

CHECK-LIST OF WATER BUGS (HEMIPTERA: HETEROPTERA: NEPOMORPHA, GERROMORPHA) IN CROATIA WITH TWO NEW RECORDS AND FOUR REDISCOVERIES

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An updated check-list of the aquatic and semi-aquatic bugs of Croatia is provided. Altogether, we list 14 families and 59 species (Nepidae – 2, Belostomatidae – 1, Ochteridae – 1, Micronectidae – 2, Corixidae – 21, Naucoridae – 1, Aphelocheiridae – 1, Notonectidae – 7, Pleidae – 1, Mesoveliidae – 2, Hebridae – 2, Hydrometridae – 1, Veliidae – 7, Gerridae – 10). However, for 11 of the listed species no exact locality record has ever been published. Five species, *Micronecta minutissima* (Linnaeus, 1758), *Velia caprai* Tamanini, 1947, *Velia rivulorum* (Fabricius, 1775), *Velia saulii* Tamanini, 1947, and *Limnoporus rufoscutellatus* (Latreille, 1807) are omitted from the list for the time being due to the lack of reliable records. Based on an examination of new material, we provide two new records for Croatia – *Corixa panzeri* Fieber, 1848 and *Sigara semistriata* (Fieber, 1848), first exact records of *Hesperocorixa linnaei* (Fieber, 1848) and *Notonecta meridionalis* Poisson, 1926, as well as new findings of *Aphelocheirus aestivalis* (Fabricius, 1803) and *Anisops sardeus sardeus* Herrich-Schaeffer, 1843 not recorded from Croatia for many decades.

Key words: Heteroptera, Nepomorpha, Aphelocheiridae, Corixidae, Notonectidae, Gerromorpha, check-list, Croatia

Kment, P. & Beran, L.: Popis vrsta vodenih stjenica Hrvatske (Hemiptera: Heteroptera: Nepomorpha) s dva nova nalaza i četiri ponovna nalaza. *Nat. Croat.*, Vol. 20, No. 1., 159–178, 2011, Zagreb.

Rad donosi aktualizirani popis vodenih stjenica Hrvatske. Ukupno popis ima 14 porodica i 59 vrsta (Nepidae – 2, Belostomatidae – 1, Ochteridae – 1, Micronectidae – 2, Corixidae – 21, Naucoridae – 1, Aphelocheiridae – 1, Notonectidae – 7, Pleidae – 1, Mesoveliidae – 2, Hebridae – 2, Hydrometridae – 1, Veliidae – 7, Gerridae – 10). Za 11 navedenih vrsta nikad nisu objavljeni točni lokaliteti nalaza. Pet vrsta, *Micronecta minutissima* (Linnaeus, 1758), *Velia caprai* Tamanini, 1947, *Velia*

rivulorum (Fabricius, 1775), *Velia saulii* Tamanini, 1947, i *Limnoporus rufoscutellatus* (Latreille, 1807) zasad su izostavljene s popisa zbog nepostajanja pouzdanih nalaza. Na temelju analize novog materijala, dajemo dva nova nalaza za Hrvatsku – *Corixa panzeri* Fieber, 1848 i *Sigara semistriata* (Fieber, 1848), prvi egzaktni nalaz *Hesperocorixa linnaei* (Fieber, 1848) i *Notonecta meridionalis* Poisson, 1926, kao i novi nalaz *Aphelocheirus aestivalis* (Fabricius, 1803) i *Anisops sardeus sardeus* Herrich-Schaeffer, 1843 koji već više desetljeća nisu zabilježeni za Hrvatsku.

Ključne riječi: Heteroptera, Nepomorpha, Aphelocheiridae, Corixidae, Notonectidae, Gerromorpha, popis vrsta, Hrvatska

INTRODUCTION

The Croatian fauna of Heteroptera, and among them especially of the aquatic and semi-aquatic bugs, has received little attention from specialists, either Croatian and foreign. Information about the Croatian fauna is found in the checklist of the Balkan Peninsula by JOSIFOV (1986), in the Palaearctic Catalogue (POLHEMUS *et al.*, 1995; ANDERSEN, 1995) and especially in the check-list and catalogue of the fauna of the former Yugoslav countries by PROTIĆ (1998a, b, 2001). Additional information about Corixidae is also included in the monograph of European Corixidae by JANSOON (1986). Most unfortunately, neither of these sources offers a comprehensive list of Croatian fauna, mainly to neglect and/or unintentional omissions of otherwise common species. Additional records of both Nepomorpha and Gerromorpha from Croatia not covered by PROTIĆ (1998a, 2001) or published after that catalogue can be found in the following papers: FIEBER (1848), DUFOUR (1863), HORVÁTH (1899, 1916, 1930), SCHUMACHER (1917), LINDBERG (1922), STICHEL (1924), TAMANINI (1947, 1949, 1959), MANCINI (1956), MENKE (1963), BENEDEK (1969, 1970), KANYUKOVA (1973), NIESER (1983), STRPIĆ (1995, 1997, 1998), KMENT (2001), MERDIĆ *et al.* (2005), RUS (2005), PEREZ GOODWYN (2006), DAMGAARD (2006, 2008).

Based on recent field work by both the present authors, we provide here two new records and four rediscoveries of Nepomorpha in the Croatian fauna. To encourage additional research on Croatian water bugs, we also provide an updated check-list of the Croatian Nepomorpha and Gerromorpha. For identification of Croatian water bugs we can recommend the following monographs and particular revisions: ANDERSEN (1990, 1994), ANDERSEN & SPENCE (1992), JANSOON (1986), KANYUKOVA (1973, 1974, 1982, 2006), NIESER (1972), SAVAGE (1989), SOÓS *et al.* (2009), STICHEL (1955–1956), and TAMANINI (1979).

RESULTS

NEW RECORDS

APHELOCHEIRIDAE

Aphelocheirus (Aphelocheirus) aestivalis (Fabricius, 1803)

Material examined: DALMATIA, Berberi env., Zrmanja river, N 44°11'47" E 15°46'09", 8.viii.2009, 2 larvae of instar 5, L. Beran lgt. & det., P. Kment revid. (coll. National Museum, Prague); Cetina river E of Podaspilje (SE of Omiš), N 43°26'14"

E 16°45'30", 18.vi.2009, 4 specimens observed, L. Beran lgt. & det., P. Kment revid. (1 micropterous ♂ in the coll. National Museum, Prague).

General distribution. Known from most of European countries except of Iberian Peninsula and southern parts of the Balkan Peninsula (Belgium, Bulgaria, Byelorussia, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Great Britain, Hungary, Ireland, Italy, Kazakhstan (European part), Latvia, Liechtenstein, Lithuania, Luxembourg, Moldavia, Netherlands, Norway, Poland, Romania, Russia (North, Central and South European Territory), Serbia, Slovakia, Slovenia, Sweden, Switzerland, Ukraine), Anatolia and Georgia (POLHEMUS *et al.*, 1995; COULIANOS, 2005; ŽIVIĆ *et al.*, 2007; FENT *et al.*, 2011). The earlier records from the Iberian Peninsula belong to two endemic species described rather recently – *Aphelocheirus murcius* Nieser et Millán, 1989 (Spain) and *A. occidentalis* Nieser et Millán, 1989 (Portugal, Spain) (NIESER & MILLÁN, 1989). The record of *Aphelocheirus aestivalis* from Morocco published by GHEIT (1995) belongs probably to the endemic species *A. rotroui* Bergevin, 1925.

Records from the Balkan Peninsula are rather rare. In Romania, there are only 10 published records collected throughout the last century (HORVÁTH, 1899, as *A. montandoni*; COJOCARU, 2005). From Bulgaria, there are only two records from the Danube River (localities Novo Selo and St'lbishche) by JOSIFOV (1958), the second specimen being found in the stomach of *Acipenser ruthenus* Linnaeus, 1758. Only recently the species was discovered in Serbia, but in rather high number of localities (PROTIĆ & ŽIVIĆ, 2007; ŽIVIĆ *et al.*, 2006, 2007). Recently, *A. aestivalis* became more common in some Central European countries than it was two or more decades earlier, probably as a result of building sewerage plants and subsequent improvement of water quality (e.g., Germany – HOFFMANN 2008, Hungary – AMBRUS *et al.* 1995, Czech Republic – P. KMENT, unpubl.).

Distribution in Croatia. HORVÁTH (1897) reported the species from Pregrada [northern Croatia, N46°09'36" E15°44'50"] and subsequently (HORVÁTH 1899) described a new species, *Aphelocheirus nigrita*, including a macropterous female from Pregrada as one of the syntypes (also in HORVÁTH, 1907). *Aphelocheirus nigrita* was synonymized with *A. aestivalis* by REUTER (1912) and BERGROTH (1917). Here we provide the first new records after a century and first ones from Dalmatia.

Comment. For identification consult KANYUKOVA (1973, 2006) and NIESER & MILLÁN (1989). The life cycle and reproduction were recently treated by PAPÁČEK & SOLDÁN (2008).

CORIXIDAE

Corixa panzeri Fieber, 1848

Material examined. Hvar Island, Starigrad env., Dračevice (N43°11.20' E 16°37.51'), silting-up pond, 13 m a.s.l., 23.vi.2009, 1 ♂ 1 ♀, P. Kment lgt. & det. (Coll. National Museum, Prague).

General distribution. This species is distributed in western, Central, southern and eastern Europe (Austria, Belgium, Bulgaria, Czech Republic, Denmark, France, Germany, Great Britain, Greece, Hungary, Ireland, Italy, Latvia, Liechtenstein, Macedonia, the Netherlands, Norway, Poland, Portugal, Romania, Russia (South Euro-

pean Territory), Slovakia, Spain, Sweden, Turkish Thrace, Ukraine), North Africa (Algeria, Morocco, Tunisia), the Near East and Central Asia (Azerbaijan, Georgia, Iran, Tajikistan, Turkish Anatolia) (JANSSON, 1986; POLHEMUS *et al.*, 1995; PROTIĆ, 1998a; RABITSCH & ZETTEL, 2000; DOLMEN, 2004; STRAKA *et al.*, 2009; FENT *et al.*, 2011). Most of the European records for *C. panzeri* concentrate in coastal areas, becoming scarce inland and the inland records being usually based on single specimens; in land-locked parts of Europe, it occurs regularly only in the Pannonian lowlands (e.g. WRÓBLEWSKI, 1980; JANSSON, 1986; AUKEMA *et al.*, 2002; RABITSCH & ZETTEL, 2000; STRAKA *et al.*, 2009).

Distribution in Croatia. New record.

Comment. For identification see JANSSON (1986).

Hesperocorixa linnaei (Fieber, 1848)

Material examined. Pag Island, Poveljana, Velo Blato lake (N44°21'58" E15°09'23"), 7.vii.2010, 1 ♀, L. Beran lgt., P. Kment det. (Coll. National Museum, Prague).

General distribution. This species is distributed in most European countries, Morocco, Algeria, Tunisia, Anatolia, Transcaucasia, Iran, Central Asia and Siberia (JANSSON, 1995; GHEIT, 1995; PROTIĆ, 1998a; GOGALA, 2003).

Distribution in Croatia. This species was indicated from Croatia by JANSSON (1986, in map) and later listed by POLHEMUS *et al.* (1995) without any exact locality. Here we present the first exact locality from Croatia.

Sigara semistriata (Fieber, 1848)

Material examined. Podlapača – Udbina, system of gravel pools by the road (N44°34' E15°43'), 2.vii.2006, 1 ♂, P. Komzák lgt., P. Kment det. (P. Komzák Collection, Brno, Czech Republic).

General distribution. European species, distributed in most of European countries (Austria, Belgium, Byelorussia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Great Britain, Hungary, Ireland, Kazakhstan (European part), Latvia, Lichtenstein, Lithuania, Moldavia, the Netherlands, Norway, Poland, Romania, Russia (North, Central and South European Territory), Slovakia, Sweden, Switzerland, Ukraine), West and East Siberia, Asian part of Kazakhstan and Mongolia (POLHEMUS *et al.*, 1995). It was listed also from Slovenia (POLHEMUS *et al.*, 1995) but there is no reliable record from that country (GOGALA, 2003). JOSIFOV (1986) listed the species also for 'Yugoslavia', but without any exact record.

Distribution in Croatia. New record.

Comment. For identification see Jansson (1986).

NOTONECTIDAE

Anisops sardeus sardeus Herrich-Schaeffer, 1849

Material examined. Brač Island, Bol env., Vidova Gora Mt. (N43°16' E16°39'), 740 m a.s.l., semi-natural reservoir by the road about 0.5 km under the top, 5.ix.2004, 3 ♂♂ 3 ♀♀, P. Kment lgt. & det.; Škrip env., Zastrazišće (N of Škrip), abandoned reservoir, 200 m a.s.l., 30.viii.2010, numerous larvae, P. Kment lgt. & det. (all Coll. National Museum, Prague).

General distribution. Portugal, Spain, France (Corsica), Malta, Italy, Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Greece, Turkey (European part), Canary Islands, Algeria, Egypt, Libya, Morocco, Tunisia), tropical Africa, Cyprus, Turkey (Asian part), Armenia, Azerbaijan, Georgia, Israel, Jordan, Syria, Iraq, Saudi Arabia, Yemen, the United Arab Emirates, Iran, Turkmenistan, India and Burma (POLHEMUS *et al.*, 1995; PROTIĆ, 1998a; KATBEH *et al.*, 2000; LINNAVUORI & HOSSEINI, 2000; LINNAVUORI *et al.*, 2011). Recently the species was collected in Hungaria (SOÓS *et al.*, 2010), north-west Romania (Berchi, in prep.) and European Russia (Central Caucasus) (KHATUKHOV *et al.*, 2009), apparently spreading northwards.

Distribution in Croatia. There is only one published record of the species from Croatia, collected in a cistern in Grohote, Šolta Island (JACZEWSKI, 1934). Our material was collected in a seminatural reservoir with only sparse submerged vegetation built in karstic terrain; the specimens were collected during a dry period with a very low water level. The same locality was also sampled in 2002, 2005, 2006, 2008 and 2009, but no additional specimens of *Anisops* were collected. An additional locality, abandoned half-dried concrete reservoir at Zastrazišće was discovered in 2010 with a numerous breeding population. Confirmed occurrence in Croatia after 70 years.

Comment. For identification see BROOKS (1951), NIESER *et al.* (1994).

Notonecta (Notonecta) meridionalis Poisson, 1926

Material examined. Brač Island, Dol env., Hladna voda (N43°20'25" E 16°36'41"), 150 m a.s.l., spring and drying-out stream, 18.vi.2009. 1 ♂, P. Kment lgt. & det. (Coll. National Museum, Prague).

General distribution. Southern parts of western and Central Europe (Great Britain (Jersey?), France, Andorra, Czech Republic, Austria, Hungary), southern Europe (Portugal, Spain, Italy, Slovenia, Croatia, Albania, Greece, Macedonia, Bulgaria, Romania), Ukraine (Crimea), Morocco, Algeria, Tunisia and Turkey (POLHEMUS *et al.*, 1995; CARAPEZZA, 1997; RABITSCH & ZETTEL, 2000; GOGALA, 2003; PAPAČEK, 2003; KANYUKOVA, 2006; SOÓS *et al.*, 2009).

Distribution in Croatia. This species was listed from Croatia by JOSIFOV (1986, as Dalmatia) and POLHEMUS *et al.* (1995) without any details. Here we present the first exact locality from Croatia.

Comment. KANYUKOVA (1973) regarded this taxon a subspecies of *N. glauca* Linnaeus, 1758, while ZIMMERMANN (1982) argued for it species status based on sympatric occurrence with *N. glauca*. ANGUS (2006) confirmed the species status of *N. meridionalis* based on a study of karyotype. In the past this species was confused with either *N. glauca* (pale form) or *N. obliqua* Thunberg, 1787 (dark form), and some of the earlier records of this species may represent misidentified *N. meridionalis*. The identification of this taxon is not easy; consult the papers by KANYUKOVA (1973, 2006) and SOÓS *et al.* (2009).

CHECK-LIST

The system and nomenclature used in the check-list mainly follow the appropriate chapters of the Palaearctic Catalogue (POLHEMUS *et al.*, 1995; ANDERSEN, 1995). The following subsequent changes are implemented: NIESER (2002) raised subfamily Micronectinae to family rank. HEBSCGAARD *et al.* (2004) established the superfamily

Aphelocheiroidea for the families Aphelocheiridae (Old World) and Potamocoridae (New World). JANSSON (2000) raised the former subspecies *Glaenocorisa propinqua propinqua* (Fieber, 1860) and *G. p. cavifrons* (Thomson, 1869) to species rank. KANYUKOVA (2003) distinguished an eastern subspecies *Arctocorisa germari mongolica* Kanyukova, 2003 from the nominotypical subspecies distributed in Europe and West Siberia. PEREZ GOODWYN (2006) raised the former subgenera of *Lethocerus* to generic rank. ANDERSEN & WEIR (2003) resurrected *Picaultia* as valid subgenus of *Microvelia*. Only the synonyms mentioned in papers dealing with Croatian fauna are listed, for complete synonymy of each taxon see POLHEMUS *et al.* (1995) and ANDERSEN (1995). Species recorded without any exact locality are marked by an asterisk '*'.

NEPOMORPHA Popov, 1968

NEPOIDEA Latreille, 1802

NEPIDAE Latreille, 1802

NEPINAE Latreille, 1802

Nepini Latreille, 1802

Nepa cinerea Linnaeus, 1758

= *Nepa rubra* Linnaeus, 1758

References. KORLEVIĆ (1887), LANGHOFFER (1899), NOVAK & WAGNER (1951, as *N. rubra*), JOSIFOV (1986, as *N. rubra*, Dalmatia), POLHEMUS *et al.* (1995), PROTIĆ (1998a, as *N. rubra*), PROTIĆ (1998b, as *N. cinerea* and *N. rubra*), STRPIĆ (1998), MERDIĆ *et al.* (2005).

Note. PROTIĆ (1998a) listed also records from Split: Stobreč and Preseka attributed to GOGALA & MODER (1960). However, there is no record Split: Stobreč in the original paper and the second locality is spelled 'Preska', which rather applies to Preska near Medvode in Slovenia.

RANATRINAE Douglas & Scott, 1865

Ranatrini Douglas & Scott, 1865

Ranatra (Ranatra) linearis (Linnaeus, 1758)

References. KORLEVIĆ (1887), HORVÁTH (1897), LANGHOFFER (1899), POLHEMUS *et al.* (1995), STRPIĆ (1995), PROTIĆ (1998a,b), STRPIĆ (1998), MERDIĆ *et al.* (2005).

BELOSTOMATIDAE Leach, 1815

LETHOCERINAE Lauck & Menke, 1961

Lethocerus patruelis (Stål, 1854)

= *Belostoma cordofanum* (non Mayr, 1853)

= *Belostoma niloticum* (non Stål, 1854)

= *Belostoma pruinosum* Dufour, 1863

References. DUFOUR (1863, as *Belostoma pruinosum*, holotype), SCHUMACHER (1917, as *Belostoma (Lethocerus) cordofanum*), NOVAK & WAGNER (1951, as *B. niloticum*), MENKE

(1963, as *L. cf. persicus*), JOSIFOV (1986, Dalmatia), PROTIĆ (1990), POLHEMUS *et al.* (1995), PROTIĆ (1998a,b), STRPIĆ (1998, as *B. cordofanum*), PEREZ GOODWYN (2006).

Note. PROTIĆ (1998a) listed also record from Hvar attributed to MARCUZZI (1983) but we did not find such a record in the original paper.

OCHTEROIDEA Kirkaldy, 1906 (1815)

OCHTERIDAE Kirkaldy, 1906 (1815)

****Ochterus (Ochterus) marginatus marginatus* (Latreille, 1804)**

References. POLHEMUS *et al.* (1995).

CORIXOIDEA Leach, 1815

MICRONECTIDAE Jaczewski, 1924

MICRONECTINAE Jaczewski, 1924

***Micronecta (Dichaetonecta) pusilla* (Horváth, 1895)**

References. WRÓBLEWSKI (1960), JANSSON (1986, revised record in map), POLHEMUS *et al.* (1995).

****Micronecta (Dichaetonecta) scholtzi* (Fieber, 1860)**

References. JANSSON (1986, revised record in map), POLHEMUS *et al.* (1995).

CORIXIDAE Leach, 1815

CYMATIAINAE Walton, 1940

***Cymatia coleoptrata* (Fabricius, 1777)**

References. WAGNER (1962), JANSSON (1986, revised record in map), POLHEMUS *et al.* (1995), PROTIĆ (1998a,b), STRPIĆ (1998), MERDIĆ *et al.* (2005).

CORIXINAE Leach, 1815

Glaenocorisini Hungerford, 1948

****Glaenocorisa propinqua* (Fieber, 1860)**

= *Corisa dohrnii* Fieber, 1848

References. FIEBER (1848, as *Corisa Dohrnii*, Dalmatia, syntype(s)), FIEBER (1860, as *C. Dohrni*), JOSIFOV (1986, Dalmatia), PROTIĆ (1998a), PROTIĆ (2001: 22).

Corixini Leach, 1815

****Arctocorisa germari germari* (Fieber, 1848)**

References. JOSIFOV (1986, Dalmatia), PROTIĆ (1998a).

***Corixa affinis* Leach, 1817**

References. HORVÁTH (1930), NOVAK & WAGNER (1951), WAGNER (1962), JANSSON (1986, revised record in map), JOSIFOV (1986, as Dalmatia), POLHEMUS *et al.* (1995), PROTIĆ (1998a,b), STRPIĆ (1998).

***Corixa panzeri* Fieber, 1848**

References. This paper.

***Corixa punctata* (Illiger, 1807)**

= *Corixa geoffroyi* Leach, 1817

= *Corisa xanthosoma* Fieber, 1848

References. FIEBER (1848, as *Corisa xanthosoma*, Dalmatia, syntype(s)), KORLEVIĆ (1887, as *C. Geoffroyi*), HORVÁTH (1897, as *C. Geoffroyi*), LANGHOFFER (1899, as *C. Geoffroyi*), JACZEWSKI (1934, as *C. geoffroyi*), NOVAK & WAGNER (1951), WAGNER (1962), JANSSON (1986, revised record in map), JOSIFOV (1986, as *C. punctata* and *C. xanthosoma*, Dalmatia), FURLAN & GOGALA (1995), POLHEMUS *et al.* (1995), PROTIĆ (1998a), STRPIĆ (1998).

***Hesperocorixa linnaei* (Fieber, 1848)**

References. JANSSON (1986, revised record in map), POLHEMUS *et al.* (1995), this paper.

***Hesperocorixa moesta* (Fieber, 1848)**

References. KORLEVIĆ (1887, as *Corixa moesta*), HORVÁTH (1897, as *Corixa moesta*), PROTIĆ (1998a,b), STRPIĆ (1998).

****Hesperocorixa parallela* (Fieber, 1860)**

References. JANSSON (1986, revised record in map), POLHEMUS *et al.* (1995).

****Hesperocorixa sahlbergi* (Fieber, 1848)**

References. JANSSON (1986, revised record in map), POLHEMUS *et al.* (1995).

****Paracorixa concinna concinna* (Fieber, 1848)**

References. JANSSON (1986, unrevised record in map), POLHEMUS *et al.* (1995).

***Sigara (Halicorixa) stagnalis* (Leach, 1817)**

= *Corisa lugubris* Fieber, 1848

References. LINDBERG (1922, as *Arctocorisa lugubris*), JACZEWSKI (1934, as *Sigara lugubris*), NOVAK & WAGNER (1955, as *Sigara lugubris*), JOSIFOV (1986, as *S. stagnalis pontica*, Dalmatia), PROTIĆ (1998a), STRPIĆ (1998).

Comment. Subspecies assignment of Croatian populations need revision.

***Sigara (Pseudovermicorixa) nigrolineata nigrolineata* (Fieber, 1848)**

= *Corisa fabricii* Fieber, 1851

References. KORLEVIĆ (1887, as *Corisa Fabricii* and *C. v. nigrolineata*), NOVAK & WAGNER (1955), JANSSON (1986, revised record in map), JOSIFOV (1986, Dalmatia), PROTIĆ (1998a), PROTIĆ (1998a,b), MERDIĆ *et al.* (2005).

***Sigara (Retrocorixa) limitata limitata* (Fieber, 1848)**

References. KORLEVIĆ (1887, as *Corixa limitata*), HORVÁTH (1897, as *Corixa limitata*), JANSSON (1986, revised record in map), PROTIĆ (1998a,b), STRPIĆ (1998).

***Sigara (Retrocorixa) semistriata* (Fieber, 1848)**

References. This paper.

****Sigara (Sigara) assimilis* (Fieber, 1848)**

References. JANSSON (1986, unrevised record in map), POLHEMUS *et al.* (1995).

***Sigara (Sigara) striata* (Linnaeus, 1758)**

References. LANGHOFFER (1899, as *Corixa striata*), WAGNER (1962), JANSSON (1986, revised record in map), POLHEMUS *et al.* (1995), PROTIĆ (1998a,b), STRPIĆ (1998).

***Sigara (Subsigara) falleni* (Fieber, 1848)**

References. LANGHOFFER (1899, as *Corixa Fallenii*), JANSSON (1986, revised record in map), POLHEMUS *et al.* (1995), PROTIĆ (1998a), STRPIĆ (1998).

Note. PROTIĆ (1998a) listed the species for Croatia only from 'Istra', Plitvice and Krk with reference to JACZEWSKI (1934), however, there are no such records in the original paper.

****Sigara (Subsigara) fossarum* (Leach, 1817)**

References. JANSSON (1986, revised record in map), POLHEMUS *et al.* (1995).

***Sigara (Vermicorixa) lateralis* (Leach, 1817)**

= *Corisa hieroglyphica* Dufour, 1833

References. KORLEVIĆ (1887, as *Corixa hieroglyphica*), JACZEWSKI (1934, as *Sigara hieroglyphica*), JANSSON (1986, revised record in map), POLHEMUS *et al.* (1995), PROTIĆ (1998a,b), STRPIĆ (1998), RUS (2005).

****Sigara (Vermicorixa) scripta* (Rambur, 1840)**

References. JANSSON (1986, revised record in map), POLHEMUS *et al.* (1995).

NAUCOROIDEA Leach, 1815**NAUCORIDAE Leach, 1815****NAUCORINAE Leach, 1815*****Ilyocoris cimicoides cimicoides* (Linnaeus, 1758)**

References. KORLEVIĆ (1887, as *Naucoris cimicoides*), LANGHOFFER (1899, as *Naucoris cimicoides*), WAGNER (1962, as *Ilyocoris cimicoides*), POLHEMUS *et al.* (1995), PROTIĆ (1998a,b), STRPIĆ (1998, as *Naucoris cimicoides*), MERDIĆ *et al.* (2005).

APHELOCHEIROIDEA Fieber, 1851**APHELOCHEIRIDAE Fieber, 1851*****Aphelocheirus (Aphelocheirus) aestivalis* (Fabricius, 1794)**

= *Aphelocheirus nigrita* Horváth, 1899

References. HORVÁTH (1897, as *A. aestivalis*), HORVÁTH (1899, as *A. nigrita*, synonym), HORVÁTH (1907, as *A. nigrita*), POLHEMUS *et al.* (1995), PROTIĆ (1998a,b), this paper.

NOTONECTOIDEA Latreille, 1802

NOTONECTIDAE Latreille, 1802

ANISOPINAE Hutchinson, 1929

***Anisops sardeus sardeus* Herrich-Schaeffer, 1849**

References. JACZEWSKI (1934, as *A. sardea*), JOSIFOV (1986, Dalmatia), POLHEMUS *et al.* (1995), PROTIĆ (1998a, as *A. sardus*), this paper.

NOTONECTINAE Latreille, 1802

Notonectini Latreille, 1802

***Notonecta (Notonecta) glauca glauca* Linnaeus, 1758**

References. JURINAC (1887), KORLEVIĆ (1887), LANGHOFFER (1899), HORVÁTH (1897), LINDBERG (1922), KANYUKOVA (1973), JOSIFOV (1986, Dalmatia), POLHEMUS *et al.* (1995), PROTIĆ (1998a,b), STRPIĆ (1998), MERDIĆ *et al.* (2005).

****Notonecta (Notonecta) lutea* Müller, 1776**

References. POLHEMUS *et al.* (1995, Dalmatia).

***Notonecta (Notonecta) maculata* Fabricius, 1794**

References. NOVAK & WAGNER (1951), JOSIFOV (1986, Dalmatia), POLHEMUS *et al.* (1995), PROTIĆ (1998a,b), STRPIĆ (1998), MERDIĆ *et al.* (2005).

***Notonecta (Notonecta) meridionalis* Poisson, 1926**

References. JOSIFOV (1986, Dalmatia), POLHEMUS *et al.* (1995), this paper.

***Notonecta (Notonecta) obliqua* Thunberg, 1787**

References. NOVAK & WAGNER (1951), POLHEMUS *et al.* (1995), PROTIĆ (1998a,b), STRPIĆ (1998).

***Notonecta (Notonecta) viridis* Delcourt, 1909**

References. HORVÁTH (1930), JACZEWSKI (1934), NOVAK & WAGNER (1951), JOSIFOV (1986, as Dalmatia), FURLAN & GOGALA (1995), POLHEMUS *et al.* (1995), PROTIĆ (1998a,b), STRPIĆ (1998), KMENT (2001), MERDIĆ *et al.* (2005).

PLEOIDEA Fieber, 1851

PLEIDAE Fieber, 1851

***Plea minutissima minutissima* Leach, 1817**

= *Plea atomaria* (non Pallas, 1771)

= *Plea leachi* McGregor & Kirkaldy, 1899

References. KORLEVIĆ (1887), JACZEWSKI (1934), NOVAK & WAGNER (1951, as *P. leachi*), WAGNER (1962, as *P. atomaria*), JOSIFOV (1986, Dalmatia), PROTIĆ (1990), POLHEMUS *et al.* (1995), PROTIĆ (1998a,b), STRPIĆ (1998), MERDIĆ *et al.* (2005).

GERROMORPHA Popov, 1971**MESOVELIOIDEA Douglas & Scott, 1867****MESOVELIIDAE Douglas & Scott, 1867****MESOVELIINAE Douglas & Scott, 1867*****Mesovelia furcata* Mulsant & Rey, 1852**References. STRPIĆ (1997, 1998), MERDIĆ *et al.* (2005).***Mesovelia vittigera* Horváth, 1895**

References. KMENT (2001).

HEBROIDEA Amyot & Serville, 1843**HEBRIDAE Amyot & Serville, 1843****HEBRINAE Amyot & Serville, 1843*****Hebrus (Hebrus) pusillus pusillus* (Fallén, 1807)**

References. KORLEVIĆ (1887), HORVÁTH (1897), BENEDEK (1970), PROTIĆ (1998a,b), STRPIĆ (1998).

***Hebrus (Hebrusella) ruficeps* Thomson, 1871**

References. HORVÁTH (1897), PROTIĆ (1998a,b).

HYDROMETROIDEA Billberg, 1820**HYDROMETRIDAE Billberg, 1820****HYDROMETRINAE Billberg, 1820*****Hydrometra stagnorum* (Linnaeus, 1758)**

References. KORLEVIĆ (1887), LANGHOFFER (1899), STICHEL (1924), NOVAK & WAGNER (1951), BENEDEK (1970), JOSIFOV (1986, Dalmatia), ANDERSEN (1995), PROTIĆ (1998a,b), STRPIĆ (1998).

GERROIDEA Leach, 1815**VELIIDAE Brullé, 1836****MICROVELIINAE China & Usinger, 1949 (1860)****Microveliini China & Usinger, 1949 (1860)*****Microvelia (Microvelia) reticulata* (Burmeister, 1835)**= *Microvelia schneideri* Scholtz, 1847References. HORVÁTH (1897, as *M. Schneideri*), BENEDEK (1970, as *M. schneideri*), BALARIN (1975), PROTIĆ (1998a,b), STRPIĆ (1998).***Microvelia (Picaultia) pygmaea* (Dufour, 1833)**

References. KORLEVIĆ (1887), HORVÁTH (1897, 1916), BENEDEK (1970), PROTIĆ (1998a,b), STRPIĆ (1998), KMENT (2001).

VELIINAE Brullé, 1836

Velia (Plesiovelia) affinis filippii Tamanini, 1947

References. TAMANINI (1947, 1949, as *V. Filippii*), BENEDEK (1969, 1970), ANDERSEN (1995), PROTIĆ (1998a).

Velia (Plesiovelia) currens (Fabricius, 1794)

References. KORLEVIĆ (1887), HORVÁTH (1897), JACZEWSKI (1934), PROTIĆ (1998a,b), STRPIĆ (1998).

Comment. KORLEVIĆ (1887) listed the species from Rijeka region, as well as HORVÁTH (1897; Fiume = Rijeka); JACZEWSKI (1934) reported a finding from Krk Island. PROTIĆ (1998a,b) and STRPIĆ (1998) listed the species from Croatia based on old published records only. Until the revision of TAMANINI (1947), several other species were misidentified under the name *V. currens* throughout Europe. ANDERSEN (1995) listed the true *V. currens* from Austria, Italy, Switzerland (Tessin), and Yugoslavia. PROTIĆ (1998a) listed its occurrence in Slovenia, Croatia, Serbia and Macedonia, and GOGALA (2003) confirmed the records for Slovenia. The old records published from Croatia are in need of confirmation; however, occurrence of this species in Croatia is more than probable.

Velia (Plesiovelia) mancinii mancinii Tamanini, 1947

References. NOVAK & WAGNER (1951), JOSIFOV (1986, Dalmatia), ANDERSEN (1995), PROTIĆ (1998a,b), STRPIĆ (1998).

Velia (Plesiovelia) muelleri Tamanini, 1947

References. TAMANINI (1947, holotype), NOVAK & WAGNER (1951), MANCINI (1956, as *V. Müllereri*), JOSIFOV (1986, Dalmatia), ANDERSEN (1995), PROTIĆ (1998a), STRPIĆ (1998).

Velia (Plesiovelia) pelagonensis Hoberlandt, 1941

References. TAMANINI (1959), JOSIFOV (1986, Dalmatia), ANDERSEN (1995).

GERRIDAE Leach, 1815

GERRINAE Leach, 1815

Gerrini Leach, 1815

Aquarius najas (De Geer, 1773)

References. JACZEWSKI (1934, as *Gerris (Hygrotrechus) najas*), NOVAK & WAGNER (1951, as *Gerris najas*), BENEDEK (1970, as *G. (Aquarius) najas*), JOSIFOV (1986, Dalmatia), ANDERSEN (1995), PROTIĆ (1998a,b), STRPIĆ (1998), MERDIĆ *et al.* (2005).

Aquarius paludum paludum (Fabricius, 1794)

References. KORLEVIĆ (1887, as *Gerris paludum*), HORVÁTH (1897, as *Gerris paludum*), LANGHOFFER (1899, as *Gerris paludum*), BENEDEK (1970, as *G. (Aquarius) paludum*), PROTIĆ (1998a,b), STRPIĆ (1998), MERDIĆ *et al.* (2005).

Gerris (Gerris) argentatus Schummel, 1832

References. HORVÁTH (1897), LANGHOFFER (1899), BENEDEK (1970), PROTIC (1998a,b), STRPIĆ (1998), KMENT (2001).

Gerris (Gerris) costae fieberi Stichel, 1938

References. KORLEVIĆ (1887, as *G. Costae*), HORVÁTH (1897, as *G. Costae*), LANGHOFFER (1899, as *G. Costae*), LINDBERG (1922, as *G. costæ*), JACZEWSKI (1934, as *G. costae*), NOVAK & WAGNER (1951, as *G. costai*), NOVAK & WAGNER (1955, as *G. costai fieberi*), BENEDEK (1970, as *G. costai fieberi*), MARCUZZI (1983, as *G. costai fieberi*), NIESER (1983, as *G. costae*), JOSIFOV (1986, Dalmatia), ANDERSEN (1995); PROTIC (1998a, as *G. costae costae* and *G. c. fieberi*), PROTIC (1998b, as *G. costai costai* and *G. costae fieberi*), STRPIĆ (1998, as *G. costae*), KMENT (2001), RUS (2005), DAMGAARD (2006).

Gerris gibbifer Schummel, 1832

= *G. gibbifer* var. *flaviventris* Puton, 1879

References. KORLEVIĆ (1887, as *G. gibbifera*), HORVÁTH (1897, incl. *G. gibbifer* var. *flaviventris*), LANGHOFFER (1899), HORVÁTH (1930), JACZEWSKI (1934), NOVAK & WAGNER (1951), BENEDEK (1970), STRPIĆ (1997, 1998), PROTIC (1998a,b).

Note. The previous records of the species may belong to *G. maculatus*. However, STRPIĆ (1997) confirmed occurrence of *G. gibbifer* in Croatia and reported a case of sympatric occurrence of *G. gibbifer* and *G. maculatus* on Krk Island.

Gerris (Gerris) lacustris (Linnaeus, 1758)

References. HORVÁTH (1894), LANGHOFFER (1899), JOSIFOV (1986, Dalmatia), ANDERSEN (1995), PROTIC (1998a,b), STRPIĆ (1997, 1998), MERDIĆ *et al.* (2005).

Gerris (Gerris) maculatus Tamanini, 1946

References. JOSIFOV (1986, Dalmatia), ANDERSEN (1995), STRPIĆ (1997, 1998), PROTIC (1998a), DAMGAARD (2008).

Gerris (Gerris) odontogaster (Zetterstedt, 1828)

References. STRPIĆ (1997, 1998), MERDIĆ *et al.* (2005).

Gerris (Gerris) thoracicus Schummel, 1832

References. KORLEVIĆ (1887, as *G. thoracica*), LANGHOFFER (1899), JACZEWSKI (1934), NOVAK & WAGNER (1951), BENEDEK (1970), JOSIFOV (1986, Dalmatia), ANDERSEN (1995), PROTIC (1998a,b), STRPIĆ (1998).

Gerris (Gerriselloides) asper (Fieber, 1860)

References. HORVÁTH (1897), BENEDEK (1970), ANDERSEN (1995, with?), STRPIĆ (1997, 1998), PROTIC (1998a,b).

Species excluded from the check-list***Micronecta (Micronecta) minutissima (Linnaeus, 1758) (Micronectidae)***

Comment. Although PROTIC (1998a) listed this species for Croatia from Rovinj (JACZEWSKI, 1934), there is no such record in the original paper. As there is no other

record of the species from Croatia, we can remove it from the check-list for the time being.

***Velia (Plesiovelia) caprai* Tamanini, 1947 (Veliidae)**

References. STRPIĆ (1998).

TAMANINI (1947) reported this species from five localities in Istria; two are actually situated in Italy ('Trieste: Boschetto; Rosandra') and three in Slovenia: ('Beca' [= Beka], 'Clanec' [= Klanec pri Kozini], and 'Corso Medio Risano' [= Rižana river]) (see GOGALA, 2003). As there is no other published locality from Croatia, the species is excluded here from the check-list for the time being.

***Velia (Plesiovelia) saulii* Tamanini, 1947 (Veliidae)**

References. ANDERSEN (1995).

Comment. ANDERSEN (1995) interpreted the type locality 'Istria, Val Recca' [= Reka valley] as situated in Croatia, however, it is in Slovenia, as well as other localities mentioned by TAMANINI (1947): 'Istria, Corso Medio Risano, Villa Decani' [= Rižana river, Dekani (Koper)] and 'Istria, Beca Ocisla' [= Beka, Ocizla] (see GOGALA, 2003). As there is no other published locality from Croatia, the species is excluded here from the check-list for the time being.

***Velia (Velia) rivulorum* (Fabricius, 1775) (Veliidae)**

References. HORVÁTH (1897), STICHEL (1924), PROTIC (1998a,b).

Comment. HORVÁTH (1897) recorded the species from Buccari [= Bakar] and Crivenica, STICHEL (1924) from Pridvorje in Dalmatia, and PROTIC (1998a) from Podgora. The records of *V. affinis filippii* from Buccari by BENEDEK (1969, 1970) are most probably based on the HORVÁTH's (1897) material. Until the revision of TAMANINI (1947), several other species were misidentified as *V. rivulorum* throughout Europe. The true *V. rivulorum* is a West Mediterranean species known from Spain, France, Italy, Algeria and Tunisia and it does not occur in Croatia.

***Limnaporus rufoscutellatus* (Latreille, 1807) (Gerridae)**

References. STRPIĆ (1998).

Comment. As there is no other record of the species from Croatia than the list by STRPIĆ (1998), it is excluded here from the check-list for the time being.

DISCUSSION

Altogether, we list 14 families and 59 species of aquatic and semi-aquatic bugs from Croatia – 37 species of Nepomorpha (Nepidae – 2, Belostomatidae – 1, Ochteridae – 1, Micronectidae – 2, Corixidae – 21, Naucoridae – 1, Aphelocheiridae – 1, Notonectidae – 7, Pleidae – 1) and 22 species of Gerromorpha (Mesoveliidae – 2, Hebridae – 2, Hydrometridae – 1, Veliidae – 7, Gerridae – 10). However, for 11 of the listed species no exact locality record has ever been published. For five other species there are no reliable records at all, i.e. *Micronecta minutissima*, *Velia caprai*, *V. rivulorum*, *V. saulii*, and *Limnaporus rufoscutellatus*, and these species are thus omitted from the list for the time being though their occurrence in Croatia (except of

West Mediterranean *V. rivulorum*) is possible. On the other hand, based on examination of new material we provide two new records for Croatia – *Corixa panzeri* and *Sigara semistriata*, the first exact record of *Hesperocorixa linnaei* and *Notonecta meridionalis*, as well as new findings of *Aphelocheirus aestivalis* and *Anisops sardeus sardeus* after more than 100 and 70 years, respectively.

It is clear that this check-list is far from being complete and its main purpose is to encourage other entomologists to collect these interesting insects in Croatia. Judging from the geographical and geomorphological conditions of Croatia, rather rich fauna of true bugs is to be expected, including species with Eurosiberian distribution in northern Croatia (e.g., *Callicorixa praeusta* (Fieber, 1848), species of *Micronecta* sensu stricto), Pannonian elements in eastern Croatia (e.g., *Cymatia rogenhoferi* (Fieber, 1864)), as well as species with Mediterranean distribution in Dalmatia.

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REFERENCES

- AMBRUS, A., BÁNKÚTI, K., CSÁNYI, B., JUHÁSZ, P. & KOVÁCS, T. 1995: New data to the distribution of *Aphelocheirus aestivalis* Fabricius, 1794 (Heteroptera, Naucoridae) in Hungary. *Folia entomologica hungarica*, **56**, 223–256.
- ANDERSEN, N. M., 1990: Phylogeny and taxonomy of water striders, genus *Aquarius* Schellenberg (Insecta, Hemiptera, Gerridae), with a new species from Australia. *Steenstrupia*, **16**, 37–81.
- ANDERSEN, N. M., 1994: Classification, phylogeny, and zoogeography of the pond skater genus *Gerris* Fabricius (Hemiptera: Gerridae). *Canadian Journal of Zoology*, **71** (1993), 2473–2508.
- ANDERSEN, N. M., 1995: Infraorder Gerromorpha Popov, 1971 – semiaquatic bugs, pp. 17–114. In: AUKEMA, B. & CH. RIEGER (eds): *Catalogue of the Heteroptera of the Palaearctic Region*. Vol. 1. Enicocephalomorpha, Dipsocoromorpha, Nepomorpha, Gerromorpha and Leptopodomorpha. The Netherlands Entomological Society, Amsterdam, xxvi + 222 pp.
- ANDERSEN, N. M. & J. R. SPENCE, 1992: Classification and phylogeny of the Holarctic water strider genus *Limnoporus* Stål (Hemiptera, Gerridae). *Canadian Journal of Zoology*, **70**, 753–785.
- ANDERSEN, N. M. & T. A. WEIR, 2003: The genus *Microvelia* Westwood in Australia (Hemiptera: Heteroptera: Veliidae). *Invertebrate Systematics*, **17**, 261–348.
- ANGUS, R. B., 2006: Chromosomal confirmation of the species rank of *Notonecta meridionalis* Poisson, 1926 (Heteroptera: Notonectidae). *Russian Entomological Journal*, **15**, 137–140.
- AUKEMA, B., J. G. M. CUPPEN, N. NIESER & D. TEMPELMAN, 2002: *Verspreidingsatlas Nederlandse wantsen* (Hemiptera: Heteroptera). Deel I: Dipsocoromorpha, Nepomorpha, Gerromorpha & Leptopodomorpha. [Distributional atlas of Dutch true bugs (Hemiptera: Heteroptera). Vol. I: Dipsocoromorpha, Nepomorpha, Gerromorpha & Leptopodomorpha]. *European Invertebrate Survey – Nederland, Leiden*, 169 pp (in Dutch).

- BALARIN, I., 1975: Inventarizacija biljnih bolesti i štetnika na graničnim područjima. Republ. sekret. za poljoprivredu, prehrambenu industriju i šumarstvo SR Hrvatske (Zagreb), **3(1-4)**, 40-67. (Not seen, cited after PROTIĆ (1998a)).
- BENEDEK, P., 1969: A *Velia* Latreille, 1804 gένusz (Heteroptera, Veliidae) Kárpát medencei fajai. (Species of the genera [sic!] *Velia* Latreille, 1804 (Heteroptera, Veliidae) in the Carpathian Basin). Folia Entomologica Hungarica, **22**, 256 - 259 (in Hungarian and English).
- BENEDEK, P., 1970: The semiaquatic Heteroptera in the Carpathian Basin with notes on the distribution and the phenology of the species. Faunistische Abhandlungen Staatliches Museum für Tierkunde in Dresden, **3**, 27-49.
- BERGROTH, E., 1917: Note on *Aphelocheirus aestivalis* Fabr. Entomologist's Monthly Magazine, **53**, 252-253.
- BROOKS, G. T., 1951: A revision of the genus *Anisops* (Notonectidae, Hemiptera). University of Kansas Science Bulletin, **34**, 301-519.
- CARAPEZZA, A., 1997: Heteroptera of Tunisia. Naturalista Siciliano, Serie IV, **21(Suppl. A)**, 1-312.
- COJOCARU, I., 2005: A new record of *Aphelocheirus aestivalis* Fabr. (Insecta: Heteroptera) for Romania. Analele Științifice ale Universității »Al. I. Cuza« Iași, Ser. Biologie Animală, **51**, 81-83.
- COULIANOS, C.-C., 2005: Annotated checklist and distribution of the true bugs (Hemiptera-Heteroptera) of Estonia. Proceedings of the Estonian Academy of Sciences: Biology, Ecology, **54**, 136-165.
- DAMGAARD, J., 2006: Phylogeny and mtDNA phylogeography of two widespread European pond skater species (Hemiptera-Heteroptera: Gerridae: *Gerris* Fabricius). Insect Systematics and Evolution, **37**, 335-350.
- DAMGAARD, J., 2008: MtDNA diversity and species phylogeny of western Palaearctic members of the *Gerris lacustris* group (Hemiptera-Heteroptera: Gerridae) with implications for »DNA barcoding« of water striders. Insect Systematics and Evolution, **39**, 107-120.
- DOLMEN, D., 2004: *Corixa panzeri* (Fieber), a species new to Norway, and *Paracorixa concinna* (Fieber) (Hemiptera-Heteroptera, Corixidae), in Gjerstadvannet, Arendal. Norwegian Journal of Entomology, **51**, 27-29.
- DUFOUR, L., 1863: Essai monographique sur les Bèlostomides. Annales de la Société Entomologique de France, Série IV, **3**, 373-400
- FENT, M., P. KMENT, B. ÇAMUR-ELIPEK & T. KIRGIZ, 2011: Annotated checklist of Enicocephalomorpha, Dipsocoromorpha, Nepomorpha, Gerromorpha and Leptopodomorpha (Hemiptera: Heteroptera) of Turkey with new records from Turkish Thrace. Zootaxa, 2856, 1-84.
- FIEBER, F. X., 1848: Synopsis aller bisher in Europa entdeckten Arten der Gattung *Corisa*. Bulletin de la Société Impériale des Naturalistes de Moscou, **21**, 505-539 + pl. X.
- FIEBER, F. X., 1860: Die europäischen Hemiptera. Halbflügler. (Rhynchota Heteroptera). Gerold's Sohn, Wien, pp. i-vi + 1-112.
- FURLAN, V. & A. GOGALA, 1995: Heteroptera of the Lošinj Island (Croatia). Acta Entomologica Slovenica, **3**, 59-71.
- GEREND, R., 1993: Beitrag zur Kenntnis der einheimischen Wasserwanzen (Hemiptera, Heteroptera) Nachweis mehrerer für die Fauna Luxemburgs neuer Arten. Bulletin de la Société des Naturalistes Luxembourgeois, **106**, 63-65.
- GHEIT, A., 1995: Catalogue des Hémiptères Hydrocorises et Amphibiocorises des provinces nord marocaines (Ire note). Entomologiste (Paris), **51**, 241-249.
- GOGALA, A., 2003: Heteroptera of Slovenia, I.: Dipsocoromorpha, Nepomorpha, Gerromorpha and Leptopodomorpha. Annals for Istrian and Mediterranean Studies, Seria Historia Naturalis, **13**, 229-240.

- GOGALA, M. & A. MODER, 1960: Prispevek k poznavanju favne stenice Slovenije (Hemiptera – Heteroptera). (Beitrag zur Kenntnis der Heteropteren-Fauna Sloweniens). Biološki Vestnik, 7, 85–99 (in Slovene, German summary).
- HEBSGAARD, M. B., N. M. ANDERSEN & J. DAMGAARD, 2004: Phylogeny of the true water bugs (Nepomorpha: Hemiptera-Heteroptera) based on 16S and 28S rDNA and morphology. Systematic Entomology, 29, 488–508.
- HOFFMANN, H.-J., 2008: Zur Verbreitung der Grundwanze *Aphelocheirus aestivalis* (Fabricius, 1794) in Deutschland, nebst Angaben zur Morphologie, Biologie, Fortpflanzung und Ökologie der Art und zum Fund eines makropteren Exemplares (Heteroptera). Entomologische Nachrichten und Berichte, 52, 149–180.
- HORVÁTH, G., 1894: Hemipterološki izlet u Primorje i na Plitvička jezera. [Hemipterological trip to Primorje and Plitvička jezera lakes]. Glasnik Hrvatskoga Naravoslovnoga Društva, 6 (1892–1894), 29–49 (in Croatian).
- HORVÁTH, G., 1897: Ordo Hemiptera. In: PASZLAVSZKY, J. (ed.): A Magyar birodalom állatvilága. A Magyar Birodalomból eddig ismert állatok rendszeres leírása. Fauna Regni Hungariae. Animalium Hungariae hucusque cognitorum enumeratio systematica. A K. M. Természettudományi Társulat, Budapest, 72 pp. (in Hungarian and Latin).
- HORVÁTH, G., 1899: Monographia generis *Aphelocheirus*. Természetrázi Füzetek, 22, 256–267.
- HORVÁTH, G., 1907: Pótlék a magyar birodalom Hemiptera-Faunájához. (Supplementum ad faunam Hemipterorum Regni Hungariae). Annales Musei Nationalis Hungarici, 5, 500–506 (in Hungarian, Latin title).
- HORVÁTH, G., 1916: Note sur les deux *Microvelia* d'Europe. Annales Musei Nationalis Hungarici, 14, 68–71.
- HORVÁTH, G., 1930: Hemiptera. In: Prirodoslovna istraživanja Sjeverno-dalmatinskog otočja. I. Dugi i Kornati. [Natural history investigations of the North-Dalmatian Archipelago. I. Islands Dugi and Kornati]. Prirodoslovna istraživanja kraljevine Jugoslavije, 16, 42–45 (in Croatian).
- JACZEWSKI, T., 1934: Notes on some Palaearctic aquatic and semi-aquatic Heteroptera, chiefly from South-Eastern Europe. Annales Musei Zoologici Polonici, 10, 267–288 + pls. xlv–xlvii.
- JANSSON, A., 1986: The Corixidae (Heteroptera) of Europe and some adjacent regions. Acta Entomologica Fennica, 47, 1–94.
- JANSSON, A., 2000: Interesting collection of Corixidae (Heteroptera) from a fishpond. Entomologica Fennica, 11, 183–184.
- JOSIFOV, M., 1958: Khemipterologichno s'obshchenie III. [Hemipterological communication III]. Izvestiya na Zoologicheskaya Institut (Sofia), 7, 343–349 (in Bulgarian).
- JOSIFOV, M., 1986: Verzeichnis der von der Balkanhalbinsel bekannten Heteropterenarten (Insecta, Heteroptera). Faunistische Abhandlungen Staatliches Museum für Tierkunde Dresden, 14, 61–93.
- JURINAC, A. E., 1887: Prilog fauni zapadne Slavonije. [Contribution to the fauna of western Slavonija]. Glasnik Hrvatskoga Naravoslovnoga Društva, 2, 21–34 (in Croatian).
- KANYUKOVA, E. V., 1973: Gladyschi (Heteroptera, Notonectidae) fauny SSSR. (Water-boatmen (Heteroptera, Notonectidae) of the fauna of the USSR). Entomologicheskoe Obozrenie, 52, 352–366 (in Russian, English summary).
- KANYUKOVA, E. V., 1974: Poluzhestkokrylye semeystva Aphelocheiridae (Heteroptera) fauny SSSR. (Water bugs of the family Aphelocheiridae (Heteroptera) in the fauna of the USSR). Zoologicheskii Zhurnal, 53, 1726–1731 (in Russian, English summary).
- KANYUKOVA, E. V., 1982: Vodomerki (Heteroptera, Gerridae) fauny SSSR. (Water-striders (Heteroptera, Gerridae) of the fauna of the USSR). Trudy Zoologicheskogo Instituta Akademii Nauk SSSR, 105, 61–93 (in Russian, English title).

- KANYUKOVA, E. V., 2003: A key to species of *Arctocoris* from Russia and Mongolia with description of *A. germari mongolica* ssp. n. (Heteroptera: Corixidae). *Zoosystematica Rossica*, **11(2)** (2002), 327–329.
- KANYUKOVA, E. V., 2006: Vodnye poluzhestkokrylye nasekomye (Heteroptera: Nepomorpha, Gerromorpha) fauny Rossii i sopedelnykh stran. [Aquatic and semiaquatic (Heteroptera: Nepomorpha, Gerromorpha) of the fauna of Russia and neighbouring countries]. Dal'nauka, Vladivostok, 296 pp (in Russian, English abstract).
- KATBEH, A., A. CARAPEZZA, & M. AKKAWI, 2000: Heteroptera of Jordan: Specimens preserved in the University of Jordan Insects Museum (Insecta). *Atti dell'Accademia Roveretana degli Agiati, Seria VII*, **10B**, 111–137.
- KHATUKHOV, A. M., A. V. YAKIMOV & V. D. L'VOV, 2008: Gladyski (Heteroptera: Notonectidae) Central'nogo Kavkaza (v predelakh Kabardino-Balkarskoy Respubliki). [Backswimmers (Heteroptera: Notonectidae) of the Central Caucasus (territory of the Kabardino-Balkarian Republic)]. *Vestnik Adygeyskogo Gosudarstvennogo Universiteta, Seriya Estestvenno-matematicheskie i Tekhnicheskie Nauki (Maykop)*, **4**, 117–119 (in Russian).
- KMENT, P., 2001: *Mesovelis vittigera* Horváth and *Microvelis pygmaea* (Dufour) (Heteroptera: Gerromorpha) in Croatia. *Acta Entomologica Slovenica*, **9**, 80–82.
- KORLEVIĆ, A., 1887: Popis raznokrilih rilčara (Rhynchota Heteroptera) okolice riečke. [List of heteropterous insects (Rhynchota Heteroptera) of environs of Rijeka]. *Glasnik Hrvatskoga Naravoslovnoga Društva*, **2**, 35–44 (in Croatian).
- LANGHOFFER, A., 1899: Prilozi entomološkoj fauni Hrvatske. [Contributions to the entomofauna of Croatia]. *Rad Jugoslavenske Akademije Znanosti i Umjetnosti*, **141**, 11–26 (in Croatian).
- LINDBERG, H., 1922: Vezeichnis der von John Sahlberg und Uunio Saalas in den Mittelmeergebieten gesammelten semiaquatischen und aquatischen Heteropteren. *Notulae Entomologicae*, **2**, 15–19 + 46–49.
- LINNAVUORI, R. E. & R. HOSSEINI, 2000: Heteroptera of Guilan with remarks on species of the adjacent areas. Part I. Nepomorpha, Gerromorpha, Leptopodomorpha, Cimicomorpha: Nabidae, Anthocoridae, Cimicidae, Microphysidae. Guilan University Press, Rasht, 94 pp.
- LINNAVUORI, R. E., P. KMENT & A. CARAPEZZA, 2011: Order Hemiptera, suborder Heteroptera, infraorders Nepomorpha, Gerromorpha, and Leptopodomorpha. In: HARTEN, A. VAN (ed.): *Arthropod fauna of the UAE. Volume 4. Dar Al Ummah Printing, Publishing, Distribution and Advertising, Abu Dhabi* (in press).
- MANCINI, C., 1956: Emitteri eterotteri del Gargano e delle Tremiti con osservazioni sulle specie a distribuzione transadriatica. *Memorie di Biogeografia Adriatica*, **3**, 161–195.
- MARCUZZI, G., 1983: Considerazioni faunistiche su alcuni eterotteri raccolti nel Bacino del Mediterraneo. *Quaderni di Ecologia Animale*, **22**, 5–31.
- MENKE, G. L., 1963: An overlooked Old World species of *Lethocerus* (Hemiptera: Belostomatidae). *Journal of the Kansas Entomological Society*, **36**, 258–259.
- MERDIĆ, E., N. KEŽA & Z. CSABAI, 2005: Aquatic insects in Kopački Rit Nature Park (Heteroptera: Nepomorpha, Gerromorpha and Coleoptera: Hydradephaga, Hydrophiloidea). *Natura Croatica*, **14**, 263–272.
- NIESER, N., 1972: De Nederlandse water – en oppervlakte wantsen (Heteroptera: Nepomorpha en Gerromorpha). [The Dutch aquatic and semi-aquatic bugs (Heteroptera: Nepomorpha and Gerromorpha)]. *Wetenschappelijke Mededelingen van de Koninklijke Nederlandse Natuurhistorische Vereniging*, **155**, 1–103 (in Dutch).
- NIESER, N., 1983: Faunistical notes on aquatic Heteroptera VI. Records from Portugal and some Mediterranean localities. *Ciência Biológica, Ecology and Systematics*, **5**, 105–115.
- NIESER, N., 2002: Guide to aquatic Heteroptera of Singapore and Peninsular Malaysia. IV. Corixoidea. *Raffles Bulletin of Zoology*, **50**, 263–274.

- NIESER, N., M. BAENA, J. MARTINEZ-AVILES & A. MILLÁN, 1994: Claves para la identificación de los heterópteros acuáticos (nepomorpha & gerromorpha [sic!]) de la Península Ibérica – con notas sobre las especies de las Islas Azores, Baleares, Canarias y Madeira. In: PRAT, N. (ed.): Claves de identificación de la flora y fauna de las aguas continentales de la Península Iberica. Publ. 5. Asociacion Española de Limnología, Madrid, 112 pp.
- NIESER, N. & A. MILLÁN, 1989: Two new species of *Aphelocheirus* from the Iberian Peninsula (Heteroptera: Naucoridae). *Entomologische Berichten (Amsterdam)*, **49**, 111–117.
- NOVAK, P. & E. WAGNER, 1951: Prilog poznavanju faune Hemiptera Dalmacije (Hemiptera – Heteroptera). (Beitrag zur Kenntnis der Hemipteren-Fauna Dalmatiens (Hem.-Heteroptera)). *Godišnjak Biološkog Instituta u Sarajevu*, **4**, 59–80 (in Croatian, German summary).
- NOVAK, P. & E. WAGNER, 1955: II. Prilog poznavanju faune Hemiptera Dalmacije (Hemiptera – Heteroptera). (II. Beitrag zur Kenntnis der Hemipteren-Fauna Dalmatiens). *Zaštita Bilja*, **30** (Dodatak), 1–10 (in German, Croatian introduction).
- PAPÁČEK, M., 2003: Two rare water bug species (Heteroptera: Nepomorpha) new for the insect fauna of the Novohradské Mountains, pp. 145–148. In: PAPÁČEK, M. (ed.): Biodiverzita a přírodní podmínky Novohradských hor II. [Biodiversity and natural conditions of Novohradské hory Mts. II]. University of South Bohemia & Institute of Entomology, Czech Academy of Sciences, České Budějovice, 221 pp.
- PAPÁČEK, M. & T. SOLDÁN, 2008: Structure and development of the reproductive system in *Aphelocheirus aestivalis* (Hemiptera: Heteroptera: Nepomorpha: Aphelocheiridae). *Acta Entomologica Musei Nationalis Pragae*, **48**, 299–318.
- PEREZ GOODWYN, P. J., 2006: Taxonomic revision of the subfamily Lethocerinae Lauck & Menke (Heteroptera: Belostomatidae). *Stuttgarter Beiträge zur Naturkunde, Serie A (Biologie)*, **695**, 1–71.
- POLHEMUS, J. T., A. JANSSON & E. KANYUKOVA 1995: Infraorder Nepomorpha – water bugs, pp. 13–76. In: AUKEMA, B. & CH. RIEGER (eds): Catalogue of the Heteroptera of the Palaearctic Region. Vol. 1. Enicocephalomorpha, Dipsocoromorpha, Nepomorpha, Gerromorpha and Leptopodomorpha. The Netherlands Entomological Society, Amsterdam, xxvi + 222 pp.
- PROTIĆ, LJ., 1990: Zbirka Hemiptera – Heteroptera Nikole A. Kormileva u Prirodnjačkom muzeju u Beogradu. Drugi deo. [Collection of Hemiptera – Heteroptera of Nikolai A. Kormilev in the Natural History Museum in Belgrade. Second Part]. Habilitacioni rad za zvanje viši kustos. Natural History Museum, Belgrade (unpublished manuscripted, cited after PROTIĆ (1998a)).
- PROTIĆ, LJ., 1998a: Catalogue of the Heteroptera fauna of Yugoslav countries. Part one. Prirodnjački Muzej u Beogradu, Posebna Izdanja, **38**, 1–215.
- PROTIĆ, LJ., 1998b: Check list of the Heteroptera fauna of Yugoslav countries. *Glasnik Prirodnjačkog Muzeja u Beogradu (B)*, **48** (1993–1994), 33–61.
- PROTIĆ, LJ., 2001: Catalogue of the Heteroptera fauna of Yugoslav countries. Part two. Prirodnjački Muzej u Beogradu, Posebna Izdanja, **39**, 1–271.
- PROTIĆ, LJ. & I. ŽIVIĆ, 2007: New data on water bugs (Heteroptera) in Serbia. *Acta Entomologica Serbica*, **12**, 17–26.
- RABITSCH, W. & H. ZETTEL, 2000: Zur Wasserwanzenfauna (Heteroptera: Gerromorpha, Nepomorpha) des nördlichen Österreich. *Linzer Biologische Beiträge*, **32**, 1257–1268.
- REUTER, O. M., 1912: Hemipterologische Miscellen. Öfersigt af Finska Vetenskapssocietetens Förhandlingar, **54A(7)**, 1–76.
- RUS, I., 2005: Katalog sbírky ploštíc (Heteroptera) kolínského rodáka Otokara Kubíka uložené v Regionálním muzeu v Kolíně – část I. (Catalogue of the Heteroptera collection of Otokar Kubík deposited in Regional Museum Kolín. – Part I.). *Práce Muzea v Kolíně, Řada Přírodovědná*, **6** (2004), 15–80 (in Czech, English summary).
- SAVAGE, A. A., 1989: *Adults of the British aquatic Hemiptera Heteroptera. A key with ecological notes*. Freshwater Biological Association, Ambleside, 173 pp.

- SCHUMACHER, F., 1917: *Belostoma (Lethocerus) cordofanum* Mayr, ein riesenhaftes tropisches Wasserinsekt und seine Verbreitung auf der Balkanhalbinsel. Sitzungsberichte der Gesellschaft Naturforschender Freunde zu Berlin, **1917(8)**, 516–519.
- SOÓS, N., P. BODA & Z. CSABAI, 2009: First confirmed occurrences of *Notonecta maculata* and *N. meridionalis* (Heteroptera: Notonectidae) in Hungary with notes, maps, and a key to the *Notonecta* species of Hungary. Folia Faunistica Hungarica, **60**, 67–78.
- SOÓS, N., A. PETRI A., ZS. NAGY-LÁSZLÓ & Z. CSABAI, 2010: *Anisops sardus* Herrich-Schaeffer, 1849: first records from Hungary (Heteroptera: Notonectidae). Folia Entomologica Hungarica, **71**, 15–18.
- STRAKA, M., P. KMENT, J. SYCHRA & J. HELEŠIĆ, 2009: The proposed Úvalský rybník Nature Monument, an important refuge for wetland insects in South Moravia (Czech Republic): A species inventory of Odonata, Heteroptera and Coleoptera (partim) with the first Czech record of *Corixa panzeri* (Corixidae). Acta Musei Moraviae, Scientiae Biologicae, **94**, 87–116.
- STICHEL, W., 1924: Die Hemipterensammlung des Zoologischen Institutes in Berlin. (Schluss). Internationale Entomologische Zeitschrift, **17**, 196–197.
- STICHEL, W., 1955–1956: Illustrierte Bestimmungstabellen der Wanzen. II. Europa (Hemiptera-Heteroptera Europae). Vol. 1. Wolfgang Stichel, Berlin – Hermsdorf, 168 pp.
- STRPIĆ, V., 1995: Preliminarni podaci za faunu Heteroptera Velebita s posebnim osvrtom na NP »Paklenica«. (Preliminary data on bug fauna (Heteroptera, Insecta) of Mt. Velebit with special reference to National Park »Paklenica«). Paklenički Zbornik, **1**, 153–159 (in Croatian, English abstract).
- STRPIĆ, V., 1997: Four species of semiaquatic bugs (Heteroptera, Gerromorpha) new for Croatian fauna. Natura Croatica, **6**, 451–455.
- STRPIĆ, V., 1998: Fauna Croatica XVII/1. Index of True Bugs [Heteroptera, Insecta] in Croatia. Popis vrsta stjenica (Heteroptera, Insecta) u Hrvatskoj (manuscript in Croatian). Downloaded from internet, no more available.
- TAMANINI, L., 1947: Contributo ad una revisione del genere *Velia* Latr. e descrizione di alcune specie nuove Hemiptera Heteroptera Veliidae). Memorie della Società Entomologica Italiana, **26**, 17–74.
- TAMANINI, L., 1949: Secondo contributo allo studio del genere *Velia* Latr. (Heteroptera: Hydrometridae). Bollettino della Società Entomologica Italiana, **79**, 35–40.
- TAMANINI, L., 1959: Valore tassonomico della *Velia serbica* Tam. e brevi osservazioni sulle *Velia* della Bulgaria. Atti della Accademia Roveretana degli Agiati, Series 5, **6** (1957), 131–135.
- WAGNER, E., 1962: 2. Beitrag zur Heteropteren-Fauna Macedoniens (Hem. Het.). Fragmenta Balcanica, **4**, 115–122.
- TAMANINI, L., 1979: Guide per il riconoscimento delle specie animali delle acque interne italiane. 6. Eterotteri acquatici (Heteroptera: Gerromorpha, Nepomorpha). Consiglio Nazionale delle Ricerche, Verona, 106 pp.
- WRÓBLEWSKI, A., 1960: Micronectinae (Heteroptera, Corixidae) of Hungary and of some adjacent countries. Acta Zoologica Academiae Scientiarum Hungaricae, **6**, 441–458.
- WRÓBLEWSKI, A., 1980: Pluskwiaki (Heteroptera). Fauna słodkowodna Polski. Zesz. 8. [True bugs (Heteroptera). Freshwater fauna of Poland. Vol. 8]. Państwowe Wydawnictwo Naukowe, Warszawa, Poznań, 156 pp (in Polish).
- ZIMMERMANN, G., 1982: Beiträge zur Wasserwanzen-Fauna Griechenlands I (Heteroptera, Nepomorpha, Gerromorpha, Saldidae). Marburger Entomologische Publikationen, **1**, 183–216.
- ŽIVIĆ, I., Z. MARKOVIĆ & M. BRAJKOVIĆ, 2006: Influence of the temperature regime on the composition of the macrozoobenthos community in a thermal brook in Serbia. Biologia (Bratislava), **61**, 179–191.
- ŽIVIĆ, I., L. PROTIĆ & Z. MARKOVIĆ, 2007: Southernmost finding in Europe of *Aphelocheirus aestivalis* (Fabricius, 1794) (Hemiptera: Heteroptera: Aphelocheiridae). Zootaxa, **1496**, 63–68.