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REMARKABLE RECORDS OF NINE RARE AUCHENORRHYNCHA SPECIES FROM AUSTRIA (HEMIPTERA)

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Abstract - We present records of nine very rare and poorly known true hopper species from Austria and a record of *Myndus musivus* from Croatia. *Glossocratus foveolatus* and *Calamotettix taeniatus* are reported from Austria for the first time. New records of *Trigonocranus emmeae, Criomorphus williamsi, Euides alpina* and *Dorycephalus baeri* are presented. New discovered habitats of *Pseudodelphacodes flaviceps* at floodplains of the Inn river are strongly influenced by hydropower utilization. Two different "ecotypes" of *Ommatidiotus dissimilis* are reported; they might represent different "cryptic species".

KEY WORDS: Austria, Biogeography, new records, planthoppers, leafhoppers, true hoppers, Cicadina, Fulgoromorpha, Cicadomorpha, Cixiidae, Cicadellidae, Delphacidae, Caliscelidae

Izvleček – IZJEMNE NAJDBE DEVETIH REDKIH VRST ŠKRŽATKOV (AUCHENORRHYNCHA) V AVSTRIJI (HEMIPTERA)

Predstavljava podatke o devetih zelo redkih in slabo poznanih vrstah škržatkov iz Avstrije in najdbo vrste *Myndus musivus* na Hrvaškem. *Glossocratus foveolatus* in *Calamotettix taeniatus* sta prvič zabeleženi v Avstriji. Predstavljeni so novi podatki za vrste *Trigonocranus emmeae, Criomorphus williamsi, Euides alpina* in *Dorycephalus baeri*. Novo odkrite habitate vrste *Pseudodelphacodes flaviceps* na poplavnih ravnicah reke Inn močno ogroža hidroenergetska izraba. Predstavljena sta dva različna "ekotipa" vrste *Ommatidiotus dissimilis*; morda predstavljata različni "kriptični vrsti".

KLJUČNE BESEDE: Avstrija, biogeografija, nove najdbe, škržatki, Cicadina, Fulgoromorpha, Cicadomorpha, Cixiidae, Cicadellidae, Delphacidae, Caliscelidae

Introduction

The distribution and ecology of the Auchenorrhyncha species of Central Europe and especially Austria is well known (e.g. HOLZINGER 2009a, b). Nevertheless, in the course of various projects, unexpected discoveries have been made that have provided new information on distribution and ecology of some species. These are summarized in this paper.

Methods, material

Auchenorrhyncha were collected by sweep-net, suction sampler and with pitfall traps. Voucher specimens are deposited in the collection of the Karl-Franzens-University Graz, Institute for Biology (coll. G. Kunz) and of the Oekoteam - Institute for Animal Ecology and Landscape Planning (coll. OEKO/Holzinger).

Results and discussion

Cixiidae SPINOLA, 1839

Myndus musivus (GERMAR, 1825)

This cixiid species is known from riverine sites; adults are usually found on willows *(Salix* spp.), rarely also on other shrubs and trees. Nymphs are living subterraneously and are obviously restricted to wet soil conditions. The species is threatened due to river regulations and hydropower utilization. In the last decades, only few records from Central Europe were published and none from Austria after 1950. Here we present two new Austrian records and one remarkable record from a temporarily flooded Dolina in Croatia, where hundreds of adults could be found on willows.

New records: Austria, Lower Austria, Donauauen National Park, riverbank vegetation, on *Salix* sp. 48°07'26"N, 16°42´89"E, 146m a.s.l., 1 ♂, 04.08.2014, G. Kunz leg. -- Austria, Burgenland, riverbank of Leitha near Potzneusiedl, 48°03’14’’N, 16°55’06’’E, 140m a.s.l., 1 ♂, 18.06.1998, W.E. Holzinger leg. -- Croatia, Istria NE Buje, E Čepići, collapse sinkhole „Malinska“, 45°25'3"N, 13°49'4"E, 330m a.s.l., hundreds of adults on *Salix* spp. within a grazed, temporarily flooded area, 25.07.2013, W.E. Holzinger, P. Holzinger & B. Komposch leg.

Trigonocranus emmeae FIEBER, 1876

This is the most enigmatic Cixiidae in the Central European fauna. Its range extends from Great Britain and France to Sweden in the North and the Caucasus region in the south-east, but only very few records have been published throughout this range - mainly of long-winged, migrating females (see e.g. HOLZINGER et al. 2003, MUSIK et al. 2013, EMELJANOV 2015). Adults are usually short-winged, pale

and have reduced compound eyes. They sustain in the soil, usually in habitats with sparse vegetation cover, and reproduce there (see HOCH et al. 2013, DE HAAS & DEN BIEMAN 2018). Only migrating individuals (females) are known to be able to fly. Short-winged specimens and thus development habitats are almost unknown.

Only a single record was known from Austria to date (MOOSBRUGGER 1946). Recently, we found a short-winged male and a nymph in a rural site in Tyrol and thus a breeding site of this species, and, in addition, a long-winged female in Lower Austria.

New records: Austria, North Tyrol, Trankhütte near Roppen, rural habitat near an old waste disposal site, 47°14’06’’N 10°49’33’’E, 840m a.s.l., 1 nymph, 21.05.2013, T. Kopf leg., and 1 short-winged ♂ in a pitfall trap, 26.06.-15.07.2013, J. Schied & T. Kopf leg. -- Austria, Lower Austria, stone quarry 1 km south of Schwarzensee, ruderal vegetation 48°00'01"N; 16°03'48’’E, 481m a.s.l., 1 ♀, 12.06.2011, G. Kunz leg.

Delphacidae LEACH, 1865

Pseudodelphacodes flaviceps (FIEBER, 1866)

This species is endemic to gravel and sand banks in the Alps, feeding monophagously on *Calamagrostis pseudophragmites*. Records are only known from four rivers: Rhine (near Lustenau, Vorarlberg, Austria; MOOSBRUGGER 1946, NICKEL 1999), Rhône (Salgesch, Wallis, Switzerland; MÜHLETHALER et al. 2016), Lech (near Augsburg, Bavaria, Germany; FISCHER 1972) and Isar (floodplains near Lenggries/Vorderriss, Krün, Fall, Ascholding and Wallgau, Bavaria, Germany; FRÖHLICH 1996, NICKEL 1999). No previous record was published from any residual water bed. We could find the species in two sites along the Inn river in Tyrol. This river is strongly influenced by hydropower utilisation: both sites by daily hydropeaking and one is, in addition, situated in a residual water bed.

New records: Austria, North-Tyrol, gravelbank of the Inn river near Fließ, 47°06’48’’N 10°38’40’’E, 845m a.s.l., 8 ♂ 22 ♀, 11.08.2009, and 4 ♀, 14.07.2010, W. E. Holzinger leg.; several ♂ & ♀, 18.08.2010, G. Kunz leg. -- Austria, North-Tyrol, riverside of Inn near Arzl/Pitztal, 47°13’04’’N, 10°46’04’’E, 710m a.s.l., pitfall trap, 1 ♀, 18.07.-03.08.2013 and 4 ♂ 2 ♀, 03.08.-28.08.2013, both J. Schied & T. Kopf leg.

Criomorphus williamsi CHINA, 1939

This is again a very rare species with only few published records, scattered from northern Germany and the Czech Republic to eastern Europe and to the Kyrgyz Republic (summarized by SCHLOSSER & HOLZINGER 2017). Here we present the second record from Austria. The species is obviously restricted to wet meadows with extensive mowing or grazing.

New record: Austria, Lower Austria, SW of Laab im Walde, wet meadow (Molinion), 48° 08'43-44’’N, 16°10’08-44’’E. 391m a.s.l., 1 ♂, 07.06.2015, J. Gunczy & G. Kunz leg.

Euides alpina (WAGNER, 1948)

This eurosiberian species is known from few localities in Central Europe only (see HOLZINGER et al. 2003), but also occurs in the Caucasus region and Central Asia (e.g. DUBOVSKIY & TURGUNOV 1971). In Austria, it was recorded once at the type locality in westernmost Austria (Frastanz, Vorarlberg; WAGNER 1948). Now we found another site in the eastern part of the country:

New record: Austria, Lower Austria, east of Laab im Walde, spring-fed meadow, on *Phragmites australis*, 48°09'13"N, 16°12'31"E, 338m a.s.l., 1 ♂, 07.06.2015; 5 ♂ 1 ♀ 1 nymph, 30.06.2017, J. Gunczy & G. Kunz leg.

Caliscelidae AMYOT & SERVILLE, 1834

Ommatidiotus dissimilis (FALLÉN, 1806)

This species is distributed throughout Europe, but ecological information published from different countries show different preferences concerning the habitat of this species. Authors from Northern and Central Europe consider it as tyrphobiotic, i.e. occurring in peat bogs and feeding only on *Eriophorum* spp. (e.g. NICKEL 2003, SUSHKO & BORODIN 2009). In contrast, records from southern part of Europe originate from moist meadows and salty habitats, where the species feeds on *Carex* spp. (e.g. GUGLIELMINO & al., 2005, GUGLIELMINO & BÜCKLE 2015). Despite its variability in colouration, no morphological differences between these two "ecotypes" are recognisable (GUGLIELMINO & BÜCKLE 2015).

Only one previous record from Austria exists (HOLZINGER 2009a). In fact, both ecotypes occur: We found *Ommatidiotus dissimilis* in inner-alpine peat bogs in western Austria (Vorarlberg) on *Eriophorum* and in inland salt marshes in the Pannonian parts of eastern Austria on *Carex*. Further (molecular) studies are encouraged, as it seems possible that these ecotypes represent cryptic species.

New records: Austria, Lower Austria, Baumgarten/March, inland salt marsh, 48°17'37-50''N 16°52'15-29''E, numerous Adults and nymphs, 01.06.2000, W. E. Holzinger leg., 20.08.2008, G. Kunz & R. Kunz leg. – Austria, Burgenland, Lake Neusiedl National Park, Lange Lacke 3km NE Apetlon, inland salt marsh, 47°45'28"N, 16°51'47"E, 118m a.s.l., 1 ♀ 12.06.2012, G. Kunz leg. -- Austria, Burgenland, Lake Neusiedl National Park, Sandeck, wet meadow, 47°43'58"N, 16°46'02"E, 115m a.s.l., 3 ♂ 01.06.2017, G. Kunz leg.; 5 ♀ 07.06.2018, G. Kunz & A. L. Rodenkirchen leg. – Austria, Vorarlberg, Doren-Moos NW Krumbach, peat bog, 47°29'54''N 9°54'41''E, 660m a.s.l., 2 ♂ 5 ♀, 04.09.2014, L. Schlosser & J. Egger leg. – Austria, Vorarlberg, Farnachmoos S Oberbildstein, peat bog, 47°27'28-30''N, 9°48'35''E, 890m, 12 ♂ 8 ♀, 25.07.2013, L. Schlosser & J. Egger leg.

Cicadellidae LATREILLE, 1825

Dorycephalus baeri KOUCHAKEVITCH, 1866

This species is known from the Steppe regions of Eastern Europe (NOVIKOV et al. 2006); DMITRIEV (2007) classified it as "Western Scythian species". It is known from very few localities in Russia, Hungary, Czech Republic and Austria only (ZAHNISER 2018). The only previous record from Austria (Mödling, Lower Austria) is about 100

years old (WAGNER & FRANZ 1961). Now we found it in another two steppe-like habitats in eastern Austria:

New records: Austria, Lower Austria, Hexenberg near Hundsheim, 48°07'33''N 16°56'08''E 245m, 2 ♂, 07.-26.05.1988, pitfall trap, W. Waitzbauer leg. – Austria, Burgenland, Lake Neusiedl National Park, SE Weiden am See, dry grassland, on *Stipa*, 47°55'05"N, 16°53'07"E, 155m, 9 Ad., 14.06.2012, G. Kunz leg.; 9 Ad., 01.06.2017, A. Koblmüller, K. Sefc & G. Kunz leg.

Glossocratus foveolatus FIEBER, 1866

This is a southern central palaearctic steppe species recorded only a few times from Europe (Hungary, Czech Republic, Slovakia, southern Russia, Serbia; EMELJANOV 1964, STOJANOVIĆ & MARKOVIĆ 2014). It lives in steppe biotopes and inland sand dunes, feeding on grasses (Poaceae). Here we present the first record from Austria.

New record: Austria, Burgenland, Lake Neusiedl National Park, Zitzmannsdorfer Wiesen, wet meadow, 47°53'12"N, 16°52'06"E, 118m, 10 ♂ 15 ♀, 06.06.2013, H. Nickel, J. Gunczy & G. Kunz leg.

Calamotettix taeniatus (HORVATH, 1911)

This species is monophagous on *Phragmites australis* and distributed throughout northern, central and southern Europe (see WALCZAK & JEZIOROWSKA 2015, GUGLIELMINO & BÜCKLE 2015). Although its host plant is common and widespread, *C. taeniatus* is rare and considered to be threatened in Red Lists (e.g. NICKEL et al. 2016). Here we present the first record from Austria.

New record: Austria, Burgenland, Lake Neusiedl National Park, Illmitz Biological Station, lighttrap, 47°46'09" N, 16°45'58"E, 120m, more than 100 Adults, 04.-05.06.2017, G. Kunz leg.

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Zusammenfassung

Die Arbeit enthält Nachweise von neun sehr seltenen und wenig bekannten Zikadenarten aus Österreich und einen interessanten Nachweis von *Myndus musivus* aus Kroatien. *Glossocratus foveolatus* und *Calamotettix taeniatus* werden erstmals aus Österreich gemeldet. Für *Trigonocranus emmeae, Criomorphus williamsi, Euides alpina* und *Dorycephalus baeri* werden die Zweitfunde für Österreich präsentiert. Zwei

neue Fundorte von *Pseudodelphacodes flaviceps* an den Ufern des Inn werden von Wasserkraftnutzung (Restwassersituation und Schwallbetrieb) geprägt. Zwei unterschiedliche "Ökotypen" von *Ommatidiotus dissimilis* kommen in Österreich vor; möglicherweise handelt es sich auch um unterschiedliche "kryptische Arten".

Резюме

Представлены находки девяти редких и малоизученных видов цикадовых из Австрии и любопытная находка *Myndus musivus* из Хорватии. *Glossocratus foveolatus* и *Calamotettix taeniatus* обнаружены в Австрии впервые, для *Trigonocranus emmeae, Criomorphus williamsi, Euides alpina* и *Dorycephalus baeri* представлены новые находки. Два новых местонахождения *Pseudodelphacodes flaviceps* находятся в пойме реки, интенсивно используемой в гидроэнергетике. *Ommatidiotus dissimilis* представлен в Австрии двумя различными экотипами; возможно, они представляют собой криптические виды.

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