



Taxonomic Paper

New records of fifteen species of Fulgoromorpha (Insecta: Hemiptera) in Bulgaria

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Abstract

Background

Bulgarian planthopper fauna (Hemiptera: Fulgoromorpha) are relatively well studied, with 164 known species from 77 genera and 11 families. Data for some species from previous studies were reported without any localities or were incomplete and need to be updated.

New information

In the present study, 13 species of planthoppers are recorded for the first time in Bulgaria - *Hyalesthes mlokosiewiczi* Signoret, 1879 (Cixiidae), *Delphax armeniacus* Anufriev, 1970, *Euides speciosa* (Boheman, 1845), *Eurysula lurida* (Fieber, 1866), *Florodelphax paryphasma* (Flor, 1861), *Jassidaeus lugubris* (Signoret, 1865), *Metropis aris* Asche, Drosopoulos & Hoch, 1983, *Oncodelphax pullula* (Boheman, 1852), *Ribautodelphax imitans* (Ribaut, 1953), *R. pungens* (Ribaut, 1953), *Stenocranus major* (Kirschbaum, 1868) (Delphacidae), *Latilica maculipes* (Melichar, 1906) and *Tshurtshurnella extrema* Dlabola, 1980 (*Issidae*). Species from the following five genera are recorded in Bulgaria for the first time: *Euides* Fieber, 1866, *Eurysula* Vilbaste, 1968, *Jassidaeus* Fieber, 1866, *Oncodelphax* Wagner, 1963 (Delphacidae) and *Latilica* Emeljanov, 1971 (*Issidae*). As a result, the total numbers of known planthopper species and genera in Bulgaria become 177 species and

82 genera. The dataset of all collected specimens presented in this work was provided separately through Global Biodiversity Information Facility (GBIF). Detailed distribution of the species and comments on those from the European Red Lists are also provided.

Keywords

Fulgoroidea, fauna, the Balkans, Cixiidae, Delphacidae, *Issidae*, Dictyopharidae

Introduction

Fulgoromorpha (planhoppers) are hemimetabolous insects belonging to the order Hemiptera. They are widespread throughout the world, but most families are richer in the tropics. About 14,000 species of fulgoromorphs have been described worldwide, belonging to 36 families (including fossils) (Bourgoin 2022) and about 730 species from 13 families are known in Europe (Hoch 2013). In Bulgaria, as well as on the Balkan Peninsula as a whole, insects of the infraorder Fulgoromorpha have been insufficiently studied from faunal, taxonomic and biological points of view. Data from older studies are incomplete and often need to be confirmed. There are no faunal lists, monographs, identification keys or other overview publications for Bulgaria. This, as well as the economic importance of the group, necessitates a comprehensive and up-to-date study of the Fulgoromorpha species in Bulgaria.

Materials and methods

The material was collected in Bulgaria between 2003 and 2021 by using sweeping nets and light towers. After collection, they were preserved in dry conditions on cotton mattresses. The specimens were dry-mounted on paper boards after humidification. Dissections were performed when necessary for identification and the dissected genitalia were glued to the boards. Due to the lack of identification keys for Balkan Fulgoromorpha, identification data were used from various publications (Holzinger et al. 2003, Biedermann and Niedringhaus 2009, Emeljanov 2015). The specimens are digitised and stored at the Zoological Collection of Sofia University (BFUS). The dataset of all records presented in this work has been published separately through Global Biodiversity Information Facility (GBIF) (Gjonov 2022). Each entry of the dataset includes a single collection specimen with individual collection number, geospatial information, date of collecting, storing collection and taxonomic affiliation.

Detailed distribution of the species and comments on those from the European Red Lists are also provided. The following abbreviations concerning conservation status of the species were used: **CR** - Critically Endangered (IUCN) and category "2" in German Red Lists, **EN** - Endangered (IUCN) and category "2" in German Red Lists, **VU** - Vulnerable and category "V" in German Red Lists.

Some species were photographed live by the author with a Canon EOS 70D DSLR camera, Canon MP-E 65 mm macro lens using an Yongnuo YN-24EX twin macro flash or with Olympus E-500 DSLR camera, Sigma 150mm F2.8 APO MACRO DG and Raynox DCR-250 macro lens attached using Bower SFD14C ring flash.

Fulgoromorpha Evans, 1946

Family Cixiidae Spinola, 1839

Genus *Hyalesthes* Signoret, 1865

Hyalesthes mlokosiewiczii Signoret, 1879

Distribution: Greece (Rhodos), Georgia (Melichar 1914), Cyprus, Lebanon, Iraq, Israel as *H. mavromoustakisi* and *H. aither* (Dlabola 1959, Hoch 1990), Turkey (Lodos and Kalkandelen 1980, Demir 2007, Demir and Demirsoy 2009, Demirel and Hasbenli 2015), Iran (Dlabola 1981, Mozaffarian and Wilson 2011, Mozaffarian 2018), Turkmenistan, Uzbekistan, Kyrgyzstan (Dlabola 1958), Armenia (Lindberg 1960), Azerbaijan, Russia (Krasnodar, Dagestan) (Emeljanov 2015).

Notes: First record for Bulgaria. **Western Danube Plain:** Guljantsi vill., 07.viii.2021, 2♂♂ and 2♀♀ (Fig. 1); **Western Rhodopes Mts.:** Djadovci vill., 26.v.2014, 9♂♂ and 4♀♀; Bachkovo vill., 29.v.2021, 1♂; **Eastern Rhodopes Mts.:** Zimzelen vill., 25.v.2014, 3♂♂ and 1♀; Bjäl Gradec vill., 02.vi.2015, 2♂♂ and 1 nymph; Dolno Lukovo vill., 01.vi.2015, 1♂. All specimens were collected on *Salix* shrubs. Detailed occurrence data: Gjonov (2022).

This species is recorded as a pest in the Caucasus (Emeljanov 2015) and Iran (Mozaffarian 2014, Mozaffarian 2018). Although it is hardly a danger to crops in Bulgaria (being found only on willow bushes), it should be monitored in the future.

Red Lists: No assessment.

Host plant: Polyphagous (Emeljanov 2015).

Family Delphacidae Leach, 1815

Genus *Delphax* Fabricius, 1789

Delphax armeniacus Anufriev, 1970

Distribution: Ukraine (Nast 1987), Greece (Drosopoulos 1982b, Drosopoulos et al. 1983), Armenia (Anufriev 1970), North-western Caucasus, Kazakhstan (Mitjaev 2015).

Notes: First record for Bulgaria. **Southern Black Sea coast:** Sinemorec vill., the mouth of Veleka River, at light, near a marsh, 14.viii.2010, 1♂. Detailed occurrence data: Gjonov (2022).

Red Lists: No assessment.

Host plant: There are no literature data. Although the specimen was collected in light, it is assumed that it came from the nearest *Phragmites australis* (Cav.) Trin. ex Steud. plantation, the typical host-plant for *Delphax* species (Nickel 2003b).

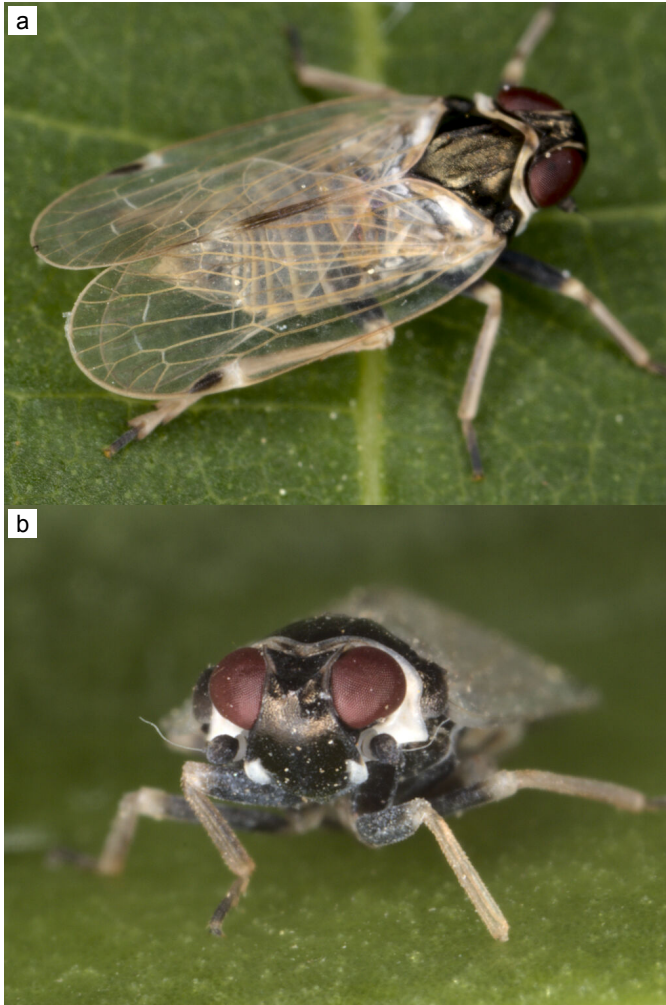


Figure 1.

Hyalesthes mlokosiewiczi Signoret, 1879 - Bulgaria, Danube Plain.

a: dorsal view [doi](#)

b: frontal view [doi](#)

Genus *Euides* Fieber, 1866

Euides speciosa (Boheman, 1845)

Nomenclature:

Della Giustina (2019) does not support the synonymy of *E. basilinea* (Germar, 1821) under *E. speciosa* proposed by Nast (1986).

Distribution: Norway, Denmark, Sweden, Finland, Estonia, Latvia, Lithuania, Russia (Karelia) (Söderman et al. 2009), Germany, Austria, Switzerland (Mühlethaler et al. 2018), Luxembourg (Niedringhaus et al. 2010a), as *E. basilinea* (Germar, 1821). Synonymisation is refuted by Della Giustina (2019) for the North of Europe. France (Della Giustina 2019), Hungary (Asche 1982a), ex-Yugoslavia (Asche 1982b), Belarus (Borodin 2004), Kazakhstan (Mitjaev 1971), Korea (Park and Jung 2020), Japan (Hayashi and Fujinuma 2016).

Notes: New record for Bulgaria. **Western Danube Plain:** Archar vill., 04.v.2015, 1♂; **Southern Black Sea coast:** Atia vill., 22.viii.2016, 1♂. Detailed occurrence data: Gjonov (2022).

Red Lists: **EN:** Saxony (Walter et al. 2003); **VU:** (under the name *E. basilinea*): Bavaria (Nickel 2003a), Tyrphobionts and Tyrphophils of Hanoverian Moor Geest (Nickel and Gärtner 2009), Watercourses and Springs on the Hoher Trauchberg, Eastern Allgäu/Bavarian Alps (Bückle and Guglielmino 2011) and Germany (Nickel et al. 2016).

Host plant: *Phragmites australis* (Della Giustina 2019).

Genus *Eurysula* Vilbaste, 1968

Eurysula lurida (Fieber, 1866)

Distribution: Norway, Denmark, Sweden, Finland, Estonia, Lithuania, Latvia, Russia (Karelia) (Söderman et al. 2009), Great Britain (Le Quesne and Payne 1981), Ireland, Belgium, France (Della Giustina 2019), Netherlands (Gravestein 1976), Luxembourg (Niedringhaus et al. 2010a, Niedringhaus et al. 2010b), Germany (Nickel and Remane 2002), Poland (Gębicki et al. 2013, Walczak 2016), Ukraine (Logvinenko 1975), Spain (Aguin-Pombo et al. 2007, Aguin-Pombo et al. 2008, Italy (Sicily) (D'Urso 1995), Switzerland (Mühlethaler et al. 2018), Austria (Holzinger 1996a, Holzinger 1996b, Kahapka and Kunz 2011, Kunz and Kahapka 2012, Holzinger et al. 2017), Czech Republic (Malenovský 2006, Malenovský et al. 2011, Malenovský and Lauterer 2012), Hungary (Asche 1982a, Orosz 2008, Orosz 2009), Slovenia (Seljak 2016), Kazakhstan, Mongolia (Mitjaev 2015), ex-Yugoslavia (Asche 1982b).

Notes: First record for Bulgaria. **Eastern Sub-Balkan Basins:** Ajtos, 23.vi.2016, 11♂♂, 1♀ and 4 nymphs; **Western Rhodopes Mts:** Poljana vill., 28.v.2014, 2♂♂, 2♀♀ and 5 nymphs. Detailed occurrence data: Gjonov (2022).

Red Lists: It is assessed as not endangered in some countries of Central Europe.

Host plant: *Calamagrostis epigeios* (L.) Roth, *C. canescens* (Weber ex F.H. Wigg.) Roth (Nickel 2003b).

Genus *Florodelphax* Vilbaste, 1968

Florodelphax paryphasma (Flor, 1861)

Distribution: Sweden, Finland, Estonia, Lithuania, Latvia, Russia (Karelia) (Söderman et al. 2009), Luxembourg (Niedringhaus et al. 2010a), Belgium (Bagnée 2004), France (Della Giustina and Remane 2001), Austria (Holzinger and Kunz 2006), Czech Republic (Preisler and Lauterer 2003, Malenovský and Lauterer 2010), Slovenia (Holzinger and Seljak 2001), ex-Yugoslavia (Asche 1982b), Kazakhstan, Kyrgyzstan, Baikal (Irkutsk) (Mitjaev 2015).

Notes: First record for Bulgaria. **Sarnena Sredna Gora:** Svezhen vill., marsh, 11.viii. 2020, 2 ♂♂. Detailed occurrence data: Gjonov (2022).

Red Lists: **CR:** Saxony (Walter et al. 2003), Austria (Holzinger 2009); Czech Republic (Malenovský and Lauterer 2017); **EN:** Bavaria (Nickel 2003a), Saxony-Anhalt (Witsack and Nickel 2004), Thuringia (Nickel and Sander 2016).

Host plant: On *Carex disticha* Huds. (Nickel 2003b).

Genus *Jassidaeus* Fieber, 1866

Jassidaeus lugubris (Signoret, 1865)

Distribution: Belgium, France (Della Giustina 2019), Luxembourg (Niedringhaus et al. 2010a), Germany (Nickel and Remane 2003), Poland (Gębicki et al. 2013), Ukraine (Logvinenko 1975), Russia (European parts) (Emel'yanov 1967, Smirnova and Anufriev 2014), Spain, Portugal (Remane and Fröhlich 1994), Italy (Sicily) (D'Urso 1995), Austria (Holzinger 1996b, Holzinger and Kunz 2006), Czech Republic, Slovakia (Diabola 1977, Malenovský and Lauterer 2012), Hungary (Asche 1982a, Orosz 2009), Romania (Orosz and Tóth 2016), Greece (Drosopoulos et al. 1983).

In the General Catalogue of the Hemiptera (Metcalf 1943) is probably mistakenly recorded for Ceylon without referring to the literature source.

Notes: First record for Bulgaria. **Western Pre-Balkan:** Rumjancevo vill., 01.x.2016, 1♂; **Belasitsa Mt:** Varshilo loc., 01.i.2014, 7♂♂ and 4♀♀ (Fig. 2). Detailed occurrence data: Gjonov (2022).

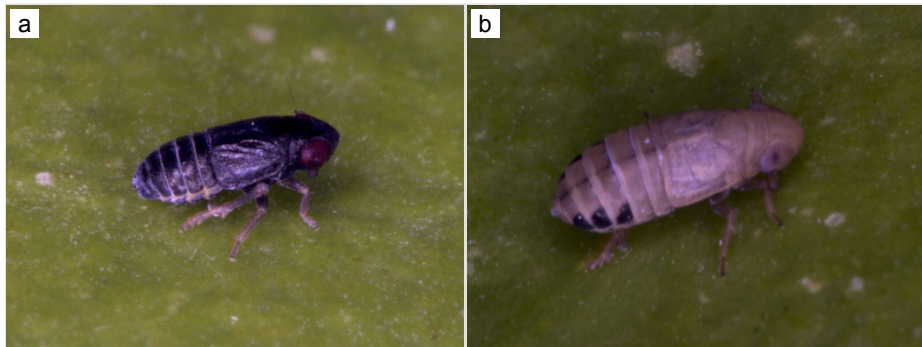


Figure 2.

Jassidaeus lugubris (Signoret, 1865) - Bulgaria, Belasitsa Mt.

a: male [doi](#)

b: female [doi](#)

Red Lists: **CR:** Saxony (Walter et al. 2003), Austria (Holzinger 2009), Turingia (Nickel and Sander 2016), Germany (Nickel et al. 2016); **EN:** Bavaria (Nickel 2003a), Saxony-Anhalt (Witsack and Nickel 2004); **VU:** Czech Republic (Malenovský and Lauterer 2017).

Host plant: *Festuca ovina* L. and perhaps also *Stipa capillata* L. (Nickel 2003b).

Genus *Metropis* Fieber, 1866

Metropis aris Asche, Drosopoulos & Hoch, 1983

Distribution: Greece (Drosopoulos et al. 1983), Slovenia (Seljak 2004, Seljak 2016)

Notes: First record for Bulgaria. **Strandzha Mt:** Goljamo Bukovo vill., 05.v.2009, 1♂. Detailed occurrence data: Gjonov (2022).

Red Lists: No assessment.

Host plant: Unknown.

Genus *Oncodelphax* Wagner, 1963

Oncodelphax pullula (Boheman, 1852)

Distribution: Norway, Denmark, Sweden, Finland, Estonia, Lithuania, Latvia, Russia (Karelia and Leningrad Region) (Söderman et al. 2009), Poland (Gębicki et al. 2013)

), Germany (Nickel and Remane 2003), Great Britain, Ireland, France, Belgium, Switzerland (Della Giustina 2019), Belarus (Borodin 2004), Austria (Kunz and Plank 2002), Czech Republic (Malenovský et al. 2014), Slovenia (Seljak 2016), Hungary (Asche 1982a), Romania (Orosz and Tóth 2016).

Notes: First record for Bulgaria. **Strandzha Mt:** Goljamo Bukovo vill., 05.v.2009, 10♂♂ and 7♀ (Fig. 3). Detailed occurrence data: Gjonov (2022).



Figure 3. [doi](#)

Oncodelphax pullula (Boheman, 1852), male - Bulgaria, Strandzha Mt.

Red Lists: **EN:** Carinthia (Austria) (Holzinger 1999), Bavaria (Nickel 2003a), Saxony (Walter et al. 2003), Saxony-Anhalt (Witsack and Nickel 2004), Austria (Holzinger 2009), Germany (Nickel et al. 2016), Watercourses and Springs on the Hoher Trauchberg, Eastern Allgäu/Bavarian Alps (Bückle and Guglielmino 2011); **VU:** Czech Republic's Red List (Malenovský and Lauterer 2017).

Host plant: Mainly *Carex nigra* (L.) Reichard (Nickel 2003b).

Genus *Ribautodelphax* Wagner, 1963

Ribautodelphax imitans (Ribaut, 1953)

Distribution: Great Britain (Le Quesne and Payne 1981), Belgium (Della Giustina 2019), Netherlands (den Bieman and Mol 2010), Luxembourg (Niedringhaus et al. 2010a), Switzerland (Mühlethaler et al. 2018), Germany (Nickel and Remane 2002), Poland (Gębicki et al. 2013), Spain (Aguin-Pombo et al. 2007), France (den Bieman 1987), Italy (Guglielmino et al. 2005, Guglielmino and Bückle 2008, Carl 2008), Austria (Holzinger 1996b, Holzinger et al. 2020), Czech Republic (Malenovský and Lauterer 2010, Malenovský and Lauterer 2012), Hungary (Györffy et al. 2009), Romania (Orosz

and Tóth 2016), Slovenia (Holzinger and Seljak 2001), Croatia (Nast 1987), Greece (den Bieman 1987), Kazakhstan (Mitjaev 2015).

Notes: First record for Bulgaria. **Sarnena Sredna Gora Mt:** Prjaporets vill., 14.viii.2020, 1♂. Detailed occurrence data: Gjonov (2022).

Red Lists: **EN:** Bavaria (Nickel 2003a); **VU:** Austria (Holzinger 2009).

Host plant: *Festuca arundinacea* Schreb. subsp. *fenas* (Lag.) Arcang. (den Bieman 1987).

***Ribautodelphax pungens* (Ribaut, 1953)**

Distribution: Sweden (Söderman et al. 2009), Netherlands, Belgium, Germany, France, Slovenia, Croatia, Bosnia and Herzegovina, Serbia (Della Giustina 2019), Luxembourg (Niedringhaus et al. 2010a), Poland (Gębicki et al. 2013), Russia (European parts) (Smirnova and Anufriev 2014), Great Britain (Le Quesne and Payne 1981), Switzerland (Mühlethaler et al. 2018), Spain (Aguin-Pombo et al. 2007), France (Corsica) (Bonfils and Della Giustina 1978), Italy (Guglielmino et al. 2005, Guglielmino and Bückle 2008), Austria (Holzinger 1996b, Kunz and Plank 2002), Czech Republic (Malenovský 2006, Malenovský et al. 2011), Hungary (Orosz 2009), Greece (den Bieman 1988).

Notes: First record for Bulgaria. **Sarnena Sredna Gora:** Prjaporets vill., 14.viii.2020, 1♂; **Eastern Rhodopes:** Kokiche vill., 06.v.2003, 1♂; **Strandzha Mt:** Izgrev vill., Marina reka loc., 08.v.2009, 2♂♂ and 2♀♀. Detailed occurrence data: Gjonov (2022).

Red Lists: **EN:** Saxony (Walter et al. 2003).

Host plant: different *Brachypodium* species (den Bieman 1987); monophagous on *Brachypodium pinnatum* (L.) P. Beauv (Nickel 2003b).

Genus *Stenocranus* Fieber, 1866

***Stenocranus major* (Kirschbaum, 1868)**

Distribution: Norway, Denmark, Sweden, Finland, Latvia (Söderman et al. 2009), Ireland, Great Britain, Belgium, Switzerland, Ukraine, Spain, France (Della Giustina 2019), Netherlands (den Bieman 1993, den Bieman et al. 2021), Russia (European parts) (Anufriev and Bayanov 2002, Söderman et al. 2009), Belarus (Borodin 2004), Luxembourg (Niedringhaus et al. 2010a), Poland (Gębicki et al. 2013), Czech Republic (Diabola 1954), Germany (Nickel and Remane 2003), Italy (D'Urso 1995, Guglielmino et al. 2005), Austria (Holzinger 1996b, Kunz 2010), Hungary (Asche 1982a), Romania (Popa and Popa 2002), Slovenia (Holzinger and Seljak 2001), ex-Yugoslavia (Asche 1982b), Serbia (Cvrković et al. 2010, Cvrković et al. 2011), Iran (Mozaffarian and Wilson 2011), Kyrgyzstan (Anufriev 2002), Malaysia (Bartlett 2009).

Notes: First record for Bulgaria. **Western Pre-Balkan:** Belgradchishki Skali, 03.v.2015, 1♂; **Western Stara Planina:** Slivnitsa vill., Aldomirovsko Blato, 18.iii.2017, 3♂♂ and 10♀♀; same location, 10.vii.2011, 1♂; **Middle Stara Planina:** Divchovoto vill., 08.v. 2015, 1♂ and 1♀. Detailed occurrence data: Gjonov (2022).

Red Lists: It is assessed as not endangered in some countries of Central Europe.

Host plant: *Phalaris arundinacea* L. (Nickel 2003b).

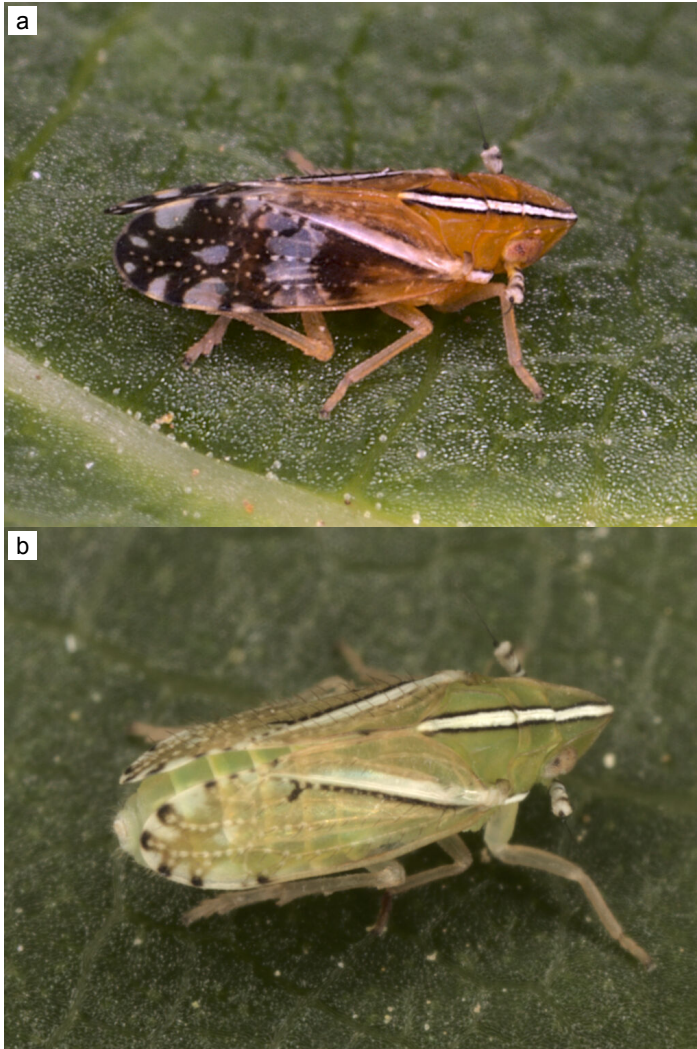


Figure 4.

Tropidocephala andropogonis Horváth, 1895 - Bulgaria, Eastern Rhodope Mts.

a: male [doi](#)

b: female [doi](#)

Genus *Tropidocephala* Stal, 1853

Tropidocephala andropogonis Horváth, 1895

Distribution: Slovakia (Diabola 1950), Hungary (Horváth 1895), Czech Republic (Diabola 1977), ex-Yugoslavia (Nast 1972), Bulgaria (Asche 1982b), Greece (Drosopoulos 1982a, Drosopoulos 1982b), Turkey (Diabola 1981).

Notes: First exact locality data for Bulgaria. **Lozenska Mt:** Dolni Pasarel vill., 16.vi.2014, 2♂; **Vlahina Mt:** above Boboshevo, Jana hut, 11.v.2010, 1♂; **Eastern Rhodopes:** Valkovich vill., 24.v.2014, 4♀♀ (Fig. 4). **Strandzha Mt:** Goljamo Bukovo vill., 05.v.2009, 1♂; Izgrev vill., 09.v.2012, 1♂ and 2♀. Detailed occurrence data: Gjonov (2022).

Red Lists: No assessment.

Host plant: *Chrysopogon gryllus* (L.) Trin., 1820 (Horváth 1895, Drosopoulos et al. 1983), also recorded on *Bothriochloa ischaemum* (L.) Keng (Drosopoulos 1982a).

Family Dictyopharidae Spinola, 1839

Genus *Dictyophara* Germar, 1833

Dictyophara pannonica (Germar, 1830)

Distribution: Italy (doubtful) (D'Urso 1995, Lessio and Alma 2008), Slovakia (Diabola 1977), Hungary (Guglielmino et al. 2013), Romania (Orosz and Tóth 2016), Bulgaria (Nast 1987), Russia (South European Russia, Western Siberia), Kazakhstan, Kyrgyzstan, Mongolia (Mitjaev 2015), Ukraine (Logvinenko 1975), Georgia (Diabola 1958), Turkey (Diabola 1957), NW China (Song and Liang 2008).

Notes: First exact locality data for Bulgaria. **Kozhuh Hill:** Rupite vill., 11.ix.2021, 2♀♀ (Fig. 5); **Western Rhodopes:** Novo selo vill., Besaparski Hills, 24.vii.2010, 2♂; same place, 07.vii.2012, 1 nymph; same place, 14.vii.2018, 1♂, 1♀ and 1 nymph; **Eastern Rhodopes:** Pastrook vill., 04.iv.2012, 1♀. Detailed occurrence data: Gjonov (2022).

Red Lists: No assessment.

Host plant: Polyphagous (Emel'yanov 1967).

Family Issidae Spinola, 1839**Genus *Latilica* Emeljanov, 1971*****Latilica maculipes* (Melichar, 1906)**

Distribution: Bosnia and Herzegovina, Croatia, Cyprus, France, Greece, Israel, Italy including the islands, Palestine, Russia (South European parts), Slovenia, Turkey, Crimea (Gnezdilov et al. 2014), Hungary (Korányi et al. 2018), Corsica (Albre and Gibernau 2019).

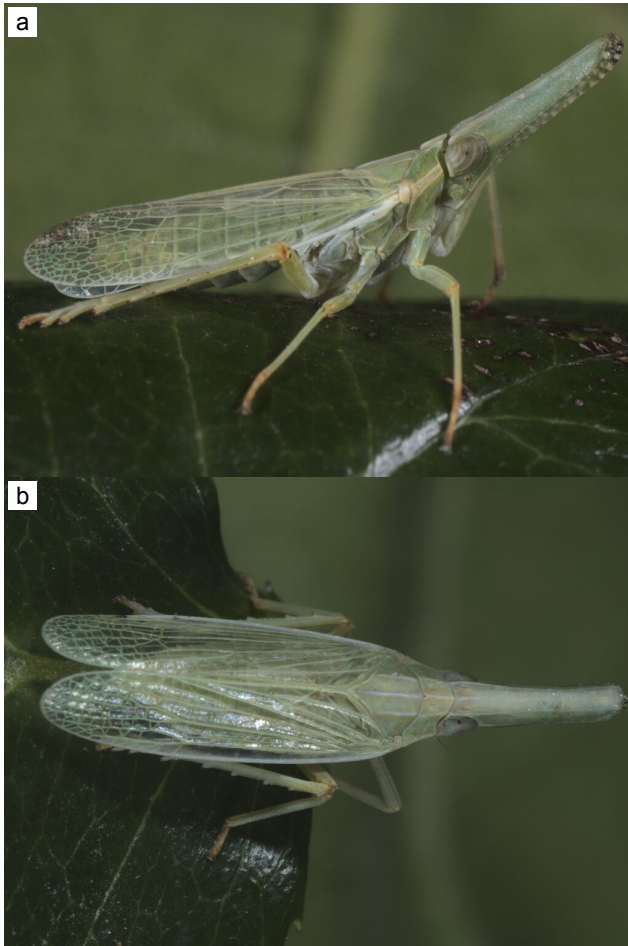


Figure 5.

Dictyophara pannonica (Germar, 1830) - Bulgaria, Kozhuh hill.

a: lateral view [doi](#)

b: dorsal view [doi](#)

Notes: First record for Bulgaria. **Northern Black Sea coast:** Varna, Morska gradina, 04.viii.2016, 2♂♂ and 1♀; Aksakovo vill., Pobiti kamani loc., 03.viii.2016, 5♂♂, 3♀♀ and 1 nymph; **Southern Black Sea coast:** Sinemorec vill., the mouth of Veleka River, 15.viii.2010, 1♂; Atia vill., 22.viii.2016, 1♂; **Strandzha Mt:** Pismenovo vill., 12.viii.2021, 1♂ (Fig. 6). Detailed occurrence data: Gjonov (2022).

Red Lists: No assessment.

Host plant: Polyphagous, arboreal (Korányi et al. 2018).

Genus *Tshurtshurnella* Kusnezov, 1927

Tshurtshurnella extrema Dalbola, 1980

Distribution: Turkey, near Ankara (Dlabola 1980, Kartal 1985) and Sinop (Tanyeri and Zeybekoğlu 2021)

Notes: First record for Bulgaria and Europe. **Eastern Sub-Balkan Basins:** Ajtos, 01.viii.2016, 2♂♂, 2♀♀ and 3 nymphs; (Fig. 7) on or near *Astracantha amacantha* subsp. *aitosensis* (Ivan.) Reer & Podlech. Detailed occurrence data: Gjonov (2022).

Red Lists: No assessment.

Host plant: Poaceae (Dlabola 1980). All specimens reported here were collected on *Astracantha amacantha* subsp. *aitosensis* or near it.



Figure 6. [doi](#)

Latilica maculipes (Melichar, 1906) - Bulgaria, Varna

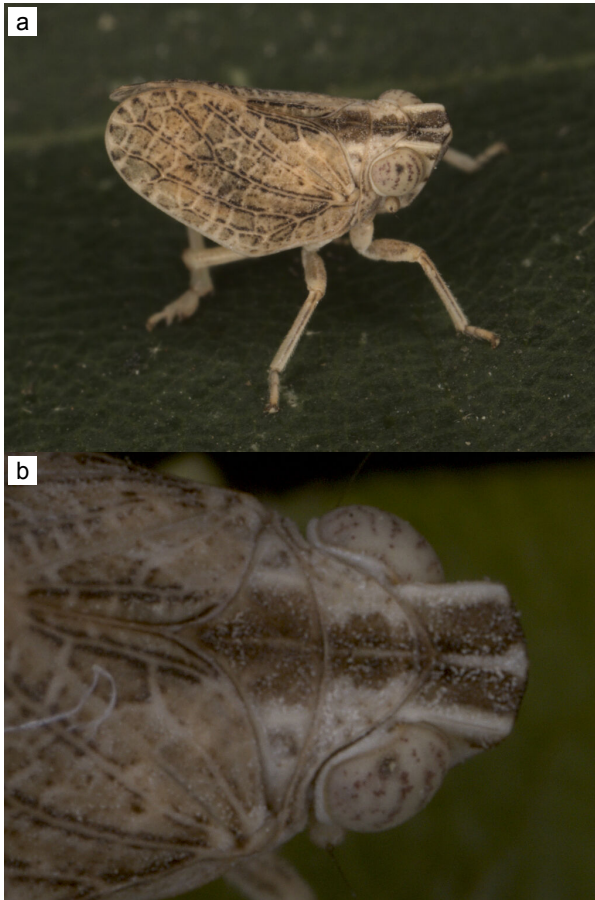


Figure 7.

Tshurtshurnella extrema Dlabola, 1980 - Bulgaria, Ajtos

a: lateral view [doi](#)

b: dorsal view of the head [doi](#)

Discussion

In the current study, a list of 13 Fulgoromorpha species recorded for the first time for Bulgaria has been compiled. They are members of the families Cixiidae (one species) - *Hyalesthes mlokosiewiczzi*, Delphacidae (10 species) - *Delphax armeniacus*, *Euides speciosa*, *Eurysula lurida*, *Florodelphax paryphasma*, *Jassidaeus lugubris*, *Metropis aris*, *Oncodelphax pullula*, *Ribautodelphax imitans*, *R. pungens*, *Stenocranus major* and *Issidae* (two species) - *Latilica maculipes* and *Tshurtshurnella extrema*. Additionally, the first exact localities for two species, *Tropidocephala andropogonis* (Delphacidae) and *Dictyophara pannonica* (Dictyopharidae), are reported for Bulgaria. Species of the following five genera have not been previously known in Bulgaria: *Euides*, *Eurysula*, *Jassidaeus*, *Oncodelphax* (Delphacidae) and *Latilica* (*Issidae*).

As a result of the study, the total numbers of known planthopper species, genera and families in Bulgaria are now 177, 82 and 13, respectively. Although the diverse Fulgoromorpha fauna in Bulgaria has been reported so far, at least fifteen more species are expected to be discovered.

The new data significantly expand the known ranges of several species, such as *H. mlokosiewichi*, *O. pullula*, *D. armenicaus* and *T. extrema*. The easternmost distribution of *H. mlokosiewichi* (which has been found for the first time on the Balkan Peninsula) and the southernmost distribution of *O. pullula* have been established. The species *D. armenicaus*, which has been found mainly in Central Asia and the Caucasus, but is also known in Greece, is found on the Bulgarian Black Sea coast. *T. extrema* was first recorded outside of Anatolia, along with the first data on its host plant.

Seven of the listed species have conservation status in Central Europe, where such assessments have been carried out. The conservation status of most of the other species has never been evaluated as they are not spread in the countries where such assessments were carried out. This emphasises the need to assess the conservation status of Fulgoromorpha in Bulgaria.

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References

- Aguin-Pombo D, Freitas C, Alvaréz P, Bourgoin T (2007) Catálogo de los hemípteros, Cicadomorpha y Fulgoromorpha de Aragón. Catalogus de la Entomofauna Aragonesa 34: 3-22.
- Aguin-Pombo D, Freitas C, Alvaréz P, Bourgoin T (2008) A bibliographic catalogue of the Cicadomorpha and Fulgoromorpha of North East Spain (Aragon). Bulletin of Insectology 61 (1): 155-156.
- Albre J, Gibernau M (2019) Diversity and temporal variations of the Hemiptera Auchenorrhyncha fauna in the Ajaccio region (France, Corsica). Annales de la Société entomologique de France (N.S.) 55 (6): 497-508. <https://doi.org/10.1080/00379271.2019.1688189>

- Anufriev GA (1970) Two new Palaearctic species of *Delphax* Fabricius, 1798 (Homoptera, Delphacidae). Bulletin de l'Académie Polonaise des Sciences. Série des Sciences Biologiques 18: 201-205.
- Anufriev GA (2002) New and little known species of cycadoids of the family Delphacidae (Homoptera, Cicadinea) from North Kyrgyzstan. Entomological Investigations in Kirgizstan 170: 165-170.
- Anufriev GA, Bayanov NG (2002) [Invertebrates fauna of Kerzhensky Reserve according to studies in 1993–2001. Materials on fauna of Nizhny Novgorod Trans-Volga region. Nizhny Novgorod]. [Proceedings of the State Natural Biosphere Reserve «Kerzhensky»] 2: 152-354.
- Asche M (1982a) Beiträge zur Delphaciden-Fauna Ungarns (Homoptera Cicadina Delphacidae). Marburger Entomologische Publikationen 1 (7): 139-154.
- Asche M (1982b) Beiträge zur Delphaciden - Fauna Jugoslawiens und Bulgariens (Homoptera Cicadina Delphacidae). Marburger Entomologische Publikationen 1 (7): 99-138.
- Bartlett C (2009) Diversity in New World Stenocraninae Planthoppers (Hemiptera: Delphacidae). Transactions of the American Entomological Society 135 (4): 443-486. <https://doi.org/10.3157/061.135.0407>
- Baugnée J (2004) Contribution a la connaissance des Delphacidae de Belgique (Hemiptera Auchenorrhyncha Fulgoromorpha). Bulletin de la Société royale belge d'Entomologie 139 (1995): 207-219. <https://doi.org/10.1002/recl.19520710604>
- Biedermann R, Niedringhaus R (2009) The Plant- and Leafhoppers of Germany - Identification Key to all Species. Wissenschaft. Wissenschaftlich Akademischer Buchvertrieb-Fründ, Scheeßel, 409 pp.
- Bonfils J, Della Giustina W (1978) Inventaire et répartition biogéographique des Homoptères Auchenorrhynques de Corse. Bulletin de la Société entomologique de France 83 (1): 23-29. <https://doi.org/10.3406/bsef.1978.21621>
- Borodin O (2004) A checklist of the Auchenorrhyncha of Belarus (Hemiptera, Fulgoromorpha et Cicadomorpha). Beiträge zur Zikadenkunde 7: 29-47.
- Bourgoin T (2022) FLOW (Fulgoromorpha Lists on The Web): a world knowledge base dedicated to Fulgoromorpha. Version 8. <https://flow.hemiptera-databases.org/flow/>. Accessed on: 2020-3-02.
- Bückle C, Guglielmino A (2011) Zur Zikadenfauna (Auchenorrhyncha) im Umland von Fließgewässern und Quellen am Hohen Trauchberg, Ostallgäu/Bayerische Alpen. Lauterbornia 73: 1-22.
- Carl M (2008) Die Zikaden (Insecta, Auchenorrhyncha) des Schlern (Südtirol, Italien). Gredleriana 8: 321-340.
- Cvrković T, Mitrović M, Jović J, Krnjajić S, Krstić O, Toševski I (2010) Diversity of cicads (Hemiptera: Auchenorrhyncha) in Serbian vineyards. Zaštita bilja 61 (3): 217-232.
- Cvrković T, Jović J, Mitrović M, Krstić O, Krnjajić S, Toševski I (2011) Potential new hemipteran vectors of stolbur phytoplasma in Serbian vineyards. Bulletin of Insectology 64 (suppl. 1): 129-130.
- Della Giustina W, Remane R (2001) Compléments à la faune de France des Auchenorrhyncha: espèces et données additionnelles; modifications à l'ouvrage de Nast (1987) (Homoptera). Bulletin de la Société entomologique de France 106 (3): 283-302. <https://doi.org/10.3406/bsef.2001.16767>

- Della Giustina W (2019) Les Delphacidae de France et des pays limitrophes (Hemiptera, Fulgoromorpha) Tome 1&2. Fédération Française des Sociétés des Sciences Naturelles, 831 pp.
- Demir E (2007) Contributions to the knowledge of Turkish Auchenorrhyncha (Homoptera, Fulgoromorpha and Cicadomorpha, excl. Cicadellidae) with a new record, *Setapius klapperichianus* Dlabola, 1988. Munis Entomology & Zoology 2 (1): 39-58.
- Demir E, Demirsoy A (2009) Preliminary report on the Fulgoromorpha (Hemiptera) fauna of Kemaliye (Erzincan) with a new record for Turkey. Munis Entomology & Zoology 4 (1): 280-286.
- Demirel E, Hasbenli A (2015) Contributions to the Bolkar Mountains Cixiidae fauna with a new record and an identification key for Turkey's *Tachycixius* (Hemiptera: Auchenorrhyncha). Pakistan Journal of Zoology 47 (5): 1341-1346.
- den Bieman CFM (1987) Biological and taxonomie differentiation in the *Ribautodelphax collinus* complex (Homoptera, Delphacidae). Thesis. Landbouwniversiteit te Wageningen, Wageningen (Netherlands), 163 pp.
- den Bieman CFM (1988) Coexistence of pseudogamous and sexual planthoppers of the genus *Ribautodelphax* (Homoptera, Delphacidae). Ecological Entomology 13 (4): 383-390. <https://doi.org/10.1111/j.1365-2311.1988.tb00370.x>
- den Bieman CFM (1993) Het spoorcicaden genus *Stenocranus* in Nederland (Homoptera: Delphacidae). Entomologische Berichten 53 (6): 83-87.
- den Bieman CFM, Mol AWM (2010) Vier soorten spoorcicaden voor het eerst in Nederland aangetroffen (Hemiptera, Fulgoromorpha, Delphacidae). Entomologische Berichten 70 (5): 162-166.
- den Bieman CFM, Tansi M, Drukker EF, de Waart S (2021) The leafhopper fauna of green roofs including the Mediterranean leaf- hopper *Circulifer haematoceps* new for the Netherlands (Auchenorrhyncha: Cicadellidae). Entomologische berichten 81 (2): 46-51.
- Dlabola J (1950) Homopterologické záznamy Slovenska. Some records of leafhoppers from Slovakia. (Homoptera, Auchenorrhyncha). Acta Societatis entomologicae Čechosloveniae 47 (1-2): 65-67.
- Dlabola J (1954) Ergänzungen zur Faunistik der ČSR und Ungarns mit der Beschreibung einer neuen *Typhlocyba*-Art (Hom., Auchenorrhyncha). Acta Societatis entomologicae Čechosloveniae 51: 149-155.
- Dlabola J (1957) Results of the zoological expedition of the National Museum in Prague to Turkey. 20. Homoptera Auchenorrhyncha. Acta Entomologica Musei Nationalis Pragae 31 (469): 19-68.
- Dlabola J (1958) Zikaden-Ausbeute vom Kaukasus (Homoptera Auchenorrhyncha). Acta Entomologica Musei Nationalis Pragae 32: 317-352.
- Dlabola J (1959) Fünf neue Zikaden-Arten aus dem Gebiet des Mittelmeers. Bollettino della Societa Entomologica Italiana 89 (9/10): 150-155.
- Dlabola J (1977) Homoptera Auchenorrhyncha. In: Enumeratio Insectorum bohemoslovakiae. Check List Tschechoslowakische Insektenfauna. Acta Faunistica Entomologica Musei Nationalis Pragae 15 (supplementum 4): 83-96.
- Dlabola J (1980) Tribus-Einteilung, neue Gattungen und Arten der Subf. Issinae in der eremischen Zone (Homoptera, Auchenorrhyncha). Sborník Národního Muzea v Praze, Řada B, Přírodní Vědy 36 (4): 173-248.

- Dlabola J (1981) Ergebnisse der tschechoslowakisch-iranischen entomologischen Expeditionen nach dem Iran (1970 und 1973). (Mit Angaben über einiger Sammelresultate in Anatolien). Homoptera: Auchenorrhyncha (II. Teil). Acta Entomologica Musei Nationalis Pragae 40: 127-311.
- Drosopoulos S (1982a) *Remanodelphax cedroni* gen. et spec. nov. from Greece (Homoptera, Auchenorrhyncha, Delphacidae). Marburger Entomologische Publikationen 1 (6): 35-88.
- Drosopoulos S (1982b) Hemipterological Studies in Greece. Part II. Homoptera - Auchenorrhyncha. On the Family Delphacidae. Marburger Entomologische Publikationen 1 (6): 35-88.
- Drosopoulos S, Asche M, Hoch H (1983) Contribution to the planthopper fauna of Greece. Homoptera, Auchenorrhyncha, Fulgoromorpha, Delphacidae). Annales de l'Institut Phytopathologique Benaki (N.S.) 14: 19-68.
- D'Urso V (1995) Homoptera Auchenorrhyncha. In: Minelli A, Ruffo S, La Porta S (Eds) Checklist delle specie della fauna italiana. -35 pp.
- Emeljanov AF (2015) Planthoppers of the family Cixiidae of Russia and adjacent territories. Key to the fauna of Russia 177: 1-252.
- Emel'yanov AF (1967) Suborder Cicadinea. In: Bei-Bienko GY (Ed.) Keys to the Insects of the European USSR. Vol.1. 1. 421-551 pp.
- Gębicki C, Świerczewski D, Szwedło J (2013) Planthoppers and leafhoppers of Poland (Hemiptera: Fulgoromorpha et Cicadomorpha) Systematics. Check-list. Bionomy. Annals of the Upper Silesian Museum in Bytom. Entomology 21-22 (21): 5-259.
- Gjonov I (2022) new_fulgoromorpha_records_bulgaria_2022. Biodiversity Data Journal. Occurrence dataset <https://doi.org/10.15468/78yrn5>
- Gnezdilov VM, Holzinger WE, Wilson M (2014) The Western Palaearctic Issidae (Hemiptera, Fulgoroidea): an Illustrated Checklist and Key to Genera and Subgenera. Proceedings of the Zoological Institute RAS 318 (Supplement 1): 6-112.
- Gravestein WH (1976) Naamlijst van de in Nederland voorkomende Cicaden (Homoptera, Auchenorrhyncha). Entomologische Berichten 36: 51-57.
- Guglielmino A, Bückle C, Remane R (2005) Contribution to the knowledge of the Auchenorrhyncha fauna of Central Italy (Hemiptera, Fulgoromorpha et Cicadomorpha). Marburger Entomologische Publikationen 3 (3): 13-98.
- Guglielmino A, Bückle C (2008) Contribution to the knowledge on the Auchenorrhyncha fauna (Hemiptera Fulgoromorpha et Cicadomorpha) of the Tuscanian-Emilian Apennines. Redia XCI: 3-23.
- Guglielmino A, Olmi M, Bückle C (2013) An updated host-parasite catalogue of world Dryinidae (Hymenoptera: Chrysidoidea). Zootaxa 3740 (1): 1-113. <https://doi.org/10.11646/zootaxa.3740.1.1>
- Györfy G, Kiss B, Koczor S, Orosz A (2009) Checklist of the fauna of Hungary. Volume 4. Hemiptera: Archaeorrhyncha, Clypeorrhyncha. Hungarian. Hungarian Natural History Museum, Budapest, 79 pp.
- Hayashi M, Fujinuma S (2016) Fulgoromorpha. In: Editorial Committee of Catalogue of the Insects of Japan (Ed.) Catalogue of the Insects of Japan Volume 4 Paraneoptera (Psocodea, Thysanoptera, Hemiptera). Entomological Society of Japan, 323-355 pp.
- Hoch H (1990) New synonyms and records in the cixiid genus *Hyaesthes* Signoret, 1865 (Hom., Fulgoroidea). Entomologist's Monthly Magazine 26: 67-70.

- Hoch H (2013) Fauna Europaea: Fulgoromorpha. <http://www.faunaeur.org>. Accessed on: 2020-1-20.
- Holzinger W (1996a) Die Zikadenfauna wärmeliebender Eichenwälder Ostösterreichs (Insecta: Homoptera, Auchenorrhyncha). Mitteilungen des Naturwissenschaftlichen Vereins für Steiermark 126: 169-187.
- Holzinger W (1996b) Kritisches Verzeichnis der Zikaden Österreichs (Ins.: Homoptera, Auchenorrhyncha). Carinthia II 186 (106): 501-507.
- Holzinger W, Seljak G (2001) New Records of Planthoppers and Leafhoppers from Slovenia, with a checklist of hitherto recorded species (Hemiptera: Auchenorrhyncha). Acta Entomologica Slovenica 9 (1): 39-66.
- Holzinger W, Kammerlander I, Nickel H (2003) The Auchenorrhyncha of Central Europe – Die Zikaden Mitteleuropas Volume 1: Fulgoromorpha, Cicadomorpha excl. Cicadellidae. Brill Academic Publishers, Leiden, The Netherlands, 674 pp.
- Holzinger W, Kunz G (2006) New records of leafhoppers and planthoppers from Austria (Hemiptera: Auchenorrhyncha). Acta Entomologica Slovenica 14: 163-174.
- Holzinger WE (1999) Rote Liste der Zikaden Kärntens (Insecta: Auchenorrhyncha). Naturschutz in Kärnten 15: 425-450.
- Holzinger WE (2009) Rote Liste der Zikaden (Hemiptera: Auchenorrhyncha) Österreichs. In: Zülka KP (Ed.) Rote Listen gefährdeter Tiere Österreichs. Checklisten, Gefährdungsanalysen, Handlungsbedarf. 14(3). Böhlau Verlag Wien, Köln, Weimar, 41-317 pp.
- Holzinger WE, Aukema B, den Bieman CFM, Bourgoin T, Burckhardt D, Carapezza A, Cianferoni F, Chen PP, Faraci F, Goula M (2017) Hemiptera records from Lake Spechtensee and from Southern Styria (Austria). Entomologica Austriaca 24: 67-82.
- Holzinger WE, Huber E, Schlosser L, Kunz G (2020) *Acanalonia conica* (Say, 1830) and three other true hopper species new for Austria (Hemiptera: Auchenorrhyncha). Cicadina 19: 9-19.
- Horváth G (1895) Hemipteres nouveaux d'Europe et des pays limitrophes. Revue d'Entomologie 6-7: 157-165.
- Kahapka J, Kunz G (2011) Zu früh für Zikaden im Kalktal? (Insecta: Hemiptera: Auchenorrhyncha). In: Nationalpark Gesäuse GmbH, Weng im Gesäuse (Ed.) Schriften des Nationalparks Gesäuse. Vielfalt Lawine – Das Kalktal bei Hieflau, 6. Nationalpark Gesäuse GmbH, Weng im Gesäuse, Admont, 142–151 pp.
- Kartal V (1985) Türkiye'den az bilinen *Tshurtshurnella extrema* Dlabola, 1980 (Homoptera, Auchenorrhyncha, Issidae) türü. Doga Bilim Dergisi 10 (2): 99-103.
- Korányi D, Markó V, Haltrich A, Orosz A (2018) First records of *Latilica maculipes* (Hemiptera: Issidae) and *Synophropsis lauri* (Hemiptera: Cicadellidae) in Hungary. Opuscula Zoologica Budapest 49 (1): 71-75. <https://doi.org/10.18348/opzool.2018.1.71>
- Kunz G, Plank C (2002) Zikaden im Nationalpark Gesäuse unter Berücksichtigung aktueller Aufsammlungen (Hemiptera: Auchenorrhyncha). Entomologica Austriaca 22: 45-73.
- Kunz G (2010) Erste Zikadenerhebungen im Nationalpark Thayatal (Insecta, Auchenorrhyncha). Wissenschaftliche Mitteilungen aus dem Niederösterreichischen Landesmuseum 21: 283-302.
- Kunz G, Kahapka J (2012) Zikaden (Insecta: Hemiptera: Auchenorrhyncha) im Kalktal bei Hieflau. Abhandlungen der Zoologisch-botanischen Gesellschaft in Österreich 38: 163-168.

- Le Quesne W, Payne KR (1981) Cicadellidae (Typhlocybinae) with a check list of the British Auchenorrhyncha (Hemiptera, Homoptera). Handbooks for the identification of British insects 2 (c): 1-95.
- Lessio F, Alma A (2008) Host plants and seasonal presence of *Dictyophara europaea* in the vineyard agro-ecosystem. Bulletin of Insectology 61 (1): 199-200.
- Lindberg PH (1960) Über Zikaden von Sowjetarmenien. Notulae entomologicae 40: 56-72.
- Lodos N, Kalkandelen A (1980) Preliminary list of Auchenorrhyncha with notes on distribution and importance of species in Turkey I. Family Cixiidae Spinola. Türkiye Bitki Koruma Dergisi 4 (1): 15-27.
- Logvinenko VN (1975) Fulgoroidny cicadovy Fulgoroidea. Fauna Ukrainy 20 (2): 1-287.
- Malenovský I (2006) Planthoppers and leafhoppers (Auchenorrhyncha, Hemiptera) of Kokorínsko Protected Landscape Area. Bohemia Centralis 27: 295-322.
- Malenovský I, Lauterer P (2010) Additions to the fauna of planthoppers and leafhoppers (Hemiptera: Auchenorrhyncha) of the Czech Republic. Acta Musei Moraviae, Scientiae Biologicae 95 (1): 49-122.
- Malenovský I, Baňář P, Kment P (2011) A contribution to the faunistics of the Hemiptera (Cicadomorpha, Fulgoromorpha, Heteroptera, and Psylloidea) associated with dry grassland sites in southern Moravia (Czech Republic). Acta Musei Moraviae, Scientiae Biologicae 96 (1): 41-187.
- Malenovský I, Lauterer P (2012) Leafhoppers and planthoppers (Hemiptera: Auchenorrhyncha) of the Bílé Karpaty Protected Landscape Area and Biosphere Reserve (Czech Republic). Acta Musei Moraviae, Scientiae Biologicae 96 (2): 155-322.
- Malenovský I, Kment P, Sychra J (2014) Faunistics, insects, Cicadomorpha, Fulgoromorpha, Heteroptera, Sternorrhyncha, Erzgebirge, Bohemia, central Europe, peat bogs, tyrphobionts, tyrphophilous fauna. Klapalekiana 50: 181-234.
- Malenovský I, Lauterer P (2017) Auchenorrhyncha (křísli). In: Farkač J, Král D, Škorpík M (Eds) Red list of threatened species in the Czech Republic. Invertebrates. Agentura ochrany přírody a krajiny ČR, Praha, 147-155 pp.
- Melichar L (1914) Zweiter Beitrag zur Kenntnis der kaukasischen Homopterenfauna. Mitteilungen des Kaukasischen Museums 8 (1-2): 127-137.
- Metcalf ZP (1943) General Catalogue of the Hemiptera, Fascicle IV, Fulgoroidea, Part 3, Araeopidae (Delphacidae). 40(3). Smith College, Northhampton, Massachusetts, USA, 544 pp.
- Mitjaev ID (1971) Leafhoppers of Kazakhstan (Homoptera-Cicadinea). Science of Kazakh SSR 1971: 1-211.
- Mitjaev ID (2015) Leafhoppers (Homoptera, Cicadinea) of Kazakhstan, annotated check-list of species. Selevinia 23: 43-81.
- Mozaffarian F, Wilson M (2011) An annotated checklist of the planthoppers of Iran (Hemiptera, Auchenorrhyncha, Fulgoromorpha) with distribution data. ZooKeys 145: 1-57. <https://doi.org/10.3897/zookeys.145.1846>
- Mozaffarian F (2014) Fauna of planthoppers superfamily Fulgoroidea (Hem.: Auchenorrhyncha) in the northwestern Iran. Journal of Field Crop Entomology 4 (1): 1-16.
- Mozaffarian F (2018) An Identification key to the species of Auchenorrhyncha of Iranian fauna recorded as pests in orchards and a review on the pest status of the species. Zootaxa 4420 (4): 475-501. <https://doi.org/10.11646/zootaxa.4420.4.2>

- Mühlethaler R, Holzinger WE, Nickel H, Wachmann E (2018) Verzeichnis der Zikaden Deutschlands, Österreichs und der Schweiz. In: Quelle & Meyer (Ed.) Die Zikaden Deutschlands, Österreichs und der Schweiz: Entdecken – Beobachten – Bestimmen. Wiebelsheim, 1-32 pp.
- Nast J (1972) Palaearctic Auchenorrhyncha (Homoptera). An annotated check list. Polish Scientific Publishers, Warszawa, 550 pp.
- Nast J (1986) Notes on some Auchenorrhyncha (Homoptera) VI - X. Annales Zoologici 40 (2-5): 297-307.
- Nast J (1987) The Auchenorrhyncha (Homoptera) of Europe. Annales zoologici 40 (15): 535-661.
- Nickel H, Remane R (2002) Check list of the planthoppers and leafhoppers of Germany, with notes on food plants, diet width, life cycles, geographic range and conservation status (Hemiptera, Fulgoromorpha and Cicadomorpha). Beiträge zur Zikadenkunde 5: 27-64.
- Nickel H (2003a) Rote Liste gefährdeter Zikaden (Hemiptera, Auchenorrhyncha) Bayerns. Schriftenreihe des Bayerischen Landesamtes für Umweltschutz 166 (2002): 1-67.
- Nickel H (2003b) The Leafhoppers and Planthoppers of Germany (Homoptera, Auchenorrhyncha): Patterns and strategies in a highly diverse group of phytophagous insects. Pensoft Publishers, Sofia-Moscow Goecke & Evers, Keltern, 460 pp.
- Nickel H, Remane R (2003) Verzeichnis der Zikaden (Auchenorrhyncha) der Bundesländer Deutschlands. Entomofauna Germanica 6: 130-154.
- Nickel H, Gärtner E (2009) Tyrphobionte und tyrphophile Zikaden (Hemiptera, Auchenorrhyncha) in der Hannoverschen Moorgeest – Biotopspezifische Insekten als Zeigerarten für den Zustand von Hochmooren. TELMA 39: 45-74.
- Nickel H, Sander FW (2016) Rote Liste der Zikaden (Insecta: Hemiptera: Auchenorrhyncha) Thüringens. Landschaftspflege und Naturschutz in Thüringen 35 (2): 33-37.
- Nickel H, Achtziger R, Biedermann R, Bückle C, Deutschmann U, Niedringhaus R, Remane R, Walter S, Witsack W (2016) Rote Liste und Gesamtartenliste der Zikaden. Naturschutz und Biologische Vielfalt 70 (4): 249-298.
- Niedringhaus R, Biedermann R, Nickel H (2010a) Verbreitungsatlas der Zikaden des Großherzogtums Luxemburg - Textband. Ferrantia 60: 1-105.
- Niedringhaus R, Biedermann R, Nickel H (2010b) Verbreitungsatlas der Zikaden des Großherzogtums Luxemburg - Atlasband. Ferrantia 61: 1-395.
- Orosz A (2008) Contributions to the leafhopper fauna of the protected areas along the river Tur (Homoptera: Auchenorrhyncha). Biharean Biologist 2 (Suppl. 1): 55-62.
- Orosz A (2009) Gyűrűfűn a Biodiverzitás Napokon gyűjtött kabócák (Auchenorrhyncha). Natura Somogyensis 13: 91-96.
- Orosz A, Tóth M (2016) Contribution to the Auchenorrhyncha fauna of Șalaj county, Romania. Studia Universitatis "Vasile Goldiș", Seria Științele Vieții 26 (1): 117-123.
- Park J, Jung S (2020) Two newly recorded genera and species of the plant hopper (Hemiptera: Auchenorrhyncha: Delphacidae) in Korea. Journal of Asia-Pacific Biodiversity 13 (2): 310-313. <https://doi.org/10.1016/j.japb.2020.03.015>
- Popa V, Popa A (2002) New records of the Auchenorrhyncha (Hemiptera) species in the fauna of Romania. Acta Entomologica Slovenica 10 (1): 91-96.

- Preisler J, Lauterer P (2003) Some new species of planthoppers and leafhoppers for the Czech Republic and Slovakia. *Beiträge zur Zikadenkunde* 6: 53-56.
- Remane R, Fröhlich W (1994) Beiträge zur Chorologie einiger Zikaden- Arten (Homoptera Auchenorrhyncha) in der Westpaläarktis. *Marburger Entomologische Publikationen* 2 (8): 131-188.
- Seljak G (2004) Contribution to the knowledge of planthoppers and leafhoppers of Slovenia (Hemiptera: Auchenorrhyncha). *Acta Entomologica Slovenica* 12 (2): 189-216.
- Seljak G (2016) New and little known plant- and leafhoppers of the fauna of Slovenia (Hemiptera: Fulgoromorpha and Cicadomorpha). *Acta Entomologica Slovenica* 24 (2): 151-200.
- Smirnova NV, Anufriev GA (2014) [On cicadina fauna (Homoptera, Cicadina) of «Kerzhensky» Reserve]. [Proceedings of the State Natural Biosphere Reserve «Kerzhensky»] 2: 124-127.
- Söderman G, Gillerfors G, Endrestøl A, Söderman G (2009) An annotated catalogue of the Auchenorrhyncha of Northern Europe. *Cicadina* 10 (1): 33-69.
- Song ZS, Liang AI (2008) The palaearctic planthopper genus *Dictyophara* Germar, 1833 (Hemiptera: Fulgoroidea: Dictyopharidae) in China. *Annales Zoologici* 58 (3): 537-549. <https://doi.org/10.3161/000345408X364364>
- Tanyeri R, Zeybekoğlu Ü (2021) Species of Cixiidae and Issidae (Hemiptera: Auchenorrhyncha: Fulgoromorpha) distributed in Sinop and Kastamonu (Turkey). *Sakarya University Journal of Science* 25 (2): 594-600. <https://doi.org/10.16984/soaufenbilder.869438>
- Walczak M (2016) The fauna of planthoppers and leafhoppers (Hemiptera: Fulgoromorpha et Cicadomorpha) in the city of Częstochowa (southern Poland). *Annals of the Upper Silesian Museum in Bytom. Entomology* 24-25: 1-193.
- Walter S, Emmrich R, Nickel H (2003) Rote Liste Zikaden. In: *Abt. Natur- und Landschaftsschutz (Ed.) Materialien zu Naturschutz und Landschaftspflege*. 27 pp.
- Witsack W, Nickel H (2004) Rote Liste der Zikaden (Hemiptera, Auchenorrhyncha) des Landes Sachsen-Anhalt. *Berichte des Landesamtes für Umweltschutz Sachsen-Anhalt* 39: 228-236.