THE SPIDER FAUNA OF AN OLIVE GROVE AND ASSOCIATED SHRUBLANDS IN MUĞLA, MİLAS, KIYIKIŞLACIK WITH NOTES ON THEIR DIVERSITY AND COMPOSITION

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THE SPIDER FAUNA OF AN OLIVE GROVE AND ASSOCIATED SHRUB LANDS IN MUĞLA, MİLAS, KIYIKIŞLACIK WITH NOTES ON THEIR DIVERSITY AND COMPOSITION

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ABSTRACT

THE SPIDER FAUNA OF AN OLIVE GROVE AND ASSOCIATED SHRUBLANDS IN MUĞLA, MİLAS, KIYIKIŞLACIK WITH NOTES ON THEIR DIVERSITY AND COMPOSITION

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In the period from May 2010 to August 2011, spider fauna of semi natural olive groves and associated shrub-lands were sampled in Muğla Province, Milas District, Kıyıkışlacık Village at the Western Mediterranean coast of Turkey. Semiquantitative sampling protocols were performed by use of pitfall traps, sweep nets, by active collecting, by sifting of tree litter and beating branches of shrubs. A total of 9967 spider specimens were obtained, from these, 3034 adult specimens were determined up to the lowest taxonomic category, and a detailed checklist is produced for the study area, composed of a total of 220 species belonging to 147 genera and 38 families. 39 species were recorded for the first time in Turkey. Species accumulation curves were used to test the representativeness of field surveys and to perform richness estimates, which were resulted in high completeness values and richness estimations around 250 – 300 species for the study area. Results on composition, phenology and distributional patterns of the spider assemblage was also briefly discussed and found to be typical for Mediterranean habitats. Diagnostic photographs for each species in the collection are also provided in the appendix.

Keywords: Mediteranean, Fauna, Arachnology

ÖZ

MUĞLA, MİLAS, KIYIKIŞLACIK'TA YER ALAN BİR ZEYTİNLİK İLE İLİŞKİLİ ÇALILIK ALANLARIN ÖRÜMCEK FAUNASI VE ÖRÜMCEKLERİN ALANDAKİ ÇEŞİTLİLİĞİ VE KOMPOZİSYONU ÜZERİNE NOTLAR

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Türkiye'nin Batı Akdeniz kıyısında yer alan, Muğla İli, Milaş İlçesi, Kıyıkışlacık Köyü mevkiinde bulunan yarı doğal zeytinliklerin ve ilişkili çalılık alanların örümcekleri Mayıs 2010 ile Ağustos 2011 tarihleri arasındaki dönemde örneklenmiştir. Örneklemelerde, yarı nicel yöntemler olan düşürme tuzakları ile örnekleme, atrapla örnekleme, elle toplama, zemin döküntülerinin elenmesi ve çalılık dallarının silkilmesi yöntemleri kullanılmıştır. Toplam 9967 örümcek örneği toplanmış; bunlardan ergin olan 3034 örnek mümkün olan en düşük taksonomik kategoriye kadar teşhis edilmiş ve çalışma alanı için, 38 familya, 147 cins ve 220 tür içeren detaylı bir kontrol listesi oluşturulmuştur. Bunlardan 39 tür Türkiye için yeni kayıttır. Çalışmanın temsil gücünü test etmek ve gözlenen zenginlik üzerinden gerçek tür zenginliğini tahmin edebilmek için tür birikim eğrileri kullanılmıştır. Bu eğriler yüksek temsil gücü değerleri ve alan için 250 ile 300 arasında örümcek tür zenginliği tahminleriyle sonuçlanmıştır. Alandaki örümceklerin tür kompozisyonu, fenolojileri ve dağılımları tartışılmış, sonuçların Akdeniz tipi yaşam alanları için tipik olduğu görülmüştür. Çalışmaya ek olarak, alanda gözlenen türler için ayırdedici karakterlerin fotoğrafları sunulmuştur.

Anahtar Kelimeler: Akdeniz Bölgesi, Fauna, Araknoloji

To My Mom, Dad and Brother

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CHAPTER 1

INTRODUCTION

Spiders (Arachnida, Araneae) have inhabited Earth for 400 million years (Jocqué et al., 2006) and now are distributed all over the world and have occupied almost all terrestrial environments (Foelix, 2011). They are ubiquitous predators as generalist feeders mainly attacking insects (Wise, 1995) and therefore been assumed as playing a major role in suppressing insect pest populations (Maloney et al., 2003) and proposed as model terrestrial predators for ecological studies (Wise, 1995). Because of some species venomous to man, some countries have severe problems with spiders as pests as well; and even if they pose no threat, many people are prone to a substantial phobia in their presence (Jocqué et al., 2006). Still, spiders inspire people from a variety of interests, from hobbyists to researchers of many disciplines, all around the world.

Although spiders have been such a center of interest, our current knowledge on their biology is far from being complete. Even faunistic studies are not complete for most of the world, only very limited areas have been comprehensively studied (Jocqué et al., 2006). As a matter of fact, knowledge on spider fauna of Turkey is imperfect too. There have been efforts to constitute checklists of Turkish spider fauna; and the number is increasing every year with new records of described species and descriptions of species new to science; but still it is very unclear that how many new species or new records are waiting to be discovered in Turkey.

1.1. General Information on Spider Biology

General information on biology of spiders is provided here, which is thought to be necessary to implement a general understanding on spider science. Recent higher level taxonomy is given and morphology of spiders is very briefly described by a special focus on taxonomically important structures.

1.1.1. Higher Level Taxonomy of Spiders

Order Araneae is examined under three suborders: Mesothelae, Mygalomorphae and Araneomorphae. The Mesothelae is proposed as the phylogenetically oldest spiders for exhibiting primitive characters. Mygalomorphae is distinct with their chelicerae lying parallel to each other; and often with reduced spinnerets. Araneomorphae includes more than 90 % of all known spiders (Foelix, 2011). As a result of extraordinary rich diversity of spiders under this suborder, high level taxonomy of Araneomorphae is still quite unclear (Foelix, 2011).

Currently there are 43244 recognized species worldwide, grouped under 111 families (Platnick, 2012). However the complete spider fauna is only known for limited areas on the globe; while for most of the world knowledge remains imperfect (Jocqué et al., 2006).

1.1.2. Spider Morphology

A typical spider displays two major body parts: the prosoma and the opisthosoma. These two body parts are connected by a structure called pedicel. See Figure 1 for illustrations of main parts.

1.1.2.1. Prosoma

Head and thoracic part are fused, forming cephalothorax. Dorsal plate of cephalothorax is called carapace; while the ventral plate is called sternum. Eyes and chelicerae are located at the anterior part of prosoma. Most spiders have eight eyes, which are arranged in specific patterns typical in different families. Some families include species with fewer than eight eyes such as Dysderidae or Oonopidae; or eyeless cave dwellers (Foelix, 2011).

Pedipalps are the second pair of appendages on prosoma after chelicerae. “Palps” resemble legs in general structure, but usually are not used for locomotion; rather they are used as sense organs. In males however, palps are also used as secondary copulation organs and are highly determinant for species level identifications (Foelix, 2011). Four pairs of legs are the remaining appendages on prosoma. Each leg are composed of coxa, trochanter, femur, patella, tibia, metatarsus and tarsus

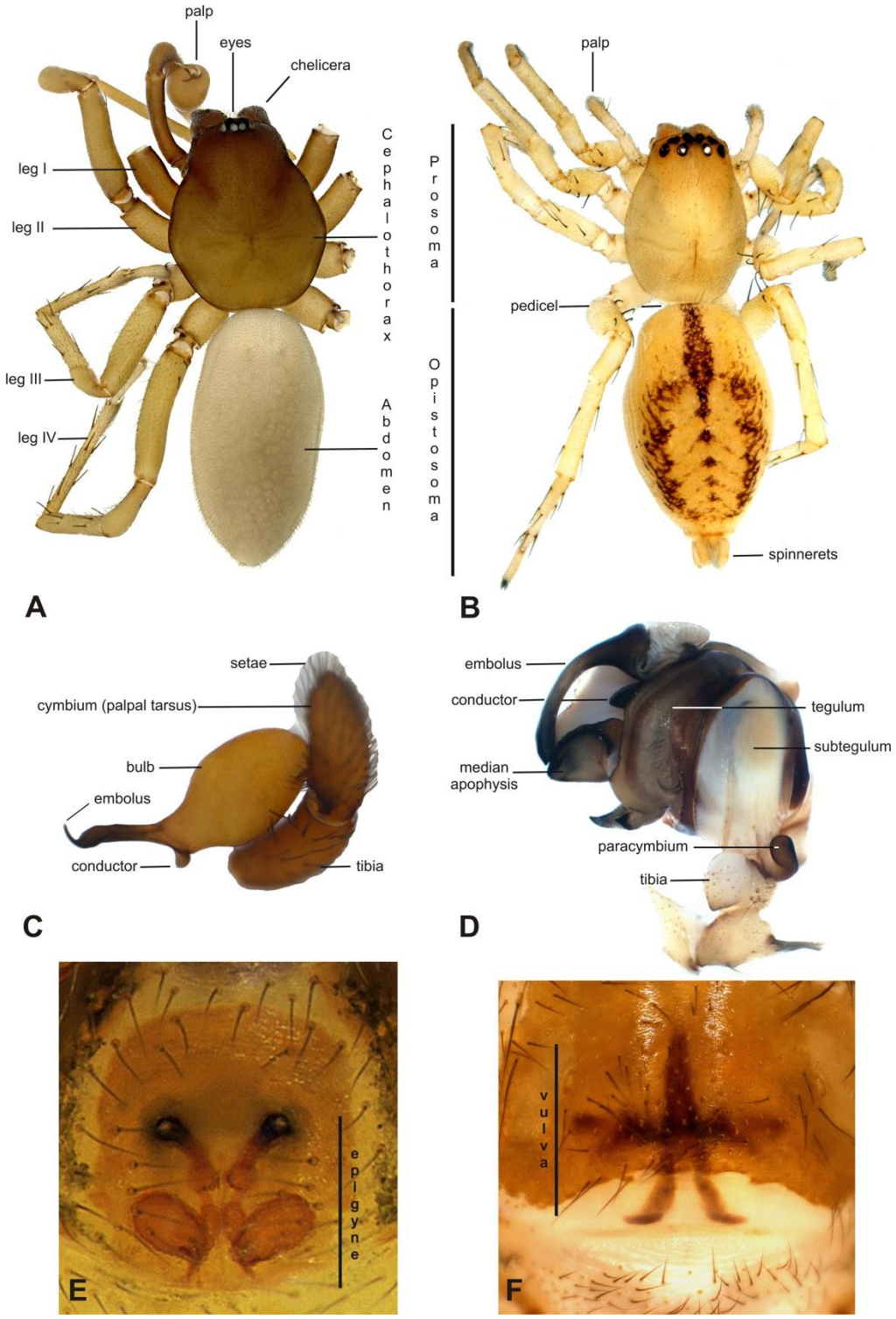

Figure 1. Figure indicating main body parts of spiders: A, dorsal view of an haplogyne spider; B, dorsal view of an entelegyne spider; C, simple palp of an haplogyne spider; D, complex palp of an entelegyne spider; E, epigyne morphology of an entelegyne spider from ventral; F, vulva of an haplogyne spider from ventral. From A to F species are *Hygrocrates deelemanus*, *Clubiona comta*, *Harpactea kencei*, *Araneus circe*, *Orthobula charitonovi* and *Dasumia sp.* respectively.

segments with two or three tarsal claws. The pairs of legs are numbered conventionally from the front: I, II, Ill, IV. Many spiders possess dense cushions of hair on their feet, the *scopulae*; concentrated type of scopulae under the claws are called claw tufts (Le Peru, 2011).

1.1.2.2. Opisthosoma

Generally oval and more or less cylindrical in shape, abdomen carries respiratory organs, the genital openings, the spinnerets and the anal opening all on the ventral side. It varies very much in size, shape and pattern depending on feeding or on egg development within species or between species in a particular family or even lower taxonomic categories. Sometimes abdomen bears tubercules or extensions in some species. Abdomen patterns are very variable, and absent in many spiders but sometimes are also used for species level identifications in some particular groups (Le Peru, 2011)

1.1.2.3. Tegument Structure

Body parts are covered by cuticle. Cuticle cover serves as protection as well as exoskeleton on which muscles are attached. Usually there are spines or hair on the surface of cuticle; all these structures are called setae, or setal structures. Trichobothria are special setal structures other than spines and often thinner. The position of the spines and sometimes trichobothria on legs and palps are often specified in the descriptions of species (Le Peru, 2011).

1.1.2.4. Sexual Organs

In spiders, species level identifications are mainly based on morphology of the external sexual organs. Based on this fact, some information on the structure and function of male and female sexual organs are presented very briefly.

Spiders are dioecious. Females are always larger than males, and it is not very uncommon to see male dwarfism (Hormiga et al., 2000). This rule is broken with very few exceptions, there are also some cases of larger males than females, such as in spider families Dysderidae and Cybaeidae.

1.2.4.1. Female copulatory organs

The female internal sexual organs consist of two ovaries, two oviducts, the uterus, the vagina, and one or more spermathecae, or seminal receptacles. And, the external part of the female reproductive organs is called the epigyne. It is located in front of the epigastric furrow, on the ventral side of abdomen (Le Peru, 2011). It is the most important character in the identification of female spiders in many families.

Presence or absence of complex epigynal structures in different spider groups have enabled a very straight forward discrimination. In some spiders epigyne is simply in the form of a furrow, these spiders are called haplogyne spiders; while spiders in which females have very distinct epigynes in the form of sclerotised plates are called as the entelegyne spiders (Figure 1). Although lacking a chitinized epigyne, haplogyne spiders also have chitinized structures in the epigastric fold, these structures are usually called as vulva (Le Peru, 2011). Even if a distinct epigyne is present or not, usually a clearing or even a dissection of epigyne or vulva is necessary for proper examination of these organs for taxonomical investigations.

1.2.4.2. Male copulatory organs, Pedipalps

A very striking difference between males and females or juveniles is the thickened palpal tarsi of males that can be easily distinguished. Male spiders lack primary copulatory organs like a penis; but have a special organ on their palpal tarsi that is specialized for the storage and transfer of sperm, which functions as a secondary copulation organ. The testes lie as paired structures inside the abdomen. Before mating, males release the sperm to the outside through a ventral opening called the epigastric furrow into a special sperm web and then transfer it to their palps (Foelix, 2011).

Complexity of palps varies between different groups. The simplest form of palp is seen in the Haplogynae and Mygalomorph spiders, in which the tarsus has a cavity at its end, holding a pear-shaped structure called the bulb (Foelix, 2011). The slender apical portion of the bulb is usually called the embolus. Tarsus cavity which contains the bulb is large and like a cup holding the bulb in many spiders. This kind of tarsus is named as the cymbium (Le Peru, 2011). Entelegynae have much more complex palp structures. The bulb consists of both sclerotised parts called the sclerites, and soft parts called the haematodochae. The haematodochae are located between the sclerites; they are inflatable, and during mating they are distended and allow the palpal organ to expand like a baloon. In resting state, the haematodochae are collapsed and largely hidden. Both sclerites and haematodochae can bear protrusions called apophysis (Le Peru, 2011). The sclerotized parts of the palpal organ have specific names. The arrangement of the different sclerites: tegulum, subtegulum, median apophysis, conductor and embolus are presented in Figure 1.

1.2. Spiders of Turkey

1.2.1. Biodiversity in Turkey

Turkey is located on a biodiversity rich geography, with around 11.000 vascular plant species recognized and with animal species much greater than plants in numbers (Davis, 1965,1985; Davis & Tan, 1988; Ekim, 2005; Kence & Bilgin, 1996; Turak et al., 2002). With such values of biodiversity, Turkey is recognized as a priority area (Myers et al., 2000; Mittermeier et al., 2004). The significance of these numbers becomes even more evident if they are compared with Europe as a whole; containing around 12500 (WWF & IUCN 1994) recognized vascular plant species distributed over an almost thirteen times larger area than Turkey.

A number of other good examples could be given for such comparisons on animal species of Turkey and Europe, especially for Vertebrata. There are around 127 species (AdaMerOs, 2012) of reptiles in Turkey, while European terrestrial reptiles consist of 151 species (Cox & Temple, 2009). Amphibians draw a relatively different scene, as we have around 33 (AdaMerOs, 2012) species in Turkey, while European species are unusually rich, around 85 (Speybroeck et al., 2010), more than two times higher in number. In bird species, usual trend returns back as the number of bird species in Turkey is around 460 (Kence & Bilgin, 1996) while in Europe estimated number is around 526 (BirdLife International, 2004). For terrestrial mammals, ratio is far or less similar with around 160 (Kence & Bilgin, 1996) species in Turkey and around 219 (Temple & Terry, 2007) species in Europe.

For Invertebrates, a striking example could be given from Lepidoptera, as a comparatively well studied invertebrate group both in Europe and Turkey. There are 380 species of butterflies known from Turkey and 482 species in Europe as a whole currently recognized (Koçak & Kemal, 2008, 2009, Karaçetin & Welch, 2011). As another relatively well studied group, Orthoptera might represent another good example, as there are 649 species (Ünal, 2012) known from Turkey while the number is around 1100 in Europe (Heller, 2004). See Figure 2.

Unfortunately it is not possible to enumerate such examples for invertebrates. Before deciding whether such a comparison is truly suggestive or not, probably one major assumption at least should be satisfied: the group of concern should have been well studied both in Europe and Turkey. Unfortunately unlike vertebrates, such an assumption might not be so realistic for many invertebrate groups in Turkey. Usually inventory studies are far behind from being complete, thus comparisons would be neither realistic nor suggestive yet regarding our country.

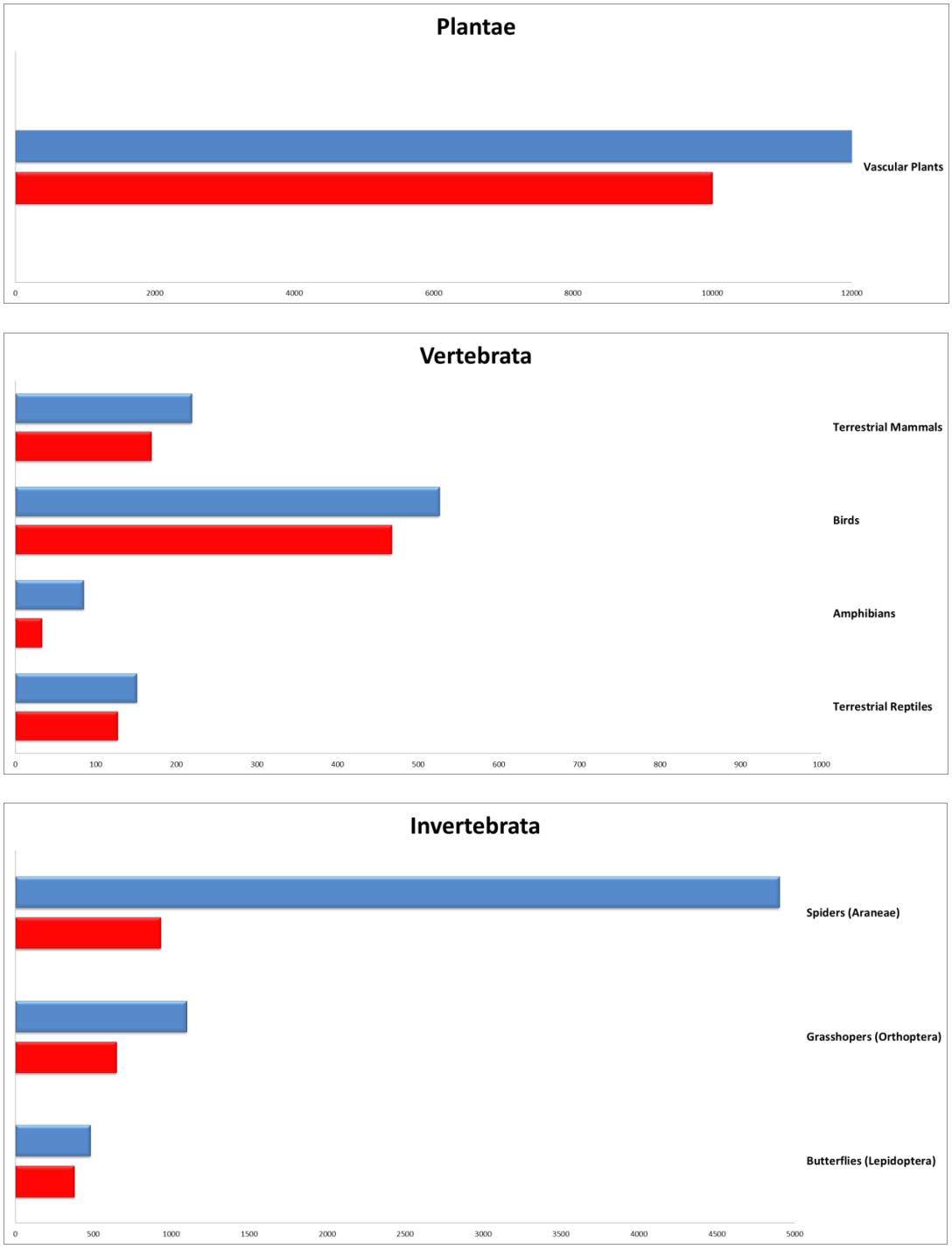

Figure 2. Graphs displaying comparisons on number of species in Turkey and Europe by presenting spiders and some better studied terrestrial groups in both regions. Blue colour indicates European species while red colour indicates Turkish species. X-axis shows the number of species. Note that numbers are far or less close to each other, except for spiders. Species numbers follows Ekim, 2005 and WWF & IUCN 1994 for plants; Kence & Bilgin, 1996 and Temple & Terry, 2007 for terrestrial mammals; Kence & Bilgin, 1996 and BirdLife International, 2004 for birds; AdaMerOs, 2012 and Speybroeck et al., 2010 for amphibians; AdaMerOs, 2012 and Cox & Temple, 2009 for reptiles; Bayram et al., 2012 and Helsdingen, 2012 for spiders; Ünal, 2012 and Heller, 2004 for grasshoppers; Koçak & Kemal, 2008, 2009 and Karaçetin & Welch, 2011 for butterflies.

Currently there are 950 spider species from 52 families reported in Turkey, according to Bayram et al., 2012. This number is actually low with respect to the previous examples of plants and animals in accordance with European representatives, as there are around 4900 spider species recorded from Europe as a whole (Helsdingen, 2012). Reason for such a difference is, possibly that Turkish Araneofauna is far from being completed; while European Araneofauna is much better studied.

Main reason for such retardation is probably the lack of native researchers in Turkey until recently. According to Karol, 2008 taxonomic research on fauna have started by Dr. Curt Kosswig and his assistants or students, after 1950's in Turkey. Spiders were not an exception. Although the first studies on Turkish spiders were took place in nineteenth century and continued by foreign scientists during 20th century, Turkish Arachnology was actually started in 1960's with Dr. Sevinç Karol.

1.2.2. History of Spider Science in Turkey

Dr. Sevinç Karol has published some quite notable papers during 1960's, but she quit studying on spiders after more or less than ten years. During the following time frame, there was no other publication by a Turkish arachnologist until 1990's. Second Turkish arachnologist was Dr. Abdullah Bayram, one of Dr. Sevinç Karol's students and the only one studied on spiders; started his publications at 1990's. Following Dr. Abdullah Bayram, many arachnologists were raised under his supervision and continue their work on spiders and other arachnids. From second half of 2000's, publications of Dr. Aydın Topçu and his students appeared in the literature, and increased in numbers by time. Altogether, Turkish arachnologists are dominating the literature since 2005 (Figure 3). By the last couple of years of 2000's, rather independent authors also published their studies, such as Kadir Boğaç Kunt, Dr. Sulhi Özkütük and Dr. Rahşen Kaya.

Long before Turkish Arachnologists' appearance in the literature, there were already a plenty of studies carried out by foreign arachnologists, and actually they were dominating the literature until 1990's. Along the following period until today, numbers of foreign originated publications did not decrease, but still outnumbered by the increasing numbers of Turkish arachnologists. After 2004, a number of cooperative work between foreign and Turkish authors were also published. See Figure 3 for details on distribution of publications by years.

All literature on Turkish spiders within my reach (mainly gathered from two sources: Bayram et al., 2012 and Platnick, 2012) were considered in the below graphs and also provided in the references. Only studies with taxonomical or faunistical content were gathered, while ecological studies on one or a few particular species were also excluded. A total of 249 publications were gathered. See references for further details on each particular publication.

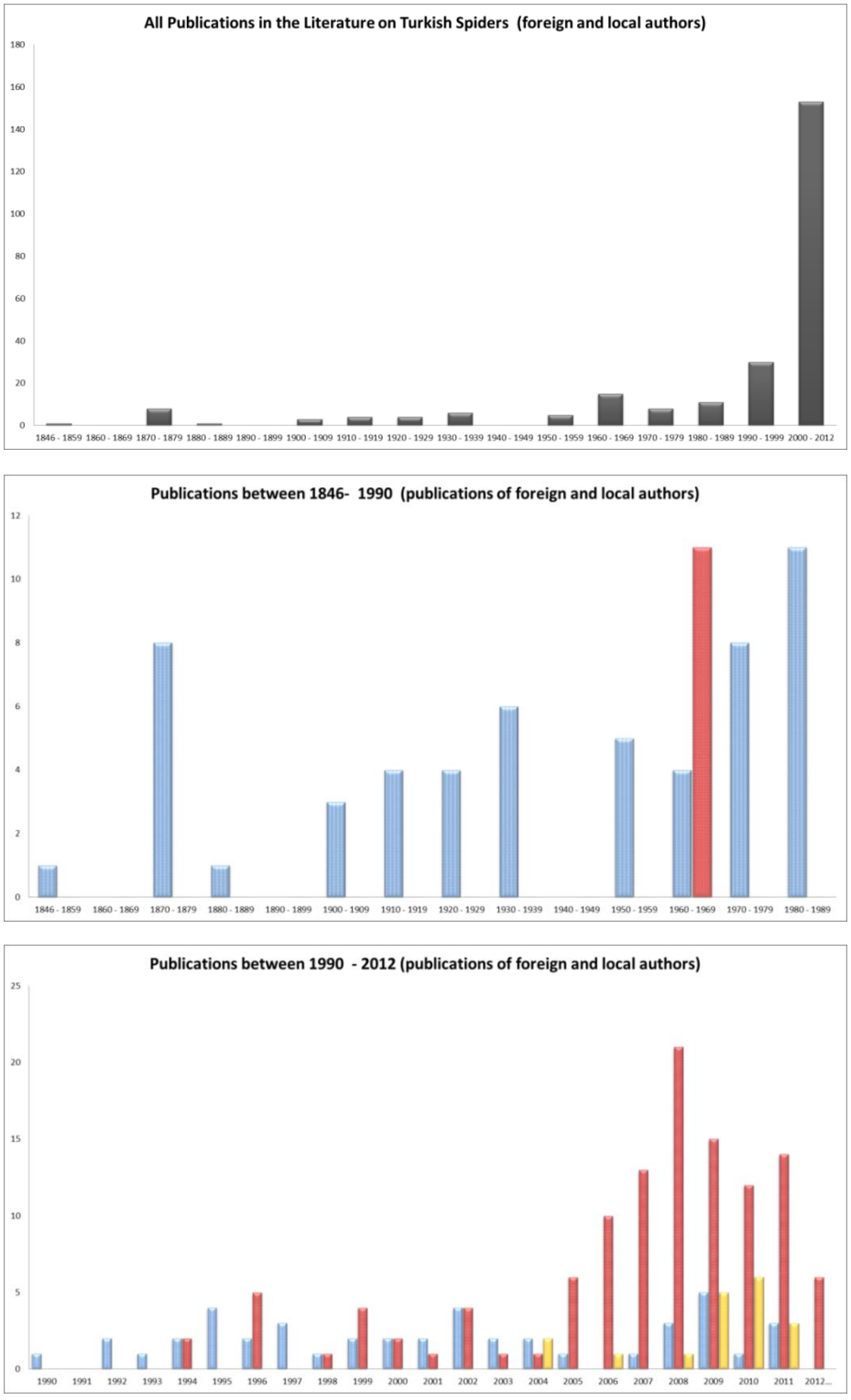

Figure 3. Graphs displaying distribution of all known publications in the literature on Turkish spiders along years. 1st graph shows all publications. In the second and third graphs blue colour indicates foreign authors, red colour indicates Turkish authors and yellow colour indicates the cooperative work between foreign and local authors. Literature gathered from Bayram et al., 2012 and Platnick, 2012.

Over 60 % of all publications on Turkish spiders have published in last 12 years period (Figure 3); dominated by papers presenting new records of previously described species or descriptions of new species from Turkey; while other types of publications (theoretical, ecological) were scarce. Inventory studies on complete spider fauna for any particular habitat type or region are very scarce too, and present studies only dealt with some particular families; or representativeness of such studies on their target study areas are often subject to debate, as sampling efforts never provided in those publications. All of these observations may be used as a very rough indicator of a huge amount of work necessary still remaining undone, for providing a representative inventory for Turkish spider fauna, as well.

1.3. Studying Mediterranean Spider Assemblages

1.3.1. Major Characters of the Mediterranean Habitats

As a part of the West-Palearctic region, Mediterranean biogeographic area basically encircles the Mediterranean Basin. Description of limits of the area was proposed to be easiest by considering some important ecological factors including vegetation, climate, latitude and altitude (Blondel et al., 2010). As a similar approach, by assigning phylogenetic groups into geographic categories, with consideration of their chorological relations, useful inferences would also be acquired (see Mediterranean chorotypes proposed by Taglianti et al., 1999). Climate is typically characterized by hot and dry summers, followed by humid and cold winters, although open to slight changes due to latitudinal or altitudinal differences in the area. Sclerophyllous trees such as some oak species of *Quercus* or olive tree *Olea europaea* are very typical in the region, and woodland associations composed of numerous similar evergreen species cover vast areas. Pine forests also represent a very common habitat type in the region (Blondel et al., 2010).

The region is one of the richest places in earth in terms terrestrial biodiversity (Blondel et al., 2010); with more than 25 000 flowering plant species (Vogiatzakis et al., 2006; Médail, 2008) while half of these species are Mediterranean endemics (Quézel, 1985). Invertebrates are very diverse in the region as well, number of insect species are estimated being around 150 000 (Baletto & Casale, 1991). A checklist on spiders of West–Palearctic region was also published (Canard, 2005), which gather all information on distribution of more than 5500 known species. This checklist represents only a rough source of information on the true potential of Mediterranean spider biodiversity though, because it covers entire Mediterranean basin but also includes northern Europe and although majority of Europe is fairly well studied in terms of spiders, rest of the region have not

been explored by similar manners yet. Number of species is still continuously rising every year, by descriptions of spider species new to science in the region.

1.3.2. Sampling the Mediterranean Spider Assemblages

As a mega diverse faunal element, spiders occupy almost all available habitats in a terrestrial community, and probably differential habitat selection of species enables them to coexist in high numbers for a given time and place (Foelix, 2011; Molles, 2007). Coddington et al., 1991 have estimated that one hectare of tropical forest can support between 300 to 800 species of spiders at a time, and Cardoso et al., 2008a have estimated that one hectare of Mediterranean forest may support more than 200 species at a time. Unlike tropical precedents, temperate Mediterranean communities are subject to large scale seasonal differences in the composition, richness or abundance in spiders assemblages too, throughout the year in a particular location (Novotny & Basset, 1998; Weeks & Holtzer, 2000; Whitmore et al., 2002).

By considering these facts mentioned above, it is necessary to adopt long scale sampling protocols of at least 1 year long or even longer; and to perform a number of methods together covering most of the major micro habitats to satisfy a fully representative inventory for a given Mediterranean habitat. Long scale (of at least one year) studies with exhaustive sampling protocols on spiders are scarce in the literature however, due to usual lack of enough resources to compile such workloads (Chatzaki et al., 1998; Cardoso et al., 2007). However, cost effective sampling protocols performed throughout minimum optimized durations were practiced for substantial occasions in the literature.

Use of a set of numerous methods together intending semi-quantitative sampling in inventory studies on spiders was first proposed by Coddington et al., 1991, and such methods have been implied in numerous studies in a variety of habitats and regions of the world (Silva & Coddington 1996; Cardoso et al., 2008a, 2009; Sørensen et al., 2002; Scharff et al., 2003; Coddington et al., 2009). Cardoso et al., 2008b and Cardoso, 2009 further proposed standardization and optimization of spider inventory studies in Mediterranean type ecosystems. These studies usually involved exhaustive sampling by pitfall trapping, sweep netting, beating of tree branches, hand collecting or other similar methods by standardized manners of efforts, during short time periods, targeting the proposed richest periods for studied areas. In all of these studies, necessity of a variety of methods has been proved for spiders.

1.3.3. Spider Assemblages of the Semi-Natural Olive Groves in Turkey

Until now, there have been no such comprehensive studies aiming to reveal the complete spider fauna or the structure of a spider assemblage for a definite area or a particular habitat in Turkey. In this study, olive groves and adjacent shrub lands in Muğla province, Milas district, Kıyıkışlacık Village were sampled extensively. Main reasons for choosing such a habitat are listed below:

- olive groves are agricultural areas with economical conveniences for local people; hopefully present work will provide contributions on pest management strategies in olive groves in the future, as spiders are natural predators of potential pest insect species;

- olive groves in the study area represent semi-natural habitats, for being barely touched except for year round livestock keeping and harvesting activities of olives in Autumn. Besides, olive tree *Olea europaea* is present naturally in the native flora in the form of the wild subspecies *Olea europaea oleaster*, which is a frequently observed member of the shrub associations found in the area; and olive gardens are always closely located and adjacent with extensively large and barely touched shrub lands in the study area;

- olive groves are also interesting for representing a slightly different habitat type from shrub associations which have higher canopy densities; and thus probably enabling development of a much diverse herbaceous vegetation. With a higher variability of micro habitats, possibly olive groves result in a higher diversity of arthropods too, and also a higher diversity of spiders;

- olive groves are preferable against dense shrub lands for the ease of field studies on any kind of research representing the region, as shrub associations usually render difficulties even just for walking.

1.3.4. Purpose of this Study

No previous study on the complete spider fauna of olive groves or shrubs or any other Mediterranean habitats from Turkey could be found in the available literature; although there were papers recording spiders from the close vicinity of the study area (Dalmas, 1920; Lecigne, 2011), there were no mentions of olive gardens or shrub lands in those studies, except publications in which thesis author was involved (Elverici et al., 2012, Kunt et al., 2011a). Spider fauna of similar habitats in neighboring countries in the close vicinity have been much better studied (Bosmans et al., 2009; Chatzaki et al., 2002a, 2002b, 2003; Lazarov, 2005, 2009). As a matter of fact, spider fauna and the structure of the spider assemblages in Mediterranean semi natural olive groves and shrub

associations are unknown in Turkey. Aim of this study was to make contributions to the knowledge on spider fauna of Turkey and to describe the diversity and composition of a spider assemblage by considering complementarity on an annual basis. Complete spider fauna of a semi natural olive grove found in Aegean coastline of Turkey was studied. Intensive semi quantitative sampling was performed and a checklist is produced. Representativeness of the study is tested by species accumulation curves and estimates for actual richness are calculated. Composition and phenology are also discussed. Colour plates presenting photographs of diagnostic characters for each species are also provided in the appendix to be used in future studies on spiders in the region.

CHAPTER 2

METHODS

2.1. Study Area

Sampling area is located in close vicinity of Kıyıkışlacık Village. Olive products represent a very common and traditional source of income for local people; and the Village is encircled by huge areas solely covered by olive groves. Native flora of the region is mainly composed of two major evergreen woodland types; *Pinus brutia* forests and shrub associations. Although pine forests too represent a major habitat type in the region, they were excluded for the purpose of this study as they form a quite different habitat type compared to olive groves. Shrub associations are always adjacent to olive groves, and much more dominant than pine trees in the close vicinity of the village (Figure 4). Majority of tree species in these associations are evergreen angiosperms, while there are some *P. brutia* and a number of other gymnosperms present too in the floral composition. Most trees are lower than 5 meters in height except pine tree trunks. Wild olive trees occur in these shrub associations abundantly. Apparently, majority of olive groves were formed by clearing of shrubs while wild olives were left behind; and later by grafting each wild olive tree. Olive groves are maintained by periodical pruning, otherwise local people say that trees would revert to wild olive trees. Olive groves are also used for keeping live stock, therefore grazing pressure is always present on flora, probably varying from high to low for different groves (Figure 5).

All sampling efforts were took place between altitudes of 0 to 100 m approximately; in an area of 110.300m^{2}" of olive groves. Rocky patches were abundant and tree litter had a very thin, dry layer if it exists. Climatic variables are typical with the Aegean coast of Turkey, with most of the precipitation occurring during winter and with almost null precipitation during summer.

Olive groves in the study area clearly display a quite different habitat type than shrub associations which have higher canopy densities; but sampling was performed together with adjacent shrubs, as

Figure 4. Image shows one of the olive groves in the study area; surrounded by shrub associations at two sides. Note that the grove is characterized by lower canopy density compared to shrubs. Photo taken in August 2011, in the afternoon.

Figure 5. An olive grove in the study area. Photo taken in August 2010, in the afternoon.

shrub associations may have a role on maintaining source populations for some spider species that also occur in groves; and shrubs were always in close relation with olive gardens for being adjacent.

2.2. Sampling Methods and Periods

Overall samplings were started at 01.05.2010 and continued with different sampling intensities for different methods until 13.08.2011. Area is visited for a total of 12 times; each visit is called a sampling season. Each season was 3 days long and performed monthly except the winter period, in which no seasons have took place.

A combination of methods was used for intensive sampling of the study area. Two different major types of sampling methods were performed; 1-) Pitfall trap surveys; 2-) Collection through collector labour. Second major type includes some different techniques, namely opportunist sampling survey; sifting of tree litter; sweep netting of herbaceous plants; and beating of shrubs.

Sampling intensity was not standard for all methods from beginning till the end of the study, except for pitfall trap surveys. Special occasions for each technique are presented below under related titles.

2.2.1. Pitfall Trap Survey

Field efforts for pitfall traps were resulted in 9 sampling seasons along a one year period; starting from 29.05.2010 and continued until 15.06.2011. Most of the sampling seasons were one month long nearly; but two of the seasons continued longer; one and a half month long during October and November; and 3 months long in winter period during December, January and February. 60 traps were established exclusively in an olive groove, at the same particular places in each survey. Each trap was 5 meters apart from the nearest trap and all traps were located through a line for ease of finding. At the end of each survey, all traps are replaced with new ones. In the end a total of 480 pitfall traps were installed.

Plastic cups, 200 ml of volume; 8cm wide at the top and 8 cm deep from top to bottom were used as traps. Two thirds of each cup was filled with preservative liquid mixture containing 80 % ethylene glycol. During the rainy season, each trap was covered with a rain cover 15 cm high from the ground, composed of a 25 cm long iron bar and 18 cm diameter of cellulose plates with studs and iron scales and washers necessary for stabilization.

At the end of each survey, trap contents (including all other organisms and detritus) were taken into 70 % ethanol in plastic bags and transferred to the laboratory. Contents of each trap were treated separately during this process. Every single spider in each sample were allocated and taken into 70 % ethanol in one glass collection tube; so each tube represents one sample in the collection.

2.2.2. Collection By Means of Collector Labour

All samplings were carried out by one collector (thesis writer); while other people if present, only accompanied without any sampling effort. Each technique was performed for at least 4 hours when applied, during time based sampling occasions. In sifting, sweep-netting and beating samples, collection of individual spiders in the sample content, composed of detritus or numerous other materials unintentionally acquired was very time consuming. Thus, timeframe passed by allocating spiders within samples were excluded from 4 hours of labour for these techniques; while in opportunist sampling time spent with transferring of materials into collection tubes was included, as it was not so time consuming. All spiders were directly taken into 50 ml falcon tubes filled with 70 % ethanol in all kinds of samplings. Other details are given below for each particular sampling technique under related titles.

2.2.2.1. Opportunist Sampling

Sampling was carried out by walking through a line mostly in olive groves, but also in closely associated shrub habitats during surveys apart from standardized samplings. Different routes were chosen for each sampling in all seasons to minimize the exploiting effects of intensive collection on the spider assemblage. Samplings by this method has been carried out during all sampling seasons from 01.05.2010 till 13.08.2011 but; efforts were standardized and time based between August 2010 and June 2011, throughout 8 sampling seasons. 12 hours of active searching of sampling effort were carried out in standardized sampling, exclusively in olive groves. 4 hours of efforts were carried out during day and the remaining 8 hours of effort were carried out during night time, but day and night samples did not identified as different groups and evaluated all together in this study.

All spiders in sight found on the ground, under stones, on their webs or burrows or during activity on any substance, on rocks, on olive tree trunks, on shrub branches or on herbaceous plants, or in special micro-habitats on the sampling line such as shores of fresh or brackish water habitats in the olive groves, were collected during this type of sampling; by hand or by the help of forceps and hand aspirators. Samples collected from different habitats during each sampling (e.g. spiders active on the ground and spiders collected from webs on shrubs) were taken into different tubes, which were treated as sub-samples in the collection. A total of 208 sub-samples were gathered, from 12

sampling seasons of which 8 of them were time based, and a total of almost 130 hours of sampling efforts were performed solely by using this technique.

2.2.2.2. Sifting Samples

Tree litter had a very thin layer in olive groves, which was useless for sampling by sifting; but some other tree species in the shrub associations accumulated enough leaves under their canopies, suitable for sifting. Litter was sifted with a 30 cm diameter sifter, with a mesh size of 6 x 6 mm; later sieved material was examined on a white sheet for ease of revealing all spiders. 4 hours of effort in each sampling season were performed only in May, June and August 2011 with a sum of 12 hours of sampling effort in total.

2.2.2.3. Sweep-net Sampling of Herbaceous Plants

Herbaceous vegetation was sparse in the studied olive groves, probably due to extensive grazing by the livestock, especially in summer and autumn periods. Still, sampling was carried out by walking through a line exclusively in olive groves and by sweeping herbaceous plants using a sweep net with a diameter of 35 cm and equipped with one meter handle. Different routes were chosen for each sampling in every visit to minimize the exploiting effects of intensive collection. Sweep-net content was examined on a white sheet for ease of revealing all spiders. 4 hours of effort in each sampling season was performed in November 2010 and March, April, May and August 2011 with a sum of 20 hours of sampling effort in total.

2.2.2.4. Beating Sampling of Shrubs

Branches of shrubs neighbouring olive groves were sampled by beating with a one meter long club and an umbrella with a diameter of 1 m. Underside of the umbrella is used for catching fallen spiders; later content was examined on a white sheet for ease of revealing all spiders. 4 hours of beating efforts were carried out in all seasons during August, September and October 2010; and March, April, May and June 2011. Beating samples were also collected in August 2011 too, but those samplings were not time based. A total of almost 30 hours of sampling efforts was performed. Olive tree branches did not sampled by beating, to avoid causing any damage on flowers or fruits.

2.3. Sorting and Identification of Specimens

2.3.1. Sorting

All collection samples were directly taken into 50 ml falcon tubes filled with 70 % ethanol; and all pitfall trap contents (including all insects, other organisms and detritus) were taken into 70 % ethanol in plastic bags in the field; and transferred to the laboratory. Glass collection tubes of different sizes sealed with 1st quality rubber caps were used for permanent storage of the specimens. 70 % ethanol was again used for this purpose. If collection tube's turbidity increases, old solution was replaced by freshly prepared ethanol. All specimens are deposited in the personal collection of Mert Elverici.

Only adult specimens were considered and identified up to species level. The main reason was that juveniles cannot usually be identified up to species or genus level, even sometimes up to family level either; or it was very time consuming to do so. Still, sub adult individuals were kept for future analysis; while for the purpose of this study, they were only recorded as "number of sub adults" for the evaluations.

2.3.2. Identification

Intensive laboratory effort was performed for identification of each adult specimen in the collection. Species were examined under a Leica S8AP0 stereomicroscope by the help of fine tip forceps in petri dishes filled with 70 % ethanol and including some quartz sand used for easy positioning. Digital images were taken by a Leica DFC280 digital camera equipped on the stereomicroscope. 2-10 photographs were taken in different focal planes and combined using "Combine ZP-image stacking software" to get clearer copies of images. Arrangement of the images was performed under Photoshop CS3 software, and later plates were prepared by using Corel-DRAW X3 software.

Species identifications were mainly based on the morphology of copulation organs in both sexes. In males, left pedipalps were cut off from femur segment and examined and photographed solely. In females, female external genitalia was examined by ventral positioning of specimens; but usually this was not enough and in addition, vulvae were dissected by using super fine dissection needles or tips of insulin injectors, with respect to the size of specimens. Dissected vulvae were cleared in 10 % KOH solution for several hours before examination, then examined and photographed solely. Morphology of some other body parts were also used for identifications (cheliceral teeth formation in genus *Enoplognatha*; abdomen shape in subfamily Argyrodinae; leg spination in many families).

Identifications were based on the related literature. For family level identifications, Jocqué, 2006; Le Peru, 2011 and Almquist, 2005, 2006 were often used. For specific level identifications, in addition to these publications many other publications by many authors were also used. Online sources Platnick, 2012 on spiders of the world and Nentwig et al., 2012 on European spiders were very resourceful for allocation of the necessary literature.

In some cases, species level identifications were not possible with the available literature or time. Colleague opinions were taken as a second effort for identifications. Specimens that could not be identified up to specific level by the end of the thesis writing were treated as morpho species and names were designated by attribution to the lowest taxonomic category that specimens could be identified, which was usually the generic level but sometimes family level.

2.4. Representativeness of Field Surveys and Richness Estimates

Species accumulation curves were created using EstimateS Software (Colwell, 2005) to estimate the effectiveness of sampling efforts aiming to present a comprehensive representation of the spider assemblage in the study area. Such randomized accumulation curves on observed species richness have been abundantly applied in many inventory studies for the assessment of adequacy of sampling efforts for specific areas (Gotelli & Colwell, 2001; Chiarucci et al., 2008; Cardoso et al., 2008a; 2009; Schröder et al., 2011). In these curves, the number of species observed are plotted as a function of sampling efforts (or the number of individuals collected); and when curve reaches an asymptote, the inventory can be assumed as reliable.

Randomized accumulation curves of observed species richness were calculated in terms of both sample based and individual based rarefaction curves for comparison, which are called Mao Tau: representing the observed richness; and Coleman curves: which are the expected accumulation curves of randomly distributed data (Colwell & Coddington, 1994). From the estimators, curves for Chao 1 and Jackknife 2 estimators were drawn and evaluated, as these two estimators usually gave the most distinct results in all analysis.

Additionally, singletons (species represented by one specimen) and doubletons (species represented by two species) were calculated too as indicators of representativeness, together with six of the most widely used non-parametric richness estimators namely Chao 1, Chao 2, Jackknife I, Jackknife II, ACE and ICE and an asymptotic mathematical function namely the Michaelis-Menten (MMMeans estimates are used instead of erratic MMRuns estimates, as presented in EstimateS).

One thousand randomizations were used for each run on EstimateS, without replacement; while default settings were used for other options.

Some other indicators were also calculated. Inventory completeness (given as completeness value in the tables), calculated as observed species richness divided by estimated richness, was calculated using the Chao 1 richness estimate, as also used so and proposed as the giving the most reliable estimations in other studies (Sørensen et al., 2002; Scharff et al., 2003; Cardoso et al., 2008b). Sampling intensity, calculated as the ratio of specimens to species, was calculated as a measure of sampling effort (Coddington et al., 1996).

All calculations in EstimateS were performed for several times with several different data sets. Pitfall trap data, opportunistic sampling data, beating data were analysed separately to visualize representativeness of each technique solely. Results of sifting and sweep-netting methods did not analysed due to low sample sizes. Complete dataset covering all data gathered from all techniques as a whole was analysed as another effort to visualize representativeness of field studies. Samples or subsamples within each survey season were pooled together and regarded as a single sample in the analysis for the total of sampling techniques for ease of managing data.

2.5. Evaluation of the Distribution Pattern

General patterns of distributions for identified species in the study area are also briefly discussed. Distribution data were extracted from two major references: from world spider catalogue (Platnick, 2012) and from a checklist on spiders of west Palearctic region (Canard, 2005). Individual papers on particular species were also used for updating information on distributions.

Taglianti et al., 1999's classification of the biogeographic sub-regions was followed by its major outlines. A number of authors have already discussed biogeographic patterns of European spiders by using chorotypes described in Taglianti et al., 1999 (Chatzaki, 2008; Deltshev, C. 2005; Schröder et al., 2011); although classification was originally conducted by considering chorology of some organisms other than spiders (Chilopoda, Coleoptera, Amphibia and Reptilia). For the species discovered in this study, it was not quite possible to gather detailed and still reliable information on distributions, to make such detailed categorisations. So some particular generalisations were necessary. For this purpose, Canard, 2005's similar but simpler classification was adopted for categorisation of major western Palearctic sub-regions. Available distribution data for species collected in this study were also considered and the following eleven chorological sub-regions were evaluated:

1. Mediterranean Europe: (M.E.) Covers Aegean Islands and mainly the Mediterranean coast of Europe including Greece, Italy, Portugal, Spain and other countries.
2. Mediterranean Middle East: (M.M.E.) Covers Turkey at the north and reaches Israel at the southernmost border and lies along the Mediterranean coast.
3. North Africa: (N.A.) Mainly covers the Mediterranean coast of North Africa, from Egypt at the east, to Morocco at the westernmost point.
4. Atlantic Europe: (A.E.) Mainly lies along the Atlantic coast of Europe, excluding Iberian Peninsula which was proposed as a part of European Mediterranean sub-region.
5. Central Europe: (C.E.) Mainly covers the central cities in Europe, from Germany at the westernmost to Ukraine at the easternmost border.
6. Northern Far East Europe: (N.E.) Covers the remaining northern lands in Europe of Norway, Sweden, Finland and Russia.
7. Cosmopolitan Species: (C.) Also noted as a separate group.
8. Holarctic Species: (H.) Includes species widely distributed across northern hemisphere.
9. Species recorded all across the Palearctic and also from Southern regions were noted as "Old World Species" (O.) and evaluated as a separate group.
10. Although represents a sub-unit for Holarctic distribution pattern; or a super-unit covering west Palearctic and its sub-regions, "Palearctic Species" (P.) were also recognized as another group, representing widespread species particularly across the Palearctic region and not yet recorded elsewhere.
11. Asia: (A.) Species with widespread distribution in Asia were noted under this title.

After the evaluation of the gathered distribution data for all species and by also considering eleven chorological sub-regions presented above, species were placed under 6 major categories as presented below:

A. **A.W.P. :** Species widespread in west Palearctic, recorded all across M.E., M.M.E., N.A., A.E., C.E. and N.E.; with their known distributions mostly limited in the region.
B. **Med. & Eur. :** Mediterranean species with distributions extended through Europe, with records covering most of the: M.E., M.M.E., N.A. and A.E. or C.E.; excluding N.E..
C. **Med. :** Indigenous species of Mediterranean region. Composed of species known in the basin with distributions usually covering most of the M.E., M.M.E. and N.A.
D. **E. Med. :** Species distributed in the eastern Mediterranean, mainly in M.M.E. and occasionally toward N.A. or A.
E. **Eur. :** European species exclusively known in the M.E., A.E., C.E. or N.E..
F. **Wide. :** Species with wide distribution ranges in the world, with C., H., O. or P. distributions.

CHAPTER 3

RESULTS

3.1. Species Collected

A total of 9967 spiders were collected in the end of all field surveys. 3034 specimens were adults; from these 220 species obtained including undetermined ones, belonging to 147 genera and 38 families. Among determined taxa, 39 species are new records for Turkey. See Tables 1 and 2 for lists of species reported with this study. 28 species could not be determined up to species level and still under determination. Of these, 17 species were identified up to generic level and 11 species were identified up to family level. See the checklist Chapter 6 for further details on species.

Among the 38 families determined, Gnaphosidae was the most species rich family and represented with 31 species; followed by Salticidae (30 species) and Theridiidae (29 species). Other species rich families were Linyphiidae (23 species); Araneidae (14 species); Thomisidae (13 species); Lycosidae (11 species); Dictynidae (8 species); Philodromidae (7 species) and Dysderidae (5 species) respectively; while most of the remaining families were represented by one or two species in the collection. Suborder Mygalomorphae was represented by only 3 species: *Cyrtocarenum cunicularium*; *Brachythele varrialei* and *Nemesia* sp. in the collection. All of the remaining taxa were belong to Araneomorphae with 18 species from Haplogynae (Filistatidae, Sicariidae, Scytodidae, Pholcidae, Segestriidae, Dysderidae, Oonopidae, Palpimanidae) and 199 species from Entelegynae. Most commonly sampled species in the olive groves were *Maimuna vestita*, *Neoscona subfusca*, *Filistata sp.*, *Synaphosus trichopus*, *Trachyzelotes barbatus*, *Zelotes solstitialis*, *Alioranus pastoralis*, *Alopecosa albofasciata*, *Hogna sp., Lycosa praegrandis*, *Oecobius maculatus*, *Palpimanus uncatus*, *Thanatus atratus*, *Holocnemus pluchei*, *Scytodes thoracica*, *Loxosceles rufescens*, *Enoplognatha macrochelis*, *Simitidion agaricographum*, *Theridion melanurum*, *Xysticus sp.*, *Zodarion kossamos* and *Zodarion thoni*.

Table 1. List of determined taxa, previously known from Turkey (undetermined species and new records excluded). Family names are given in uppercase:

CTENIZIDAE: *Cyrtocarenum cunicularium*. NEMESIIDAE: *Brachythele varrialei*. FILISTATIDAE: *Filistata insidiatrix, Pritha nana*. SICARIIDAE: *Loxosceles rufescens*. SCYTODIDAE: *Scytodes thoracica, Scytodes velutina*. PHOLCIDAE: *Holocnemus pluchei*, *Spermophora senoculata*. SEGESTRIIDAE: *Segestria senoculata*. DYSDERIDAE: *Dysdera rubus*, *Harpactea kencei*, *Harpactea cf. sturanyi*. PALPIMANIDAE: *Palpimanus uncatus*. MIMETIDAE: *Mimetus laevigatus*. ERESIDAE: *Eresus walckenaeri*. OECOBIIDAE: *Oecobius maculatus*, *Oecobius rhodiensis*. ULOBORIDAE: *Uloborus plumipes*, *Uloborus walckenaerius*. THERIDIIDAE: *Anatolidion gentile*, *Argyrodes argyrodes*, *Crustulina scabripes*, *Enoplognatha afrodite*, *Enoplognatha gemina*, *Enoplognatha giladensis*, *Enoplognatha macrochelis*, *Enoplognatha thoracica*, *Episinus truncates*, *Euryopis episinoides*, *Kochiura aulica*, *Latrodectus geometricus*, *Neospintharus syriacus*, *Neottiura herbigrada*, *Steatoda paykulliana*, *Steatoda triangulosa*, *Theridion adrianopoli*, *Theridion melanurum*, *Theridion mystaceum*. LINYPHIIDAE: *Alioranus pastoralis*, *Araeoncus humilis*, *Erigone dentipalpis*, *Erigonoplus spinifemuralis*, *Meioneta rurestris*, *Microlinyphia pusilla*, *Ostearius melanopygius*, *Palliduphantes byzantinus*, *Prinerigone vagans*, *Sintula retroversus*, *Tenuiphantes tenuis*. ARANEIDAE: *Agalenatea redii, Araneus circe*, *Araniella cucurbitina*, *Argiope lobata*, *Cyclosa conica*, *Gibbaranea bituberculata*, *Hypsosinga sanguinea*, *Larinioides suspicax*, *Mangora acalypha*, *Neoscona adianta*, *Neoscona subfusca*, *Parazygiella montana*. LYCOSIDAE: *Alopecosa albofasciata*, *Arctosa leopardus*, *Arctosa variana*, *Geolycosa vultuosa*, *Hogna radiata*, *Lycosa praegrandis*, *Pardosa roscai*, *Pirata piraticus*. OXYOPIDAE: *Oxyopes globifer*, *Oxyopes lineatus*. ZOROPSIDAE: *Zoropsis lutea*. AGELENIDAE: *Agelena orientalis*, *Maimuna vestita*. CYBAEIDAE: *Argyroneta aquatica*. DICTYNIDAE: *Dictyna civica*. *Marilynia bicolor*, *Nigma puella*, *Scotolathys simplex*. AMAUROBIIDAE: *Amaurobius erberi*. MITURGIDAE: *Cheiracanthium mildei*. ANYPHAENIDAE: *Anyphaena sabina*. LIOCRANIDAE: *Mesiotelus tenuissimus*. ZODARIIDAE: *Palaestina expolita*, *Zodarion kossamos*, *Zodarion thoni*. PRODIDOMIDAE: *Prodidomus amaranthinus*. GNAPHOSIDAE: *Anagraphis pallens*, *Berinda ensigera*, *Callilepis cretica*, *Cryptodrassus creticus*, *Drassodes lutescens*, *Drassyllus jubatopalpis*, *Drassyllus praeficus*, *Haplodrassus morosus*, *Haplodrassus signifier*, *Leptodrassus albidus*, *Nomisia aussereri*, *Nomisia exornata*, *Nomisia palaestina*, *Nomisia ripariensis*, *Pterotricha lentiginosa*, *Scotophaeus blackwalli*, *Scotophaeus scutulatus*, *Trachyzelotes barbatus*, *Zelotes* cf. *apricorum*, *Zelotes* cf. *longipes*, *Zelotes solstitialis*, *Zelotes tenuis*. SELENOPIDAE: *Selenops radiatus*. SPARASSIDAE: *Eusparassus walckenaeri*, *Micrommata ligurina*. PHILODROMIDAE: *Philodromus bistigma*, *Philodromus cespitum*, *Philodromus pulchellus*, *Philodromus rufus*, *Thanatus atratus*, *Thanatus imbecillus*. THOMISIDAE: *Heriaeus simoni*, *Runcinia grammica*, *Synema globosum*, *Synema plorator*, *Thomisus onustus*, *Tmarus piochardi*, *Xysticus caperatus*, *Xysticus cor*, *Xysticus cribratus*, *Xysticus thessalicus*, *Xysticus tristrami*. SALTICIDAE: *Aelurillus v-insignitus*, *Chalcoscirtus infimus*, *Cyrba algerina*, *Euophrys rufibarbis*, *Evarcha jucunda*, *Habrocestum papilionaceum*, *Heliophanus equester*, *Heliophanus kochii*, *Heliophanus tribulosus, Heliophanus melinus*, *Leptorchestes berolinensis*, *Menemerus semilimbatus*, *Mogrus neglectus*, *Pellenes diagonalis*, *Pellenes flavipalpis*, *Philaeus chrysops*, *Phlegra lineata*, *Plexippoides gestroi*, *Pseudeuophrys obsoleta*, *Pseudicius picaceus, Salticus noordami*, *Synageles dalmaticus*, *Thyene imperialis*.

Table 2. List of taxa recorded for the first time in Turkey. Family names are given in uppercase:

OONOPIDAE: *Opopaea* cf. *punctata.* MIMETIDAE: *Ero flammeola.* THERIDIIDAE: *Enoplognatha diversa, Lasaeola convexa, Platnickina nigropunctata, Simitidion agaricographum, Simitidion lacuna, Steatoda maura, Theridion cyprusense, Theridion genistae.* LINYPHIIDAE: *Canariphantes zonatus, Mecopisthes nasutus, Megalepthyphantes nebulosus, Pelecopsis laptevi, Styloctetor romanus.* ARANEIDAE: *Cyrtophora citricola, Zygiella atrica.* LYCOSIDAE: *Pardosa luctinosa, Pardosa vlijmi.* PISAURIDAE: *Pisaura orientalis.* AGELENIDAE: *Tegenaria paragamiani.* DICTYNIDAE: *Argenna subnigra, Lathys humilis, Lathys stigmatisata, Nigma flavescens.* LIOCRANIDAE: *Agroeca parva, Mesiotelus scopensis.* CLUBIONIDAE: *Clubiona genevensis*. GNAPHOSIDAE: *Leptopilos hadjissaranti, Leptopilos levantinus, Poecilochroa furcata, Synaphosus trichopus, Zelotes* cf. *mundus, Zelotes* cf. *scrutatus, Zelotes zin.* THOMISIDAE: *Xysticus tenebrosus.* SALTICIDAE: *Menemerus taeniatus, Salticus propinquus, Sibianor aurocinctus.* Additional 3 genera are also new records for Turkey, among species under determination: NEMESIIDAE: *Nemesia* sp.; OONOPIDAE: *Orchestina* sp.; THERIDIIDAE: *Rhomphaea* sp..

3.2. Evaluation of Representativeness and Richness Estimates

3.2.1. Overall Sampling

Samples from all methods were gathered in 13 samples for the analysis of the total data set (samples from 12 visits + pitfall trap samples). See Table 3 for summarized descriptive information on overall sampling. The sampling intensity was calculated as 14 individuals per species approximately; and this was the highest intensity value calculated in this study (see Table 4). The estimated spider species richness was ranged from around 250 to 300 by different estimators. Completeness value was calculated as 90 %.

Table 3. Descriptive data summarized for overall sampling.

	All Samples
Samples	13
Adults %	30%
Individuals (adults)	3034
Species	220
New Species for Turkey	39
Genera	147
Families	38
Sampling Intensity	13.79
Singletons	41 (18%)
Doubletons	31 (14%)
Chao 1 ± SD	244.62 ± 10.54
Chao 2 ± SD	266.07 ± 14.98
Jackknife 1 ± SD	282.69 ± 17.15
Jackknife 2	306.17
ACE	247.04
ICE	273.86
Michaelis-Menten	307.26
Completeness	90%

Randomized accumulation curves were close for reaching asymptotes; indicating that field survey was quite successful to cover most of the micro habitats and most of the species (see Figure 6). The singleton and doubleton curves were approaching, which may indicate a fine inclusion of rare species; together with a slightly lower percentage of singletons by 18 %. Coleman curve, which is the expected species accumulation curve of randomly distributed data, showed a similar behavior with Mao-Tau curve, which may indicate that species in the sample are more or less randomly distributed among the samples. Both curves rise slowly, which indicates a high number of rare species in the inventory, which really is the situation as around 50 % of species were represented by 5 or lower than 5 individuals. Chao 1 estimated the lowest richness with the lowest SD and ACE estimated a very close richness. SD was high for all of the estimators. Michaelis-Menten estimated the highest richness values.

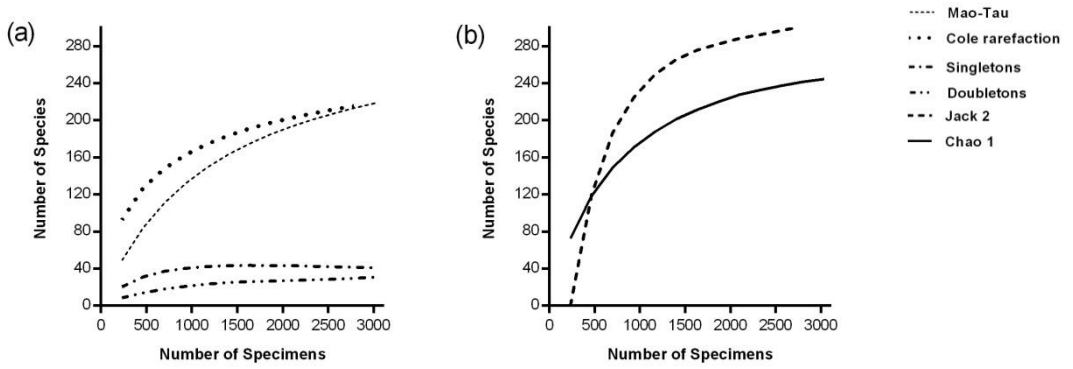

Figure 6. Randomized accumulation curves for overall samples (a) observed species richness, singletons, doubletons and (b) two of the non-parametric estimators namely Chao 1 and Jack 2, which usually give the most distinct results.

Table 4. Descriptive data summarized for different sampling methods.

	Pitfall Traps	Opportunist	Beating	Sweep Netting	Sifting
Samples	9	8	8	4	3
Adults %	40%	49%	18%	15%	7%
Individuals (adults)	1392	907	324	111	25
Species	106	138	45	37	15
Unique species per method	28	48	12	7	0
Genera	71	110	39	36	14
Families	26	29	15	13	9
Sampling Intensity	13.13	6.57	7.2	3	1.6
Singletons (%)	38 (36%)	41(30%)	11(24%)	---	---
Doubletons (%)	14 (13%)	26 (19%)	6(13%)	---	---
Chao 1 ± SD	156.57 ± 22.83	168.37 ± 12.47	52.85 ± 6.33	---	---
Chao 2 ± SD	183.02 ± 29.59	200.15 ± 19.9	51.56 ± 4.53	---	---
Jackknife 1 ± SD	152.11 ± 11.34	199.25 ± 15.75	59 ± 6.48	---	---
Jackknife 2	181.08	230.53	61.35	---	---
ACE	154.76	171.14	52.27	---	---
ICE	187.62	232	55.77	---	---
Michaelis-Menten	158.97	246.17	76.94	---	---
Completeness	68%	82%	85%	---	---

3.2.2. Pitfall Trap Sampling

480 established traps were end up with a total number of 375 samples (each sample representing a trap) while remaining traps were lost, with a rate of 69 % trap survival. 22440 trap days were aimed but 15492 trap days were concluded in the end of surveys. Lost traps (lost samples) were probably caused by three main reasons: 1- removing of traps by local people; or 2- by domestic or wild animals; and 3 - losses caused by weather conditions (heavy rains) or soil movements.

A total of 3469 individual spiders were acquired from pitfall traps, of which 1392 were adults. From these, 106 species including undetermined species from 71 genera and 26 families were identified. 28 species were unique to trap surveys. See Table 4 for further calculations. All spiders acquired in each trap survey season were regarded as one sample for the analysis; so a total of 9 samples

were analyzed. See Table 4 for summarized descriptive information on pitfall trap sampling. The sampling intensity was calculated as 13 individuals per species approximately, as the highest value compared to other methods in this study; however percentage of singletons was the highest with 36 %. The estimated spider species richness is ranged from around 150 to 180 with very high amounts of SD. Completeness value was calculated as 68 %.

None of the randomized accumulation curves reached an asymptote, with curves still increasing by higher slopes compared to curves of other methods (see Figure 7). The singleton and doubleton curves were diverging in the end, with a high number of singletons (36 %). Coleman and Mao-Tau curves rise slowly, indicating a high number of rare species in the inventory, which really was the situation as around 65 % of species were represented by 5 or lower than 5 individuals. Abundance based estimators estimated similar and lower richness values around 150 species except for Jackknife 2, which estimated a richness value of 181. Similar to the Jackknife 2, incidence based estimators calculated higher richness values around 180. Jackknife 1 gave the lowest SD. Michaelis-Menten estimated a lower richness value as 158.

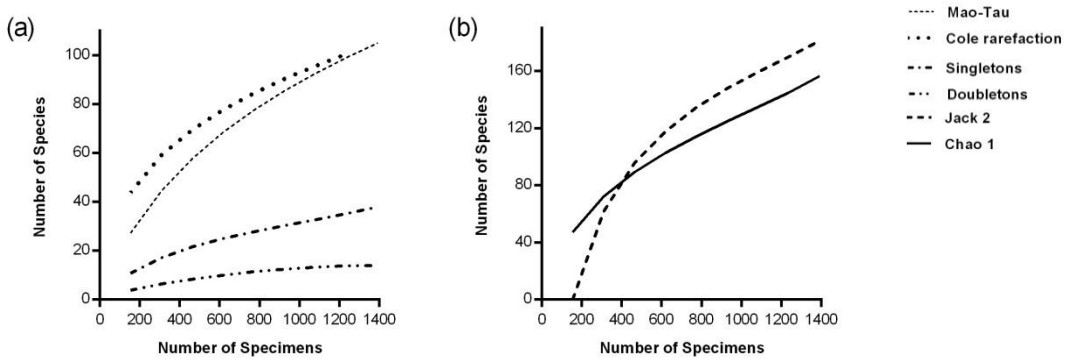

Figure 7. Randomized accumulation curves for pitfall samples (a) observed species richness, singletons, doubletons and (b) two of the non-parametric estimators namely Chao 1 and Jack 2.

3.2.3. Opportunist Sampling

Only the data from standardized samples are evaluated here, which were collected between August 2010 and June 2011 sampling seasons. All spiders collected in each survey season were regarded as one sample, so totally 8 samples were analyzed. A total of 1843 spiders were included in the samples, of which 907 were adults. From these, 138 species including undetermined species from 110 genera and 29 families were identified. 48 species were unique to opportunist sampling surveys, which is the highest value of number of unique species compared to other methods. See Table 4 for summary of further descriptive information. The sampling intensity was very low;

approximately 7 individuals per species. The estimated richness is ranged from around 170 to 240 by different estimators. Completeness value, calculated as 82 %.

Again, none of the randomized accumulation curves reached an asymptote but they were close to. The singleton and doubleton curves were increasing and almost parallel in the end, while percentage of singletons was high with 30 %. Coleman and Mao-Tau curves rise slowly, which indicates a high number of rare species in the inventory, as also around 71 % of species were represented by 5 or lower than 5 individuals. Range of estimated richness values was very high, around 70 as SD values were also high, while Chao 1 gave the lowest estimate with around 168 with lowest SD values. Jackkinfe 2 and Michaelis-Menten gave the highest estimations.

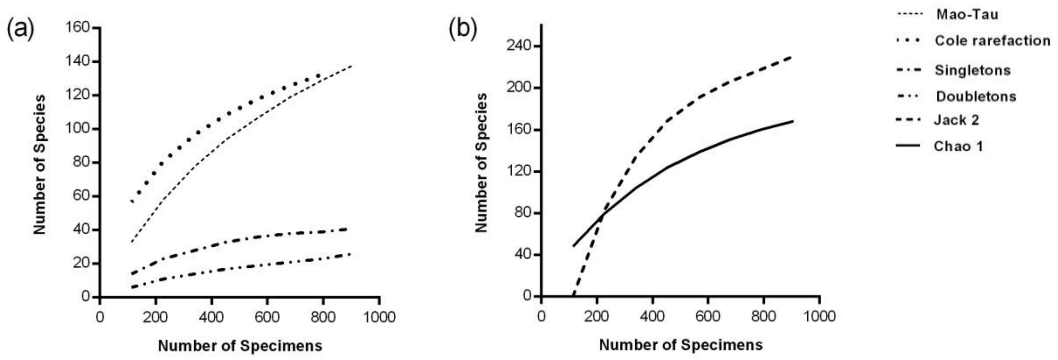

Figure 8. Randomized accumulation curves for opportunistic samples (a) observed species richness, singletons, doubletons and (b) two of the non-parametric estimators namely Chao 1 and Jack 2.

3.2.4. Beating Sampling

All collected samples were analyzed. All spiders collected in each survey season were regarded as one sample, so totally 8 samples were analyzed. A total of 2073 spiders were collected, of which 324 were adults. From these, 45 species from 39 genera and 15 families were identified. 12 species were unique to beating samples of shrubs. See Table 4 for summary of further descriptive information. The sampling intensity was respectively low with approximately 7 individuals per species. Percentage of singletons was 24 %. The estimated richness is ranged from around 50 to 60 approximately by most of the estimators. Completeness value, calculated as 85 %. Randomized accumulation curves of observed richness were close to asymptotes, while estimator curves Chao 1 and Jackknife 2 have reached their asymptotes. The singleton and doubleton curves were decreasing but parallel in the end. Coleman and Mao-Tau curves rise slowly, which indicates a high number of rare species in the inventory, as also around 30 % of species were represented by 5 or lower than 5 individuals. Although all non-parametric estimators gave similar estimates around

50 and 60 with relatively low SD values, Michaelis-Menten estimator resulted by a very high estimate around 77.

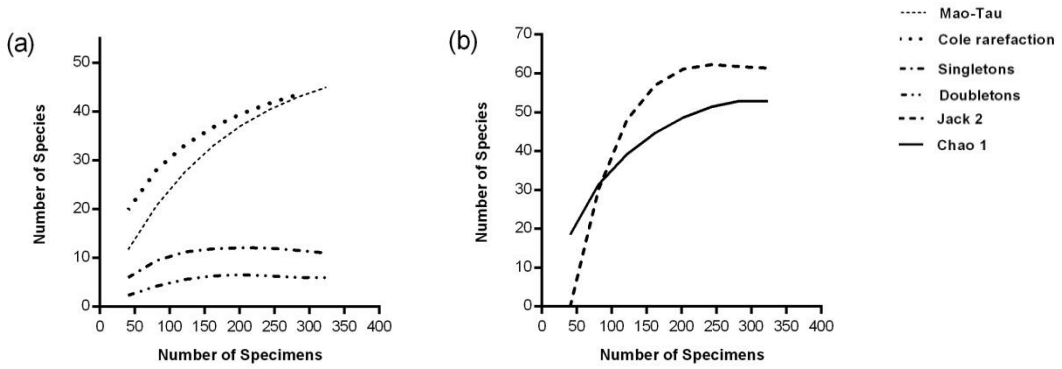

Figure 9. Randomized accumulation curves for beating samples (a) observed species richness, singletons, doubletons and (b) two of the non-parametric estimators namely Chao 1 and Jack 2.

3.2.5. Sweep Netting and Sifting

A total of 760 spiders were collected by sweep netting, of which 111 were adults. From these, 37 species from 36 genera and 13 families were identified. 7 species were unique to sweep netting samples. Sifting samples were resulted in 357 spiders, of which 25 were adults. 15 species belonging to 14 genera and 9 families were identified from these specimens. There was no unique species for this sampling method. Sampling intensity was very low for both methods. See Table 4 for calculations on both methods. Data were not analyzed for these two methods by considering the low sample sizes and therefore obvious inadequacy of representativeness on habitats sampled.

3.3. Composition and Phenology of the Spider Assemblage

Results of pitfall trap sampling, opportunist collecting and beating of shrubs methods were evaluated here, as these were the most exhaustively performed methods; while beating and sweep netting methods were concluded with small sample sizes and low number of specimens in the collection. Each particular method was evaluated separately; as each one proposed for sampling different types of habitats by different scales; and possibly each method was prone to different types of biases, making it difficult to confirm overall evaluations on the total data set. Results of pitfall trap sampling was further evaluated by considering phenology, as this method has proven to be used in the measurement of active density (Uetz & Unzikeri, 1976) and thus enabling observation of phenology; and also for providing better measures of communities as sampling procedure is less prone to biases that might be caused by differential abilities of researchers or collectors (Chatzaki et al., 1998).

3.3.1.Pitfall Trap Sampling

Among the 26 families and 106 species sampled by pitfall traps (see Table 5), Gnaphosidae was the most species rich family and represented with 25 species; followed by Linyphiidae (15 species); Salticidae (12 species); Theridiidae (8 species); Thomisidae, Lycosidae and Dysderidae (5 species each). 11 families were represented with single species. See Figure 10 for the annual richness of families included in the pitfall samples.

Table 5. List of taxa sampled by pitfall traps. Family names are given in uppercase:

CTENIZIDAE: *Cyrtocarenum cunicularium*; NEMESIIDAE: *Brachythele varrialei*, *Nemesia* sp.; FILISTATIDAE: *Filistata insidiatrix*, *Filistata* sp., *Pritha nana*; SICARIIDAE: *Loxosceles rufescens*; SCYTODIDAE: *Scytodes thoracica*, *Scytodes velutina*; PHOLCIDAE: *Spermophora senoculata*; DYSDERIDAE: *Dysdera rubus*, *Dysdera* sp. I, *Dysdera* sp. II, *Harpactea kencei*, *Harpactea cf. sturanyi*; OONOPIDAE: *Opopaea* cf. *punctata*; PALPIMANIDAE: *Palpimanus uncatus*; MIMETIDAE: *Ero flammeola*; ERESIDAE: *Eresus walckenaeri*; OECOBIIDAE: *Oecobius maculatus*, *Oecobius rhodiensis*; THERIDIIDAE: *Crustulina scabripes*, *Enoplognatha afrodite*, *Enoplognatha gemina*, *Enoplognatha macrochelis*, *Episinus truncates*, *Steatoda paykulliana*, *Theridion adrianopoli*, *Theridion cyprusense*; LINYPHIIDAE: *Alioranus pastoralis*, *Araeoncus humilis*, *Canariphantes zonatus*, *Erigonoplus spinifemuralis*, *Mecopisthes nasutus*, *Palliduphantes byzantinus*, *Pelecopsis laptevi*, *Prinerigone vagans*, *Styloctetor romanus*, *Tenuiphantes tenuis*; LYCOSIDAE: *Alopecosa albofasciata*, *Hogna radiate*, *Hogna* sp. , *Lycosa praegrandis*, *Pardosa roscai*; AGELENIDAE: *Agelena orientalis*, *Maimuna vestita*; DICTYNIDAE: *Argenna subnigra*, *Scotolathys simplex*; AMAUROBIIDAE: *Amaurobius erberi*; MITURGIDAE: *Cheiracanthium mildei*; LIOCRANIDAE: *Agroeca parva*, *Mesiotelus scopensis*, *Mesiotelus tenuissimus*; ZODARIIDAE: *Palaestina expolita*, *Zodarion kossamos*, *Zodarion thoni*; PRODIDOMIDAE: *Prodidomus amaranthinus*; GNAPHOSIDAE: *Anagraphis pallens*, *Berinda ensigera*, *Callilepis cretica*, *Cryptodrassus creticus*, *Drassodes lutescens*, *Drassyllus jubatopalpis*, *Haplodrassus morosus*, *Haplodrassus signifier*, *Leptopilos hadjissaranti*, *Leptopilos levantinus*, *Nomisia aussereri*, *Nomisia exornata*, *Nomisia palaestina*, *Nomisia ripariensis*, *Pterotricha lentiginosa*, *Synaphosus trichopus*, *Trachyzelotes barbatus*, *Zelotes* cf. *apricorum*, *Zelotes* cf. *longipes*, *Zelotes* cf. *mundus*, *Zelotes* cf. *scrutatus*, *Zelotes solstitialis*, *Zelotes tenuis*, *Zelotes zin*; PHILODROMIDAE: *Thanatus atratus*, *Thanatus imbecillus*; THOMISIDAE: *Xysticus caperatus*, *Xysticus cribratus*, *Xysticus thessalicus*, *Xysticus tristrami*, *Xysticus* sp.; SALTICIDAE: *Aelurillus v-insignitus*, *Chalcoscirtus infimus*, *Euophrys rufibarbis*, *Evarcha jucunda*, *Habrocestum papilionaceum*, *Leptorchestes berolinensis*, *Phlegra lineata*, *Plexippoides gestroi*, *Pseudicius picaceus*, *Salticus propinquus*, *Synageles dalmaticus*.

Abundances of spider families draw a relatively different scene though; as Zodariidae was the most dominant with over a 25 % representation; followed by Gnaphosidae (19 %); Linyphiidae (9 %), Scytodidae (9 %), Thomisidae (8 %) and Sicariidae (5 %); while other families were only represented with less than 5 % of abundance in the pitfall trap samples (see Figure 11). Composition of the assemblage showed notable variability between monthly samples. Numbers of specimens were lowest in winter and March, probably due to decreases in the activity of most surface active species. However these two periods have also witnessed highest proportions of adults within the samples, indicating surface activity of adults of winter active species. Summer samples indicated a higher amount of surface activity by numerous specimens caught; however most of them were juveniles;

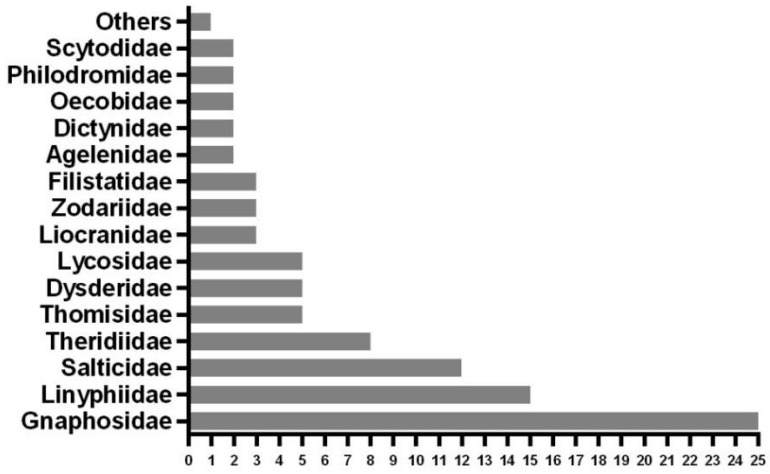

Figure 10. Annual richness of different spider families acquired from pitfall traps. 11 families were represented with single species; while Gnaphosidae, Linyphiidae, Salticidae and Theridiidae were the richest families.

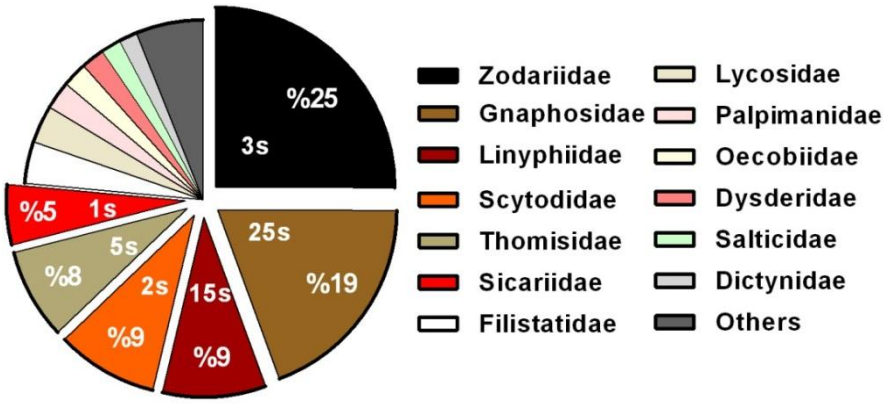

Figure 11. Annual abundances of the most common spider families acquired from pitfall traps. Percent representation and numbers of species for dominant families are also noted on the graph.

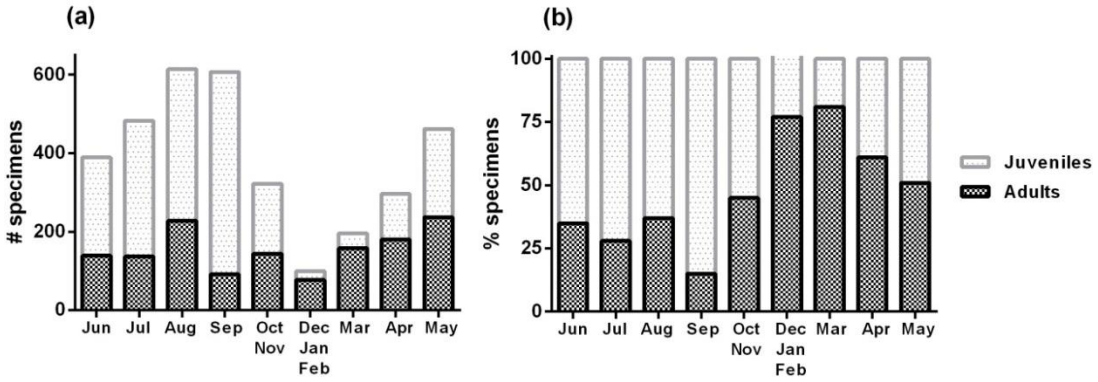

Figure 12. Monthly representation of adults and juveniles in pitfall trap samples. (a) showing the variability in terms of amounts; (b) indicates the percent proportions.

as this was also the case for autumn samples. Spring samples were richer by adult specimens, but proportion of juveniles increased towards summer. See Figure 12 for graphs on monthly representation of adults and juveniles in pitfall trap samples.

Observed richness also witnessed variations between monthly samples (see Figure 13). Late spring was the richest period with 43 % of 106 species sampled. Percent richness decreased from early summer till autumn samples and was the lowest in October-November sample. In the following period, richness increased until the late spring-early summer period. With a rough generalization, highest number of species was recorded in spring by 72 species, while summer richness was the second highest by 44 species. There were only 26 species in autumn samples and 22 species in winter samples.

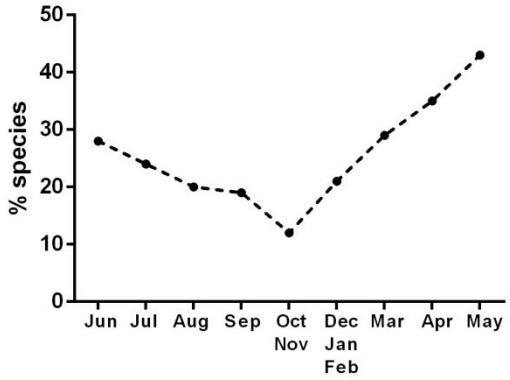

Figure 13. Variation of percent representation of species richness in pitfall trap samples.

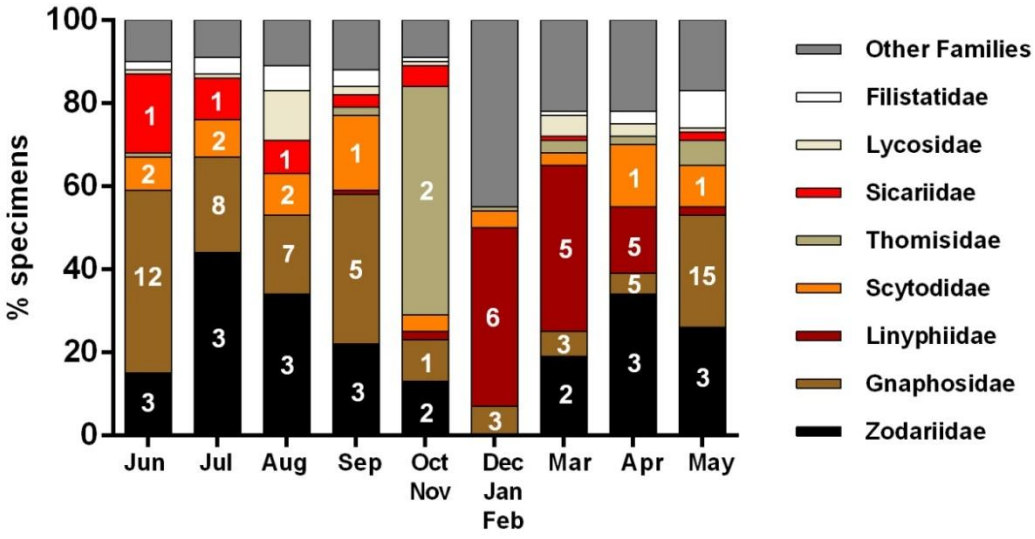

Figure 14. Monthly percent representation of families in pitfall trap samples. Bars indicate the percent proportions for the most abundant families for each month, while rarer families were displayed all together. Numbers in the bars indicate the number of species observed from each family in each particular sample.

Family composition showed notable variability between sampling periods as well. Gnaphosidae was present in all samples on a year round basis, but represented by a lower number of specimens in late autumn, winter and early spring. Species richness for Gnaphosidae was also lowest in these colder periods; but both abundance and richness increased in late spring and early summer, and remained moderate along summer and early autumn (Figure 14). Contrarily to Gnaphosidae, members of the family Linyphiidae were very abundant in samples during winter and the first half of spring, while almost absent in other samples.

Winter samples did not only characterize by higher proportions of Linyphiidae, but also with increased presence of other families as well. Although represented with very few specimens and absent in pitfall trap samples for most of the year, members of Theridiidae displayed a relatively high activity in winter and early spring with respect to many other families. Especially, members of the genus *Enoplognatha* seems to be winter active. Amaurobiidae was another winter active family, as the only member, *Amaurobius erberi* could be acquired in winter samples of pitfall traps in the study area. Most of the specimens of *Scotolathys simplex* from Dictynidae were appeared in winter samples as well. Dysderidae was also represented with a high number of specimens in winter samples.

Although there were quite notable changes between numbers and relative abundances of species, family level composition was observed to be quite similar from late spring to early autumn and abundantly represented by Zodariidae, Gnaphosidae, Scytodidae and Sicariidae (see Figure 14). An abrupt change in proportions at the second half of autumn was observed however, as Thomisidae dominated the samples. Although Thomisidae was represented with two species in the October - November sample, male specimens of the undetermined species *Xysticus sp.* was dominating the sample alone. Such an abrupt occurrence of this species was definitely due to mating behavior of males, which were highly motile in this period in search of females. Thomisidae was represented by lower numbers of specimens in the remaining samples.

High abundance of Zodariidae in almost all samples was particularly surprising. Although year round presence of adults has been previously recorded for this family in Mediterranean ecosystems (Chatzaki et al., 1998) such year round high abundances have not been reported in the any of the available literature. Other species well represented on a year round basis in the pitfall samples were *Oecobius maculatus*, *Palpimanus uncatus*, *Scytodes thoracica* and *Loxosceles rufescens* which were all rarer in winter samples. Although represented with low numbers of specimens in the samples, *Harpactea kencei* from Dysderdidae; undetermined *Filistata sp.* and *Pritha nana* from Filistatidae; and *Euophrys rufibarbis* from Salticidae are also proposed for showing year round activity patterns,

as adult specimens were present in all spring, summer and autumn samples. For majority of the remaining species in the study area, activity, or in other words, “adult availability” was only restricted with a particular month or a season, as usual in temperate ecosystems.

3.3.2. Opportunist Sampling

Only the data from standardized samples were evaluated here, to minimize biases due to over sampling of some micro-habitats while lesser sampling of others. Among the 29 families and 138 species sampled (See Table 6), Theridiidae was the most species rich family and represented by 23 species; and followed by Gnaphosidae (19 species); Salticidae (18 species); Linyphiidae (10 species) and Lycosidae (9 species) as the richest families. See Figure 15 for the annual richness of spider families included in the samples of the opportunist collection method. 11 families were represented with single species in the collection.

Table 6. List of taxa sampled by opportunist collection. Family names are given in uppercase :

CTENIZIDAE: *Cyrtocarenum cunicularium*. NEMESIIDAE: *Brachythele varrialei*. FILISTATIDAE: *Filistata insidiatrix, Filistata sp*. SICARIIDAE: *Loxosceles rufescens*. SCYTODIDAE: *Scytodes thoracica,* PHOLCIDAE: *Holocnemus pluchei*, *Spermophora senoculata*. SEGESTRIIDAE: *Segestria senoculata*, *Segestria sp.*. DYSDERIDAE: *Dysdera rubus*, *Dysdera sp. I*, *Harpactea kencei*. OONOPIDAE: *Opopaea* cf. *punctata*. PALPIMANIDAE: *Palpimanus uncatus*. MIMETIDAE: *Ero flammeola*. OECOBIIDAE: *Oecobius maculatus* ULOBORIDAE: *Uloborus plumipes*, *Uloborus walckenaerius*. THERIDIIDAE: *Anatolidion gentile*, *Argyrodes argyrodes*, *Crustulina scabripes*, *Enoplognatha afrodite*, *Enoplognatha diversa*, *Enoplognatha giladensis*, *Enoplognatha macrochelis*, *Enoplognatha thoracica*, *Episinus truncates*, *Euryopis episinoides*, *Kochiura aulica*, *Lasaeola convexa, Latrodectus geometricus*, *Neospintharus syriacus*, *Neottiura herbigrada*, *Platnickina nigropunctata*, *Simitidion agaricographum*, *Steatoda maura*, *Steatoda paykulliana*, *Steatoda triangulosa*, *Theridion adrianopoli*, *Theridion cyprusense*, *Theridion melanurum*. LINYPHIIDAE: *Erigone dentipalpis*, *Erigonoplus spinifemuralis*, *Meioneta rurestris*, *Microlinyphia pusilla*, *Ostearius melanopygius*, *Sintula retroversus*, *Styloctetor romanus*, *Tenuiphantes tenuis* and two unidentified species. TETRAGNATHIDAE: *Tetragnatha sp.*. ARANEIDAE: *Argiope lobata*, *Cyrtophora citricola*, *Gibbaranea bituberculata*, *Larinioides suspicax*, *Neoscona subfusca*, *Parazygiella Montana*, *Zygiella atrica*. LYCOSIDAE: *Alopecosa albofasciata*, *Arctosa leopardus*, *Arctosa variana*, *Geolycosa vultuosa*, *Hogna radiata*, *Hogna sp.*, *Lycosa praegrandis*, *Pardosa roscai*, *Pardosa vlijmi*, ZOROPSIDAE: *Zoropsis lutea*. AGELENIDAE: *Agelena orientalis*, *Maimuna vestita, Malthonica sp*., *Tegenaria paragamiani*. DICTYNIDAE: *Dictyna civica*. *Lathys humilis, Lathys stigmatisata, Nigma flavescens*. LIOCRANIDAE: A*groeca parva, Mesiotelus scopensis, Mesiotelus tenuissimus*. CLUBIONIDAE: *Clubiona* genevensis. ZODARIIDAE: *Zodarion kossamos*, *Zodarion thoni*. GNAPHOSIDAE: *Anagraphis pallens*, *Drassodes lutescens*, *Drassyllus praeficus*, *Haplodrassus morosus*, *Haplodrassus signifier*, *Leptodrassus albidus*, *Nomisia aussereri*, *Nomisia exornata*, *Nomisia palaestina*, *Nomisia ripariensis*, *Pterotricha lentiginosa*, *Scotophaeus blackwalli*, *Scotophaeus scutulatus*, *Synaphosus trichopus*, *Trachyzelotes barbatus*, *Zelotes* cf. *longipes*, *Zelotes* cf. *scrutatus*, *Zelotes solstitialis*, *Zelotes tenuis*. SELENOPIDAE: *Selenops radiatus*. SPARASSIDAE: *Eusparassus walckenaeri*. PHILODROMIDAE: *Philodromus bistigma*, *Philodromus pulchellus*, *Philodromus rufus*, *Thanatus atratus*, *Thanatus imbecillus*. THOMISIDAE: *Synema globosum*, *Thomisus onustus*, *Tmarus piochardi*, *Xysticus cribratus*, *Xysticus tenebrosus*, *Xysticus thessalicus*, *Xysticus tristrami*. *Xysticus sp*.. SALTICIDAE: *Cyrba algerina*, *Euophrys rufibarbis*, *Evarcha jucunda*, *Habrocestum papilionaceum*, *Heliophanus kochii*, *Heliophanus melinus*, *Menemerus semilimbatus*, *Menemerus taeniatus*, *Pellenes diagonalis*, *Pellenes flavipalpis*, *Philaeus chrysops*, *Plexippoides gestroi*, *Pseudeuophrys obsoleta*,*Pseudicius picaceus, Salticus propinquus*, *Sibianor aurocinctus, Synageles dalmaticus*, and one undetermined species.

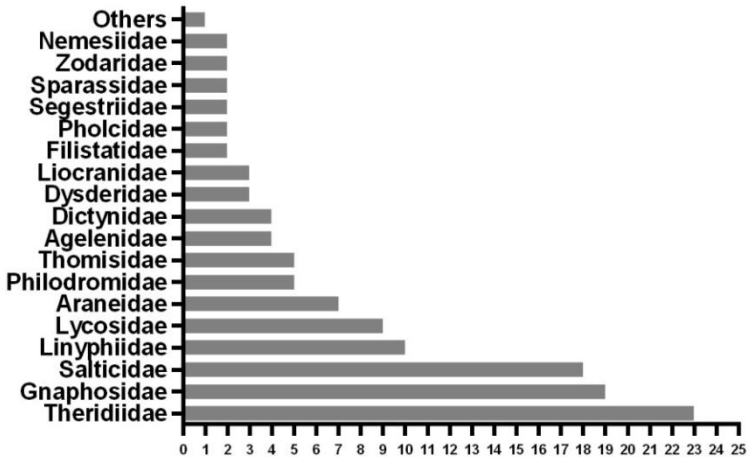

Figure 15. Annual richness of spider families included in the opportunistic collection samples. 11 families were represented with single species; while Theridiidae, Gnaphosidae, Salticidae, Linyphiidae, and Lycosidae were the richest ones.

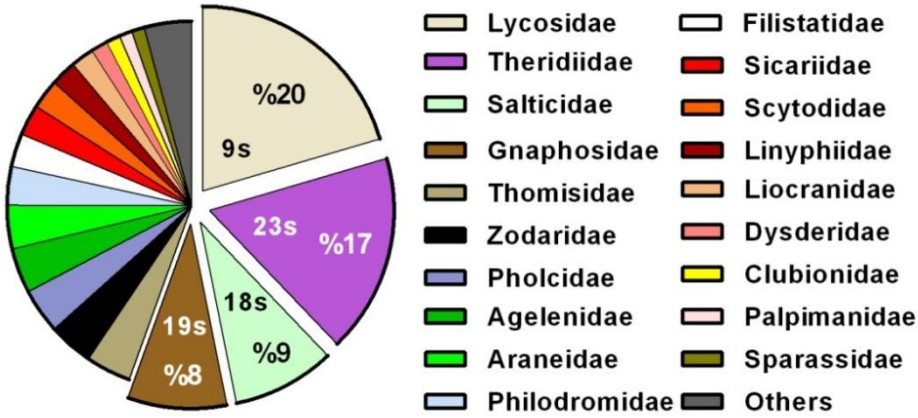

Figure 16. Annual abundances of the commonest spider families in the opportunist collection samples. Percent representation and numbers of species for dominant families are also noted on the graph.

Relative abundances of dominant families were slightly different from richness values, as 20 % of all adult spiders were from Lycosidae; 17 % from Theridiidae; 9 % from Salticidae and 8 % of spiders were from Gnaphosidae; while other families were represented by lower than 5 % abundance in the opportunist collection samples. See Figure 16 for further details. Numbers of specimens varied greatly between monthly samples, still, percent proportions of adults and sub-adults were almost stable between months; close to 50 % during spring and early summer, while slightly lower in autumn. In August 2010 sample, ratio of adults was surprisingly high and around 80 %, but this was caused by one very abundant species, an undetermined *Hogna sp.* dominating the sample. April samples were characterized by the highest number of individuals in the collection. See Figure 17 for details on monthly distribution of individuals between samples.

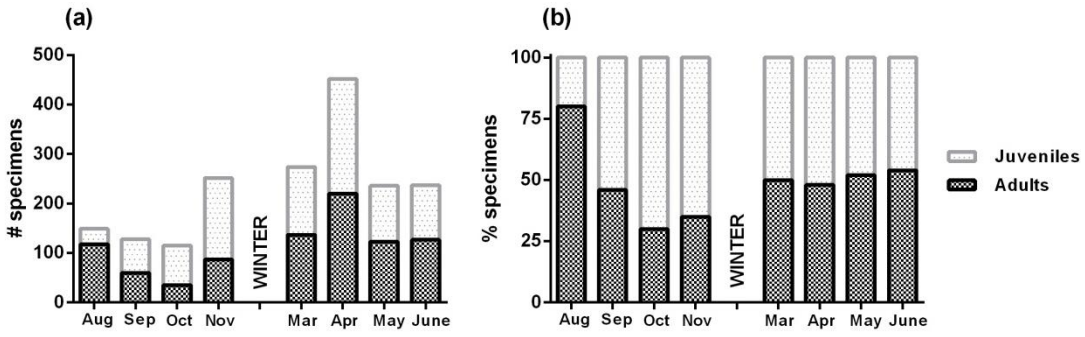

Figure 17. Monthly representation of adults and juveniles in opportunist collection samples. (a) showing the variability in terms of amounts; (b) indicates the percent proportions.

There was notable variation in observed richness between monthly samples (see Figure 18). Richness was relatively high along spring and early summer and April sample was the richest with 23 % of all species sampled during the standardized sampling seasons. Late summer and early autumn samples witnessed the lowest values; but richness increased notably in November sample.

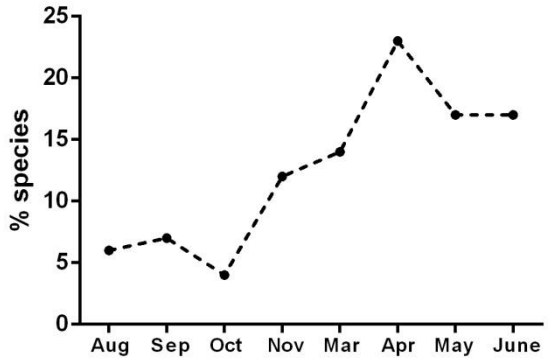

Figure 18. Variation of percent representation of species richness in standardized samples of opportunist collection.

3.3.3. Beating Sampling

Complete data set was evaluated here, which was resulted by 45 species from 15 families (See Table 7). See Figure 19 for the annual richness of spider families included in the beating samples. Theridiidae was the most species rich family and represented by 11 species. Salticidae, Araneidae and Thomisidae were other rich families, represented by 7, 5 and 4 species respectively. Dictynidae, Linyphiidae and Philodromidae were also well represented in the samples, each family with three species.

Table 7. List of taxa sampled by beating sampling. Family names are given in uppercase:

SEGESTRIIDAE: *Segestria senoculata*. OONOPIDAE: *Orchestina* sp.. MIMETIDAE: *Mimetus laevigatus*. ULOBORIDAE: *Uloborus plumipes*, *Hyptiotes sp.*. THERIDIIDAE: *Argyrodes argyrodes*, *Dipoena sp.*, *Episinus truncates*, *Kochiura aulica*, *Lasaeola convexa, Neospintharus syriacus*, *Platnickina nigropunctata, Simitidion agaricographum, Simitidion lacuna, Theridion genistae*, *Theridion mystaceum*. LINYPHIIDAE: *Meioneta rurestris*, *Styloctetor romanus* and one undetermined species. ARANEIDAE: *Araneus circe*, *Araniella cucurbitina*, *Cyclosa conica*, *Cyrtophora citricola, Neoscona subfusca*. OXYOPIDAE: *Oxyopes globifer*. DICTYNIDAE: *Dictyna civica*, *Marilynia bicolor*, *Lathys humilis*. ANYPHAENIDAE: *Anyphaena sabina*. CLUBIONIDAE: *Clubiona genevensis*. GNAPHOSIDAE: *Leptodrassus albidus*. PHILODROMIDAE: *Philodromus bistigma*, *Philodromus cespitum*, *Philodromus pulchellus*. THOMISIDAE: *Heriaeus simoni*, *Synema globosum*, *Tmarus piochardi*, *Xysticus cor*. SALTICIDAE: *Evarcha jucunda*, *Heliophanus kochii*, *Heliophanus tribulosus, Salticus noordami*, *Synageles dalmaticus*, *Thyene imperialis* and one undetermined species.

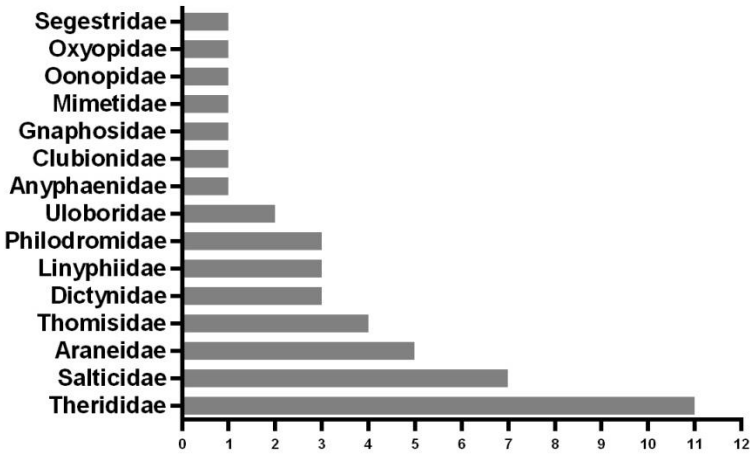

Figure 19. Annual richness of spider families included in the beating samples. Theridiidae, Salticidae, Araneidae and Thomisidae were the richest families.

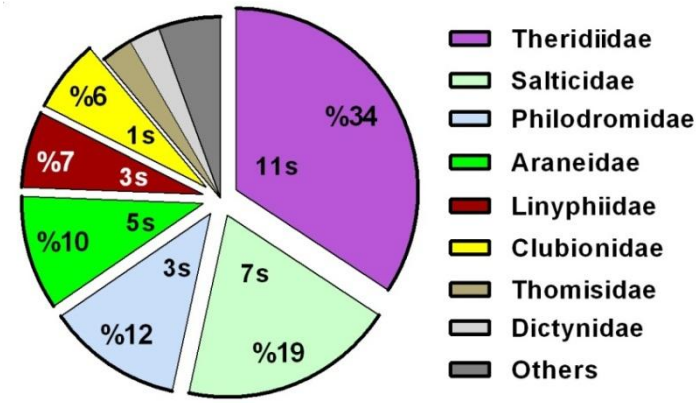

Figure 20. Annual abundances of the most common spider families in the beating samples. Percent representation and numbers of species for dominant families are also noted on the graph.

Annual abundances of dominant families were far or less similar to annual richness values; as Theridiidae was the most dominant with over 34 % representation; followed by Salticidae (19 %); Philodromidae (12 %), Araneidae (10 %), Linyphiidae (7 %) and Clubionidae (6 %). See Figure 20 for annual comparison of dominant families in beating samples.

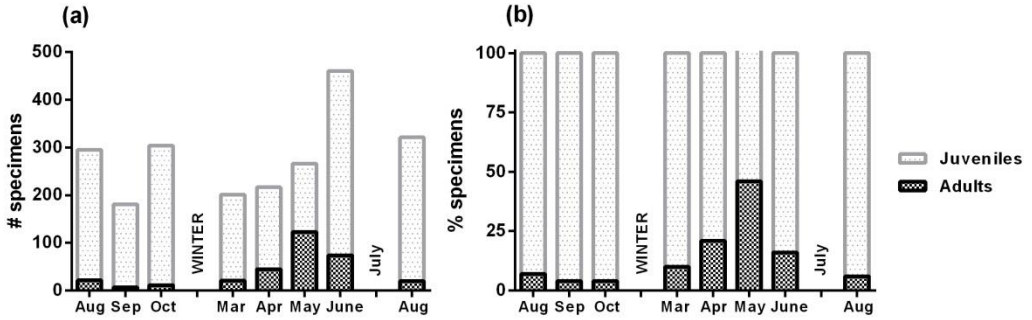

Figure 21. Monthly representation of adults and juveniles in beating samples. (a) showing the variability in terms of amounts; (b) indicates the percent proportions.

In beating samples, highest number of individuals was recorded in June. Proportion of adults was relatively higher in April, May and June, in comparison with rest of the samples; while highest proportion of adults was acquired in May. Still, it was quite notable that juveniles were much more abundant than adults in shrub canopy habitat all along the year. Lowest proportions of adults were recorded in autumn samples. See Figure 21 for details on monthly distribution of adults and subadults between beating samples.

Observed richness was also higher in April, May and June than the rest of the samples; while May sample was actyually the richest. Lowest richness values were recorded in September; but March sample was also low, similar to the October sample. See Figure 22 for percent representation of richness values between months.

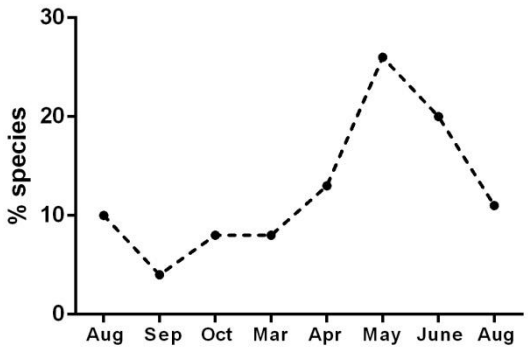

Figure 22. Variation of percent representation of species richness in beating samples .

3.4. Distributional Patterns

Tables 8 – 13 presents species lists included under each distributional category, also see the checklist for further detailed information on locality records or on chorological sub-regions that each species were placed.

Table 8. List of species widespread in the west Palearctic (A.W.P.):

Pritha nana, *Mimetus laevigatus, Uloborus plumipes*, *Uloborus walckenaerius*, *Enoplognatha thoracica*, *Kochiura aulica*, *Steatoda paykulliana*, *Alopecosa albofasciata*, *Arctosa variana*, *Anyphaena sabina*, *Drassodes lutescens*, *Micrommata ligurina*, *Synema plorator*, *Xysticus caperatus*, *Leptorchestes berolinensis*, *Menemerus semilimbatus*.

Table 9. List of species widespread in the Mediterranean and Europe (Med. & Eur.):

Filistata insidiatrix, *Holocnemus pluchei*, *Argyrodes argyrodes*, *Crustulina scabripes, Lasaeola convexa*, *Sintula retroversus*, *Geolycosa vultuosa*, *Lycosa praegrandis*, *Agelena orientalis*, *Maimuna vestita*, *Dictyna civica*, *Nigma puella*, *Amaurobius erberi*, *Mesiotelus tenuissimus*, *Zodarion thoni*, *Leptodrassus albidus*, *Pterotricha lentiginosa*, *Scotophaeus scutulatus*, *Eusparassus walckenaeri*, *Philodromus pulchellus*, *Tmarus piochardi*, *Xysticus cor*, *Xysticus thessalicus*, *Evarcha jucunda*, *Heliophanus equester*, *Menemerus taeniatus*, *Pellenes diagonalis*, *Pellenes flavipalpis*, *Phlegra lineata*.*Pseudicius picaceus*, *Salticus propinquus*, *Synageles dalmaticus*,

Table 10. List of species with distributions mostly limited in the Mediterranean basin (Med.):

Cyrtocarenum cunicularium, *Dysdera rubus*, *Harpactea kencei*, *Harpactea sturanyi*, *Palpimanus uncatus*, *Ero flammeola*, *Eresus walckenaeri*, *Oecobius maculatus*, *Oecobius rhodiensis*, *Anatolidion gentile*, *Enoplognatha afrodite*, *Enoplognatha diversa*, *Enoplognatha gemina*, *Enoplognatha macrochelis*, *Episinus truncates*, *Platnickina nigropunctata*, *Simitidion lacuna*, *Simitidion agaricographum*, *Steatoda maura*, *Theridion genistae*, *Alioranus pastoralis*, *Palliduphantes byzantinus*, *Pelecopsis laptevi*, *Pardosa roscai*, *Oxyopes globifer*, *Palaestina expolita*, *Berinda ensigera*, *Callilepis cretica*, *Leptopilos levantinus*, *Nomisia palaestina*, *Nomisia ripariensis*, *Zelotes solstitialis*, *Philodromus bistigma*, *Thanatus imbecillus*, *Mogrus neglectus*, *Salticus noordami*.

Table 11. List of species with eastern Mediterranean distribution (E.Med.):

Brachythele varrialei, *Scytodes velutina*, *Opopaea* cf. *punctata*, *Enoplognatha giladensis*, *Neospintharus syriacus*, *Theridion cyprusense*, *Prodidomus amaranthinus*, *Anagraphis pallens*, *Drassyllus jubatopalpis*, *Haplodrassus morosus*, *Zelotes scrutatus*, *Zelotes zin*, *Xysticus tristrami*, *Plexippoides gestroi*.

Table 12. List of species with European distribution (Eur):

Theridion adrianopoli, *Canariphantes zonatus*, *Erigonoplus spinifemuralis*, *Mecopisthes nasutus*, *Zygiella atrica*, *Pardosa vlijmi*, *Pisaura orientalis*, *Zoropsis lutea*, *Tegenaria paragamiani*, *Argenna subnigra*, *Scotolathys simplex, Agroeca parva*, *Mesiotelus scopensis*, *Zodarion kossamos*, *Cryptodrassus creticus*, *Leptopilos hadjissaranti*, *Poecilochroa furcata*, *Synaphosus trichopus*, *Zelotes apricorum*, *Xysticus tenebrosus*, *Habrocestum papilionaceum*, *Heliophanus tribulosus*.

Table 13. List of species with wide distribution ranges (Wide.):

Loxosceles rufescens, *Scytodes thoracica*, *Spermophora senoculata*, *Segestria senoculata* , *Euryopis episinoides*, *Latrodectus geometricus*, *Neottiura herbigrada*, *Steatoda triangulosa*, *Theridion melanurum*, *Theridion mystaceum*, *Araeoncus humilis*, *Erigone dentipalpis*, *Megalepthyphantes nebulosus*, *Meioneta rurestris*, *Microlinyphia pusilla*, *Ostearius melanopygius*, *Prinerigone vagans*, *Styloctetor romanus*, *Tenuiphantes tenuis*, *Agalenatea redii*, *Araneus circe*, *Araniella cucurbitina*, *Argiope lobata*, *Cyclosa conica*, *Cyrtophora citricola*, *Gibbaranea bituberculata*, *Hypsosinga sanguinea*, *Larinioides suspicax*, *Mangora acalypha*, *Neoscona adianta*,

Table 13. continued.

Neoscona subfusca, *Parazygiella montana*, *Arctosa leopardus*, *Hogna radiate*, *Pardosa luctinosa*, *Pirata piraticus*, *Oxyopes lineatus*, *Argyroneta aquatica*, *Lathys humilis*, *Lathys stigmatisata*, *Marilynia bicolor*, *Nigma flavescens*, *Cheiracanthium mildei*, *Clubiona genevensis*, *Drassyllus praeficus*, *Haplodrassus signifier*, *Nomisia aussereri*, *Nomisia exornata*, *Scotophaeus blackwalli*, *Trachyzelotes barbatus*, *Zelotes longipes*, *Zelotes mundus*, *Zelotes tenuis*, *Selenops radiatus*, *Philodromus cespitum*, *Philodromus rufus*, *Thanatus atratus*, *Heriaeus simoni*, *Runcinia grammica*, *Synema globosum*, *Thomisus onustus*, *Xysticus cribratus*, *Aelurillus v-insignitus*, *Chalcoscirtus infimus*, *Cyrba algerina*, *Euophrys rufibarbis*, *Heliophanus kochii*, *Heliophanus melinus*, *Philaeus chrysops*, *Pseudeuophrys obsoleta*, *Sibianor aurocinctus*, *Thyene imperialis*.

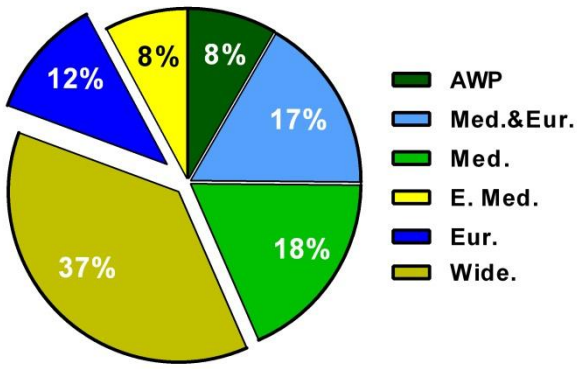

Figure 23. Representation of 6 major distributional categories for 191 identified species in this study. Percent representation for each particular category was also provided in the slices.

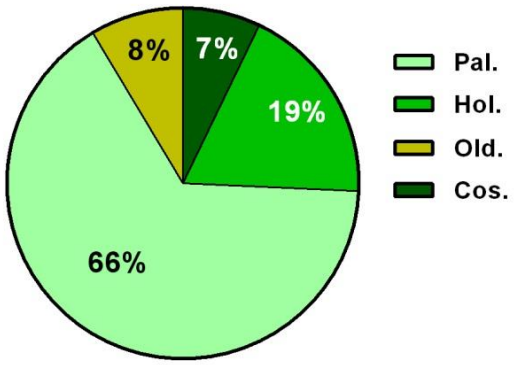

Figure 24. Representation of chorological groups under widespread category. Percent representation for each particular group was also provided in the slices. Note that Palearctic species group is the most dominant.

Evaluation of gathered distribution data among 192 identified species clearly indicated that majority of the spider fauna was composed of species with wide distributions at varying scales. See Figure 23 for representation of six major distributional categories. Widespread category (Wide.) was represented by 37 %; while majority of these (66 %) were composed of species with Palearctic distribution ranges (see Figure 24). Another widely distributed category, spiders of west Palearctic

(A.W.P.) were represented by a lower number of species though, with 8 %. Remaining categories were dominated by spiders with Mediterranean and European distributions, while 18 % of these species were mostly seen in the Mediterranean basin (Med.). 17 % were composed of another group of Mediterranean species, with distributions extended through the Central and Atlantic Europe (Med. & Eur.). European species (Eur.) were represented by 12 %. As a more or less distinct category, Eastern Mediterranean species (E. Med.) were only represented by 8 % of all determined species.

By a rough generalisation, 87 % of identified species, excluding widespread category (Wide.), are known to show European occurrence mostly besides of their wider distribution ranges (species from remaining distributional categories except E. Med. species); while Europe absent species (E. Med.) were 13 % in proportion, again excluding widespread species. By the current knowledge on distributions and also on the amount of specifically determined species, endemicity was low in the study area; while only endemics were *Brachythele varrialei* and *Harpactea kencei* in the region, as *B. varrialei* was only recorded in the close vicinity; and *H. kencei* was collected and described for the first time during this study, and not yet recorded from elsewhere. Determination of unidentified species is crucial to reveal further new species for the world from the region, and efforts will continue.

CHAPTER 4

DISCUSSION

4.1. General Overview

There is no previous published material on spider fauna of semi-natural olive groves in Turkey in the available literature. Lecigne, 2011 recorded 62 species from Izmir, in the close vicinity of study area; and it was the only more or less comprehensive publication on spider fauna of Mediterranean habitats at the Aegean coast of Turkey. With 220 species recorded in this study, baseline information is produced on spider fauna of both semi-natural olive groves and other similar xeric Mediterranean habitats in the region. Annual estimated species richness around 250 to 300 species and observed family richness of 38 families were all similar with other extensively studied Mediterranean habitats in the close vicinity; as Bosmans et al. 2009, reported around 300 species from 37 families on Lesbos Island (40 % covered by olive trees), and Lazarov, 2005, 2009 reported 225 species from 32 families in shrub associations at the South-West Bulgaria. Although surface area, sampling protocols, sampled habitats, altitudes and many similar factors varied between these studies, it is roughly assumed that high complementarity values have achieved in those two studies, to be able to compare results. Composition of the assemblage is also typical for the Mediterranean region; high species richness and commonness of Gnaphosidae, Salticidae, Theridiidae and Linyphiidae have previously been reported in a number of studies on Mediterranean habitats (Cardoso et al., 2007, 2009; Chatzaki et al. 1998; Bosmans et al. 2009; Lazarov, 2005, 2009). Presence of Ctenizidae is also characteristic for the eastern Mediterranean (Chatzaki et al., 1998).

Of the 28 species that could not be determined up to species level, 17 were identified up to generic level and 11 were identified up to only family level. Additionally, among the specifically identified taxa, there are some conspicuous species present as well with unusual characteristics, which may actually be new species to science. As long as the studies continue on determination and description of unidentified or suspicious specimens, number of new species will eventually increase.

4.2. Evaluation of Representativeness

By considering richness estimates, no single method could catch the estimates for the total data set; while opportunist sampling was the only method that could get close to it. Highest estimates of opportunist sampling was within the range of estimations of overall sampling. Such a result is reasonable actually, as both pitfall trap and beating sampling methods were concentrated on specific habitats and dominantly sampled epigeal ground dwellers and canopy fauna of shrubs respectively; whereas in opportunist sampling, a variety of habitats were sampled from ground to olive trees and shrubs, as it is also the case for the total data set. Nevertheless, necessity of using a set of methods together in faunistic studies on spiders has been approved.

Analysis revealed that the complete data set altogether and data acquired from the beating samples gave the most "complete" inventories, with highest completeness values, lower amounts of singletons and behavior of curves which were very close to their asymptotes. Although sample size was also the lowest for beating sampling compared to other methods analyzed in this study, efforts were still successful in representing the spider fauna of shrub canopy habitat, as richness was not very high for this particular habitat during the sampling period.

Although represented by the highest number of specimens and sampling intensity after the complete data set, pitfall trap results were concluded with the lowest completeness value, highest proportion of singletons and still increasing curves. This was probably due to high richness and low evenness of epigeal ground dwellers which were dominantly sampled by this method in the study area during the given sampling period.

Sweep netting and sifting methods were represented by low number of specimens in the collection, due to low number of samples and rareness of suitable habitats to exhaustively perform these methods in the study area. Thus, results could not be assumed as representative for the particular habitats sampled by these methods.

In conclusion, representativeness was found to be sufficiently satisfying for some methods, while efforts remained insufficient for others. However, it is assumed that in general, this study have successfully covered common species in the study area and also revealed most of the rare or cryptic species as well. Nevertheless, this study was conducted in a very limited surface area in one locality; thus it is not possible to consider results of this study to be fully representative on wider ranges, as diversity and composition of arthropod communities can substantially vary between wide distances. Further faunistical studies are necessary both in semi-natural olive groves and in a variety of natural Mediterranean habitats at the Aegean coast of Turkey, to establish a better understanding on

spiders of this biodiversity rich region and also to clarify the value of semi-natural olive groves in maintaining biodiversity as agricultural areas with economical conveniences.

4.3. Composition and Phenology

Each method was concluded with different richness and abundances of particular spider families. Ground spider family Gnaphosidae was most abundantly sampled by pitfall trap sampling, which is a method widely used for measuring activity of epigeal or ground active fauna. Linyphiidae was the second richest family in trap samples, but exclusively during colder periods. Such composition of ground fauna with diverse Gnaphosidae and winter active Linyphiidae is typical for Mediterranean habitats (Cardoso et al. 2007). Salticidae and Theridiidae were also represented by a number of species in trap samples, but not as rich as they were in the opportunist collection samples. Evidently, pitfall trap sampling method did not efficiently sample Salticidae and Theridiidae. This failure of pitfall traps was also stressed by Chatzaki et al., 1998 for Salticidae. Similarly, Araneidae was absent in trap samples while it was diversely found in opportunist collection and beating samples. These results indicate that traps were successful on sampling small epigeal spiders and mainly nocturnal ground dwellers such as highly motile wandering spiders; while less motile web builders would be missed by this method or day dwellers such as Salticidae might avoid traps for some reason, perhaps due to their better visual abilities. Large ground dwellers from Lycosidae and Mygalomorphae were also rare in the samples; as a possible consequence of trap size, which was probably small to efficiently sample those large species.

Opportunist sampling method was resulted with the highest number of species, probably due to two main reasons, as efforts were the most exhaustive and widest range of microhabitats were covered. This method was apparently successful on sampling less motile web builders such as Theridiidae and Araneidae, or active day dwellers such as Salticidae; however cryptic species such as small soil dwellers like Linyphiidae or night active species such as in Gnaphosidae were a little bit overlooked and represented by lower number of species compared to pitfall trap samples. Lycosidae was a better represented family in opportunist samples with high number of species but not all of these species were truely related with xeric environments of olive gardens or maquis associations; as almost half of the species demand more humid habitats such as riparian zones of fresh or brackish water habitats, but at the same time coexist within the closely located terrestrial olive gardens. *A. leopardus*, *A. variana*, *P. roscai* and *P. vlijmi* are those semi-aquatic Lycosids in the standardized samples. Apart from these, sampling protocol for opportunist sampling method was probably prone to biases that might have been caused by differential detectability of different

species. Detectability varied especially due to differential body sizes, color patterns, behavioral characteristics or other similar reasons; as small, well camouflaged or cryptic species were most probably overlooked, while large and visually apparent species were excessively sampled. Differentiation of habitats between seasons also influenced detectability of spiders, for example in spring, detection probability was lower for ground spiders due to intense cover of herbaceous plants on the ground. In order to avoid or minimize biases caused by detectability, thesis author alone made the samplings but still results should be treated with caution, especially on phenology.

Beating samples were characterized by lower richness values compared to pitfall trapping and opportunist sampling methods, probably due to uniformity of shrub canopy habitat sampled in this method; while pitfall trapping and opportunist sampling methods have sampled a wider variety of microhabitats. Web builders from Theridiidae dominated samples together with highly motile day dwellers from Salticidae and ambush predators from Philodromidae.

Spring was previously proposed as the richest period of the year for Mediterranean spider assemblages (Cardoso et al., 2007). The argument was supported by the results of this study, as highest richness values were observed in spring samples for all methods. Similarly, highest proportion of adults was observed in spring, indicating an obvious peak of activity of adults for most of the species in all methods except for the opportunist sampling, in which highest proportion of adults was observed in August. Proportion of adults was also higher for rest of the year in opportunist samples compared to other methods. These deviations from other methods for opportunist sampling was probably caused due to biases mentioned above, especially on detectability, as adults were probably more detectable than juveniles and thus more frequently sampled. In contrast to the opportunist sampling, beating samples were marked by higher proportions of juveniles on a year round basis. As such biases on sampling were unlikely for beating samples, ever green shrub canopy habitat may actually have an important role as “nurseries” for juvenile spiders on a year round basis.

4.4. Distributional Patterns

Although it was not possible to enlighten origins of spiders and to discuss chorological distributions in greater detail; evidently composition of this particular spider assemblage in the semi natural olive groves coincides with European fauna, more than other geographical regions in the close vicinity. Another and probably the most important factor shaping the faunal composition was of course Mediterraneanity, both in terms biogeography and ecological conditions. Indeed, most of the species in the inventory were previously known from other localities in the Mediterranean basin.

Species from Middle East were also represented in substantial amounts, indicating that regional fauna was affected from both European and Middle Eastern Mediterranean. It is difficult to discuss or confirm endemicity of species for the region, as the current knowledge is very limited on distributions of spider species in Turkey. For the time being, there are two species only known from the close vicinity of study area and could be called as endemics, *Brachythele varrialei* and *Harpactea kencei*, but these species might have wider actual distributions; which is a problem that will be solved in the future, by further studies on spider fauna at the Mediterranean coast of Turkey. On the other hand, number of supposed endemics will probably rise, as there are probably many more new species to science among the 28 species remaining undetermined. One of the endemics, *Harpactea kencei* Kunt, Elverici, Özkütük & Yağmur, 2011 was actually collected and noticed as a new species to science for the first time during field and laboratory studies of this study.

Among the newly recorded taxa, there were also some interesting species records in the list. Westernmost locality records are given for *O. punctata* and *Zelotes zin*; offering further western distributions for these two species. As another interesting record, *Theridion cyprusense* was previously only known from Cyprus Island. New record extended the distribution range of this species through Mediterranean coast of Turkey, which may indicate the wider distribution of this species further in Europe or in the Middle East. *Leptopilos hadjissaranti* was previously only known in Crete Island. New record indicates this species' presence in the Mediterranean coast of Turkey. Easternmost locality records are given for the following European species, indicating their Anatolian occurrence: *Canariphantes zonatus*, *Mecopisthes nasutus*, *Zygiella atrica*, *Pardosa vlijmi*, *Pisaura orientalis*, *Tegenaria paragamiani*, *Argenna subnigra*, *Agroeca parva, Mesiotelus scopensis, Poecilochroa furcata*, *Synaphosus trichopus* and *Xysticus tenebrosus*. Remaining new records were not particularly surprising, as those were species with more or less widespread distribution patterns in the Mediterranean basin or even in wider ranges.

CHAPTER 5

CONCLUSION

This is one of the most comprehensive studies on spider fauna of a particular habitat in Turkey; and also the first attempt aiming to enlighten composition of the spider assemblages in semi-natural olive groves in Turkey. It is also proposed that results of this study might be partially representative on Mediterranean shrub ecosystems found in the close vicinity of the study area. Observed richness of 220 species and estimated richness between 250 to 300 species are the highest values ever recorded on spider fauna of any particular locality in Turkey. Of course this does not mean that the region is the richest place in Turkey in terms of spider biodiversity; but actually it proves that Turkish spiders have poorly studied. Although studies are scarce in Turkey, similar results on spider biodiversity were reported from other Mediterranean habitats in other countries in the close proximity, indicating that results are usual for Mediterranean habitats.

Amounts of newly recorded or undetermined species may represent another good indicator to display the shortage of knowledge on spider fauna in Turkey. In this study, almost 30 % of all recorded species were previously unknown from Turkey, by assuming that there would be many new records for Turkey or new species to the world among the undetermined specimens. By considering intense habitat loss at the Mediterranean coast of Turkey today, it is an urgent need to increase our knowledge on faunal composition of the region, and to reveal priority areas for conservation planning. To address this problem, inventory studies are necessary with a special focus on areas representing native habitat types for the region.

Although current knowledge on biodiversity of semi natural olive groves and associated shrub lands in the study area is limited with spiders, it is possible to conclude that this type of agricultural lands are actually good in maintaining biodiversity. Further studies on fauna of native Mediterranean habitats are necessary as mentioned above, also for a better assessment of olive groves as environment friendly agricultural lands.

Most species rich families were Gnaphosidae, Salticidae, Theridiidae and Linyphiidae. Spring samples were marked by the highest richness values but all seasons were characterized by their own particular species, while there were only few species showing activity for more than two seasons or even longer. These are all typical features for Mediterranean habitats. Evaluation of distributional patterns was also marked by high proportion of representatives from the Mediterranean, together with species which have wider distributions. Among the Mediterranean species, a substantial amount showed resemblance with Europe, while Middle Eastern species were also represented in good numbers. Apparently, spider assemblage was affected both from Europe and the Middle East.

Nevertheless, all of these results should be treated as preliminary, as many more large scale field surveys are necessary for developing a better understanding on spiders of any Mediterranean habitat found in the Mediterranean coastline of Turkey. Hopefully, work on these interesting habitats will continue in Turkey.

CHAPTER 6

CHECKLIST

Information on all of the species and specimens in the collection are presented in detail under the checklist in the following pages. Families are presented in taxonomical order and species are given under family titles. Taxonomy follows Platnick, 2012. Distribution information is only available for species level identifications, and follows Platnick, 2012 and Canard, 2005; while some recent publications on specific taxa were also refered for updating information. Label data acquired from pitfall trap sampling and other methods are presented separately, as two groups give quite different types of data. Further comments including taxonomical notes, habitat information and sampling techniques for each species are also noted for each particular species in the collection. Diagnostic genitalia photographs are given in the appendix. Photographs with taxonomic importance for species that could not be determined up to specific level were not presented in the appendix; and species that could only be determined up to family level were only mentioned under family titles.

6.1. Checklist of Spiders of Semi-Natural Olive Groves and Associated Shrub Lands in Muğla, Milas, Kıyıkışlacık

6.1.1. FAMILY: CTENIZIDAE Thorell, 1887

Represented by a single species.

6.1.1.1. *Cyrtocarenum cunicularium* (Olivier, 1811)

Distribution: Mediterranean

Pitfall trap materials: 20.11.2010 – 04.03.2011, 3 ♂♂

Collection materials: 29.05.2010, 5 ♀♀ | 20.11.2010, 1 ♂ | 18.06.2011, 2 ♀♀

Comments: Identifications based on Le Peru, 2011: 72, f. 33. Very typical trap door spider. Abundant

in olive groves but hard to find due to their well camouflaged burrows. All adult females collected in early summer with eggs or nymphs in their burrows. No surface activity for adult females could be detected. Adult males were hard to find and only acquired in winter period during surface activity.

6.1.2. FAMILY: NEMESIIDAE Simon, 1889

Represented by 2 genera and 2 species with one new record.

6.1.2.1. *Nemesia* sp. indet

Pitfall trap materials: 01.09.2010 – 01.10.2010, 4 ♂♂ | 20.11.2010 – 04.03.2011, 1 ♂

Collection materials: -

Comments: Generic level identification based on Le Peru, 2011: 76. Represents a new genus record for Turkey.

6.1.2.1. *Brachythele varrialei* (Dalmas, 1920)

Distribution: Turkey, Endemic (Mediterranean Middle East)

Pitfall trap materials: 29.06.2010 – 26.07.2010, 1 ♀ | 01.10.2010 – 20.11.2010, 2 ♀♀

Collection materials: 20.11.2010, 1 ♂

Comments: Identifications based on Le Peru, 2011: 89, f. 45 and Raven, 1985a: 96, f. 85-91. One adult male found in an imprecisely build retreat under a large stone. Female of this species is unknown to science (Platnick, 2012). Previously known from the close vicinity (Dalmas, 1920).

6.1.3. FAMILY: FILISTATIDAE Ausserer, 1867

Represented by 2 genera and 3 species with one previously unknown species from Turkey.

6.1.3.1. *Filistata insidiatrix* (Forsskål, 1775)

Distribution: Central and Atlantic Europe, Mediterranean to Turkmenistan

Pitfall trap materials: 29.05.2010 – 29.06.2010, 1 ♂

Collection materials: 24.07.2010, 2 ♀♀ | 05.09.2010, ♂ | 02.10.2010, 1 ♀ | 20.11.10, 1 ♂ | 06.03.2011, 1 ♀ | 10.04.2011, 1 ♀ | 15.05.2011, 2 ♂♂ 3 ♀♀ | 17.06.2011, 2 ♂♂ 2 ♀♀ | 10.08.2011, 2 ♀♀

Comments: Identifications based on Le Peru, 2011: 109, f. 108. Collected from funnel like retreats (similar to those of *Segestria* species) build under stones; on olive tree trunks; on stone walls or large rocks; especially abundant in damp places. Recently recorded in the close vicinity (Lecigne, 2011).

6.1.3.2. *Filistata* sp. indet

Pitfall trap materials: 29.05.2010 – 29.06.2010, 2 ♂♂ | 29.06.2010 – 26.07.2010, 5 ♂♂ | 26.07.2010 – 01.09.2010, 12 ♂♂ 1 ♀ | 01.09.2010 – 01.10.2010, 1 ♂ 2 ♀♀ | 12.04.2011 – 13.05.2011, 1 ♂ 1 ♀ | 13.05.2011 – 17.06.2011, 6 ♂♂

Collection materials: 29.06.2010, 1 ♂ | 08.08.2010, 1 ♂ | 19.11.2010, 1 ♀ | 05.03.2011, 2 ♀♀ | 10.04.2011, 1 ♀ | 15.05.2011, 3 ♀♀ | 17.06.2011, 1 ♂ 1 ♀ | 12.08.2011, 1 ♂ 2 ♀♀

Comments: Generic level Identification based on Le Peru, 2011: 109, f 106. A previously unknown species from Turkey. Collected under rocks or acquired from sifting samples. One male collected on the ground during activity at night. Few specimens acquired from sweep net samples. Represented well in pitfall trap surveys due to year round activity on the ground except the winter period.

6.1.3.3. *Pritha nana* (Simon, 1868)

Distribution: All West Palearctic

Pitfall trap materials: 29.06.2010 – 26.07.2010, 1 ♂ | 01.09.2010 – 01.10.2010, 1 ♂ | 04.03.2011 – 09.04.2011, 1 ♂ | 12.04.2011 – 13.05.2011, 1 ♂ 1 ♀ | 13.05.2011 – 17.06.2011, 13 ♂♂

Collection materials: -

Comments: Identifications based on Le Peru, 2011: 109, f. 109.

6.1.4. FAMILY: SICARIIDAE Keyserling, 1880

Represented by a single species.

6.1.4.1. *Loxosceles rufescens* (Dufour, 1820)

Distribution: Cosmopolitan

Pitfall trap materials: 29.05.2010 – 29.06.2010, 22 ♂♂ 3 ♀♀ | 29.06.2010 – 26.07.2010, 13 ♂♂ 1 ♀ | 26.07.2010 – 02.09.2010, 15 ♂♂ 3 ♀♀ | 01.09.2010 – 01.10.2010, 3 ♂♂ | 01.10.2010 – 20.11.2010, 6 ♂♂ 3♀♀ | 04.03.2011 – 09.04.2011, 1 ♂ | 12.04.2011 – 13.05.2011, 1 ♀ | 13.05.2011 – 17.06.2011, 4 ♂♂

Collection materials: 01.07.2010, 2 ♂♂ 6 ♀♀ | 22.07.2010 – 27.07.2010, 3 ♂♂ 6 ♀♀ | 04.09.2010, 6 ♀♀ | 03.10.2010, 3 ♂♂ 2 ♀♀ | 19.11.2010, 1 ♀ | 04.03.2011, 1 ♀ | 09.04.2011, 3 ♀♀ | 16.05.2011, 1 ♂ 1♀ | 17.06.2011 – 20.06.2011, 2 ♂ 5 ♀♀ | 12.08.2011, 2 ♀♀

Comments: Identifications based on Le Peru, 2011: 111, f. 112. Very abundant all along the year, but apparently most active in summer. Most specimens collected under stones, some acquired from sifting samples. Previously recorded from close vicinity of the region (Dalmas, 1920, Lecigne, 2011).

6.1.5. FAMILY: SCYTODIDAE Blackwall, 1864

Represented by a single genus and 2 species.

6.1.5.1. *Scytodes thoracica* (Latreille, 1802)

Distribution: Holarctic, Pacific Islands

Pitfall trap materials: 29.05.2010 – 29.06.2010, 8 ♂♂ 2 ♀♀ | 29.06.2010 – 26.07.2010, 4 ♂♂ 7 ♀♀ | 26.07.2010 – 02.09.2010, 15 ♂♂ 7 ♀♀ | 01.09.2010 – 01.10.2010, 11♂♂ 6 ♀♀ | 01.10.2010 – 20.11.2010, 1 ♂ 6 ♀♀ | 20.11.2010 – 04.03.2011, 1 ♂ 2 ♀♀ | 04.03.2011 – 09.04.2011, 4 ♀♀ | 12.04.2011 – 13.05.2011, 21 ♂♂ 5 ♀♀ | 13.05.2011 – 17.06.2011, 18♂♂ 6 ♀♀

Collection materials: 01.05.2010, 2 ♀♀ | 27.07.2010, 1 ♂ 3 ♀♀ | 04.09.2010, 2 ♂♂ | 03.10.2010, 3 ♀♀ | 21.11.2010, 3 ♀♀ | 05.03.2011, 2 ♀♀ | 09.04.2011, 1 ♂ 6 ♀♀ | 16.05.2011, 4 ♀♀ | 20.06.2011, 1 ♂ 3 ♀♀ | 12.08.2011, 1 ♂ 1 ♀

Comments: Identifications based on Bürgis, 1990: 290, f. 2-7. Collected exclusively under stones, but pitfall trap results also indicate great amount of surface activity all along the year.

6.1.5.2. *Scytodes velutina* Heineken & Lowe, 1832

Distribution: Mediterranean

Pitfall trap materials: 29.05.2010 – 29.06.2010, 1 ♀ | 29.06.2010 – 26.07.2010, 1 ♂ | 26.07.2010 – 02.09.2010, 1 ♂

Collection materials: 18.06.2011, 1 ♂ 1 ♀ | 05.08.2011, 1 ♀

Comments: Identifications based on Wunderlich, 1987: 100, f. 257-261, 706. Much rarer than *S. thoracica.* Specimens acquired from sifting and trap samples in summer period. Recently recorded in close vicinity by Kunt et al., 2012.

6.1.6. FAMILY: PHOLCIDAE C. L. Koch, 1850

Represented by 2 genera and 2 species.

6.1.6.1. *Holocnemus pluchei (Scopoli, 1763)*

Distribution: Atlantic and Central Europe, Mediterranean, introduced elsewhere

Pitfall trap materials: -

Collection materials: 01.05.2010, 2 ♂♂ 1 ♀ | 02.07.2010, 2 ♂♂ 1 ♀ | 27.07.2010, 6♂♂ 3 ♀♀ | 08.08.2010, 4 ♀ | 04.09.2010, 2 ♂♂ 5 ♀♀ | 20.11.2010, 3 ♂♂ 1 ♀ | 09.04.2011, 4 ♂♂ 3 ♀♀ | 16.05.2011, 2 ♂♂ | 20.06.2011, 6 ♂♂ 1 ♀ | 05.08.2011, 1 ♂ 1 ♀ | 12.08.2011, 1 ♂ 2 ♀♀

Comments: Identifications based on Le Peru, 2011: 152, f. 182. Collected on nests located between rocks; on olive tree trunks; or on lower braches of shrubs close to the ground level. Was very abundant and easy to find in suitable habitats on a year round basis.

6.1.6.2. *Spermophora senoculata* (Dugès, 1836)

Distribution: Holarctic, introduced elsewhere

Pitfall trap materials: 29.5.2010 - 29. 6. 2010, 1 ♂ | 26.07.2010 – 02.09.2010, 1 ♀

Collection materials: 01.07.2010, 1 ♂ 2 ♀♀ | 16.05.2011, 1 ♀ | 10.06.2011, 3 ♂♂ 10 ♀♀ | 03.08.2011, 1 ♀

Comments: Identifications based on Le Peru, 2011: 157, f. 201-202. Collected under stones; in buildings or in rock cavities. Adult activity mainly concentrated in the summer period.

6.1.7. FAMILY: SEGESTRIIDAE Simon, 1893

Represented by a single genus and 2 species, with one previously unknown species from Turkey.

6.1.7.1. *Segestria senoculata* (Linnaeus, 1758)

Distribution: Palearctic

Pitfall trap materials: -

Collection materials: 27.07.2010, 1 ♀ | 03.10.2010, 2 ♀♀ | 05.03.2011, 1 ♀ | 16.05.2011, 1 ♀ | 20.06.2011, 1 ♀ | 03.08.2011, 1 ♀

Comments: Identifications based on Le Peru, 2011: 166, f. 224. Collected from funnel like retreats (similar to those of *F. insidiatrix* and *Segestria* sp.) on stone walls or rock surfaces with narrow fissures. One specimen acquired from beating samples. Abundant in damp places.

6.1.7.2. *Segestria* sp. indet

Pitfall trap materials: -

Collection materials: 20.11.2010, 1 ♂

Comments: Generic level identification based on Le Peru, 2011: 161. A previously unknown species from Turkey. One adult male and numerous sub adults collected from retreats (similar to those of *F. insidiatrix* and *S. senoculata*) on large rocks at the sea shore.

6.1.8. FAMILY: DYSDERIDAE C. L. Koch, 1837

5 species are identified belonging to 2 genera, with three previously unknown species from Turkey. One of these species was described and published as *Harpactea kencei* Kunt et al. 2011, as a new species to science.

6.1.8.1. *Dysdera rubus* Deeleman-Reinhold, 1988

Distribution: Turkey, Greece (Mediterranean)

Pitfall trap materials: 29.05.2010 – 29.06.2010, 1 ♂

Collection materials: 09.04.2011, ♀

Comments: Identifications based on Le Peru, 2011: 249, f. 335. An adult female collected under a stone.

6.1.8.2. *Dysdera* sp. I indet

Pitfall trap materials: 04.03.2011 – 09.04.2011, 1 ♂ | 12.04.2011 – 13.05.2011, 3 ♂♂ | 13.05.2011 – 17.06.2011, 2 ♀♀

Collection materials: 09.04.2011 – 11.04.2011, 3 ♂♂ 2♀♀ | 18.06.2011, 1 ♂

Comments: Generic level identification based on Le Peru, 2011: 245, f. 317. A previously unknown species from Turkey. Although resembles *D. neocretica* Deeleman-Reinhold, 1988 in many aspects, there are some differences. A very marked difference is on the orientation of tip of embolus. Collected at night on the ground during activity. Both trap and collection results indicates an activity pattern in spring and early summer.

6.1.8.3. *Dysdera* sp. II indet

Pitfall trap materials: 20.11.2010 – 04.03.2011, 1 ♀ | 04.03.2011 – 09.04.2011, 5 ♂♂ 1 ♀ | 12.04.2011 – 13.05.2011, 1 ♂ | 13.05.2011 – 17.06.2011, 2 ♂♂ 1 ♀

Collection materials: -

Comments: Generic level identification based on Le Peru, 2011: 245, f. 317. A previously unknown species from Turkey. Another species morphologically resembling *D. neocretica*; but differs from the previous species in the length of bulb, morphology of embolus, and a number of other characters such as smaller body size and less evident punctures on cephalothorax. Only acquired from pitfall traps in spring.

6.1.8.4. *Harpactea kencei* Kunt, Elverici, Özkütük & Yağmur, 2011

Distribution: Kıyıkışlacık, Turkey, Endemic (Mediterranean Middle East)

Pitfall trap materials: 29.05.2010 – 29.06.2010, 1 ♂ | 20.11.2010 – 04.03.2011, 3 ♂♂ 3 ♀♀ | 04.03.2011 – 09.04.2011, 3 ♂♂| 13.05.2011 – 17.06.2011, 2 ♂♂

Collection materials: 09.04.2011 – 11.04.2011, 5 ♂♂ 1 ♀

Comments: Detailed taxonomic notes provided in Kunt et al., 2011a: 135, f. 9-15. New species to world. Collected at night on the ground during activity in April, trap results also indicates an activity pattern along spring and early summer.

6.1.8.5. *Harpactea* cf. *sturanyi* (Nosek, 1905)

Distribution: Bulgaria, Turkey (Mediterranean)

Pitfall trap materials: 12.04.2011 – 13.05.2011, 1 ♂

Collection materials: -

Comments: Identification based on Le Peru, 2011: 282, f. 454. *H. camenarum* Brignoli, 1977 and *H. sturanyi* are two very similar species. True identity of the only specimen in the collection is not clear yet, but assumed as *H.* cf. *sturanyi*, as *H. camenarum* is unknown from Turkey.

6.1.9. FAMILY: OONOPIDAE Simon, 1890

Represented by 2 genera and 2 species, both are new records for Turkey.

6.1.9.1. *Opopaea* cf. *punctata* (O. P.-Cambridge, 1872)

Distribution: Lebanon, Israel (Mediterranean Middle East)

Pitfall trap materials: 29.5.2010 - 29. 6. 2010, 1 ♀ | 04.03.2011 – 09.04.2011, 1 ♂ | 12.04.2011 – 13.05.2011, 1 ♂ 1 ♀

Collection materials: 09.04.2011, 1 ♂

Comments: Identifications based on Saaristo & Marusik, 2008: 29, f. 64-72, 155-165, 196, 202, 227. Represents a new genus record for Turkey. A very similar species to *O. punctata* with very slight differences on male and female genitalia. Represented by fairly enough specimens in the collection to indicate an activity pattern in spring.

6.1.9.2. *Orchestina* sp. indet

Pitfall trap materials: -

Collection materials: 11.04.2011, 1 ♀

Comments: Identifications based on Saaristo, 2007: 124, f. 16.-21. Represents a new genus record for Turkey. Very similar to *O. pavesii* (Simon, 1873) and *O. pavesiiformis* Saaristo, 2007. Species level identification was not possible due to lack of males. One adult female acquired from beating samples.

6.1.10. FAMILY: PALPIMANIDAE Thorell, 1870

Represented by a single species.

6.1.10.1. *Palpimanus uncatus* Kulczyński, 1909

Distribution: Egypt, Turkey, Greece (Mediterranean)

Pitfall trap materials: 29.5.2010 - 29. 6. 2010, 5 ♂♂ 1 ♀ | 29.06.2010 – 26.07.2010, 1 ♂ 3 ♀ | 26.07.2010 – 02.09.2010, 3 ♂♂ 8 ♀♀ | 01.09.2010 – 01.10.2010, 2 ♂♂ 1 ♀ | 01.10.2010 – 20. 11.2010, 1 ♀ | 04.03.2011 – 09.04.2011, 2 ♂♂ | 12.04.2011 – 13.05.2011, 4 ♂♂ | 13.05.2011 – 17.05.2011, 3 ♂♂ 1 ♀

Collection materials: 02.05.2010, 1 ♀ | 02.07.2010, 1 ♂ 1 ♀ | 27.07.2010, 1 ♀ | 04.09.2010, 2 ♀♀ | 01.10.2010, 2 ♂♂ 2 ♀♀ | 21.11.2010, 1 ♂ | 13.05.2011, 1 ♀ | 12.08.2011, 2 ♀♀

Comments: Identifications based on Le Peru, 2011: 310, f. 543. Collected on the ground at night during activity; or collected under stones. Was present in the samples along a year round basis, except the winter period. Recently recorded in the close vicinity (Lecigne, 2011).

6.1.11. FAMILY: MIMETIDAE Simon, 1881

Represented by 2 genera and 2 species, with one new record for Turkey.

6.1.11.1. *Ero flammeola* Simon, 1881

Distribution: Mediterranean

Pitfall trap materials: 12.04.2011 – 13.05.2011, 1 ♂ 1 ♀

Collection materials: 19.11.2010, 1 ♂

Comments: Identifications based on Le Peru, 2011: 314, f. 547. New record for Turkey. An adult male collected under a stone; apparently a ground dweller species.

6.1.11.2. *Mimetus laevigatus* (Keyserling, 1863)

Distribution: All West Palearctic

Pitfall trap materials: -

Collection materials: 02.05.2010, 1 ♀ | 18.06.2011, 1 ♀

Comments: Identifications based on Le Peru, 2011: 315, f. 550. Collected on shrubs by beating and hand collection in opportunist sampling.

6.1.12. FAMILY: ERESIDAE C. L. Koch, in Berendt, 1845

Represented by a single species.

6.1.12.1. *Eresus walckenaeri* Brullé, 1832

Distribution: Mediterranean

Pitfall trap materials: 12.04.2011 – 13.05.2011, 2 ♂♂

Collection materials: 01.05.2010, 4 ♂♂ | 02.09.2010, 1 ♀ | 09.04.2011, 1 ♀ | 14.05.2011, 2 ♂♂ | 22.07.2011 – 27.07.2011, 2 ♀♀ | 08.08.2011, 1 ♀

Comments: Identifications based on Le Peru, 2011: 321, f. 561. Adult males were active in spring for a very short time period and collected on the ground during activity at day and night. Adult females collected from burrows under large rocks.

6.1.13. FAMILY: OECOBIIDAE Blackwall, 1862

2 species identified belonging to one genus.

6.1.13.1. *Oecobius maculatus* Simon, 1870

Distribution: Mediterranean to Azerbaijan

Pitfall trap materials: 29.5.2010 - 29. 6. 2010, 2 ♂♂ | 29.06.2010 – 26.07.2010, 3 ♂♂ | 26.07.2010 – 02.09.2010, 10♂♂ 1 ♀ | 01.09.2010 – 01.10.2010, 1♂ 2 ♀♀ | 04.03.2011 – 09.04.2011, 1 ♂ | 12.04.2011 – 13.05.2011, 4 ♂♂ 1 ♀ | 13.05.2011 – 17.05.2011, 4 ♂♂ 1 ♀

Collection materials: 26.07.2010, 1 ♂ 4 ♀♀ | 09.04.2011, 1 ♂ | 13.05.2011, 2 ♀♀ | 10.06.2011, 1 ♀

Comments: Identifications based on Kaya, Uğurtas & Akkaya, 2007. Collected on the ground at night during activity or under stones. Present in the samples in all sampling season along one year, except the winter.

6.1.13.2. *Oecobius rhodiensis* Kritscher, 1966

Distribution: Greece, Turkey (Mediterraean)

Pitfall trap materials: 13.04.2011 – 17.05.2011, 1 ♂

Collection materials: 01.07.2010, 1 ♀

Comments: Identifications based on Demir, Seyyar & Aktaş, 2009: 459, f. 7-15. One adult female collected on the ground at night.

6.1.14. FAMILY: ULOBORIDAE Thorell, 1869

Represented by 2 genera and 3 species.

6.1.14.1. *Hyptiotes* sp. indet

Pitfall trap materials: -

Collection materials: 03.10.2010, 1 ♀ | 10.08.2011, 1 ♀

Comments: Identifications based on Almquist, 2005: 43. Species level identification was not possible due to lack of male specimens. Specimens collected on shrubs. It is very likely that this species is *H. paradoxus* (C.L.Koch, 1834).

6.1.14.2. *Uloborus plumipes* Lucas, 1846

Distribution: All West Palearctic, Argentina (introduced)

Pitfall trap materials: -

Collection materials: 08.08.2010, 1 ♂ | 10.04.2011, 4 ♀♀ | 16.05.2011, 1 ♂ 7 ♀ | 12.08.2011, 3 ♀♀

Comments: Identifications based on Roberts, 1998: 93, f. Collected from webs located on shrubs; pine tree trunks; or between large stones. A relatively abundant species.

6.1.14.3. *Uloborus walckenaerius* Latreille, 1806

Distribution: Palearctic

Pitfall trap materials: -

Collection materials: 19.06.2011, 1 ♂ 1 ♀

Comments: Identifications based on Le Peru, 2011: 336, f. 584. Collected in deep rock crevices on large rock formations. Recently recorded in the close vicinity (Lecigne, 2011).

6.1.15. FAMILY: THERIDIIDAE Sundevall, 1833

Represented by 17 genera and 29 species, with 10 previously unknown species from Turkey.

6.1.15.1. *Anatolidion gentile* (Simon, 1881)

Distribution: Mediterranean

Pitfall trap materials: -

Collection materials: 16.05.2011, 2 ♀♀

Comments: Identifications based on Knoflach, Rollard & Thaler, 2009: 229, f. 1-9. One specimen acquired from sifting samples; the other one collected under a stone.

6.1.15.2. *Argyrodes argyrodes* (Walckenaer, 1841)

Distribution: Atlantic and Central Europe, Mediterranean, West Africa

Pitfall trap materials: -

Collection materials: 29.05.2010, 1 ♂ 3 ♀♀ | 05.09.2010, 1 ♂ 1 ♀ | 10.08.2011, 1 ♀

Comments: Identifications based on Kaya et al., 2010a: 9, f. 2-8. A kleptoparasitic species, collected on webs of *N. adianta* (Walckenaer, 1802) (Araneidae) in May 2010. Other specimens acquired from beating samples.

6.1.15.3. *Crustulina scabripes* Simon, 1881

Distribution: Atlantic and Central Europe, Mediterranean

Pitfall trap materials: 12.04.2011 – 13.05.2011, 1 ♂

Collection materials: 02.05.2010, 1 ♂ | 16.05.2011, 1 ♀ | 18.06.2011, 3 ♀♀

Comments: Identifications based on Le Peru, 2011: 438, f. 670. Specimens collected under stones or on olive tree trunks; one adult female acquired from beating samples.

6.1.15.4. *Dipoena* sp. indet

Pitfall trap materials: -

Collection materials: Specimens acquired from beating samples: 11.04.2011, 2 ♀♀ | 20.06.2011, 2 ♀♀

Comments: Generic level identifications based on Le Peru, 2011: 378. A previously unknown species from Turkey.

6.1.15.5. *Enoplognatha afrodite* Hippa & Oksala, 1983

Distribution: Mediterranean

Pitfall trap materials: 04.03.2011 – 09.04.2011, 1 ♂ 1 ♀

Collection materials: 10.04.2011, 2 ♀♀

Comments: Identifications based on Hippa & Oksala, 1983: 73, f. 3, 5, 8, 10-11, 13-14. Two adult females collected under stones.

6.1.15.6. *Enoplognatha diversa* (Blackwall, 1859)

Distribution: Mediterranean

Pitfall trap materials: -

Collection materials: 11.04.2011, 1 ♂

Comments: Identifications based on Bosmans & Van Keer, 1999: 226, f. 78-82. A new record for Turkey, collected under a stone.

6.1.15.7. *Enoplognatha gemina* Bosmans & van Keer, 1999

Distribution: Mediterranean to Azerbaijan

Pitfall trap materials: 20.11.2010 – 04.03.2011, 3 ♂♂ | 04.03.2011 – 09.04.2011, 2 ♂♂

Collection materials: -

Comments: Identifications based on Bosmans & Van Keer, 1999: 235, f. 103-107. Only males acquired by pitfall traps in spring.

6.1.15.8. *Enoplognatha giladensis* (Levy & Amitai, 1982)

Distribution: Mediterranean Middle East

Pitfall trap materials: -

Collection materials: 09.04.2011, 1 ♂ 1 ♀

Comments: Identifications based on Huseynov & Marusik, 2008: 154, f. 19-23, 58, 66. Collected under stones.

6.1.15.9. *Enoplognatha macrochelis* Levy & Amitai, 1981

Distribution: Mediterranean to Azerbaijan

Pitfall trap materials: 20.11.2010 – 04.03.2011, 2 ♂♂ 1 ♀ | 04.03.2011 – 09.04.2011, 1 ♀

Collection materials: 04.03.2011 – 06.03.2011, 4 ♂♂ 13 ♀♀ | 09.04.2011 - 10.04.2011, 18 ♀♀

Comments: Identifications based on Huseynov & Marusik, 2008: 154, f. 3-4, 40-41, 44-45, 57, 68. Collected under stones, abundant in spring.

6.1.15.10. *Enoplognatha thoracica* (Hahn, 1833)

Distribution: Holarctic

Pitfall trap materials: -

Collection materials: 04.03.2011, 1 ♂ | 10.04.2011, 3 ♂♂ 1 ♀

Comments: Identifications based on Bosmans & Van Keer, 1999: 216, f. 30-35. Collected under stones.

6.1.15.11. *Episinus truncatus* Latreille, 1809

Distribution: Palearctic

Pitfall trap materials: 12.04.2011 – 13.05.2011, 1 ♀

Collection materials: 02.05.2010, 1 ♂ 3 ♀♀ | 13.05.2011 - 16.05.2011, 4 ♂♂ 6 ♀♀ | 17.06.2011, 1 ♀

Comments: Identifications based on Knoflach & Thaler, 2000: 421, f. 10, 16, 22. Specimens collected on webs very closely build on ground level, on herbaceous plants or shrubs; abundant in spring.

6.1.15.12. *Euryopis episinoides* (Walckenaer, 1847)

Distribution: Palearctic

Pitfall trap materials: -

Collection materials: 27.07.2010, 1 ♂ | 19.06.2011, 1 ♂ | 03.08.2011, 1 ♀ | 12.08.2011, 1 ♂

Comments: Identifications based on Marusik, Kunt & Danışman, 2009: 69, f. 5-8. Specimens collected under stones or on olive tree trunks. Recently recorded in the close vicinity (Lecigne, 2011).

6.1.15.13. *Kochiura aulica* (C. L. Koch, 1838)

Distribution: All West Palearctic

Pitfall trap materials: -

Collection materials: 27.07.2010, 2 ♀♀ | 07.03.2011, 1 ♂ 1 ♀ | 11.04.2011, 7 ♂♂ 1 ♀| 16.05.2011, 1 ♂ 3♀♀ | 19.06.2011, 2 ♂♂ 1 ♀ | 01.08.2011, 1 ♀ | 01.07.2010, 8 ♀♀

Comments: Identifications based on Le Peru, 2011: 455, f. 740. Majority of the specimens acquired from sweep net or beating samples; few specimens collected under stones. Abundant during spring and summer. Recently recorded in the close vicinity (Lecigne, 2011).

6.1.15.14. *Lasaeola convexa* (Blackwall, 1870)

Distribution: Atlantic and Central Europe, Mediterranean

Pitfall trap materials: -

Collection materials: 09.08.2010, 4 ♂♂ 2 ♀♀ | 04.09.2010, 1 ♂ 1 ♀ | 05.03.2011, 1 ♀ | 11.04.2011, 1 ♂ 1 ♀ | 16.05.2011, 1 ♀ | 09.08.2011, 2 ♂♂

Comments: Identifications based on Levy, 1998b: 154, f. 287-293. New record for Turkey. All specimens acquired from beating of shrubs.

6.1.15.15. *Latrodectus geometricus* C. L. Koch, 1841

Distribution: Cosmopolitan

Pitfall trap materials: -

Collection materials: 04.09.2010, 1 ♀

Comments: Identifications based on Le Peru, 2011: 455, f. 742. One adult female collected under a large stone.

6.1.15.16. *Neospintharus syriacus* (O. P.-Cambridge, 1872)

Distribution: Mediterranean Middle East

Pitfall trap materials: -

Collection materials: 03.10.2010, 1 ♂ 1 ♀ | 10.04.2011, 1 ♂ 2 ♀♀

Comments: Identifications based on Kaya, Yağmur & Kunt, 2009: 89, f. 2-13. Specimens collected under stones or acquired from beating samples.

6.1.15.17. *Neottiura herbigrada* (Simon, 1873)

Distribution: Palearctic

Pitfall trap materials: -

Collection materials: 02.05.2010, 1 ♀ | 11.04.2011, 1 ♀ | 16.05.2011, 2 ♀♀

Comments: Identifications based on Marusik, Kunt & Danışman, 2009: 72, f. 9-12. Specimens collected under stones. Recently recorded in the close vicinity (Lecigne, 2011).

6.1.15.18. *Platnickina nigropunctata* (Lucas, 1846)

Distribution: Mediterranean

Pitfall trap materials: -

Collection materials: 09.08.2010, 5 ♀♀ | 03.10.2010, 1 ♀ | 05.03.2011, 1 ♂ | 11.04.2011, 3 ♂♂ | 16.05.2011, 1 ♀ | 19.06.2011, 3 ♂♂ 2 ♀♀ | 13.08.2011, 1 ♀

Comments: Identifications based on Levy, 1998b: 189, f. 357-363. Represents a new record for Turkey. Acquired from sweep net and beating samples; some specimens also collected under stones.

6.1.15.19. *Rhomphaea* sp. indet

Pitfall trap materials: -

Collection materials: 10.08.2011, 1 ♀

Comments: Identifications based on Agnarsson, 2004: 480. Represents a new genus record for Turkey. Species level identification was not possible due to lack of males, and due to deformation of female genitalia of the only female specimen acquired. One adult female acquired from beating of shrubs.

6.1.15.20. *Simitidion agaricographum* (Levy & Amitai, 1982)

Distribution: Greece, Israel (Mediterraenan)

Pitfall trap materials: -

Collection materials: 01.10.2010, 1 ♀ | 11.04.2011, 13 ♂♂ 4 ♀♀ | 13.05.2011 – 16.05.2011, 5♂♂ 26 ♀♀ | 18.06.2011, 2 ♂♂ 4 ♀♀

Comments: Identifications based on Le Peru, 2011: 473, f. 804. A new record for Turkey. Majority of specimens acquired from beating samples while few adult females collected under stones.

6.1.15.21. *Simitidion lacuna* Wunderlich, 1992

Distribution: Canary Islands, Spain, North Africa, Israel (Mediterranean)

Pitfall trap materials: -

Collection materials: 13.05.2011, 1 ♀

Comments: Identifications based on Levy & Amitai, 1982: 94, f. 17-22. A new record for Turkey. One adult specimen acquired from beating samples.

6.1.15.22. *Steatoda maura* (Simon, 1909)

Distribution: Mediterranean

Pitfall trap materials: -

Collection materials: 21.11.2010, 2 ♀♀ | 04.03.2011, 1 ♀ | 11.04.2011, 1 ♀ | 16.05.2011, 1 ♀

Comments: Identifications based on Levy, 1998b: 67, f. 123-130. A new record for Turkey. Collected from webs on olive tree trunks.

6.1.15.23. *Steatoda paykulliana* (Walckenaer, 1805)

Distribution: All West Palearctic

Pitfall trap materials: 12.04.2011 – 13.05.2011, 1 ♀

Collection materials: 01.05.2010, 1 ♀ | 20.11.2010, 2 ♂♂ 2 ♀♀ | 04.03.2011 – 07.03.2011, 8 ♂♂ 5 ♀♀ | 09.04.2011, 1 ♂ 4 ♀♀ | 18.06.2011, 1 ♀

Comments: Identifications based on Levy, 1998b: 63, f. 116-122. Specimens collected on webs found under large stones; on olive trees; on large rocks and similar substances. Adults abundant in olive groves from autumn to spring.

6.1.15.24. *Steatoda triangulosa* (Walckenaer, 1802)

Distribution: Cosmopolitan

Pitfall trap materials: -

Collection materials: 19.06.2011, 1 ♂

Comments: Identifications based on Levy, 1998b: 59, f. 104-111. One adult specimen collected on web between large rocks. Previously reported by Dalmas, 1920 in close vicinity of the region.

6.1.15.25. *Theridion adrianopoli* Drensky, 1915

Distribution: Mediterranean Europe, Turkey

Pitfall trap materials: 04.03.2011 – 09.04.2011, 1 ♂

Collection materials: 02.05.2010, 1 ♀ | 04.03.2011, 3 ♂♂ | 09.04.2011 - 11.04.2011, 6 ♂♂ 11 ♀♀ | 13.05.2011, 1 ♀

Comments: Identifications based on Le Peru, 2011: 473, f. 803. Collected under stones. Abundant on the ground in spring.

6.1.15.26. *Theridion cyprusense* Wunderlich, 2011

Distribution: Cyprus, Turkey

Pitfall trap materials: 04.03.2011 – 09.04.2011, 1 ♂ 1 ♀

Collection materials: 02.05.2010, 1 ♂ | 19.06.2011, 1 ♀

Comments: Identifications based on Wunderlich, 2011: 240, f. 3-5. Female of this species has not been described yet. New record for Turkey. Specimens collected on webs between rocks, closely located to the ground level.

6.1.15.27. *Theridion genistae* Simon, 1873

Distribution: Western Mediterranean to Uzbekistan

Pitfall trap materials: -

Collection materials: 11.04.2011, 9 ♂♂ | 16.05.2011, 2 ♀♀ | 20.06.2011, 2 ♀♀

Comments: Identifications based on Knoflach, Rollard & Thaler, 2009: 241, f. 34-40. New record for Turkey. Acquired from beating samples.

6.1.15.28. *Theridion melanurum* Hahn, 1831

Distribution: Holarctic, Azores

Pitfall trap materials: -

Collection materials: 02.05.2010, 1 ♀ | 01.07.2010, 1 ♀ | 04.03.2011, 12 ♂♂ 5 ♀♀ | 10.04.2011, 6 ♂♂ 7 ♀♀ | 16.05.2011, 2 ♀♀

Comments: Identifications based on Almquist, 2005: 100, f. 122a-f. Collected under stones or on olive tree trunks under barks.

6.1.15.29. *Theridion mystaceum* L. Koch, 1870

Distribution: Palearctic

Pitfall trap materials: -

Collection materials: 02.05.2010, 2 ♀♀ | 11.04.2011, 7 ♀♀ | 16.05.2011, 3 ♀♀

Comments: Identifications based on Wunderlich, 2011: 252, f. 50-55. Specimens acquired from beating samples.

6.1.16. FAMILY: LINYPHIIDAE Blackwall, 1859

Represented by 16 genera and 16 species, but additional 7 species remains unidentified even up to generic level yet (which means a total of 23 potential species in the collection) and not presented in the list below. There are at least 5 new records (excluding unidentifieds) for Turkey. Most records came from winter and spring samples for Linyphiid spiders in general.

6.1.16.1. *Alioranus pastoralis* (O. P.-Cambridge, 1872)

Distribution: Mediterranean, Tajikistan

Pitfall trap materials: 20.11.2010 – 04.03.2011, 12 ♂♂ | 04.03.2011 – 09.04.2011, 41 ♂♂ 5 ♀♀ | 12.04.2011 – 13.05.2011, 13 ♂♂ 10 ♀♀ | 13.05.2011 – 17.06.2011, 2 ♂♂

Collection materials: 11.04.2011, 5 ♀♀ | 15.05.2011, 1 ♀

Comments: Identifications based on Tanasevitch, 1989: 125, f. 115-116. Acquired from sweep net and sifting samples. Abundant during winter and early spring.

6.1.16.2. *Araeoncus humilis* (Blackwall, 1841)

Distribution: Palearctic, New Zealand

Pitfall trap materials: 13.05.2011 – 17.06.2011, 1 ♂

Collection materials: 11.04.2011, 2 ♀♀

Comments: Identifications based on Roberts, 1987: 90, f. 40a, 41b. Females acquired from sweep net samples. Recently recorded in the close vicinity (Lecigne, 2011).

6.1.16.3. *Canariphantes zonatus* (Simon, 1884)

Distribution: Mediterranean Europe

Pitfall trap materials: 20.11.2010 – 04.03.2011, 12 ♂♂ 4 ♀♀ | 04.03.2011 – 09.04.2011, 8 ♂♂ 1 ♀ | 12.04.2011 – 13.05.2011, 1 ♂

Collection materials: -

Comments: Identifications based on Bosmans, 2006: 179, f. 12-17. New record for Turkey. Abundant in trap samples during winter and early spring.

6.1.16.4. *Erigone dentipalpis* (Wider, 1834)

Distribution: Holarctic

Pitfall trap materials: -

Collection materials: 11.04.2011, 1 ♀ | 13.05.2011, 1 ♀

Comments: Identifications based on Roberts, 1987: 94, f. 43a, 45b. An adult female collected under stones; another acquired from sweep net samples. Recently recorded in the close vicinity (Lecigne, 2011).

6.1.16.5. *Erigonoplus spinifemuralis* Dimitrov, 2003

Distribution: Europe, Turkey

Pitfall trap materials: 12.04.2011 – 13.05.2011, 1 ♂

Collection materials: 11.04.2011, 1 ♀

Comments: Identifications based on Gnelitsa, 2007: 208, f. 1-5, 8-11. Collected under a stone.

6.1.16.6. *Mecopisthes nasutus* Wunderlich, 1995

Distribution: Mediterranean Europe

Pitfall trap materials: 20.11.2010 – 04.03.2011, 2 ♂♂ | 04.03.2011 – 09.04.2011, 4 ♀♀

Collection materials: -

Comments: Identifications based on Wunderlich, 1995b: 664, f. 55-62. New record for Turkey. Collected under stones.

6.1.16.7. *Megalepthyphantes nebulosus* (Sundevall, 1830)

Distribution: Holarctic

Pitfall trap materials: -

Collection materials: 05.08.2011, 1 ♀

Comments: Identifications based on Roberts, 1987: 148, f. 77a. New record for Turkey. Single specimen collected under a stone.

6.1.16.8. *Meioneta rurestris* (C. L. Koch, 1836)

Distribution: Palearctic

Pitfall trap materials: -

Collection materials: 04.03.2011, 1 ♀ | 11.04.2011, 1 ♀ | 16.05.2011, 3 ♀♀ | 17.06.2011, 1 ♀

Comments: Identifications based on Roberts, 1987: 122, f. 61c. Collected under rocks; or acquired from sweep net and beating samples. Recently recorded in the close vicinity (Lecigne, 2011).

6.1.16.9. *Microlinyphia pusilla* (Sundevall, 1830)

Distribution: Holarctic

Pitfall trap materials: -

Collection materials: 02.05.2010, 1 ♂ | 11.04.2011, 1 ♂ | 19.06.2011, 1 ♀

Comments: Identifications based on Roberts, 1987: 164, f. 86b. Collected on webs located on the ground level. One adult male acquired from sweep net samples.

6.1.16.10. *Ostearius melanopygius* (O. P.-Cambridge, 1879)

Distribution: Cosmopolitan

Pitfall trap materials: -

Collection materials: 05.03.2011, 1 ♂ | 10.04.2011, 1 ♀ | 15.05.2011, 1 ♂ 2 ♀♀

Comments: Identifications based on Roberts, 1987: 113, f. 55a. Collected under stones. Recently recorded in the close vicinity (Lecigne, 2011).

6.1.16.11. *Palliduphantes byzantinus* (Fage, 1931)

Distribution: Bulgaria, Greece, Turkey (Mediterranean)

Pitfall trap materials: 13.05.2011 – 17.06.2011, 1 ♀

Collection materials: -

Comments: Identifications based on Deltshev, 1980: 44, pl.

6.1.16.12. *Pelecopsis laptevi* Tanasevitch & Fet, 1986

Distribution: Mediterranean, Iran, Central Asia

Pitfall trap materials: 04.03.2011 – 09.04.2011, 1 ♂

Collection materials: -

Comments: Identifications based on Tanasevitch, 1989: 145, f. 174-177. New record for Turkey.

6.1.16.13. *Prinerigone vagans* (Audouin, 1826)

Distribution: Old World

Pitfall trap materials: 04.03.2011 – 09.04.2011, 1 ♂

Collection materials: 11.04.2011, 3 ♂♂

Comments: Identifications based on Roberts, 1987: 94, f. 42e, 45a. Acquired from sweep net samples; one specimen collected on the ground at day time during activity.

6.1.16.14. *Sintula retroversus* (O. P.-Cambridge, 1875)

Distribution: Europe, Mediterranean Middle East

Pitfall trap materials: -

Collection materials: 10.04.2011, 2 ♀

Comments: Identifications based on Tanasevitch, 1990: 108, f. 14.9-10. Collected under stones.

6.1.16.15. *Styloctetor romanus* (O. P.-Cambridge, 1872)

Distribution: Palearctic

Pitfall trap materials: 01.09.2010 – 01.10.2010, 1 ♂

Collection materials: 04.09.2010, 3 ♂♂ | 11.04.2011, 1 ♀

Comments: Identifications based on Roberts, 1987: 70, f. 29a. New record for Turkey. Adult males acquired from beating samples; one adult female collected under a stone.

6.1.16.16. *Tenuiphantes tenuis* (Blackwall, 1852)

Distribution: Palearctic (elsewhere, introduced)

Pitfall trap materials: 12.04.2011 – 13.05.2011, 1 ♂ 1 ♀

Collection materials: 04.03.2011, 3 ♂♂

Comments: Identifications based on Roberts, 1987: 150, f. 78c. Collected under stones. Recently recorded in the close vicinity (Lecigne, 2011).

6.1.17. FAMILY: TETRAGNATHIDAE Menge, 1866

Represented by a single species.

6.1.17.1. *Tetragnatha* sp. indet

Pitfall trap materials: -

Collection materials: 02.07.2010, 1 ♀ | 19.06.2011, 2 ♂♂ 2 ♀♀

Comments: Identifications based on Almquist, 2005: 120. Specimens collected on webs located between large rocks at the sea shore.

6.1.18. FAMILY: ARANEIDAE Clerck, 1757

Represented by 13 genera and 14 species, with two new records for Turkey.

6.1.18.1. *Agalenatea redii* (Scopoli, 1763)

Distribution: Palearctic

Pitfall trap materials: -

Collection materials: 01.05.2010, 1 ♀ | 28.05.2010, 1 ♀ | 11.04.2011, 2 ♀♀

Comments: Identifications based on Almquist, 2005: 135, f. 148a-k. Specimens collected on webs build on shrubs; or acquired from sweep net samples.

6.1.18.2. *Araneus circe* (Audouin, 1826)

Distribution: Palearctic

Pitfall trap materials: -

Collection materials: 02.05.2010, 3 ♂♂ 4 ♀♀ | 15.05.2011, 1 ♂ 1 ♀ | 17.06.2011 – 20.06.2011, 2 ♂♂ 9 ♀♀

Comments: Identifications based on Thaler, 1991: 50, f. 25, 29. Collected on webs build on shrubs, olive trees, between large rocks or between tall herbaceous plants. Abundant in spring.

6.1.18.3. *Araniella cucurbitina* (Clerck, 1757)

Distribution: Palearctic

Pitfall trap materials: -

Collection materials: 15.05.2011, 2 ♀♀

Comments: Identifications based on *A. c.* Roberts, 1995: 328, f. Acquired from beating samples.

6.1.18.4. *Argiope lobata* (Pallas, 1772)

Distribution: Old World

Pitfall trap materials: -

Collection materials: 02.08.2010, 2 ♀♀ | 01.08.2011 – 10.08.2011, 12♀♀

Comments: Identifications based on Loksa, 1972: 110, f. 100A, 101C-D. Collected on webs generally build on tall xerophytic herbaceous plants. Occasionally webs also observed on shrubs.

6.1.18.5. *Cyclosa conica* (Pallas, 1772)

Distribution: Holarctic

Pitfall trap materials: -

Collection materials: 01.05.2010, 3 ♀♀ | 15.05.2011, 1 ♂

Comments: Identifications based on Roberts, 1995: 336, f. Adult females collected on webs build on shrubs; one adult male acquired from beating samples. Recently recorded in the close vicinity (Lecigne, 2011).

6.1.18.6. *Cyrtophora citricola* (Forsskål, 1775)

Distribution: Old World, Greater Antilles, Costa Rica, Colombia

Pitfall trap materials: -

Collection materials: 01.07.2010, 1 ♂ 3 ♀♀ | 22.07.2010 – 27.07.2010, 3 ♀♀ | 03.10.2010, 1 ♀ | 18.06.2011, 2 ♀♀ | 10.08.2011, 1 ♀

Comments: Identifications based on Levy, 1998a: 323, f. 47-56. New record for Turkey. Adult females collected or observed by beating and during direct searching of shrubs. The only male individual was found dead on the web of an adult female.

6.1.18.7. *Gibbaranea bituberculata* (Walckenaer, 1802)

Distribution: Palearctic

Pitfall trap materials: -

Collection materials: 04.03.2011 – 07.03.2011, 2 ♂♂ 1 ♀ | 10.04.2011, 1 ♀ | 03.05.2011, 1 ♀

Comments: Identifications based on Almquist, 2005: 159, f. 167a-b. Acquired from sweep net samples; one female collected on web closely located to the ground on herbaceous xerophytic

plants. Recently recorded in the close vicinity (Lecigne, 2011).

6.1.18.8. *Hypsosinga sanguinea* (C. L. Koch, 1844)

Distribution: Palearctic

Pitfall trap materials: -

Collection materials: 12.08.2011, 1 ♀

Comments: Identifications based on Almquist, 2005, f. 173a-f. One adult female acquired from sweep net samples.

6.1.18.9. *Larinioides suspicax* (O. P.-Cambridge, 1876)

Distribution: Palearctic

Pitfall trap materials: -

Collection materials: 01.05.2010, 1 ♀ | 10.05.2010, 1 ♂ 1 ♀ | 08.08.2010, 3 ♀♀ | 10.04.2011, 1 ♀ | 15.05.2011, 3 ♀♀

Comments: Identifications based on Levy, 1998a: 347, f. 144-150. Collected or observed on webs build between large rocks at seashore; or on webs build on reeds near brackish or fresh water marshes.

6.1.18.10. *Mangora acalypha* (Walckenaer, 1802)

Distribution: Palearctic

Pitfall trap materials: -

Collection materials: 11.04.2011, 1 ♀ | 15.05.2011, 1 ♀

Comments: Identifications based on Roberts, 1995: 337, f. Adult specimens acquired from sweep net samples. Recently recorded in the close vicinity (Lecigne, 2011).

6.1.18.11. *Neoscona adianta* (Walckenaer, 1802)

Distribution: Palearctic

Pitfall trap materials: -

Collection materials: 29.05.2010, 3 ♂♂ 5 ♀♀ | 18.06.2011, 1 ♂ 1 ♀

Comments: Identifications based on Roberts, 1995: 324, f. Collected on webs between grasses or lower branches of shrubs close to the ground. Recently recorded in the close vicinity (Lecigne, 2011).

6.1.18.12. *Neoscona subfusca* (C. L. Koch, 1837)

Distribution: Old World

Pitfall trap materials: -

Collection materials: 01.05.2010, 2 ♂♂ 4 ♀♀ | 28.06.2010 – 01.07.2010, 5♂♂ 11♀♀ | 25.07.2010, 3 ♀♀ | 08.08.2010, 1 ♂ 3 ♀♀ | 03.09.2010, 1 ♀ | 02.10.2010, 1 ♀ | 17.06.2011 – 20.06.2011, 2 ♂♂ 8♀♀ | 03.08.2011, 1 ♂ 1 ♀ | 09.08.2011, 1 ♀

Comments: Identifications based on Levy, 1998a: 336, f. 96-107. Collected on webs build on shrubs or acquired from beating samples. Most abundant araneid spider along summer.

6.1.18.13. *Parazygiella montana* (C. L. Koch, 1834)

Distribution: Palearctic

Pitfall trap materials: -

Collection materials: 20.11.2010, 6♂♂ 1 ♀ | 10.04.2011 1 ♀

Comments: Identifications based on Roberts, 1995: 335, f. Collected on nests build on olive tree trunks.

6.1.18.14. *Zygiella atrica* (C. L. Koch, 1845)

Distribution: Europe

Pitfall trap materials: -

Collection materials: 19.11.2010 - 20.11.2010, 1 ♂ 8 ♀♀ | 04.03.2011 – 05.03.2011, 4 ♀♀ | 10.04.2011, 1 ♀

Comments: Identifications based on Almquist, 2005: 179, f. 184a-g. New record for Turkey. Collected on webs build on olive tree trunks, few individuals found on webs on the ground.

6.1.19. FAMILY: LYCOSIDAE Sundevall, 1833

Represented by 7 genera and 11 species, with two new records for Turkey.

6.1.19.1. *Alopecosa albofasciata* (Brullé, 1832)

Distribution: All West Palearctic

Pitfall trap materials: 29.5.2010 - 29. 6. 2010, 1 ♀ | 4.3.2011 - 9.4.2011, 5 ♂♂ 3 ♀♀ | 12.04.2011 – 13.05.2011, 5 ♂♂ 2 ♀♀

Collection materials: 04.03.2011 - 07.03.2011, 3 ♂♂ 4 ♀♀ | 11.04.2011, 8 ♂♂ 3 ♀♀ | 15.05.2011, 2 ♀♀

Comments: Identifications based on Fuhn & Niculescu-Burlacu, 1971: 145, f. 67a-f. Collected on the ground during day or night, under stones or during activity. Abundant in spring. Recently recorded in the close vicinity (Lecigne, 2011).

6.1.19.2. *Arctosa leopardus* (Sundevall, 1833)

Distribution: Palearctic

Pitfall trap materials: -

Collection materials: 02.07.2010, 1 ♂ | 12.08.2011, 1 ♀

Comments: Identifications based on Almquist, 2005: 203, f. 204a-f. Collected at the shores of a permanent brackish water brook.

6.1.19.3. *Arctosa variana* C. L. Koch, 1847

Distribution: All West Palearctic

Pitfall trap materials: -

Collection materials: 20.06.2011, 2 ♂♂ 3 ♀♀

Comments: Identifications based on Fuhn & Niculescu-Burlacu, 1971: 189, f. 93a-d. Collected at the shores of temporary water bodies.

6.1.19.4. *Geolycosa vultuosa* (C. L. Koch, 1838)

Distribution: Europe, Mediterranean, Mediterranean Middle East

Pitfall trap materials: -

Collection materials: 01.05.2010, 2 ♀♀ | 04.03.2011, 2 ♀♀

Comments: Identifications based on Zyuzin & Logunov, 2000: 308, f. 5-6, 10. Collected from burrows.

6.1.19.5. *Hogna radiata* (Latreille, 1817)

Distribution: Palearctic

Pitfall trap materials: 29.06.2010 – 26.07.2010, 1 ♀

Collection materials: 13.05.2011, 3 ♂♂ 3 ♀♀ | 18.06.2011, 5 ♂♂ 3 ♀♀ | 01.08.2011, 14 ♀♀

Comments: Identifications based on Fuhn & Niculescu-Burlacu, 1971: 195, f. 95a-e. Collected at night on the ground during activity.

6.1.19.6. *Hogna* sp. indet

Pitfall trap materials: 29.06.2010 – 26.07.2010, 1 ♂ | 26.07.2010 – 02.09.2010, 15 ♂♂ 13 ♀♀ | 01.09.2010 – 01.10.2010, 1 ♀

Collection materials: 30.07.2010 – 02.08.2010, 15 ♂♂ 27 ♀♀ | 31.08.2010 – 04.09.2010, 10 ♂♂ 13 ♀♀ | 01.08.2011 – 10.08.2011, 7 ♂♂ 11♀♀ | 19.11.2010, 2 ♀♀

Comments: Very similar to *H. radiata,* differs slightly in male and female genitalia; and in phenology and body sizes. Possibly *H. graeca* (Roewer, 1951) but comprehensive comparison was not possible due to lack of genitalia drawings in the literature for this species. Collected on the ground at night during activity. Very abundant in August. Very similar specimens also recorded in the close vicinity recently by Lecigne, 2011.

6.1.19.7. *Lycosa praegrandis* C. L. Koch, 1836

Distribution: Europe, Mediterranean to Central Asia

Pitfall trap materials: 26.07.2010 – 02.09.2010, 1 ♂

Collection materials: 03.09.2010, 1♂ 3 ♀♀ | 22.07.2010, 5 ♂♂ 5 ♀♀ | 30.07.2010 – 02.08.2010, 5 ♂♂ 2 ♀♀ 03.09.2010, 1 ♂ 1 ♀ | 17.06.2011, 1 ♀ | 08.08.2011, 3 ♂♂ 1 ♀

Comments: Identifications based on Zyuzin & Logunov, 2000: 306, f. 1-2. Adult males collected on the ground at night during activity; adult females either collected from burrows or during activity in the close periphery of burrows. Abundant in August.

6.1.19.8. *Pardosa roscai* (Roewer, 1951)

Distribution: Mediterranean Europe and Mediterranean Middle East

Pitfall trap materials: 13.05.2011 – 17.06.2011, 1 ♂

Collection materials: 02.10.2010, 1 ♀ | 14.05.2011, 2♂♂ 2 ♀♀ | 19.06.2011, 9 ♂♂ 15 ♀♀ | 03.08.2011, 3 ♀♀

Comments: Identifications based on Bayram, Efil & Deltshev, 2009: 465, f. 1-5. Collected at day and night at shores of temporary water bodies or in wadies. One specimen acquired far away from any water bodies by pitfall traps.

6.1.19.9. *Pardosa luctinosa* Simon, 1876

Distribution: Palearctic

Pitfall trap materials: -

Collection materials: 12.08.2011, 1 ♂

Comments: Identifications based on Tongiorgi, 1966: 300, f. 139-142. New record for Turkey. One adult male collected at the shores of a permanent brackish water brook.

6.1.19.10. *Pardosa vlijmi* den Hollander & Dijkstra, 1974

Distribution: Europe

Pitfall trap materials: -

Collection materials: 02.07.2010, 3 ♂♂ 13 ♀♀

Comments: Identifications based on den Hollander & Dijkstra, 1974: 58, f. 1.1a-b. New record for Turkey. Collected at the shores of a permanent brackish water brook.

6.1.19.11. *Pirata piraticus* (Clerck, 1757)

Distribution: Holarctic

Pitfall trap materials: -

Collection materials: 12.08.2011, 1 ♂ 1 ♀

Comments: Identifications based on Almquist, 2005: 243, f. 238a-f. Specimens collected at the shores of a permanent brackish water brook.

6.1.20. FAMILY: PISAURIDAE Simon, 1890

Represented by a single species, which is also a new record for the Turkey.

6.1.20.1. *Pisaura orientalis* Kulczyński, 1913

Distribution: Mediterranean Europe

Pitfall trap materials: -

Collection materials: 02.05.2010, 2 ♂♂ 3 ♀♀ | 16.05.2011, 2 ♀

Comments: Identifications based on Brignoli, 1984c: 38, f. 5-8. New record for Turkey. Male of this species has not been described yet and unknown to science (Platnick, 2012). Male specimens were approved by DNA barcoding technique (Ratnasingham et. al., 2007). Collected on herbaceous plants.

6.1.21. FAMILY: OXYOPIDAE Thorell, 1870

Represented by 1 genera and 2 species.

6.1.21.1. *Oxyopes globifer* Simon, 1876

Distribution: Mediterranean

Pitfall trap materials: -

Collection materials: 08.08.2010, 3 ♀♀ | 17.06.2011, 1 ♂ | 09.08.2011, 1 ♀

Comments: Identifications based on Levy, 1999: 41, f. 10A-E, 11A-D, 12A-C. Acquired from beating samples.

6.1.21.2. *Oxyopes lineatus* Latreille, 1806

Distribution: Palearctic

Pitfall trap materials: -

Collection materials: 13.05.2011, 3 ♂♂ 2 ♀♀ | 01.08.2011, 1 ♀

Comments: Identifications based on Levy, 1999: 35, f. 4A-C, 5A-C. Acquired from sweep net samples.

6.1.22. FAMILY: ZOROPSIDAE Bertkau, 1882

Represented by a single species.

6.1.22.1. *Zoropsis lutea* (Thorell, 1875)

Distribution: Europe, Turkey

Pitfall trap materials: -

Collection materials: 19.11.2010, 1 ♂ 2 ♀ | 04.03.2011, 2 ♀♀ | 09.04.2011, 1 ♀

Comments: Identifications based on Levy, 1990: 141, f. 1-16. Specimens collected on the ground at night during activity in November; latter females found under stones with cocoons.

6.1.23. FAMILY: AGELENIDAE C. L. Koch, 1837

Represented by 4 genera and 4 species, with two previously unknown species from Turkey.

6.1.23.1. *Agelena orientalis* C. L. Koch, 1837

Distribution: Europe, Mediterranean

Pitfall trap materials: 26.07.2010 – 02.09.2010, 1♀

Collection materials: 30.06.2010 – 02.07.2010, 4♀♀ | 31.08.2010 – 04.09.2010, 2♀♀ | 17.06.2011, 1 ♀ | 05.08.2011, 1 ♀

Comments: Identification based on Kovblyuk & Kastrygina, 2011: 274, f. 13–15-27. Collected on funnel webs build on the ground, between vegetation or large rocks; on olive tree trunks; on shrubs. Previously recorded in close vicinity of the study area (Dalmas, 1920).

6.1.23.2. *Maimuna vestita* (C. L. Koch, 1841)

Distribution: Europe, Mediterranean Middle East

Pitfall trap materials: 01.10.2010 – 20.11.2010, 1♀ | 20.11.2010 – 04.03.2011, 1♂ 1♀ | 04.03.2011 – 09.04.2011, 1♂ 1♀

Collection materials: 20.11.2010, 10♂♂ 6♀♀ | 03.04.2011, 3♂♂ 9♀♀ | 10.04.2011, 2♂♂ 4♀♀ | 14.5.2011, 1♀

Comments: Identification based on *M. v.* Levy, 1996 : 109, f. 101-105. Collected on funnel webs usually build on the ground between leaves, stones or other substrates or on rock surfaces, stone walls and olive tree trunks. Adults abundant in Autumn and early Spring. Previously recorded in close vicinity of the region (Dalmas, 1920). Recently recorded in the close vicinity (Lecigne, 2011).

6.1.23.3. *Malthonica* sp. in det

Pitfall trap materials: -

Collection materials: 02.05.2010, 1 ♂ | 29.05.2010, 3♂♂ 2♀♀ | 01.07.2010, 2♀♀ | 02.09.2010, 1♀

Measurements:

Comments: Generic level identification based on Bolzern, Hänggi & Burckhardt, 2010. A previously unknown species from Turkey. Collected or observed on nests characteristically located in deep and shaded rock cavities on large rock formations. Males also found away from nests at night on large rocks or on stone walls.

6.1.23.4. *Tegenaria paragamiani* Deltshev, 2008

Distribution: Greece

Pitfall trap materials: -

Collection materials: 29.05.2010, 1 ♂ | 18.06.2011, 1 ♀

Comments: Identifications based on Deltshev, 2008: 40, f. 9-16. New record for Turkey. Collected on nests build on the ground level between rocks.

6.1.24. FAMILY: CYBAEIDAE Banks, 1892

6.1.24.1. *Argyroneta aquatica* (Clerck, 1757)

Distribution: Palearctic

Pitfall trap materials: -

Collection materials: 08.08.2011, 3 ♂♂ 6 ♀♀

Measurements:

Comments: Identifications based on De Blauwe, 1973: 4, f. 1-3. Collected in a permanent brackish water brook, from retreats under water under stones or in macrophytes.

6.1.25. FAMILY: DICTYNIDAE O. P.-Cambridge, 1871

Represented by 5 genera and 8 species, with 4 previously unknown species for Turkey.

6.1.25.1. *Argenna subnigra* (O. P.-Cambridge, 1861)

Distribution: Europe

Pitfall trap materials: 04.03.2011 – 09.04.2011, 9 ♂♂ 1 ♀ | 12.04.2011 – 13.05.2011, 7 ♂♂

Collection materials: -

Comments: Identifications based on Almquist, 2006: 304, f. 267a-f. New record for Turkey.

6.1.25.2. *Dictyna civica* (Lucas, 1850)

Distribution: Europe, North Africa

Pitfall trap materials: -

Collection materials: 08.08.2010, 1 ♂ | 11.04.2011, 1♂ 4 ♀♀ | 15.05.2011, 1 ♀ | 01.08.2011 – 12.08.2011, 6♂♂ 2 ♀♀

Comments: Identifications based on Loksa, 1969: 43, f. 26G, 28A-B, 32D-E. Acquired from sweep net and beating samples. Also collected on the ground under rocks.

6.1.25.3. *Lathys humilis* (Blackwall, 1855)

Distribution: Palearctic

Pitfall trap materials: -

Collection materials: 06.03.2011, 2 ♂♂ 4 ♀♀ | 11.04.2011, 1 ♀ | 15.05.2011, 2 ♀♀

Comments: Identifications based on Marusik, Kovblyuk & Nadolny, 2009: 22, f. 21-24, 38, 43. New record for Turkey. Acquired from beating samples or collected on the ground under stones.

6.1.25.4. *Lathys stigmatisata* (Menge, 1869)

Distribution: Palearctic

Pitfall trap materials: -

Collection materials: 20.11.2010, 1 ♂

Comments: Identifications based on Marusik, Kovblyuk & Nadolny, 2009: 22, f. 4, 29-32, 44, 51-53. New record for Turkey. Collected during ground sampling under stones.

6.1.25.5. *Marilynia bicolor* (Simon, 1870)

Distribution: Palearctic

Pitfall trap materials: -

Collection materials: 09.08.2011, 2 ♂♂

Comments: Identifications based on Lehtinen, 1967: 246, f. 310. Acquired from beating samples. Recently recorded in the close vicinity (Lecigne, 2011).

6.1.25.6. *Nigma flavescens* (Walckenaer, 1830)

Distribution: Palearctic

Pitfall trap materials: -

Collection materials: 20.11.10, 3 ♂♂

Comments: Identifications based on Wunderlich, 2011: 313, f. 2, 5, 8, 10, 17. New record for Turkey. Adult males collected during ground sampling.

6.1.25.7. *Nigma puella* (Simon, 1870)

Distribution: Europe, North Africa

Pitfall trap materials: -

Collection materials: 11.04.2011, 1 ♂

Comments: Identifications based on Wunderlich, 2011: 313, f. 4, 6, 9, 13, 18. Only specimen acquired from sweep net samples.

6.1.25.8. *Scotolathys simplex* Simon, 1884

Distribution: Mediterranean Europe

Pitfall trap materials: 20.11.2010 – 04.03.2011, 6 ♂♂

Collection materials: 14.05.2011, 3 ♀♀

Comments: Identifications based on Marusik, Kovblyuk & Nadolny, 2009: 32, f. 39-42, 58-64. Adult females acquired from sifting samples.

6.1.26. FAMILY: AMAUROBIIDAE O. P.-Cambridge, 1871

Represented by a single species.

6.1.26.1. *Amaurobius erberi* (Keyserling, 1863)

Distribution: Europe, Mediterranean

Pitfall trap materials: 20.11.2010 – 04.03.2011, 4 ♂♂

Collection materials: -

Comments: Identifications based on Pesarini, 1991: 266, f. 3a-b, 6a-b. Acquired from pitfall traps in winter period.

6.1.27. FAMILY: MITURGIDAE Simon, 1886

Represented by 1 genus and 2 species.

6.1.27.1. *Cheiracanthium mildei* L. Koch, 1864

Distribution: Holarctic, Argentina

Pitfall trap materials: 29.06.2010 – 26.07.2010, 1 ♂

Collection materials: 12.08.2011, 1 ♀

Comments: Identifications based on Heimer & Nentwig, 1991: 396, f. 1032. Specimen collected under rocks. Recently recorded in the close vicinity (Lecigne, 2011).

6.1.27.2. *Cheiracanthium* sp. indet

Pitfall trap materials: -

Collection materials: 02.05.2010, 1 ♂

Comments: Male palp very typical within the genus as described in Almquist, 2006: 351; with retrolateral apophysis and long and tapering cymbial spur. Specimen collected during day on herbaceous plants.

6.1.28. FAMILY: ANYPHAENIDAE Bertkau, 1878

Represented by a single species.

6.1.28.1. *Anyphaena sabina* L. Koch, 1866

Distribution: All West Palearctic

Pitfall trap materials: -

Collection materials: 05.03.2011, 1 ♂

Comments: Identifications based on Urones, Barrientos & Espuny, 1995: 123, f. 18-22. One adult male acquired from beating samples.

6.1.29. FAMILY: LIOCRANIDAE Simon, 1897

Represented by 2 genera and 3 species, with 2 new records for the Turkey.

6.1.29.1. *Agroeca parva* Bosmans, 2011

Distribution: Greece

Pitfall trap materials: 01.10.2010 - 20.11.2010, 1 ♂

Collection materials: 10.04.2011, 1 ♀

Comments: Identifications based on Bosmans, 2011: 19, f. 11-14. New record for Turkey. Collected at night on the ground.

6.1.29.2. *Mesiotelus scopensis* Drensky, 1935

Distribution: Greece, Bulgaria, Macedonia

Pitfall trap materials: 29.5.2010 - 29. 6. 2010, 3 ♀♀ | 01.10.2010 - 20.11.2010, 2 ♀♀ | 20.11.2010 - 4.3.2011, 2 ♂♂ 1♀ | 4.3.2011 - 9.4.2011, 3 ♂♂ 2 ♀♀

Collection materials: 20.11.2010, 2 ♀♀ | 4.03.2011, 1 ♂ 5 ♀♀ | 10.04.2011, 2 ♀♀

Comments: Identifications based on Bosmans et al., 2009: 34, f. 29-33 and Lazarov, 2009: 34, f. 6-10. New record for Turkey. Collected at night on the ground or under stones.

6.1.29.3. *Mesiotelus tenuissimus* (L. Koch, 1866)

Distribution: Europe, Mediterranean

Pitfall trap materials: 13.05.2011 – 17.06.2011, 2 ♀♀

Collection materials: 21.11.2010, 4 ♀♀ | 05.03.2011, 4 ♀♀

Comments: Identifications based on Bosmans et al., 2009: 35, f. 24-28. Collected at night on the ground or under stones.

6.1.30. FAMILY: CLUBIONIDAE Wagner, 1887

Represented by one species, which is also a new record for Turkey.

6.1.30.1. *Clubiona genevensis* L. Koch, 1866

Distribution: Palearctic

Pitfall trap materials: -

Collection materials: 04.03.2011 – 07.03.2011, 3♂♂ 11 ♀♀ | 09.04.2011, 5 ♀♀ | 03.05.2011, 2 ♂♂ 2 ♀♀ | 13.05.2011 – 16.05.2011, 10 ♀♀ | 18.06.2011, 1 ♀

Comments: Identifications based on Almquist, 2006: 368, f. 318a-h. New record for Turkey. Collected at night on the ground; under stones; on shrubs; or acquired from sweep net; sifting; and beating samples.

6.1.31. FAMILY: ZODARIIDAE Thorell, 1881

Represented by 2 genera and 3 species.

6.1.31.1. *Palaestina expolita* O. P.-Cambridge, 1872

Distribution: Mediterranean Europe and Mediterranean Middle East

Pitfall trap materials: 29.05.2010 – 29.06.2010, 4 ♂♂ | 29.06.2010 – 26.07.2010, 3 ♂♂ 1 ♀ | 26.07.2010 – 02.09.2010, 2 ♂♂ 2 ♀♀ | 02.09.2010 – 01.10.2010, 1 ♀ | 12.04.2011 – 13.05.2011, 1 ♂ 2 ♀♀ | 13.05.2011 – 17.06.2011, 9 ♂♂

Collection materials: -

Comments: Identifications based on Levy, 1992: 69, f. 1-12.

6.1.31.2. *Zodarion kossamos* Bosmans, 2009

Distribution: Mediterranean Europe

Pitfall trap materials: 29.05.2010 – 29.06.2010, 4 ♂♂ 1 ♀ | 29.06.210 – 26.07.2010, 18 ♂♂ 11 ♀♀ | 26.07.2010 – 02.09.2010, 13 ♂♂ 6 ♀♀ | 01.09.2010 – 01.10.2010, 5 ♀♀ | 01.10.2010 – 20.11.2010, 1 ♂ 3 ♀♀ | 04.03.2011 – 09.04.2011, 2 ♂♂ 3 ♀♀ | 12.04.2011 – 13.05.2011, 8 ♂♂ 2 ♀♀ | 13.05.2011 – 17.06.2011, 4 ♂♂ 9 ♀♀

Collection materials: 11.04.2011, 5 ♂♂ | 16.05.2011, 1 ♂ 1 ♀ | 17.06.2011, 3 ♂♂ 1 ♀

Comments: Identifications based on Bosmans, 2009: 253, f. 100-103, 146-147. Collected on the ground at night during activity; or collected under stones. Recently recorded in the close vicinity (Lecigne, 2011).

6.1.31.3. *Zodarion thoni* Nosek, 1905

Distribution: Europe, Mediterranean Middle East

Pitfall trap materials: 29.05.2010 – 29.06.2010, 7 ♂♂ 4 ♀♀ | 29.06.210 – 26.07.2010, 16 ♂♂ 10 ♀♀ | 26.07.2010 – 02.09.2010, 34 ♂♂ 21 ♀♀ | 01.09.2010 – 01.10.2010, 5 ♂♂ 9 ♀♀ | 01.10.2010 – 20.11.2010, 12 ♂♂ 6 ♀♀ | 04.03.2011 – 09.04.2011, 18 ♂♂ 6 ♀♀ | 12.04.2011 – 13.05.2011, 38 ♂♂ 10 ♀♀ | 13.05.2011 – 17.06.2011, 23 ♂♂ 15 ♀♀

Collection materials: 02.05.2010, 1 ♂ 2 ♀♀ | 27.07.2010, 3 ♂♂ 3 ♀♀ | 04.09.2010, 1 ♀ | 03.10.2010, 2 ♂♂ 2 ♀♀ | 22.11.2010, 1 ♂ | 11.04.2011, 6 ♂♂ 6 ♀♀ | 16.05.2011, 5 ♂♂ | 17.06.2011, 3 ♂♂ 2 ♀♀ | 03.08.2011, 1 ♀

Comments: Identifications based on Bosmans, 2009: 272, f. 168-169, 176-177. Collected on the ground at night during activity or collected under stones. Abundant on a year round basis, except winter period. Recently recorded in the close vicinity (Lecigne, 2011).

6.1.32. FAMILY: PRODIDOMIDAE Simon, 1884

Represented by a single species.

6.1.32.1. *Prodidomus amaranthinus* (Lucas, 1846)

Distribution: Mediterranean Middle East, North Africa

Pitfall trap materials: 13.05.2011 – 17.06.2011, 1 ♂

Collection materials: -

Comments: Identifications based on Topçu & Türkeş, 2010: 425, f. 1-3.

6.1.33. FAMILY: GNAPHOSIDAE Pocock, 1898

Represented by 17 genera and 30 species, with 7 new records for Turkey, excluding one unidentified species, which is not presented in the list below.

6.1.33.1. *Anagraphis pallens* Simon, 1893

Distribution: South Africa, Mediterranean Europe, Mediterranean Middle East

Pitfall trap materials: 29.06.2010 – 26.07.2010, 2 ♂♂ | 26.07.2010 – 02.09.2010, 4 ♂♂ | 01.09.2010 – 01.10.2010, 1 ♂ | 20.11.2010 – 04.03.2011, 1 ♂

Collection materials: 03.09.2010, 1 ♂ | 21.11.2010, 2 ♂♂ | 14.05.2011, 1 ♀ | 03.08.2011, 1 ♂

Comments: Identifications based on Murphy, 2007: 41, f. 230-231. Collected under stones.

6.1.33.2*. Berinda ensigera* (O. P.-Cambridge, 1874)

Distribution: Mediterranean Europe, Mediterranean Middle East

Pitfall trap materials: 29.05.2010 – 29.06.2010, 1 ♀ | 29.06.2010 – 26.07.2010, 1 ♀ | 13.05.2011 – 17.06.2011, 3 ♂♂

Collection materials: 01.07.2010, 2 ♀♀

Comments: Identifications based on Kovblyuk et al., 2009: 170, f. 1-11. Collected at night on the ground. Recently recorded in the close vicinity (Lecigne, 2011).

6.1.33.3*. Callilepis cretica* (Roewer, 1928)

Distribution: Mediterranean Europe, Mediterranean Middle East

Pitfall trap materials: 29.05.2010 – 29.06.2010, 1 ♂

Collection materials: -

Comments: Identifications based on Chatzaki, Thaler & Mylonas, 2002a: 575, f. 20-23.

6.1.33.4*. Cryptodrassus creticus* Chatzaki, 2002

Distribution: Mediterranean Europe

Pitfall trap materials: 29.05.2010 – 29.06.2010, 2 ♂♂ | 13.05.2011 – 17.06.2011, 2 ♂♂

Collection materials: -

Comments: Identifications based on Murphy, 2007: 65, f. 530-531.

6.1.33.5*. Drassodes lutescens* (C. L. Koch, 1839)

Distribution: All West Palearctic

Pitfall trap materials: 13.05.2011 – 17.06.2011, 1 ♂

Collection materials: 05.03.2011, 2 ♂♂ | 09.04.2011, 5 ♂♂ 3 ♀♀ | 13.05.2011, 2 ♀♀ |

Comments: Identifications based on Chatzaki, Thaler & Mylonas, 2002b: 613, f. 23-26. All adult males collected at night on the ground during activity; while females collected under stones.

6.1.33.6*. Drassyllus jubatopalpis* Levy, 1998

Distribution: Mediterranean Middle East

Pitfall trap materials: 13.05.2011 – 17.06.2011, 2 ♂♂

Collection materials: -

Comments: Identifications based on Kovblyuk et al., 2009: 176, f. 25-26

6.1.33.7*. Drassyllus praeficus* (L. Koch, 1866)

Distribution: Palearctic

Pitfall trap materials: -

Collection materials: 19.06.2011, 1 ♀

Comments: Identifications based on Chatzaki, Thaler & Mylonas, 2003. Collected at the shore of a temporary water body.

6.1.33.8*. Gnaphosa* sp. indet

Pitfall trap materials: -

Collection materials: 02.05.2010, 2 ♀

Comments: Specimens display very characteristical morphology of epigyne and vulvae, however due to lack of male specimens, species level identification was not possible. Specimens collected on the ground at night.

6.1.33.9*. Haplodrassus morosus* (O. P.-Cambridge, 1872)

Distribution: Mediterranean Middle East to Central Asia

Pitfall trap materials: 04.03.2011 – 09.04.2011, 1 ♂

Collection materials: 04.03.2011, 1♂ 1 ♀

Comments: Identifications based on Levy, 2004: 26, f. 62-65. Collected under stones.

6.1.33.10*. Haplodrassus signifer* (C. L. Koch, 1839)

Distribution: Holarctic

Pitfall trap materials: 04.03.2011 – 09.04.2011, 1 ♂

Collection materials: 05.03.2011, 2 ♂♂

Comments: Identifications based on Almquist, 2006: 411, f. 354a-i. Collected under stones.

6.1.33.11*. Leptodrassus albidus* Simon, 1914

Distribution: Europe, Mediterranean Middle East

Pitfall trap materials: -

Collection materials: 17.06.2011, 3 ♀♀

Comments: Identifications based on Chatzaki, Thaler & Mylonas, 2002a: 589, f. 64-65, 72. Collected on the ground; one specimen acquired from sweep net samples.

6.1.33.12. *Leptopilos hadjissaranti* (Chatzaki, 2002)

Distribution: Crete

Pitfall trap materials: 26.07.2010 – 02.09.2010, 1 ♂ 3 ♀♀ | 13.05.2011 – 17.06.2011, 1 ♂

Collection materials: 18.06.2011, 1 ♂

Comments: Identifications based on Chatzaki, Thaler & Mylonas, 2002a: 590, f. 68-69, 76-77. New record for Turkey. Collected at night on the ground.

6.1.33.13. *Leptopilos levantinus* Levy, 2009

Distribution: Crete, Israel

Pitfall trap materials: 26.07.2010 – 02.09.2010, 1 ♂ 1 ♀

Collection materials: 17.06.2011, 1 ♀

Comments: Identifications based on Levy, 2009: 10, f. 19-22. New record for Turkey. Collected at night on the ground.

6.1.33.14. *Nomisia aussereri* (L. Koch, 1872)

Distribution: Palearctic

Pitfall trap materials: 01.09.2010 – 01.10.2010, 2 ♂♂ 2 ♀♀ | 01.10.2010 – 20.11.2010, 3 ♂♂ 3 ♀♀ | 12.04.2011 – 13.05.2011, 1 ♂

Collection materials: 03.09.2010, 1 ♂ | 01.10.2010 – 03.10.2010, 13♂♂ 1 ♀ | 20.11.2010, 4 ♀

Comments: Identifications based on Levy, 1995: 929, f. 21-25. Collected on the ground during activity at night or under stones. Previously recorded in close vicinity of the region (Dalmas, 1920).

6.1.33.15. *Nomisia exornata* (C. L. Koch, 1839)

Distribution: All West Palearctic to Central Asia

Pitfall trap materials: 12.04.2011 – 13.05.2011, 1 ♂ | 13.05.2011 – 17.06.2011, 3 ♂♂ 1 ♀

Collection materials: 02.05.2010, 2 ♂♂ 1 ♀ | 13.05.2011, 1 ♂ 1 ♀

Comments: Identifications based on Murphy, 2007: 32, f. 120-121. Collected on the ground at night or under stones. Recently recorded in the close vicinity (Lecigne, 2011).

6.1.33.16. *Nomisia palaestina* (O. P.-Cambridge, 1872)

Distribution: Mediterranean Europe, Mediterranean Middle East

Pitfall trap materials: 12.04.2011 – 13.05.2011, 1 ♀

Collection materials: 09.04.2011, 1 ♂ 3 ♀♀

Comments: Identifications based on Levy, 1995: 938, f. 48-52. Collected under stones.

6.1.33.17*. Nomisia ripariensis* (O. P.-Cambridge, 1872)

Distribution: Mediterranean Europe, Mediterranean Middle East

Pitfall trap materials: 29.05.2010 – 29.06.2010, 1 ♀ | 12.04.2011 – 13.05.2011, 1 ♂ | 13.05.2011 – 17.06.2011, 4 ♂♂ 3 ♀♀

Collection materials: 13.05.2011, 2 ♀♀ | 18.06.2011, 3 ♀♀

Comments: Identifications based on Levy, 1995: 931, f. 26-30. Collected under stones; one specimen acquired from sifting samples.

6.1.33.18*. Poecilochroa furcata* Simon, 1914

Distribution: Europe

Pitfall trap materials: -

Collection materials: 02.05.2010, 1 ♂

Comments: Identifications based on Di Franco, 2001: 203, f. 3-4. New record for Turkey. Only specimen collected under stones.

6.1.33.19*. Pterotricha lentiginosa* (C. L. Koch, 1837)

Distribution: Europe, Mediterranean

Pitfall trap materials: 29.06.2010 – 26.07.2010, 1 ♀

Collection materials: 16.05.2011, 2 ♂♂ 1 ♀

Comments: Identifications based on Levy, 1995: 969, f. 126-127. Collected under stones.

6.1.33.20*. Scotophaeus blackwalli* (Thorell, 1871)

Distribution: Cosmopolitan

Pitfall trap materials: -

Collection materials: 10.04.2011, 1 ♀

Comments: Identifications based on Platnick & Shadab, 1977b: 41, f. 123-129. One adult female collected on an olive tree, under bark.

6.1.33.21. *Scotophaeus scutulatus* (L. Koch, 1866)

Distribution: Europe, Mediterranean Middle East, Central Asia

Pitfall trap materials: -

Collection materials: 20.11.10, 1 ♀

Comments: Identifications based on Chatzaki, Thaler & Mylonas, 2002b: 619, f. 46-47. One adult female collected on the ground at night, during activity.

6.1.33.22. *Synaphosus trichopus* (Roewer, 1928)

Distribution: Mediterranean Europe

Pitfall trap materials: 29.05.2010 – 29.06.2010, 4 ♀♀ | 29.06.2010 – 26.07.2010, 1 ♀ | 26.07.2010 – 02.09.2010, 6 ♀♀ | 12.04.2011 – 13.05.2011, 4 ♂♂ | 13.05.2011 – 17.06.2011, 10 ♂♂ 2 ♀♀

Collection materials: 13.05.2011, 4 ♂♂ 2 ♀♀ | 17.06.2011, 1 ♂ 2 ♀♀

Comments: Identifications based on Chatzaki, Thaler & Mylonas, 2002b: 623, f. 53-54, 59-60. New record for Turkey. Collected at night on the ground; under stones; or acquired from sifting samples.

6.1.33.23. *Trachyzelotes barbatus* (L. Koch, 1866)

Distribution: Mediterranean to Central Asia, USA

Pitfall trap materials: 29.05.2010 – 29.06.2010, 6 ♂♂ 10 ♀♀ | 29.06.2011 – 26.07.2011, 6 ♂♂ 11 ♀♀ | 26.07.2010 – 02.09.2010, 1 ♂ 6 ♀♀ | 01.09.2010 – 01.10.2010, 1 ♂ | 13.05.2011 – 17.06.2011, 2 ♂♂

Collection materials: 02.05.2010, 1 ♂ | 28.06.2010, 2 ♀♀ | 17.06.2011, 1 ♂

Comments: Identifications based on Chatzaki, Thaler & Mylonas, 2003: 53, f. 20-21, 26-27. Collected at night on the ground during activity or under stones.

6.1.33.24. *Zelotes* cf. *apricorum* (L. Koch, 1876)

Distribution: Europe to Kazakhstan

Pitfall trap materials: 29.05.2010 – 29.06.2010, 11 ♂♂ 3 ♀♀ | 13.05.2011 – 17.06.2011, 10 ♂♂ 2 ♀♀

Collection materials: -

Comments: Identifications based on Murphy & Platnick, 1986: 99, f. 1-4. Specimens are very similar to *Z. apricorum* with slight differences on both male and female genitalia.

6.1.33.25. *Zelotes* cf. *longipes* (L. Koch, 1866)

Distribution: Palearctic

Pitfall trap materials: 29.05.2010 – 29.06.2010, 2 ♀♀ | 20.11.2010 – 04.03.2011, 1 ♀ | 04.03.2011 – 09.04.2011, 1 ♂ 5 ♀♀ | 13.05.2011 – 17.06.2011, 3 ♀♀

Collection materials: 02.10.2010, 1 ♂ | 19.11.2010, 1♀ | 04.03.2011, 1 ♂ 1 ♀ | 09.04.2011, 1 ♀

Comments: Identifications based on Locket & Millidge, 1951: 114, f. 58F, 59B, E. Male genitalia very similar but there are slight differences in female genitalia. Collected under stones.

6.1.33.26. *Zelotes* cf. *mundus* (Kulczyński, 1897)

Distribution: Palearctic

Pitfall trap materials: 29.05.2010 – 29.06.2010, 14 ♂♂ 2 ♀♀ | 29.06.2010 – 26.07.2010, 3 ♂♂ 2 ♀♀ | 26.07.2010 – 02.09.2010, 1 ♀ | 13.05.2011 – 17.06.2011, 1 ♂

Collection materials: -

Comments: Identifications based on Esyunin & Efimik, 1997: 111, f. 16, 19-22. New record for Turkey. Female genitalia very similar. Male genitalia differs in structure of tibial apophysis and there are slight differences at the apical part of male bulbus.

6.1.33.27. *Zelotes* cf. *scrutatus* (O. P.-Cambridge, 1872)

Distribution: Mediterranean Middle East, North Africa

Pitfall trap materials: 29.05.2010 – 29.06.2010, 2 ♀♀ | 13.05.2011 – 17.06.2011, 6 ♂♂ 1 ♀

Collection materials: 02.05.2010, 1 ♂ | 13.05.2011, 1 ♀ | 17.06.2011, 1 ♀

Comments: Identifications based on Chatzaki, Thaler & Mylonas, 2003: 69, f. 72-76. Both male and female are very similar to *Z. scrutatus*, with only very slight differences. New record for Turkey. Collected under stones.

6.1.33.28. *Zelotes solstitialis* Levy, 1998

Distribution: Mediterranean Europe, Mediterranean Middle East

Pitfall trap materials: 26.07.2010 – 02.09.2010, 16 ♂♂ 3 ♀♀ | 01.09.2010 – 01.10.2010, 7 ♂♂ 19 ♀♀

Collection materials: 23.07.2010, 6 ♂♂ 1 ♀ | 08.08.2010, 1 ♂ | 04.09.2010, 2 ♂♂ 2 ♀♀

Comments: Identifications based on Chatzaki, Thaler & Mylonas, 2003: 60, f. 46-47, 50-51. Collected under stones.

6.1.33.29. *Zelotes tenuis* (L. Koch, 1866)

Distribution: Holarctic

Pitfall trap materials: 29.05.2010 – 29.06.2010, 1 ♂ | 29.06.2010 – 26.07.2010, 3 ♂♂ | 01.09.2010 – 01.10.2010, 1 ♀ | 13.05.2011 – 17.06.2011, 1 ♂

Collection materials: 22.07.2010, 1 ♀ | 17.06.2011, 3 ♂♂ 1 ♀

Comments: Identifications based on Levy, 1998c: 131, f. 78-81. Collected on the ground at night during activity or under stones; or acquired from sifting samples.

6.1.33.30. *Zelotes zin* Levy, 1998

Distribution: Mediterranean Middle East

Pitfall trap materials: 29.05.2010 – 29.06.2010, 2 ♂♂ | 29.06.2010 – 26.07.2010, 1 ♀ | 13.05.2011 – 17.06.2011, 2 ♂♂

Collection materials: -

Comments: Identifications based on Levy, 1998c: 129, f. 73-74 and Levy, 2009: 40, f. 85-86. New record for Turkey.

6.1.34. FAMILY: SELENOPIDAE Simon, 1897

Represented by a single species.

6.1.34.1. *Selenops radiatus* Latreille, 1819

Distribution: Palearctic

Pitfall trap materials: -

Collection materials: 21.11.2010, 4 ♂♂ 2 ♀♀ | 01.08.2011, 1 ♀ | 09.04.2011, 1 ♀ | 18.06.2011, 1 ♀

Comments: Identifications based on Kunt, Tezcan & Yağmur, 2011: 608, f. 2A-G. Collected at night on large and smooth surfaced rocks during activity. Was abundant in rocky patches of the study area, and collected or observed exclusively on very smooth surfaced large rocks. A very well camouflaged, very quick and very hard to collect spider species. Adults were abundant in autumn, and although present, gets rarer in spring.

6.1.35. FAMILY: SPARASSIDAE Bertkau, 1872

Represented by 2 genera and 2 species.

6.1.35.1. *Eusparassus walckenaeri* (Audouin, 1826)

Distribution: Europe, Mediterranean

Pitfall trap materials: -

Collection materials: 30.06.2010 – 02.07.2010, 5 ♀♀ | 04.09.2010, 2 ♀♀ | 17.06.2011, 1 ♂ 1 ♀

Comments: Identifications based on Levy, 1989: 132, f. 3-18. Specimens collected at night on the ground, on olive trees or on large rocks during activity. Some specimens also collected under large stones from their retreats. A very fast and very hard to collect spider species, was abundant in summer period. This spider builds a white, papery retreat under large stones and probably one spider builds many of these retreats along its life time, because such retreats are very common to find, almost under every single large stone or other kinds of substrates on the ground.

6.1.35.2. *Micrommata ligurina* (C. L. Koch, 1845)

Distribution: Europe, Mediterranean

Pitfall trap materials: -

Collection materials: 07.03.2011, 1 ♀

Comments: Identifications based on Urones, 2004: 46, f. 1-3, 14-17. One adult female acquired from sweep net samples. Previously recorded from the close vicinity of study area (Dalmas, 1920).

6.1.36. FAMILY: PHILODROMIDAE Thorell, 1870

Represented by 2 genera and 7 species.

6.1.36.1. *Philodromus bistigma* Simon, 1870

Distribution: Mediterranean

Pitfall trap materials: -

Collection materials: 02.05.2010, 1 ♀ | 13.05.2011 – 16.05.2011, 12 ♂♂ 13 ♀♀ | 18.06.2011, 5 ♀♀

Comments: Identifications based on Crespo, 2008: 403, f. 3A-C. Collected under stones; or acquired from sifting samples.

6.1.36.2. *Philodromus cespitum* (Walckenaer, 1802)

Distribution: Holarctic

Pitfall trap materials: -

Collection materials: 01.07.2010, 1 ♀ | 13.05.2011, 4 ♂♂ 5 ♀♀ | 17.06.2011, 2 ♀♀

Comments: Identifications based on Almquist, 2006: 456, f. 390a-f. Acquired from beating samples; or collected on shrubs. Recently recorded in the close vicinity (Lecigne, 2011).

6.1.36.3. *Philodromus pulchellus* Lucas, 1846

Distribution: Europe, Mediterranean

Pitfall trap materials: -

Collection materials: 09.04.2011, 1 ♂ 1 ♀ | 18.06.2011, 3 ♀♀

Comments: Identifications based on Muster, Bosmans & Thaler, 2007: 60, f. 5, 7, 21, 32, 43, 54, 63-64. Acquired from beating or sifting samples. Recently recorded in the close vicinity (Lecigne, 2011).

6.1.36.4. *Philodromus rufus* Walckenaer, 1826

Distribution: Holarctic

Pitfall trap materials: -

Collection materials: 04.03.2011, 1 ♂

Comments: Identifications based on Almquist, 2006: 468, f. 400a-d. A single specimen collected on olive tree trunk.

6.1.36.5. *Philodromus* sp. indet

Pitfall trap materials: -

Collection materials: 28.06.2010, 1 ♀

Comments: Female genitalia typical for the genus, as described in Almquist, 2006: 453. Species level identification was not possible due to lack of males in the collection. Collected under a large rock.

6.1.36.6. *Thanatus atratus* Simon, 1875

Distribution: Palearctic

Pitfall trap materials: 12.04.2011 – 13.05.2011, 4 ♂♂ 1 ♀ | 13.05.2011 – 17.05.2011, 7 ♂♂ 2 ♀♀

Collection materials: 02.05.2010, 1 ♀ | 13.05.2011 – 16.05.2011, 7 ♂♂ 16 ♀♀ | 19.06.2011, 1 ♀

Comments: Identifications based on Almquist, 2006: 471, f. 403a-d. Collected under stones and on herbaceous plants; or acquired from sweep net samples.

6.1.36.7. *Thanatus imbecillus* L. Koch, 1878

Distribution: Mediterranean

Pitfall trap materials: 12.04.2011 – 13.05.2011, 1 ♂ | 13.05.2011 – 17.06.2011, 1 ♀

Collection materials: 09.04.2011, 2 ♂♂ 1 ♀

Comments: Identifications based on Logunov & Huseynov, 2008: 124, f. 19-22. Collected at day time on the ground during activity.

6.1.37. FAMILY: THOMISIDAE Sundevall, 1833

Represented by 6 genera and 13 species; with one new record for Turkey.

6.1.37.1. *Heriaeus simoni* Kulczyński, 1903

Distribution: Palearctic

Pitfall trap materials: -

Collection materials: 16.05.2011, 1 ♀

Comments: Identifications based on Loerbroks, 1983: 107, f. 15, 29-36. One adult female acquired from beating samples.

6.1.37.2. *Runcinia grammica* (C. L. Koch, 1837)

Distribution: Palearctic, St. Helena, South Africa

Pitfall trap materials: -

Collection materials: 13.08.2011, 5 ♀♀

Comments: Identifications based on Roberts, 1995: 155, f. Acquired from sweep net samples.

6.1.37.3. *Synema globosum* (Fabricius, 1775)

Distribution: Palearctic

Pitfall trap materials: -

Collection materials: 01.05.2010, 6 ♂♂ 4 ♀♀ | 28.06.2010, 1 ♀ | 20.06.2011, 1 ♂ 1 ♀

Comments: Identifications based on Ono, 1988: 146, f. 148-158. Collected on herbaceous plants but specimens also acquired from beating samples.

6.1.37.4. *Synema plorator* (O. P.-Cambridge, 1872)

Distribution: Europe, Mediterranean

Pitfall trap materials: -

Collection materials: 11.04.2011, 2 ♂♂ 4 ♀♀

Comments: Identifications based on Levy, 1985: 56, f. 78-81. Acquired from sweep net samples.

6.1.37.5. *Thomisus onustus* Walckenaer, 1805

Distribution: Palearctic

Pitfall trap materials: -

Collection materials: 28.06.2010, 1 ♀ | 27.07.2010, 1 ♀ | 07.03.2011, 1 ♀ |11.04.2011, 1 ♂ | 20.06.2011, 1 ♂ | 03.08.2011, 1 ♂ | 13.08.2011, 5 ♂♂ 1 ♀

Comments: Identifications based on Almquist, 2006: 496, f. 421a-g. Most specimens acquired from sweep net samples but few specimens also collected on shrubs as well.

6.1.37.6. *Tmarus piochardi* (Simon, 1866)

Distribution: Mediterranean

Pitfall trap materials: -

Collection materials: 27.07.2010, 1 ♂ | 08.08.2010, 1 ♀ | 04.09.2010, 2 ♀♀ | 11.04.2011, 1 ♂ | 09.08.2011, 4 ♂♂ 1 ♀

Comments: Identifications based on Levy, 1985: 25, f. 24-27. Most specimens acquired from beating samples; some specimens also acquired from sweep net samples.

6.1.37.7. *Xysticus caperatus* Simon, 1875

Distribution: Northern Europe, Mediterranean

Pitfall trap materials: 13.05.2011 – 17.06.2011, 3 ♂♂

Collection materials: -

Comments: Identifications based on Demir, Aktaş & Topçu, 2009a: 102, f. 5-6.

6.1.37.8. *Xysticus cor* Canestrini, 1873

Distribution: Europe, Mediterranean

Pitfall trap materials: -

Collection materials: 16.05.2011, 1 ♂

Comments: Identifications based on Demir, Aktaş & Topçu, 2010a: 18, f. 1-5. One adult male acquired from sifting samples.

6.1.37.9. *Xysticus cribratus* Simon, 1885

Distribution: Palearctic

Pitfall trap materials: 20.11.2010 – 04.03.2011, 1 ♀

Collection materials: 20.11.2010, 8 ♀♀ | 06.03.2011, 2 ♀♀ | 09.04.2011, 1 ♀

Comments: Identifications based on Simon, 1932: 837, 839, 881, f. 1264, 1270. Collected at night on the ground during activity or under stones.

6.1.37.10. *Xysticus tenebrosus* Silhavy, 1944

Distribution: Europe

Pitfall trap materials: -

Collection materials: 01.07.2010, 1 ♂ | 27.07.2010, 2 ♀♀ | 17.06.2011-20.06.2011, 6 ♂♂ 1 ♀ | 05.08.2011, 1 ♀

Comments: Identifications based on Deltshev, Lazarov & Blagoev, 2004: 194, f. 8-11. New record for Turkey. Collected at night on the ground during activity or collected under stones.

6.1.37.11. *Xysticus thessalicus* Simon, 1916

Distribution: Europe, Mediterranean

Pitfall trap materials: 29.05.2010 – 26.06.2010, 1 ♀ | 12.04.2011 – 13.05.2011, 1 ♂ 1 ♀ | 13.05.2011 – 17.06.2011, 1 ♀

Collection materials: 07.03.2011, 1 ♂ 2 ♀ | 09.04.2011 - 11.04.2011, 6 ♂♂ 5 ♀♀

Comments: Identifications based on Karol, 1966d: 27, f. 1-3 and Azarkina & Logunov, 2001: 148, f. 18-19. Specimens acquired from sweep net samples; or collected on the ground during activity at day time or collected under stones. Recently recorded in the close vicinity (Lecigne, 2011).

6.1.37.12. *Xysticus tristrami* (O. P.-Cambridge, 1872)

Distribution: Mediterranean Middle East, Central Asia

Pitfall trap materials: 01.09.2010 – 01.10.2010, 1 ♂ | 01.10.2010 – 20.11.2010, 7 ♂♂

Collection materials: 03.10.2010, 1 ♂

Comments: Identifications based on Levy, 1985: 79, f. 114-117. One adult male collected under stones. Previously recorded from the close vicinity of the region (Dalmas, 1920).

6.1.37.13. *Xysticus* sp. indet

Pitfall trap materials: 01.10.2010 – 20.11.2010, 79 ♂♂ 2 ♀♀ | 04.03.2011 – 09.04.2011, 4 ♀♀ | 12.04.2011 – 13.05.2011, 1 ♀ | 13.05.2011 – 17.06.2011, 10 ♀♀

Collection materials: 19.11.2010, 1 ♂ 1 ♀ | 06.03.2011, 3 ♀♀

Comments: Identifications based on Almquist, 2006: 497. Specimens collected on the ground during activity or collected under stones.

6.1.38. FAMILY: SALTICIDAE Blackwall, 1841

Represented by 27 identified species belonging to 20 genera, with aditional 3 species remained unidentified (30 species in total) and not presented in the list below. There are 3 new records for Turkey.

6.1.38.1. *Aelurillus v-insignitus* (Clerck, 1757)

Distribution: Palearctic

Pitfall trap materials: 01.10.2010 – 20.11.2010, 1 ♂ 1 ♀

Collection materials: -

Comments: Identification based on Almquist, 2006: 520, f. 437a-h. Recently recorded in the close vicinity (Lecigne, 2011).

6.1.38.2. *Chalcoscirtus infimus* (Simon, 1868)

Distribution: Palearctic

Pitfall trap materials: 04.03.2011 – 09.04.2011, 1 ♀ | 12.04.2011 – 13.05.2011, 1 ♀

Collection materials: -

Comments: Identifications based on Noflatscher, 1993: 283, f. 9-11. Recently recorded in the close vicinity (Lecigne, 2011).

6.1.38.3. *Cyrba algerina* (Lucas, 1846)

Distribution: All West Palearctic

Pitfall trap materials: -

Collection materials: 01.05.2010, 2 ♂♂ | 13.05.2011, 1 ♂ | 17.06.2011, 2 ♀♀

Comments: Identifications based on Metzner, 1999: 35, f. 1a-h. Collected at day time on the ground during activity; or under stones. Recently recorded in the close vicinity (Lecigne, 2011).

6.1.38.4. *Euophrys rufibarbis* (Simon, 1868)

Distribution: Palearctic

Pitfall trap materials: 29.5.2010 - 29. 6. 2010, 1 ♀ | 01.10.2010 – 20.11.2010, 4 ♂♂ | 20.11.2010 – 04.03.2011, 3 ♂♂ | 04.03.2011 – 09.04.2011, 1 ♀ | 12.04.2011 – 13.05.2011, 1 ♀ | 13.05.2011 – 17.06.2011, 1 ♂ 8 ♀♀

Collection materials: 19.11.2010, 1 ♀ | 04.03.2011, 3 ♀♀ | 09.04.2011, 5 ♀♀

Comments: Identifications based on Metzner, 1999: 51, f. 16a-k. Collected under stones.

6.1.38.5. *Evarcha jucunda* (Lucas, 1846)

Distribution: Europe, Mediterranean

Pitfall trap materials: 13.05.2011 – 17.06.2011, 1 ♂

Collection materials: 08.08.2010, 1 ♀ | 04.09.2010, 2 ♀♀ | 16.05.2011, 2 ♂♂ | 20.06.2011, 4 ♂♂ 1 ♀| 03.08.2011, 2 ♂♂ | 09.08.2011, 1 ♂ 3 ♀♀

Comments: Identifications based on Metzner, 1999: 148, f. 113a-j. Collected at day time during activity; under stones; or acquired from beating samples.

6.1.38.6. *Habrocestum papilionaceum* (L. Koch, 1867)

Distribution: Greece

Pitfall trap materials: 01.09.2010 – 01.10.2010, 1 ♀ | 12.04.2011 – 13.05.2011, 1 ♂ | 13.05.2011 – 17.06.2011, 5 ♂♂ 2 ♀♀

Collection materials: 09.04.2011, 6 ♂♂ | 13.05.2011, 4 ♂♂ 3 ♀♀ | 17.06.2011, 1 ♀ | 10.08.2011, 1 ♀

Comments: Identifications based on Metzner, 1999: 62, f. 27a-k. Collected at day time during activity on the ground or under stones at night. Recently recorded in the close vicinity (Lecigne, 2011).

6.1.38.7. *Heliophanus equester* L. Koch, 1867

Distribution: Europe, Mediterranean Middle East

Pitfall trap materials: -

Collection materials: 16.05.2011, 2 ♀♀

Comments: Identifications based on Metzner, 1999: 102, f. 68a-i. Acquired from beating samples. Recently recorded in the close vicinity (Lecigne, 2011).

6.1.38.8. *Heliophanus kochii* Simon, 1868

Distribution: Palearctic

Pitfall trap materials: -

Collection materials: 07.03.2011, 3 ♂♂ | 09.04.2011, 7 ♂♂ 1 ♀ | 16.05.2011, 2 ♂♂ 3 ♀♀

Comments: Identifications based on Prószyński, 2003: 78, f. 296-299. Collected at day time on the ground during activity or under stones; or acquired from sweep net and beating samples. Recently recorded in the close vicinity (Lecigne, 2011).

6.1.38.9. *Heliophanus tribulosus* Simon, 1868

Distribution: Europe

Pitfall trap materials: -

Collection materials: 11.04.2011, 2 ♂♂ 1 ♀ | 16.05.2011, 1 ♂

Comments: Identifications based on Metzner, 1999: 100, f. 65a-j. Acquired from beating samples. Recently recorded in the close vicinity (Lecigne, 2011).

6.1.38.10. *Heliophanus melinus* L. Koch, 1867

Pitfall trap materials: -

Collection materials: 16.05.2011, 1 ♀

Comments: Identifications based on Roberts, 1998: 200, f. and Heimer & Nentwig, 1991: 504, f. 1350. Collected under a stone. Recently recorded in the close vicinity (Lecigne, 2011).

6.1.38.11. *Leptorchestes berolinensis* (C. L. Koch, 1846)

Distribution: Europe, Mediterranean Middle East

Pitfall trap materials: 29.06.2010 – 26.07.2010, 1 ♂

Collection materials: -

Comments: Identifications based on Zabka, 1997: 61, f. 182-188.

6.1.38.12. *Menemerus semilimbatus* (Hahn, 1829)

Distribution: All West Palearctic, Argentina, USA (introduced)

Pitfall trap materials: -

Collection materials: 01.05 2010, 1 ♂ | 27.07.2010, 2 ♂♂ | 12.08.2011, 1 ♂

Comments: Identifications based on Metzner, 1999: 144, f. 109a-h. Collected at day time on the ground. Previously recorded from the close vicinity of study area (Dalmas, 1920 and Lecigne, 2011).

6.1.38.13. *Menemerus taeniatus* (L. Koch, 1867)

Distribution: Europe, Mediterranean Middle East; Argentina

Pitfall trap materials: -

Collection materials: 27.07.2010, 1 ♀ | 10.04.2011, 2♀♀ | 05.08.2011, 1 ♀

Comments: Identifications based on Metzner, 1999: 145, f. 110a-j. New record for Turkey. One adult female collected at day time on the ground during activity; other specimens collected at night on olive trees under barks.

6.1.38.14. *Mogrus neglectus* (Simon, 1868)

Distribution: Mediterranean Europe, Mediterranean Middle East

Pitfall trap materials: -

Collection materials: 16.05.2011, 3 ♀♀

Comments: Identifications based on Metzner, 1999: 151, f. 117a-k. Acquired from sweep net samples.

6.1.38.15. *Pellenes diagonalis* (Simon, 1868)

Distribution: Europe, Mediterranean Middle East

Pitfall trap materials: -

Collection materials: 09.04.2011, 2 ♂♂

Comments: Identifications based on Metzner, 1999: 128, f. 91a-i. Collected at day time on the ground during activity. Recently recorded in the close vicinity (Lecigne, 2011).

6.1.38.16. *Pellenes flavipalpis* (Lucas, 1853)

Distribution: Europe, Mediterranean Middle East

Pitfall trap materials: -

Collection materials: 09.04.2011, 1 ♂ | 16.05.2011, 1 ♂

Comments: Identifications based on Metzner, 1999: 127, f. 93a-j. Collected at day time on the ground during activity. Recently recorded in the close vicinity (Lecigne, 2011).

6.1.38.17. *Philaeus chrysops* (Poda, 1761)

Distribution: Palearctic

Pitfall trap materials: -

Collection materials: 02.05.2010, 1 ♂ 2 ♀♀ | 16.05.2011, 2 ♂♂ 1 ♀ | 18.06.2011, 1 ♂

Comments: Identifications based on Pesarini, 1997: 260, f. 9 and Roberts, 1998: 215, f. Collected at day time on the ground during activity or collected at night under stones. Recently recorded in the close vicinity (Lecigne, 2011).

6.1.38.18. *Phlegra lineata* (C. L. Koch, 1846)

Distribution: Europe, Mediterranean Middle East

Pitfall trap materials: 13.05.2011 – 17.06.2011, 1 ♀

Collection materials: 16.05.2011, 2 ♂♂

Comments: Identifications based on Metzner, 1999: 70, f. 35a-l. Acquired from sweep net samples.

6.1.38.19. *Phlegra* sp.

Pitfall trap materials: -

Collection materials: 02.05.2010, 1 ♂

Comments: Generic level identification based on Almquist, 2006: 550. Collected at day time on the ground during activity.

6.1.38.20. *Plexippoides gestroi* (Dalmas, 1920)

Distribution: Mediterranean Middle East

Pitfall trap materials: 01.09.2010 – 01.10.2010, 1 ♂ | 01.10.2010 – 20.11.2010, 1 ♀

Collection materials: 04.09.2010, 1 ♂ 2 ♀♀ | 03.10.2010, 1 ♀ | 19.11.2010, 3 ♀♀ | 04.03.2011, 3 ♀♀ | 09.04.2011, 6 ♀♀ | 16.05.2011, 1 ♀

Comments: Identifications based on Metzner, 1999: 135, f. 99a-i. All specimens collected under stones. Previously recorded from the close vicinity of the region (Dalmas, 1920).

6.1.38.21. *Pseudeuophrys obsoleta* (Simon, 1868)

Distribution: Palearctic

Pitfall trap materials: -

Collection materials: 04.09.2011, 2 ♀♀

Comments: Identifications based on Metzner, 1999: 54, f. 19a-h. Collected at daytime on the ground during activity.

6.1.38.22. *Pseudicius picaceus* (Simon, 1868)

Distribution: Europe, Mediterranean

Pitfall trap materials: 29.06.2010 – 26.07.2010, 1 ♀

Collection materials: 16.05.2011, 1 ♂ | 10.08.2011, 1 ♀

Comments: Identifications based on Metzner, 1999: 93, f. 58a-g. New record for Turkey. Collected at day time on the ground during activity.

6.1.38.23. *Salticus noordami* Metzner, 1999

Distribution: Mediterranean Europe, Mediterranean Middle East

Pitfall trap materials: -

Collection materials: 11.04.2011, 1 ♂ | 16.05.2011, 1 ♂ 3 ♀♀ | 20.06.2011, 4 ♀♀

Comments: Identifications based on Logunov, 2009: 915, f. 36-42. Acquired from sweep net or beating samples.

6.1.38.24. *Salticus propinquus* Lucas, 1846

Distribution: Europe, Mediterranean

Pitfall trap materials: 13.05.2011 – 17.06.2011, 1 ♀

Collection materials: 16.05.2011, 1 ♀

Comments: Identifications based on Metzner, 1999: 115, f. 81a-i. New record for Turkey. Collected at day time on the ground during activity.

6.1.38.25. *Sibianor aurocinctus* (Ohlert, 1865)

Distribution: Palearctic

Pitfall trap materials: -

Collection materials: 12.08.2011, 2 ♂♂

Comments: Identifications based on Zabka, 1997: 41, f. 60-69. New record for Turkey. Collected at the shores of a permanent brackish water brook.

6.1.38.26. *Synageles dalmaticus* (Keyserling, 1863)

Distribution: Europe, Mediterranean

Pitfall trap materials: 13.05.2011 – 17.06.2011, 1 ♂ 1 ♀

Collection materials: 01.05.2010, 1 ♂ | 09.04.2011, 1 ♂ | 13.05.2011, 2 ♂♂ | 13.05.2011 – 16.05.2011, 9 ♂♂ 13 ♀♀ | 20.06.2011, 9 ♀♀

Comments: Identifications based on Thaler, 1983: 297, f. 17-19, 22, 26, 29. Some specimens collected under stones but generality of the specimens acquired from beating samples.

6.1.38.27. *Thyene imperialis* (Rossi, 1846)

Distribution: Old World

Pitfall trap materials: -

Collection materials: 10.03.2010, 2 ♂♂ | 04.09.2010, 1 ♂ | 07.03.2011, 1 ♂ | 16.05.2011, 4 ♂♂

Comments: Identifications based on Metzner, 1999: 132, f. 97a-l. Acquired from sweep net and beating samples.

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APPENDIX A

FIGURES PRESENTING PHOTOGRAPHS OF DIAGNOSTIC CHARACTERS FOR SPIDER SPECIES COLLECTED IN THIS STUDY

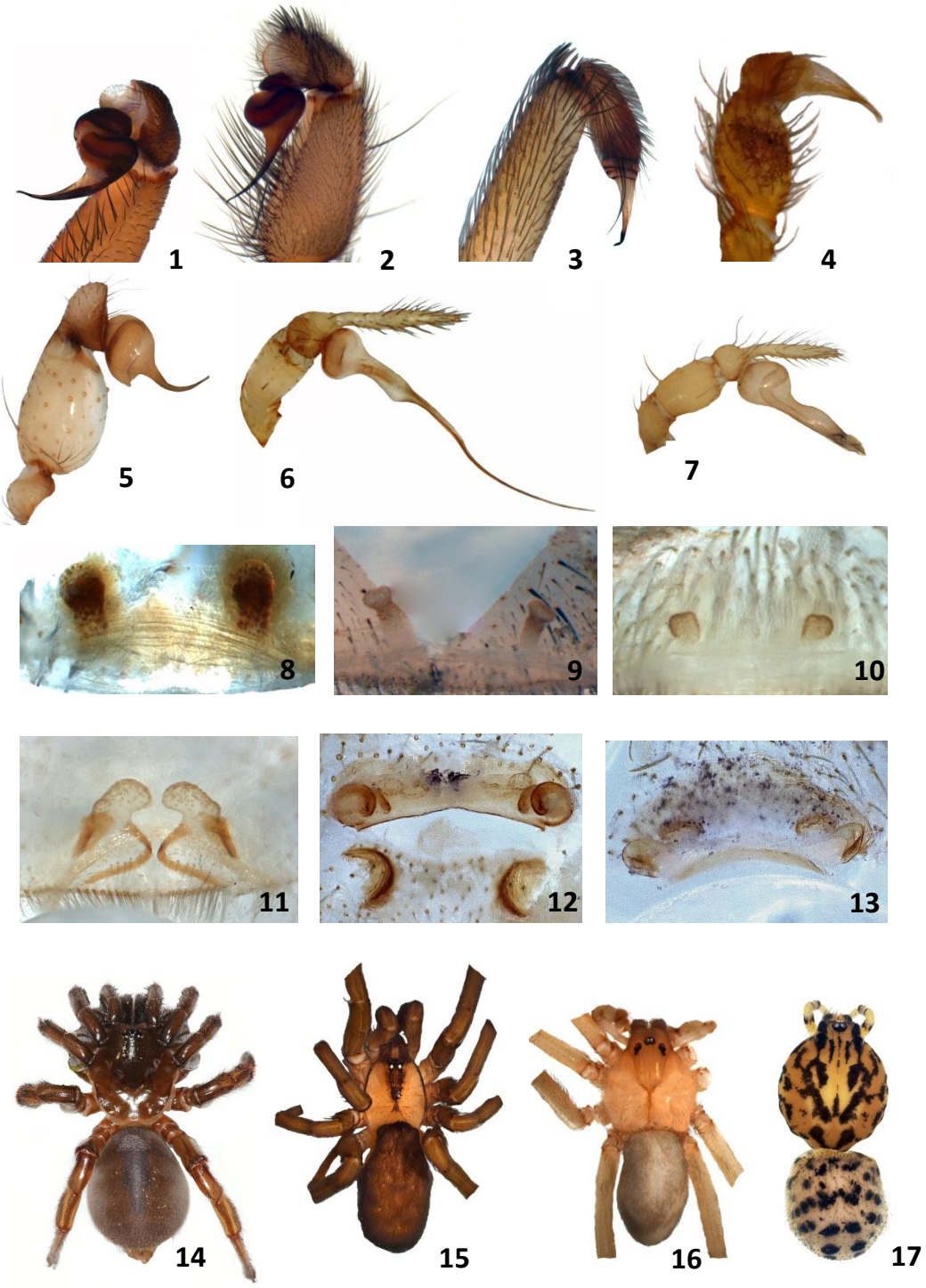

Figure A.1. CTENIZIDAE, NEMESIIDAE, FILISTATIDAE, SICARIIDAE, SCYTODIDAE. 1,8,14 - *Cyrtocarenum cunicularium*; 2,9 - *Brachythele varrialei*; 3,10,15 - *Filistata insidiatrix*; 4 - *Pritha nana*; 5,11,16 - *Loxosceles rufescens*; 6,12,17 - *Scytodes thoracica*; 7,13 - *Scytodes velutina*.

Figure A.2. PHOLCIDAE. SEGESTRIDAE. DYSDERIDAE. OONOPIDAE. PALPIMANIDAE. 1,2 - *Holocnemus pluchei*; 3,4,14 - *Spermophora senoculata*; 15 - *Segestria senoculata*; 5,10 - *Dysdera rubus*; 16 - *Dysdera* sp. I; 6 - *Harpactea sturanyi*; 7,11 - *Harpactea kencei*; 8,12,17 - *Opopaea punctata*; 18 - *Orchestina* sp.; 9,13,19 - *Palpimanus uncatus*.

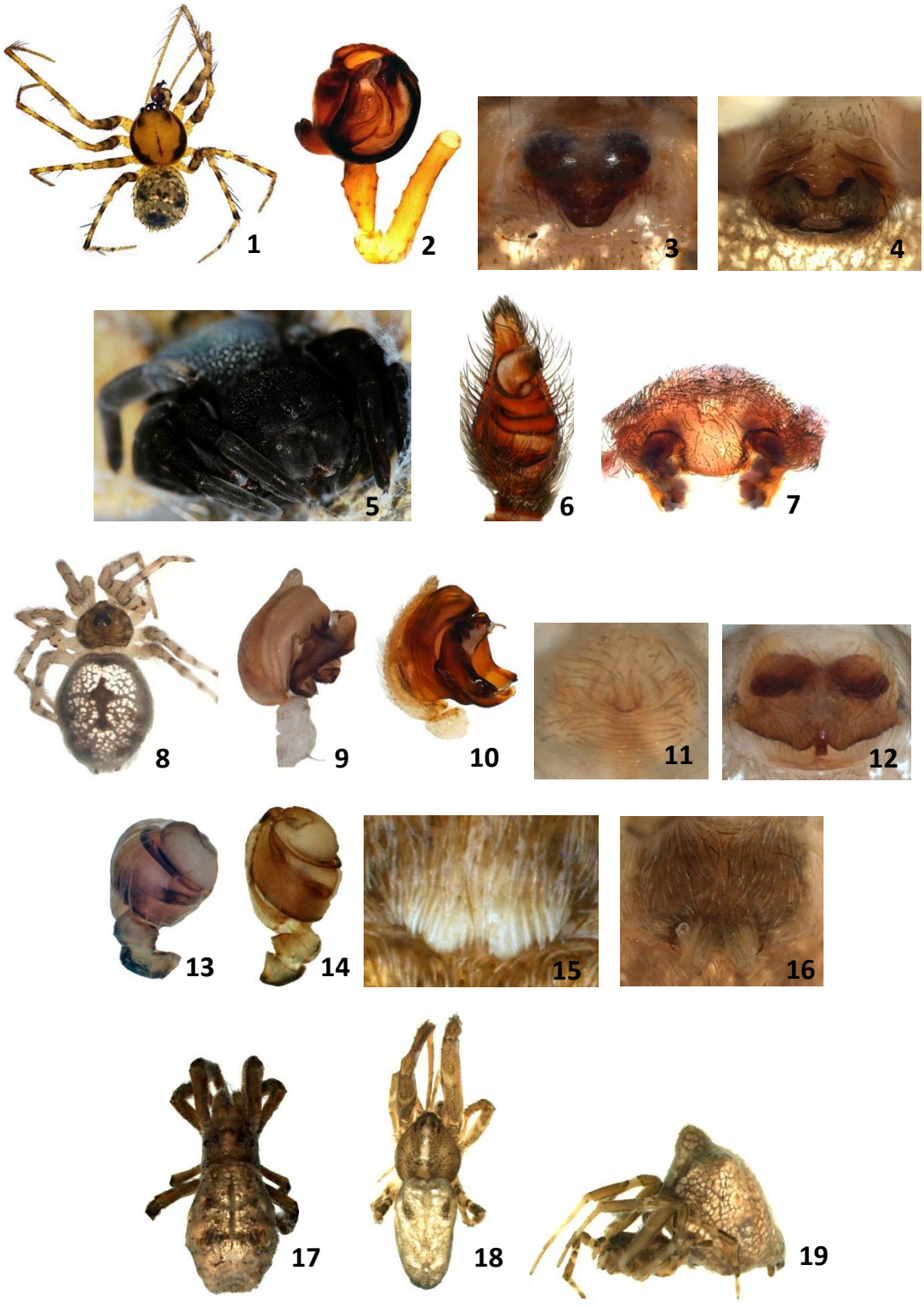

Figure A.3. MIMETIDAE, ERESIDAE,OECOBIIDAE, ULOBORIDAE. 1,2,3 - *Ero flammeola*; 4 - *Mimetus laevigatus*; 5,6,7 - *Eresus walckenaeri*; 8,9,11 - *Oecobius maculatus*; 10,12 - *Oecobius rhodiensis*; 13,15 - *Uloborus walckenaerius*; 14,16,18,19 - *Uloborus plumipes*; 17 - *Hyptiotes* sp.

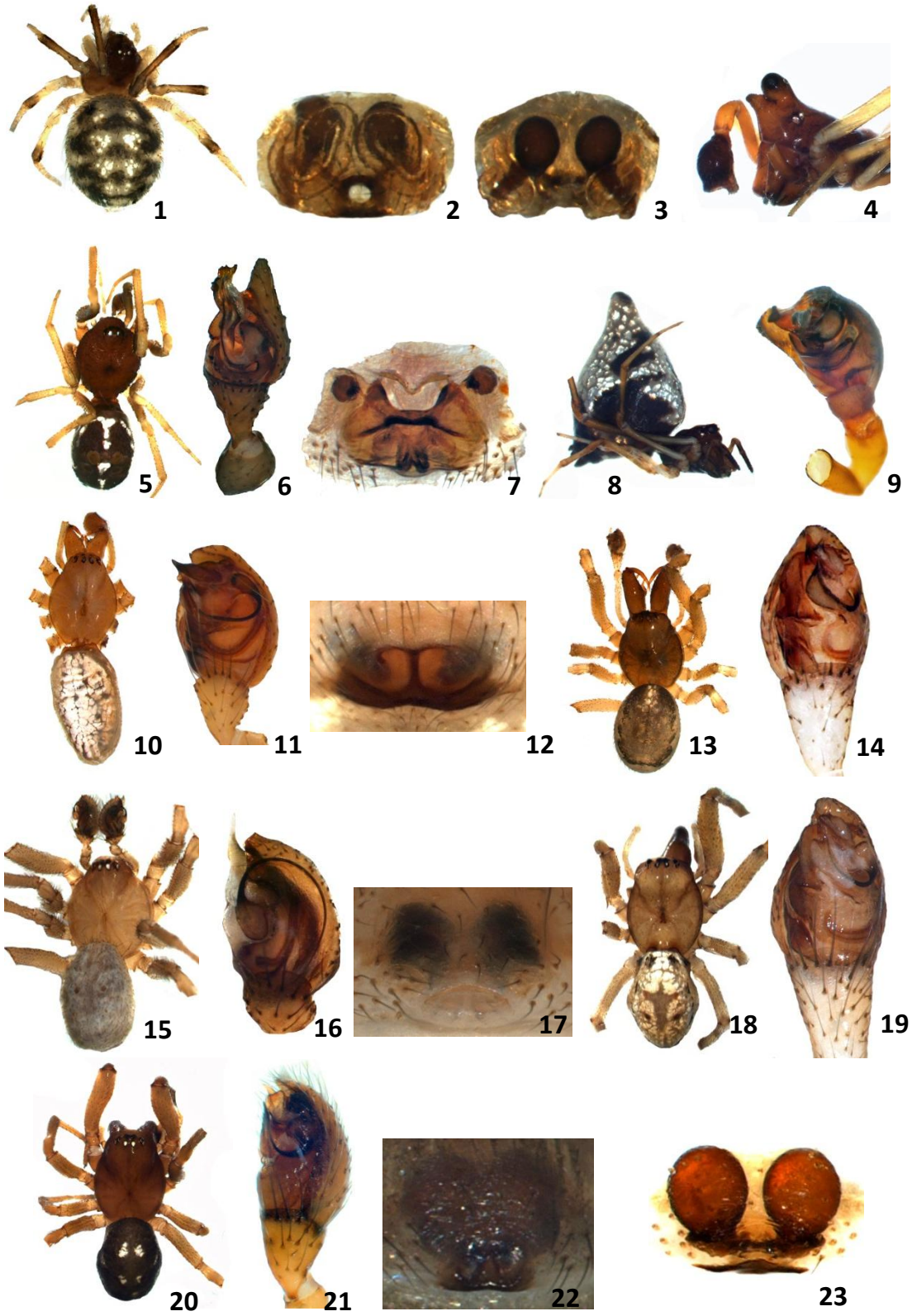

Figure A.4. THERIDIIDAE. 1,2,3 - *Anatolidion gentile*; 4,8,9 - *Argyrodes argyrodes*; 5,6,7 - *Crustulina scabripes*; 10,11,12 - *Enoplognatha afrodite*; 13 - *Enoplognatha gemina*; 14 - *Enoplognatha diversa*; 15,16,17 - *Enoplognatha giladensis*; 18,19,23 - *Enoplognatha macrochelis*; 20,21,22 - *Enoplognatha thoracica*.

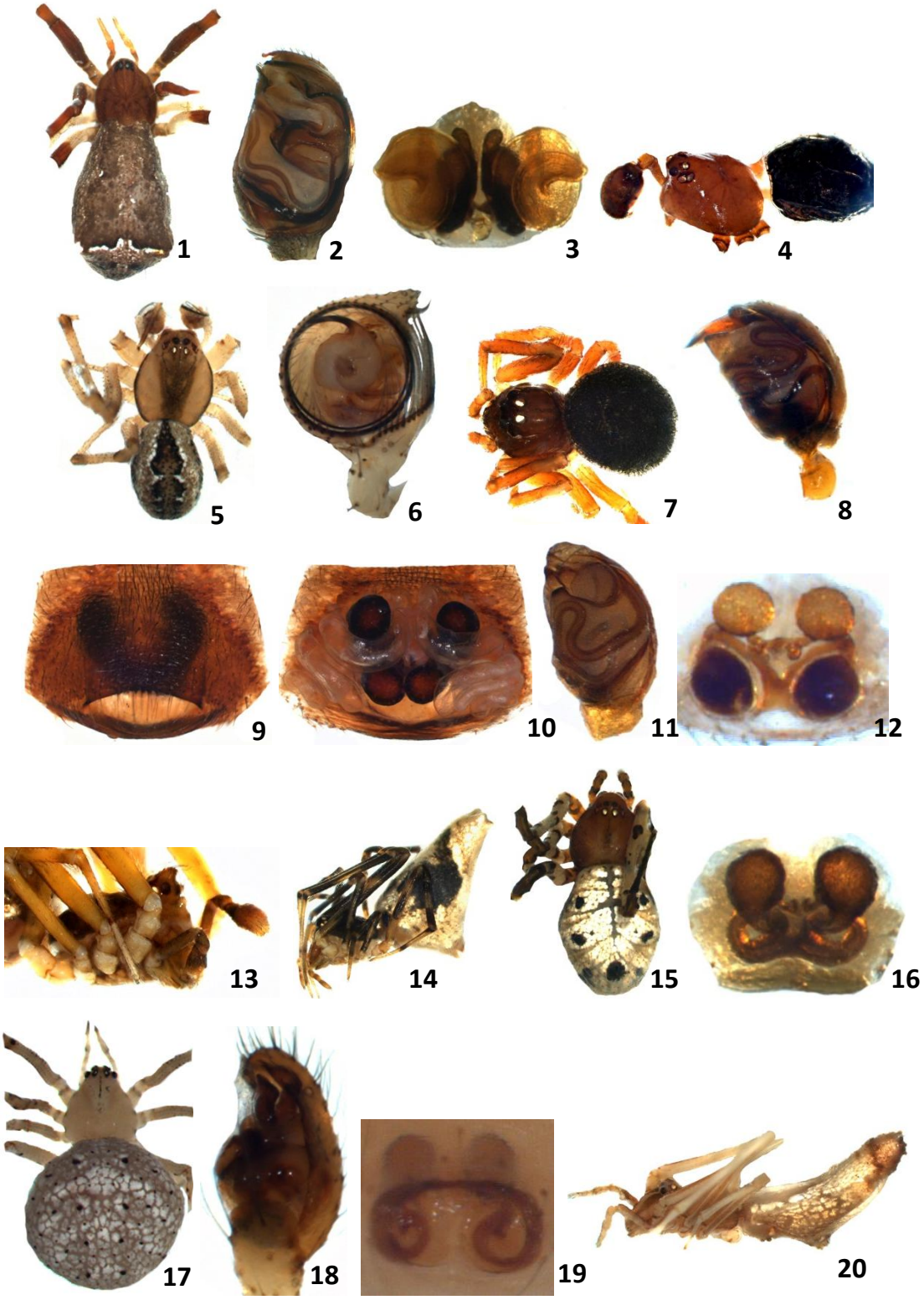

Figure A.5. THERIDIIDAE. 1,2,3 - *Episinus truncatus*; 4,8 - *Euryopis episinoides*; 5,6 - *Kochiura aulica*; 7,11,12 - *Lasaeola convexa*; 9,10 - *Latrodectus geometricus*; 13,14 - *Neospintharus syriacus*; 15,16 - *Neottiura herbigrada*; 17,18,19 - *Platnickina nigropunctata*; 20 - *Rhomphaea* sp.

Figure A.6. THERIDIIDAE. 1,2 - *Simitidion agaricographum*; 3,4- *Simitidion lacuna*; 5,6 - . *Steatoda maura*; 7,8 - *Steatoda paykulliana*; 9,10 - *Steatoda triangulosa*; 11,12,13 - *Theridion adrianopoli*; 14,15 - *Theridion cyprusense*; 16,17,18 - *Theridion genistae*.

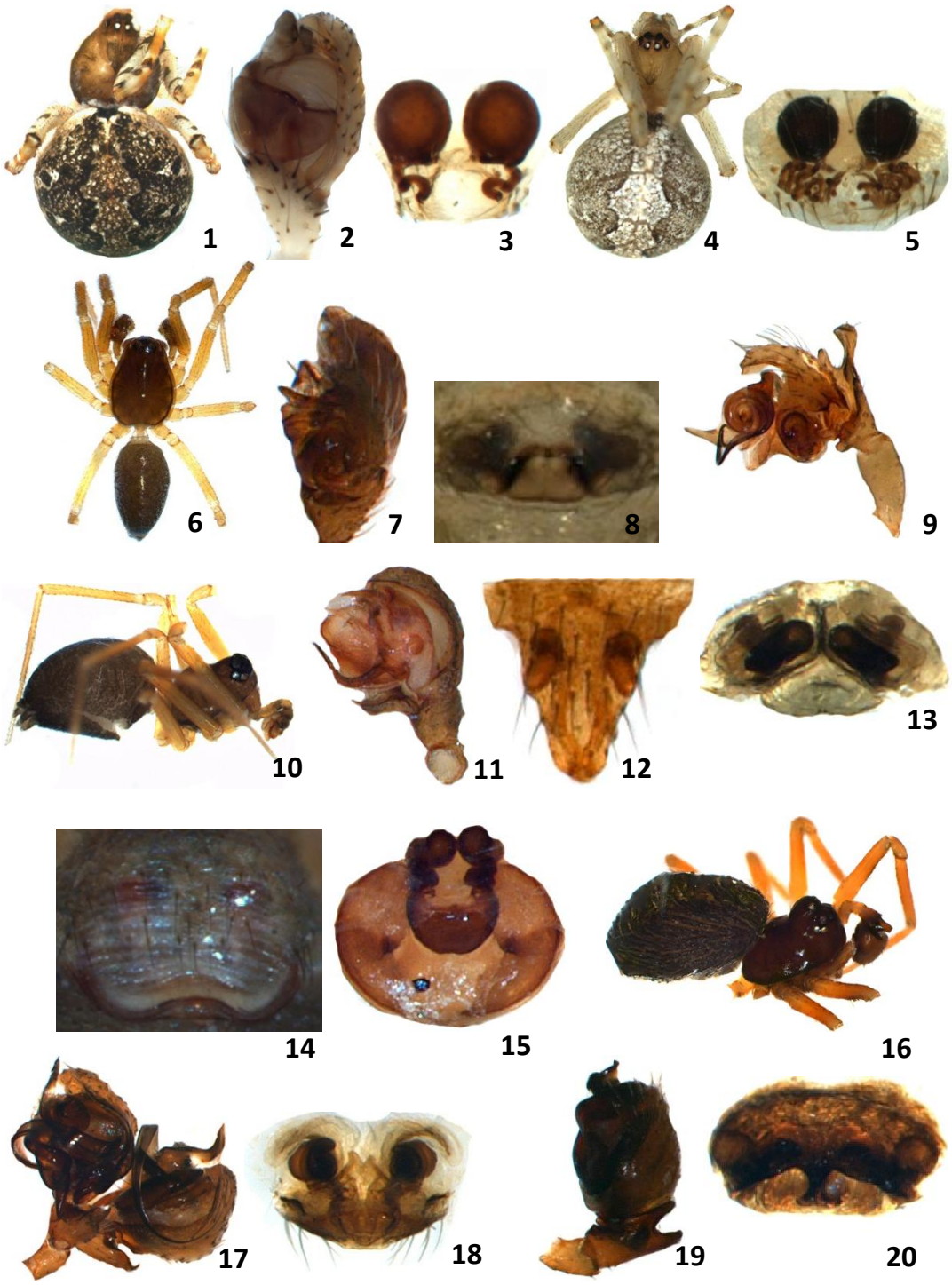

Figure A.7. THERIDIIDAE, LINYPHIIDAE. 1,2,3 - *Theridion melanurum*; 4,5 - *Theridion mystaceum*; 6,7,8 - *Alioranus pastoralis*; 9,13 - *Araeoncus humilis*; 10,11,12 - *Canariphantes zonatus*; 14,15 - *Erigone dentipalpis*; 16,19,20 - *Erigonoplus spinifemuralis*; 17,18 - *Mecopisthes nasutus*.

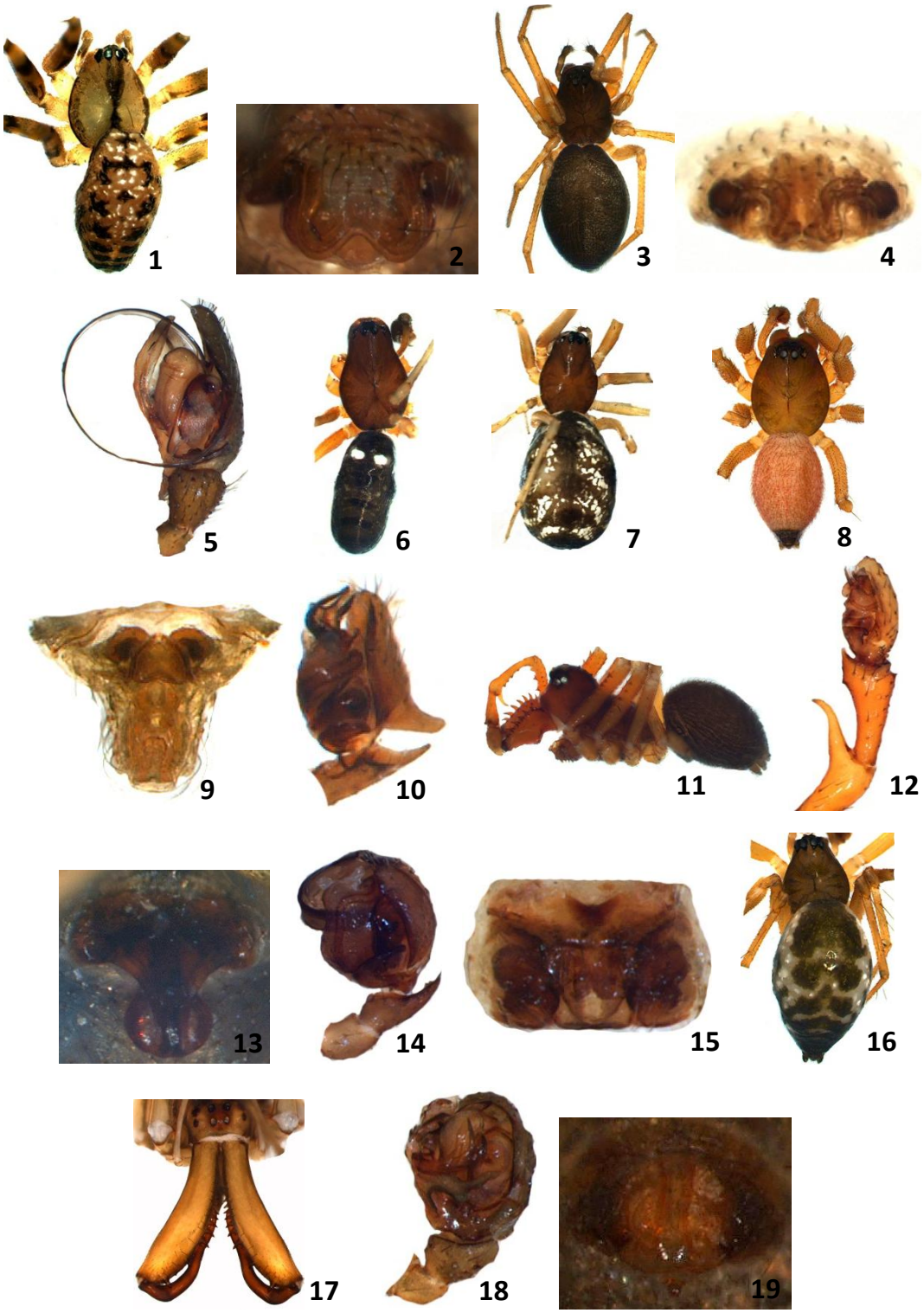

Figure A.8. LINYPHIIDAE, TETRAGNATHIDAE. 1,2 - *Megalepthyphantes nebulosus*; 3,4 - *Meioneta rurestris*; 5,6,7 - *Microlinyphia pusilla*; 8 - *Ostearius melanopygius*; 9 - *Palliduphantes byzantinus*; 10 - *Pelecopsis laptevi*; 11,12 - *Prinerigone vagans*; 13 - *Sintula retroversus*; 14,15 - *Styloctetor romanus*; 16,18,19 - *Tenuiphantes tenuis*; 17 - *Tetragnatha* sp.

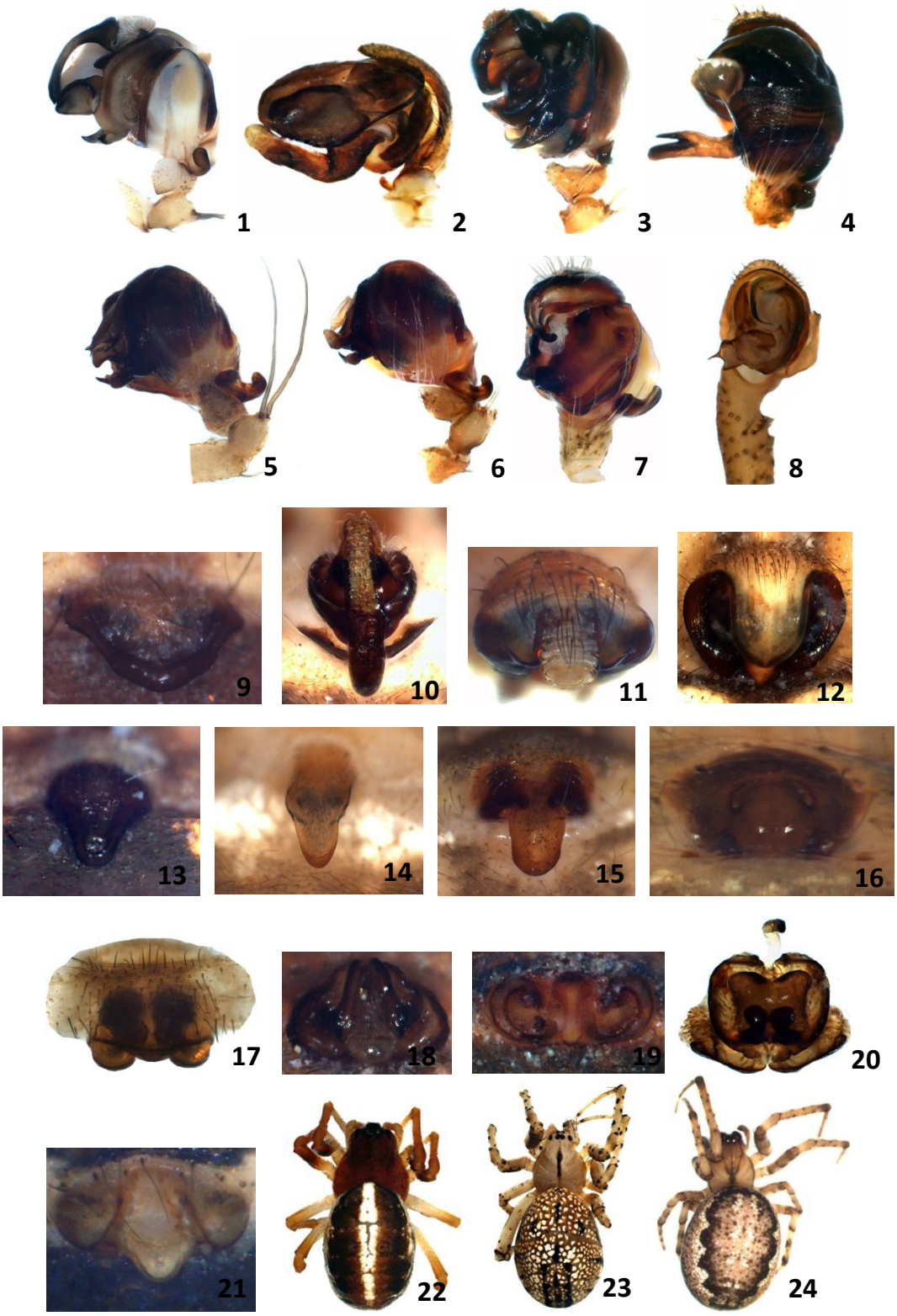

Figure A.9. ARANEIDAE. 1,10 - *Araneus circe*; 9 - *Agalenatea redii*; 11 - *Araniella cucurbitina*; 12 - *Argiope lobata*; 2 - *Cyclosa conica*; 3,18 - *Gibbaranea bituberculata*; 17 - *Cyrtophora citricola*; 19,22 - *Hypsosinga sanguinea*; 4,20 - *Larinioides suspicax*; 21,24 - *Mangora acalypha*; 5,13 - *Neoscona adianta*; 6,14 - *Neoscona subfusca*; 7,15,24 - *Parazygiella montana*; 8,16 - *Zygiella atrica*.

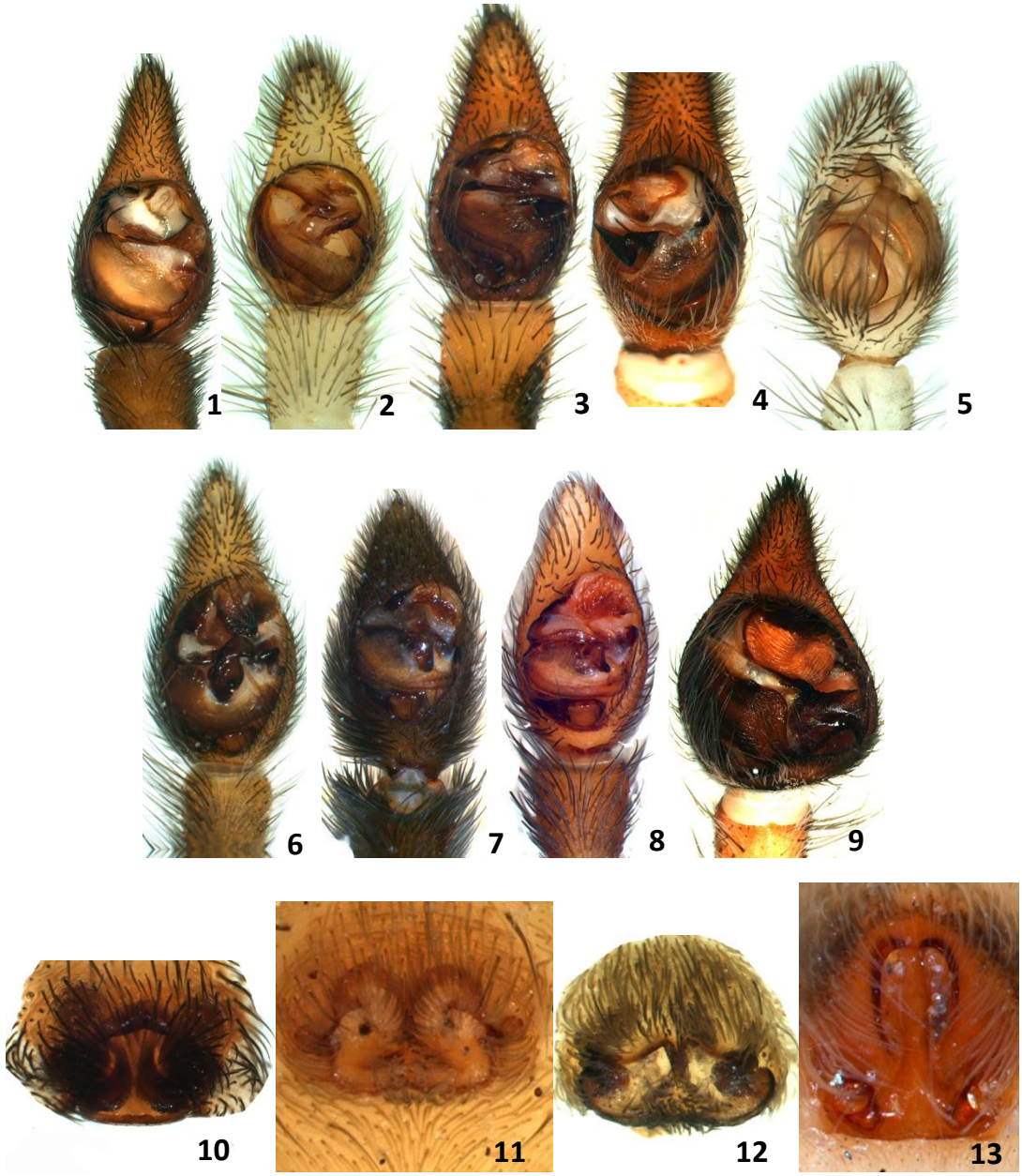

Figure A.10. LYCOSIDAE. 1,10 - *Alopecosa albofasciata*; 2,11 - *Arctosa leopardus*; 3,12 - *Arctosa variana*; 4 - *Hogna radiata*; 5 - *Pirata piraticus*; 6 - *Pardosa luctinosa*; 7,13 - *Pardosa roscai*; 8 - *Pardosa vlijmi*; 9 - *Lycosa praegrandis*.

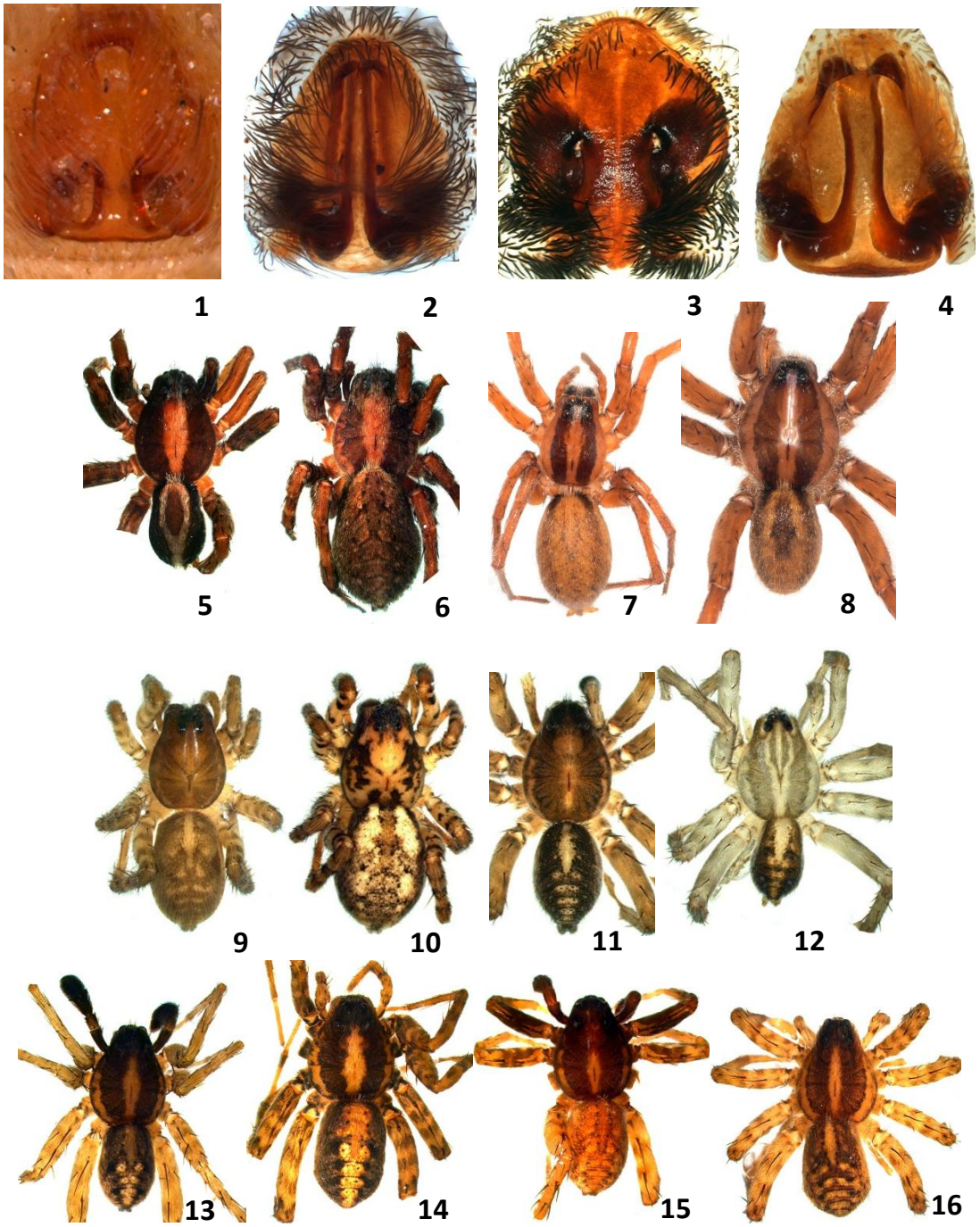

Figure A.11. LYCOSIDAE. 1 - *Pardosa vlijmi*; 2 - *Geolycosa vultuosa*; 3 - *Lycosa praegrandis*; 4,8 - *Hogna radiata*; 5,6 - *Alopecosa albofasciata*; 7 - *Hogna* sp. ; 9 - *Arctosa leopardus*; 10 - *Arctosa variana*; 11 - *Pardosa luctinosa*; 12 - *Pirata piraticus*; 13,14 - *Pardosa roscai*; 15,16 - *Pardosa vlijmi*.

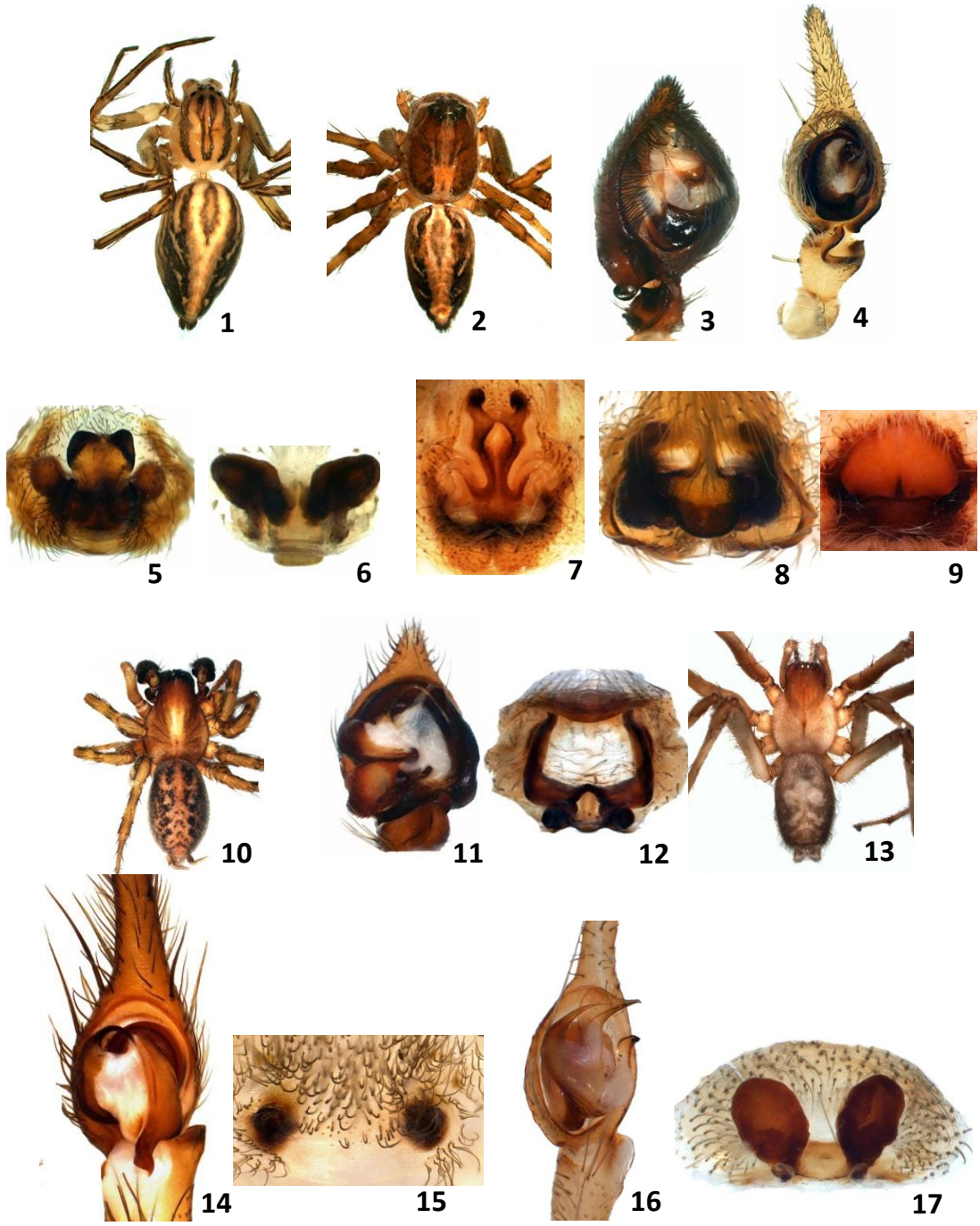

Figure A.12. PISAURIDAE, OXYOPIDAE, ZOROPSIDAE, AGELENIDAE. CYBAEIDAE. 1,4,6 – *Oxyopes lineatus*; 2,3,5 - *Oxyopes globifer*; 7 - *Pisaura orientalis*; 8 - *Zoropsis lutea*; 9 - *Agelena orientalis*; 10,11,12 - *Maimuna vestita*; 13,16,17 - *Tegenaria paragamiani*; 14,15 - *Argyroneta aquatica*.

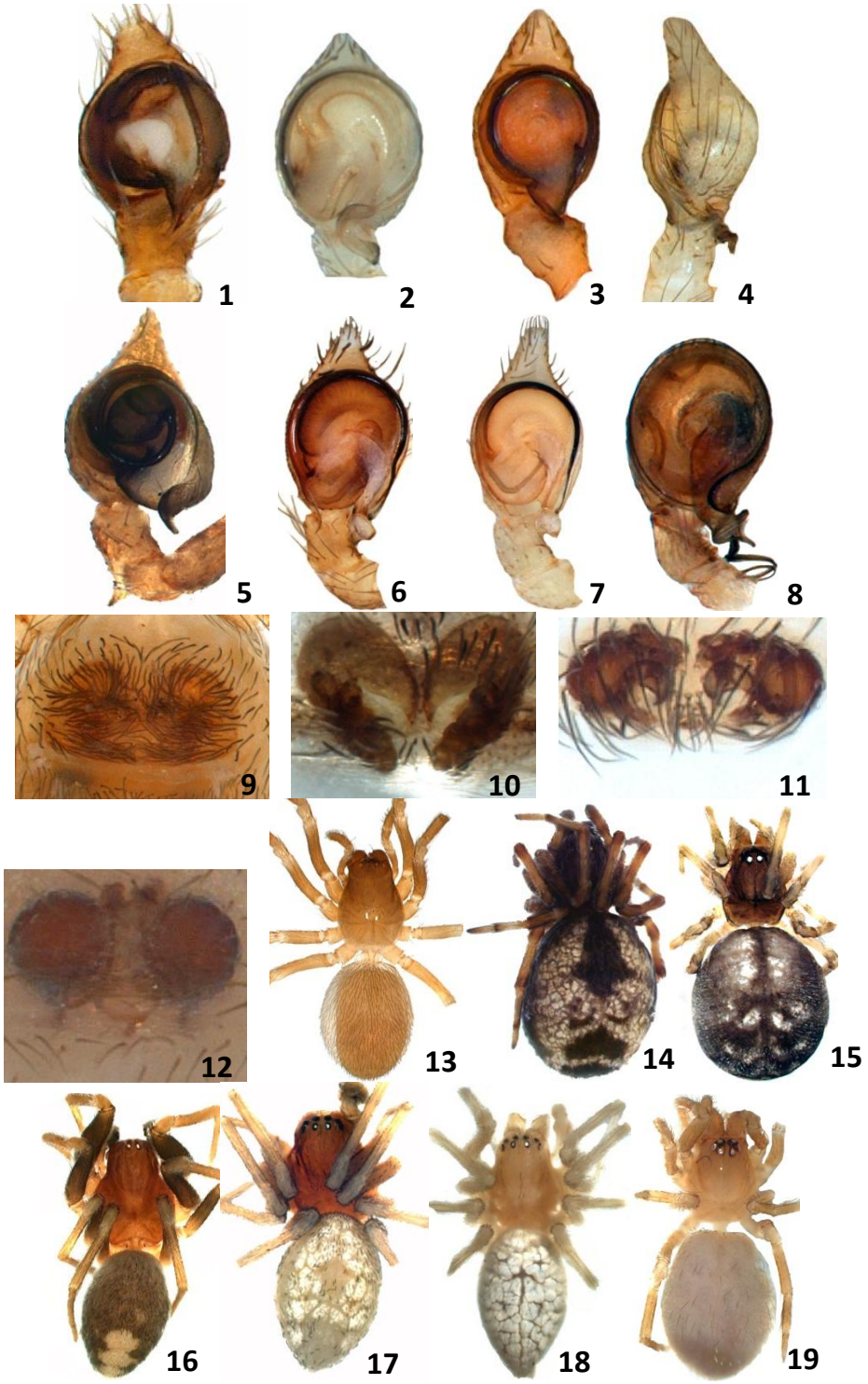

Figure A.13. DICTYNIDAE. 1,9,13 - Argenna subnigra; 2,10,14 - *Dictyna civica*; 3,11,15 - *Lathys humilis*; 4 - *Lathys stigmatisata*; 5,16 - *Marilynia bicolor*; 6,17 - *Nigma puella*; 7,18 - *Nigma flavescens*; 8,12,19 - *Scotolathys simplex*.

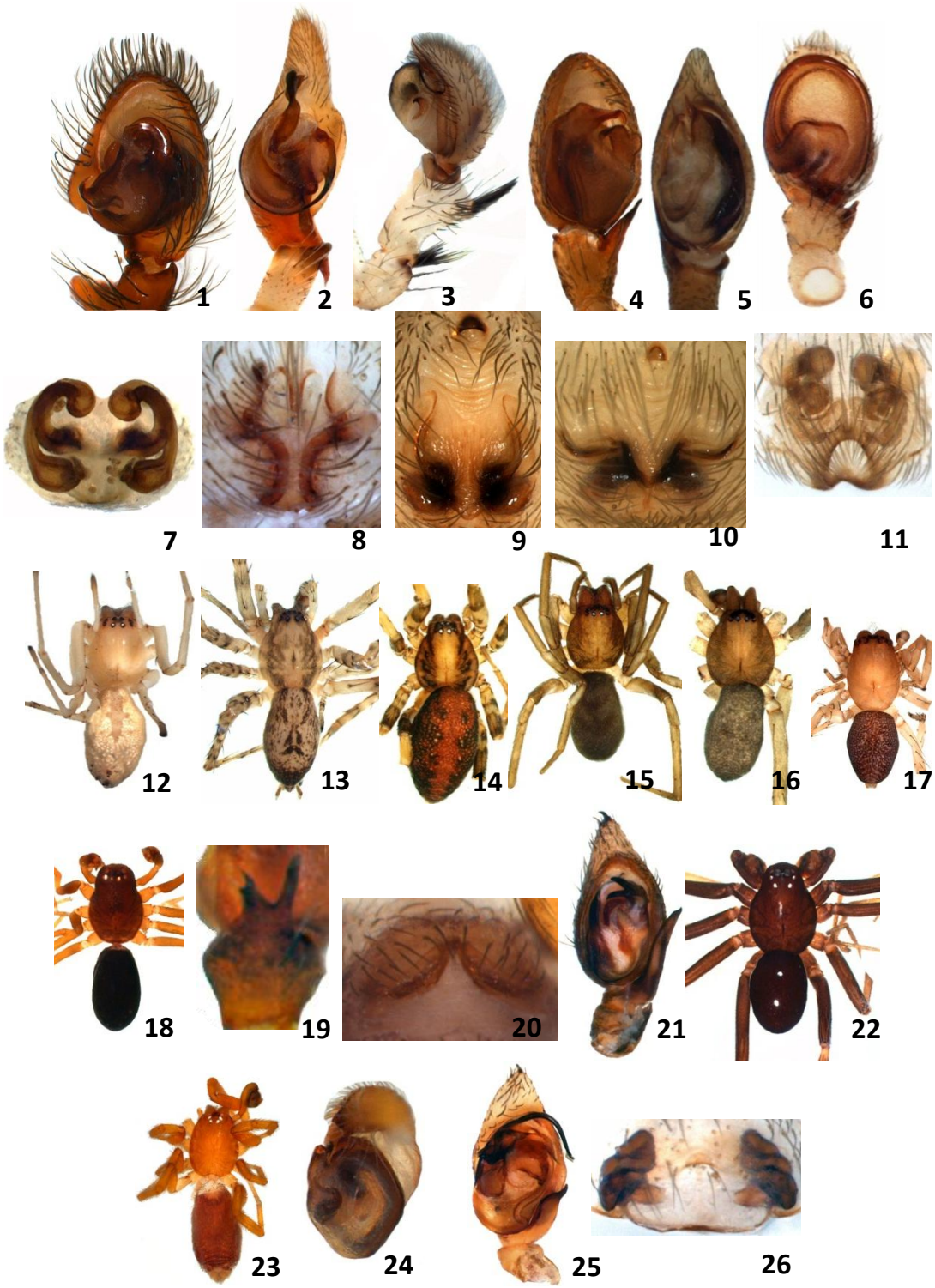

Figure A.14. AMAUROBIIDAE, MITURGIDAE, ANYPHAENIDAE, LIOCRANIDAE, CLUBIONIDAE, ZODARIIDAE, PRODIDOMIDAE. 1 - *Amaurobius erberi*; 2,7,12 - *Cheiracanthium mildei*; 3,13 - *Anyphaena sabina*; 4,8,14 - *Agroeca parva*; 5,9,15 - *Mesiotelus scopensis*; 10,16 - *Mesiotelus tenuissimus*; 6,11,17 - *Clubiona genevensis*; 18,19,20 - *Palaestina expolita*; 21 - *Zodarion kossamos*; 22,25,26 - *Zodarion thoni*; 23,24 - *Prodidomus amaranthinus*.

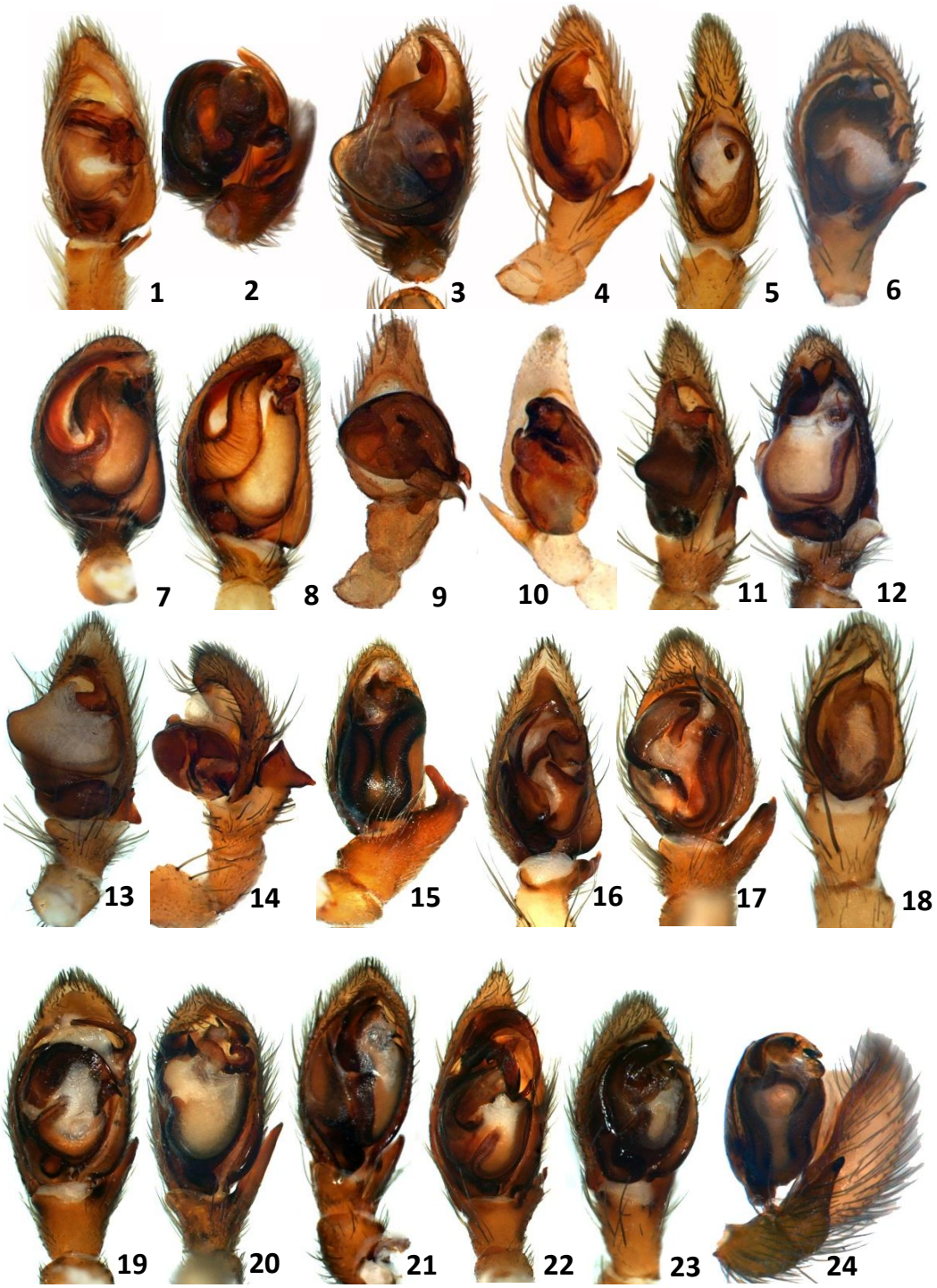

Figure A.15. GNAPHOSIDAE. 1 - *Anagraphis pallens*; 2 - *Berinda ensigera*; 3 - *Callilepis cretica*; 4 - *Cryptodrassus creticus*; 5 - *Drassodes lutescens*; 6 - *Drassyllus jubatopalpis*; 7 - *Haplodrassus morosus*; 8 - *Haplodrassus signifier*; 9 - *Leptopilos hadjissaranti*; 10 - *Leptopilos levantinus*; 11 - *Nomisia aussereri*; 12 - *Nomisia exornata*; 13 - *Nomisia palaestina*; 14 - *Nomisia ripariensis*; 15 - *Poecilochroa furcata*; 16 - *Pterotricha lentiginosa*; 17 - *Scotophaeus scutulatus*; 18 - *Synaphosus trichopus*; 19 - *Trachyzelotes barbatus*; 20 - *Zelotes longipes*; 21 - *Zelotes scrutatus*; 22 - *Zelotes solstitialis*; 23 - *Zelotes tenuis*; 24 - *Zelotes zin*.

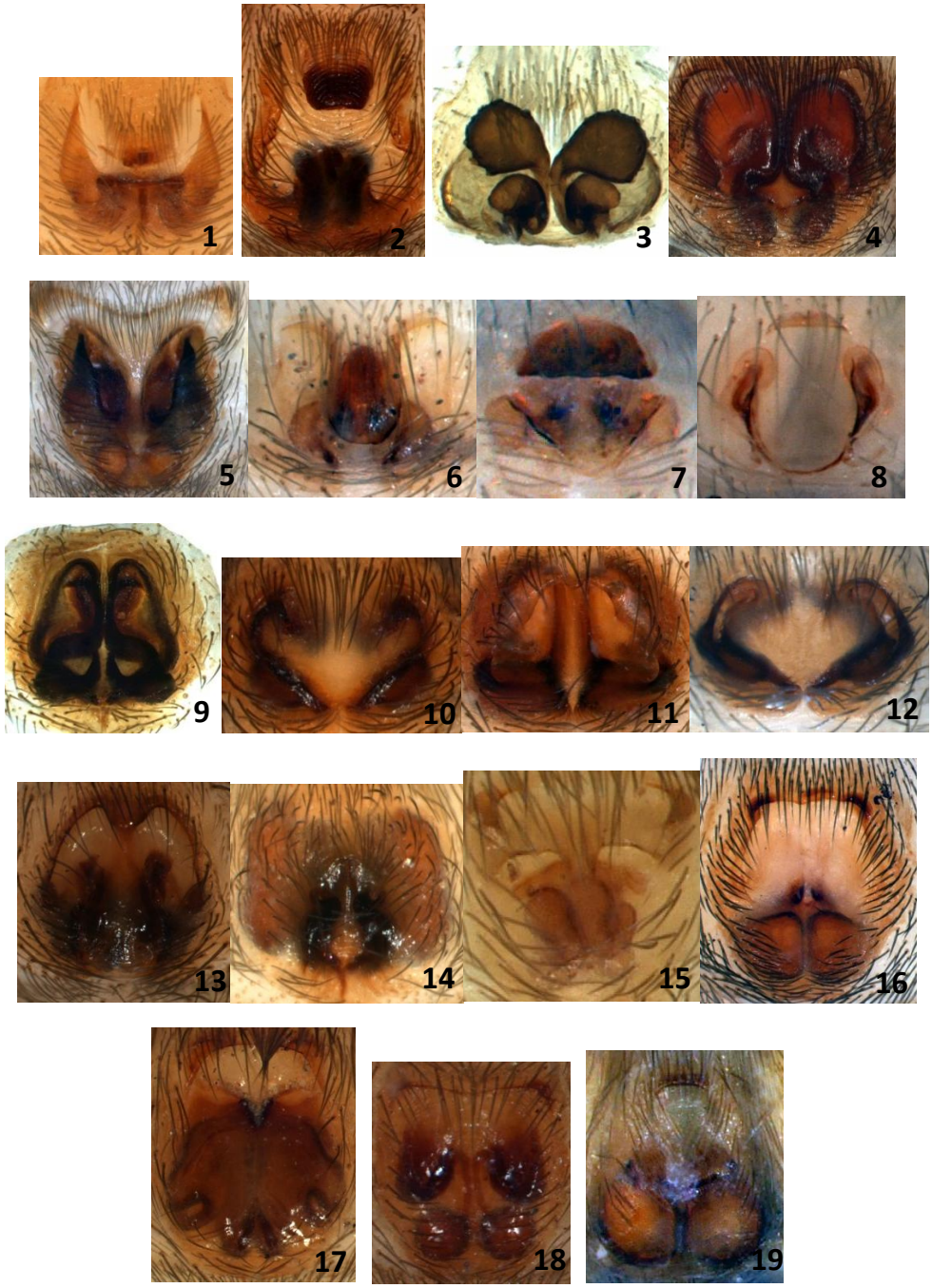

Figure A.16. GNAPHOSIDAE. 1 - *Anagraphis pallens*; 2 - *Berinda ensigera*; 3 - *Drassodes lutescens*; 4 - *Drassyllus praeficus*; 5 - *Haplodrassus morosus*; 6 - *Leptodrassus albidus*; 7 - *Leptopilos hadjissaranti*; 8 - *Leptopilos levantinus*; 9 - *Nomisia aussereri*; 10 - *Nomisia exornata*; 11 - *Nomisia palaestina*; 12 - *Nomisia ripariensis*; 13 - *Pterotricha lentiginosa*; 14 - *Scotophaeus blackwalli*; 15 - *Synaphosus trichopus*; 16 - *Trachyzelotes barbatus*; 17 - *Zelotes solstitialis*; 18 - *Zelotes tenuis*; 19 - *Zelotes zin*.

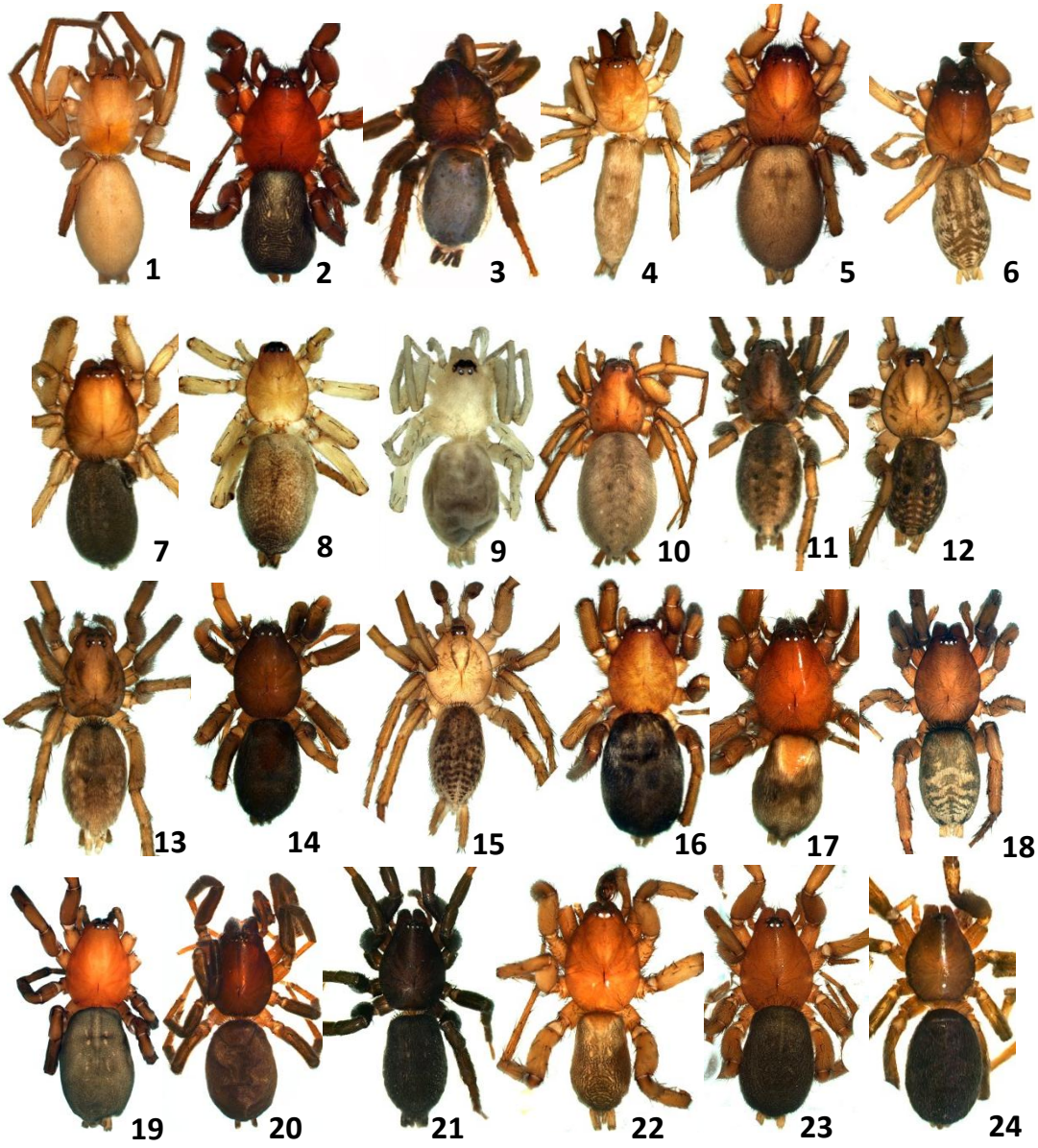

Figure A.17. GNAPHOSIDAE. 1 - *Anagraphis pallens*; 2 - *Berinda ensigera*; 3 - *Callilepis cretica*; 4 - *Drassodes lutescens*; 5 - *Gnaphosa* sp.; 6 - *Haplodrassus morosus*; 7 - *Haplodrassus signifier*; 8 - *Leptodrassus albidus*; 9 - *Leptopilos levantinus*; 10 - *Nomisia aussereri*; 11 - *Nomisia exornata*; 12 - *Nomisia palaestina*; 13 - *Nomisia pariensis*; 14 - *Poecilochroa furcate*; 15 - *Pterotricha lentiginosa*; 16 - *Scotophaeus blackwalli*; 17 - *Scotophaeus scutulatus*; 18 - *Synaphosus trichopus*; 19 - *Trachyzelotes barbatus*; 20 - *Zelotes apricorum*; 21 - *Zelotes longipes*; 22 - *Zelotes solstitialis*; 23 - *Zelotes tenuis*; 24 - *Zelotes zin*.

Figure A.18. SELENOPIDAE, SPARASSIDAE, PHILODROMIDAE. 1,2 - *Selenops radiatus*; 3,4 - *Eusparassus walckenaeri*; 5,6 - *Micrommata ligurina*; 7,9,10 - *Philodromus bistigma*; 11,12 - *Philodromus cespitum*; 13,14 - *Philodromus pulchellus*; 15 - *Philodromus rufus*; 8,16,17 - *Thanatus atratus*; 18,19 - *Thanatus imbecillus*.

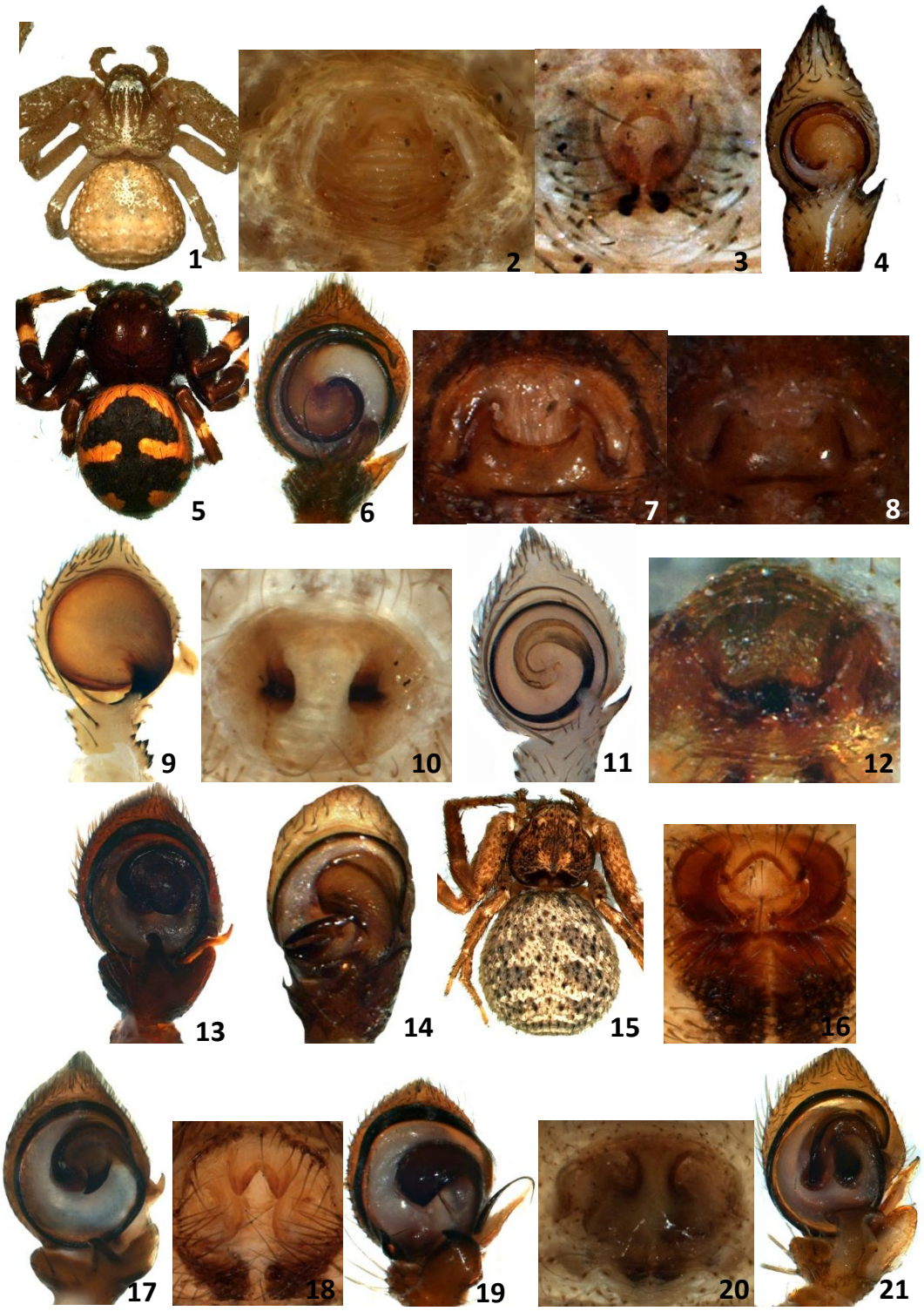

Figure A.19. THOMISIDAE. 1,2 - *Heriaeus simoni*; 3 - *Runcinia grammica*; 4,8 - *Synema globosum*; 5,6,7 - *Synema plorator*; 9,10 - *Thomisus onustus*; 11,12 - *Tmarus piochardi*; 13 - *Xysticus caperatus*; 14 - *Xysticus cor*; 15,16 - *Xysticus cribratus*; 17,18 - *Xysticus tenebrosus*; 19,20 - *Xysticus thessalicus*; 21 - *Xysticus tristrami*.

Figure A.20. SALTICIDAE. 1,2 - *Aelurillus v-insignitus*; 3 - *Chalcoscirtus infimus*; 4,8,9 - *Cyrba algerina*; 5,6 - *Euophrys rufibarbis*; 7,12,13 - *Evarcha jucunda*; 10,11 - *Habrocestum papilionaceum*; 14,16,18 - *Heliophanus kochii*; 15,17,19 - *Heliophanus tribulosus*; 20 - *Heliophanus melinus*; 21 - *Heliophanus equester*; 22 - *Menemerus taeniatus*; 23 - *Mogrus neglectus*.

Figure A.21. SALTICIDAE. 1 - *Leptorchestes berolinensis*; 2 - *Menemerus semilimbatus*; 3,4 - *Pellenes flavipalpis*; 5 - *Pellenes diagonalis*; 6,7 - *Philaeus chrysops*; 8,9 - *Phlegra lineata*; 10,11 - *Plexippoides gestroi*; 12,13,14 - *Pseudicius picaceus*; 15 - *Pseudeuophrys obsoleta*; 16,17 - *Salticus propinquus*; 18,19 - *Salticus noordami*.