☿; **11**, 3☿☿; **15**, 3☿☿; **25**, ☿; **31**, 11☿☿; **33**, 4☿☿; **34**, 3☿☿; **36**, 4☿☿; **38**, 3☿☿; **39**, 2☿☿; **41**, 5☿☿; **43**, 10☿☿; **45**, 2☿☿; **46**, ☿; **51**, 11☿☿.

R e m a r k s : Nests are under the stones, in the soil. Workers on the trees.

***Formica gagates* LATREILLE 1798**

M a t e r i a l e x a m i n e d : **3**, ☿☿; **6**, ☿☿; **18**, ☿☿; **23**, ☿; **25**, 2☿☿; **28**, ☿☿; **31**, ☿☿; **34**, ☿☿; **35**, ☿; **37**, ☿; **38**, 2☿☿; **45**, 9☿☿; **47**, 6☿☿; **51**, 6☿☿; **55**, 21☿☿; **57**, 21☿☿.

R e m a r k s : Nests are under the stones.

***Formica glauca* RUZSKY 1895**

M a t e r i a l e x a m i n e d : **33**, 2☿☿; **38**, ☿.

R e m a r k s : Nests are under the stones.

***Formica sanguinea* LATREILLE 1798**

M a t e r i a l e x a m i n e d : **18**, 2☿☿; **25**, 3☿☿; **26**, 7☿☿; **57**, 9☿☿.

R e m a r k s : Workers are on the oak and beech trees.

***Formica balcanina* PETROV & COLLINGWOOD 1993**

M a t e r i a l e x a m i n e d : **33**, ☿.

R e m a r k s : Workers were caught nearby the stream in a willow area.

***Formica fusca* LINNÉ 1758**

M a t e r i a l e x a m i n e d : **44**, 13☿☿; **52**, ♀, 26☿☿; **55**, 5☿☿.

R e m a r k s : Nests are under the stones and in soil.

***Cataglyphis nodus* (BRULLÉ 1832)**

M a t e r i a l e x a m i n e d : **1**, 5☿☿; **2**, ♂, 10☿☿; **3**, ☿; **4**, 6☿; **5**, ♀, 4☿☿; **23**, 5☿☿; **28**, ☿☿; **30**, ☿☿; **31**, ☿☿; **35**, ☿☿; **37**, ☿☿; **39**, ☿☿; **41**, ☿☿; **42**, ☿☿; **43**, ☿☿; **44**, ☿☿; **49**, ☿☿.

R e m a r k s : Nests are polycalic and are made in wheat lands, roadsides, inside the soil and under the stones.

***Cataglyphis viaticoides* (ANDRÉ 1881)**

M a t e r i a l e x a m i n e d : **5**, 13☿☿; **7**, 7☿☿; **14**, 18☿☿; **28**, ☿☿; **35**, 5☿☿; **42**, 2☿☿; **44**, ☿☿; **49**, ☿☿.

R e m a r k s : Nests are in the soil.

***Cataglyphis aenescens* NYLANDER 1849**

M a t e r i a l e x a m i n e d : **4**, 3☿☿; **11**, ☿☿.

R e m a r k s : Nests are in the soil.

Table 2: Distribution of the species by altitude

Altitude	Number of species	%
0-200	40	49
200-400	47	59
400-600	46	56
600-800	51	62
800-1000	37	45
1000-1200	12	15
1200-1400	7	0, 9
1400-1600	6	0, 7

Discussion

The present study was performed vertically on the Samanlı Mountains situated at the Marmara region. The sampling sites included 58 localities having 20 different habitats at altitudes between 100m and 1600m. As a result, 81 species belonging to 28 genera and 4 subfamilies (Ponerinae, Myrmicinae, Dolichoderinae, Formicinae) were determined. 74 of these species are in Myrmicinae (38 species) and Formicinae (36 species) families in which have widest distribution in Turkey.

The species that we have determined as *Strongylognthus huberi*, *Lasius platythorax*, *Lasius psammophilus* are new record for Turkey.

The species belong to *S. testaceus* and *S. huberi* groups, which are the two major groups of *Strongylognathus* genus – the social parasite of *Tetramorium*, are known from Turkey. *S. testaceus*, known from whole Europe – from England to south Mediterranean, Ukraine, Caucasus, south-east Siberia and Kazakhstan, is commonly represented in Turkey. However, distribution of *S. huberi* group, whose three species (*S. alpinus*, *S. silvestrii*, *S. kervillei*) are known in Turkey up to now, is not so common. Regarding the distribution of species, which is Iberic peninsula in south Europe, The Pyrennes, The Alps, The Appennins and Uzbekistan, south-east Russia (RUSSKY 1896), one can conclude that it has a gap in geographic distribution. But that this species has been found in Turkey in our study fills this gap.

In the species list of the Balkan ants, AGOSTI & COLLINGWOOD 1987a-b mentioned by use of the literature and collection that Plagiolepis taurica is present in Turkey but they did not give the locality. In this respect, the distribution of this species is assured by our study.

Lasius niger defined by LINNEAUS in 1758 attract attention with its wide habitat selection because it is the most widely distributed species of the Palaearctic region. Their habitat selection range shows unusual diversity; from very dry to humid areas, from very dense forest to open areas, from urban areas to wild places without human. Just before 15 years from now, following SEIFERT 1991's division of this eurotopic species into two sibling species as *L. niger* (LINNEAUS 1758) and *L. platythorax* SEIFERT 1991 according to their morphological and ecological features, it became very easy to explain ecology and distribution of these species. However, this separation made it necessary to revise the studies and materials of more than 200 years. *L. platythorax* existence in Turkey gained certainity with our study but at the same time it made it necessary to revise the material collected previously and defined as *L. niger* in order to reveal its exact distribution in Turkey.

The taxonomic position of *L. psammophilus* is similar to *L. niger*/*L. platythorax*. SEIFERT 1992 devided *L. alienus* into three sibling species (*L. alienus*, *L. psammophilus*, *L. paralienus*). Hence it is necessary to study all the material from *L. alienus* group obtained before, in order to understand the exact distribution of *L. psammophilus*, whose existence in Turkey became definite with this study.

The 78 % of the 46 species previously recorded from the Istranca Mountains (ÇAMLITEPE & AKTAÇ 1987) and the 47 % of the 15 species previously recorded from Uludağ Mountain (DONISTHORPE 1950) have been determined on the Samanlı Mountains. This result is not surprising if the distribution of the species is concerned. Because there are similarities between the Istranca Mountains and the Samanlı Mountains regarding the altitude. The difference regarding Uludağ fauna may be due to sampling localities, because the majority of the species were determined around 2000m altitudes.

As can be seen in Table 2, the numbers of species are decreasing over the 1000m and thus, only 6 species were recorded over the 1400m. Similar results have also been seen in the data of AKTAÇ 1988. According to AKTAÇ, the number of species recorded at 2000m (45 species) decrease parallel to the altitude and this number reduced down to 2 above 3200m. However, the decline in the species number cannot be explained by altitude alone. Because, the altitude is alone neither a determining factor it is an ecological factor for insect distribution (MANI 1968). Other than the altitude, the other features of the mountains such as geographic positions, formation, glacial features, climatic conditions, vegetation, and soil structure may play important role on the distribution.

Lasius turcicus which was recorded from 15 of the 20 habitats has the highest ecological tolerance. The number of the species that was recorded from only one habitat is 20. This overrecord can be explained with some species' being stenotopic, some species's criptic habits and also some species' rarity.

Zusammenfassung

In dieser Untersuchung wurde die Ameisenfauna von "Samanlı" Gebirge in der Senkrecht-Höhe von 100 bis 1600m gearbeitet. Das Material wurde in den Jahren 1996 bis 2004 von 58 Lokalitäten und 20 unterschiedlichen Lebensräumen gesammelt. 81 Arten der 28 Gattungen festgestelt, die 4 Unterfamilien (Ponerinae, Myrmicinae, Dolichoderinae, Formicinae) gehören. Davon sind drei Arten (*Strongylognthus huberi*, *Lasius platythorax*, *Lasius psammophilus*) neu für Ameisen-Fauna der Türkei.

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