

The fig leafhopper, *Ficocyba ficaria* (Horváth, 1897) established in Hungary (Hemiptera, Cicadellidae)

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Abstract

The fig leafhopper, *Ficocyba ficaria* (Horváth, 1897) (Cicadellidae: Typhlocybinae: Typhlocybini) was described from the coast of the Adriatic sea. Since then the species has been reported from several countries, primarily from the Mediterranean area of the Western Palaearctic Region. In the course of the current study the species was found at several locations in Hungary, indicating the presence of stable populations. An overview of currently known distribution of the species is provided. Recent records of the species including results of the present study indicate range expansion of the fig leafhopper.

Key Words

Carpathian Basin, climate change, *Ficus carica*, invasive species, range expansion, Typhlocybinae

Introduction

Leafhoppers (Cicadellidae) is a highly species-rich family of true hoppers (Auchenorrhyncha) with more than 20000 species worldwide (Dietrich 2013; Dmitriev et al. 2025). Cicadellidae has the highest number of phytophagous sap-feeders and the highest number of plant pathogen vectors (Dietrich 2013). Different feeding strategies are present in the family, including phloem-, xylem- and mesophyll-feeders (Dietrich 2013).

Members of the subfamily Typhlocybinae are mesophyll-feeders, thus, these species may cause visible damage on plant leaves, however, their vector capabilities are limited as compared to phloem-feeders. Nevertheless,

there are examples of typhlocybine vectors (Abou-Jawdah et al. 2014).

Invasive species pose a great threat to agriculture globally (Paini et al. 2016). Europe is also heavily affected by invasion of non-indigenous species, as indicated by country-level studies a large percentage of these species are Hemipterans (Jucker et al. 2008; Liebhold et al. 2024).

Nevertheless, it is important to note that species native to a geographic region may also become invasive (Valéry et al. 2009).

Fig (*Ficus carica* L.) (Moraceae) originates from the Eastern part of the Mediterranean region, nevertheless, by now it has become a widely cultivated plant in Europe both as ornamental and fruit plant. In Hungary it was

planted since the 16th century, however, recently it was found to spread in the country (Wirth et al. 2020).

Ficocyba ficaria (Horváth, 1897) was described by Hungarian entomologist Géza Horváth at the end of the 19th century as *Typhlocyba ficaria* (Horváth 1897). Based on morphological characteristics, Carlo Vidano erected the *Ficocyba* genus (Vidano 1960), *F. ficaria* is the only representative of the genus. The species is considered a typical Mediterranean species (Nickel 2022). The General Catalogue of the Homoptera (Metcalf 1968) lists the species from Hungary, however, these records refer to the locations originally described by Horváth (Horváth 1897), which are now located in Croatia.

In the present paper we report *F. ficaria* from multiple locations in Hungary, the results suggest that the species is well established in the country and consequently in a major part of the Carpathian Basin.

Materials and methods

Observations were made and samples were collected from fig trees at several locations in Hungary. Locations included Budapest and Baranya, Borsod-Abaúj-Zemplén, Fejér, Heves, Hajdú-Bihar, Pest, Somogy and Veszprém counties in Hungary.

Individuals were collected by insect aspirator or together with leaf samples taken from fig trees. The collected materials were taken to the laboratory where individuals were identified to species and sexed according to Ribaut's (Ribaut 1936) and Vidano's (Vidano 1960) works.

Voucher specimens are deposited in the Hemiptera Collection of the Hungarian Natural History Museum Public Collection Centre – Hungarian Natural History Museum, Budapest (HNHM) and in the first author's collection.

Results and discussion

Taxonomic position

Order: Hemiptera Linnaeus, 1758

Suborder: Auchenorrhyncha Duméril, 1805

Family: Cicadellidae Latreille, 1825

Subfamily: Typhlocybinae Kirschbaum, 1868

Tribus: Typhlocybini Kirschbaum, 1868

Genus: *Ficocyba* Vidano, 1960

Species: *Ficocyba ficaria* (Horváth, 1897)

Description. Body length from vertex tip to the wing tips 2.9 mm to 3.2 mm for males and 3 mm to 3.3 mm for females (Vidano 1960); body slender. Basic colouration of live individuals whitish usually with a faint yellowish tinge. Apical part of elytra slightly fuscous. Vertex rounded in males, more prominent in females (Fig. 1). Second apical cell of elytra triangular. Hind wings with 2 apical cells, which are apically open.

Genital plates of males dorsally curved. Pygofer lobes of males with a characteristic blackish spot ventrally. Styles very characteristic, bifurcate. Aedeagus relatively robust and straight with two small triangular lobes apically. VIIth sternit of females rounded, concave, distal end of the ovipositor with a characteristic blackish spot.

A detailed description and illustration of the genitalia of the species is provided in the works of Ribaut (Ribaut 1936) and Vidano (Vidano 1960).

Material examined. HUNGARY – **Budapest** • 2 ♂♂, 1 ♀; XVI. district, 1.Sept.2024. leg. Áron Székely • 1 ♂, 2 ♀♀; XI. district, 2.Oct.2024. leg. Zsolt Medve • 7 ♀♀; III. district, 28.June.2025. leg. Sándor Koczor – **Baranya county** • 1 ♂; Nagyarsány, Szársomlyó, 26–29.Oct.2024. leg. Bence Péter Schlitt – **Borsod-Abaúj-Zemplén county** • 2 ♂♂, 3 ♀♀; Mezőkövesd, 27.Sept.2024. leg. Áron Horváth – **Fejér county** • 3 ♀♀; Etyek, 4.Sept.2024. leg. Attila Takács • 1 ♂; Etyek, 10.Sept.2024. leg. Attila Takács • 1 ♀; Székesfehérvár, Kisfalud, 17.Sept.2024. leg. Attila Takács • 1 ♀; Székesfehérvár, Kisfalud, 25.Sept.2024. leg. Attila Takács – **Heves county** • 2 ♂♂, 1 ♀; Maklár, 3.Oct.2024. leg. Máté Bernát – **Pest county** • 10 ♂♂, 6 ♀♀; Pilisvörösvár, 26.Sept.2024. leg. Balázs Kiss • 5 ♀♀; Érd, 2.Oct.2024. leg. Hanna Herák • 1 ♂; Gödöllő, 12.Oct.2024. leg. Gergő Tamási – **Somogy county** • 2 ♂♂, 2 ♀♀; Kaposvár, 27.Sept.2024. leg. Bence Péter Schlitt – **Veszprém county** • 4 ♂♂, 13 ♀♀; Balatonfüzfő, 19.Aug.2024. leg. Sándor Koczor • 4 ♂♂, 4 ♀♀; Balatonfüzfő, 20.Aug.2024. leg. Ádám Csongor Koczor • 2 ♂♂, 1 ♀; Balatonfüzfő, 21.Aug.2024. leg. Benedek Zalán Koczor

In the course of the current study, *F. ficaria* was found at several locations in Hungary (Fig. 2). Besides collection of adults, nymphs and exuviae were also observed. In addition to collected samples, field observations were also made of the species primarily at urban and semiurban localities. The localities of the observations and the collected individuals in Hungary are shown in Fig. 2.

Distribution. The species is widely spread in the Mediterranean area of the Western Palaearctic Region, it has been reported from several countries including Bulgaria, Croatia, France, Greece, Israel, Italy (including Sardinia), Lebanon, Malta, Montenegro, Morocco, Portugal, Serbia, Slovenia, Spain and from Switzerland (Nast 1972, 1987; Holzinger and Seljak 2001; Mifsud et al. 2012; Thanou et al. 2018; Nickel 2022; Vujić and Vesović 2023).

Recently, the species was also recorded in Germany, however, as the author noted, the species has not been found previously, despite targeted occasional search for the species for decades, thus, the persistence of the population is considered doubtful (Nickel 2022). In 2024 two observations were made of the species in Belgium, but no specimens were preserved (GBIF.org 2025). Very recently, the species was also recorded from Crimea region (Gubin et al. 2025).

As indicated by the results of the present study, the species is currently probably widespread in Hungary and consequently in a major part of the Carpathian Basin.

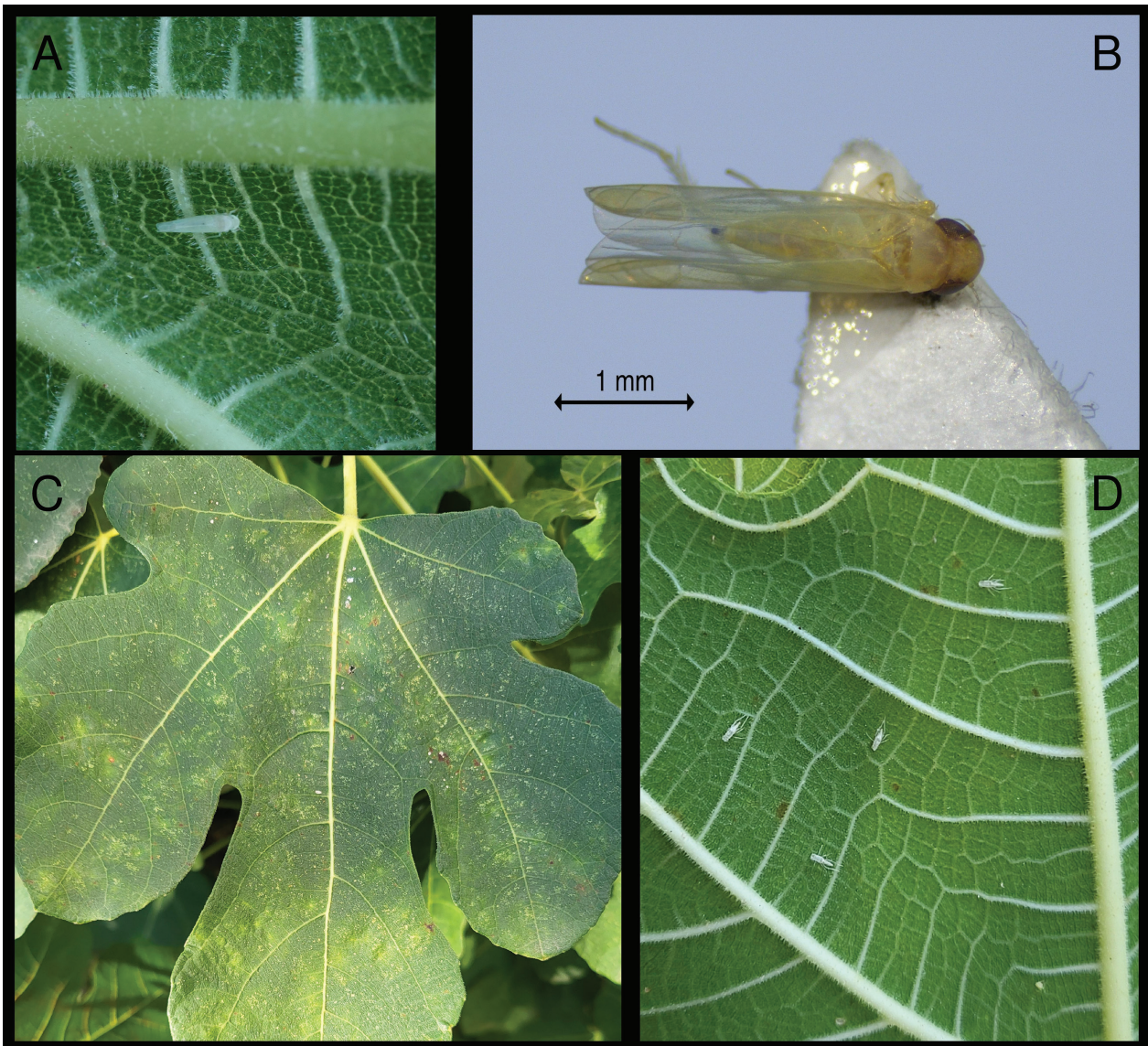


Figure 1. **A.** Adult *Ficoxyba ficaria* (Horváth, 1897) on a fig leaf; **B.** *Ficoxyba ficaria* (Horváth, 1897) female (Scale bar: 1 mm); **C.** Light spots indicating feeding damage on a fig leaf; **D.** Exuviae on a fig leaf.

Nevertheless, despite more than a century of faunistic studies on Auchenorrhyncha, including intensive faunistic projects in several regions, *F. ficaria* has not been recorded previously from present day Hungary according to the latest checklist (Györfly et al. 2009), indicating a relatively recent occurrence and distribution. Notably, even recent targeted surveys of fig pests in Hungary (e.g. Fazekas et al. 2022) and occasional searches for the species by the first author on fig trees starting more than a decade ago did not detect the species previously, further supporting the assumption that it has spread to the country only in the past few years.

As a consequence of the climate change monthly temperatures show increase including winter months, resulting in milder winters (Lakatos et al. 2021), which could help the establishment of Mediterranean species. Fig as a host plant of *F. ficaria* was recently found to show naturalisation and spontaneous spread in Hungary (Wirth et al. 2020), but the changed climatic conditions most

probably also provide favourable conditions to the fig leafhopper as well.

Biology. According to observations in Italy the species performs one generation on *Lonicera* spp. from autumn to spring and has two generations on its summer host, fig (Vidano 1960). Feeding activity of the species causes light spots on leaves of the host plants (Fig. 1).

During autumn migration *F. ficaria* can be observed on different tree and shrub species as well including *Crataegus* spp., *Populus* spp., *Prunus* spp., *Quercus* spp., *Rubus* spp. and *Ulmus* spp. (Mazzoni 2005). The species overwinters as egg.

A very special feature of the species is its obligatory dioecy reported by Vidano (Vidano 1960) which is known from several aphid species, however, it is very exceptional in Cicadellidae.

Etymology. The species previously lacked a Hungarian common name. Assigning common names to allochthonous and invasive species can help raise public

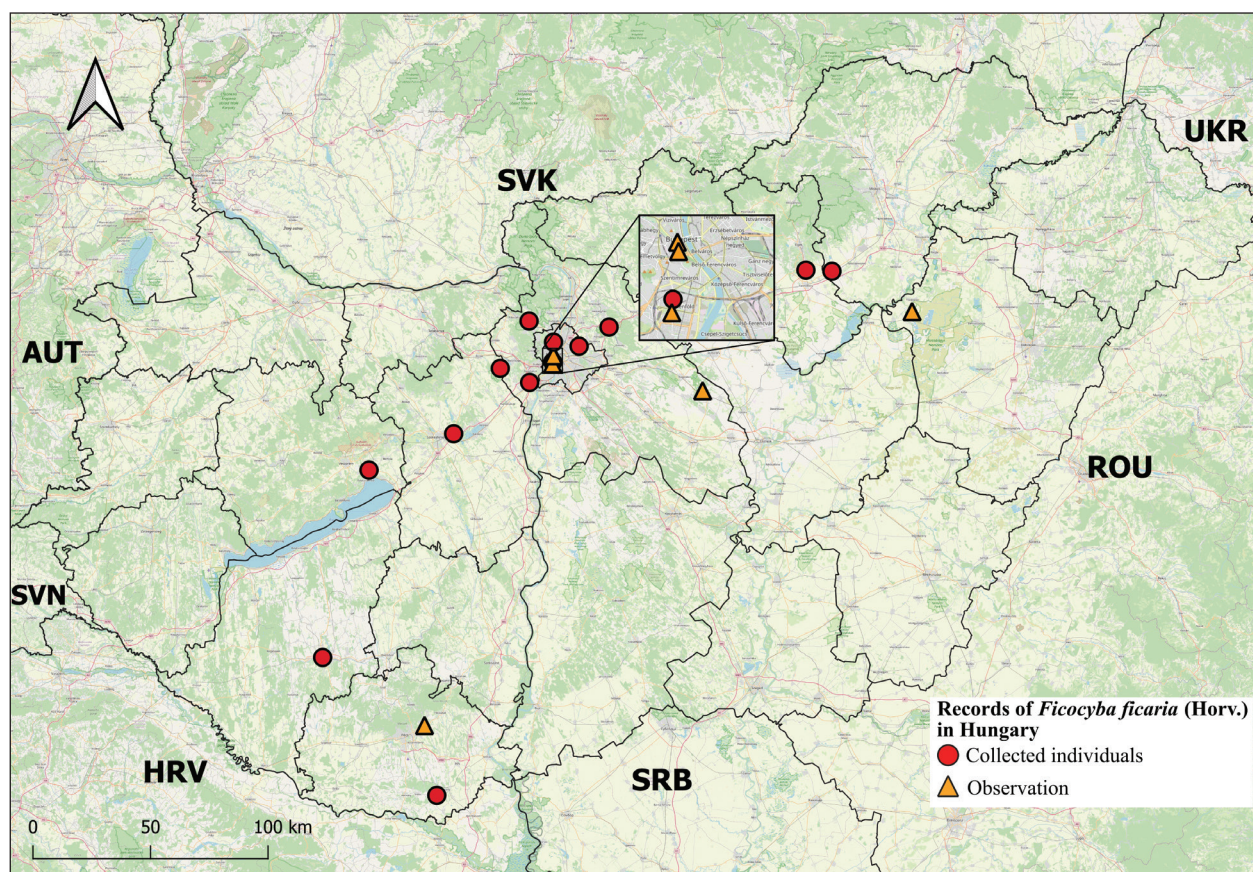


Figure 2. Locations of observations and collection data of *Ficocyba ficaria* (Horváth, 1897) in Hungary.

awareness and improve communication about their presence and impact. Proposed Hungarian name – „Fehér fügekabóca”, where „fehér” (=white) refers to its general colour, „füge” (=fig) refers to its main host plant and „kabóca” is a term for Auchenorrhynchan insects.

Conclusions

Ficocyba ficaria has been reported from several Mediterranean countries, however, it is likely that the species is also present in other countries in the Mediterranean area of the western Palaearctic region. The results of the current study suggest that the species is established in Hungary and thus in a major part of the Carpathian Basin. The current data and recent records distant from its previously known distribution seem to indicate range expansion of the species, thus, its future occurrence in further countries is to be expected.

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