

The Turkish Harvestmen (Opiliones) with zoogeographical remarks

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Abstract

The species of Turkish harvestmen fauna that were recorded by various authors from different localities of Turkey are zoogeographically evaluated. Also, chorotypes for each taxon are given with the zoogeographical remarks.

Keywords: Arachnida, Harvestmen, Opiliones, Turkey.

Introduction

Harvestmen (Opiliones) are represented by more than 6000 described species (Hallan, 2005), and comprise the third most diverse order of Arachnida. They are significant predators in natural ecosystems and often found in disturbed habitats as well as in forests, under stones, in caves, on the trunks of trees, on the soil, in forest litter, in soil crevices, and sometimes rather deep in the soil.

Harvestmen are common and abundant arachnids in Turkey. These animals are insufficiently studied in Turkey and there is a need to update faunal and ecological data. There are a few articles on the harvestmen fauna in Turkey. The first data on Turkish opilionid were published by foreigner arachnologists, such as Kulczyński (1903), Nosek (1905), Roewer (1923, 1950, 1956, 1957, 1959, 1962), Gruber (1968, 1969, 1976, 1979, 1998), Šilhavý (1955), Starega (1973, 1976, 1981, 2003), Martens (1978, 2006) and Snegovaya (1999). Recently, harvestmen attracted the attention of Turkish authors and studies on opilionid fauna of Turkey have gradually increased (Bayram, 1994; Bayram *et al.*, 2005; Bayram & Çorak, 2007; Çorak & Bayram, 2007; Yiğit *et al.*, 2007; Kurt *et al.*, 2008a, 2008b; Bayram *et al.*, 2010).

Nowadays, such data about the Turkish harvestmen fauna have reached a considerable level. At present, 63 species and 1 subspecies belonging to 7 families have

been recorded from the country until the present time. The main aim of the present paper is to evaluate the Turkish harvestmen fauna zoogeographically and faunistically by using known data.

Material and Methods

In this paper, classification and nomenclature of the harvestmen suggested by Hallan (2005) are followed. Within the family, the genera and species are listed alphabetically. Distribution of species in geographical regions of Turkey is summarized in remarks according to Topçu *et al.* (2005) [MR = Marmara, AR = Aegean, BSR = Black Sea [WBR, MBR, EBR], CAR = Central Anatolia, EAR = East Anatolia, MER = Mediterranean, and SAR = Southeast Anatolia Regions]. The present zoogeographical characterization is based on the chorotype classification of Anatolian fauna, recently proposed by Vigna Taglianti *et al.* (1999). In this study, as possible as one chorotype description can be identified for each taxon. But this kind of description can not be possible for some taxa, so one, two or three chorotypes are used for them.

Results

Family Dicranolasmatidae Simon, 1879

Dicranolasma giljarovi Šilhavý, 1966

Distribution in Turkey: CAR, EAR. **World Distribution:** Eastern Mediterranean, Caucasia (Martens, 1965; Starega, 1978; Snegovaya, 1999; Çorak, 2004; Bayram & Çorak, 2007). **Chorotype:** Turano-Mediterranean.

Dicranolasma hoberlandti Šilhavý, 1956

Distribution in Turkey: MR, MER. **World Distribution:** Southeast European, Eastern Mediterranean, Caucasia, Middle East (Martens, 1965; Gruber, 1969; Starega, 1973; Bayram & Çorak, 2007). **Chorotype:** Turano-Mediterranean.

Dicranolasma ponticum Gruber, 1998

Distribution in Turkey: MBR, EBR. **World Distribution:** Southeast European, Eastern Mediterranean, Caucasia, Middle East (Gruber, 1998; Bayram & Çorak, 2007). **Chorotype:** Turano-Mediterranean.

Dicranolasma ressli Gruber, 1998

Distribution in Turkey: CAR. **World Distribution:** Turkey (Gruber, 1968). **Chorotype:** Anatolian.

Dicranolasma scabrum (Herbst, 1799)

Distribution in Turkey: MR, CAR, EAR. **World Distribution:** Central Europe to South Europe, Caucasia, Middle East (Martens, 1965; Starega & Chevrizov, 1978; Karaman, 1995; Snegovaya, 1999; Çorak, 2004; Bayram & Çolak, 2007). **Chorotype:** W-Palearctic.

Family Ischyropsalididae Simon, 1879

Ischyropsalis hellwigi hellwigi (Panzer, 1794)

Distribution in Turkey: CAR. **World Distribution:** European (Spoek, 1975; Bliss & Martens, 1995; Klimeš, 2000; Novak & Gruber, 2000; Starega, 2002; Komposch, 2004; Komposch & Gruber, 2004; Blick & Komposch, 2004; Hallan, 2005; Kurt *et al.*, 2008a). **Chorotype:** European.

Family Nemastomatidae Simon, 1872

Giljarovia tenebricosa (Redikorzevi, 1936)

Distribution in Turkey: EBR. **World Distribution:** Caucasia, Turkey (Martens, 2006).

Chorotype: Turano-Anatolian.

Giljarovia turcica Gruber, 1976

Distribution in Turkey: MBR, EBR. **World Distribution:** Turkey (Gruber, 1976).

Chorotype: Anatolian.

Histicostoma caucasicum (Redikorzev, 1936)

Distribution in Turkey: EBR. **World Distribution:** Russia, Turkey, Georgia (Redikorzev, 1936; Roewer, 1951; Starega, 1966, 1978; Snegovaya & Chemeris, 2004; Martens, 2006). **Chorotype:** E-European.

Mediostoma ceratocephalum Gruber, 1976

Distribution in Turkey: MER. **World Distribution:** Turkey (Gruber, 1976).

Chorotype: Anatolian.

Mitostoma gracile (Redikorzew, 1936)

Distribution in Turkey: EBR, CAR. **World Distribution:** Russia, Caucasia, Bulgaria, Turkey (Starega, 1976; Martens, 1978, 2006; Snegovaya & Chemeris, 2004).

Chorotype: E-European.

Nemastoma anatolicum Roewer, 1962

Distribution in Turkey: MER. **World Distribution:** Turkey (Roewer, 1962; Starega, 1973). **Chorotype:** Anatolian.

Paranemastoma supersum (Roewer, 1951)

Distribution in Turkey: EBR. **World Distribution:** Georgia, Turkey (Martens, 2006).

Chorotype: Turano-Anatolian.

Paranemastoma weneri Kulczyński, 1903

Distribution in Turkey: Unknown exact locality. **World Distribution:** Turkey (Hallan, 2005). **Chorotype:** Anatolian.

Pyza anatolica (Roewer, 1959)

Distribution in Turkey: EAR, SAR. **World Distribution:** Turkey (Gruber, 1979).

Chorotype: Anatolian.

Pyza taurica Gruber, 1979

Distribution in Turkey: MER, CAR. **World Distribution:** Turkey (Gruber, 1979).

Chorotype: Anatolian.

Vestiferum alatum Martens, 2006

Distribution in Turkey: EBR. **World Distribution:** Georgia, Turkey (Martens, 2006).

Chorotype: Turano-Anatolian.

Family Phalangiidae Latreille, 1802

Buresilia macrina (Roewer, 1956)

Distribution in Turkey: Unknown exact locality. **World Distribution:** Turkey (Roewer, 1956; Starega, 1981; Hallan, 2005). **Chorotype:** Anatolian.

Dasylobus kulczynskii Nosek, 1905

Distribution in Turkey: CAR. **World Distribution:** Turkey (Nosek, 1905; Hallan, 2005). **Chorotype:** Anatolian.

Egaenus convexus (C.L. Koch, 1835)

Distribution in Turkey: Unknown exact locality. **World Distribution:** Europe to Central Asia (Roewer, 1956; Starega, 2000; Klimeš, 2000; Novak & Gruber, 2000; Komposch, 2004; Blick & Komposch, 2004; Komposch & Gruber, 2004).

Chorotype: Palearctic.

Egaenus marenzelleri Nosek, 1905

Distribution in Turkey: CAR. **World Distribution:** Turkey (Nosek, 1905; Hallan, 2005). **Chorotype:** Anatolian.

Homolophus funestus L. Koch, 1877

Distribution in Turkey: CAR. **World Distribution:** Siberia, Mongolia, Turkey (Blick & Komposch, 2004; Hallan, 2005; Stol, 2007; Kurt *et al.*, 2008b).

Chorotype: Central Asiatic-European.

Lacinius ephippiatus (C.L. Koch, 1885)

Distribution in Turkey: EAR. **World Distribution:** East Europe to North Europe, Caucasia, Turkey (Spoek, 1975; Martens, 1978; Stol, 1993, 2002, 2007; Bliss & Martens, 1995; Farzalieva & Esyunin, 1999; Vanhercke, 1999; Novak & Gruber, 2000; Klimeš, 2000; Starega, 2002; Komposch, 2004; Komposch & Gruber, 2004; Blick & Komposch, 2004; Hallan, 2005; Çorak *et al.*, 2008). **Chorotype:** European.

Metaphalangium cirtaum (C.L. Koch, 1839)

Distribution in Turkey: Unknown exact locality. **World Distribution:** South Europe, Mediterranean (Cokendolpher, 1990; Bayram *et al.*, 2010).

Chorotype: S-European+Mediterranean.

Metaphalangium strandi (Nosek, 1905)

Distribution in Turkey: CAR. **World Distribution:** Turkey (Nosek, 1905; Hallan, 2005). **Chorotype:** Anatolian.

Metaplatybunus grandissimus (C.L. Koch, 1839)

Distribution in Turkey: Unknown exact locality. **World Distribution:** Eastern Mediterranean, Georgia (Roewer, 1912, 1923, 1956, 1959; Martens, 1966; Starega, 1966; Mitov, 2000). **Chorotype:** E-Mediterranean.

Metaplatybunus petrophilus Martens, 1965

Distribution in Turkey: CAR, EAR. **World Distribution:** Eastern Mediterranean (Çorak, 2004; Bayram *et al.*, 2010). **Chorotype:** E-Mediterranean.

Mitopus morio (Fabricius, 1779)

Distribution in Turkey: CAR. **World Distribution:** European (Spoek, 1975; Martens, 1978; Stol, 1993, 2002, 2007; Bliss & Martens, 1995; Farzalieva & Esyunin, 1999; Vanhercke, 1999; Klimeš, 2000; Novak & Gruber, 2000; Starega, 2002; Komposch & Gruber, 2004; Komposch, 2004; Blick & Komposch, 2004; Hallan, 2005). **Chorotype:** European.

Oligolophus hansenii (Kraepelin, 1896)

Distribution in Turkey: CAR. **World Distribution:** Central to West Europe, Turkey (Spoek, 1975; Stol, 1993, 2002, 2007; Bliss & Martens, 1995; Vanhercke, 1999; Starega, 2002; Blick & Komposch, 2004; Hallan, 2005; Kurt *et al.*, 2008b). **Chorotype:** European.

Oligolophus tridens (C.L. Koch, 1836)

Distribution in Turkey: CAR. **World Distribution:** European (Spoek, 1975; Martens, 1978; Vanhercke, 1999; Klimeš, 2000; Novak & Gruber, 2000; Starega, 2002; Komposch & Gruber, 2004; Komposch, 2004; Blick & Komposch, 2004; Hallan, 2005; Stol, 2007; Kurt *et al.*, 2008b). **Chorotype:** European.

Opilio hemseni Roewer, 1952

Distribution in Turkey: EBR. **World Distribution:** Ukraine, Russia, Georgia, Turkey, Iran (Starega, 2003). **Chorotype:** E-European+ Irano-Anatolian.

Opilio insulae Roewer, 1956

Distribution in Turkey: AR. **World Distribution:** Ukraine, Greece, Turkey (Gruber, 1978; Bayram *et al.*, 2010). **Chorotype:** E-European.

Opilio lederi Roewer, 1911

Distribution in Turkey: EAR, SAR. **World Distribution:** European, Caucasia, Central Asia, North Africa, Turkey (Gruber, 1979; Bayram *et al.*, 2010). **Chorotype:** Palearctic.

Opilio parietinus (De Geer, 1778)

Distribution in Turkey: CAR. **World Distribution:** European, Caucasia, Central Asia, North Africa, Turkey (Šilhavý, 1966; Spoek, 1975; Hillyard & Sankey, 1989; Bliss & Martens, 1995; Snegovaya, 1999; Vanhercke, 1999; Klimeš, 2000; Novak & Gruber, 2000; Starega, 2002; Komposch & Gruber, 2004; Çorak, 2004; Komposch, 2004; Blick & Komposch, 2004; Stol, 2007). **Chorotype:** Palearctic.

Opilio redikorzevi Roewer, 1956

Distribution in Turkey: CAR. **World Distribution:** Caucasia, Turkey (Redikorvez, 1936; Šilhavý, 1966; Kurt *et al.*, 2008b). **Chorotype:** Turano-Anatolian.

Opilio saxatilis C.L. Koch, 1839

Distribution in Turkey: CAR, EAR. **World Distribution:** European (Šilhavý, 1966; Spoek, 1975; Martens, 1978; Hillyard & Sankey, 1989; Bliss & Martens, 1995; Snegovaya, 1999; Vanhercke, 1999; Klimeš, 2000; Mitov, 2000; Novak & Gruber, 2000; Starega, 2002; Blick & Komposch, 2004; Çorak, 2004; Komposch, 2004; Komposch & Gruber, 2004; Hallan, 2005; Stol, 2007). **Chorotype:** European.

Opilio validus Roewer, 1959

Distribution in Turkey: Unknown exact locality. **World Distribution:** Turkey (Mitov, 2000). **Chorotype:** Anatolian.

Phalangium opilio Linnaeus, 1761

Distribution in Turkey: CAR. **World Distribution:** European (Šilhavý, 1966; Spoek, 1975; Martens, 1978; Hillyard & Sankey, 1989; Bliss & Martens, 1995; Snegovaya, 1999; Vanhercke, 1999; Klimeš, 2000; Novak & Gruber, 2000; Starega, 2002; Blick & Komposch, 2004; Çorak, 2004; Komposch, 2004; Komposch & Gruber, 2004; Hallan, 2005; Stol, 2007;). **Chorotype:** European.

Phalangium punctipes (C.L. Koch, 1878)

Distribution in Turkey: CAR. **World Distribution:** Cuba, Congo, Central Asia, Caucasia, Eastern Mediterranean (Šilhavý, 1966; Blick & Komposch, 2004; Hallan, 2005; Kurt *et al.*, 2008b; Stol, 2007). **Chorotype:** Palearctic+Neotropical+Afrotropical.

Phalangium savignyi Audouin, 1825

Distribution in Turkey: MER. **World Distribution:** Russian, Caucasia, Mediterranean (Cokendolpher, 1990; Bayram *et al.*, 2010). **Chorotype:** Mediterranean.

Platybunoides argaea Šilhavý, 1956

Distribution in Turkey: CAR. **World Distribution:** Turkey (Šilhavý, 1956).

Chorotype: Anatolian.

Platybunus anatolicus Roewer, 1956

Distribution in Turkey: CAR. **World Distribution:** Turkey (Roewer, 1956).

Chorotype: Anatolian.

Rafalskia cretica (Roewer, 1923)

Distribution in Turkey: Unknown exact locality. **World Distribution:** Eastern Mediterranean (Mitov, 2003). **Chorotype:** E-Mediterranean.

Rafalskia olympica (Kulczyński, 1903)

Distribution in Turkey: MR. **World Distribution:** Turkey (Starega, 1981; Karaman, 2002; Hallan, 2005). **Chorotype:** Anatolian.

Rilaena gruberi Starega, 1973

Distribution in Turkey: EAR. **World Distribution:** Iraq, Turkey (Starega, 1973).

Chorotype: SW-Asiatic (Irano-Anatolian).

Zachaeus anatolicus (Kulczyński, 1923)

Distribution in Turkey: CAR. **World Distribution:** Eastern Mediterranean, Yugoslavia, Azerbaijan (Starega, 1978; Snegovaya, 2002). **Chorotype:** Turano-Mediterranean.

Zachaeus crista (Brullé, 1832)

Distribution in Turkey: CAR, WBR. **World Distribution:** European, Turkey, Azerbaijan (Martens, 1965; Gruber, 1969, 1979; Hillyard & Sankey, 1989; Snegovaya, 1999; Klimeš, 2000; Çorak, 2004; Komposch, 2004; Bayram & Çorak, 2007).

Chorotype: European.

Zachaeus hebraicus (Simon, 1884)

Distribution in Turkey: MER. **World Distribution:** Eastern Mediterranean, Middle East (Roewer, 1923, 1956; Starega, 1967, 1973). **Chorotype:** E-Mediterranean.

Zachaeus orchimonti (Giltay, 1933)

Distribution in Turkey: Unknown exact locality. **World Distribution:** Turkey (Giltay, 1933; Hallan, 2005). **Chorotype:** Anatolian.

Family Sclerosomatidae Simon, 1879

Leiobunum albigenum Sørensen, 1911

Distribution in Turkey: MER. **World Distribution:** Eastern Mediterranean (Šilhavý, 1956). **Chorotype:** E-Mediterranean.

Leiobunum ghigii Di Caporiacco, 1927

Distribution in Turkey: Unknown exact locality. **World Distribution:** Eastern Mediterranean (Di Caporiacco, 1929; Gruber, 1968). **Chorotype:** E-Mediterranean.

Leiobunum rotundum (Latreille, 1798)

Distribution in Turkey: CAR. **World Distribution:** European (Šilhavý, 1966; Spoek, 1975; Martens, 1978; Hillyard & Sankey, 1989; Bliss & Martens, 1995; Snegovaya, 1999; Vanhercke, 1999; Klimeš, 2000; Novak & Gruber, 2000; Starega, 2002; Blick & Komposch, 2004; Çorak, 2004; Komposch, 2004; Komposch & Gruber, 2004; Hallan, 2005; Kurt *et al.*, 2008a; Stol, 2007). **Chorotype:** European.

Leiobunum rupestre (Herbst, 1799)

Distribution in Turkey: CAR. **World Distribution:** European (Martens, 1978; Martens, 1995; Klimeš, 2000; Novak & Gruber, 2000; Starega, 2002; Blick & Komposch, 2004; Komposch, 2004; Bliss & Komposch, 2004; Hallan, 2005; Kurt *et al.*, 2008a; Stol, 2007).
Chorotype: European.

Leiobunum seriatum Simon, 1878

Distribution in Turkey: MER. **World Distribution:** Eastern Mediterranean, Middle East (Šilhavý, 1955; Starega, 1973). **Chorotype:** E-Mediterranean.

Family Sironidae Simon, 1879

Cyphophthalmus duricorius bithynicus (Gruber, 1969)

Distribution in Turkey: MR. **World Distribution:** Turkey (Gruber, 1968).
Chorotype: Anatolian.

Cyphophthalmus duricorius yalovenssis (Gruber, 1969)

Distribution in Turkey: MR. **World Distribution:** Turkey (Gruber, 1968).
Chorotype: Anatolian.

Family Trogulidae Sundevall, 1833

Calathocratus beieri Gruber, 1968

Distribution in Turkey: MER. **World Distribution:** Turkey (Gruber, 1968; Schönhofer, 2009). **Chorotype:** Anatolian.

Platybessobius caucasicus Šilhavý, 1966

Distribution in Turkey: Unknown exact locality. **World Distribution:** Russia, Caucasia, Turkey (Roewer, 1923, 1950; Redikorvez, 1936; Šilhavý, 1955; Snegovaya, 1999). **Chorotype:** E-European.

Platybessobius singularis Roewer, 1940

Distribution in Turkey: MER, AR, CAR, MR, WBR. **World Distribution:** Caucasia, Turkey, Greece (Šilhavý, 1966; Gruber, 1968; Schönhofer, 2009).
Chorotype: Turano-Mediterranean (Balkano-Anatolian).

Trogulocratus rhodiensis Gruber, 1963

Distribution in Turkey: MR, AR. **World Distribution:** Turkey, Greece (Martens, 1965; Gruber, 1978). **Chorotype:** Turano-Mediterranean (Balkano-Anatolian).

Trogulus graecus Dahl, 1903

Distribution in Turkey: Unknown exact locality. **World Distribution:** Eastern Mediterranean (Starega, 1976; Mitov, 2000; Schönhofer, 2009). **Chorotype:** E-Mediterranean.

Trogulus gypseus Simon, 1879

Distribution in Turkey: MER, AR. **World Distribution:** Mediterranean (Roewer, 1959; Martens, 1965; Gruber, 1968; Schönhofer, 2009). **Chorotype:** Mediterranean.

Trogulus tricarinatus (Linnaeus, 1758)

Distribution in Turkey: MR. **World Distribution:** Central to South Europe (Roewer, 1959; Gruber, 1968; Martens, 1978; Mitov, 2000; Schönhofer, 2009). **Chorotype:** European.

Trogulus uncinatus Gruber, 1973

Distribution in Turkey: MR. **World Distribution:** Turkey (Gruber, 1968; Schönhofer, 2009). **Chorotype:** Anatolian.

Zoogeographical Remarks

Turkish harvestmen include 63 species and 1 subspecies belonging to 7 families. They have different chorotypes as follows:

19 species (+ 1 subspecies), about 31%, have “Anatolian” chorotype. They are endemic to Turkey. These taxa are: *Buresilia macrina*, *Calathocratus beieri*, *Cyphophthalmus duricorius bithynicus*, *C. d. yalovensisi*, *Dasylobus kulczyanskii*, *Dicranolasma resslis*, *Egaenus marenzelleri*, *Giljarovia turcica*, *Mediostoma ceratocephalum*, *Metaphalangium strandi*, *Nemastoma anatolicum*, *Opilio validus*, *Paranemastoma weneri*, *Platybunoides argaea*, *Platybunus anatolicus*, *Pyza anatolica*, *P. taurica*, *Rafalskia olympica*, *Trogulus uncinatus*, *Zachaeus orchimonti*.

11 species, about 18%, have “European” chorotype. These taxa are: *Ischyropsalis hellwigi hellwigi*, *Lacinius ephippiatus*, *Leiobunum rotundum*, *L. rupestre*, *Mitopus morio*, *Oligolophus hansenii*, *O. tridens*, *Opilio saxatilis*, *Phalangium opilio*, *Trogulus tricarinatus* and *Zachaeus crista*.

8 species, about 11%, have “E-Mediterranean” chorotype. These taxa are: *Leiobunum albigenum*, *L. ghigii*, *L. seriatum*, *Metaplatybunus grandissimus*, *M. Petrophilus*, *Rafalskia cretica*, *Trogulus graecus* and *Zachaeus hebraicus*.

6 species, about 8%, have “Turano-Mediterranean” chorotype. These taxa are: *Dicranolasma giljarovi*, *D. hoberlandti*, *D. ponticum*, *Platybessobius singularis*, *Trogulocratus rhodiensis* and *Zachaeus anatolicus*.

4 species, about 6%, have “Turano-Anatolian” chorotype. These taxa are: *Giljarovia tenebricosa*, *Opilio redikorzevi*, *Paranemastoma supersum* and *Vestiferum alatum*.

4 species, about 6%, have “E-European” chorotype. These taxa are: *Histicostoma caucasicum*, *Mitostoma gracile*, *Opilio insulae* and *Platybessobius caucasicus*.

3 species, about 5%, have “Palearctic” chorotype. These taxa are: *Egaenus convexus*, *Opilio lederi* and *O. parietinus*.

2 species, about 3%, have “Mediterranean” chorotype. These taxa are: *Phalangium savignyi* and *Trogulus gypseus*.

Each, 1 species, about 2%, of the remaining species has a different chorotype.

Dicranolasma scabrum has “W-Palearctic” chorotype.

Homolophus funestus has “Central Asiatic-European” chorotype.

Metaphalangium cirtaum has “S-European+Mediterranean” chorotype.

Opilio hemseni has “E-European+Irano-Anatolian” chorotype.

Phalangium punctipes has “Palearctic+Neotropic+Afrotropical” chorotype.

Rilaena gruberi has “SW-Asiatic (Irano-Anatolian)” chorotype.

So, most Turkish harvestmen species belongs to Anatolian chorotype (31 %). European and E-Mediterranean chorotypes (29 %) follow them.

Acknowledgment

We are very grateful to Dr. Natali Snegovaya (Azerbaijan) for her advice and her valuable comments.

References

Bayram, A. 1994. Tarla kenarlarında yer alan ot kümelerinin arthropod faunası. *Y. Y. U. Ziraat Fak. Dergisi.*, 4: 139-149.

Bayram, A. & Çorak, İ. 2007. A new record for the harvest spider fauna of Turkey: *Dicranolasma giljarovi* Šilhavý, 1966 (Opiliona, Dicranolasmatidae). *Turk. J. Zool.*, 31: 9-12.

- Bayram, A., Danişman, T., Çorak, İ. & Yeşilyurt, F. 2005. Kırıkkale ilinin araneo-faunası üzerine bir çalışma (Arthropoda: Arachnida). *Ekoloji*, 14(56): 1-8.
- Bayram, A., Çorak, İ., Danişman, T., Sancak, Z. & Yiğit, N. 2010. Checklist of harvestmen of Turkey (Arachnida: Opiliones). *Mun. Ent. Zool.*, 5(2): 563-585.
- Blick, T. & Komposch, C. 2004. *Checkliste der Weberknechte Mittel- und Nordeuropas. Checklist of the harvestmen of Central and Northern Europe (Arachnida: Opiliones)* [Internet]. [cited 20 April 2010] Available from: http://www.arages.de/checklist/checklist04_opiliones.html
- Bliss, P. & Martens, J. 1995. Weberknechte. In: Platen, R., T. Blick, P. Bliss, R. Drogl, A. Malten, J. Martens, P. Sacher & J. Wunderlich: Verzeichnis der Spinnentiere (excl. Acarida) Deutschlands (Arachnida: Araneida, Opilionida, Pseudoscorpionida). *Arachnol. Mitt.*, 1: 1-55.
- Caporiacco, L. di 1929. Ricerche faunistiche nell'isole italiane dell'Egeo. Aracnidi. *Archivio zoologico italiano*, Napoli, 13: 221-242.
- Cokendolpher, J.C. 1990. Harvestmen of Egypt (Arachnida: Opiliones). *Serket*, 2(1): 9-13.
- Çorak, İ. 2004. Systematics and bioecology of harvest spiders collected from Anatolia (Arachnida: Opilionida). M.S. thesis, Graduate School of Natural and Applied Sciences, University of Kırıkkale, Kırıkkale, Turkey.
- Çorak, İ & Bayram, A. 2007. Harvestmen Fauna of the Soğuksu National Park, Ankara (Arachnida: Opiliones). *Mun. Ent. Zool.*, 2(2): 455-460.
- Çorak, İ., Bayram, A., Karol, S., Danişman, T., Sancak, Z. & Yiğit, N. 2008. A new record for The Harvestmen Fauna of Turkey: *Lacinius ephippiatus* (C.L. Koch, 1835) (Opiliones, Phalangidae). *Turk. J. Arach.*, 1(2): 114-117.
- Farzalieva, G.S. & Esyunin, S.L. 1999. The Harvestmen fauna of the Urals, Russia, with a key to the Ural species (Arachnida: Opiliones). *Arthropoda Selecta*, 8(3): 183-199.
- Giltay, L. 1933. Aracnides recueillis par M. D'Orchymont au cours de ses voyages aux Balkans et en Asie Mineure en 1929, 1930 et 1931. *Bull. Mus. Roy. Hist. Nat. Belg.*, 8(22): 1-40.
- Gruber, J. 1968. Ergebnisse zoologischer Sammelreisen in der Türkei: *Calathocratus beieri*, ein neuer Trogulide aus Anatolien (Opiliones, Arachnida). *Ann. Naturhist. Mus. Wien.*, 72: 435-441.
- Gruber, J. 1969. Weberknechte der Familien Sironidae und Trogulidae aus der Türkei. (Ergebnisse der österreichisch-türkischen Anatolien-Expeditionen 9). *Rev. Fac. Sci. Univ. Istanbul*, (B) 34(1-12): 75-88.
- Gruber, J. 1976. Ergebnisse zoologischer Sammelreisen in der Türkei: Zwei neue Nemastomatidenarten mit Stridulationsorganen, nebst Anmerkungen zur systematischen Gliederung der Familie (Opiliones, Arachnida). *Ann. Naturhist. Mus. Wien*, 80: 781-801.
- Gruber, J. 1978. Weberknechte (Opiliones, Arach.) von Inseln der Agais. *Ann. Naturhist. Mus. Wien*, 81: 567-573.
- Gruber, J. 1979. Ergebnisse zoologischer Sammelreisen in der Türkei. Über Nemastomatiden-Arten aus der Verwandtschaft von *Pyzaa* Südwestasien und Südosteuropa (Opiliones, Arachnida). *Ann. Naturhist. Mus. Wien*, 82: 559-577.
- Gruber, J. 1998. Beiträge zur Systematik der Gattung *Dicranolasma* (Arachnida: Opiliones, Dicranolasmatidae). I. *Dicranolasma thracium* Starega und verwandte Formen aus Südosteuropa und Südwestasien. *Ann. Naturhist. Mus. Wien*, 100B: 489-537.
- Hallan, J. 2006. *Synopsis of the described Opiliones of the world*. [Internet]. [cited 15 April 2010] Available from: <http://insects.tamu.edu/research/collection/hallan/Acari/Family/Opiliones1.htm>
- Hillyard, P.D. & Sankey, J.H.P. 1989. *Harvestmen: Synopses of the British Fauna*. The Linnean Society Publication, London. 4: 1-120.

- Karaman, M.I. 1995. Diverziteit faune kosaca (Opiliones, Arachnida) Jugoslavije sa pregledom vrsta od međunarodnog značaja. Pp: 329-335. In: Stevanović, V. & Vasić, V. (Eds), Biodiverziteit Jugoslavije sa pregledom vrsta od međunarodnog značaja, Bioloski Fakultet i Ecolibri, Belgrad. [In Serbian].
- Karaman, M.I. 2002. A contribution to the knowledge of species *Rafalskia olympica* (Kulczyński, 1903) (Opiliones, Phalangiidae, Phalangiinae). *Arachnol. Mitt.*, 24: 62-71.
- Klimeš, L. 2000. Checklist of harvestmen (Opiliones) of Czechia and Slovakia. *Ekológia*, 19(3): 125-128.
- Komposch, C. 2004. The harvestmen fauna of Hungary (Arachnida, Opiliones). pp. 227-242. In: F. Samu & C. Szinetar (eds.): *European Arachnology*, 2002. 356 pp. Budapest (Plant Prot. Inst.) & Szobmathely (Berzsenyi Coll.).
- Komposch, C. & Gruber, J. 2004. Die Weberknechte Österreichs (Arachnida, Opiliones). *Denisia*, 12: 485-534.
- Kulczyński, W. 1903. Arachnoidea in Asia Minore et ad Constantinopolim a Dre F. Werner collecta. *Sitz-ber. Akad. Wiss.*, 112: 627-680.
- Kurt, K., Babaşoğlu, A., Seyyar, O., Demir, H. & Topçu, A. 2008a. New faunistic records for the Turkish harvestmen fauna (Arachnida: Opiliones). *Mun. Ent. Zool.*, 3(2): 654-660.
- Kurt, K., Demir, H., Seyyar, O. & Topçu, A. 2008b. Some harvestmen records (Arachnida: Opiliones) from Niğde province of Turkey. *Serket*, 11(1): 2-6.
- Martens, J. 1965. Über südägäische Weberknechte der Inseln Karpathos, Rhodos und Kos (Arachnoidea, Opiliones). *Senck. biol.*, 46(1): 61-79.
- Martens, J. 1966. Zoologische Aufsammlungen auf Kreta III. Opiliones. *Ann. Naturhist. Mus. Wien*, 69: 347-362.
- Martens, J. 1978. Spinnentiere, Arachnida: Weberknechte, Opiliones. *Die Tierwelt Deutschlands*, vol. 64. G. Fischer Verlag, Jena. 464 pp.
- Martens, J. 2006. Weberknechte aus dem Kaukasus (Arachnida, Opiliones, Nemastomatidae). *Senck. biol.*, 86(2): 145-210.
- Mitov, P.G. 2000. Contribution to the Knowledge of the Harvestmen (Arachnida: Opiliones) of Albania. *Ekológia (Bratislava)*, 19(3): 159-169.
- Mitov, P.G. 2003. Rare and endemic harvestmen (Opiliones, Arachnida) species from the Balkan Peninsula. II. Three new for the Bulgarian fauna Opiliones (Arachnida) with zoogeographical notes. *Linzer biologische Beiträge*, Linz, 35(1), 273-288.
- Nosek, A. 1905. Araneiden, Opilionen und Chernetiden. In Penther, A. und E. Zederbauer, Ergebnisse einer naturwissenschaftlichen Reise zum Erdschias-Dagh (Kleinasien). *Ann. Naturh. Hofmus.*, Wien, 20: 114-154.
- Novak, T. & Gruber, J. 2000. Remarks on published data on harvestmen (Arachnida: Opiliones) from Slovenia. *Ann. Hist. Nat.*, 2(21): 281-308.
- Redikorvez, V.V. 1936. Materials to Opiliones fauna of the USSR. *Works of Inst. of Zoology USSR*, 3: 33-57.
- Roewer, C.F. 1912. Revision der Opiliones Palpatores (Opiliones, Plagiostethi). 2. Familie der Phalangiidae. *Abh. Ver. Hamburg*, 20(1): 1-295.
- Rowever, C.F. 1923. *Die weberknechte der Erde. Systematische Bearbeitung der bisher bekannten Opiliones* Gustav Fischer. Jena, 1116 pp.

- Roewer, C.F. 1950. Über Ischyropsalididae und Troglidae. Weitere Weberknechte 15. *Senckenbergiana, Frankfurt*, 31: 11-56.
- Roewer, C.F. 1951. Über Nemastomatiden. Weitere Weberknechte XVI. *Senck. biol.*, 32(1/4): 95–153.
- Roewer, C.F. 1956. Über Phalangiinae (Phalangiidae: Opiliones, Palpatores). *Senck. biol.*, 37(3/4): 247-318.
- Roewer, C.F. 1957. Über Oligolophinae, Caddoinae, Sclerosomatinae, Leiobuninae, Neopilioninae und Leptobuninae (Phalangiidae, Opiliones Palpatores). (Weitere Weberknechte XX). *Senck. biol.*, 38(5/6): 323-358.
- Roewer, C.F. 1959. Die Araneae, Solifuga und Opiliones der Sammlungen des Herrn Dr. K. Lindberg aus Griechenland, Creta, Anatolien, Iran und Indien. *Göteborgs K. Vetensk-o vitterh Samh Handl.*, 8(4): 1-47.
- Roewer, C.F. 1962. Über einige mediterrane Arachniden. *Fragmenta Entomologica*, 4(2): 11–18.
- Schönhofer, A.L. 2009. Revision of Troglidae Sundevall, 1833 (Arachnida: Opiliones). *Dissertation zur Erlangung des Grades 'Doktor der Naturwissenschaften, Am Fachbereich Biologie, Der Johannes Gutenberg-Universität, Mainz*, 197 pp.
- Šilhavý, V. 1955. Resultata Expeditionis Zoologicae Musei Nationalis. *Acta Entomologica Musei Nationalis Pragae*, 19: 31-39.
- Šilhavý, V. 1956. Výsledky zoologické expedice Národního musea v Praze do Turecka. *Sborník Entomologického Oddělení Národního Musea v Praze*, 30(441): 31–39.
- Šilhavý, V. 1966. Über die Genitalmorphologie der Nemastomatidae (Arach., Opiliones). *Senck. biol.*, 47(1): 67-72.
- Snegovaya, N.Y. 1999. Contribution to the harvest spider (Arachnida, Opiliones) fauna of the Caucasus. *Turk. J. Zool.*, 23: 453-459.
- Snegovaya, N.Y. 2002. The harvestmen (Arachnida, Opiliones) of Ismailly State Reserve. *VI International Conference "Biodiversity of the Caucasus" Makhachkala, Russia*, pp. 230–231 [In Russian].
- Snegovaya, N.Y. & Chemeris, A.N. 2004. A contribution to the knowledge of the harvestmen fauna of the Zakataly State Reserve, Azerbaijan (Arachnida: Opiliones). *Arthropoda Selecta*, 13(4): 263-278.
- Spoek, G.L. 1975. Spinachtigen - Arachnida. III. De Hooiwagens (Opilionida) van Nederland. *Wetensch. Meded. Koninkl. Nederl. Natuurhist. Veren.*, 50: 1-31.
- Starega, W. 1966. Beitrag zur Kenntnis der Weberknecht-Fauna (Opiliones) der Kaukasusländer. *Ann. Zool.*, Warsawa, 23(13): 387-411.
- Starega, W. 1967. Einige Weberknecht-Arten (Opiliones) aus Israel. *Israel Journal of Zoology*, 15(2): 57–63.
- Starega, W. 1973. Beitrag zur Kenntnis der Weberknechte (Opiliones) des Nahen Ostens. *Ann. Zool.*, Warsawa, 30(6): 129-153.
- Starega, W. 1976. Die Weberknechte (Opiliones, excl. Sironidae) Bulgariens. *Ann. Zool.*, Warsawa, 33(18): 287-433.
- Starega, W. 1978. Katalog der Weberknechte (Opiliones) der Sowjet-Union. *Fragm. Faun.*, Warsaw, 23(10): 197-241.

- Starega, W. 1981. Über *Platybunus strigosus* (L. Koch, 1867), nebst Bemerkungen über andere Arten der Platybuninae (Opiliones: Phalangiidae). *Bulletin de L'Académie Polonaise des Sciences, Varsovie, Cl. II. Série des Sciences Biologiques*, 28(8-9): 521-525.
- Starega, W. 2000. *Check-list of harvestmen (Opiliones) of Poland*. [Internet]. [cited 16 April 2010] Available from: <http://www.archnologia.edu.pl/kosarze.html>
- Starega, W. 2002. Baltic amber harvestmen (*Opiliones*) from Polish collections. *Ann. Zool.*, Warszawa, 52: 601–604.
- Starega, W. 2003. On the identity and synonymies of some Asiatic Opilioninae (Opiliones: Phalangiidae). *Acta Arachnologica*, 52(2): 91-102.
- Starega, W. & Chevrizov, B.P. 1978. Novyj vid roda *Zacheus* C.L. Koch (Opiliones: Phalangiidae) iz Predkavkazja. [A new species of the harvestmen of the genus *Zacheus* (Opiliones, Phalangiidae) from Northern Caucasus]. *Entomologicheskoe Obozrenie*, Leningrad, 57(2): 419–422.
- Stol, I. 1993. Check-list of North European Opiliones. *Fauna Norv.*, B40: 77-79.
- Stol, I. 2002. De nordiske langbeinartenes utbredelse (Opiliones), med forslag til norske navn. *Insekt-Nytt.*, 27(4): 11-20.
- Stol, I. 2007. Checklist of Nordic Opiliones. *Norw. J. Entomol.*, 54: 23-26.
- Topçu, A., Demir, H. & Seyyar, O. 2005. A Checklist of the spiders of Turkey. *Serket*, 9(4): 109-140.
- Vanhercke, L. 1999. *Opiliones in Belgium*. [Internet]. [cited 15 April 2010] Available from: <http://www.elve.net/opilio/home.htm>
- Vigna Taglianti, A.V., Audisio, P.A., Biondi, M., Bologna, M.A., Carpaneto, G.M., De Biase, A., Fattorini, S., Piattella, E., Sindaco, R., Venchi, A. & Zapparoli, M. 2000. A proposal for a chorotype classification of the Near East fauna, in the framework of the Western Palearctic Region. *Biogeographia*, 20: 31-59.
- Yiğit, N., Bayram, A., Çorak, İ. & Danişman, T. 2007. External morphology of the male harvestman *Phalangium opilio* (Arachnida: Opiliones). *Annals of the Entomological Society of America*, 100(4): 574-581.