

New Delphacidae Species (Hemiptera) for the Turkish Fauna

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ABSTRACT

Delphacids, are easily distinguished from the other families of Hemiptera by post tibial spurs, are harmful to many agricultural and cultural plants with their piercing-sucking mouthparts. Some of the species have economical importance for agricultural crops. Fifty seven species were reported from Turkey according to the literature. This study was carried out in the Central Black Sea Region of Turkey. Four delphacid species, *Kelisia guttula*, *K. confusa*, *K. sabulicola* and *Ribautodelphax imitans* were new records for the Delphacidae fauna of Turkey. Figures of genitalia, data on examined specimens and general distribution of species have been given.

Keywords: Central Black Sea Region, Delphacidae, Fauna, Hemiptera, Turkey.

INTRODUCTION

The family Delphacidae belongs to the order Hemiptera. It is a very large family with 2227 species placed in six subfamilies and 427 genera (Asche 1985, 1990; Bourgoin, 2019). The post-tibial spur on the hind legs of the Delphacidae individuals is the most distinctive feature that distinguishes this family from other families of the Hemiptera order (Wilson & Turner, 2010). The delphacid specimens feed by sucking phloem sap from plant species almost exclusively belonging to the Cyperaceae and Poaceae families with their piercing-sucking mouthparts. Most of the species are found at the root and stem parts of the host plant, which are usually close to the ground. Therefore, they do not attract much attention and can be easily overlooked. Delphacidae species damage plants directly by feeding and laying eggs, and indirectly by carrying pathogens such as viruses, rickettsia, bacteria and mycoplasmas from diseased plants to healthy plants (Ossiannilsson, 1978; O'Brein & Wilson, 1985).

The first studies about the Delphacidae fauna of Turkey were carried out by Fahringer (1922) and Bodenheimer (1958). Then Dlabola (1957, 1971a, 1971b) listed 22 species and described a new genus and a new species. Linnavuori (1965) reported another two species. Asche (1982a) reported 37 species and stated that nine of them were new records. Lodos & Kalkandelen (1980, 1988) listed 52 species and nine of them were new record for Turkish fauna. Finally, Güçlü (1996) reported the new record of the two species. Fifty seven species were distributed in Turkey according to the literature (Dlabola, 1957; Lodos & Kalkandelen, 1980, 1988; Asche, 1982a; Güçlü, 1996).

This study aims to contribute to the Turkish Delphacidae fauna by determining species distribution in the Central Black Sea region.

MATERIALS AND METHODS

Specimens were collected from different localities in the Central Black Sea Region in 2009-2010 by sweep net in the day-time. Specimens were prepared according to the standard methods. Species were identified by comparing with the descriptions and figures given in Perris (1857); Fieber (1866); Ribaut (1934); Linnavuori (1957); Le Quesne (1960); Ossiannilsson (1978); Asche (1985); Anufriev & Emeljanov (1988) and Holzinger, Kammerlander, & Nickel (2003). Specimen were deposited in the collection of Suluova Vocational School, Amasya University, Turkey.

RESULTS

Subfamily: Kelisiinae Wagner, 1963

Genus: *Kelisia* Fieber, 1866

***Kelisia guttula* (Germar, 1818) (Fig. 1,2)**

Material examined: Amasya, Gümüşhacıköy, 850 m, 15.06.2010, 1 ♂, 1 ♀; Tokat, Tahtoba, 1055 m, 17.10.2009, 2 ♀♀, leg. M. Karavin.

General Distribution: Albania, Algeria, Austria, Azerbaijan, Belarus, Belgium, Bulgaria, Crimea, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lebanon, Lithuania, Luxembourg, Macedonia, M. Siberia, Norway, Netherlands, Poland, Portugal, Romania, Slovenia, Spain, Switzerland, Tadzhikistan, Tunisia, Ukraine, United Kingdom (Diabola, 1954, 1958, 1964; Holzinger & Seljak, 2001; Holzinger et al, 2003; Borodin, 2004; Maczey et al, 2005; Söderman, 2007; Aguin-Pombo et al, 2007; Niedringhaus et al, 2010; Gębicki et al, 2013; Mühlethaler et al, 2016; Della Guistina, 2019; Borodin & Borodina, 2021).

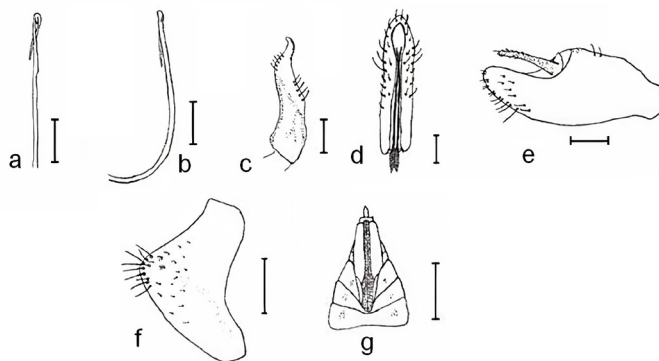


Figure 1. Genital structures, *Kelisia guttula*, a) aedeagus, from ventral, b) aedeagus, from left, c) stylus, d, e) anal tube, from below, right, f) pygopher, from right, g) tip of female abdomen, from ventral (scale a, b, f: 0.2 mm; c, d, e: 0.1 mm; g: 0.5 mm).

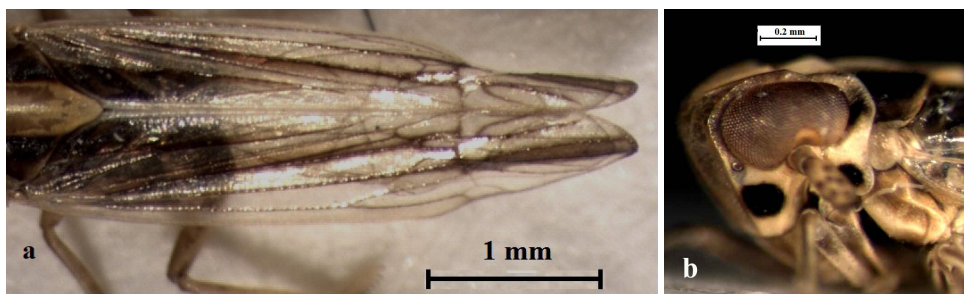


Figure 2. *Kelisia guttula*, the apex of the fore wing (a), and lateral aspect of the head and prothorax (b).

***Kelisia confusa* Linnavuori, 1957 (Fig. 3, 4)**

Material examined: Samsun, Altinkum, 20 m, 14.07.2009, 1 ♂, 1 ♀, leg. M. Karavin.

General Distribution: Austria, Bosnia-Herzegovina, Bulgaria, Croatia, Czech Republic, Finland, France, Germany, Greece, Hungary, Italy, Latvia, Macedonia, Poland, Serbia, Slovenia, Sweden, Switzerland (Nast, 1972; Asche, 1982b; Asche & Hoch, 1982; Holzinger et al, 2003, Holzinger & Kunz, 2006; Söderman et al, 2009; Malenovský, 2013; Mühlethaler et al, 2016; Della Guistina, 2019; Borodin & Borodina, 2021).

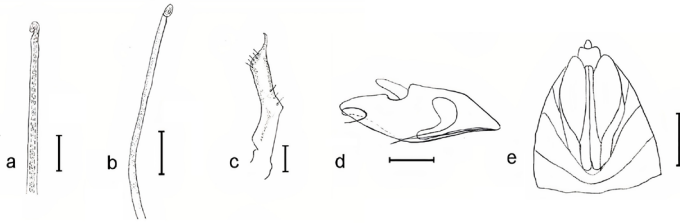


Figure 3. Genital structures, *Kelisia confusa*, a) aedeagus, from ventral, b) aedeagus, from left, c) stylus, d) anal tube, from right, e) tip of female abdomen, from ventral (scale a, b, d: 0.2 mm; c: 0.1 mm; e: 0.5 mm).

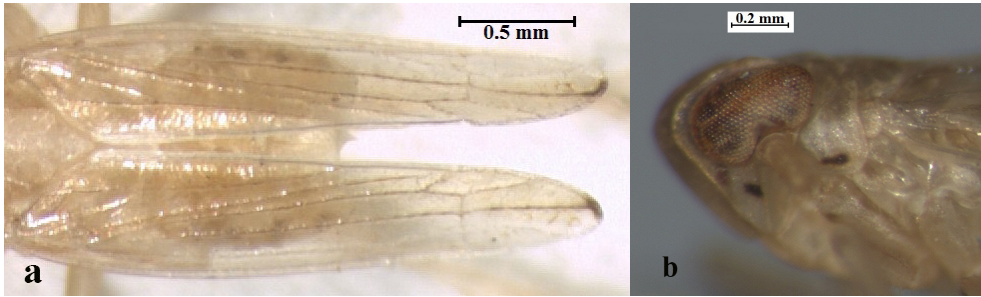


Figure 4. *Kelisia confusa*, a) the apex of the fore wing, b) lateral aspect of the head and prothorax.

***Kelisia sabulicola* Wagner, 1952 (Fig. 5, 6)**

Material examined: Samsun, Kurupelit, OMÜ Campus, 200 m, 20.08.2009, 1 ♂, 28.09.2009, 1 ♀; Çorum, Beydili, 875 m, 10.09.2009, 6 ♂♂, 3 ♀♀; Tokat, Dökmektepe, 550 m, 12.09.2009, 1 ♂, 1 ♀; Amasya, Taşova, 250 m, 16.10.2009, 1 ♂; Tokat, Niksar, Çamiçi, 1225 m, 16.10.2009, 2 ♀♀; Tokat, Turhal, 550 m, 18.10.2009, ♂; Sinop, Dikmen, Aşağıakgüney, 160 m, 03.10.2009, 1 ♂; Samsun, Hacıllı, 730 m, 11.06.2010, 1 ♂; Çorum, Ortaköy, Esentepe, 890 m, 14.06.2010, 4 ♂♂, 1 ♀; Amasya, Gümüşhacıköy, 850 m, 15.06.2010, 2 ♂♂, leg. M. Karavın.

General Distribution: Austria, Belgium, England, Estonia, Finland, France, Germany, Ireland, Italy, Jersey, Latvia, Lithuania, Netherlands, Poland, Scotland, Sweden, Wales (Nast, 1972; Baugnée, 1995; Holzinger, 1996; Guglielmino & Bückle, 2007; Söderman et al., 2009; Della Giustina & Remane, 2001; Della Giustina, 2019).

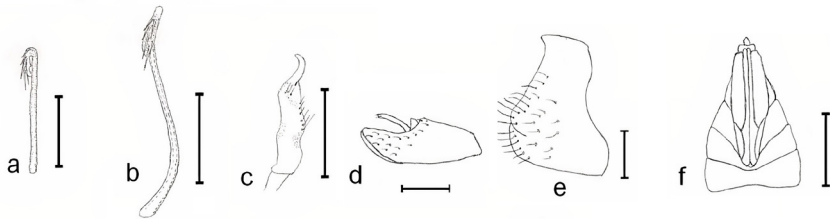


Figure 5. Genital structures, *Kelisia sabulicola*, a) aedeagus, from ventral, b) aedeagus, from left, c) stylus, d) anal tube, from right, e) pygopher, from right, f) tip of female abdomen, from ventral (scale a, b, c, d, e: 0.2 mm; f: 0.5 mm).

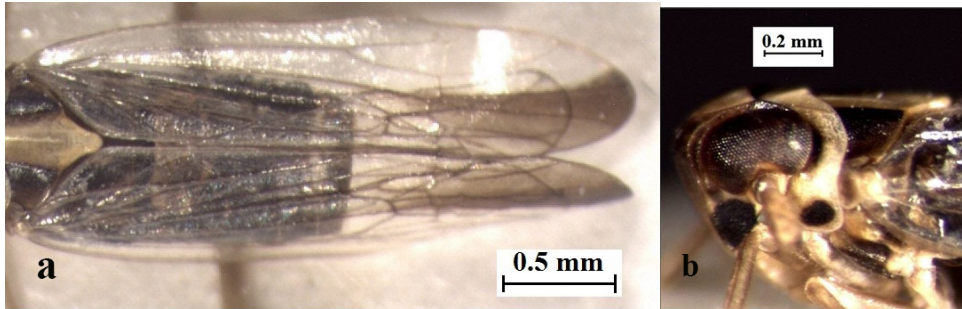


Figure 6. *Kelisia sabulicola*, a) the apex of the fore wing, b) lateral aspect of the head and prothorax.

Subfamily: Delphacinae Wagner, 1963

Genus: *Ribautodelphax* Wagner, 1963

***Ribautodelphax imitans* (Ribaut, 1953) (Fig. 7)**

Material examined: Tokat, Turhal, Şenyurt, 570 m, 13.06.2010, 7 ♂♂, 8 ♀♀, leg. M. Karavin.

General Distribution: Austria, Belgium, Bulgaria, Croatia, Czech Republic, England, France, Germany, Greece; Italy, Kazakhstan, Luxembourg, Netherlands, Poland, Romania, Slovakia, Spain, Switzerland (Nast, 1972, 1987; den Bieman, 1987; Holzinger, 1996; Holzinger & Seljak, 2001; Nickel & Remane 2002; Guglielmino et al, 2005; Aguin-Pombo et al, 2007; den Bieman & Mol, 2010; Niedringhaus et al, 2010; Malenovský & Lauterer, 2012; Gębicki et al, 2013; Mitjaev, 2015; Orosz & Tóth, 2016; Mühlethaler et al, 2018; Della Giustina, 2019; Holzinger et al, 2020; Gjonov, 2022).

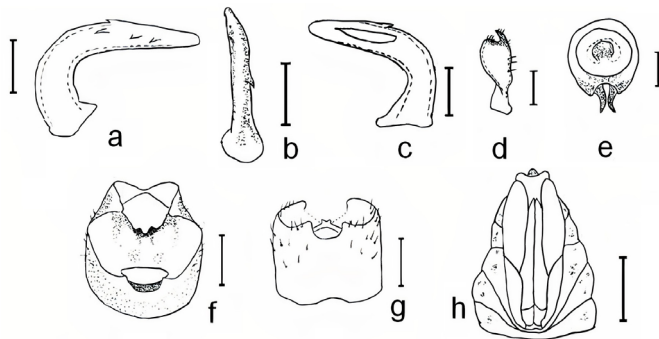


Figure 7. Genital structures, *Ribautodelphax imitans*, a, b, c) aedeagus, left, dorsal, right, d) stylus, e) anal tube f, g) pygopher, anterior, right, h) tip of female abdomen from ventral (scale a, b, c, d, e: 0.1 mm; f, g: 0.2 mm; h: 0.5 mm).

CONCLUSIONS AND DISCUSSION

In this study, it was determined that four species, *Kelisia guttula*, *K. confusa*, *K. sabulicola* and *Ribautodelphax imitans* are new records for the Delphacidae fauna

of Turkey. The taxonomic characters of the species examined in this study are in harmony with the drawings and descriptions given in the literature. No significant variation was observed in the taxonomic characters of the species. Considering the general distribution of the identified species, it seems that, except *K. sabulicola*, the others were also reported in other countries close to Turkey. While *K. sabulicola* was known mostly from Northern Europe, it was recorded from several places in Turkey with this study. Male genital characters of *K. sabulicola* were similar to the definitions and drawings given by Ossiannilsson (1978) and Holzinger et al. (2003). It is hoped that these results will contribute to future studies on this subject and provide useful information for plant protection in agricultural fields.

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