

A Study on Araneo-Fauna (Arachnida: Araneae) of Görükle Campus Area (Bursa)

Rahşen S. Kaya* and İsmail Hakkı Uğurtaş

Department of Biology, Faculty of Arts and Sciences, Uludağ University, 16059 Nilüfer, Bursa, Turkey

ABSTRACT

In this research, spider specimens collected from Görükle Campus area between 2000 and 2001. A total of 687 adults were collected, and 69 spider species belong to 52 genera in 23 families were recorded.

Key Words: Arachnida, Araneae, fauna, Bursa, Turkey.

INTRODUCTION

Spiders are distributed all over the world and have conquered all ecological environments. Many are specialized as snare builders (web builders), whereas others hunt their victims (ground spiders or wandering spiders) (Foelix 1996). All spiders are predators, except for the very well-known larger mygalomorphs, the great majority feed principally on insects (Mark et al 1999).

There are many faunistic and ecological studies in worldwide. In spite of increased studies on spiders of Turkey in recent years, there are still many regions that have not been sufficiently studied. The first detailed faunal study of the spider fauna of Turkey was carried out by Karol in 1967. In the following years many faunistic and ecological studies have been carried out by Bayram (1987), Bayram and Varol (1999, 2001), Bayram and Göven (2001), Bayram and Özdağ (2002), Bayram and Ünal (2002), Bayram et al. (2002), Varol (1995, 2001), Allahverdi (1996), Ünal (2002), Topçu and Demir (2004) and Topçu et al (2005, 2006) in different localities in Turkey.

In 2002, Bayram revised Karol's checklist (1967) and reported 520 species belonging to 162 genera from Turkey (Bayram 2002). Later, a checklist of Turkish spiders was published by Topçu et al (2005). At present, taxonomists recognize about 39725 spider species which they group into 108 families (Platnick 2007). To date, a total of 613 species have been given from Turkey in the literature (Bayram 2002; Topçu et al 2005).

The purpose of this study is to make contributions to the spider diversity of Bursa, Turkey.

Description of the Study Area

The study area is located in the north-west of Bursa (Turkey) about 20 km from the city centre and 50 km from the coast of the Marmara Sea (Figure 1). The study area is about 16 km² and situated 110 m above sea level. It generally exhibits Mediterranean vegetation and climate (Akman 1999).

Analysis of the flora of Uludağ University campus shows that Mediterranean elements are dominant, while Euro-Siberian and Irano-Turanian elements can be detected. In this area, the following species are most commonly found: *Quercus infectoria* Olivier subsp. *infectoria*, *Q. pubescens* Willd., *Paliurus spina-christi* Miller, *Rubus discolor* Weihe et Nees, *R. sanctus* Schereber, *Prunus divericata* Ledeb., *Filipendula vulgaris* Moench, *Cretaegus monogyna* Jacq., *Cydonia oblonga* Miller, *Pyrus elaeagnifolia* Pallas, *Spartium junceum* L., *Cistus creticus* L., *Salix alba* L., *S. fragilis* L., *Typha latifolia* L., *Ranunculus arvensis* L., *Papaver rhoeas* L., *Silene italica* (L.) Pers., *Ferula commiunis* L., *Senecio vulgaris* L., *S. vernalis* Waldst et Kit, *Tussilago farfara* L., *Matricaria chamomilla* L., *Artemisia absinthium* L., *Centaurea virgata* Lam., *C. depressa* Bieb., *Tragopogon longirostris* Bisch. ex Schultz, *Sonchus asper* (L.) Hill, *Jasminum fruticans* L., *Verbascum lagurus* Fish. et Mey., *V. bombyciferum* Boiss., *Sideritis montana* L., *Salvia virgata* Jacq., *Plantago major* L., *P. lanceolata* L., *Carex flacca* Schreber, *Hordeum bulbosum* L., *Bromus sterilis* L., *Avena barbata* Pott ex Link, *Lolium perenne* L., *Poa annua* L., *Sorghum halepense* (L.) Pers., *Ziziphora capitata* L., *Anchusa thessela* Boiss. et Spruner. In addition to the natural vegetation around Görükle, there are also arboreal plants such as *Acer negundo* L., *Platanus orientalis* L., *Pinus nigra* Arn., *P. brutia* Ten., *Cupressus sempervirens* L., *Robinia pseudoacacia* L., *Catalpa bignonioides* Walt., *Cedrus libani* A. Richard, *Fraxinus excelsior* L., *Juglans regia* L., *Populus alba* L., *P. nigra* L., *Salix babylonica* L., *Ligustrum vulgare* L. and *Syringa vulgaris* L. (Tarımcılar and Kaynak 1995).

* Corresponding author: rkaya@uludag.edu.tr

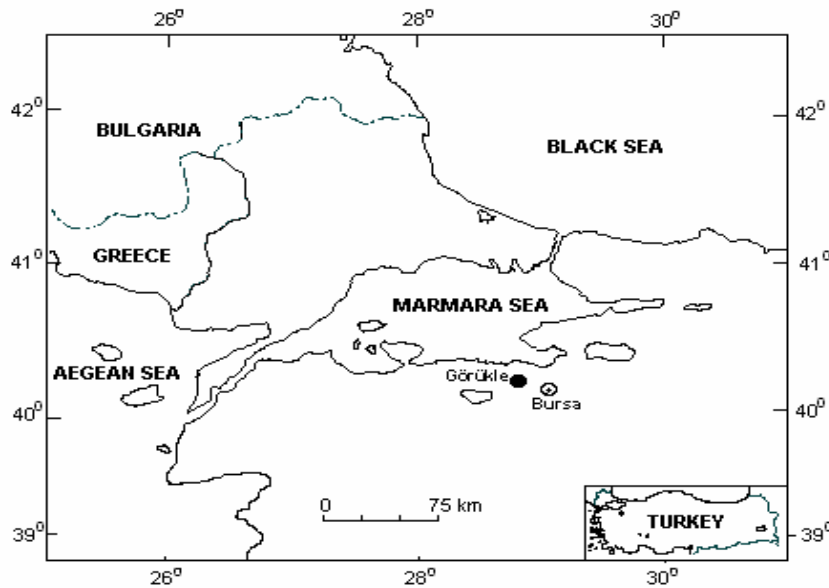


Figure 1. The study area (●)

MATERIAL AND METHODS

The samples were collected from campus area of Uludağ University in 2000 and 2001. A total of 687 adult spider specimens were collected. The spider specimens were collected in Uludağ University campus area by hand collecting. Spiders were sampled from plants, branches, on ground, under stones, in and around buildings. The collected samples were preserved in glycerol. In this paper we follow the nomenclature used by the World Spider Catalog (Platnick 2007).

The spider specimens were identified according to Decae (1996), Heimer and Nentwig (1991), Levy (1987, 1996, 1997), Nentwig et al (2006), Roberts (1996) and Prószyński (2006).

RESULTS AND DISCUSSION

In this study, spider species living at Görükle Campus area of Uludağ University were determined. Non-adult specimens were not evaluated. A total of 687 adult individuals from 69 spider species, 52 genera and 23 families were sampled in the study area during the study period.

Families and the number of species are as follows: Ctenizidae 1, Sicariidae 1, Scytodidae 1, Pholcidae 2, Segestriidae 1, Eresidae 1, Uloboridae 1, Theridiidae 5, Linyphiidae 1, Tetragnathidae 2, Araneidae 10, Lycosidae 5, Pisauridae 1, Oxyopidae 3, Agelenidae 4, Dictynidae 1, Titanoecidae 1, Miturgidae 2, Gnaphosidae 3, Sparassidae 1, Philodromidae 2, Thomisidae 11, Salticidae 9.

The spider species and the number of adult specimens recorded from the study area are given in Table (1). In this study, the most collected spider family was jumping spiders (Salticidae). This was followed by crab-spiders (Thomisidae) and orb-web spiders (Araneidae). Salticidae comprised 20.8%, Thomisidae 11.7% and Araneidae 10.4% of the total spider density. Salticidae and Araneidae were represented by the greatest number of genera. But, the family Thomisidae was represented by the greatest number of species (Figure 2). These conclusions fit the records of Bayram et al (2005).

The most common and abundant spiders were *Pisaura mirabilis* (Clerck 1757), *Pholcus phalangioides* (Fuesslin 1775), *Mogrus neglectus* (Simon 1868), *Agelena labyrinthica* (Clerck 1757), *Menemerus semilimbatus* (Hahn 1829) and *Uloborus walckenaerius* Latreille, 1806. *Pisaura mirabilis* was found in low vegetation, grassland, woodland, on the flowers and on the ground in the study area. *Pholcus phalangioides* and *Menemerus semilimbatus* were collected especially in and around buildings and rocky areas. We observed that both of them were abundant in the buildings. *Mogrus neglectus* was collected in stony areas. *Agelena labyrinthica* spiders were collected from their sheet webs at ground level between grasses, brushes and tree roots. *Uloborus walckenaerius* spiders were collected from their horizontal webs on vegetation near to the ground at heathlands and grassland areas.

Table 1. Total list of spider species in Görükle Campus Area (Bursa)

Species	Distribution	♀	♂	Total adult
1. CTENIZIDAE				
<i>Cyrtocarenum cunicularium</i> (Olivier, 1811)	Greece, Crete, Rhodes, Turkey	-	2	2
2. SICARIIDAE				
<i>Loxosceles rufescens</i> (Dufour, 1820)	Cosmopolitan	-	3	3
3. SCYTODIDAE				
<i>Scytodes thoracica</i> (Latreille, 1802)	Holarctic, Pacific Is.	2	1	3
4. PHOLCIDAE				
<i>Pholcus phalangioides</i> (Fuesslin, 1775)	Cosmopolitan	27	14	41
<i>Spermophora senoculata</i> (Dugès, 1836)	Holarctic	16	15	31
5. SEGESTRIIDAE				
<i>Segestria florentina</i> (Rossi, 1790)	Europe to Georgia	-	2	2
6. ERESIDAE				
<i>Eresus cinnaberinus</i> (Olivier, 1789)	Paelearctic	1	5	6
7. ULOBORIDAE				
<i>Uloborus walckenaerius</i> Latreille, 1806	Paelearctic	37	2	39
8. THERIDIIDAE				
<i>Enoplognatha ovata</i> (Clerck, 1757)	Holarctic	1	-	1
<i>Enoplognatha thoracica</i> (Hahn, 1833)	Holarctic	-	1	1
<i>Steatoda bipunctata</i> (Linnaeus, 1758)	Holarctic	1	-	1
<i>Steatoda paykulliana</i> (Walckenaer, 1805)	Europe, Mediterranean to Central Asia	4	1	5
<i>Steatoda triangulosa</i> (Walckenaer, 1802)	Cosmopolitan	1	-	1
9. LINYPHIIDAE				
<i>Frontinellina frutetorum</i> (C.L.Koch, 1834)	Paelearctic	24	3	27
10. TETRAGNATHIDAE				
<i>Tetragnatha extensa</i> (Linnaeus, 1758)	Holarctic	4	2	6
<i>Tetragnatha montana</i> Simon, 1874	Paelearctic	2	3	5
11. ARANEIDAE				
<i>Agalenatea redii</i> (Scopoli, 1763)	Paelearctic	7	1	8
<i>Araneus diadematus</i> Clerck, 1757	Holarctic	-	1	1
<i>Araniella cucurbitina</i> (Clerck, 1757)	Paelearctic	1	1	2
<i>Argiope bruennichi</i> (Scopoli, 1772)	Paelearctic	15	-	15
<i>Argiope lobata</i> (Pallas, 1772)	Old World	4	-	4
<i>Cyclosa conica</i> (Pallas, 1772)	Holarctic	12	-	12
<i>Gibbaranea bituberculata</i> (Walckenaer, 1802)	Paelearctic	6	-	6
<i>Larinioides cornutus</i> (Clerck, 1757)	Holarctic	5	-	5
<i>Mangora acalypha</i> (Walckenaer, 1802)	Paelearctic	-	1	1
<i>Neoscona adianta</i> (Walckenaer, 1802)	Paelearctic	16	2	18
12. LYCOSIDAE				
<i>Alopecosa fabrilis</i> (Clerck, 1757)	Paelearctic	2	3	5
<i>Pardosa amentata</i> (Clerck, 1757)	Europe, Russia	2	-	2
<i>Pirata piraticus</i> (Clerck, 1757)	Holarctic	5	5	10
<i>Trochosa robusta</i> (Simon, 1876)	Paelearctic	3	1	4
<i>Trochosa ruricola</i> (De Geer, 1778)	Holarctic, Bermuda	2	2	4
13. PISAURIDAE				
<i>Pisaura mirabilis</i> (Clerck, 1757)	Paelearctic	35	8	43
14. OXYOPIIDAE				
<i>Oxyopes heterophthalmus</i> (Latreille, 1804)	Paelearctic	11	5	16

Table 1. (continue)

<i>Oxyopes lineatus</i> Latreille, 1806	Palaearctic	2	2	4
<i>Oxyopes ramosus</i> (Martini & Goeze, 1778)	Palaearctic	-	1	1
15. AGELENIDAE				
<i>Agelena labyrinthica</i> (Clerck, 1757)	Palaearctic	31	6	37
<i>Allagelena gracilens</i> (C.L.Koch, 1841)	Central Europe, Mediterranean to Central Asia	4	1	5
<i>Maimuna vestita</i> (C.L.Koch, 1841)	Eastern Mediterranean	5	3	8
<i>Tegenaria parietina</i> (Fourcroy, 1785)	Holarctic	2	1	3
16. DICTYNIDAE				
<i>Dictyna latens</i> (Fabricius, 1775)	Europe to Central Asia	9	-	9
17. TITANOECIDAE				
<i>Nurscia albomaculata</i> (Lucas, 1846)	Europe to Central Asia	4	1	5
18. MITURGIDAE				
<i>Cheiracanthium elegans</i> Thorell, 1875	Europe to Central Asia	2	1	3
<i>Cheiracanthium punctorium</i> (Villers, 1789)	Europe to Central Asia	20	2	22
19. GNAPHOSIDAE				
<i>Drassodes lapidosus</i> (Walckenaer, 1802)	Palaearctic	10	4	14
<i>Drassylus lutetianus</i> (L.Koch, 1866)	Europe to Kazakhstan	4	2	6
<i>Drassylus praeficus</i> (L.Koch, 1866)	Europe to Central Asia	2	1	3
20. SPARASSIDAE				
<i>Micrommata virescens</i> (Clerck, 1757)	Palaearctic	5	1	6
21. PHILODROMIDAE				
<i>Philodromus cespitum</i> (Walckenaer, 1802)	Holarctic	3	-	3
<i>Philodromus longipalpis</i> Simon, 1870	Europe, Iran	4	-	4
22. THOMISIDAE				
<i>Diaea livens</i> Simon, 1876	USA, Central Europe to Azerbaijan	-	1	1
<i>Misumena vatia</i> (Clerck, 1757)	Holarctic	2	1	3
<i>Runcinia grammica</i> (C.L.Koch, 1837)	Palaearctic, St. Helena, South Africa	22	6	28
<i>Synema globosum</i> (Fabricius, 1775)	Palaearctic	23	6	29
<i>Thomisus onustus</i> Walckenaer, 1805	Palaearctic	8	5	13
<i>Xysticus acerbus</i> Thorell, 1872	Europe to Central Asia	-	1	1
<i>Xysticus audax</i> (Schrank, 1803)	Palaearctic	1	-	1
<i>Xysticus cristatus</i> (Clerck, 1757)	Palaearctic	-	1	1
<i>Xysticus kempeleni</i> Thorell, 1872	Europe to Central Asia	-	1	1
<i>Xysticus kochi</i> Thorell, 1872	Europe, Mediterranean to Central Asia	-	2	2
<i>Xysticus lanio</i> C.L.Koch, 1835	Palaearctic	1	-	1
23. SALTICIDAE				
<i>Euophrys frontalis</i> (Walckenaer, 1802)	Palaearctic	2	3	5
<i>Evarcha arcuata</i> (Clerck, 1757)	Palaearctic	18	6	24
<i>Menemerus semilimbatus</i> (Hahn, 1829)	Canary Is. to Azerbaijan; Argentina	30	7	37
<i>Mogrus neglectus</i> (Simon, 1868)	Greece, Turkey, Israel, Azerbaijan	33	7	40
<i>Pellenes diagonalis</i> (Simon, 1868)	Corfu, Greece, Turkey, Israel	-	5	5
<i>Philaeus chrysops</i> (Poda, 1761)	Palaearctic	7	2	9
<i>Phlegra fasciata</i> (Hahn, 1826)	Palaearctic	6	2	8
<i>Salticus scenicus</i> (Clerck, 1757)	Holarctic	7	4	11
<i>Synageles dalmaticus</i> (Keyserling, 1863)	Mediterranean	4	-	4

Zoogeographical distribution of the collected species show that Palaearctic and Holarctic species are dominant (Platnick 2007).

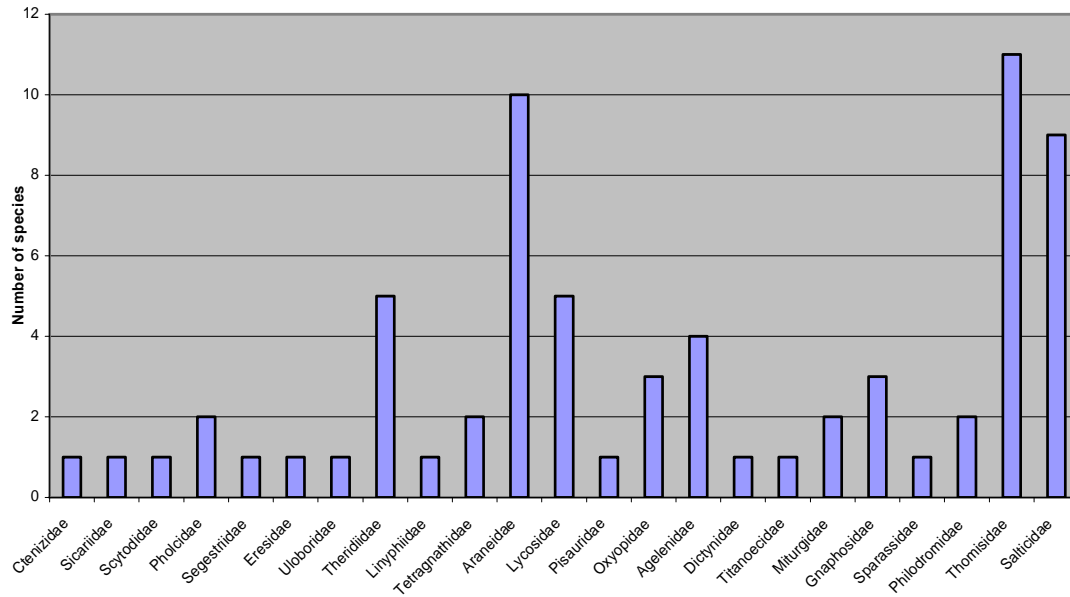


Figure 2. Number of spider species per family in the study area

ACKNOWLEDGMENTS

We would like to thank Dr. Abdullah Bayram for his valuable suggestions and help in identification of spiders. We also thank Mr. Hisham El-Hennawy (Egypt) for providing literature.

REFERENCES

- Akman Y. (1999). İklim ve Biyoiklim (Biyoiklim Metodları ve Türkiye İklimleri. Kariyer Matbaacılık Ltd. Şti., Ankara.
- Allahverdi H. (1996). Van İli Korunga ve Yonca Tarlalarında Örümcek (Araneae) Populasyonları Üzerine Bir Araştırma. M.Sc. Thesis. Yüzüncü Yıl Üniversitesi. Van, Türkiye, 67 p.
- Bayram A. (1987). Doğu Canik Dağları Örümcekleri. M.Sc. Thesis. Ankara Üniversitesi, Ankara, Türkiye, 35p.
- Bayram A. (2002). Distribution of Turkish Spiders. In: Zoogeography of Turkey (Ed: A. Demirsoy). Meteksan Publ., Ankara, pp. 638-657.
- Bayram A., Danişman T., Yeşilyurt F., Çorak İ., and Ünal M. (2005). Kırkkale İlinin Araneo-Faunası Üzerine (Arthropoda: Arachnida). Ekoloji 14(56): 1-8.
- Bayram A., and Göven M.A. (2001). *Uloborus walckenaerius* Latreille, 1806 (Araneae, Uloboridae), A spider new to Turkish fauna. Turk J Zool 25: 241-243.
- Bayram A., and Özdağ S. (2002). *Micrommata virescens* (Clerck, 1757), a new species for the spider fauna of Turkey (Araneae, Sparassidae). Turk J Zool 26: 305-307.
- Bayram A., Özdağ S., and Kaya R. (2002). New spider [Araneae] records for Turkey: *Hyptiotes paradoxus* (Koch C.L., 1834) [Uloboridae], *Diaea pictilis* (Banks, 1896) [Thomisidae], *Alopecosa fabrilis* (Clerck, 1757) [Lycosidae] and *Evarcha arcuata* (Clerck, 1757) [Salticidae]. Isr J Zool 48(3): 250-251.
- Bayram A., and Ünal M. (2002). A new record for the Turkish spider fauna: *Cyclosa conica* Pallas (Araneae, Araneidae). Turk J Zool 26: 173-175.
- Bayram A., and Varol M.İ. (1999). Van Yöresi Ot Kümelerinde Örümcekler (Araneae) Üzerine Bir Araştırma. Turk J Zool 23(1): 15-21.
- Bayram A., and Varol M.İ. (2001). Çukur Tuzaklar İle Zemin Örümceklerinde (Araneae) Mevsimsel Aktivitenin Tesbiti. Ekoloji Çevre Dergisi 10(38): 3-8.
- Decae A.E. (1996). Systematics of the trapdoor spider genus *Cyrtocarenum* Ausserer, 1871 (Araneae, Ctenizidae). Bull Br Arachnol Soc 10:161-170.
- Foelix R.F. (1996). Biology of Spiders. Georg Thieme Verlag, Oxford University Press, Oxford.
- Heimer S., and Nentwig W. (1991). Spinnen Mitteleuropas. Verlag Paul Parey, Berlin.
- Karol S. (1967). Türkiye Örümcekleri I. Ön Liste. Ankara Üniversitesi Fen Fakültesi Yayınları, Ankara.
- Levy G. (1987). Spiders of the genera *Araniella*, *Zygiella*, *Zilla* and *Mangora* (Araneae, Araneidae) from Israel, with notes on *Metellina* species from Lebanon. Zool Scripta 16(3): 243-257.
- Levy G. (1996). The agelenid funnel-weaver family and the spider genus *Cedicus* in Israel (Araneae, Agelenidae and Cybaeidae). Zool Scripta 25(2): 85-122.
- Levy G. (1997). Twelve genera of orb - weaver spiders (Araneae, Araneidae) from Israel. Isr J Zool 43: 311-365.
- Mark P., Canard A., and Ysnel F. (1999). Spiders (Araneae) useful for pest limitation and bioindication. Agric Ecosys Environ 74: 229-273.

- Nentwig W., Hänggi A., Kropf C., and Blick T. (2006). Spinnen Mitteleuropas/Central European Spiders. An internet identification key. <http://www.araneae.unibe.ch> Version 8.12.2003.
- Platnick N.I. (2007). The world spider catalog, version 7.5. American Museum of Natural History, <http://research.amnh.org/entomology/spiders/catalog/index.html>
- Prószyński J. (2006). Salticidae (Araneae) of the World. 2003 version, revised in part on March 20th, 2006. <http://salticidae.org/salticid/main.htm>
- Roberts M.J. (1996). Spiders of Britain and Northern Europe. Harper Collins Publishers, London.
- Tarımcılar G., and Kaynak G. (1995). Uludağ Üniversitesi (Bursa) Kampüs Alanı Florası. I. Ondokuz Mayıs Üniversitesi Fen Dergisi 6(1): 21-45.
- Topçu A., and Demir H. (2004). New crab spider (Araneae: Thomisidae) records for Turkey. Isr J Zool 50: 421-422.
- Topçu A., Demir H., and Seyyar O. (2005). A Checklist of the spiders of Turkey. Serket 9(4): 109-140.
- Topçu A., Türkeş T., Seyyar O., Kunt K.B., and Demir H. (2006). A New Species for the Araneofauna of Turkey, *Oxyopes ramosus* (Martini & Goeze, 1778), [Araneae, Oxyopidae]. Turk J Zool 30: 117-119.
- Ünal M. (2002). Kızılırmak Yeşilvadi (Kırıkkale) Ağ Örtücü Örümceklerinin (*Arachnida: Araneae*) Taksonomisi Üzerine Araştırmalar. M.Sc. Thesis. Kırıkkale Üniversitesi, Kırıkkale, Türkiye, 78p.
- Varol M.I. (1995). Van Gölü havzası *Lycosidae*, *Gnaphosidae* ve *Clubionidae* (*Ordo: Araneae*) Faunası Üzerine Taksonomik Bir Araştırma. M.Sc. Thesis. Yüzüncü Yıl Üniversitesi, Van, Türkiye, 60p.
- Varol M.I. (2001). Kuzey Doğu Anadolu Bölgesi Yer Örümceklerinin (*Arachnida: Araneae*) Sistematiği ve Ekolojisi. Ph.D. Thesis. Yüzüncü Yıl Üniversitesi, Van, Türkiye, 133p.