Cyrtophora citricola (Araneae: Araneidae: Cyrtophorinae), a first record for Turkey

Mert Elverici, İlyas Tekşam, Recep Sulhi Özkütük & Kadir Boğaç Kunt

doi: 10.5431/aramit4402

Abstract: We recorded the tent-web spider *Cyrtophora citricola* (Forsskål, 1775) (Araneidae: Cyrtophorinae) from Turkey for the first time at two sites. Body measurements and a brief description of the female are presented, as well as information on the sites (olive and orange orchards, shrubs) and the accompanying spider fauna.

Keywords: Mediterranean, orb-weaver, spider, tent-web

The spider family Araneidae currently includes 168 genera and 3029 described extant species and subspecies (PLATNICK 2012). 53 species and one subspecies are known from Turkey (BAYRAM et al. 2012).

The subfamily Cyrtophorinae was first established by SIMON (1895) for the genus *Cyrtophora*. Members of this subfamily differ from other araneid spiders, mainly by their distinctive tent-web architecture (SCHARFF & CODDINGTON 1997). Furthermore, as elucidated by LEVI (1997), *Cyrtophora* also differs from other araneids by the proportions of the leg articles, having the second to fourth combined patella and tibia slightly shorter than the femur of the same leg and also shorter than the combined metatarsus and tarsus of the same leg. As additional characters, the legs are relatively heavy and the lateral eyes are slightly separated. LEVI (1997) also noted that *Cyrtophora* differs from *Argiope*, *Gea*, *Kapogea* and *Mecynogea* by the arrangement of the posterior eye row, and from *Manogea* by the cephalic region being wider (for details see LEVI 1997: 250-251).

Cyrtophora includes 43 species and 9 subspecies which are distributed throughout the tropical and subtropical regions of the world (PLATNICK 2012). *Cyrtophora citricola* (Forsskål, 1775) originates from the Old World, but has also been recorded from the Americas (PLATNICK 2012). It is considered as both a useful and a harmful agent in biological control as a result of its characteristic bulky and 'permanent' web structure (EDWARDS 2006). In terms of proximity to Turkey, the species is already known from Malta, Greece and Israel (LEVY 1997, HELSDINGEN 2011).

The purpose of this brief article is to record the araneid spider *Cyrtophora citricola* as a new species record for the Turkish araneofauna. Consequently, the subfamily Cyrtophorinae and the genus *Cyrtophora* are also reported from Turkey for the first time.

Mert ELVERİCİ, Department of Biology, Faculty of Science and Arts, University of Erzincan, TR-24100, Erzincan, Turkey – Department of Biological Sciences, Faculty of Arts and Sciences, Middle East Technical University, TR-06800 Ankara, Turkey, E-Mail: elverici@metu.edu.tr
İlyas TEKŞAM, West Mediterranean Agricultural Research Institute, Plant Protection Department, TR-07100 Antalya, Turkey
Recep Sulhi ÖZKÜTÜK, Department of Biology, Faculty of Science, Anadolu University, TR- 26470 Eskişehir, Turkey
Kadir Boğaç KUNT, Poligon Sitesi 71/27-B, TR-06810 Dodurga, Çayyolu, Ankara, Turkey

eingereicht: 4.2.2012, akzeptiert: 29.3.2012; online verfügbar: 15.5.2012

Material and methods

All specimens were collected from two different provinces in Turkey (Fig. 1) using a hand aspirator and preserved in 70% ethanol. The carapace and abdomen measurements were taken after dissection, with each one measured separately and then combined to generate the total body length. All measurements are in mm.

Results

Material examined: 11 ♀, Antalya Province, Serik District, Eminceler Village (36°53'58.72"N, 31°3'55.85"E), 02. May 2007, in orange orchard, 8 m a.s.l., leg. İ. Tekşam; 1 ♂, 10 ♀, Muğla Province, Milas District, Kıyıkışlacık Village (37°16'38.80"N, 27°33'47.97"E), 01. July 2010, in olive orchards and shrubs, 5-100 m a.s.l., leg. M. Elverici.

Further data: Muğla Province, Ortaca District, Dalyan Town – no details known (Dalyan Town: 36°50'15"N; 28°45'58"E, almost at sea level) (KOCH 2012).

Measurements (n=10♀): total length 10.00-10.93, carapace length 4.00-4.53, carapace width (max.) 3.00-3.44, leg I 12.48-14.98, leg II 11.40-13.20, leg III 7.60-8.00, leg IV 10.40-12.20.

Description: Carapace usually brown, but varying from blackish-brown to yellowish-brown among individuals. Cephalothorax yellowish towards the posterior edge. Surface covered by tiny greyish hair,

Figure 1: Map of study area ❶ Antalya Province ❷ Muğla Province, Milas District ❸ Ditto, Ortaca District

which becomes intense in the cephalic region. Distance between anterior lateral and posterior lateral eyes one and a half times the diameter of the anterior lateral eye. Sternum heart-shaped, yellowish-brown, surface covered by sparse black hair. Aboral part of labium, exterior halves of gnathocoxae blackish-deep brown, interior halves bright yellowish at the surface and usually hairless. Legs yellowish brown; colour tones on segments variable among individuals, usually with deep brown or blackish annulations. Abdomen colour and dorsal pattern variable among individuals. However, two pairs of dorsal tubercles and a pair of posterior tubercles are highly characteristic. Scapus absent on epigyne (generic character).

The only male individual was found dead on the web of an adult female from Muğla province. The remains of the male were deformed and desiccated, but the species-specific median apophysis on the relatively well preserved and still deformed palps enabled us to make an unequivocal identification.

Habitat and ecology

The specimens from Muğla were collected in the course of field studies aiming to determine the spider fauna of olive orchards found in Kıyıkışlacık Village. Olive orchards and associated shrubby vegetation were surveyed periodically over one year using several techniques, at altitudes from sea level up to 100 m. All *C. citricola* specimens were collected or observed by beating and during direct searching of shrubs. Specimens were often observed on *Myrtus communis* shrubs, and it was quite common to see several spiders on adjacent webs upon a single tree. The first adult female was observed in June and they were quite common in July, while the last adult individual was observed in September.

Distribution

Europe: France (Mainland, Corsica); Greece; Italy (Sicily & Sardinia); Malta; Portugal (Mainland & Madeira); Spain (Mainland, Balearic & Canary Islands) (HELSDINGEN 2011). Asian Near East: Israel (LEVY 1997); Old World (PLATNICK 2012), also introduced into the Americas: Greater Antilles, Costa Rica, Colombia (PLATNICK 2012), and Brazil (ALVARES & DE MARIA 2004).

Accompanying species

In a few cases during the sampling of shrubs in Kıyıkışlacık, specimens of the kleptoparasitic spiders *Argyrodes argyrodes* (Walckenaer, 1842) and *Neospintharus syriacus* (O. P.-Cambridge, 1872) were found together with *C. citricola* within the beating samples acquired from the same branches. We suspect that both of these species were kleptoparasites in the webs of *C. citricola*.

Besides *C. citricola*, the following species of araneid spiders were also recorded from Kıyıkışlacık: *Agalenatea redii* (Scopoli, 1763), *Araneus circe* (Audouin, 1826), *Araniella cucurbitina* (Clerck, 1757), *Argiope lobata* (Pallas, 1772), *Cyclosa conica* (Pallas, 1772), *Gibbaranea bituberculata* (Walckenaer, 1802), *Hypsosinga sanguinea* (C.L. Koch, 1844), *Larinioides suspicax* (O. P.-Cambridge, 1876), *Mangora acalypha* (Walckenaer, 1802), *Neoscana adianta* (Walckenaer, 1802), *Neoscona subfusca* (C.L. Koch, 1837), and *Parazygiella*

montana (C.L. Koch, 1834). Among these, *A. circe*, *A. cucurbitina, C. conica, M. acalypha,* and *N. subfusca* were collected on shrubs along with *C. citricola*, while other species were more abundant in other types of habitats.

A. circe, *N. subfusca* and *C. citricola* were the three most abundant araneids on shrubs. *A. circe* had its peak of activity earlier than the other two, in May and early June, later it completely disappeared. *N. subfusca* was active for a longer period of time from June to October, showing a large overlap with the activity of *C. citricola*. The remaining species were rare in the sampling area and represented by only few specimens in the collection.

Discussion

With the addition of *C. citricola*, the number of araneid spiders known from Turkey has increased to 54 and the number of subfamilies of Araneidae has increased to four. Based on the previously known distribution of *C. citricola*, the geographical position of Turkey and the zoogeographical distributions of other araneids recorded from Turkey, the discovery of *C. citricola* in Turkey is not particularly surprising. Its presence at three locations in Muğla and Antalya provinces may indicate that *C. citricola* is widely distributed throughout the Turkish Mediterranean coast. The specimens from Antalya were collected in orange orchards by direct searching, and found on webs built on orange trees. Adults were collected more than one month earlier than in Muğla. This was probably due to latitudinal differences between the two localities, or to annual climatic fluctuations, as specimens were collected with a time interval of three years between samples.

Occurrence of the kleptoparasitic spiders *A. argyrodes* and *N. syriacus* near *C. citricola* webs is interesting, but not surprising, as *N. syriacus* was first described from Lebanon on webs of *C. citricola* and *A. argyrodes* is also known from webs of *C. citricola*. Still, both of these species can also live freely or can be found on webs of other species (of Araneidae, Theridiidae, Pholcidae, Linyphiidae, Uloboridae) (Edwards 2006, Kaya et al. 2009, 2010).

C. citricola is a well-known species both in terms of ecology and systematics (Lubin 1974, Buskirk 1975, Levi 1997, Leborgne et al. 1998, Levy 1997). All information about the Turkish specimens and their habitats fits with the hitherto existing data.

References

Alvares É.S.S. & M. De Maria (2004): First record of *Cyrtophora citricola* (Forskål) in Brazil (Araneae, Araneidae). – Revista Brasileira de Zoologia 21: 155-156 – doi: 10.1590/S0101-81752004000100026

Bayram A., K.B. Kunt & T. Danişman (2012): The checklist of the spiders of Turkey. Version 2012.1. – Internet: http://www.spidersofturkey.com (accessed on 16/03/12)

Buskirk R.E. (1975): Coloniality, activity patterns and feeding in a tropical orb-weaving spider. – Ecology 56: 1314-1328 – doi: 10.2307/1934699

Edwards G.B. (2006): *Cyrtophora citricola* (Araneae: Araneidae), a colonial tentweb orbweaver established in Florida. – Florida Department of Agriculture and Consumer Services Division of Plant Industry, Entomology Circular 411: 1-4

Helsdingen P.J. van (2011): Araneae. In: Fauna Europaea. Database European spiders and their distribution. Version 2011.2. – Internet: http://www.european-arachnology.org/reports/fauna.shtml (accessed on 16/03/12)

Kaya R.S., K.B. Kunt, Y.M. Marusik & E.A. Yağmur (2010): The first record of genus *Argyrodes* Simon, 1864 (Araneae: Theridiidae) from Turkey. – Serket 12: 7-12

Kaya R.S., E.A. Yağmur & K.B. Kunt (2009): The first record of genus *Neospintharus* Exline, 1950 (Araneae: Theridiidae) from Turkey. – Serket 11: 87-92

Koch N. (2012): Opuntienspinne – *Cyrtophora citricola*. In: dalyaninfo.de. – Internet: http://www.dalyaninfo.de/images/tiere_spinnen/grossbilder_800/opuntienspinne_01_01_800.html (accessed 16/03/12)

Leborgne R., T. Cantarella & A. Pasquet (1998): Colonial life versus solitary life in *Cyrtophora citricola* (Araneae, Araneidae). – Insectes Sociaux 45: 125-134 – doi: 10.1007/s000400050074

Levi H.W. (1997): The American orb weavers of the genera *Mecynogea*, *Manogea*, *Kapogea* and *Cyrtophora* (Araneae: Araneidae). – Bulletin of the Museum of Comparative Zoology, Harvard University 155: 215-255

Levy G. (1997): Twelve genera of orb-weaver spiders (Araneae, Araneidae) from Israel. – Israel Journal of Zoology 43: 311-365

Lubin Y.D. (1974): Adaptative advantages and the evolution of colony formation in *Cyrtophora* (Araneae, Araneidae). – Zoological Journal of the Linnean Society 54: 321-339 – doi: 10.1111/j.1096-3642.1974.tb00806.x

Platnick N.I. (2012): The world spider catalog, version 12.5. American Museum of Natural History, New York. – Internet: http://research.amnh.org/iz/spiders/catalog/ (accessed on 16/03/12)

Scharff N. & J.A. Coddington (1997): A phylogenetic analysis of the orb-weaving spider family Araneidae (Arachnida, Araneae). – Zoological Journal of the Linnean Society 120: 355-434 – doi: 10.1111/j.1096-3642.1997.tb01281.x