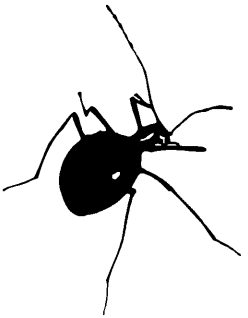

LJUBLJANA, DECEMBER 2004 Vol. 12, No. 2: 189–216

CONTRIBUTION TO THE KNOWLEDGE OF PLANTHOPPERS AND LEAFHOPPERS OF SLOVENIA (HEMIPTERA: AUCHENORRHYNCHA)

Gabrijel SELJAK

Agricultural and Forestry Institute Nova Gorica, Slovenia;
E-mail: gabrijel.seljak@kvz-ng.si

Abstract - Some Auchenorrhyncha species that are new, endemic and less common in the fauna of Slovenia are presented, as well as their current distribution discussed. 63 species new to Slovenia are listed, so the total number of the species known increased to 483. *Quartausius dalmatinus* Dlabola is recognized as a younger synonym of *Quartausius hamatus* (Then). The host plants of *Chlorita beieri* Dlabola, *Chlorita szelenica* Dlabola, *Macrosteles sardus* Ribaut and *Nanosius chloroticus* (Melichar) have been recognized. A critical review of the checklist published in 2001 had also been made and misidentified or misinterpreted species and records revised. *Forcipata forcipata* (Flor) is removed from the Slovenian Auchenorrhyncha checklist.

KEY WORDS: Hemiptera, Auchenorrhyncha, fauna, Slovenia

Izvleček - PRISPEVEK K POZNAVANJU ŠKRŽATKOV SLOVENIJE (HEMIPTERA: AUCHENORRHYNCHA)

V prispevku so obravnavane za slovensko favno nove, endemične in manj pogoste vrste škržatkov (Auchenorrhyncha) ter prikazana njihova razširjenost. 63 vrst je novih za ozemlje Slovenije, s čimer je skupno število znanih vrst naraslo na 483. *Quartausius dalmatinus* Dlabola je spoznan kot mlajši sinonim vrste *Quartausius hamatus* (Then). Za vrste *Chlorita beieri* Dlabola, *Chlorita szelenica* Dlabola, *Macrosteles sardus* Ribaut in *Nanosius chloroticus* (Melichar) so bile ugotovljene njihove gostiteljske rastline. Kritično je bil pregledan seznam vrst objavljen leta 2001 in popravljene napake, ki so bile napravljene zaradi napačne določitve ali interpretacije vrst. Vrsta *Forcipata forcipata* (Flor) je umaknjena s seznama vrst škržatkov Slovenije.

KLJUČNE BESEDE: Hemiptera, Auchenorrhyncha, favna, Slovenija

Introduction

The checklist of the Auchenorrhyncha of Slovenia (Holzinger & Seljak, 2001), which included 378 species, represents a good base for further faunistic investigations. Recently Schürrer & Löcker (2003) contributed an additional 41 species new to the fauna of Slovenia. Despite that, the Auchenorrhyncha fauna of Slovenia is still poorly known, with exception of the Cicadoidea (Gogala & Gogala, 1999). Since these publications have been published, a lot of new material has been collected and many species new to the territory of Slovenia discovered. Not all these data are included and discussed in this article, but only that concerning new and the most interesting species. Within the framework of the research project concerning potential vectors of the grapevine yellows in Slovenia, also a more detailed investigation of Auchenorrhyncha fauna in several infected vineyards had been conducted (Seljak & al, 2003). A critical review of the checklist published in 2001 showed that some species were misinterpreted or even misidentified, which are discussed and revised here.

Methods

Our faunistic investigations had still been focused mainly on the western part of the country. This time more attention had been paid to the fauna of the Karst edge and the Slovene coastal region, as well as to the Auchenorrhyncha fauna of vineyards in the NE and SW Slovenia.

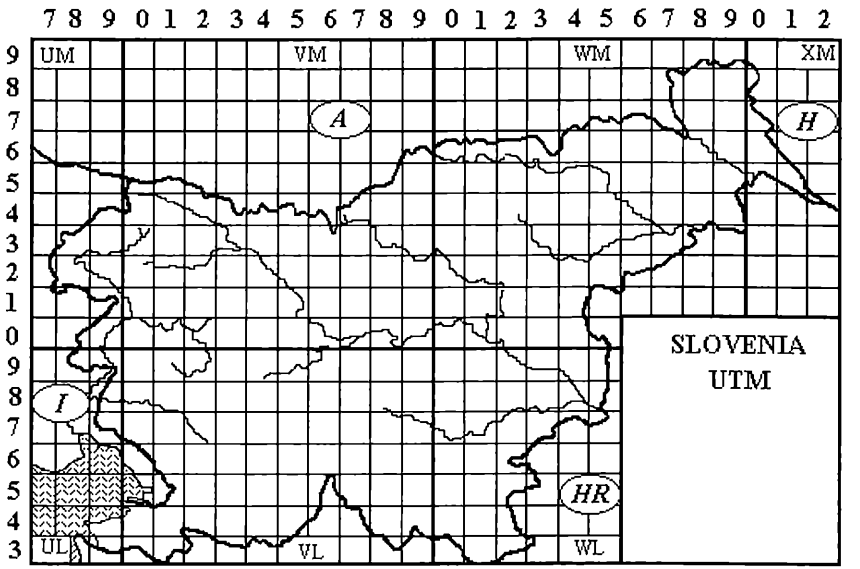

Fig. 1: Map of Slovenia with the UTM-grid.

The sweep-netting method was mainly used to provide specimens for laboratory examination. Species that were new, rare or interesting for Slovenia were mounted on specimen cards and included in the author's collection. For qualitative and quantitative survey of ampelophagous species in vineyards yellow sticky traps were used and replaced monthly.

Concerning taxonomy and nomenclature I have followed Holzinger et al. (1997, 2003), respectively Nast (1987). For each sampling site, the name, the UTM-grid code (Fig. 1) and the collecting date is given. When other collectors provided specimens, the collector is indicated by the name.

Abbreviations

HS indicates the checklist published in 2001 (Holzinger & Seljak, 2001): New records of planthoppers and leafhoppers from Slovenia, with a checklist of hitherto recorded species (Hemiptera: Auchenorrhyncha). Acta Entomologica Slovenica, vol. 9 (1), 39-66.

* New species to the fauna of Slovenia.

Results

1. Revision and comments to the checklist of Auchenorrhyncha of Slovenia (Holzinger & Seljak, 2001)

1.1. The genus *Forcipata* DeLong & Caldwell, 1936 in Slovenia

Two species of this genus are recorded in HS - *Forcipata citrinella* (Zetterstedt, 1828) and *Forcipata forcipata* (Flor, 1861). Subsequent examination of specimens from my collection and the material from sampling sites indicated, according to Vidano's species concept of the genus *Forcipata* (Vidano, 1965), that these two species were misinterpreted. Therefore, all the distribution data in HS concerning *Forcipata citrinella* refer to *Forcipata major* (Wagner, 1947) and those of *F forcipata* to **F obtusa* Vidano, 1965. Both species, in particularly the first one, are widespread and fairly common in Slovenia.

On the 20th September 2002 some males of the true *Forcipata citrinella* (Zetterstedt, 1828) were found among the material of leafhoppers collected in the vineyards of Turški vrh (WM83) in east Slovenia. This is the only known occurrence of *Forcipata citrinella* in Slovenia so far. The assumption that the transalpine populations of *F citrinella* and the cisalpine populations of *F major* meet or even live together right in this area appears to be acceptable. Since *F citrinella* has never been found in the western part of Slovenia, it might be interesting to know the distribution demarcation line between these two species. Therefore, more detailed faunistic examinations should be conducted in this part of Slovenia.

The species *Forcipata forcipata* is removed from the checklist as an unconfirmed species in Slovenia.

1.2 Other remarks to some species recorded in HS (2001)

Javesella discolor (Boheman, 1847)
Material examined: Mangart - 2000 m (UM94), 23.07.2002; Smrekovec (VM94), 22.06.2002.
Graeffe's record from the surrounding of Tolmin was indicated as dubious in HS (Graeffe, 1903). However, its occurrence on Mangart not far to the north of Tolmin makes the validity of his record much likely. It was also collected in substantial numbers on the mountain Smrekovec in 2002.

Aphrophora pectoralis Matsumura, 1903
This is a very common and widespread species at least in the western part of Slovenia. More detailed examinations have shown it is the prevailing species among the willow feeding species of the genus *Aphrophora* in W Slovenia. *Aphrophora salicina* (Goeze, 1778) seems to be rather rare, so the records for this species in HS need confirmation.

Notus flavipennis (Zetterstedt, 1828)
Material examined: Cerkniško jezero (VL56), 23.06.2001, 14.08.2001; Planinsko polje (VL47), 28.06.2001.
Graeffe's (1903) records of this species were marked as doubtful in HS, because of uncertain identity of populations in his collecting area. He wrote down: "Häufig im ganzen Küstenland auf Wiesen vom Mai bis in den November", therefore it is unusual that we have not found it in this area so far. The western edge of the range dividing its occurrence from the sister species *Notus italicus* Wagner, 1954 is still unclear in this area. Specimens in my collection from the above mentioned sites represent only *Notus flavipennis*. However, it should be stressed that both sites are situated outside the Graeffe's collecting area and have a continental climate. From the Vidano's records of *Notus italicus* from the neighbouring Friuli-Venezia Giulia (Italy) (Servadei, 1967) we can conclude that the two species meet somewhere along the Slovene-Italian border.

Eupteryx zelleri (Kirschbaum, 1868)
Material examined: Lijak 450 m (VL09), 02.05.2002 on *Calamintha braumeana*; Červar in Istria, (Croatia, UL91), 04.08.2000 and 14.08.2002 on *Calamintha* sp.
Graeffe's (1903) record of this species was also marked with a question mark in HS, because of too roughly defined distribution of his *Eupteryx putoni* Lethiery in the coastal region, which did not permit an accurate judgment about its occurrence in the territory of Slovenia. The new records allow the assumption that it is probably not rare in the submediterranean part of Slovenia, in particular in the coastal region. It was always caught on various *Calamintha* species.

Ophiola decumana (Kontkanen, 1949)
Material examined: Pokljuka - Močila bog (VM23), 14.08.2003.

Then's record from Lesce (Lees) (Then, 1886) was marked as doubtful in HS. This new locality, which is not very far from Then's collecting area, supports the validity of his record.

2. Records of new, rare and interesting species in Slovenia

Cixiidae

**Trigonocranus emmeae* Fieber, 1875

Material examined: Turški vrh (WM83), 18.07.2002.

A single female was caught on a yellow sticky trap during the survey of leafhopper fauna in the vineyards of the NE Slovenia in 2002. According to Holzinger & al. (2003) it is probably widely spread in Central Europe, but the collecting methods being used may not be appropriate for this species.

**Cixius alpestris* (Wagner, 1939)

Material examined: Bukovo (VM11), 13.07.2002.

This species belongs to the *Cixius sticticus* Rey, 1891 morphogroup. Several morphospecies can be distinguished within this group, but their taxonomic validity has not been clarified satisfactorily yet (Holzinger & al., 2003). The specimen in my collection corresponds entirely to the Wagner's original description and drawings (Wagner, 1939). For this and the next species I therefore follow the old species concept of this group, where more species are distinguished. In any case it seems to be very rare in Slovenia.

Cixius carniolicus (Wagner, 1939)

Material examined: Nanos (VL27; type locality); 06.07.2002, 26.07.2002.

Many specimens were swept from shrubs and low vegetation on very warm and dry stony slopes along the main road to the mountain Nanos at about 600 m a.s.l. In 1926 Wagner had probably collected the type specimens on the same locality. The specimens examined correspond to Wagner's description and drawings very well. No important deviation or variation in phallosoma structure was noticed among the specimens.

Cixius cunicularis (Linnaeus, 1767)

Additional material examined: Nanos - 600 m (VL27), 16.07.2004; Dolenji Novaki - 400 m (VM21), 20.07.2003; Labinje - 670 m (VM21), 20.07.2003.

**Cixius distinguendus* Kirschbaum, 1868

Material examined: Most na Soči (VM01), 19.08.2002, 16.08.2003; Skalnica (UL99), 30.08.2003.

Cixius dubius Wagner, 1939

Additional material examined: Loke (UL99), 15.04.2001; Nova Gorica 300 m (UL99), 01.05.2001; Brje pri Komnu (VL07), 23.06.2001; Pri peči (VL09), 30.04.2002; Lijak - 450 m (VL09), 02.05.2002; Rodik - 500 m (VL25), 07.06.2001.

Cixius simplex (Herrich-Schaeffer, 1835)
Material examined: Grgar (UL99), 31.08.2002.

Hyalesthes obsoletus Signoret, 1865
Additional material examined: Vedrijan and Vipolže (UL89), 03.07.2003; Prvačina (UL98), 27.06.2003; Tabor (VL08), 27.06.2003; Osek (VL08), 16.07.2003; Zavode pod Gorjanci (WL37), 10.07.2004; Leskovec (WL39), 10.07.2004; Počehova (WM55), 11.07.2003; Mestni vrh pri Ptuju (WM64), 22.07.2003; Police pri Radgoni (WM76), 15.07.2003; Turški vrh (WM83), 26.06.2002; Litmerk (WM84), 26.06.2002; Strezetina (WM84), 20.06.2003; Svetinje (WM94), 26.06.2002; Kog (WM94), 20.06.2003 and 22.07.2003; Mali Brebrovnik (WM94), 20.06.2003 and 22.07.2003; Bogojina (WM97), 22.07.2003.
In the sunny sloping vineyards of the NE Slovenia it often appears quite abundantly. Adults are mostly found feeding on *Urtica dioica* and *Convolvulus arvensis*, but other herbs and sometimes grapevine are also used as food-plants. They appear from end of May to the beginning of August. This species is well known as a vector of harmful phytoplasma disease of grapevine - Grapevine bois noir phytoplasma, which had an important impact on grape production in Drava wine-region in the last few years. The two-year investigations carried out in vineyards of NE Slovenia showed a comparatively close correlation between the population rate of *Hyalesthes obsoletus* and the disease incidence (Seljak & al, 2003).

Hyalesthes luteipes Fieber, 1876
Additional material examined: Škocjanski zatok (VL04), 21.07.2001.
Adults appear from the beginning of June to the middle of August. They were often found as very numerous populations, so far only on *Ulmus* spp. Its occurrence in Slovenia is limited to the submediterranean SW part of the country.

**Pentastiridius leporinus* (Linneus, 1761)
Material examined: Seča (UL93), 19.06.2004; Škocjanski zatok (VL04), 23.05.2000 [leg. Brelih] and 21.07.2001 [author]. Ankaran (VL04), 29.07.2004.

**Reptalus melanochaetus* (Fieber, 1866)
Material examined: Škocjanski zatok (VL04), 21.07.2001; Strunjan (UL94), 16.08.2004.
Specimens were caught among grasses (mostly *Elymus* spp.) and herbs on the embankments along the coast near Koper. It has been recorded to occur in former Yugoslavia (Nast, 1987), but not in the territory of Slovenia.

**Reptalus quinquecostatus* (Dufour, 1833)
Material examined: Seča (UL93), 19.06.2004; Škocjanski zatok (VL04) - 21.07.2001 and 04.07.2004; Ajševica (UL98), 01.08.2004.
Found mostly on shrubs and grass vegetation along the coast. This finding confirms Graeffe's record from the surroundings of Trieste (Graeffe, 1903).

Reptalus panzeri (Löw, 1883)
Additional material examined: Seča (UL93), 19.06.2004; Nova Gorica (UL99), 19.07.2004; Grgar (UL99), 18.07.2004, Branik (VL07), 30.06.2002; Vitovlje (VL08), 04.08.2002; Nanos - Rebernice 600

m (VL27), 06.07.2002; Turški vrh (WM83), 26.06.2002; Svetinje (WM94), 26.06.2002; Mali Brebrovnik (WM94) , 20.06.2003.

Reptalus cuspidatus (Fieber)

Additional material examined: Sečovlje (UL93), 20.06.2001; Strunjan (UL94), 22.06.2001; Kanal (UM90), 05.07.2003; Vrsno 600 m (UM91), 05.07.2003; Volarje (UM91), 26.06.2004; Škocjan (VL04), 01.06.2001; Šmarje (VL04), 22.05.2002; Tabor (VL06), 16.07.2001; Pliskovica (VL06), 07.06.2003; Brje pri Komnu (VL07), 23.06.2001; Rabotnica (VL07), 30.06.2002; Šempas (VL08), 12.06.2001; Tabor (VL08), 27.06.2003; Črni Kal (VL14), 01.06.2001; Dolga poljana - 340 m (VL18), 20.06.2003; Želin (VM10), 25.06.2003; Ukovnik - Sp. Idrija (VM20), 13.07.2003; Labinje 670 m (VM21), 20.07.2003; Smrekovec - 1350 m (VM94), 22.06.2002; Trebnje (WL08), 10.07.2004; Krško polje (WL38), 10.07.2004; Ptujska gora (WM53), 20.09.2002; Police pri Radgoni (WM76), 15.07.2003; Strezetina (WM84), 20.06.2003; Svetinje (WM94), 26.06.2002; Kog (WM94), 20.06.2003; Mali Brebrovnik (WM94), 20.06.2003;

This is the most common species of the genus *Reptalus* in Slovenia and sometimes may appear in a very high frequency. Adults fly from the end of May to mid August. They were mostly swept from xerothermic grass layers with *Bromus erectus* and *Brachypodium rupestre*. On Smrekovec the specimens were caught even at about 1000 m a.s.l.

Delphacidae

Asiraca clavicornis (Fabricius, 1794)

Additional material examined: Debeli rtič (VL04), 06.10.2001; Črnotiče (VL014), 06.10.2001; Ajševica (VL08), 08.09.2001; Šempas (VL08), 28.09.2002, Turški vrh (WM83), 20.09.2002; Strezetina (WM84), 22.07.2003; Svetinje (WM94) 26.06.2002; Mali Brebrovnik (WM94), 20.06.2003; Bogojina (WM97), 22.07.2003; Sebeborci (WM97), 22.07.2003.

Locally common. It was already recorded by Scopoli under the specific name *Cimex aequinoctialis* in his Entomologia carniolica (Scopoli, 1763). Although he did not state the precise locality, it refers without any doubt to the territory of Slovenia.

**Kelisia brucki* Fieber, 1878

Material examined: Lazaret, Ankaran (VL04), 29.07.2004 on *Bulboschoenus maritimus*; Loke (UL99), 09.11.2003 on *Holoschoenus vulgaris*.

**Kelisia guttulifera* (Kirschbaum, 1868)

Material examined: Panovec (UL98), 21.08.2001; Grgar - 300 m (UL99), 18.07.2004; Podčela - 350 m (UM83), 06.08.2004; Vojsko - 950 m (VL19), 18.08.2001.

**Kelisia vittipennis* (J. Sahlberg, 1868)

Material examined: Pokljuka Močila bog (VM23), 14.08.2003; Zabreška planina, 1050 m (VM34), 02.08.2003 [leg. Prešern].

Graeffe's (1903) records for the coastal region were stated in HS, but with a question mark. He wrote down: "Auf trockenen Grassplätzen im Küstenlande von Mai bis Oktober." It is clear now that his *Kelisia vittipennis* represents *Kelisia hagemini*

Remane & Jung, which is common in dry xerothermic calcareous Karst meadows and hillsides (see below!). *K. vittipennis* populates completely different biotopes, mostly montane bogs and other permanently wet sites associated with cottongrasses (*Eriophorum* spp.)

Kelisia hagemini Remane & Jung, 1995
Additional material examined: Sabotin 600 m (UL99), 10.09.2002; Skalnica 320 m (UL99), 30.08.2003; Ravnica (UL99), 12.10.2003; Socerb (VL14), 02.10.2001; Črnotiče 420 m (VL14), 06.10.2001; Nanos (VL27), 16.10.2001 and 26.07.2002; Malo polje (VL28), 21.09.2003.
Quite common in dry xerothermic Karstic meadows and pastures, so far only in the SW Slovenia.

**Kelisia halpina* Remane & Jung, 1995
Material examined: Lepena 640 m (UM93), 26.08.2001; Stržiška planina 1400 m (VM11), 15.09.2000; Soriška planina - 1300 m (VM22), 14.08.2003; also found on Učka 1390 m in Croatia, 22.08.2002.

**Kelisia pallidula* (Boheman, 1847)
Material examined: Podčela 350 m (UM83), 06.08.2004; Kobarid 235 m (UM92), 15.09.2001; Planinsko polje (VL47), 28.06.2001; Cerkniško jezero (VL56), 14.08.2001; Pokljuka barje Močila (VM23), 14.08.2003; always on very wet to peaty sites.

**Kelisia praecox* Haupt, 1935
Material examined: Podčela - 380 m (UM83), 16.09.2002; Nova Gorica - 100 m (UL98), 01.07.2003.
These findings represent probably its westernmost known distribution data in this part of Europe. It has not been recorded in Italy yet.

Stenocranus major (Kirschbaum, 1868)
Additional material examined: Tolmin - 200 m (VM01), 13.10.2002.

**Stenocranus fuscovittatus* (Stål, 1858)
Material examined: Ajševica 100 m (VL08), 08.09.2001; on periodically wet meadows rich with various *Carex* sp.

Delphacinus mesomelas (Boheman, 1850)
Material examined: Smrekovec - 1380 m (VM94), 22.06.2002.

Criomorphus albomarginatus Curtis, 1833
Additional material examined: Bovec 800 m (UM83), 30.05.2001; Smrekovec 1400 m (VM94), 22.06.2002; Rogla - 1470 m (WM24), 25.07.2004.

Dicranotropis divergens Kirschbaum, 1868
Additional material examined: Mangart 2000 m (UM94), 23.07.2002; Snežnik 1500 m (VL54), 21.07.2002; Krn - 1100 m (UM92), 05.07.2003.
Often in high frequency at higher altitudes in mountains.

Chloriona sicula Matsumura, 1910

Material examined: Strunjan (UL94), 12.09.2003; Škocjanski zatok (VL04), 21.07.2001; Prvačina (UL98), 04.09.2003; Ankaran (VL04), 29.07.2004; also mouth of a river Mirna in Istria (Croatia, UL82).

In the territory of Slovenia, R. Remane found this Mediterranean species for the first time in Sečovlje (Holzinger & Seljak, 2001). All new localities also belong to the SW submediterranean area. Here it appears to be the most frequent *Chloriona* species in *Phragmites australis* stands.

**Nothodelphax distincta* (Flor, 1861)

Material examined: Pokljuka - Močila bog, 1100 m (VM23), 14.08.2003.

So far only known from this locality, where a single female was caught. *Eriophorum vaginatum* is recorded as its host plant (Nickel & Remane, 2002, Nickel, 2003), which is rather sparsely present in this locality. This is probably its southernmost known occurrence in Europe (Holzinger & al. 2003, Nast, 1987).

Pastiroma clypeata (Horvath, 1897)

Material examined: Červar (UL91, Istria, Croatia), 10.08.2003.

This species has not been found in the territory of Slovenia yet. Due to the vicinity of this locality to the Slovenian south border, it might be also expected along the Slovenian coast. Many specimens were swept from turfs of *Puccinellia palustris* in a periodically submerged saltmarsh.

**Metropis aris* Asche, Drosopoulos & Hoch, 1983

Material examined: Kastelec and Črnotiče (VL14), 30.05.2004 and 19.06.2004.

Till now this species has only been known from northwest Greece with certainty (Asche & al., 1983). According to Lauterer it might be present also in former Yugoslavia (d'Urso and Asche, 1984). This new occurrence on the Karst edge in Slovenia confirms Lauterer's opinion. *Metropis aris* is probably widely distributed throughout the east Adriatic region and reaches here only its northernmost distribution limit. It is just another member of the rich east Adriatic endemism. Our specimens were caught in very dry xerothermic meadows with lots of *Stipa pennata* s.l. and *Scorzonera austriaca*. Females seem to be more common then males.

Muirodelphax aubei (Perris, 1857)

Additional material examined: Škocjanski zatok (VL04), 06.07.2004.

According to Holzinger & al. (2003) this species is widely distributed in Europe. In Slovenia it has been collected only in the coastal region so far. It was repeatedly found also along the west Istrian coast (HR).

Horvathianella palliceps (Horvath, 1897)

Additional material examined: Ravnica (UL99), 22.04.2004; Loke (UL99), 02.05.2004; Črniške Ravne - 500 m (VL08), 03.07.2004.

**Xanthodelphax flaveola* (Flor, 1861)
Material examined: Soriška planina - 1300 m (VM22), 14.8.2003.

**Javesella forcipata* (Boheman, 1847)
Material examined: Blegoš - 1340 m (VM31), 29.07.2001; in a wet shadow site in a wood.

Javesella obscurella (Boheman, 1847)
Material examined: Smrekovec - 1350 m (VM94), 22.06.2002.

**Javesella stali* (Metcalf, 1943)
Material examined: Litmerk (WM84), 26.06.2002; in a dense stand of *Equisetum arvense* in a vineyard.

**Ribautodelphax fanari* Asche, Drosopoulos & Hoch, 1986
Material examined: Seča (UL93), 19.06.2004; Škocjanski zatok (VL04), 21.07.2001 in 04.07.2004; Ankaran (VL04), 29.07.2004; Poreč in Istria (Croatia), 05.08.2001 and 10.08.2003.
Only a huge amount of material collected in 2004 made me possible to identify this species with certainty. Before that I considered specimens collected along the Adriatic coast as *Ribautodelphax collina* (Boheman, 1847). Morphologically *R. fanari* differs only slightly from *R. collina* by having a bit shorter styli and apically blunt processes of ventral pygofer incision. On the other hand it is morphologically and genetically also very close to the species *R. pungens*. The host plants and acoustic signals distinguish it however clearly from the remaining species of the *R. collina* complex (Bieman, 1987). Its host plant is the grass *Elytrigia atherica*, which occurs commonly on salty ruderal places and in salt marches along the Slovene seashore. This species originally described from Greece (Asche & al., 1986) has already been recorded to occur also in Istria, more precisely in the bay Budava near the village Valtura (Bieman, 1987).

Tettigometridae

**Tettigometra laeta* Herrich-Schaeffer, 1835
Material examined: Socerb (VL14), 02.10.2001 and 30.05.2004.
Several specimens of this beautiful species were caught in extremely dry xerothermic Karst pasture. It appears to occur very rarely.

Caliscelidae

Caliscelis wallengreni (Stål, 1863)
Material examined: Škocjanski zatok (VL04), 21.07.2001; Potoče (VL08), 25.07.2001.
The locality in the UTM-quadrant VL08 represents the northernmost occurrence of this species in Slovenia so far.

**Caliscelis bonellii* (Latreille, 1807)
Material examined: Dragonja (UL93); Strunjan (UL94); Hrvoji (VL03); Debeli rtič (VL04), Ankaran (VL05); Katinara (VL14).
It is not rare on xerothermic meadows in the coastal region.

Issidae

**Latilica maculipes* (Melichar, 1906)

Material examined: Dragonja (UL93), 02.10.2001; Strunjan (UL94), 03.09.2002; Šmarje pri Kopru (VL04), 11.09.2002.

Not rare on shrubs in autumn. Its occurrence in Slovenia is however restricted to the coastal region round Trieste bay.

**Bubastia obsoleta* (Fieber, 1877)

Material examined: Šmarje pri Kopru (VL04), 22.05.2002; Črni kal (VL14), 05.06.2001; Socerb (VL14), 11.03.2001 and 30.05.2004; Brje pri Komnu (VL07), 23.06.2001; Gaberje (VL17), 01.05.2002; Lijak (VL09), 15.04.2001, 10.03.2002, 02.05.2002, 06.04.2003; Podsabotin (UL99), 22.05.1998 and 19.05.2004; Sabotin (UL99) 01.05.2001.

Locally it often occurs in high frequency, but only in the SW submediterranean part of the country. Adults appear from March to June in xerothermic woods of *Quercus pubescens, Ostrya carpinifolia* and *Fraxinus ornus* feeding on undergrowth vegetation. We found adults feeding on various tall herbs, like *Dictamnus albus* and *Asparagus acutifolius*.

Kervillea conspurcata (Spinola, 1839)

Material examined: Črnotiče (VL14), 30.05.2004.

The presence and distribution of some Issidae in Slovenia have been somewhat clarified only recently, after the material from Slovenia was revised by V. Gnezdilov (Sanct Petersburg, Russia, pers. comm.). Thus, also the identification of specimens from the locality Podsabotin (UL99) recorded as *Quadrastylum conspurcatum* in HS, has been proved as wrong and they represent actually *Bubastia obsoleta* (Fieber, 1877). Anyway, the occurrence of *Kervillea conspurcata* in Slovenia has been confirmed only very recently. Many specimens were collected on a sunny xerothermic karstic meadow just below the Karst edge.

Cercopidae

Cercopis arcuata Fieber, 1844

Additional material examined: Kostanjevica na Krasu (UL97), 27.05.2003; Kromberk (UL99), 28.04.2002; Lijak (UL99), 02.05.2002; Šmarje (VL04), 22.05.2002; Pliskovica (VL06), 07.06.2003; Brje pri Komnu (VL07), 07.06.2003; Šmihel - 300 m (VL08), 30.03.2002; Pri peči (VL09), 30.04.2002; Socerb (VL14), 22.05.2002; Gaberje (VL17), 01.05.2002; Ajdovščina Hubelj (VL18), 01.06.2002; Rebrnice (VL26), 15.05.2002; Sanabor Zavetniki (VL28), 10.05.2002; Podkraj 900 m (VL28), 30.05.2002; Čelje (VL34), 17.05.2002; Lanišče (VL38), 12.05.2002; Kurja vas (VL39), 12.06.2002; Strmica pri Zaplani (VL48), 12.05.2002.

Only two records were given in HS. Anyway, more detailed faunistic examinations in last years have shown that it is by far the most common and widespread Cercopidae species in Slovenia at least in its western part. In contrast to the remaining two more mesophilous species of the genus *Cercopis*, it lives exclusively

in more xerothermic sites. Sometimes the adults of all three species can provoke typical lesions on leaves of some cultivated and wild deciduous trees, i.e. pear, apple, grapevine, but mostly without any impact on their growth and production.

Aphrophoridae

Aphrophora corticea (Germar, 1821)
Material examined: Slavnik (VL14), 24.06.1999 on *Pinus nigra* [leg. Brelih], Hudičevec (VL26) (Schürrer & Löcker, 2003).

Aphrophora major Uhler, 1896
Material examined: Ajševica (UL98), 26.08.2002 on *Salix cinerea*; Slap Boka (VM00), 16.09.2002 on *Salix eleagnos*; Hudičevec (VL26), 11.09.2001 on *Salix aurita* (Schürrer & Löcker, 2003).
This species seems to be very rare in Slovenia.

Cicadellidae

Ulopinae

Ulopa reticulata (Fabricius, 1794)
Additional material examined: Črni vrh nad Cerknem 1200 m (VM21), 20.07.2003; Pokljuka - barje Močila - 1200 m (VM23), 14.08.2003; Smrekovec - 1500 m (VM94), 22.06.2002.
Since Kiauta (1962) no new records have been reported for Slovenia, although it can be found everywhere where *Calluna vulgaris* is abundantly present, but usually in rather low frequency.

Macropsinae

Oncopsis carpini (J. Sahlberg, 1871)
Material examined: Črnotiče and Socerb (VL14), 30.05.2004; Trstelj (UL98), 29.05.2004; Nova Gorica - 300 m (UL99), 26.05.2002, 18.05.2003; Solkan - 100 m (UL99), 05.05.2002; Lijak - 450 m (VL09), 02.05.2002; Ajdovščina - 200 m (VL18), 01.06.2002; Nanos 950 m (VL27), 06.07.2002; Sanabor (VL28), 10.05.2002.
Widespread and quite common in some places. All material examined here was swept from *Ostrya carpinifolia* Scop. Larvae of various instars and the instars moulting capsule fixed on leaf midrib have been also found. Thus, *Ostrya carpinifolia* is the true host plant of *Oncopsis carpini*. Young larvae hatch at the bud burst of *Ostrya carpinifolia*, mostly toward the end of March. In the climatic conditions of SW Slovenia adults appear at the beginning of May and can be found till the middle of July.

Hephathus nanus (Herrich-Schaeffer, 1835)
Material examined: Škocjan (VL04), 01.06.2001; Kastelec (VL14), 13.09.2003; Lokev na Krasu (VL15), 22.09.2001; Železna vrata (VL07), 27.06.2003; Most na Soči (VM01), 16.08.2003; Labinje - 670 m (VM21), 20.07.2003; Strezetina (WM84), 20.06.2003.

Hephathus freyi (Fieber, 1868)
This mediterranean species has not been found in Slovenia yet. On 07.08.2001 two specimens were swept from tall herbs at the mouth of the river Mirna in Istria (Croatia, UL91), not far from Slovenian southern border. Therefore, its occurrence in the costal region of Slovenia seems to be possible.

Agalliinae

**Anaceratagallia laevis* Ribaut, 1935
Material examined: Seča (UL93), 19.06.2004, Ankaran (VL05), 06.10.2001; Kastelec (VL14), 02.10.2001; Nova Gorica (UL98), 25.06.2004.

Idiocerinae

Stenidiocerus poecilus (Herrich-Schaeffer, 1835)
Additional material examined: Nova Gorica (UL99), 19.04.2001; Šempas (VL08), 29.09.2002 on *Populus nigra*.

**Tremulicerus distinguendus* (Kirschbaum, 1868)
Material examined: Anhovo (UM90), 31.08.2002 on *Populus alba*.

**Acericerus heydenii* (Kirschbaum, 1868)
Material examined: Skalnica - 200 m (UL99), 30.08.2003; Nanos - Rebernice 600 m (VL27), 06.07.2002, in both cases on *Acer monspessulanum*; Labinje - 670 m (VM21); 20.07.2003 on *Acer campestre*.

Tremulicerus vitreus (Fabricius, 1803)
Material examined: Nova Gorica (UL99), 25.08.2002; Prvačina (UL98), 27.06.2003; Jez Vogršček (VL08), 30.08.2003, on *Populus nigra*.

Penthimiinae

Penthimia nigra (Goeze, 1778)
Additional material examined: Solkanski most (UL99), 01.05.2001; Pri peči (VL09), 30.04.2002; Ajdovščina Hubelj (VL18), 01.06.2002 [var. *fulva* Ribaut, 1952]; Sanabor Zavetniki (VL28), 10.05.2002 [var. *haemorrhoa* (Schrank, 1781)]; Strmica pri Zaplani (VL48), 12.05.2002.

Anoscopus albifrons (Linneus, 1758)
Material examined: Brje pri Komnu (VL07), 23.06.2001; Zabreška planina 1050 m (VM34), 02.08.2003 [leg. Prešern].

Anoscopus flavostriatus (Don, 1799)
Material examined: Soriška planina - 1300 m (VM22), 14.08.2003; Zabreška planina, 1050 m (VM34), 02.08.2003 [leg. Prešern].

Cicadellinae

**Errhomenus brachypterus* Fieber, 1866
Material examined: Blegoš - 1360 m (VM31), 29.07.2001.

In Europe a widely distributed species, but mostly rare or more probably often overlooked. A single specimen was found among turfs of the grass *Calamagrostis arundinacea* in a mountain beech wood.

Typhlocybinae

Schürrer and Löcker recently made an important contribution to the knowledge of Typhlocybinae distribution in Slovenia. 41 species new to the fauna of Slovenia were added to the checklist and the relationships to their host plants were discussed (Schürrer and Löcker, 2003; Löcker, 2003). In this paper, we are dealing with some additional interesting species from this subfamily and its distribution data.

Alebra viridis Rey 1894

Material examined: Paljevo (UL99), 20.09.2003 on *Quercus cerris*; Stara Gora (UL98), 11.07.2004 on *Quercus petraea*.

This species has been often overlooked, because it has been only recently confirmed as a valid taxonomic entity (Gillham, 1991). Therefore, it is probably much more common and widespread as we know, in particular because it is very difficult to be distinguished from *A. albostriella*. Its host plant is mostly *Quercus cerris*, but also *Quercus petraea* and *Fagus sylvatica* have been recorded (Lauterer, 1996, Schürrer and Löcker, 2003, Löcker, 2003)

**Micantulina micantula* (Zetterstedt, 1840)

Material examined: Lepena - 700 m (UM92), 22.08.2003.

It must be very rare in Slovenia; so far a single female has been fund on tall herbs on an alpine pasture.

**Wagneriala minima* (J. Sahlberg, 1871)

Material examined: Nanos - Lanišče - 950 m (VL27), 06.07.2002; Col - 720 m (VL28), 14.07.2001.

Several specimens were swept from turfs of *Carex montana*, *C. caryophyllea* and *Teucrium montanum*.

Wagneriala sinuata (Then, 1897)

Additional material examined: Strunjan (UL94), 22.06.2001; Nova Gorica (UL99), 09.06.2002; Lijak (UL99), 09.11.2003; Šempas (VL08), 28.09.2002.

**Empoasca kontkaneni* Ossiannilsson, 1949

Material examined: Lepena - 700 m (UM92), 22.08.2003.

Many specimens were swept from the undergrowth vegetation with *Rubus idaeus* and various ferns in a shady alpine coniferous forest. As far as I know, this is its southernmost occurrence in Europe. It might be much more widely distributed in the Alps.

**Chlorita beieri* Dlabola, 1959

Material examined: Šmarje pri Kopru (VL04), 22.05.2002; Petrinjski kras (VL14), 01.06.2001, 06.10.2001; Pliskovica (VL06), 07.06.2003; Kostanjevica na Krasu (UL97), 01.09.2001; Opatje selo

(UL98), 01.09.2001; in surroundings of Nova Gorica (UL99) - type locality, 17.06.2001, 05.10.2002; Sabotin 600 m (UL99), 10.09.2002; Kucelj 1100 m (VL08), 02.09.2002; Trnovo (VL09), 25.07.2003; Sinji vrh - 980 m (VL18), 12.08.2001; Col - 720 m (VL28), 14.07.2001; Lepena (UM93), 26.08.2001.

Dlabola described this species from unidentified material collected by Graeffe in the surroundings of Gorica (Görz) and deposited in the Naturhistorisches Museum in Vienna (Dlabola, 1959). Its type locality is quite probably within the territory of Slovenia. It is one of the most common *Chlorita* species on very dry xerothermic meadows round Nova Gorica and southwards on Karst along the Slovene-Italian border. Its distribution is closely associated with the host plants, which are *Satureja subspicata* Bartl. and *S. montana* ssp. *variegata* (Host) Ball. Adults appear from the end of May to the middle of October. Little is still known about its life cycle. Probably it develops two generations per year.

Chlorita mendax (Ribaut, 1933)

Additional material examined: Lijak - 450 m (VL09), 02.05.2002, Solkan (UL99), 21.05.2000, Stan Čepovanska dolina (VL09), 13.06.1999; Podkraj - 850 m (VL28), 30.05.2002; Jelenk 750 m (UM90), 02.07.2000; Črniške Ravne - 500 m (VL08), 03.07.2004.

This is another *Chlorita* species, the type locality of which is most probably in the UTM-quadrants UL98 or UL99, which includes Gorizia (Italy) and Nova Gorica (Slovenia). Ribaut (1936) wrote: "Cette espèce décrite d'après des exemplaires de Gorizia (Italie) " On this locality adults and nymphs have always been found only on *Artemisia campestris* L. and on *A. alba* Turra. Adults appear from the end of April to the beginning of July. It has only one generation per year.

**Chlorita szelenica* Dlabola, 1967

Material examined: Gaberje (VL17), 01.05.2002; Golec (VL07), 30.06.2002.

Both times the adults were swept from the mats of various *Thymus* species, mainly *Thymus longicaulis*. The species was described by Dlabola on the basis of the material deposited in Nat. Museum Budapest, which had been collected by Horvath on Zelenika in the Montenegro coastal region (Dlabola, 1967). Morphological characteristics of the examined material correspond fully to the original description and the drawings made by Dlabola. The enormous geographical disjunction of this new locality from the type one allows the speculation that the species is probably much widely distributed along the eastern Adriatic coast. Anyway it is a representative of the reach east Adriatic endemism.

Chlorita paolii (Ossianillsson, 1939)

Material examined: Panovec (UL98), 29.08.2003; Loke (UL99), 30.09.2000; Ravnica (UL99), 25.07.2003; Vodice (UL99), 20.09.2003; Jez Vogršček (VL08), 17.08.2001; Nanos Abram 900 m (VL27), 26.07.2002; Malo polje (VL28), 21.09.2003; Turški vrh (WM83), 20.09.2002

This species is quite common and widespread in the W part of Slovenia living on *Achillea* spp. and *Artemisia* spp. The sister species *Chlorita viridula* (Fallen, 1806) has never been found in Slovenia, so I consider that Graeffe's record of *Ch. viridis* should be considered as *Chlorita paolii* (Graeffe, 1903).

**Fagocyba cruenta* (Herrich-Schaeffer, 1838)
Material examined: Sinji vrh - 980 m (VL18), 12.08.2001 on *Fagus sylvatica*.
This is the only locality of this species I know. Otherwise, Löcker repeatedly mentions it in association with various deciduous trees (*Castanea sativa, Ostrya carpinifolia, Fraxinus excelsior*), but he did not put it on the list of the new species to the fauna of Slovenia (Löcker, 2003). Also no localities of its occurrence are given. In any case, it is much less common than the sister species *Fagocyba douglasi*, which has the same host range.

Aguriahana stellulata (Burmeister, 1841)
Material examined: Ušnik (VM01), 13.07.2002 on *Tilia platyphyllos*.

**Edwardsiana salicicola* (Edwards, 1885)
Material examined: Ajševica (VL08), 02.08.2003 on *Salix cinerea*.
It is widely distributed in the Central and North Europe, but there have been no records from the South Europe so far (Nast, 1978, dUrso, 1995). Therefore this record might represent the southernmost known locality. It might be much more common in Slovenia, taking in consideration the frequency of its host plants (*Salix, cinerea, S. aurita, S. caprea*).

Edwardsiana candidula (Kirschbaum, 1868)
Additional material examined: Vodice (UL99), 20.09.2003; Šempas (VL08), 28.09.2002;

Edwardsiana crataegi (Douglas, 1876)
Additional material examined: Nova Gorica (UL99), 18.07.2001; Šempas (VL08), 18.10.2002; Rakitnica (VL85), 02.10.2003 on *Malus pumila*.

Edwardsiana geometrica (Schrank, 1801)
Material examined: Črni vrh 1200 m (VM21), 20.07.2003 on *Alnus incana*; Nemški rovt 750 m (VM22) on *Alnus incana*, 14.08.2003; Bohinjska Bistrica (VM23), 19.08.2002 on *Alnus glutinosa*.

Eupteryx atropunctata (Goeze, 1778)
Material examined: Podčela (UM83), 16.09.2002; Kobarid - 235 m (UM92), 15.09.2001; Mrzli log 900 m (VL28), 21.09.2003;

**Eupteryx filicum* (Newman, 1853)
Material examined: Godovič - 600 m (VL38), 29.08.2001 on *Pteridium aquilinum*; Labinje 700 m (VM21), 01.11.2001 on *Polypodium vulgare*.

**Eupteryx lelievrei* (Lethierry, 1874)
Material examined: Loški potok (VL65), 23.06.2001 on *Betonica officinalis*.
So far recorded neither in Italy nor in former Yugoslavia (Nast, 1987, d'Urso, 1995).

Eupteryx tenella (Fallen, 1806)
Material examined: Nova Gorica (UL99), 16.05.2000; Sabotin - 600 m (UL99), 10.09.2002; Vodice (UL99), 20.09.2003; Mestni vrh pri Ptuju (WM64), 22.07.2003;

**Eupteryx thoulessi* Edwards, 1926

Material examined: Jez Vogršček (VL08), 17.08.2001; Ajševica (VL08), 08.09.2001. In both cases on *Lycopus europaeus* on wet meadows.

Eupteryx vittata (Linneus, 1758)

Additional material examined: Panovec (UL98), 21.08.2001; Paljevo (UL99), 20.09.2003; Lanišče (VL38), 11.09.2003.

**Eurhadina ribauti* (Wagner, 1935)

Material examined: Panovec (UL98), 29.08.2003 on *Quercus petraea*;

Linnavuoriana sexmaculata (Hardy, 1850)

Material examined: Lepena - 700 m (UM92), 26.08.2001 on *Salix appendiculata.*

Löcker mentions this species many times in association with various trees, but no localities of its occurrence are given (Löcker 2003).

Ribautiana cruciata (Ribaut, 1931)

Material examined: Kostanjevica na Krasu (UL97), 01.09.2001; Škocjanski zatok (VL04), 21.07.2001.

Many records of this species have been published only recently (Schürrer & Löcker, 2003), all of them from SW Slovenia.

Fruticidia sanguinosa (Rey, 1891)

Material examined: above Nova Gorica (UL99), 26.08.2002; Kromberk (UL99), 31.08.2002, 29.08.2003; Lijak (UL99), 09.11.2003; Šempas (VL08), 28.09.2002; also Červar in Istria (UL91), 11.08.1998.

**Hauptidia distinguenda* (Kirschbaum, 1868)

Material examined: Ratečevo brdo (VL35), 16.10.2003.

Two males and one female were caught on a yellow sticky trap in a glasshouse with ornamental flowers. Serious injuries on tomato and *Petunia* leaves in glasshouses provoked by this species have been recently recorded in the surrounding of Zagreb in Croatia (Seljak & Paglarini, 2004)

**Hauptidia provincialis* (Ribaut, 1931)

Material examined: Portorož (UL94), 26.05.2001 and 07.05.2004; Spodnje Škofije (VL04), 20.01.2003 on *Primula acaulis.*

This species is not rare in the coastal region. In high frequency it was caught on *Parietaria officinalis*, *Geranium robertianum* and *G. rotundifolium* in Portorož. Adults were found to be feeding also on *Sonchus asper* and *Melandrium album.* In certain circumstances it can become a minor pest on various ornamental plants in glasshouses. Thus, remarkable injuries on ornamental *Primula acaulis* were registered in a glasshouse in Škofije near Koper during the winter 2003. This population obviously originated from outdoors, because some specimens could be caught on *Parietaria officinalis* around the glasshouses as well.

**Tamaricella tamaricis* (Puton, 1872)

Material examined: Strunjan (UL94), 12.09.2003 on *Tamarix* sp.

**Zygina nivea* (Mulsant & Rey, 1855)
Material examined: Nova Gorica (UL99), 19.01.2003 on *Elaeagnus pungens*; Anhovo (UM90), 31.08.2002 on *Populus alba*; Koper (VL04), 20.10.2003 captured on a yellow sticky trap; Malek (WM94), 20.09.2002 on *Populus alba*.
Graeffe's record from the neighbourhood of Trieste has predicted its possible occurrence in the territory of Slovenia as well.

**Zygina tithidae* Ferrari, 1882
Material examined: Nova Gorica (UL99), 19.01.2003 on *Elaeagnus pungens* as a winter host.

Zyginidia mocsaryi (Horvath, 1910)
Material examined: Strunjan (UL94), 22.06.2001; Ravnica (UL99), 17.06.2001; Vitovlje (VL08), 04.08.2002; Nanos - Rebernice 600 n (VL27), 26.07.2002.
Not rare in SW Slovenia.

**Zyginidia servadeii* Vidano, 1982
Material examined: Šmarje pri Kopru (VL04), 11.09.2002;
A single male was caught on a dry xerothermic meadow with some short bushes.

Deltocephalinae

Grypotes staurus Ivanoff, 1885
Material examined: Strunjan (UL94), 22.06.2001 on *Pinus pinea*; Ankaran (VL05), 03.09.2002, on *Pinus nigra*.

**Opsius lethierryi* Wagner, 1942
Material examined: Škocjanski zatok (VL04), 21.07.2001; Strunjan (UL94), 16.08.2004; Ankaran (VL05), 29.07.2004, always on *Tamarix* sp.

**Macrosteles oshanini* Razvyazkina, 1957
Material examined: Planinsko polje (VL47), 28.06.2001; Cerkniško jezero (VL56), 23.06.2001, 14.08.2001; on perodically submerged marshy sites.

Macrosteles ossiannilssoni Lindberg, 1954
Material examined: Pokljuka, Močila bog - 1200 m (VM23), 14.08.2003; mouth of the river Mirna in Istria (Croatia, UL82), 07.08.2001, 11.09.2002.
In August 2001 and 2002 it appeared in a very substantial number in a regularly submerged costal salt marsh on *Juncus* sp. in the mouth of the river Mirna in Istria.

**Macrosteles quadripunctulatus* (Kirschbaum, 1868)
Material examined: Parecag (UL93), 09.10.2003; Nova Gorica (UL99), 05.10.2002 on *Cichorium intybus*; Tolmin (VM01), 13.10.2002; Celje (WM22), 15.10.2003, captured on yellow sticky traps.

**Macrosteles salsolae* (Puton, 1872)
Material examined: Sečoveljske soline (UL93), 20.06.2001, 03.09.2002; Strunjan (UL94), 12.09.2003; Škocjanski zatok (VL04), 21.07.2001, on vegetation in the salt-ponds near the sea.

Macrosteles sardus Ribaut, 1948

Material examined: Rožna dolina (UL98), 12.07.2003; Ajševica (VL08), 02.08.2003, 06.09.2003.

Its host plant was unknown till now (Nickel, 2003). We have found larvae and adults of this species exclusively on *Epilobium hirsutum* L. Possibly it populates also some other *Epilobium* species. However, in the mixed vegetation with *Epilobium hirsutum* and *E. parviflorum* it could never be found on the latter. Its appearance on *Salix aurita* (Schürrer and Löcker, 2003) should be considered as an accidental drift to this plant. In 2003 nymphs were found on its host plants up to the end of September. It probably overwinters in the egg stage.

Sagatus punctifrons (Fallen, 1826)

Material examined: Kanal (UM90), 05.07.2003; Cerkniško jezero (VL56), 14.08.2001; Želin (VM10), 25.06.2003, always on *Salix purpurea*.

Scaphoideus titanus Ball, 1932

Additional material examined: Maribor (WM45), 20.08.2004; Počehova (WM55), 25.08.2004; Sebeborci (WM97), 22.07.2003 and 18.09.2003.

So far, this nearctic species has been known only from vineyards in SW Slovenia (Seljak, 2002). In 2003 and 2004 it was repeatedly captured on yellow sticky traps also in some vineyards in NE Slovenia. During a systematic monitoring of leafhoppers in Croatian vineyards in 2003 carried out by the Institute for Plant Protection in Agriculture and Forestry of the Republic of Croatia its occurrence in Ilok (Croatia) has also been discovered. Evidently, it begins to invade the Pannonian region progressively.

**Platymetopius guttatus* Fieber, 1869

Material examined: Nanos - Rebernice 600 m (VL27), 26.07.2002.

2 females and 1 male were caught on *Quercus pubescens* on a warm south-exposed rocky slope below the mountain ridge, almost at the same place as *Cixius carniolicus*.

**Proceps acicularis* Mulsant & Rey, 1855

Material examined: Sabotin - 600 m (UL99), 10.09.2002; Črni Kal (VL14), 05.06.2001; Črnotiče - 420 m (VL14), 06.10.2001.

This mediterranean species probably occurs only in the submediterranean region of Slovenia.

**Idiodonus cruentatus* (Panzer, 1799)

Material examined: Vršič - 1400 m (VM04), 23.07.2002; Črno jezero na Pohorju - 1200 m (WM34), 25.07.2004.

**Allygidius commutatus* (Scott, 1872)

Material examined: Rabotnica (VL07), 30.06.2002; Vojsko (VL19), 20.07.2002.

In both cases the adults were caught on *Populus tremula*.

**Orientus ishidae* (Matsumura, 1902)

Material examined: Nova Gorica (UL99), 28.07.2002 (captured on a yellow sticky trap) and 16.07.2004; Ljubljana (VL59), 14.07.2004 [leg. Mühlethaler].

This east Palaearctic species was discovered in Switzerland and in some neighbouring regions only very recently (Günthart & Mühlethaler, 2002). In Slovenia two females were already captured on yellow sticky traps in Nova Gorica in August 2002, but could not be identified at that time. In July 2004 a substantial population of this species has been found on either upper mentioned localities, mainly on willows and some fruit trees.

Phlepsius intricatus (Herrich-Schaeffer, 1838)

Material examined: Socerb (VL14), 11.03.2001 [leg. Kofol].

Rhopalopyx adumbrata (J. Sahlberg, 1842)

Material examined: Col - 720 m (VL28), 14.07.2001; Soriška planina - 1300 m (VM22), 19.08.2002; Blegoš - 1500 m (VM31), 29.07.2001; Zabreška planina, 1050 m (VM34), 02.08.2003;. Učka (Croatia) 1390 m (VL31), 22.08.2002.

According to some authors its main distribution area might be the middle and north Europe (Ossiannilsson, 1983, Nast, 1987). So far it has not been found in Italy (d'Urso, 1995). In Slovenia it occurs on dry short-grass meadows and pastures, mainly in the montane level. However, it was also found very close to the Adriatic Sea on Učka in Croatia at about 1390 m a.s.l.

**Cicadula albingensis* Wagner, 1940

Material examined: Kobarid 235 m (UM92), 15.09.2001; Ajševica (VL08), 08.09.2001; on damp places associated with *Scirpus sylvaticus* and various *Carex* sp.

Thamnotettix zelleri (Kirschbaum, 1868)

Additional material examined: Kozana (UL89), 17.05.2003; Škocjan (VL04), 01.06.2001; Škocjanski zatok (VL04), 22.05.2002.

A mediterranean species known in Europe only in south France, Italy, Greece and former Yugoslavia till now.

Limotettix striola (Fallen, 1806)

Material examined: Cerkniško jezero (VL56), 23.06.2001; Dobrovnik (XM06), 09.06.2001.

Nanosius chloroticus (Melichar, 1896)

Additional material examined: Nanos Hribač, 900 m (VL27), 26.07.2002; Kucelj 1150 m (VL08), 04.09.2004; Učka in Croatia - 1390 m (VL31), 22.08.2002

The type locality on the mountain Nanos was the only known locality of this species in Slovenia for a long time. Recently we found it on the mountain Kucelj about 25 km westwards as well. Furthermore, it was discovered also on the peak Učka in Croatia about 60 km towards the south with similar climatic conditions and vegetation. In our host plant choice experiment with adults, where four prevailing

plant species (*Sesleria juncifolia* Wulf. ex Suffr., *Carex humilis* Leyss., *Genista sericea* Wulf. and *Anthyllis jacquinii* Kerner) from the type locality were tested, *Sesleria juncifolia* was always chosen and used as the food plant.

Arocephalus languidus (Flor, 1861)

Material examined: Ravnica (UL99), 12.10.2003; Lepena - 700 m (UM92), 22.08.2003; Kucelj - 1150 m (VL08), 04.09.2004; Ajdovščina Hubelj (VL18), 01.06.2002; Col 720 m (VL28), 14.07.2001; Labinje 700 m (VM21), 22.08.2004; Cimprovka 1250 m (VM21), 23.08.2004; Soriška planina 1300 m (VM22), 23.08.2004; Maribor - Tezno (WM55), 16.09.2004; Turški vrh (WM83), 20.09.2002.

It seems to be widespread in Slovenia, mainly associated with *Sesleria*.

**Psammotettix nodosus* (Ribaut, 1925)

Material examined: Porezen - 1350 m (VM21), 07.08.1998; Blegoš (VM31), 29.07.2001;

Always on mountain-sites among acidophile short grasses.

**Psammotettix provincialis* Ribaut, 1925

Material examined: Debeli rtič (VL04), 06.10.2001; Ankaran (VL05), 06.10.2001; Červar (Croatia, UL91), 14.08.2002.

It is very similar to *P alienus* (Dahlbom, 1850) and differs somewhat only in the shape of aedeagus. So far, it has been found only in the coastal area.

Psammotettix cephalotes (Herrich-Schaeffer, 1834)

Material examined: Kobarid - 235 m (UM92), 15.09.2001; Krn - 1100 m (UM92), 05.07.2003; Vojsko 1050 m (VL19), 23.08.2003; Kalce - 500 m (VL38), 29.08.2001; Hotedršcica (VL38), 10.05.2002; Dole (VL39), 12.06.2002; Vršič - 1400 m, JZ (VM04), 07.08.1999; Porezen (VM21), 19.08.2000; Črni vrh nad Cerknem (VM21), 20.07.2003; Blegoš (VM31), 29.07.2001; Nemški rovt 750 m (VM22), 14.08.2003; Črnivec - 860 m (VM72), 15.08.2000; Smrekovec (VM94), 22.06.2002.

All records in HS concerning this species actually refer to *Psammotettix helvolus* and have to be replaced. There are very few reliable morphological characteristics to distinguish with certainty these two species, because there are no differences in the shape of aedeagus and in the structure of the genital segment in general. In *P cephalotes* green colours on the fore wings should be decisive for its discrimination from *P helvolus*, where these colours may not be present. However, there are populations with some intermediate characteristics, where light green cast may be noticed on the proximal half of the forewings, especially in live specimens. In such cases a reliable discrimination between these two species by classical morphological methods is almost impossible. We could notice that *P cephalotes* prefers more acid heaths in the montane area, while *P helvolus* usually populates dry calcareous hill-sites.

**Psammotettix helvolus* (Kirschbaum, 1868)

Material examined: Socerb (VL14), 02.10.2001; Kozina (VL15), 02.05.2003; Slavnik (VL24), 05.06.2001; Gorenje pri Divači (VL16), 22.09.2001; Kostanjevica na Krasu (UL97), 01.09.2001; Trstelj - 640 m (UL98), 26.06.1999; Golec - 380 m (VL07), 30.06.2002; Gojače (VL08), 20.05.1998, 28.09.2000; Ravnica (UL99), 09.05.1998, 16.05.1999; Kromberk (UL99), 28.05.1998; Loke (UL99),

30.09.2000; Ajševica (VL08), 08.09.2001; Solkan (UL99), 01.05.2001; Slap pri Vipavi (VL17), 30.07.1998; Gaberje (VL17), 01.05.2002; Duplje (VL18), 30.09.1999; Dolga poljana (VL18), 13.07.2001; Kucelj 1200 m (VL08), 21.06.1998, 03.09.2000; Trščaki (VM00), 31.08.2002; Mala Lazna - 1100 m (VL09), 23.08.2003; Sinji vrh - 980 m (VL18), 12.08.2001; Vojsko - 1040 m (VL19), 18.08.2001; Nanos (VL27), 10.08.2000, 06.07.2002, 26.07.2002; Col (VL28), 27.05.1998; Malo polje (VL28), 21.09.2003; Studeno (VL37), 06.06.1999; Godovič 600 m (VL38), 29.05.2002; Bevke (VL59), 14.07.2001; Soriška planina 1300 m (VM22), 19.08.2002; Lepena 600 m (UM93), 26.08.2001; Mangart - 2000 m (UM94), 23.07.2002.

This is probably the most common *Psammotettix* species in Slovenia, at least in its western part.

**Quartausius hamatus* (Then, 1896) [= *Quartausius dalmatinus* Dlabola, 1974] new synonym

Material examined: Socerb (VL14), 03.10.2001.

A single male was caught in short grasses on a very dry xerothermic Karst meadow. This locality is very close to the type locality (VL15) " auf dem Karst bei Triest (zu Boršt und Bazovica)" (Then, 1896).

The generic identity of Then's *Deltocephalus hamatus* Then, 1896 remained unclear for a long time and only recently has been clarified (Holzinger & al, 1997). Nast (1987) and d'Urso (1995) still consider it a dubious species. Despite Then's good original description and satisfactory drawings, Dlabola did not recognize this species describing the new genus and species *Quartausius dalmatinus,* found among the material collected in Dalmatia. Comparing Then's description and drawings with the specimen in my collection on the one hand and Dlabola's excellent drawings and description of the new genus and species on the other hand, I cannot find any differences between them (Then, 1896; Dlabola, 1974). Therefore I consider *Quartausius dalmatinus* Dlabola as a younger synonym of *Deltocephalus hamatus* Then. However, a comparative verification of both holotypes would be strongly recommended. The new generic positioning of this species appears to be justified, because of a very characteristic aedeagus shape. Otherwise, there are many morphological similarities with *Jassargus, Adarrus, Errastanus* and *Turrutus*, as Dlabola had already stressed. On its type locality there is very difficult to distinguish it macroscopically from the endemic *Jassargus* species, in particular *Jassargus bicorniger* Then, 1896 and *Jassargus bispinatus* Then, 1896, which occur together at the same places. Zoogeographically the Karst region with the type locality is probably only the northern edge of the range of this endemic eastern Adriatic species.

Jassargus bispinatus (Then, 1896)

Material examined: Petrinjski Kras (VL14), 01.06.2001; Slavnik - 820 m (VL14), 05.06.2001; Črni Kal (VL14), 05.06.2001; Socerb (VL14), 02.10.2001; Črnotiče 420 m (VL14), 06.10.2001; Kastelec (VL14), 22.05.2002, 13.09.2003; Kozina (VL15), 02.05.2003; Croatia: Červar (UL91), 09.06.2001, 16.08.2002; Bečaji (UL92), 11.09.2002; Brseč (VL30), 22.08.2002; Učka - vas (VL31), 22.08.2002.

This endemic species was described by Then (1896) from the specimens collected above Trieste (VL15) (" auf dem Karst bei Triest - in Boršt und Bazovica - auf

trockenen Wiesen..."), very close to the Italian-Slovene border. This type locality is actually the same as of the other two endemic species *Quartausius hamatus* and *Jassargus bicorniger*. According to the hitherto published records and the data examined by myself the type locality appears to be also the northern edge of the range of its distribution. Towards the south it occurs fairly common on very dry xerothermic Karst meadows. It was also found in many localities in Istria (Croatia) in a substantial high frequency. Actually nothing is known about its life cycle. Adults appear from May to June and from August to the beginning of October.
Faunistic examinations, hitherto carried out, showed an interesting distribution picture of two endemic *Jassargus* species - *Jassargus bispinatus* (Then, 1896) and *Jassargus bicorniger* (Then, 1896) - in the territory of Slovenia, which is indicated in figure 2. The first one has been found only at the Karst edge and southwards, while the second one only from the Karst plateau on both sides of the Italian-Slovene border to the southern slopes of Trnovski gozd. Thus, *Jassargus bicorniger* seems to be limited merely to this very restricted area. Up till now, I have not found both species together, although they populate very similar habitats. Further investigations of this area shall be needed to clarify the real distribution of this two endemic species.

**Jassargus dentatus* D'Urso, 1980*

Material examined: Stara gora (UL98), 10.06.2003, 08.07.2003.
Several specimens were caught in an oak park near the main cemetery of Nova Gorica, where the ground vegetation is being cut down periodically. Among the plants of the undergrowth vegetation *Carex pilulifera* L., *Carex pallescens* L., *Danthonia decumbens* (L.) DC. and *Calluna vulgaris* (L.) Hull are most abundantly present. However, its host plant could not be established yet. This species has been described quite recently and was known only from the province Piemonte in Italy (d'Urso, 1980). Since the specimens were found in a very small area, it is also possible that the species is not native here, but had been introduced by man. Further fieldwork in similar habitats in the surrounding could give an answer to this question. Adults have been collected from June to mid July.

**Jassargus sursumflexus* (Then, 1902)*

Material examined: Planinsko polje (VL47), 28.06.2001; Cerkniško jezero (VL56), 14.08.2001; Pokljuka Močila bog (VM23), 14.08.2003; always on periodically submerged wet sites, often very abundant.

Jassargus pseudocellaris (Flor, 1861)

Material examined: Črni vrh over Cerkno - 1230 m (VM21), 20.07.2003.
It seems to be a very rare species living among the turfs of short grasses like *Agrostis tenuis* Sibth. and *Festuca heteromalla* Pour. on acid soil.

Arthaldeus pascuellus (Fallen, 1826)

Material examined: Grobišče (VL36), 12.09.2004; Orehek pri Postojni (VL36), 12.09.2004; Kalce - 500 m (VL38), 29.08.2001; Planinsko polje (VL47), 28.06.2001; Loški potok (VL65), 23.06.2001; Jelovica - Ledine 1100 m (VM32), 19.09.2004.

Emeljanovianus medius (Mulsant & Rey, 1855)
Material examined: Vojsko - 1050 m (VL19), 23.08.2003; Nanos - Lanišče 950 m (VL27), 06.07.2002; Blegoš - 1350 m (VM31), 29.07.2001.

**Mocuellus metrius* (Flor, 1861)
Material examined: Mala Lazna - 1100 m (VL09), 23.08.2003; Grobišče (VL36), 12.09.2004.
Swept from stands of *Phalaris arundinacea* in temporary moist sites.

Discussion

Since the first provisional checklist of Auchenorrhyncha of Slovenia was published (Holzinger & Seljak, 2001) approximately a hundred species new to the fauna of Slovenia have been discovered. Schürrer and Löcker enriched this list recently for 41 species, mainly arboricolous species belonging to the subfamily Typhlocybinae (Schürrer & Löcker, 2003). Another 63 species new to Slovenia have been discovered and discussed in the present overview; Cixiidae 6 species, Delphacidae 12 species, Tettigometridae 1 species, Issidae 3 species, Caliscelidae - 1 species and Cicadellidae - 39 species. *Forcipata forcipata* has been removed from the checklist because of its misinterpretation in the past.

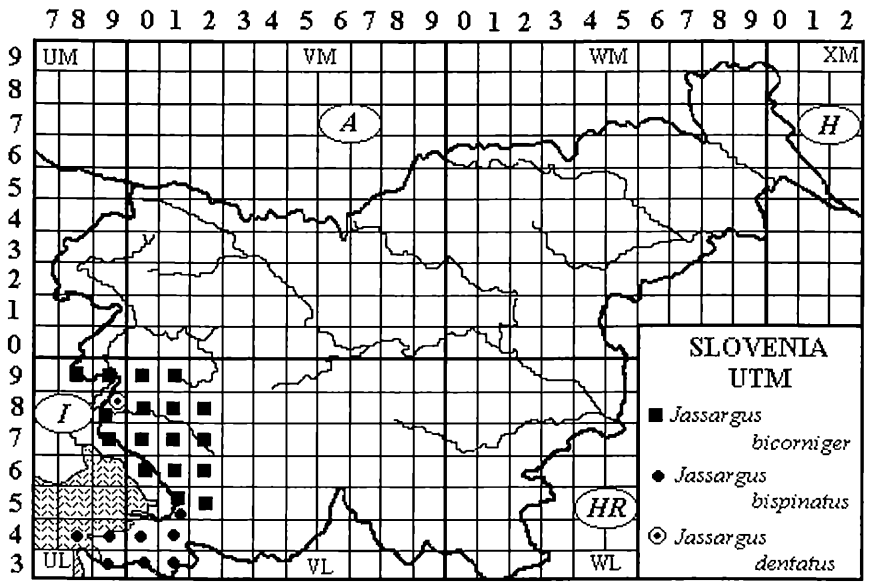

Fig. 2: Currently known distribution of *Jassargus bicorniger, J. bispinatus* and *J. dentatus* in Slovenia.

Despite the still incomplete knowledge of Auchenorrhyncha fauna of Slovenia an important share of endemism cannot be overlooked. This is confined mainly to the SW part of the country, which is characterized by the submediterranean climate and vegetation. However it mostly represents only the northernmost range of the larger east Adriatic endemism, which is very rich in unique species. As the representatives of this endemic fauna should be mentioned: *Metropis aris*, *Chlorita beieri*, *Chlorita szelenica*, *Eupteryx ribauti*, *Nanosius chloroticus*, *Jassargus bispinatus*, *Jassargus bicorniger*, *Quartausius hamatus*. They can be considered as the relicts of the tertiary glacial period. On the base of the current faunistic knowledge, the species *Jassargus bicorniger* (Then) seems to be limited to a very restricted area from the Karst edge at the south to the southern slopes of the Trnovski gozd.

The comparatively high Dinaric mountain chain, which protrudes from the NW towards the SE of the country, has played the decisive role in the development and distribution of the flora and fauna in this area. These mountains represent an insurmountable barrier for the warm Mediterranean air and spreading of thermophilic Mediteranean plant and animal species towards the N and NO. From this line towards the SW the number of typical Mediterranean species increases considerably, in particular on the Karst plateau and in the coastal area. Also the whole known Slovenian richness of endemic Auchenorrhyncha species appertains actually to this area. Besides the endemic species already indicated above, most characteristic Mediteranean species of this part of Slovenia should be mentioned: *Hyalesthes luteipes, Reptalus melanochaetus, Reptalus quinquecostatus, Reptalus cuspidatus, Kelisia brucki, Chloriona sicula, Eurysanoides flavobrunnea, Chlorionidea flava, Horvathianella palliceps, Ribautodelphax bicolor, Ribautodelphax fanari, Caliscelis wallengreni, Caliscelis bonellii, Latilica maculipes, Bubastia obsoleta, Kervillea conspurcata, Latissus dilatatus, Lyristes plebejus, Tettigetta brullei, Tettigetta dimissa, Tettigetta argentata, Tibicina haematodes, Anaceratagallia laevis, Eupteryx zelleri, Fruticidia sanguinosa, Hauptidia provincialis, Tamaricella tamaricis, Zyginidia servadeii, Grypotes staurus, Opsius lethierryi, Macrosteles salsolae, Proceps acicularis, Thamnotettix zelleri, Psammotettix provincialis*. Many of these species reach the northernmost edge of their range here in this part of Europe.

On the other hand some Siberian species like *Nothodelphax distincta, Xanthodelphax flaveola, Javesella stali, J. forcipata, Empoasca kantkoneni, E. affinis, Edwardsiana salicicola, Linnavuoriana decempunctata, Cicadula albingensis, Mocuellus metrius* and maybe some others, seem to reach here the most southern boundary of their occurrence. They preferably occur in cold shady Alpine valleys and in wet montane places.

In short, geographically and climatically transitional character of Slovenia comes to light also in the case of the Auchenorrhyncha fauna. The Mediterranean, European, east European, Alpine and even Siberian species meet here on a comparatively very restricted area and make this fauna peculiarly diverse.

References

Ann., 1999: Cicada clavicornis Fabricius, 1794 (currently Asiraca clavicornis); Insecta, Homoptera): specific name conserved. *Bulletin of Zoological Nomenclature* 56(3), 211-212.

Asche, M., S. Drosopoulos, H. Hoch, 1983: Metropis aris nov. sp,. eine neue Delphacidae aus Nordwest-Grichenland (Homoptera, Auchenorrhyncha, Fulgoromorpha, Delphacidae). *Marburger Entomologische Publikationen* Bd. 1, Heft 8, 95-106.

Dlabola, J., 1967: Beschreibungen von neuen südpaläarktischen Zikadenarten (Homoptera, Auchenorrhyncha). *Acta entomologica musei naturalis Pragae*, 37, 31-50.

Dlabola, J., 1974: Übersicht der Gattungen Anoplotettix, Goldeus und Thamnotettix mit Beschreibung von 7 neuen mediterranen Arten (Homoptera, Auchenorrhyncha). *Acta entomologica musei naturalis Pragae*, 15 (177), 103-129.

D'Urso, V., 1980: Jassargus dentatus, nuova specie di Deltocephalinae della brughiera Piemontese (Insecta, Homoptera, Cicadellidae). *Animalia* 7 (1/3), 123-133.

D'Urso, V., M. Asche, 1984: Metropis nebrodensis nov. spec. from Sicily and diagnosis of females of west-palearctic Metropis-species (Homoptera, Auchenorrhyncha, Fulgoromorpha, Delphacidae). *Animalia* 11 (1-3), 91-101.

D'Urso, V., 1995: Checklist delle specie della Fauna Italiana; 42. Homoptera Auchenorrhyncha. Ed. Calderini Bologna; 35 pp.

Gogala, M., A. Gogala, 1999: A checklist and provisional atlas of the Cicadoidea fauna of Slovenia. *Acta Entomologica Slovenica*, 7(2): 119-128.

Graeffe, E., 1903: Beiträge zur Cicadinenfauna des Österreichischen Küstenlandes. *Bolletino della Società Adriatica di Scienze Naturali in Trieste*, 21: 41-63.

Günthart, H., R. Mühlethaler, 2002: Provisorische Checklist der Zikaden der Schweiz (Insecta: Hemiptera, Auchenorrhyncha). *Denisia* 04, Nr. 176, 329-338.

Holzinger, W., G. Seljak, 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. E., W. Fröhlich, H. Günthart, P. Lauterer, H. Nickel, A. Orosz, W. Schedl, R. Remane, 1997: Vorläufiges Verzeichnis der Zikaden Mitteleuropas (Insecta: Auchenorrhyncha). *Beiträge zur Zikadenkunde*, 1: 43-62.

Holzinger, W., I. Kammerlander, H. Nickel, 2003: The Auchenorrhyncha of Central Europe/ Die Zikaden Mitteleuropas; Fulgoromorpha, Cicadomorpha exl. Cicadellidae. Brill, Leiden - Boston, 673 pp.

Kiauta, B., 1962: Prispevek k poznavanju škržatov na loškem ozemlju. Loški razgledi, Škofja Loka, 9: 7 pp.

Lauterer, P., 1996: Faunistic novelities of leafhoppers (Homoptera, Auchenorrhyncha) from the territory of the Czech Republic with notes on the fauna of Slovakia. *Acta Mus. Moraviae, Sci. nat.*, 80, 235-242.

Löcker, H., 2003: Arborikole Zikaden-Gilden in Slowenien (Hemiptera, Auchenorrhyncha). *Beiträge zur Zikadenkunde* 6: 7-38.

Melichar, L., 1896: Cicadinen (Hemiptera-Homoptera) von Mittel-Europa. Verlag Felix Dames, Berlin, 364 + XII pp.

Nast, J., 1987: The Auchenorrhyncha (Homoptera) of Europe. *Ann. zool. Warsz.* 40: 535-662.

Nickel, H., 2003: The Leafhoppers and Planthoppers of Germany (Hemiptera, Auchenorrhyncha): Patterns and strategies in a highly diverse group of phytophagous insects. Pensoft Publishers. Sofia-Moscow; 460 str.

Nickel, H., R. Remane, 2002: Artenliste der Zikaden Deutschlands, mit Angabe von Nährpflanzen, Nahrungsbreite, Lebenszyklus, Areal und Gefärdung (Hemiptera, Fulgoromorpha et Cicadomorpha.). *Beiträge zur Zikadenkunde* 5, 27-64.

Ossiannilsson, F., 1983: The Auchenorrhyncha (Homoptera) of Fennoscandia and Denmark. Part 3: The Family Cicadellidae: Deltocephaline, Catalogue, Literature and Index. *Fauna Entomologica Scandinavica* 7(3): 594-979.

Ribaut, H., 1936: Homoptères Auchenorhynques (I. Typhlocybidae). *Faune de France* 31, 228 pp.

Schürrer, B., H. Löcker, 2003: New records of leafhoppers and planthoppers from Slovenia (Hemiptera, Auchenorrhyncha). *Acta Entomologica Slovenica* 11(1): 71-78.

Seljak, G., 2002: Non-european Auchenorrhyncha (Hemiptera) and their geographical distribution in Slovenia. *Acta entomologica slovenica*, 10 (1), 97-101.

Seljak, G., G. Matis, J. Miklavc, K. Beber, 2003: Identifikacija potencialnih naravnih prenašalcev trsnih rumenic v Podravski vinorodni deželi. Zbornik predavanj in referatov 6. slovenskega posvetovanja o varstvu rastlin, Zreče 4. do 6. marca 2003. Ljubljana: Društvo za varstvo rastlin Slovenije, 2003, 283-288.

Seljak, G, N. Pagliarini, 2004: The leafhoppers of the genus Hauptidia [Auchenorrhyncha, Cicadellidae]: little known pests on the ornamental plants and vegetables in Croatia and Slovenia. *Phragmenta entomologica Croatica*, in press (in Croatian, English abstract).

Servadei, A., 1967: Rhynchota (Heteroptera Homoptera Auchenorrhyncha). Catalogo topografico e sinonimico. *Fauna d'Italia* 9: 851 pp.

Then, F., 1896: Neue Arten der Cicadinen-Gattungen Deltocephalus und Thamnotettix. *Mitteilungen des naturwissenschafltichen Vereins für Steiermark*, 32: 165-197.

Then, F., 1886: Katalog der Österreichischen Cicadinen. *Jahres Bericht über das Gymnasium der k.k. Theresianischen Akademie in Wien*; 1-59.

Vidano, C., 1965: Sulle Forcipata transalpine e cisalpine con descrizione di specie nuove (Homoptera, Typhlocybidae). *Boll. di Zoologia agraria e di Bachicoltura*, II, vol. 6, 37-60.

Wagner, W., 1939: Die Zikaden des Mainzer Beckens. Zugleich eine Revision der Kirschbaumschen Arten aus der Umgebung von Wiesbaden. *Jahrbuch des Nassauer Vereins für Naturkunde Wiesbaden*, 86: 77-212.

Received / Prejeto: 29. 6. 2004