

The fauna and systematic of the genus *Terellia* R-D., 1830 (Diptera: Tephritidae) with a key to the species of *Terellia* in Turkey

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Abstract: This study is based on the *Terellia* species collected from 27 provinces of Turkey during 1999-2006. The locality, host plants (including new records), and figures of the wing pattern of each species are given. An identification key to all 15 species of *Terellia* known from Turkey is presented and their distribution in Turkey and other countries summarized.

Key words: *Terellia*, Tephritidae, key, systematic, fauna, Turkey

Türkiye *Terellia* R-D., 1830 (Diptera: Tephritidae) türlerinin tanı anahtarı ile *Terellia* cinsinin faunası ve sistematığı

Özet: Bu çalışma 1999 - 2006 yılları arasında Türkiye'den toplanan *Tephritis* Latreille türlerine dayanmaktadır. Her bir türün lokalitesi, konukçu bitkileri (yeni kayıtlar dahil) ve kanat deseni resimleri verilmiştir. Türkiye'den bilinen 15 *Terellia* türü için teşhis anahtarı sunulmuş olup türlerin Türkiye'de yayılışları ve diğer ülkedeki yayılışları özetlenmiştir.

Anahtar sözcükler: *Terellia*, Tephritidae, tanı anahtarı, sistematik, fauna, Türkiye

Introduction

The tribe *Terellini* was revised by Korneyev (1985). He considered *Terellia* and *Cerajocera* as distinct genera differing in wing pattern and shape of the glans of the male phallus. The characters that Korneyev (1985) suggested as synapomorphies of *Terellia* were mostly related to the wing pattern,

but also based on the similar shape of the tip of the aculeus and the association with the Asteraceae.

All specimens used in this study were collected in Turkey in spring and summer between 1999 and 2006. In the present paper, we provide a key to all 15 species of *Terellia* from Turkey. The illustrations are arranged in alphabetical order of the species.

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Materials and methods

The specimens were collected in 27 provinces of Turkey during 1999-2006. The collected specimens, including types, are deposited in the Department of Biology, Faculty of Science and Arts, Gaziantep University, Gaziantep, Turkey (GUGT).

The terminology and morphological interpretations used in this paper follow White et al. (1999). Host plants were determined by Şemsettin Civelek and Necattin Türkmen. Material examined, host plants, distribution, and pictures of the wings of all species are given. For convenience the following species accounts are presented in alphabetical order.

Results and discussion

Taxonomy

Genus *Terellia* Robineau-Desvoidy, 1830

Type species: *Terellia palpata* Robineau-Desvoidy, 1830: 758.

For the synonymy and bibliography see Norrbom et al. (1999).

Diagnosis. *Terellia* is distinguished from other Terellini genera by the following combination of characters (see Merz (1994) for more complete list of characters): frons flat or slightly convex; fronto-facial angle slightly projecting or rather rounded; face slightly concave; epistome projecting; palp usually spatulate and projecting anterior of epistome; mesonotum usually flat and distinctly longer than wide, in *T. virens* as long as wide and convex; setae situated on or very close to line of anterior supra-alars; wing either banded, or hyaline, or slightly infuscate; stigma yellowish; veins R_{4+5} and M usually slightly convergent in their distal sections; terminal section of vein M usually at least twice as long as penultimate section; cell cup with short or indistinct point; abdomen often with 4 rows of black spots dorsally, some spots sometimes lacking; aculeus pointed or rounded at apex.

Korneyev (1985) considered *Terellia* and *Cerajocera* as distinct genera differing in wing pattern and in the shape of the male aedeagal glans. However, Korneyev (1987) described *Terellia* (*Cerajocera*) *clarissima* reared from *Jurinea mollis* in southern Ukraine with entirely hyaline wings (as in the typical *Terellia*) and the shape of the phallic glans as in

Cerajocera. He therefore concluded that *Cerajocera* is a subgenus of *Terellia* differing only in the shape of the male phallic glans.

Biology: All known species of *Terellia* infest the flowerheads of Asteraceae in the larval stage.

Key to Species of the Genus *Terellia* from Turkey

1. Wing hyaline except for yellowish pterostigma or a small spot present near the apex of wing (Figures 3, 6, 7) **2**
- Wing with 3-4 bands (Figures 1, 4, 8, 9) **10**
2. Mesonotum as long as wide **3**
- Mesonotum distinctly longer than wide **5**
3. Dorsocentral setae situated on posterior to apex of mesonotum pattern **uncinata** White
- Dorsocentral setae situated on outside to dark pattern **4**
4. Tip of phallus with distinctly extended terminal sinus and preputium **virens** Loew
- Tip of phallus with weakly extended terminal sinus and short preputium ... **zerovae** Korneyev
5. Pedicel of male longer than first flagellomere **yukseli** Kütük
- Pedicel of male shorter than first flagellomere ... **6**
6. First flagellomere or antenna completely brown to black **8**
- Antenna entirely greenish or yellow **7**
7. The length-width ratio of wing 3 at level of pterostigma; hyaline parts of wing brownish **sabroskyi** Freidberg
- The length-width ratio of wing 2.3 at level of pterostigma; hyaline parts of wing whitish **serratulae** (Linnaeus)
8. Oviscape distinctly longer than preabdomen; scape and pedicel yellow **fuscicornis** (Loew)
- Oviscape shorter than preabdomen; scape and pedicel brown **9**
9. Ultimate section of vein M 1.9 times as long as penultimate section; aculeus rounded at apex **luteola** Wiedemann
- Ultimate section of vein M 2.3 times as long as penultimate section; aculeus pointed at apex **nigripalpis** Hendel

10. Wing with 3 brown bands or 4 zigzag bands (Figures 8, 14) 12
- Wing with 4 distinct and straight yellow or green bands (Figures 1, 2) 11
11. Pedicel of male longer than first flagellomere *ceratocera* Hendel
- Pedicel of male shorter than first flagellomere.....*gynaecochochroma*(Hering)
12. Wing pattern with 4 bands and 2nd and 3rd band forming zigzags (Figure *quadratula* (Loew)
- Wing pattern with 3 irregular bands not forming zigzags (Figure 4) 13
13. Dorsocentral setae situated on black area and anterior to anterior supra-alar setae; terminal section of vein M 2.5 times as long as penultimate section 14
- Dorsocentral setae situated outside black area and posterior to anterior supra-alar setae; terminal section of vein M 1.5 times as long as penultimate section *colon* (Meigen)
14. A few black hairs present on first flagellomere; apical scutellar setae 0.8 times as long as basal scutellar setae; basal half of arista brown *ruficauda* (Fabricius)
- Hairs absent on first flagellomere; apical scutellar setae as long as basal scutellar setae; basal half of arista whitish. *winthemii* (Meigen)

Subgenus *Cerajocera* Rondani, 1856

Terellia (Cerajocera) ceratocera Hendel, 1913; (Figure 1)

Specimens examined: Antalya: 2 ♂♂, 5 ♀♀, Kaş, Çamlıova, 950 m, 21.v.2000; Isparta: 3 ♂♂, 1 ♀, Yenişarbademli, 1414 m, 12.vi.2001; Kahramanmaraş: 4 ♂♂, 2 ♀♀, Göksun, Hutaş, 1655 m, 21.vi.2002; Kayseri: 7 ♂♂, 4 ♀♀, Sarız, 1610 m, 08.vi.2005; Sivas: 5 ♂♂, 4 ♀♀, Kangal, Akgedikli, 1500 m, 15.07.2006.

Distribution: Albania, Austria, Belgium, Britain, Bulgaria, Czech Republic, Denmark, Estonia, Finland, France, Germany, Italy, Lithuania, Norway, Poland, Romania, Russia Central, Russia East, Slovakia, Sweden, Switzerland, The Netherlands, Turkey, and East Palaearctic (Kütük and Özgür, 2003; Merz and Korneyev, 2004).

Host plants: *Centaurea scabiosa*, *C. alpestris* (White, 1988; Merz, 1994; Kütük and Özgür, 2003).

Terellia (Cerajocera) gynaecochochroma (Hering, 1936); (Figure 2)

Specimens examined: Ankara: 3 ♂♂, 5 ♀♀, Kalecik, Çandır, 825 m, 12.vi.2003; Antalya: 2 ♂♂, 2 ♀♀, Kaş, Kalkan, 23 m, 21.v.2000; Burdur: 2 ♂♂, side of lake, 875 m, 13.vi.2001; Çankırı: 6 ♂♂, 7 ♀♀, Korgun, Akçakavak, 835 m, 12.vi.2003; Hatay: 1 ♀, 1 ♂, Yayladağı, Sebenoba, 545 m, 10.v.2002; Isparta: 2 ♂♂, Aksu, Yakaköy, 1800 m, 27.vi.2000; 2 ♀♀, Aksu, Yakaköy, 1760 m, 12.v.2001; Kayseri: 2 ♂♂, 5 ♀♀, Tomarza, 1390 m, 06.vii.2005; 4 ♂♂, 6 ♀♀, Yazılı, 1545 m, 07.vii.2006; 3 ♂♂, 3 ♀♀, Pınarbaşı, Karaboğaz, 1550 m, 08.vii.2005; Osmaniye: 1 ♂, 2 ♀♀, Düziçi, Gökçayır, 375 m, 10.vi.2002; 2 ♂♂, 2 ♀♀, Yarpuz plateau, 1075 m, 11.vi.2002; Samsun: 3 ♂♂, 5 ♀♀, Ladik, Küpecik, 965 m, 14.vi.2003; Sivas: 6 ♂♂, 3 ♀♀, Kangal, Tahtalı, 1540 m, 04.vi.2005; 4 ♂♂, 1 ♀, Şarkışla, 1500 m, 15.vi.2005; 3 ♂♂, 4 ♀♀, Central, 1295 m, 05.vii.2005; 2 ♂♂, 4 ♀♀, Taşlıderdere, 1335 m, 10.vii.2005; 6 ♂♂, 2 ♀♀, Şarkışla, Tavladere, 1680 m, 11.vii.2005; 3 ♂♂, 7 ♀♀, Yıldızeli, Çermik, 1345 m, 11.vii.2006; 6 ♂♂, 9 ♀♀, Kangal, 1570 m, 15.vii.2006; 3 ♂♂, 5 ♀♀, Gürün, Yazyurdu, 1550 m, 15.vii.2006; 8 ♂♂, 3 ♀♀, Kangal, Kuşkayası, 1515 m, 16.vii.2006.

Distribution: Croatia, Cyprus, Iran, Israel, Lebanon, Turkey, Central and South Europe, and Caucasus (Thompson, 1999; Khouzama et al., 2002; Kütük and Varol, 2006; Bjelis, 2007).

Host plants: *Onopordum anisacanthum* and *O. illyricum* (Khouzama et al., 2002; Kütük and Varol, 2006).

Terellia (Cerajocera) yukseli Kütük, 2009. (Figure 3)

Specimens examined: 12 ♂♂, 6 ♀♀, Niğde, Sazlıca, 1140 m, 11.vi.2003; 10 ♂♂, 10 ♀♀, Niğde, Hüyük, 1370 m, 11.vi.2003.

Distribution: Turkey (Kütük, 2009).

Host plants: *Centaurea urvillei* (Kütük, 2009).

Subgenus *Terellia* Robineau-Desvoidy, 1830

Terellia (s.str.) colon (Meigen, 1826); (Figure 4)

Specimens examined: Adana: 2 ♂♂, 1 ♀, Pozantı, Akarca, 1205 m, 27.vi.2001; 1 ♂, 1 ♀, Feke, Çürükler,



Figures 1-3. Wings of *Terellia* (*Cerajocera*): 1- *Terellia* (*Cerajocera*) *ceratocera*, 2- *T.* (*Cerajocera*) *gynaeochroma*, 3- *T.* (*Cerajocera*) *yukseli*.

790 m, 31.v.2002; Antalya: 3 ♂♂, 1 ♀, İbradı, 1190 m, 23.vi.1999; Denizli: 2 ♂♂, Beyağaç, Pınarönü, 1020 m, 22.v.2000.

Distribution: Austria, Azerbaijan, Belgium, Britain, Crete, Czech Republic, Denmark, Dodecanese Island, France, Germany, Georgia, Greece, Hungary, Israel, Italy, Kazakhstan, Kirghizia, Lithuania, Moldova, North Aegean Island, Poland, Romania, Russia Central, Russia East, Sicily, Slovakia, Spain, Sweden, Switzerland, West Siberia, Tajikistan, The Netherlands, Turkmenistan, Turkey, Ukraine, Uzbekistan, East Palaearctic, Near East, and North Africa (Foote, 1984; Kütük and Özgür, 2003; Özgür and Kütük, 2003; Merz and Korneyev, 2004).

Host plants: *Centaurea scabiosa*, *C. iberica*, *Carthamus tinctorius*, *C. tenuis*, *C. glaucus*, *C. lanatus*, and *Cirsium arvense* (White, 1988; Freidberg and Kugler, 1989; Merz, 1994; Kütük and Özgür, 2003).

Terellia* (s.str.) *fuscicornis (Loew, 1844); (Figure 5)

Specimens examined: Adana: 2 ♂♂, 1 ♀, Karahan, 70 m, 23.v.2001; 3 ♂♂, 5 ♀♀, Karaisalı, Güvenç, 180 m, 23.v.2001; 7 ♂♂, 3 ♀♀, Karaisalı, Bekirli, 245 m, 23.v.2001; 2 ♂♂, 1 ♀, Kargakekeç, 80 m, 24.v.2001; Denizli: 2 ♀♀, Çameli, Akpınar, 848 m, 22.v.2000; Isparta: 6 ♂♂, 2 ♀♀, Aksu, Yakaköy, 1925

m, 13.vii.2000; Kastamonu: 6 ♂♂, 9 ♀♀, Bulacak, 1080 m, 13.vi.2003; Kayseri: 4 ♂♂, 3 ♀♀, Tomarza, Dadaloğlu, 1390 m, 06.vii.2005; 3 ♂♂, 7 ♀♀, Pınarbaşı, 1530 m, 15.vii.2006; Sivas: 3 ♂♂, 3 ♀♀, Gürün, Konakpınar, 1775 m, 15.vii.2006.

Distribution: Crete, Cyprus, France, Greece, Italy, Madeira, Malta, Sardinia, Sicily, Spain, Israel, Turkey, and North Africa (Giray, 1979; Foote, 1984; Freidberg and Kugler, 1989; Kütük and Özgür, 2003; Özgür and Kütük, 2003; Merz and Korneyev, 2004).

Host plant: *Cynara scolymus*, *C. syriaca*, and *Onopordum tauricum* (Freidberg and Kugler, 1989; Kütük and Özgür, 2003).

Terellia* (s.str.) *luteola (Wiedemann, 1830); (Figure 6)

Specimens examined: Adana: 2 ♂♂, Pozantı, Alpu, 1120 m, 30.v.2002; 2 ♂♂, 1 ♀, Karahan, 70 m, 23.v.2001; Burdur: 2 ♀♀, Yeşilova, Karaatlı, 1160 m, 13.vi.2001; Hatay: 2 ♂♂, Narlıca, 110 m, 08.v.2002; 1 ♂, 2 ♀♀, Dörtüol, Yeniuyurt, 23 m, 08.v.2002; 2 ♂♂, 2 ♀♀, Belen, Kıcı, 575 m, 08.v.2002; 2 ♂♂, 2 ♀♀, Yayladağı, Leylekli, 545 m, 10.v.2002;. Isparta: 1 ♂, 1 ♀, Yalvaç, 1520 m, 08.vii.2000; Kastamonu: 3 ♂♂, 5 ♀♀, Devrekani, 1070 m, 13.vi.2003. Kayseri: 3 ♂♂, 5 ♀♀, Erciyes plateau, 1955 m, 07.vii.2005; 3 ♂♂,

Pınarbaşı, Aşağıbeyçayır, 1665 m, 17.vii.2006; Sivas: 3 ♂♂, 5 ♀♀, Şarkışla, 1500 m, 05.vii.2005; 3 ♂♂, 3 ♀♀, Kangal, Akgedikli, 1500 m, 15.vii.2006.

Distribution: Crete, Egypt, Israel, Italy, Lebanon, Spain, Tunisia, and Turkey (Thompson, 1999; Khouzama et al., 2002; Kütük and Varol, 2006; Merz and Korneyev, 2004).

Host plants: *Carthamus syriacus* and *C. tenuis* (Khouzama et al., 2002).

Terellia (s.str.) nigripalpis Hendel, 1927; (Figure 7)

Specimens examined: Kahramanmaraş: 2 ♂♂, 3 ♀♀, Göksun, 1630 m, 20.vi.2002; 2 ♂♂, 2 ♀♀, Andrın, 1275 m, 20.vi.2002; Kayseri: 14 ♂♂, 16 ♀♀, Yazılı, 1545 m, 17.vi.2005; 11 ♂♂, 14 ♀♀, Tomarza, Dadaloğlu, 1570 m, 06.vii.2005; 6 ♂♂, 8 ♀♀, Sarız, 1610 m, 08.vii.2005; 10 ♂♂, 5 ♀♀, Sarız, Yeşilkent, 1575 m, 16.vii.2006; 8 ♂♂, 5 ♀♀, Erciyes plateau, 1945 m, 17.vii.2005; Sivas: 12 ♂♂, 21 ♀♀, Yıldızeli, Çermik, 1345 m, 05.vii.2005; 7 ♂♂, 11 ♀♀, Şarkışla, Tavladere, 1680 m, 05.vii.2005; 6 ♂♂, 7 ♀♀, Yıldızeli, 1420 m, 05.viii.2005; 3 ♂♂, 5 ♀♀, Gürün, Yazıyurdu, 1550 m, 15.vii.2006; 7 ♂♂, 3 ♀♀, Gürün, Konakpınar, 1775 m, 15.vii.2006; 3 ♂♂, 3 ♀♀, Kangal, Akgedikli, 1500 m, 15.vii.2006.

Distribution: Turkey (Hendel 1927; Kütük, 2008).

Host plants: *Cirsium vulgare* and *Centaurea* spp. (Kütük, 2008)

Terellia (s.str.) quadratula (Loew, 1869); (Figure 8)

Specimens examined: Giresun: 8 ♂♂, 11 ♀♀, Şebinkarahisar, 1280 m, 18.vi.2003; Isparta: 7 ♂♂, 3 ♀♀, Yalvaç, Bağkonak, 1210 m, 15.vi.1999; 7 ♂♂, 9 ♀♀, Yalvaç, Sücüllü, 1200 m, 21.vi.2000; 5 ♂♂, 3 ♀♀, Yalvaç, Eleği, 1190 m, 21.vi.2000; Kahramanmaraş: 14 ♂♂, 11 ♀♀, Andrın, 1275 m, 20.vi.2002; Kayseri: 4 ♂♂, 4 ♀♀, Sarız, 1610 m, 08.vii.2005; Sivas: 4 ♂♂, 7 ♀♀, Yıldızeli, Çermik, 1345 m, 14.viii.2005; 6 ♂♂, 4 ♀♀, Kangal, Akgedikli, 1500 m, 15.vii.2006.

Distribution: Armenia, Azerbaijan, Georgia, Iran, Israel, Lebanon, and Turkey (Foote, 1984; Freidberg and Kugler, 1989; Kütük and Özgür, 2003).

Host plants: *Echinops viscosus* (Freidberg and Kugler, 1989).

Terellia (s.str.) ruficauda (Fabricius, 1794); (Figure 9)

Specimens examined: Burdur: 2 ♂♂, 2 ♀♀, Yeşilova, Karaatlı, 1160 m, 13.vi.2001; Isparta: 1 ♂, Yenişarbademli, 1560 m, 27.vi.2000; 2 ♂♂, 1 ♀, Aksu, Çayır plateau, 1925 m, 13.vii.2000; Kahramanmaraş: 2 ♂♂, Göksun, Acielma, 1675 m, 13.viii.2001; Kayseri: 18 ♂♂, 21 ♀♀, Sarız, 1610 m, 08.vii.2005; Sivas: 5 ♂♂, 8 ♀♀, Ulaş, 1430 m, 19.vi.2003; 4 ♂♂, 5 ♀♀, Şarkışla, Kaynar, 1500 m, 05.vii.2005; 5 ♂♂, 7 ♀♀, Şarkışla, 1680 m, 05.viii.2005.

Distribution: Armenia, Austria, Azerbaijan, Belgium, Britain, Bulgaria, Czech Republic, Denmark, Finland, France, Hungary, Ireland, Italy, Kazakhstan, Kirgizhia, Lithuania, Northern Ireland, Norway, Poland, Romania, Russia Central, Russia East, Slovakia, Spain, Sweden, Switzerland, The Netherlands, Tajikistan, Turkey, Turkmenistan, Ukraine, Uzbekistan, East Palaearctic and Nearctic region (Foote, 1984; Kütük and Özgür, 2003; Merz and Korneyev, 2004).

Host plants: *Cirsium palustre*, *C. arvense*, *C. eriophorum*, and *C. dissectum*, (White, 1988; Merz, 1994; Kütük and Özgür, 2003).

Terellia (s.str.) sabroskyi Freidberg, 1982; (Figure 10)

Specimens examined: Antalya: 2 ♂♂, 1 ♀, Termessos, 700 m, 13.v.2000, leg. Dr. A. Freidberg (TAU)

Distribution: Crete and Turkey (Freidberg, 1982; Merz and Korneyev, 2004).

Host plants: *Ptilostemon gnaphaloides* (Freidberg, 1982).

Terellia (s.str.) serratulae (Linnaeus, 1758); (Figure 11)

Specimens examined: Adana: 1 ♂, 1 ♀, Çotlu, 15 m, 13.iv.2001; 5 ♂♂, 2 ♀♀, Pozantı, Alpu, 1120 m, 16.iv.2001; 6 ♂♂, 5 ♀♀, Pozantı, Hamidiye, 1445 m, 17.v.2001; 3 ♂♂, 5 ♀♀, Karaisalı, Bekirli, 170 m, 23.v.2001; 19 ♂♂, 11 ♀♀, Pozantı, Alpu, 1120 m, 25.v.2001; 1 ♂, 1 ♀, Aladağ, Kelerbaşı, 910 m, 05.vi.2001; 3 ♂♂, 1 ♀, Aladağ, Büyük sofulu, 1030 m, 28.vi.2001; 1 ♂, 4 ♀♀, Feke, Çürükler, 600 m,

30.v.2002; 2 ♂♂, 4 ♀♀, Saimbeyli, Gürleşen, 785 m, 30.v.2002; 2 ♂♂, 3 ♀♀, Tufanbeyli, Doğanbeyli, 1455 m, 30.v.2002; Adıyaman: 9 ♂♂, 14 ♀♀, Besni, 1000 m, 19.viii.2001; Antalya: 3 ♀♀, Kaş, Sinekçibeli, 1500 m, 20.vi.1999; 2 ♀♀, İbradı, 1190 m, 23.vi.1999; 2 ♂♂, Kaş, Sinekçibeli, 1300 m, 11.vii.1999; 1 ♂, 3 ♀♀, Akseki, Göktepe plateau, 2100 m, 13.vii.1999; 2 ♂♂, Kaş Kalkan, 23 m, 21.v.2000; 3 ♂♂, 5 ♀♀, Kaş, Gömbe, 1850 m, 24.vi.2000; 1 ♂, 2 ♀♀, Kumluca, Gölcük, 1130 m, 25.vi.2000; 3 ♂♂, 1 ♀, Alanya, Gökbel plateau, 1450 m, 10.vii.2000; 3 ♂♂, Alanya, Gevne valley, 1585 m, 10.vii.2000; 1 ♂, 1 ♀, Gündoğmuş, Güneycik, 500 m, 12.vii.2000; 4 ♂♂, 5 ♀♀, Akseki, Geylan plateau, 1190 m, 12.vii.2000; 2 ♂♂, 2 ♀♀, İbradı, 1180 m, 13.vii.2000; Aydın: 2 ♂♂, Karacasu, Yolaltı, 784 m, 23.v.2000; Burdur: 1 ♂, 4 ♀♀, Tefenni, 1100 m, 20.v.1999; 2 ♀♀, Gölhisar, Karapınar, 1020 m, 23.vi.2000; 4 ♂♂, 2 ♀♀, Ağlasun, Yeşilbaşköy, 1400 m, 15.vii.2000; 2 ♂♂, 5 ♀♀, Soğanlı, 1515 m, 15.vii.2000; 1 ♂, 3 ♀♀, Yeşilova, Salda, 1175 m, 16.vii.2000; Denizli: 2 ♂♂, Serinhisar, 1250 m, 21.v.1999; 2 ♂♂, 1 ♀, Acıpayam, Ören, 1250 m, 10.vii.1999; 1 ♂, 2 ♀♀, Acıpayam, Aliveren, 1460 m, 23.vi.2000; 3 ♂♂, 7 ♀♀, Acıpayam, Ören, 1175 m, 16.vii.2000; 5 ♂♂, 3 ♀♀, Acıpayam, Köke, 850 m, 16.vii.2000; 4 ♂♂, 10 ♀♀, Serinhisar, Yatağan, 1080 m, 18.vii.2000; 1 ♂, 1 ♀, Serinhisar, Kefe plateau 1450 m, 18.vii.2000; Hatay: 2 ♂♂, 1 ♀, Belen, Kıcı, 575 m, 08.v.2002; 2 ♂♂, 1 ♀, Reyhanlı, Batı Ayrancı, 110 m, 08.v.2002; 3 ♂♂, Samandağı, Çevlik, 220 m, 09.v.2002; 4 ♂♂, 2 ♀♀, Yayladağı, Yalaz, 530 m, 10.v.2002; 9 ♂♂, 3 ♀♀, İskenderun, 1040 m, 13.vi.2002; 1 ♂, 1 ♀, İskenderun, Işıklı, 180 m, 14.vi.2002; Isparta: 3 ♂♂, Yalvaç, Sultan mountains, 1570 m, 15.vi.1999; 2 ♂♂, 3 ♀♀, Yalvaç, Yarıkkaya, 1450 m, 08.vii.1999; 4 ♂♂, 2 ♀♀, Yenişarbademli, Senit plateau, 1750 m, 14.vii.1999; 3 ♂♂, 5 ♀♀, Aksu, Çayır plateau, 1880 m, 14.vii.1999; 2 ♂♂, 4 ♀♀, Yalvaç, Sultan mountains, 1560 m, 20.vii.1999; 1 ♂, Senirkent, Aşağıkasıkara, 940 m, 21.vi.2000; 2 ♂♂, Sütçüler, Kesmeköy, 983 m, 26.vi.2000; 3 ♀♀, Aksu, Karağı, 1210 m, 27.vi.2000; 3 ♂♂, 3 ♀♀, Aksu, Çayır plateau, 1710 m, 27.vi.2000; 3 ♂♂, 1 ♀, Yenişarbademli, 1230 m, 13.vii.2000; 4 ♂♂, 5 ♀♀, Aksu, Dedegöl mountains, 1650 m, 13.vii.2000; 2 ♀♀, Sütçüler, Yeniköy, 1125 m, 15.vii.2000; 2 ♂♂, 3 ♀♀, Keçiborlu, Kaplanlı, 1110

m, 19.vii.2000; 3 ♂♂, 1 ♀, Keçiborlu, Özbahçe, 1330 m, 19.vii.2000; 1 ♂, 1 ♀, Uluborlu, İleydağ, 1160 m, 19.vii.2000; 1 ♂, 2 ♀♀, Yalvaç, Kuyucak, 1125 m, 20.vii.2000; Kahramanmaraş: 5 ♂♂, 5 ♀♀, Andırın, 1275 m, 20.vi.2002; 3 ♂♂, 8 ♀♀, Andırın, Efirazgılı, 565 m, 20.vi.2002; 7 ♂♂, 9 ♀♀, Göksun, Hutaş, 1655 m, 21.vi.2002; 6 ♂♂, 5 ♀♀, Ağabeyli, 540 m, 21.vi.2002; Kayseri: 8 ♂♂, 4 ♀♀, Tomarza, 1390 m, 16.vi.2005; 4 ♂♂, 5 ♀♀, Yahyalı, 1570 m, 06.vii.2005; 7 ♂♂, 2 ♀♀, Erciyes plateau, 1945 m, 07.vii.2005; 3 ♂♂, 6 ♀♀, Erciyes mountain, 2210 m, 06.vii.2005; 5 ♂♂, 6 ♀♀, Tomarza, Dadaloğlu, 1570 m, 06.vii.2005; 3 ♂♂, 4 ♀♀, Sarız, 1610 m, 08.vii.2005; 3 ♂♂, 3 ♀♀, Pınarbaşı, Karaboğaz, 1550 m, 18.vi.2006; 6 ♂♂, 3 ♀♀, Sarız, Yeşilkent, 1575 m, 16.vii.2006; Muğla: 1 ♀, Fethiye, Kızılbel, 1225 m, 22.v.2000; 3 ♂♂, 1 ♀, Fethiye, Zorlar, 1500 m, 19.vi.1999; 3 ♀♀, Kemer, Seki, 1190 m, 23.vi.2000; Nevşehir: 3 ♂♂, 7 ♀♀, Hacibektaş, 1305 m, 11.vi.2003; Niğde: 3 ♂♂, 4 ♀♀, Sazlıca, 1140 m, 11.vi.2003; Osmaniye: 4 ♂♂, 4 ♀♀, Düziçi, 460 m, 10.vi.2002; 10 ♂♂, 9 ♀♀, Yarpuz, 1075 m, 11.vi.2002; Sinop: 4 ♂♂, 2 ♀♀, Yenikonak, Bakır, 485 m, 13.vi.2003; Sivas: 2 ♂♂, 6 ♀♀, Kangal, Sipahikonağı, 1450 m, 04.vii.2005; 3 ♂♂, 4 ♀♀, Şarkışla, Kaynar, 1500 m, 05.vii.2005; 5 ♂♂, 7 ♀♀, Yıldızeli, Çermik, 1345 m, 05.vii.2005; 3 ♂♂, 6 ♀♀, Kangal, Akgedikli, 1500 m, 16.vi.2006; 5 ♂♂, 3 ♀♀, Gürün, Konakpınar, 1775 m, 15.vii.2006; 3 ♂♂, 3 ♀♀, Kangal, Kuşkayası, 1515 m, 15.vii.2006; 9 ♂♂, 11 ♀♀, Yıldızeli, Çermik, 1345 m, 11.viii.2006; Tokat: 2 ♂♂, 3 ♀♀, Niksar, Akıncı, 420 m, 18.vii.2003.

Distribution: Albania, Andorra, Armenia, Austria, Azerbaijan, Balearic Islands, Belgium, Britain, Bulgaria, Channel Island, China, Corsica, Crete, Cyprus, Czech Republic, Denmark, Finland, France, Georgia, Germany, Greece, Iran, Iraq, Ireland, Israel, Italy, Kazakhstan, Malta, Moldova, Norway, Poland, Portugal, Romania, Russia Central, Russia East, Sardinia, Sicily, Slovakia, Spain, Sweden, Switzerland, Syria, The Netherlands, Turkey, Ukraine, East Palaearctic, and North Africa (Giray, 1979; Foote, 1984; Kütük and Özgür, 2003; Özgür and Kütük, 2003; Merz and Korneyev, 2004).

Host plants: *Carduus defloratus*, *C. nutans*, *C. acanthoides*, *Cirsium vulgare*, *C. tuberosum*,

C. arvense, *C. gnaphaloides*, *C. phyllocephalum*, *Onopordom tauricum*, *O. acanthium*, *Picnomon acarna*, and *Centaurea iberica* (White, 1988; Freidberg and Kugler, 1989; Merz, 1994; Kütük and Özgür, 2003).

Terellia* (s.str.) *uncinata White, 1989; (Figure 12)

Specimens examined: Ankara: 1 ♂, 1 ♀, Yağlıpınar, 11.vii.1995, leg. R. Sophia.

Distribution: Albania, Bulgaria, Crete, Greece, Italy, North Aegean Island, and Turkey (Merz and Korneyev, 2004).

Host plants: *Centaurea solstitialis* (White, 1989).

Terellia* (s.str.) *virens (Loew, 1846); (Figure 13)

Specimens examined: Adana: 2 ♂♂, 5 ♀♀, Pozantı, Hamidiye, 1445 m, 17.v.2001; 3 ♂♂, 3 ♀♀, Pozantı, Alpu, 1120 m, 25.v.2001; 2 ♂♂, 3 ♀♀, Aladağ, 760 m, 05.vi.2001; 13 ♂♂, 11 ♀♀, Aladağ, Büyük Sofulu, 1030 m, 28.vi.2001; Antalya: 3 ♀♀, Akseki, 950 m, 23.vi.1999; 4 ♂♂, 1 ♀, İbradı, 1190 m, 23.vi.1999; 2 ♂♂, 2 ♀♀, Akseki, Göktepe plateau, 2100 m, 13.vii.1999; 3 ♂♂, İbradı, 1250 m, 13.vii.1999; 1 ♂, 3 ♀♀, Manavgat, Sağırini, 65 m, 25.vi.2000; 3 ♂♂, 7 ♀♀, Akseki, Geylan plateau, 1265 m, 12.vii.2000; 6 ♂♂, 6 ♀♀, İbradı, 1225 m, 13.vii.2000; Burdur: 6 ♂♂, 4 ♀♀, Yeşilova, Karaatlı, 1160 m, 13.vi.2001; 3 ♀♀, Yeşilova, Çaltepe, 1210 m, 14.vi.2001; 2 ♂♂, Tefenni, Hasanpaşa, 1145 m, 14.vi.2001; 2 ♀♀, Yeşilova, Salda, 1000 m, 21.v.1999; 1 ♂, 2 ♀♀, Yeşilova, Eşeler mountain, 1390 m, 10.vii.1999; 3 ♀♀, Gölhisar, Karapınar, 1020 m, 23.vi.2000; Denizli: 2 ♂♂, 3 ♀♀, Yassıhöyük, 888 m, 21.v.1999; 2 ♂♂, 1 ♀, Çivril, Sarılar, 805 m, 16.vi.1999; Isparta: 2 ♂♂, 2 ♀♀, Gönen, Gölbaşı, 930 m, 13.vi.2001; 1 ♂, Senirkent, Gençali, 925 m, 16.vi.1999; 2 ♂♂, Yalvaç, Sultan mountains 1520 m, 08.vii.1999; 1 ♂, 1 ♀, Yalvaç, Bağkonak, 1390 m, 08.vii.1999; 3 ♂♂, 1 ♀, Yalvaç, Yarıkkaya, 1450 m, 08.vii.1999; 5 ♂♂, 4 ♀♀, Senirkent, 1050 m, 09.vii.1999; 4 ♀♀, Aksu, Çayır plateau, 1925 m, 14.vii.1999; 1 ♂, 2 ♀♀, Senirkent, Aşağıkaşıkara, 940 m, 22.vi.2000; 5 ♂♂, 7 ♀♀, Sütçüler, İncidere, 1085 m, 26.vi.2000; 8 ♂♂, 3 ♀♀, Aksu, Yılanlı, 1220 m, 27.vi.2000; 3 ♂♂, Aksu, 1315 m, 27.vi.2000; 1 ♀, Yenişarbademli, 1135 m, 27.vi.2000; 4 ♂♂, 3 ♀♀, Aksu, Dedegöl mountains, 1290 m, 13.vii.2000; Kayseri: 6 ♂♂, 9 ♀♀, Pınarbaşı, Kaynar, 1615 m, 05.vii.2005; 2 ♂♂, 2 ♀♀, Tomarza,

Dadaloğlu, 1570 m, 06.vii.2005; 3 ♂♂, 1 ♀, Hisarcık, 1790 m, 06.vii.2005; 6 ♂♂, 2 ♀♀, Pınarbaşı, Sıradan, 1440 m, 07.vii.2005; 4 ♀♀, Pınarbaşı, Karaboğaz, 1550 m, 08.vii.2005; 2 ♂♂, Pınarbaşı, Karaboğaz, 1550 m, 18.viii.2005; 2 ♂♂, 3 ♀♀, Sarız, 1610 m, 08.vii.2005; 3 ♂♂, Pınarbaşı, 1530 m, 16.vii.2006; Kırıkkale: 2 ♂♂, 4 ♀♀, Keskin, 1100 m, 12.vi.2003; Tokat: 5 ♂♂, 3 ♀♀, Niksar, Akıncı, 420 m, 18.vi.2003; Sivas: 3 ♂♂, 5 ♀♀, Taşlıdere, 1335 m, 04.vii.2005; 3 ♂♂, Şarkışla, 1500 m, 05.vii.2005; 4 ♂♂, 1 ♀, Kangal, Akgedikli, 1500 m, 15.vii.2006.

Distribution: Albania, Afghanistan, Austria, Bulgaria, Corsica, Czech Republic, France, Germany, Greece, Hungary, Iran, Israel, Italy, Kazakhstan, Poland, Romania, Russia Central, Russia East, Sicily, Slovakia, Spain, Switzerland, Turkey, Ukraine, East Palaearctic, Nearctic region, and North Africa (Kütük and Özgür, 2003; Özgür and Kütük, 2003; Merz and Korneyev, 2004).

Host plants: *Centaurea iberica*, *C. hyalolepis*, *C. vallesiaca*, *C. calcitropa*, *C. solstitialis*, *C. maculosa*, *C. alba*, and *C. pichleri* (Giray, 1979; Freidberg and Kugler, 1989; Merz, 1994; Kütük and Özgür, 2003).

Terellia* (s.str.) *winthemi (Meigen, 1826); (Figure 14)

Specimens examined: Burdur: 4 ♂♂, 2 ♀♀, Gölhisar, Karapınar, 1020 m, 23.vi.2000.

Distribution: Albania, Austria, Belgium, Britain, Czech Republic, Finland, France, Germany, Hungary, Italy, Kazakhstan, Lithuania, Norway, Poland, Russia Central, Russia East, Slovakia, Spain, Sweden, Switzerland, The Netherlands, Turkey, Ukraine, and East Palaearctic (Foote, 1984; Kütük and Özgür, 2003; Merz and Korneyev, 2004).

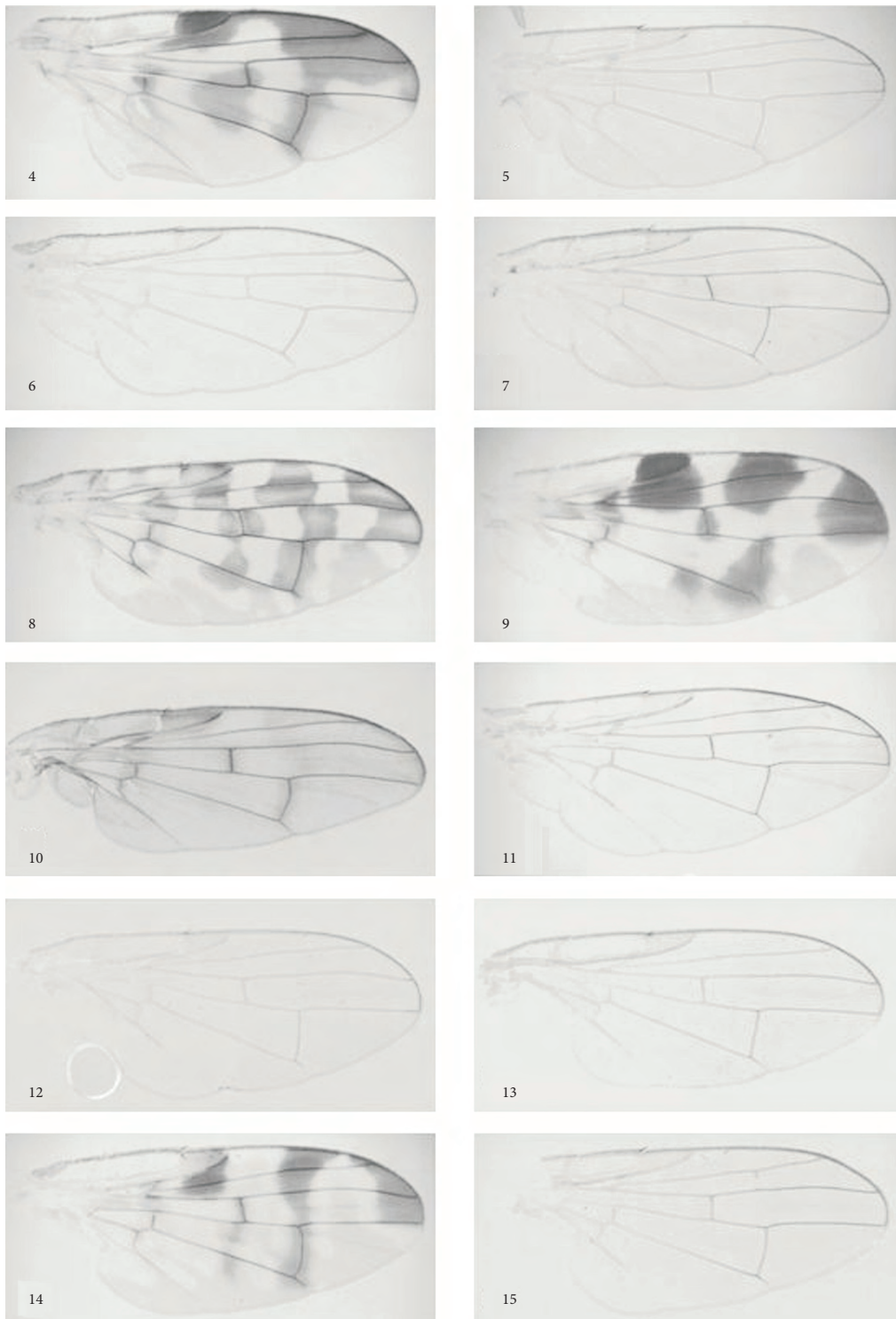
Host plants: *Carduus crispus*, *C. defloratus*, *C. acanthoides*, *Cirsium eriophorum*, and *C. depressa* (White, 1988; Merz, 1994; Kütük and Özgür, 2003).

Terellia* (s.str.) *zerovae Korneyev, 1985; (Figure 15)

Specimens examined: Kayseri: 5 ♂♂, 2 ♀♀, Pınarbaşı, 1600 m, 21.vii.2005; Sivas: 4 ♂♂, 7 ♀♀, Taşlıdere, 1335 m, 04.vii.2005.

Distribution: Crete, Greece, Romania, and Turkey (Merz and Korneyev, 2004).

Host plants: *Centaurea iberica* (Korneyev, 1985).



Figures 4-15. Wings of *Terellia* s. str.: 4- *Terellia* (s.str.) *colon*, 5- *T.* (s.str.) *fuscicornis*, 6- *T.* (s.str.) *luteola*, 7- *T.* (s.str.) *nigripalpis*, 8- *T.* (s.str.) *quadratura*, 9- *T.* (s.str.) *ruficauda*, 10- *T.* (s.str.) *sabroskyi*, 11- *T.* (s.str.) *serratulae*, 12- *T.* (s.str.) *uncinata*, 13- *T.* (s.str.) *virens*, 14- *T.* (s.str.) *winthemi*, 15- *T.* (s.str.) *zerovae*.

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