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ANNOTATED CHECKLIST OF THE MINUTE MOSS BEETLES (INSECTA: COLEOPTERA: HYDRAENIDAE) OF CROATIA, WITH TWO LECTOTYPE DESIGNATIONS

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This is the first annotated checklist of the Hydraenidae of Croatia. It is based on reliable literature data and the examination of unpublished specimens identified by the authors. A total of 65 species is confirmed to occur in Croatia: 26 species of *Hydraena* Kugelann, 1794, nine species of *Limnebius* Leach, 1825, and 30 species of *Ochthebius* Leach, 1815. With regard to the biogeographical regions of Croatia, 47 of these species are found in the Mediterranean Region, 28 in the Continental and 14 in the Alpine Region. Four species are recorded from Croatia for the first time: *Hydraena* (s. str.) *assimilis* Rey, 1885, *Limnebius* (s. str.) *aluta* Bedel, 1881, *Ochthebius* (*Asiobates*) *flavipes* Dalla Torre, 1877, and *O.* (s. str.) *pedicularius* Kuwert, 1887. Four species are classified as "unconfirmed or doubtfully recorded" from Croatia. *Ochthebius* (*Asiobates*) *bicolon* Germar, 1824 is deleted from the Croatian checklist. An additional 29 species that potentially could occur in this country are discussed. Only one hydraenid species, *Hydraena angustata* Sturm, 1938, is currently regarded as endemic to Croatia, but it is assumed to be more wide-spread. A total of 14 Croatian hydraenid species is regarded as endemic or subendemic to the Balkan Region. Lectotypes are designated for *Hydraena* (s. str.) *croatica* Kuwert, 1888 and *Ochthebius* (*Aulacochthebius*) *narentinus* Reitter, 1885. A photograph of the dorsal habitus of *H.* (s. str.) *croatica* is published for the first time. The history of the exploration of the Hydraenidae of Croatia is outlined. Compared to other South European countries like Spain or Italy, the knowledge of the hydraenid fauna of Croatia is still remarkably poor, and very few Croatian hydraenid specimens have been barcoded so far; only one specimen was found databased in BOLD and GeneBank (accessed June 2025).

Keywords: water beetles, *Hydraena*, *Limnebius*, *Ochthebius*, Balkan Region, faunistics, distribution, endemism, new records, history of exploration, lectotype designations

Jäch, M.A., Brojer, M., Lugić, E. & Mičetić Stanković, V.: Popis vrsta šavoljika (Insecta: Coleoptera: Hydraenidae) Hrvatske, s opisima dvaju lektotipova. Nat. Croat., Vol. 34, No. 2, _____, 2025, Zagreb.

Ovaj rad predstavlja prvi popis vrsta porodice Hydraenidae Hrvatske. Popis je temeljen na relevantnim literaturnim podacima kao i na do sada neobjavljenim nalazima i determinaciji vrsta od strane autora. Ukupno je zabilježeno 65 vrsta raspoređenih unutar tri roda: rod *Hydraena* Kugelann, 1794 s 26 vrsta, rod *Limnebius* Leach, 1825 s devet vrsta te rod *Ochthebius* Leach, 1815 s 30 vrsta. Na osnovu biogeografske analize 47 vrsta je ustanovljeno u mediteranskoj regiji, 28 u kontinentalnoj, a 14 u alpinskoj regiji. Četiri vrste su novi nalazi za hrvatsku faunu: *Hydraena* (s. str.) *assimilis* Rey, 1885, *Limnebius* (s. str.) *aluta* Bedel, 1881, *Ochthebius* (*Asiobates*) *flavipes* Dalla Torre, 1877 i *O.* (s. str.) *pedicularius* Kuwert, 1887, dok su za četiri vrste nalazi klasificirani kao neprovjereni ili upitni. Vrsta *Ochthebius* (*Asiobates*) *bicolon* Germar, 1824 je ovim istraživanjem uklonjena s popisa hrvatske faune, a za 29 vrsta pretpostavljena je prisutnost na području Hrvatske. Za sada je samo jedna vrsta,

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Hydraena angustata Sturm, 1938, klasificirana kao endemska za Hrvatsku, ali s pretpostavkom da joj je areal distribucije i veći. Važno je naglasiti da je 14 vrsta ustanovljenih ovim istraživanjem endemskog ili subendemskog rasprostranjenja za područje Balkana. U sklopu ovog rada određeni su lektotipovi za vrste *Hydraena* (s. str.) *croatica* Kuwert, 1888 i *Ochthebius* (*Aulacochthebius*) *narentinus* Reitter, 1885 te je prvi puta objavljena fotografija dorzalne strane habitusa vrste *H.* (s. str.) *croatica*. Također, ukratko je predstavljena povijest istraživanja porodice Hydraenidae na području Hrvatske. Zaključno, u usporedbi sa drugim južnoeuropskim zemljama poput Španjolske ili Italije, znanje o fauni porodice Hydraenidae u Hrvatskoj je još uvijek nedostatno. Tako je primjerice do sada je svega nekoliko primjeraka s područja Hrvatske DNA barkodirano sa svega jednom jedinkom pronađenom u bazi podataka BOLD i GeneBank (pristupljeno lipanj 2025).
Keywords: vodeni kornjaši, *Hydraena*, *Limnebius*, *Ochthebius*, Balkan, fauna, rasprostranjenost, endemske vrste, novi nalazi, povijest istraživanja, određivanje lektotipova

INTRODUCTION

The Hydraenidae or minute moss beetles (Croatian: šavoljike) are a family of "true water beetles" of world-wide distribution, occurring even in the Antarctic Realm and at elevations above 5,000 m (JÄCH & BALKE, 2008; JÄCH *et al.*, 2016). Hydraenids are generally very small, ranging in body length (measured from the anterior margin of the labrum to the elytral apex) from 0.8 mm (some *Limnebius* spp.) to 3.5 mm (*Ochthebius granulatus* Mulsant, 1844). In many countries, even in Europe, hydraenids are still poorly studied, not only because of their small size, but also because of their cryptic habitats (tiny puddles, the interstitial of gravel banks, cliff seepages, or even supralittoral cracks in rocky sea shores). Furthermore, some species have a very restricted distribution, as for instance *Hydraena angustata* Sturm, 1938, the only hydraenid species currently regarded as endemic to Croatia, with an approximate range of about 2,000 km², based on all known specimens and verified literature records.

Thirty-nine genera and more than 2,000 species of Hydraenidae are currently recognized world-wide. In Croatia, only the three globally most wide-spread genera, *Hydraena* Kugelann 1794, *Limnebius* Leach, 1815, and *Ochthebius* Leach, 1815, occur.

An annotated checklist of the Hydraenidae of Croatia has not been published so far. Some early attempts to summarize the distribution of the hydraenids of "Dalmatia", the coastal part of Croatia, were published by MÜLLER (1909) and NOVAK (1952). However, at that time, Dalmatia included also the surroundings of Herceg Novi and the Bay of Kotor, which are now part of Montenegro. MÜLLER (1909) recorded a total of 28 species and subspecies from the Croatian part of Dalmatia, while an additional three species (*Hydraena dalmatina* Ganglbauer, 1901 and *H. morio* Kiesenwetter, 1849, and *H. pulchella* Germar, 1824) were recorded only from "Castelnuovo" (Herceg Novi, Montenegro). NOVAK (1952) provided a summary of the Hydraenidae of the "Adriatic coast", which in fact refers to the area of

"Dalmatia" sensu MÜLLER (1909) comprising also the northernmost part of the coast of Montenegro. Largely based on the data provided by MÜLLER (1909), NOVAK (1952) listed 28 taxa (plus five that were recorded only from present-day Montenegro). These early contributions by MÜLLER (1909) and NOVAK (1952) are based largely on outdated nomenclature and on a considerable number of misidentifications and therefore cannot be regarded as reliable data sources. Furthermore, the data published by SCHLOSSER KLEKOVSKI (1877), who provided the first substantial faunistic account on the Hydraenidae of Croatia, recording a total of 13 species, partly with detailed localities, were not mentioned by MÜLLER (1909) and NOVAK (1952) at all. In his "Catalogus faunae Jugoslaviae", GUÉORGUIEV (1971) listed about 60 taxa from Croatia, largely without any accurate locality data, and therefore this "catalogue" also cannot be regarded as a reliable data source.

The most recent information on the hydraenid species occurring in Croatia was provided in the "Catalogue of Palaearctic Coleoptera" (JÄCH & SKALE, 2015), which includes 66 taxa from Croatia but does not contain detailed locality data or information on the faunistic literature.

The present article provides the first annotated checklist of the minute moss beetles of Croatia based on a review of reliable literature data and on the examination of specimens deposited in various museums and private collections. Furthermore, lectotypes are designated for two hydraenid species described from Croatia in the 19th century.

In addition, the history of the exploration of the Hydraenidae of Croatia is outlined below.

MATERIAL AND METHODS

The studied specimens are deposited in the following institutions and private collections:

CFB coll. Hans Fery, Berlin, Germany
CFS coll. Dirk Frenzel, Sonneberg, Germany
CLK coll. Manfred Lederwasch, Kufstein, Austria
CMT coll. Ladislav Mencl, Týnec nad Labem, Czechia
CPL coll. Egon Pretner, deposited in the Slovenian Museum of Natural History [Prirodoslovni muzej Slovenije], Ljubljana, Slovenia
CSG coll. Andre Skale, Gera, Germany
DEI Senckenberg Deutsches Entomologisches Institut, Müncheberg, Germany
GMV Varaždin City Museum [Gradski muzej Varaždin], Varaždin, Croatia (Mišel Jelić, Ivica Pakrac)

HNHM Hungarian Natural History Museum, Budapest, Hungary (György Makranczy)

HPM Croatian Natural History Museum [Hrvatski prirodoslovni muzej], Zagreb, Croatia

IRSNB Institut royal des Sciences naturelles de Belgique, Bruxelles, Belgium

MHNG Muséum d'Histoire naturelle, Genève, Switzerland

MNHNP Museum National d'Histoire Naturelle, Paris, France

MNB Museum für Naturkunde, Leibniz-Institut für Evolutions- und Biodiversitäts-forschung [formerly: Zoological Museum of the Humboldt University of Berlin], Berlin, Germany

NMW Natural History Museum Vienna [Naturhistorisches Museum Wien], Wien, Austria

PMS Natural History Museum Split [Prirodoslovni muzej i zoološki vrt grada Splita], Split, Croatia (Bože Kokan)

SNMB Slovak National Museum [Slovenské národné múzeum], Bratislava, Slovakia

The GMV contains only 10 specimens of Hydraenidae, none of which is of faunistic significance.

Due to the currently poor accessibility, the following collections have not (or only partly) been examined: collection of Edmund Reitter in the HNHM; the National Museum of Bosnia and Herzegovina [Zemaljski muzej Bosne i Hercegovine, ZMBH], Sarajevo, Bosnia and Herzegovina, containing parts of the collection of V. Apfelbeck; and the Civico Museo di Storia Naturale di Trieste (CMSNT), Italy, containing parts of the collections of G. Müller and A. Steinbühler.

Unfortunately, the collection of J.K. Schlosser Klekovski (Figs 1–3), deposited in the HPM, could not be examined adequately, because the collection is poorly preserved; some specimens are damaged, destroyed or completely lost. Furthermore, the specimens are not provided with identification labels (with two exceptions) or locality labels, only consecutive numbers written on variously coloured paper are attached to them. Obviously, these numbers refer to a list, which includes additional information on the identification and provenance. However, such a list could not be found so far. We decided to leave the specimens untouched (undissected) to preserve their original condition for historical reasons.

Figs 1–4. Historical specimens of Hydraenidae collected in Croatia in the 19th century: 1–3) *Hydraena* spp. (1), *Limnebius* spp. (2), *Ochthebius* spp. (3) of the historical, separately stored, original collection of J.K. Schlosser Klekovski (1808–1882), deposited in the HPM; 4) *Ochthebius* (*Asiobates*) *hebaueri*, dissected male with labels (the green label is typical of the E. Eppelsheim collection, labels not to scale), collected by V. Kahr (1798–1867), deposited in the NMW.

History of the exploration of the Hydraenidae of Croatia

The first hydraenid species that have been recorded from Croatia are probably those listed by DEJEAN (1821: 50): "*Hydræna angustata* Dej." (nomen nudum, referring to *H. angustata* Sturm, 1938, deposited in the MNHNP, examined by M.A. Jäch) and "*Ochthebius pallidus*

Dej." (nomen nudum). The provenance of *Hydraena angustata* was quoted as "Illyria", which either refers to the Napoleonic "Illyrian Provinces" (1809–1814) or their successor state, the "Kingdom of Illyria" (1816–1849), a crown land of the Austrian Empire. "Illyria" comprised parts of today's Italy, Slovenia, Austria and Croatia, but it can be assumed that the specimens listed by DEJEAN (1821) originated from NW Croatia, because *H. angustata* has so far not been found anywhere outside the Primorje-Gorski Kotar County. It should, however, be kept in mind that the exact distribution of this species still needs to be clarified. The provenance of the second species, "*Ochthebius pallidus*", was quoted as "Dalmat.[ia]"; *O. pallidus* is regarded as a nomen nudum, which probably refers to *O. meridionalis* Rey, 1885 (see below).

The first substantial faunistic account on the Hydraenidae of Croatia was published by SCHLOSSER KLEKOVSKI (1877), a famous botanist and entomologist (BLAGEC, 2014), who recorded a total of 13 hydraenid species. Joseph Calasenz Schlosser von Klekovski (1808–1882) was born in Jindřichov (Moravia, Czechia). After completing his medical studies and receiving his PhD from the University of Vienna (Austria) he moved to Croatia in 1836 to work as a physician. In the years 1877–1879 he published the first comprehensive contribution (in three volumes) on the Croatian beetle fauna under his Croatian name Josip Krasoslav Schlosser Klekovski. Unfortunately, some species names used in his book, such as "*Ochthebius margipallens* Latr." and "*Ochthebius pallidus* Dej.", cannot be attributed to valid species. Furthermore, his identifications are partly incorrect and more or less unverifiable, because of the reasons explained above under "Material and methods".

The exploration of the hydraenid fauna of Croatia is based mainly on the activities of Austrian coleopterists. Following the example of the members of the imperial family, many Austrians were dedicated naturalists and insect collectors at the turn of the century. Lured by a veritable cornucopia of rare and undescribed insect species, hundreds of amateurs and professional insect dealers travelled to the largely unexplored southern crown lands of the Empire: the Austrian Littoral (Trieste Province, a remnant of the former Kingdom of Illyria), Carniolia, Croatia-Slavonia, Dalmatia, as well as Bosnia and Herzegovina. Numerous type specimens, collected during these years, are deposited in the NMW. The insect trade was a very prosperous business at that time. Hordes of coleopterists from the northern parts of the empire set out for the south, preferably using the "Austrian Southern Railway", which linked the capital Vienna with the port of Trieste (the capital of the crownland "Austrian Littoral") since 1857. From Trieste, they were able to continue their journey to the Dalmatian coast by boat, or, since 1876 by train to Pola [today: Pula], Austria's main naval base at the southern tip of

the Istrian Peninsula. Train travels to Trieste became so popular among coleopterists that even train schedules of the "Austrian Southern Railway" were printed on the inside back cover in some of the fascicles (e.g. vol. 3, fascicle 4, 1914) of the first volumes of the Viennese beetle journal "Coleopterologische Rundschau" (Coleopterological Review), founded in 1911 (JÄCH & SCHUH, 2012).

List of coleopterists of the Austrian Empire who substantially contributed to the exploration of the Hydraenidae of Croatia (in alphabetical order):

APFELBECK, Victor (1859–1934), born in Eisenerz (Styria, Austria), forester for the famous Hungarian Count Batthyâny in Ludbreg, Croatia (1878–1886), and later in Sarajevo, Bosnia and Herzegovina (1887–1890); from April 1890 till 1925 he was curator at the State Museum in Sarajevo. In between he ran an insect trading business in Sarajevo (1889, 1911).
Apfelbeck described *Hydraena homogyna* Apfelbeck, 1909 (a junior synonym of *H. subintegra* Ganglbauer, 1901), based on specimens collected in Bosnia and Herzegovina, and he collected the only known Croatian specimens of several rare hydraenid species, e.g., *Hydraena egoni* Jäch, 1986, *Ochthebius hungaricus* Endrödy-Younga, 1967, *O. montanus* Frivaldszky, 1881, and it can be assumed that the type material of *Hydraena croatica* Kuwert, 1888 and maybe also *H. perparvula* Kuwert, 1890, a junior synonym of *H. pulchella* Germar, 1824 was collected by Apfelbeck near Ludbreg.
Furthermore, Apfelbeck was the first author, who illustrated the male genitalia of Hydraenidae (i.e., *Hydraena bosnica* Apfelbeck, 1909, *H. gracilis* Germar, 1824, *H. subintegra*), thereby contributing immensely to the enhancement of the taxonomy of this family (Apfelbeck, 1909).

GANGLBAUER, Ludwig (1856–1912), born in Vienna (Austria), one of the most famous coleopterists at his time, 1883–1912 curator and 1906–1912 head of the Zoological Department of the NMW, co-founder (1882) and editor (1882–1884) of the "Wiener Entomologische Zeitung" (Viennese Entomological Journal), which eventually has been united with the "Koleopterologische Rundschau" (Coleopterological Review) in 1934.
Ganglbauer is the author of ten valid Croatian hydraenid species (= 15 %), plus one junior synonym, all described in 1901 and 1904: *Hydraena dalmatina* Ganglbauer, 1901, *H. kaufmanni* Ganglbauer, 1901, *H. paganettii* Ganglbauer, 1901, *H. schuleri* Ganglbauer, 1901, *H. subintegra* Ganglbauer, 1901, *Limnebius fallaciosus* Ganglbauer, 1904, *L. paganettii* Ganglbauer, 1904, *Ochthebius dalmatinus* Ganglbauer, 1904, *O. fallaciosus* Ganglbauer, 1901, *O. montenegrinus* Ganglbauer, 1901, and *Ochthebius muelleri* Ganglbauer, 1901

(currently regarded as a junior synonym of *Ochthebius deletus* Rey, 1885). *Hydraena ganglbaueri* Apfelbeck, 1912, a junior synonym of *H. bosnica* Apfelbeck, 1909 described from Bosnia and Herzegovina, and Croatia has been dedicated to Ganglbauer by APFELBECK (1912).

HOLDHAUS, Karl (1883–1975), born in Baden near Vienna, Austria (1905–1949 NMW staff member); K. Holdhaus collected several hydraenid species in Croatia, including the type specimens of *Hydraena subjuncta* Orchymont, 1930 and *Limnebius fallaciosus* Ganglbauer, 1904.

KAHR, Veit (1798–1867), insect dealer (NONVEILLER, 1999) from Fürstenfeld (eastern Styria, Austria) [erroneously spelled "Fürstenberg" in Horn *et al.* (1990)]. Besides the specimens in the MNHNP (Dejean collection) mentioned above, the specimens collected by J.K. Schlosser Klekovski (HPM) (Figs 1–3) and by V. Kahr (NMW) (Fig. 4) are probably the oldest, still existing Croatian specimens of Hydraenidae. One species of *Limnebius* and four species of *Ochthebius* labelled "Dalmatia Kahr" (without date or detailed locality information), obviously collected before 1868, have been traced (see below).

KAUFMANN, Josef (1836–1913), born in Großmugl (Lower Austria), a clerk at the "Austrian Southern Railway", and one of the most dedicated Coleopterists at his time; J. Kaufmann collected many new beetle species in Dalmatia, including *Hydraena kaufmanni* (erroneously listed under Tenebrionidae in NONVEILLER (1999: 198)), which has been dedicated to him by GANGLBAUER (1901).

KNISCH [spelled "KNIŽ" in his early works], Alfred (1885–1926), born in Vienna (Austria). KNISCH (1924) published a world catalogue of the Hydraenidae (at that time still regarded as a subfamily of the unrelated Hydrophilidae). Knisch collected the only specimens of *Limnebius perparvulus* Rey, 1884 known from Croatia so far.

MÜLLER, Josef (resp. Guiseppe) (1880–1964), born in Zadar (Croatia), moved to Graz (Austria) in 1898 to obtain his PhD (natural history) in 1902; employment as curator at the Civico Museo di Storia Naturale di Trieste (Italy) in 1921 (from 1928–1946 director of that museum).

Müller can be regarded as Austrian (his father was Austrian, and he studied in Graz), as Croatian (because of his mother and his place of birth) and as Italian (because of his permanent employment in Trieste, where he spent most of his live and where he died at the age of 84).

Josef Müller collected the only specimens of *Ochthebius fallaciosus* Ganglbauer, 1901 known from Croatia so far. *Ochthebius muelleri* (currently regarded as a junior synonym of *O. deletus*) has been dedicated to Müller by GANGLBAUER (1901), and *Hydraena muelleri* Pretner, 1931 has been dedicated to Müller by PRETNER (1931); the latter species was originally described from Slovenia and Italy, but it can be assumed that it occurs in northern Croatia as well, because its nearest localities (e.g., Zagorje near Lesično) lie only about 10 km from the Croatian border.

PAGANETTI-HUMMLER, Gustav (1871–1949), born in Vienna (Austria), a very eager collector and insect dealer. *Hydraena paganettii* Ganglbauer, 1901 and *Limnebius paganettii* Ganglbauer, 1904 have been dedicated to Paganetti-Hummler based on specimens, which were collected by him in Montenegro.

REITTER, Edmund (1845–1920), born in Moravia (Czechia), one of the most famous coleopterists at that time, co-founder (1882) and editor (1882–1918) of the "Wiener Entomologische Zeitung" (Viennese Entomological Journal), which eventually was united with the "Koleopterologische Rundschau" (Coleopterological Review) in 1934; insect dealer (since 1879 in Vienna, 1881–1891 in Mödling near Vienna, and afterwards in Paskau [today: Paskov, Moravia, Czechia]).

Reitter described thousands of new species of beetles, mostly from the Palearctic Region, including three new species of *Ochthebius* from Croatia: *O. adriaticus* Reitter, 1886, *O. narentinus* Reitter, 1885, and *O. steinbuehleri* (Reitter, 1886). The syntypes of *O. narentinus* (see below) and some of the paralectotypes of *Hydraena kaufmanni* (see JÄCH, 1990a) were collected by him.

STEINBÜHLER, August; according to HORN *et al.* (1990), A. Steinbühler lived in Graz (Styria, Austria) and in "Pola" [today: Pula, Croatia], and died "ca. 1915"; most probably, August Steinbühler refers to the Austro-Hungarian Navy member ("Marinegeneralkommissär") August Steinbühler (born 7.VI.1852 in Vienna, died 12.VI.1922 in Graz, Austria) (see: https://forum.axishistory.com/viewtopic.php?t=272378&start=135). Steinbühler was not mentioned in NONVEILLER (1999). He collected the type specimens of *O. adriaticus* and *O. steinbuehleri* at Pula in 1885. The latter species was dedicated to him by REITTER (1886a).

ZELLICH, Josef, a colonel in the Austro-Hungarian Army, lived in Klagenfurt (Carinthia, Austria). He died in 1932 (HÖLZEL, 1936). Zellich collected the type specimens of *Ochthebius dalmatinus* at Dubrovnik.

Post-imperial coleopterists:

The basis for the identification and a solid modern nomenclature of the Croatian Hydraenidae, as well as numerous faunistic data were provided mainly by two authors, Armand-Hippolyte d'ORCHYMONT (1881–1947) from Belgium, and Manfred A. JÄCH (NMW), the first author of the present article. Their contributions were partly published in the first half of the 20th century (ORCHYMONT, 1930, 1932, 1934, 1936, 1937, 1938, 1940, 1942, 1944, 1945) and mostly in the second half of the 20th century and in the 21st century (JÄCH, 1981, 1983, 1986, 1988, 1889a–d, 1990b, 1991, 1992a–b, 1993a–b, 1995, 1999; JÄCH & DELGADO, 2008; DELGADO & JÄCH, 2009, 2014; JÄCH & DÍAZ, 2012; JÄCH *et al.*, 2019).

Three of the species known from Croatia were described by Orchymont (*Hydraena belgica* Orchymont, 1930, *H. subjuncta* Orchymont, 1930, *Ochthebius peregrinus* Orchymont, 1941), and four by M.A. Jäch (*Hydraena egoni* Jäch, 1986, *Ochthebius celatus* Jäch, 1989, *O. corcyraeus* Jäch, 1990, *O. hebaueri* Jäch, 1983). The only confirmed Croatian specimen of *Ochthebius crenulatus* Mulsant & Rey, 1850 was collected by M.A. Jäch on the island of Krk during a students' field trip of the University of Vienna in 1980.

Annotated checklist of the Hydraenidae of Croatia

This checklist includes 65 species, which we regard as confirmed for Croatia, based on verified literature records and on hitherto unpublished faunistic data of specimens, which were identified by us. The general distribution of each species is outlined as well. Additional explanatory notes are provided in case of certain species with doubtful taxonomic status.

All taxa are listed alphabetically.

Only the taxonomically most relevant synonyms are listed here. A complete updated list of synonyms was published by JÄCH & SKALE (2015).

Genus *Hydraena* Kugelann, 1794 (26 spp.)

Subgenus *Hydraena* s. str.

Hydraena alpicola Pretner, 1931

Records from Croatia: This species was originally described as a subspecies of *Hydraena emarginata* Rey, 1885 by PRETNER (1931), who recorded also material from Croatia (Skrad) collected by Ján Obenberger (1892–1964), a famous Czech entomologist (NONVEILLER, 1999); the depository and the number of these Croatian specimens were not documented. No additional specimens of *H. alpicola* have been recorded from Croatia since then.

General distribution: Subendemic to the eastern Alps: Germany, Switzerland, Italy, Austria,

Slovenia, Croatia (JÄCH & SKALE, 2015). *Hydraena alpicola* was erroneously recorded from Bosnia and Herzegovina by PRETNER (1970: 135, as subspecies of *H. saga* Orchymont, 1930), because these records in fact refer to *H. saga* (see JÄCH & DÍAZ, 2017: fig. 21).

Hydraena angustata Sturm, 1836

Records from Croatia: This species was originally described from "Illyria", probably from its Croatian part (see above). SCHLOSSER KLEKOVSKI (1877: 115) recorded *H. angustata* from Križevci (NE of Zagreb), but his identifications are not trustworthy. ORCHYMONT (1940) recorded numerous Croatian specimens, which he collected at Sušak (near Rijeka) in July 1929, but the remaining specimens listed by the same author (from "Istrie" [Istria] and "Slovénie italienne méridionale" [southern Italian Slovenia]) in fact belong to the very closely related sister species, *H. chiesai* Janssens, 1965, which had not yet been described at that time. No other literature records are known, but there are several specimens from Sušak (leg. E. Pretner, July 1957) and from Krk Island (leg. M.A. Jäch, May 1980 and August 1988; leg. R. Schuh, August 1999; leg. A. Komarek, May 2002) deposited in the CPL and the NMW.

General distribution: Endemic to NW Croatia (Primorje-Gorski Kotar County); so far, it is the only endemic hydraenid species known from Croatia.

Hydraena assimilis Rey, 1885

Records from Croatia: This species, which is very common in France and Italy, has not been recorded from Croatia so far. Among some undetermined specimens in the HPM, M.A. Jäch & M. Brojer 2024 identified two specimens (1♂, 1♀) of *H. assimilis* collected by P. Novak at Gata (NNE of Omiš) in July 1911.

Taxonomic note: It would be most desirable to sequence the DNA of various eastern populations of *H. assimilis* (including specimens from Croatia) as they may in fact turn out to belong to an undescribed species.

General distribution: Wide-spread in western Europe and Italy, but patchily distributed in the southeastern parts of the continent (JÄCH & SKALE, 2015). First record for Croatia.

Hydraena belgica Orchymont, 1930

Records from Croatia: This species was recorded from Croatia for the first time by PRETNER (1931: 95) under the name "Hydraena *subintegra* Ganglbauer": Fužine (coll. Korlevič, Zagreb). Further literature records: PRETNER (1970), VIDAKOVIĆ MAODUŠ (2022).

General distribution: From Belgium and the Netherlands eastwards to Romania (JÄCH & SKALE, 2015).

Hydraena chiesai Janssens, 1965

Records from Croatia: The record from Croatia by JÄCH & SKALE (2015) is based on 23 specimens from three localities (leg. E. Pretner, April 1913, leg. H. Hebauer, July 1981, leg. L. Mencl, July 1994) in central and eastern Istria (CMT, CPL, NMW).

Taxonomic note: JÄCH (1989b: 191) synonymized *H. chiesai* with *H. angustata*. However, subsequent studies revealed that *H. chiesai*, although being very similar and very closely related to its sister species, deserves recognition as a separate species and needs to be officially removed from synonymy with *H. angustata* (M.A. Jäch, in prep.). Molecular studies would be very helpful to confirm the specific status of *H. chiesai*.

General distribution: Italy, Slovenia, Croatia (JÄCH & SKALE, 2015). Endemic to the Istrian Peninsula.

Hydraena croatica Kuwert, 1888

Synonym: *Hydraena jaechi* Hebauer, 1982

Records from Croatia: As the epithet prompts, this species has been originally described from "Croatia" without detailed locality data (KUWERT, 1888), but it can be assumed that the type material was collected by the insect dealer V. Apfelbeck [1859–1934] near Ludbreg (northern Croatia) and eventually obtained by Eduard Eppelsheim [1837–1896] (see below, under "Lectotype designation"). One male from Poljanec near Ludbreg (leg. V. Apfelbeck, December 1885) is deposited in the NMW. The exact distribution of *H. croatica* in Croatia still needs to be clarified.

Recent literature record: VIDAKOVIĆ MAODUŠ (2022: 206).

Lecotype designation: According to the original description (KUWERT, 1888: 121), there are three syntypes deposited in the collection of E. Eppelsheim: "In der Sammung des Herrn Dr. Eppelsheim in drei Stücken aus Croatien vorgefunden". According to HORN *et al.* (1990: 109), the collection of Eppelsheim is deposited in the NMW.

Lectotype male (NMW), by present designation (Fig. 5): "Croatia" [handwritten], "72" [handwritten on a typical green Eppelsheim label], "croatica Kuwert" [handwritten].

The two other syntypes mentioned in the original description could not be located with certainty, however, two specimens in the NMW, labelled: "Croatia bor." and one male (MNHNP, coll. Kuwert) labelled: "Croatia", "Ex Musaeo A Kuwert 1894" are possible candidates.

Taxonomic note: HEBAUER (1982) described this species under the synonymic name *Hydraena jaechi* from Montenegro and provided the first illustration of its aedeagus.

Fig. 5. *Hydraena* (s. str.) *croatica*, lectotype male (NMW).

In 1982, Franz Hebauer intentionally did not inform the first author of this article in advance about his plans to describe *Hydraena jaechi*, because the dedication should be a surprise. The surprise came off perfectly, but not in a way Hebauer had expected, because M.A. Jäch immediately recognized that the allegedly new species dedicated to him, *H. jaechi*, was in fact identical to a species described almost hundred years earlier, *H. croatica*, of which a male syntype was deposited in the NMW (see above). GANGLBAUER (1904a: 206) regarded *H. croatica* as a synonym of the West Mediterranean *H. regularis* Rey, 1885 (= *H. cordata* Schaufuss, 1883), which should have seemed most suspicious to Hebauer, when he described a new species of the *H. palustris* group from SE Europe.

Hydraena croatica, *H. cordata* and *H. curta* Kiesenwetter, 1849 belong to the *H. palustris*

species group. Although the aedeagi of *H. croatica* and *H. palustris* Erichson, 1837 are very similar (compare BERTHÉLEMY, 1965 and HEBAUER, 1982), *H. croatica* was found to be phylogenetically more closely related to *H. curta* (known from France and Spain) than to *H. palustris*, based on molecular data (TRIZZINO *et al*., 2013b).

General distribution: Balkan Region (JÄCH & SKALE, 2015).

Hydraena czernohorskyi Müller, 1911

Records from Croatia: Originally described from Slovenia, this species was recorded by PRETNER (1970) from a single Croatian locality (Hum, leg. A. Schatzmayr, March 1915) in NE Istria; two specimens from a nearby (or even the same) locality ("Ročko Polje", leg. H. Malicky, October 1988) are deposited in the NMW. Two males (CMT), collected in southeastern Istria (between Rabac and Labin) by L. Mencl in July 1994, were identified by M.A. Jäch.

By mistake, TRIZZINO *et al.* (2013a: 114) assigned two Italian localities ("Okolica Trstat" and "Okolica Gorice", both published correctly by PRETNER, 1970) to Croatia and provided incorrect coordinates.

General distribution: Italy, Slovenia, Croatia (JÄCH & SKALE, 2015). Subendemic to the Istrian Peninsula.

Hydraena dalmatina Ganglbauer, 1901

Records from Croatia: In Croatia, this species seems to be confined to the Konavle Region in the very southern tip of the country (PRETNER, 1970).

General distribution: Croatia, Montenegro, North Macedonia (JÄCH & SKALE, 2015); erroneously recorded from Bosnia and Herzegovina by TRIZZINO *et al.* (2013a: 115), because he attributed the cited locality from Montenegro (Begovina) by mistake to Bosnia and Herzegovina.

Hydraena egoni Jäch, 1986

Records from Croatia: The only Croatian record for this species was provided in the original description by JÄCH (1986): "Kievo" [= Kijevo, SE of Knin], leg. V. Apfelbeck 1902.

General distribution: Southeastern Europe, probably extinct in Central Europe (JÄCH & SKALE, 2015).

Hydraena excisa Kiesenwetter, 1849

Records from Croatia: PRETNER (1931: 106) expressed his doubt that this species might be found in the Balkan Region south of Slovenia, but almost 40 years later he recorded *H. excisa*

from Croatia for the first time (PRETNER, 1970). The record of *H. gracilis* from Mt. Moslavačka (ca. 50 km ESE of Zagreb) in SCHLOSSER KLEKOVSKI (1877: 115) obviously refers to *H. excisa*, because the only specimens of the "*Haenydra* lineage" in the collection of Schlosser Klekovski (HPM) belong to *H. excisa* (not to *H. gracilis*); there are three specimens (one undamaged female, one damaged female and one damaged male) mounted on the same pin (collection number "1767"), the two females possessing widely excised elytral apices typical of *H. excisa*.

Recent literature record: VIDAKOVIĆ MAODUŠ (2022: 206).

General distribution: Very wide-spread in Europe; Finland to Russia, reaching Greece in the south (JÄCH & SKALE, 2015).

Hydraena gracilis Germar, 1824

Records from Croatia: This is one of the most common species of *Hydraena* in Croatia. Records were for instance provided by KOČA (1905), PRETNER (1931, 1970), JÄCH (1995), MIČETIĆ STANKOVIĆ *et al.* (2019), VIDAKOVIĆ MAODUŠ (2022). The record of *H. gracilis* from Mt. Moslavačka (ca. 50 km ESE of Zagreb) in SCHLOSSER KLEKOVSKI (1877: 115) was obviously based on a misidentification of *H. excisa* (see above).

General distribution: This species occurs in large parts of Europe, from Ireland to the Urals, but it is rare or absent in the south (JÄCH & SKALE, 2015).

Hydraena intermedia Rosenhauer, 1847

Records from Croatia: The only confirmed record from Croatia (Bednja River in Varaždin County), was recently provided by VIDAKOVIĆ MAODUŠ (2022).

General distribution: Austria, Croatia, Italy, Slovenia (JÄCH & SKALE, 2015; VIDAKOVIĆ MAODUŠ, 2022).

Hydraena kaufmanni Ganglbauer, 1901

Records from Croatia: This species was originally described from Croatia (type locality: Pridvorje, Konavle Region) by GANGLBAUER (1901), based on specimens collected by J. Kaufmann [1836–1913] and E. Reitter (see also GANGLBAUER (1904a) and JÄCH (1990a)). Outside the Konavle Region it was collected near Dubrovnik (specimens in NMW and CPL).

General distribution: This species is confined to the southern tip of Croatia and to Montenegro (JÄCH & SKALE, 2015).

Hydraena melas Dalla Torre, 1877

Records from Croatia: ORCHYMONT (1934: 25) recorded this species under the name *H.*

sternalis Rey, 1893 from "Croatie (Leskovac)", collected by him on July 26, 1929 (see also JÄCH, 1988: 136). "Leskovac" obviously refers to Plitvički Ljeskovac in the Plitvice Lakes NP (see below, under *H. pygmaea* Waterhouse, 1833).

Recent literature records: MIČETIĆ STANKOVIĆ *et al.* (2019), VIDAKOVIĆ MAODUŠ (2022).

General distribution: France to Ukraine, absent in the northern and very southern parts of Europe (JÄCH & SKALE, 2015).

Hydraena minutissima Stephens, 1829

Records from Croatia: HORION (1949) recorded this species from Croatia without providing detailed locality data. The record from Croatia by JÄCH & SKALE (2015) is based on three specimens deposited in the CPL, collected from three localities in the Alpine Region by E. Pretner.

Recent literature records: MIČETIĆ STANKOVIĆ *et al.* (2018, 2019).

General distribution: Ireland to Ukraine, not in Scandinavia (JÄCH & SKALE, 2015).

Hydraena morio Kiesenwetter, 1849

Records from Croatia: The first detailed records from Croatia were obviously published by ORCHYMONT (1940). Numerous specimens from all biogeographical regions of Croatia are held in the CPL and NMW; the oldest ones were collected from Skrad by J. Obenberger in 1913.

Recent literature record: ŠERIĆ JELASKA *et al.* (2015).

General distribution: Poland southwards to northern Italy and eastwards to Ukraine and western Anatolia (JÄCH & SKALE, 2015).

Hydraena nigrita Germar, 1824

Records from Croatia: The first detailed records were obviously provided by MÜLLER (1909): Velebit Mountains (1 ex.), and Konavle Valley (numerous specimens, leg. K. Holdhaus); the correct identification of the latter specimens is confirmed by the rich material collected by K. Holdhaus in the Konavle Region ("Canaletal"), deposited in the NMW. Additional specimens from all over Croatia are deposited in the CPL and NMW. Further literature records: ORCHYMONT (1940: 10), VIDAKOVIĆ MAODUŠ (2022).

General distribution: Most parts of Europe (JÄCH & SKALE, 2015).

Hydraena palustris Erichson, 1837

Records from Croatia: The Croatian record published by JÄCH & SKALE (2015) is based on specimens collected in Slavonia (Migalovci) by E. Pretner in May 1943 (CPL, NMW).

SCHLOSSER KLEKOVSKI (1877: 115) erroneously recorded this species from Mt. Moslavačka (ca. 50 km ESE of Zagreb). There is one teneral specimen in the Schlosser Klekovski collection in the HPM bearing an original handwritten identification label ("*Hydr. palust*.") and the collection number "1766". However, in this specimen the pronotum is anteriorly not emarginate, and therefore it cannot belong to *H. palustris* or to *H. croatica*. It resembles *H. nigrita*, but we refrain from dissecting and remounting it due to historical reasons.

General distribution: Great Britain to West Siberia; not yet recorded from Greece and other parts of southern Europe (JÄCH & SKALE, 2015).

Hydraena pulchella Germar, 1824

Synonym: *Hydraena perparvula* Kuwert, 1890

Records from Croatia: The junior synonym, *H. perparvula*, has been described by KUWERT (1890) from "Bosnia. Croatia" without any further details. A handwritten label ("Croatia") was found to be attached to three of the syntypes (see ORCHYMONT, 1936). *Hydraena pulchella* was recently rediscovered in Croatia by VIDAKOVIĆ MAODUŠ (2022), who recorded this species from the Bednja River in Varaždin County.

General distribution: European (JÄCH & SKALE, 2015).

Hydraena pygmaea Waterhouse, 1833

Records from Croatia: ORCHYMONT (1944: 8) recorded this species from two localities: "Babinpotok-Cznariek, 25-VII [1929]", and "Leskovac, 26-VII [1929]". Although A. d'Orchymont's collecting trip in 1929 was focused on the Istrian Peninsula, he obviously visited also the Plitvice Lakes before he returned to Belgium. Without doubt, these two localities refer to Babin Potok and Plitvički Ljeskovac (formerly spelled "Leskovac"; see FARKAŠ-VUKOTINOVIĆ, 1859), which are both located in the Plitvice area. Apart from the material recorded by A. d'Orchymont, one specimen (CPL) was collected by E. Pretner (June 1943) in the surroundings of Zagreb, and one specimen (HPM) was found in the spring of the Kupica River by V. Mičetić Stanković (September 7, 2016).

General distribution: Great Britain to Georgia and Armenia (JÄCH & SKALE, 2015).

Hydraena riparia Kugelann, 1794

Records from Croatia: There are numerous specimens from many Croatian localities deposited in the CPL and NMW, seven of which were published by JÄCH (1988); the oldest dated specimen was collected at Zagreb (Maksimir) in 1898.

Recent literature records: MIČETIĆ STANKOVIĆ *et al.* (2018, 2019), VIDAKOVIĆ MAODUŠ (2022).

General distribution: Ireland to Japan; this is the most wide-spread species of the genus (JÄCH & SKALE, 2015).

Hydraena schuleri Ganglbauer, 1901

Records from Croatia: PRETNER (1970) recorded this species from two localities in northern Croatia: Skrad, leg. J. Obenberger, July 1913; Vrapče near Zagreb, leg. E. Pretner, June 1943. In Croatia, *H. schuleri* has obviously not been collected again since 1943.

General distribution: Northeastern Italy to south Germany and Poland eastwards to Ukraine (JÄCH & SKALE, 2015).

Hydraena subintegra Ganglbauer, 1901

Synonym: *Hydraena homogyna* Apfelbeck, 1909

Records from Croatia: This Balkan endemic was originally described from Bosnia and Herzegovina. PRETNER (1970) recorded this species under the name *H. homogyna* from the Plitvice Lakes NP and the Paklenica NP.

Recent literature record: MIČETIĆ STANKOVIĆ *et al.* (2019).

Taxonomic note: The taxonomy of *H. subintegra* is still not solved satisfactorily (JÄCH & DÍAZ, 2012, FREITAG *et al.*, 2021), but we think that the specimens from Croatia are conspecific with the type specimens from Bosnia and Herzegovina.

General distribution: Balkan endemic; Croatia to Bulgaria and Greece (JÄCH & DÍAZ, 2012; JÄCH & SKALE, 2015).

Hydraena subjuncta Orchymont, 1930

Records from Croatia: This species was originally described from Croatia (type locality: Konavle Region) by ORCHYMONT (1930) based on specimens collected by K. Holdhaus in the Konavle Valley, identified as *Hydraena subdeficiens* by GANGLBAUER (1904a); in the original description, ORCHYMONT (1930) refers to "*H. subdeficiens* sensu Ganglbauer, 1904 (nec Rey, 1885)" (see also JÄCH, 1981). MÜLLER (1909) recorded *H. subdeficiens* sensu Ganglbauer [= *H. subjuncta*] with some doubt also from the surroundings of Split ("Salona" [= Solin], leg. E. Karaman and J. Müller, and "Castelvecchio" [Kaštel Stari], leg. E. Karaman); we have traced five specimens in the PMS (one of them dated: "8.1916") and two in the SNMB, all collected by E. Karaman at "Castelvecchio", which were identified as *H. subjuncta* by M.A. Jäch & M. Brojer 2025. ROUBAL (1927) recorded this species under the name *H. sicula* Kiesenwetter, 1849 from Makar (above Makarska); in the original collection of J. Roubal (SNMB), M. Brojer & M.A. Jäch 2024 found three specimens and identified them as *H. subjuncta*, based

on one genitalized male. In addition, we found three unpublished specimens of *H. subjuncta* in the Roubal collection (SNMB): Solin (2 exs.) and Makarska (1 ex.). Numerous specimens from various localities along the southern Dalmatian coast are housed in the NMW: Cavtat, Dubrovnik (e.g., Ombla Spring), Pelješac (Orebić), Split (Stobreč).

Recent literature record: MIČETIĆ STANKOVIĆ *et al.* (2018).

General distribution: Southeastern Europe; Croatia, Montenegro, Albania, North Macedonia, Greece (JÄCH & SKALE, 2015).

Hydraena truncata Rey, 1885

Records from Croatia: JÄCH & SKALE (2015) listed this species for Croatia based on specimens from Risnjak NP (leg. M. Lederwash, July 2003, CLK).

General distribution: France and Spain eastwards to Ukraine (JÄCH & SKALE, 2015).

Subgenus *Phothydraena* Kuwert, 1888

Hydraena paganettii Ganglbauer, 1901

Records from Croatia: MÜLLER (1909) obviously provided the first record from Croatia (1 ex., Sinj, leg. E. Karaman, PMS, vid. M.A. Jäch & M. Brojer 2025). One male from Istria (Mirna ("Quieto") River, leg. G. Springer, May 1932) is deposited in the NMW, and one specimen from Bjelovar (Hrgovljani, leg. E. Pretner) is housed in the CPL.

Recent literature record: ŠERIĆ JELASKA *et al.* (2015: as "*paganetti*", incorrect subsequent spelling).

General distribution: Czechia to Italy, eastwards to the Caucasus and Israel (JÄCH & SKALE, 2015).

Genus *Limnebius* Leach, 1815 (9 spp.)

Subgenus *Bilimneus* Rey, 1883

Limnebius atomus (Duftschmid, 1805)

Records from Croatia: This species was recorded from Croatia by KOČA (1905) under the name *L. picinus* Marsham, 1802 based on a specimen from Vinkovci (May 1900, leg. G. Koča, HPM). Eventually, MÜLLER (1909) recorded this species (also as *L. picinus*) from Metković (leg. K. Holdhaus and F. Tax); some specimens from Metković (leg. K. Holdhaus and G. Paganetti) are housed in the NMW (JÄCH, 1993a). Additional specimens of *L. atomus* (originally misidentified as *L. picinus*) from Petrinja (March 1912, leg. R. Weingärtner) are deposited in the HPM.

Recent record: ŠERIĆ JELASKA *et al.* (2015).

General distribution: Eurosiberian (JÄCH, 1993a, JÄCH & SKALE, 2015).

Limnebius perparvulus Rey, 1884

ORCHYMONT (1938: 290, footnote 4) recorded *Limnebius oblongus* Rey, 1883 from Croatia (Metković, leg. A. Knisch). However, due to its West Mediterranean distribution (France, Italy, Morocco, Spain), the occurrence of *L. oblongus* in Croatia is most unlikely, and therefore this record certainly refers to the wide-spread and closely related *L. perparvulus*, already confirmed for several other SE European countries like Bosnia and Herzegovina, Bulgaria, Albania, North Macedonia and Greece (JÄCH, 1993a, JÄCH & SKALE, 2015, BROJER, 2023). We did not examine the material seen by ORCHYMONT (1938), which is probably deposited in the IRSNB, but the illustration of the aedeagus provided by this author evidently refers to *L. perparvulus*.

General distribution: Spain to Azerbaijan (JÄCH & SKALE, 2015).

Subgenus *Limnebius* s. str.

Limnebius aluta Bedel, 1881

Records from Croatia: Based on two specimens (HPM), this species is here recorded from Croatia for the first time: Granice (Slavonia), 45°23'57.6"N 18°7'4.7"E, August 2018, leg. E. Lugić. The identification has been confirmed by DNA barcoding.

General distribution: Great Britain to West Siberia (JÄCH & SKALE, 2015). First record for Croatia.

Limnebius crinifer Rey, 1885

Records from Croatia: JÄCH (1993a) recorded this species from Croatia based on historical material from Brač Island ("Insel Brazza") (NMW) and the Konavle Valley ("Canale"), leg. A. Paganetti (MNB). One female from Trnovec (June 1950, leg. K. Igalffy), originally misidentified as *L. nitidus*, is deposited in the HPM.

The records of *L. crinifer* in KOČA (1905) and GUÉORGUIEV (1971) from Vinkovci refer to incorrectly identified specimens of *L. stagnalis* deposited in the HPM (see below).

General distribution: Eurosiberian (JÄCH & SKALE, 2015).

Limnebius fallaciosus Ganglbauer, 1904

Records from Croatia: This species was originally described from Croatia by GANGLBAUER (1904a) based on specimens collected by K. Holdhaus (see also JÄCH, 1993a); type locality: Konavle Valley ("Canalethal") in the southernmost tip of Dalmatia. Additional specimens

were reported by ORCHYMONT (1945) from Pridvorje-Ljuta from the same area.

GANGLBAUER (1904a) originally described this species as "*L. paganettii* var. *fallaciosus*" based on specimens collected by "G. Paganetti-Hummler bei Castelnuovo [at Herceg Novi, Montenegro]". However, 14 of the 16 alleged syntypes deposited in the NMW and provided with identification labels ("v. *fallaciosus*") in Ganglbauer's handwriting were collected by K. Holdhaus in the "Canalethal" [Konavle Valley, Croatia]. Most probably, GANGLBAUER (1904a) just forgot to list these Croatian specimens in the original description (see also below, under *L. paganettii*). In any case, JÄCH (1993a) designated a specimen from the Konavle Valley as lectotype.

General distribution: SE Europe, including European Turkey (JÄCH & SKALE, 2015).

Limnebius furcatus Baudi, 1872

Records from Croatia: As already mentioned by MÜLLER (1909), *L. furcatus* seems to be the most common species of this genus in northern and central Dalmatia. Numerous records were published by MÜLLER (1909), KREKICH *et al.* (1911), SCHATZMAYR (1923), ORCHYMONT (1945), NOVAK (1952), JÄCH (1993a), and recently by ŠERIĆ JELASKA *et al.* (2015).

Several historical specimens are housed in the HPM and PMS, including specimens which had originally been incorrectly identified, e.g., one male and one female from Rab Island (leg. R. Weingärtner, misidentified as *L. crinifer* resp. *L. truncatulus* Thomson, 1853 [= *L. parvulus* Herbst, 1797), two females from Split ("Castelvecchio", in HPM and PMS, August 1916, leg. E. Karaman, misidentified as *L. stagnalis*), and one male from Trnovec (June 1950, leg. K. Igalffy, misidentified as *L. nitidus*).

Additional material from Istria (Pula), Krk Island, Cres Island, Rab Island, Ražanac is housed in the NMW.

General distribution: Predominantly West Mediterranean and western East Mediterranean; very rare (or probably extinct) in Central Europe (JÄCH & SKALE, 2015).

Limnebius paganettii Ganglbauer, 1904

Records from Croatia: The Croatian record in JÄCH & SKALE (2015) is based on two alleged paralectotypes of *L. paganettii* (deposited in the NMW) collected by K. Holdhaus in the Konavle Region in southern Croatia. In the original description of *L. paganettii*, GANGLBAUER (1904a) mentioned only "Castelnuovo" [Herceg Novi, Montenegro], not "Canalethal" [Konavle Valley, Croatia]. MÜLLER (1909) was the first author, who pointed out the presence of these two type specimens from Croatia. The actual occurrence of this species in Croatia still needs to be verified by targeted field surveys.

General distribution: SE Europe, Turkey (JÄCH & SKALE, 2015).

Limnebius papposus Mulsant, 1844

Records from Croatia: MÜLLER (1909) recorded this species from Omiš ("Almissa"), Sinj, Solin ("Salona"), and Dragović (43°51'59"N 16°30'43"E, IX.1901, collector unknown); the specimens could be traced in the HPM and PMS and the identifications were verified by M. Brojer 2025. In addition to the material published by Müller (1909), there is a single male from Imotski ("Imoski") deposited in the PMS (det. M. Brojer 2025).

JÄCH (1993a) recorded *L. papposus* from Pula ("Pola"), leg. F. Lang (NMW), Bjelovar, July 1942, leg. E. Pretner (CPL), and Zagreb-Maksimir, 1945, leg. E. Pretner (CPL). Additional specimens from Sinj (leg. F. Tax) and "Dalmatia" (leg. V. Kahr) are deposited in the NMW.

The HPM houses historical specimens of *L. papposus* from Lužnica (May 1943, previously misidentified as *L. nitidus*), Zagreb-Maksimir (April 1949), Petrinja (March 1912, leg. R. Weingärtner), Salona (leg. E. Karaman), and Trnovec (May 1949, leg. K. Igalffy, previously misidentified as *L. truncatulus* [= *L. parvulus*]).

The specimen erroneously reported by NOVAK (1952) from Zadar (1893, leg. P. Novak) in fact belongs to *L. furcatus* (1 male, HPM, det. M. Brojer 2024).

Recent literature records: ŠERIĆ JELASKA *et al.* (2015), MIČETIĆ STANKOVIĆ *et al.* (2018).

General distribution: Western and northern Europe eastwards to Iran (JÄCH & SKALE, 2015).

Limnebius stagnalis Guillebeau, 1890

Records from Croatia: This species has been recorded from Croatia by MÜLLER (1909) from the surroundings of Split ("Salona" [Solin], leg. E. Karaman, identification unconfirmed, no specimens found in HPM, NMW and PMS) and the Konavle Valley ("Canalethal", leg. K. Holdhaus, two specimens in NMW). ORCHYMONT (1945) recorded *L. stagnalis* again from the Konavle Valley (Pridvorje-Ljuta) based on specimens collected by himself in 1930. JÄCH (1993a) listed this species also from Zagreb ("Agram", leg. V. Apfelbeck, 4 exs., NMW).

NOVAK (1952) recorded *L. stagnalis* from Kaštel Stari near Split (August 1916, leg. E. Karaman), however, among the specimens from "Castelvecchio" [Kaštel Stari] deposited in the HPM (1 female) and PMS (1 male, 1 female), both females turned out to belong to *L. furcatus*, while the male (PMS, det. Brojer 2024, aedeagus dissected) was correctly identified.

In addition, there are the following specimens of *L. stagnalis* deposited in the HPM: one male and one female from Trnovec (June 1950, leg. K. Igalffy), originally misidentified as *L. nitidus*; one male and one female from Petrinja (April 26, 1900, leg. R. Weingärtner) and one

female from Vinkovci (March 9, 1912, leg. G. Koča), all three originally misidentified as *L. crinifer*.

Recent literature record: ŠERIĆ JELASKA *et al.* (2015).

General distribution: SE Central Europe to Italy, eastwards to Turkey and the Caucasus (JÄCH & SKALE, 2015).

Genus *Ochthebius* Leach, 1815 (30 spp.)

Subgenus *Asiobates* Thomson, 1859

Ochthebius corcyraeus Jäch, 1990

Records from Croatia: Five paratypes (CPL, NMW) of *O. corcyraeus* were collected near Rovinj by E. Pretner in April 1959 (JÄCH, 1990b).

General distribution: Italy, Croatia, Albania, Greece (JÄCH & SKALE, 2015).

Ochthebius crenulatus Mulsant & Rey, 1850

Records from Croatia: The only confirmed record from Croatia is based on a single male from Krk Island collected by M.A. Jäch in May 1980 (JÄCH, 1990b). It can, however, be assumed that the records of *O. bicolon* from Krk by STUSSINER (1881: 93) and MÜLLER (1923: 51) actually also refer to *O. crenulatus.*

General distribution: France to Czechia, southwards to Italy, Malta and Croatia (JÄCH & SKALE, 2015).

Ochthebius dilatatus Stephens, 1829

Records from Croatia: The oldest Dalmatian specimens available (1 male, 2 females), labelled "impressicollis Lap. Dalmatia Kahr" (collected before 1868), are deposited in the NMW. MÜLLER (1909) listed four Croatian localities under the synonymic name "impressicollis Cast.": Nin ("Nona"), Zadar ("Zara"), Split ("Spalato"), Solin ("Salona"). KREKICH *et al.* (1911) recorded "O. impressicollis" from Rab ("Arbe") Island. One female of *O. dilatatus* from Zadar (leg. H. Hebauer, May 1978) is deposited in the NMW.

General distribution: Coastal areas of Europe, Turkey, and North Africa (JÄCH, 1990b, JÄCH & SKALE, 2015).

Ochthebius flavipes Dalla Torre, 1877

Records from Croatia: This species has not been recorded from Croatia before. Two females of *O. flavipes* (previously misidentified as "*Ochthebius* (*Homalochthebius* Kuw.) *impressus* Marsh.") collected by G. Koča at Vinkovci (E Slavonia) on April 14, 1900 and May 2, 1900 are deposited in the HPM (coll. Koča, det. M. Brojer & M.A. Jäch 2024). These two

specimens have been published by KOČA (1905: 133) under the name "*Ochthebius riparius* Ill.".

General distribution: France to West Siberia. First record for Croatia.

Ochthebius hebaueri Jäch, 1983

Records from Croatia: The holotype of *O. hebaueri* was collected in Montenegro, but three of the paratypes were taken in Croatia near Metković and Dubrovnik (see JÄCH, 1983); apart from these paratypes, there are about 70 historical specimens from Metković deposited in the NMW (leg. K. Holdhaus, leg. G. Paganetti-Hummler, leg. F. Tax). The oldest specimen of *O. hebaueri* in the NMW (Eppelsheim collection) is a male labelled: "pygmaeus . | Dalmat . Kahr" (Fig. 4), which was obviously collected by V. Kahr (1798–1867). One male ("Metkovics" [Metković], leg. F. Tax) is deposited in the PMS (dissected and identified by M.A. Jäch & M. Brojer 2025); two additional females (vid. M.A. Jäch & M. Brojer 2025) in the same collection ("Metk." [Metković], and "Draćevo bei [near] Metk.") most probably belong to *O. hebaueri* as well.

The specimens recorded by Schlosser Klekovski (1877: 111) as "*O. pygmaeus*" might belong to *O. hebaueri* or *O. minimus* (Fabricius, 1792), which could not be verified, because these specimens could not be examined (see above under "Material and methods"). The records from Split, Metković and Dubrovnik by MÜLLER (1909), ORCHYMONT (1942) and NOVAK (1952), under "Ochthebius impressus Marsh.", most probably all refer to *O. hebaueri*.

General distribution: Croatia to Greece (JÄCH & SKALE, 2015).

Ochthebius hungaricus Endrödy-Younga, 1967

Records from Croatia: According to ENDRÖDY-YOUNGA (1970), two of the paratypes were collected in Croatia (Ludbreg and Pakrac, leg. V. Apfelbeck). We are not aware of any recent records from Croatia.

General distribution: Eastern Central Europe, northwards to Finland, southwards to Croatia and eastwards to East Siberia (JÄCH & SKALE, 2015).

Ochthebius minimus (Fabricius, 1792)

Records from Croatia: JÄCH (1990b) recorded this species from Slavonski Brod, leg. E. Pretner, September 1943 (2 ♂♂ in NMW) and Osijek, leg. H. Fery, July 1976. One male from Darda [N of Osijek], leg. E. Pretner, May 1940, is deposited in the CPL.

The specimens recorded by SCHLOSSER KLEKOVSKI (1877: 111) as "*O. pygmaeus*" might belong to *O. hebaueri* or *O. minimus*, which could not be verified, because these specimens

could not be examined (see above under "Material and methods").

General distribution: Very wide-spread in Europe, known also from northern Turkey (JÄCH & SKALE, 2015).

Ochthebius montanus Frivaldszky, 1881

Records from Croatia: JÄCH (1990b) recorded this species from "Kievo" [= Kijevo, SE of Knin], leg. V. Apfelbeck 1902 (CPL).

General distribution: Southeastern Europe (JÄCH & SKALE, 2015).

Ochthebius peregrinus Orchymont, 1941

Records from Croatia: JÄCH & SKALE (2015) listed *O. peregrinus* for Croatia based on a historical male specimen labelled "Dalmatia", collected by V. Kahr (NMW). The occurrence of this rarely collected species in Croatia was confirmed recently by D. Frenzel in May 2023: coastal saline marsh at Rtina - Miočići, 44°16'51"N 15°18'26"E, ca. 20 km ENE of Zadar (7 exs., CSG, CFS, det. A. Skale).

General distribution: Along the coast of the Adriatic Sea: Italy, Slovenia?, Croatia, Greece (JÄCH & SKALE, 2015).

Ochthebius striatus (Castelnau, 1840)

Records from Croatia: Most of the historical Croatian records (e.g., by MÜLLER, 1909) of *O. bicolon* Germar, 1824 (which actually does not occur in Croatia) seem to refer to *O. striatus*, see also ORCHYMONT (1937), who provided the earliest record from Croatia ("Dalmatie") by using the name *O. striatus*. The first detailed record from Croatia was provided by JÄCH (1990b): "Gravosa" [today: Gruž, part of Dubrovnik] (NMW). About 30 historical specimens from the Konavle Region and the surroundings of Dubrovnik (collected by A. Fleischer, K. Holdhaus, J. Kaufmann, G. Paganetti-Hummler, E. Reitter) are deposited in the NMW.

General distribution: Hungary to Iran and Israel (JÄCH & SKALE, 2015).

Subgenus *Aulacochthebius* Kuwert, 1887

Ochthebius exaratus Mulsant, 1844

Records from Croatia: Several Croatian localities were listed by MÜLLER (1909), SCHATZMAYR (1923) and NOVAK (1952), mostly collected from the Dalmatian coast including some islands.

Two specimens from Zadar ("Zara"), leg. P. Novak, 1896, are deposited in the HPM, and two specimens from Split ("Spalato") and Knin, both collected by E. Karaman and stored in the

PMS were identified by M.A. Jäch & M. Brojer 2025.

This species was recently recorded from the Krka NP by ŠERIĆ JELASKA *et al.* (2015).

General distribution: Western Europe and North Africa, eastwards to Turkey (JÄCH & SKALE, 2015).

Ochthebius narentinus Reitter, 1885

Records from Croatia: This species has been originally described from specimens collected by E. Reitter 1879 in the Neretva ("Narenta") Valley, at Metković (Croatia) and at Domanovići (Bosnia and Herzegovina) (Reitter, 1885). Three specimens from the same area are deposited in the CPL (Opuzen ("Forte Opus"), 1 ex., leg. V. Apfelbeck, 1903) and the NMW (Metković, 2 exs., leg. A. Kniž). There are no other records known from Croatia.

Lectotype designation: The number of syntypes is not exactly known, but two syntypes were traced in the HNHM.

Lectotype, sex not identified (HNHM), by present designation: "Dalmatien | Metkovich [Metković] | Reitter 79." [printed and framed], "Ochth.narentinus | Reitt. | Coll. Reitter" [first and second line handwritten, third line printed]. **Paralectotype**, sex not identified (HNHM): "Herzegowina | Domanovici [Domanovići] | Reitter 79." [printed and framed], "coll.Reitter" [printed], "O.naren- | tinus m." [handwritten]. A lecto- and a paralectotype label has been attached to the specimens by M.A. Jäch in 1989.

General distribution: France to Israel (JÄCH & SKALE, 2015).

Subgenus *Cobalius* Rey, 1886

The taxonomy of the three Croatian species known so far is still unclarified and should become a high-priority research focus. All Croatian species of the subgenus *Cobalius* are exclusively found in littoral rock pools.

Ochthebius adriaticus Reitter, 1886

Records from Croatia: This species has been originally described from Croatia by REITTER (1886a) based on specimens collected by A. Steinbühler; type locality: Istria (Pula ("Pola")). Numerous additional localities have been published since then (e.g., GANGLBAUER, 1904b; MÜLLER, 1909, 1916; LIEBMANN, 1945; BEIER, 1956; JÄCH, 1989d; VILLASTRIGO *et al.*, 2019). *Ochthebius adriaticus* is found along the entire Croatian coast.

Taxonomic note: Three subspecies of *O. adriaticus* are currently recognized (see JÄCH, 1989d), but they almost certainly represent distinct species, which need to be revised

taxonomically using molecular methods. One specimen from Croatia (Trsteno) was already sequenced by VILLASTRIGO *et al.* (2019).

General distribution: Italy to Greece (JÄCH & SKALE, 2015).

Ochthebius cf. *celatus* Jäch, 1989

Records from Croatia: JÄCH (1989d) recorded *O. celatus* from Mljet ("Meleda") Island based on historical specimens deposited in three different museum collections including the NMW. According to JÄCH (1989d), specimens recorded from Mljet by ORCHYMONT (1932) under the name *O. asper* Sahlberg, 1900 belong to *O.* cf. *celatus* and not to the "true" *O. asper* (see below).

Taxonomic note: *Ochthebius celatus* was originally described from Israel. Molecular data (VILLASTRIGO *et al.*, 2020) and distinct aedeagal differences (see JÄCH, 1989d) suggest that *O. celatus* represents in fact a complex of several distinct species. The specimens from Mljet obviously belong to an undescribed species. Molecular data of specimens from Israel and Croatia are necessary to clarify the status of the population from Mljet. Furthermore, it will be most desirable to clarify, whether *O.* cf. *celatus* is more wide-spread along the Adriatic coast or whether it is really restricted to Mljet Island.

General distribution: The exact distribution of the "true" *O. celatus* and the Croatian "*O.* cf. *celatus*" still needs to be clarified. The *O. celatus* complex has so far been recorded from eight countries from France to Israel (JÄCH & SKALE, 2015).

Ochthebius subinteger Mulsant & Rey, 1861 or *O. asper* Sahlberg, 1900

Records from Croatia: GANGLBAUER (1904a) listed Dalmatia ("Dalmatien") in the general distribution of *O. subinteger*, without providing a detailed record; he possibly referred to the historical specimens from Pula ("Pola") and Hvar ("Lesina", leg. F. Tax (1855–1921), an imperial baker from Graz, Austria) deposited in the NMW. MÜLLER (1909) recorded this species from Hvar ("Lesina") and Mljet ("Meleda"), but it should be kept in mind that the specimens from Mljet might in fact belong to *O.* cf. *celatus* (see above). JÄCH (1989d) recorded *O. subinteger* from eight Croatian localities (Istria to Dubrovnik, incl. Lastovo Island).

Taxonomic note: *Ochthebius asper* (described from Greece) has been synonymized with *O. subinteger* (described from France) by JÄCH (1989d), but it was recently reinstated as a proper species based solely on molecular evidence (VILLASTRIGO *et al.*, 2020). Unfortunately, no specimens of *O. asper* or *O. subinteger* from Croatia have been sequenced by VILLASTRIGO *et al.* (2022: supplementary table S1). It remains therefore still unclarified, whether the Croatian

specimens identified by JÄCH (1989d) as *O. subinteger* belong to *O. subinteger* or to the newly reinstated *O. asper*. Considering geographical aspects, they most likely represent *O. asper*.

General distribution: The distribution of *O. subinteger* and *O. asper* can be clarified only in the course of a thorough taxonomic revision of the species group.

Subgenus *Enicocerus* Stephens, 1829

Ochthebius colveranus Ferro, 1979

Records from Croatia: The record of "*Ochthebius exsculptus* s. *halbherri*" from Solin ["Salona"] by NOVAK (1952) refers to *O. colveranus* (1 male in HPM, det. M.A. Jäch 2024). Specimens recorded as "*O. exculptus*" [sic; incorrect subsequent spelling] by SCHLOSSER KLEKOVSKI (1877: 115) from Selnica and Mali Bukovec at the Drava River probably also refer to *O. colveranus*, or maybe even to *O. melanescens* Dalla Torre, 1877 (see below). JÄCH (1992b) and DELGADO & JÄCH (2014) recorded this species from Istria (Boljun) and the Otuča River near Gračac.

General distribution: SE Germany and NE Italy to N Turkey and the Caucasus (JÄCH & SKALE, 2015).

Ochthebius gibbosus Germar, 1824

Records from Croatia: The only confirmed record for this species is based on a single specimen deposited in the HPM: Krapina, leg. R. Weingärtner, August 5, 1928. SCHLOSSER KLEKOVSKI (1877: 114) recorded this species from Vukovar and Lake Palaša" (= Palača) south of Osijek, which has been drained and converted into agricultural land at the end of the 19th century, but no intact specimen of *Enicocerus* could be found in the Schlosser Klekovski collection in the HPM.

General distribution: Belgium to Denmark, eastwards to the Balkan Region, Russia and northern Turkey (JÄCH, 1992b; JÄCH & SKALE, 2015).

Ochthebius montenegrinus Ganglbauer, 1901

Synonym: *Ochthebius ljutensis* Müller, 1924

Records from Croatia: In Croatia, this species is so far known only from the Jadro Spring near Solin (MÜLLER, 1909: 474), collected by E. Karaman (1 female in PMS, vid. M.A. Jäch & M. Brojer 2025), and from the Ljuta River in the Konavle Region: "Ljuta - Konavli 9-IX-l957", collected by E. Pretner (CPL, NMW).

There exists considerable uncertainty concerning the true type locality of *O. ljutensis*, which

is a junior synonym of *O. montenegrinus* (Jäch, 1992b). When MÜLLER (1924) described *O. ljutensis*, he referred to the type locality as "Ljuta alle Bocche di Cattaro" [Ljuta at the Bay of Kotor], translated by NOVAK (1952) as "Boka Kotorska (Ljuta)", which definitely lies in Montenegro. However, in contrast to the original description, the labels of the lectotype and the paralectotypes suggest that the type specimens were in fact collected in the Ljuta River in southern Croatia (Konavle Region), because they are all labelled: "Canale", which clearly refers to the Konavle Region in Croatia. Because of this discrepancy, it may prove to be difficult to find out whether the type specimens were collected in the Ljuta River north of Kotor (Montenegro) or in the homonymic Ljuta River in the Konavle Region of Croatia.

Taxonomic note: It should be pointed out that the DNA of various populations of *O. montenegrinus* should be sequenced and compared to each other in order to make sure that they really represent a single variable species and not a complex of several closely related, microendemic species.

General distribution: Endemic to SE Europe (JÄCH, 1992b; JÄCH & SKALE, 2015).

Subgenus *Ochthebius* s. str.

Ochthebius cf. *corrugatus* Rosenhauer, 1856

Records from Croatia: A single female was collected recently in a saline spring on Pag Island (Vlašići, 44°19'20"N 15°12'13"E, May 2023, leg. D. Frenzel).

Taxonomic note: This species was originally described from Spain. The specimen from Croatia currently cannot be unambiguously identified, because *O. corrugatus* very likely represents a complex of several closely related species. Exact identification of the single female from Pag Island will only be possible after a thorough taxonomic revision of the entire complex using also molecular data. A specimen tentatively identified as *O.* cf. *corrugatus* from Tunisia was sequenced by VILLASTRIGO *et al.* (2019).

General distribution: *Ochthebius corrugatus* s. l. is currently regarded as widely distributed: from Portugal to Croatia, and from Tunisia to Israel (JÄCH & SKALE, 2015).

Ochthebius dalmatinus Ganglbauer, 1904

Synonym: *Ochthebius butinensis* Hebauer, 1986

Records from Croatia: This species was originally described from Croatia by GANGLBAUER (1904a) based on specimens collected by J. Zellich at Dubrovnik ("Ragusa") – see also JÄCH (1989c). Later, this species was also found near Split ("Salona" [Solin], without date, leg. E. Karaman; 1 ex. in the PMS, vid. M.A. Jäch & M. Brojer 2025) and by E. Pretner in July 1913 (JÄCH, 1989c), and finally, HEBAUER (1986) described the same species, based on two female

specimens from Krk Island, under the synonymic name *O. butinensis*.

General distribution: Italy, Croatia, Bosnia and Herzegovina, Montenegro, Greece (incl. Crete) (JÄCH, 1989c, 1999; JÄCH & SKALE, 2015).

Ochthebius deletus Rey, 1885

Synonym: *Ochthebius muelleri* Ganglbauer, 1901

Records from Croatia: The first Croatian record of this species was provided by GANGLBAUER (1901), when he described the synonym *O. muelleri* from Nin ("Nona"). Eventually, MÜLLER (1909, 1923) and JÄCH (1992a) added five additional localities: Rab Island, Pag Island, Šibenik ("Sebenico"), Trogir and Split. The two records of "*Ochthebius viridis* s. *fallaciosus*" from Nin and Bokanjac (near Zadar) by NOVAK (1952) actually refer to *O. deletus*.

More recently, this species was collected on Cres Island (Osor, salt marsh, May 2006, leg. A. Link, NMW) and on Pag Island (Vlašići, VIII.2023, leg. V. Mičetić Stanković, NMW).

Taxonomic note: The taxonomy of *Ochthebius deletus* has not yet been clarified satisfactorily; since there are obviously distinct morphological differences between some of the populations, it would be desirable to sequence the DNA of specimens from various parts of the distribution area including Croatia. Possibly, *O. deletus*, originally described from France, is in fact a mixture of several closely related species. Based on molecular data of a specimen from Mallorca (Balearic Islands), VILLASTRIGO *et al.* (2019) restored the specific status of *O. deletus*.

General distribution: Spain to Turkey (JÄCH & SKALE, 2015).

Ochthebius fallaciosus Ganglbauer, 1901

Records from Croatia: This species was originally described from Croatia (type locality: Zadar, leg. J. Müller) by GANGLBAUER (1901), see also JÄCH (1992a) and JÄCH & DELGADO (2008). For the moment we are not able to confirm this species from other localities in Croatia.

The two records of "*Ochthebius viridis* s. *fallaciosus*" from Nin and Bokanjac (near Zadar) by NOVAK (1952) in fact refer to *O. deletus* (see above) based on the examination of the two specimens deposited in the HPM.

Taxonomic note: The taxonomy of *Ochthebius fallaciosus* has not yet been clarified sactisfactorily; it will be necessary to sequence and compare the DNA of specimens from various parts of the distribution area including Croatia. So far, *O. fallaciosus* has been sequenced only from Morocco (VILLASTRIGO *et al.*, 2019).

General distribution: Western Europe to Greece; Morocco (JÄCH & DELGADO, 2008).

Ochthebius lividipennis Peyron, 1858

Records from Croatia: JÄCH (1992a) recorded this species from two localities in eastern Croatia (Osijek, July 1957, leg. H. Eckerlein (Coburg, Germany), three specimens in NMW; Slavonski Brod, October 1944, leg. E. Pretner, CPL). Two males, originally misidentified as *O. marinus* Paykull, 1798 and *O. foveolatus* by G. Koča and R. Weingärtner, are deposited in the HPM: Vinkovci (E Slavonia), April 1900; Zagreb, May 1913.

General distribution: From Poland to Italy eastwards to Iran; North Africa (JÄCH & SKALE, 2015).

Ochthebius meridionalis Rey, 1885

Records from Croatia: Specimens recorded as "*Ochthebius pallidus*" by DEJEAN (1821: 50) from "Dalmatia" likely refer to *O. meridionalis*; the specimens might be deposited in the MNHNP or in the Musée d'histoire naturelle - Guimet, Lyon, France (MGL). NOVAK (1952) recorded "*Ochthebius marinus* s. *meridionalis*" from several Croatian localities, referring partly to the records of "*O. marinus* Payk. subsp. *pallidipennis* Cast., Gglb." by MÜLLER (1909: 475). In fact, four specimens ("Spalato", leg. E. Karaman) located in the PMS, originally misidentified as *O. marinus*, were examined by M.A. Jäch & M. Brojer 2025 and found to belong to *O. meridionalis*; these four specimens, obviously collected more than 100 years ago, represent the only confirmed record from Croatia so far; one male was dissected by M.A. Jäch, and the aedeagus was mounted in DMHF on the same card with the beetle.

Taxonomic note: This species, originally described from France, is very widely distributed and variable species (JÄCH, 1992b). It seems therefore most likely that it is composed of several closely related species. Molecular studies would be most helpful to clarify the taxonomy of this species complex.

General distribution: Western Europe to Turkmenistan; North Africa (JÄCH & SKALE, 2015).

Ochthebius metallescens metallescens Rosenhauer, 1847

Records from Croatia: MÜLLER (1909) recorded *O. metallescens* from the Konavle Valley ("Canaletal") collected by K. Holdhaus (one male deposited in the NMW) and from Solin ("Salona", without date, leg. E. Karaman; 1 ex. in the PMS, vid. M.A. Jäch & M. Brojer 2025), where it occurs together with its close relative *O. dalmatinus* (see above). JÄCH (1989c) listed material from four Croatian localities (from Istria to the Konavle Region), collected between 1913 and 1958.

One male from the confluence of the rivers Dobra and Kupa (45°32'57"N 15°31'24"E, leg. S. Gottstein & V. Mičetić, February 2009) is deposited in the NMW.

Recent literature record: MIČETIĆ STANKOVIĆ *et al.* (2019).

General distribution: Wide-spread in Europe but absent in the British Isles, Scandinavia and Russia; known also from Turkey (JÄCH & SKALE, 2015).

Ochthebius pedicularius Kuwert, 1887

Records from Croatia: The only confirmed record for this species is based on specimens (incl. males) deposited in the HPM, collected by R. Weingärtner at Zagreb in May 1913. Originally, these specimens were incorrectly identified as *O. foveolatus* Germar, 1824 and *O. nanus* Stephens, 1829 by R. Weingärtner. The specimens recorded by SCHLOSSER KLEKOVSKI (1877: 111) as *O. foveolatus* from the Lonja River might also belong to *O. pedicularius*, which could not be verified, because these specimens could not be examined (see above under "Material and methods").

General distribution: Germany to Italy, eastwards to Ukraine (JÄCH & SKALE, 2015). First record for Croatia.

Ochthebius punctatus Stephens, 1829

Records from Croatia: The first reliable record for this species in Croatia was provided quite recently: Pag Island (Vlašići, 44°19'20"N 15°12'13"E, May 2023, leg. D. Frenzel; 15 specimens deposited in NMW, coll. A. Skale, coll. D. Frenzel).

General distribution: British Isles to Portugal, eastwards to Italy and Croatia; NW Africa (JÄCH & SKALE, 2015).

Ochthebius pusillus Stephens, 1835

Records from Croatia: GANGLBAUER (1904b) recorded this species from Mljet ("Meleda"). Eventually, *O. pusillus* was found in the Konavle Valley ("Canaletal") by K. Holdhaus (MÜLLER, 1909) and on Cres Island (Osor) (Schatzmayr, 1923). JÄCH (1992a) recorded this species from Istria (Mirna ("Quieto") River, April 1932, leg. G. Springer, CPL), Zagreb (leg. E. Pretner, CPL), Slavonski Brod (Jelas Polje, October 1944, leg. E. Pretner, numerous specimens, CPL, NMW), and Osijek (July 1976, leg. H. Fery, CFB). Additional unpublished material is deposited in the NMW (Istria: Buje and Motovun) and HPM (Petrinja, March 1912, leg. R. Weingärtner; Trnovec, leg. K. Igalffy).

The record from Lošinj Island by NOVAK (1970) is obviously based on a confusion with the record provided from Cres by SCHATZMAYR (1923). The record from Morović (leg. V. Zoufal, NMW) by Jäch (1992a) actually refers to Serbia instead of Croatia.

General distribution: Great Britain to Russia and Turkey (JÄCH & SKALE, 2015).

Ochthebius steinbuehleri (Reitter, 1886)

Records from Croatia: This species has been originally described from Croatia by REITTER (1886b) based on specimens collected by A. Steinbühler at "Pola" (Pula). Numerous additional localities have been published since then (e.g., GANGLBAUER, 1904b,;MÜLLER, 1909, 1916; LIEBMANN, 1945; BEIER, 1956; JÄCH, 1993b; VILLASTRIGO *et al.*, 2022). *Ochthebius steinbuehleri* is found in Istria and all along the Croatian coast.

Taxonomic note: *Ochthebius steinbuehleri* is a member of the *O.* (s. str.) *quadricollis* species group. All members of this group are, just like most of the species of the subgenus *Cobalius*, found exclusively in supratidal rock pools. The taxonomy of the *O. quadricollis* group is still not clarified satisfactorily and should become a high-priority research focus. The discovery of undescribed cryptic species can be expected (ANTONINI *et al.*, 2010; AUDISIO *et al.*, 2010; A. Villastrigo, pers. comm. 2025).

General distribution: Italy to Turkey (JÄCH & SKALE, 2015).

Ochthebius viridis Peyron, 1858

Records from Croatia: JÄCH & DELGADO (2008) listed this species from Zadar and Krk Island.

Taxonomic note: *Ochthebius viridis* was originally described from Turkey (Tarsus). Specimens from Croatia should be sequenced to compare their DNA with the specimen of *O. viridis* from Turkey (Izmir) sequenced by VILLASTRIGO *et al.* (2019).

General distribution: Western Europe to Central Asia (JÄCH & DELGADO, 2008).

Unconfirmed or doubtfully recorded species

Hydraena (s. str.) *bosnica* Apfelbeck, 1909

Synonym: *Hydraena ganglbaueri* Apfelbeck, 1912

Records from Croatia: This species was recorded from NE Croatia (Ludbreg) in the original description of *Hydraena bosnica* by APFELBECK (1909: 498) as well as in the original description of its junior synonym *H. ganglbaueri* (Apfelbeck 1912: 659). KNISCH (1924: 45) did not mention Croatia under *H. bosnica* in his world catalogue of Hydraenidae. PRETNER (1970: 17–18), treating both taxa as synonyms of *H. hungarica* Rey, 1884, also did not mention the Croatian record, although he listed several other specimens collected by V. Apfelbeck, while GUÉORGUIEV (1971: 27) listed "Cro?" in the distribution of *H. hungarica*, expressing his doubts about the occurrence of this species in Croatia. In the first edition of the Catalogue of Palaearctic Coleoptera, JÄCH (2004: 103) re-established *H. bosnica* as a valid species and included also the Croatian record, while Croatia was deleted from the second

edition (JÄCH & SKALE, 2015: 132), because the authors found no evidence for the occurrence of *H. bosnica* in Croatia.

TRIZZINO *et al.* (2013a: 76) incorrectly stated about the type material of *H. bosnica*: "Holotype/Lectotype not yet formally designated. Type series probably destroyed". In fact, the type series is not destroyed. A lectotype (deposited in the NMW) was designated by MIČETIĆ STANKOVIĆ & JÄCH (2012: 83).

The paralectotype from Ludbreg, a single female, has recently been traced by G. Makranczy in the HNHM (label data: "Apfelb. Ludbreg", "Coll. Apfelbeck", "bosnica det. Apflb. [sic]"). This female is definitely a member of the *H. hungarica* species complex, which includes four described species so far: *H. bosnica* (endemic to southern Bosnia and Herzegovina), *H. hungarica* (Carpathian endemic), *H. kucinici* Mičetić Stanković & Jäch, 2012 (known so far only from North Macedonia and the Kosovo), and *H. leonhardi* Breit, 1916 (endemic to central Bulgaria). At least two additional undescribed taxa from Bulgaria and Greece, belonging to the same species complex are deposited in the NMW.

The occurrence of *H. bosnica* in northern Croatia, almost 300 km from its confirmed distribution area is unexpected and gives rise to speculation: 1) the specimen was actually collected in Bosnia and eventually mislabelled; 2) if the provenance of the specimen is indeed correct, it might belong to an undescribed species, because it can, of course, not be totally excluded that an unknown member of the *H. hungarica* species complex does exist in the forested hills near Ludbreg and/or in the nearby, poorly explored Papuk Mountains of Slavonia. In any case, a thorough faunistic survey of the mountain streams of northeastern Croatia is highly desired.

General distribution: Currently regarded as endemic to southern Bosnia and Herzegovina (MIČETIĆ STANKOVIĆ & JÄCH, 2012). Not confirmed for Croatia by recent findings.

Ochthebius (s. str.) *caudatus* Frivaldszky, 1883

Records from Croatia: JÄCH *et al.* (2019) recorded a single historical male from the island of Brač (Croatia) deposited in the NMW. There is a printed label ("INSEL BRAZZA DALMATIEN" [Isle of Brač Dalmatia]) attached to the specimen that provides no detailed information on the exact locality, the date of collecting or the collector. Since the island of Brač is far away from the main distribution area of *Ochthebius caudatus*, the Carpathian Mountains of Poland and Romania, where it lives in salt springs (JÄCH *et al.*, 2019), there is no real evidence that this species does or ever did occur in Croatia. We cannot exclude the fact that this specimen has been incorrectly labelled.

General distribution: Hungary, Poland, Romania (JÄCH *et al.*, 2019).

Ochthebius (s. str.) *evanescens* Sahlberg, 1875

Records from Croatia: GANGLBAUER (1904a) recorded this species from "Dalmatien (Ragusa)" [Dalmatia (Dubrovnik)], but there are no specimens from Dubrovnik in the NMW. Instead, there is one female sharing the same label data with the single male of *O. caudatus* (see above) deposited in the NMW (see JÄCH, 1992a).

Taxonomic note: The taxonomy of *Ochthebius evanescens* has not yet been clarified sactisfactorily. It is very probably a complex of several distinct species. This species was originally described from NW Russia, and three other species, *O. alutaceus* Reitter, 1885 (from Azerbaijan), *O. glabratus* Kuwert, 1887 (from Serbia), and *O. laevigatus* Sharp, 1887 (from Orenburg, south of the Ural Mountains) were later synonymized with *O. evanescens*. Very probably, all these synonyms deserve separate specific status; a taxonomic revision based on molecular data is dearly needed. So far, only one specimen of *O. evanescens* s. l. (from Azerbaijan) has been sequenced (see VILLASTRIGO *et al.*, 2019).

General distribution: From NE Italy to Turkey and East Siberia (JÄCH & SKALE, 2015).

Ochthebius (s. str.) *mediterraneus* (Ieniştea, 1988)

Records from Croatia: DELGADO & JÄCH (2009) recorded this species from Croatia based on a single historical male labelled: "Dalmatia Reitter Coll. Künnemann" (DEI). As long as there are no detailed modern records, we prefer to regard the presence of this species in Croatia as unconfirmed, especially since it is not recorded from any other SE European country so far.

General distribution: Spain, France, Italy, NW Africa (JÄCH & SKALE, 2015).

Species deleted from the Croatian checklist

Ochthebius (*Asiobates*) *bicolon* Germar, 1824

There are no confirmed records from Croatia. The record in JÄCH & SKALE (2015) must be deleted because of lack of evidence. The occurrence of *O. bicolon* in Croatia (and Bosnia and Herzegovina) is actually very unlikely.

ORCHYMONT (1937: 221) already stated that the "true" *O. bicolon* is absent in the East Mediterranean (incl. Dalmatia); all specimens from this area identified as "*bicolon*" and examined by him turned out to belong to *O. striatus*, which is corroborated by the fact that six of the Croatian specimens of *O. striatus* in the NMW carry a historical "*O. bicolon*" label. On the other hand, *O. crenulatus* may as well be easily confused with *O. bicolon* (see above). The records of *O. bicolon* from Croatia provided by MÜLLER (1909, 1923) have not been checked,

but they most probably refer to *O. crenulatus* (Krk), and *O. striatus* (Ston, Dubrovnik, Konavle). The record of "*O. bicolon*" from Krk ("im großen See auf Veglia [in the large lake (? Lake Ponikve) on Krk]") (Stussiner 1881: 93) could also not be checked so far; according to HORN *et al.* (1990), the specimens should be deposited in the Slovenian Museum of Natural History (Ljubljana, Slovenia).

General distribution: Western Europe eastwards to Scandinavia and Russia (JÄCH & SKALE, 2015). The nearest confirmed localities are found in western Austria, more than 300 km northwest of Croatia.

Additional species that potentially could occur in Croatia

This list includes 29 species that were so far not recorded from Croatia but could or even should occur in this country. The list is not supposed to be complete, as there are evidently a lot of additional wide-spread or poorly known and scatteredly distributed species that could be taken into consideration, e.g., *Hydraena* (s. str.) *bicolorata* Jäch, 1997 (very common in the southern Balkan Region) that could reach Croatia in the south, *H. bimagua* Jäch, 1986 (known from central and southern Bosnia and Herzegovina), *H.* (s. str.) *carniolica* Pretner, 1970 (known from NE Italy and NW Slovenia but being probably more wide-spread), and *Ochthebius* (s. str.) *nilssoni* Hebauer, 1986 (a very wide-spread but rare species known so far from Sweden, Ireland and NE Italy, where it was found together with *O. nobilis* Villa & Villa, 1835 and *O. pedicularius* in gravel banks of the Tagliamento River).

Hydraena (s. str.) *britteni* Joy, 1907

A very wide-spread northern species that is known from some isolated populations in SE Europe: North Macedonia, Romania, Bulgaria, Greece. This species might well occur in some small mountain bogs in northern Croatia.

General distribution: Predominantly a northern species becoming rare towards the south (JÄCH & SKALE, 2015).

Hydraena (s. str.) *dentipes* Germar, 1842

This wide-spread species was collected in the Bela (a tributary of the Vipava River) at Sanabor (east of Ajdovščina, western Slovenia), only about 40 km from the Croatian border.

General distribution: France to Poland and Romania, reaching Italy and Slovenia in the south (JÄCH & SKALE, 2015).

Hydraena (s. str.) *devincta* Orchymont, 1940

JÄCH & SKALE (2015) included Croatia in the distribution of this species just because of the

close proximity of the Slovenian localities (Rižana River), but there are no confirmed records from Croatia known so far. However, some rivers in the northeastern part of the Istrian Peninsula, about 10–20 km south of the Rižana River, seem to provide suitable habitats for *H. devincta* in Croatia.

General distribution: NE Italy and SW Slovenia (JÄCH & SKALE, 2015).

Hydraena (s. str.) *lapidicola* Kiesenwetter, 1849

There are no confirmed records known from Croatia, but this species might well occur at higher altitudes in northern Croatia.

General distribution: Subendemic to the Alps (JÄCH & SKALE, 2015).

Hydraena (s. str.) *muelleri* Pretner, 1931

This species was originally described from Slovenia and Italy, and was subsequently recorded also from the northern slope of the Karavanks in Austria. It can be assumed that *H. muelleri* occurs also in some mountain streams in northern Croatia, because its nearest localities in Slovenia (e.g., Zagorje near Lesično) lie only about 10 km from the Croatian border.

General distribution: NE Italy, Slovenia, S Austria (JÄCH & SKALE, 2015).

Hydraena (s. str.) *pachyptera* Apfelbeck, 1909

This species is recorded from most of the Balkan countries and might occur also in Croatia.

General distribution: Bosnia and Herzegovina, Serbia, Romania, Montenegro, Albania, North Macedonia, Bulgaria, Greece, and European Turkey (JÄCH & SKALE, 2015).

Hydraena (s. str.) *reyi* Kuwert, 1888

The record from Croatia by JÄCH & SKALE (2015) was based on the fact that this species is known from Slovenia, Bosnia and Herzegovina, and Serbia and therefore most probably occurs also in Croatia. However, confirmed detailed records from Croatia are obviously still lacking. No specimens from Croatia were found by us in any of the museum collections examined.

General distribution: Northern Spain and France eastwards to West Siberia (JÄCH & SKALE, 2015).

Hydraena (s. str.) *saga* Orchymont, 1930

Due to its remarkably wide distribution (see JÄCH & DÍAZ, 2017: fig. 21) and its presence in three neighbouring countries, it cannot be excluded that this species occurs in Croatia as well.

General distribution: Widely distributed just north of the Alps, in the Carpathians and in a few countries of the Balkan Region (Bosnia and Herzegovina, Montenegro, Serbia, North

Macedonia) (JÄCH & SKALE, 2015).

Hydraena (s. str.) *vedrasi* Orchymont, 1931

Synonym: *Hydraena montenegrina* Pretner, 1970

Although the likelihood of the occurrence of this species in Croatia is not as high as in many other species, we decided to list it here, because it was quite recently recorded from Bosnia and Herzegovina, where it was found to be quite common in the upper Neretva Valley (BROJER, 2023).

General distribution: Bosnia and Herzegovina, Montenegro, Albania, North Macedonia, Greece (JÄCH & SKALE, 2015; BROJER, 2023).

Limnebius (*Bilimnius*) *myrmidon* Rey, 1883

This species was listed for Croatia by GUÉORGUIEV (1971) and JÄCH & SKALE (2015), but no specimens or publications with detailed data are known. Principally, the occurrence of this species in Croatia is very likely, because *L. myrmidon* has been reported from the Slovenian part of Istria, from Bosnia and Herzegovina as well as from Serbia (JÄCH, 1993a; BROJER, 2023).

General distribution: Spain to Azerbaijan (JÄCH & SKALE, 2015).

Limnebius (s. str.) *nitidus* (Marsham, 1802)

Actually, there exists no confirmed detailed record of *L. nitidus* from Croatia. Historical specimens in the HPM, which originally had been misidentified as *L. nitidus* were recently checked: while both specimens in the collection of V. Redenšek (Lužnica, May 1943; Zagreb-Maksimir, April 1949) were identified by us as *L. papposus*, specimens of the collections of R. Weingärtner and K. Igalffy were actually found to belong to *L. stagnalis* (Zagreb, May 1916; Trnovec, June 1950), *L. furcatus* (Trnovec, June 1950), and *L. crinifer* (Trnovec, June 1950). But since there are confirmed records from Slovenia and Hungary, *L. nitidus* might well occur in northern or eastern Croatia.

General distribution: Ireland to Russia, reaching the northern fringe of the Mediterranean Region in the south (JÄCH & SKALE, 2015).

Limnebius (s. str.) *truncatellus* (Thunberg, 1794)

The record from Croatia by JÄCH & SKALE (2015) was based on the fact that there are confirmed records for this species from Slovenia, Bosnia and Herzegovina, Serbia, and Montenegro, and therefore it most probably occurs also in Croatia. However, confirmed detailed records from Croatia are obviously still lacking. SCHLOSSER KLEKOVSKI (1877: 111)

recorded this species from Croatia without any detailed data, GUÉORGUIEV (1971) indicated only "Cro" (without detailed data). We found no specimens of *L. truncatellus* from Croatia in the CPL, HPM, NMW, or PMS.

General distribution: Very wide-spread in Europe, known also from Morocco (JÄCH & SKALE, 2015).

Ochthebius (*Asiobates) haberfelneri* Reitter, 1890

Although there are no records from Croatia, this species might well be found in this country due to its general distribution. It has, however, still to be tested by molecular studies, whether the populations from the Alps are indeed conspecific with the specimens from the Balkans.

General distribution: This species is one of the rarest and most enigmatic European hydraenid species. Originally described from Austria, it was later also recorded from NE Italy (Tarvisio), Bosnia and Herzegovina (Mt. Igman), and North Macedonia (Šar Planina) (JÄCH, 1990b; AUDISIO & DE BIASE, 2006; JÄCH & SKALE, 2015).

Ochthebius (*Enicocerus*) *granulatus* Mulsant, 1844

This wide-spread species has been collected in the Pohorje Mountains in northeastern Slovenia, just at the Croatian border (JÄCH, 1992b). In all probability, this species occurs also in the adjacent mountains of Croatia.

General distribution: France, Germany, Switzerland, Italy, Austria, Slovenia, Slovakia, Romania (JÄCH & SKALE, 2015).

Ochthebius (*Enicocerus) melanescens* Dalla Torre, 1877

This species is known from Slovenia, Serbia, Romania, Bosnia and Herzegovina, Montenegro and Greece and therefore most probably occurs in Croatia as well.

General distribution: Central Europe and Italy eastwards to the Balkan Peninsula and Ukraine (JÄCH, 1992b; JÄCH & SKALE, 2015).

Ochthebius (*Micragasma*) *paradoxus* Sahlberg, 1900

This is a poorly known species with an apparently very wide distribution (see HERNANDO *et al.*, 2017: fig. 1). It seems to prefer saline pools, and it can be expected to occur in suitable habitats in Croatia as well.

General distribution: Italy, Greece, Ukraine, Russia (JÄCH & SKALE, 2015).

Ochthebius (s. str.) *bernhardi* Jäch & Delgado, 2008

This species is not yet known from Croatia, but due to its wide Ponto-Mediterranean

distribution, it may well occur in the eastern parts of this country. The nearest localities are those from Hungary (Lake Balaton) and Serbia (Fruška Gora).

General distribution: Czechia and eastern Austria to southern Russia, western Turkey and northern Israel (JÄCH & DELGADO, 2008, JÄCH & SKALE, 2015).

Ochthebius (s. str.) *difficilis* Mulsant, 1844

In the Balkan Region, this species is known from Bosnia and Herzegovina, Albania, Greece, Bulgaria and European Turkey. Due to its very wide distribution, *O. difficilis* can be expected to occur also in Croatia. It must, however, be mentioned that *O. difficilis* is probably a complex of two or more closely related species.

General distribution: From northwestern Africa and the Iberian Peninsula eastwards to Iran (JÄCH & SKALE, 2015).

Ochthebius (s. str.) *foveolatus* Germar, 1824

SCHLOSSER KLEKOVSKI (1877: 111) recorded this species from the Lonja River, but this record could not be verified, because these specimens could not be examined (see above under "Material and methods"). JÄCH & SKALE (2015) listed this species for Croatia based on the fact that it has been confirmed for various SE European countries (Bosnia and Herzegovina, Serbia, Romania, Bulgaria, Greece) and therefore quite likely does exist in Croatia as well. However, since there are no detailed records known to us (GUÉORGUIEV (1971) simply wrote "Cro (Da)" [Croatia Dalmatia]), probably referring to misidentified material deposited in the HPM, we decided to regard the occurrence of this species in Croatia as unconfirmed. Specimens of "*O. foveolatus*" deposited in the collection of R. Weingärtner (HPM) in fact turned out to belong to *O. pedicularius* and *O. lividipennis* (det. M.A. Jäch & M. Brojer 2024).

General distribution: France to Turkey (JÄCH & SKALE, 2015).

Ochthebius (s. str.) *insidiosus* Jäch, 1999

This species has been described from Rijeka Crnojevića (Montenegro), roughly 40 km from the Croatian border. It can, however, be expected that *O. insidiosus* is actually more widely distributed.

General distribution: Currently regarded as endemic to Montenegro (JÄCH & SKALE, 2015).

Ochthebius (s. str.) *lanuginosus* Reiche & Saulcy, 1856

JÄCH & SKALE (2015) listed *O. lanuginosus* for Croatia, because it lies well within the distribution area of this species. Furthermore, this species has been recorded from Croatia

under the name "*O. sericeus lanuginosus*" by GUÉORGUIEV (1971), but this record is neither detailed ("Cro (Da)") [Croatia Dalmatia] nor verifiable.

General distribution: Italy, Albania, Greece, Turkey, Cyprus, Israel (JÄCH & SKALE, 2015).

Ochthebius (s. str.) *morettii* Pirisinu, 1974

This species is wide-spread in the Apennine Mountains but occurs also in NE Italy (see AUDISIO & DE BIASE, 2006), e.g., at Muggia, just 15 km from the Croatian border. It can be expected that this species will also be found in Croatia and Slovenia during targeted field surveys focussing on hygropetric habitats.

Taxonomic note: This species was originally described from the Apennines. The conspecifity of the populations from NE Italy should be clarified using molecular data.

General distribution: Currently regarded as endemic to Italy (JÄCH & SKALE, 2015).

Ochthebius (s. str.) *nanus* Stephens, 1829

This Atlantic-West Mediterranean species has been recorded also from the Adriatic coast near Brindisi in Italy (AUDISIO & DE BIASE, 2006), and it therefore cannot be totally excluded that it occurs also in Croatia.

General distribution: Morocco, Iberian Peninsula, France, Great Britain, Belgium, Netherlands, Germany, Italy (JÄCH & SKALE, 2015).

Ochthebius (s. str.) *nobilis* Villa & Villa, 1835

GANGLBAUER (1901) noted that this species occurs also in Dalmatia, probably referring to the two specimens in the NMW labelled "Dalmatien", leg. V. Kahr (see JÄCH, 1989b); another specimen with the same label data is deposited in the MHNG.

Although *O. nobilis* most probably does (or did) occur in Croatia, because it is also known from other SE European countries (Slovenia, Albania, Greece), there is no evidence that the specimens deposited in the MHNG and NMW were really collected within the borders of present-day Croatia, because in former times Dalmatia included also the Bay of Kotor (Montenegro).

General distribution: France and Germany to Italy and Greece (JÄCH & SKALE, 2015).

Ochthebius (s. str.) *parvannulatus* Delgado & Jäch, 2009

There are no records from Croatia, but this species has been collected by V. Apfelbeck at Čapljina (Bosnia and Herzegovina) not far from the Croatian border (DELGADO & JÄCH, 2009).

General distribution: Bosnia and Herzegovina, Albania, North Macedonia, Greece, Turkey,

and southern Russia (DELGADO & JÄCH, 2009; JÄCH & SKALE, 2015).

Ochthebius (s. str.) *peisonis* Ganglbauer, 1901

There is one obviously historical male specimen (without aedeagus) in the NMW labelled: "Kniš [sic] Kroatien" (handwritten), which probably should read: "Croatia, leg. A. Kniž". However, according to the paper quality, the original label must have replaced by somebody in recent years. According to the wide distribution of *O. peisonis*, we cannot completely exclude the possibility of its occurrence in eastern Croatia.

General distribution: Czechia, Austria, Slovakia, Hungary, Romania, Ukraine, southern Russia, Turkey, West Siberia (JÄCH & SKALE, 2015).

Ochthebius (s. str.) *peisonis* has been erroneously recorded from Italy (Friuli-Venezia Giulia: Monfalcone) by TOLEDO & ROCCHI (2017). In fact, their specimen belongs to *O. meridionalis* (det. M.A. Jäch 2017).

Ochthebius (s. str.) *pretneri* Jäch, 1999

This species has been described from Šavnik (Montenegro), which lies only about 70 km from the Croatian border.

General distribution: Currently regarded as endemic to Montenegro (JÄCH & SKALE, 2015).

Ochthebius (s. str.) *ragusae* Kuwert, 1887

This species is currently regarded as very wide-spread. Croatia lies more or less within its distribution range and the occurrence of this species can be expected, especially since it has been recorded from North Macedonia (JÄCH, 1989a), Albania and Greece, and from the Adriatic coast in Italy (AUDISIO & DE BIASE, 2006); the isolated records from NE Italy in AUDISIO & DE BIASE (2006) seems to be questionable and still need to be verified.

General distribution: Mediterranean and Middle East to Central Asia (JÄCH & SKALE, 2015).

Ochthebius (s. str.) *sidanus* Orchymont, 1942

Although there are no confirmed records from Croatia, this country lies well within the currently recognized distribution area of *O. sidanus*, because there are confirmed records from Slovenia, Bosnia and Herzegovina (JÄCH, 1991), and from Montenegro (unpublished specimens deposited in the NMW). However, it seems most likely that this species represents in fact a complex of several closely related species; in any case, detailed molecular studies would be most desirable.

General distribution: Spain to Poland, Ukraine and Greece (JÄCH & SKALE, 2015).

DISCUSSION

Compared to other South European countries, such as Spain or Italy, the knowledge of the hydraenid fauna of Croatia is still remarkably poor. No area-covering sampling has been carried out in Croatia so far. We are, for instance, not aware of any specimens collected in the Kopački rit, a famous wetland at the confluence of the rivers Drava and Danube, being part of a UNESCO Biosphere Reserve, commonly known as the "Amazon of Europe" (https://www.amazon-of-europe.com).

While most of the species of *Hydraena* and *Limnebius* are quite easily distinguishable based on aedeagal morphology, the aedeagi of many species of *Ochthebius* are remarkably uniform, lacking well recognisable specific characters. Comprehensive use of molecular data (DNA sequencing) would certainly enhance the clarification of the taxonomy of many species of *Ochthebius*, for instance in case of the following Croatian taxa: *Ochthebius* cf. *celatus*, *O.* cf. *corrugatus*, *O. dalmatinus*, *O. deletus*, *O. fallaciosus*, *O. meridionalis*, *O. montenegrinus*, *O. punctatus*, *O subinteger*/*asper*, and *O. viridis*. Unfortunately, very few Croatian hydraenid specimens have been barcoded so far. Only one, *Limnebius papposus*, was found databased in BOLD and GeneBank (accessed June 2025), and only very few Croatian specimens have been sequenced by the staff of the Institute of Evolutionary Biology, Barcelona, Spain (A. Villastrigo, pers. comm. 2025).

CONCLUSIONS

A total of 65 valid species is here regarded as occurring in Croatia: 26 species of *Hydraena*, nine species of *Limnebius*, and 30 species of *Ochthebius*. Four species are recorded from Croatia for the first time: *Hydraena* (s. str.) *assimilis* Rey, 1885, *Limnebius* (s. str.) *aluta* Bedel, 1881, *Ochthebius* (*Asiobates*) *flavipes* Dalla Torre, 1877, and *O.* (s. str.) *pedicularius* Kuwert, 1887. It is assumed that the actual number of species occurring in Croatia is much higher; 29 species from neighbouring areas that potentially could occur in Croatia are discussed. Furthermore, it is assumed that even some undescribed species may be discovered in the future, especially by using DNA sequencing: the Croatian populations of *Hydraena* (s. str.) *assimilis*, *Ochthebius* (s. str.) cf. *celatus*, and *O.* (s. str.) cf. *corrugatus* are for instance assumed to belong to undescribed species (see also below, under "Discussion"). Four species are classified as "unconfirmed or doubtfully recorded" from Croatia, because it is assumed that the records are based on wrong locality data: *Hydraena* (s. str.) *bosnica*, *Ochthebius* (s. str.) *caudatus*, *O.* (s. str.) *evanescens*, and *O.* (s. str.) *mediterraneus*. *Ochthebius* (*Asiobates*) *bicolon* Germar, 1824 is deleted from the Croatian checklist, because all former records of

this species obviously refer to *Ochthebius* (*Asiobates*) *crenulatus* or *O.* (*A.*) *striatus*.

Ten of the 65 Croatian species are regarded to have been originally described from Croatia, i.e., their type localities are definitely (and in one case, *Hydraena angustata*, most probably) located in Croatia (Fig. 6):

Hydraena (s. str.) *angustata* Sturm, 1836: "Illyria" (? Primorje Region)

Hydraena (s. str.) *croatica* Kuwert, 1888: "Croatia" (probably collected at Ludbreg)

Hydraena (s. str.) *kaufmanni* Ganglbauer, 1901: Konavle Region

Hydraena (s. str.) *subjuncta* Orchymont, 1930: Konavle Region

Limnebius (s. str.) *fallaciosus* Ganglbauer, 1904: Konavle Region

Ochthebius (*Aulacochthebius*) *narentinus* Reitter, 1885: Metković

Ochthebius (*Cobalius*) *adriaticus* Reitter, 1886: Pula

Ochthebius (s. str.) *dalmatinus* Ganglbauer, 1904: Dubrovnik

Ochthebius (s. str.) *fallaciosus* Ganglbauer, 1901: Zadar

Ochthebius (s. str.) *steinbuehleri* (Reitter, 1886): Pula

Only one hydraenid species, *Hydraena angustata*, is currently regarded as endemic to Croatia. Besides *Hydraena angustata*, thirteen of the Croatian species are regarded as endemic or subendemic to the Balkan Region: *Hydraena chiesai*, *H. croatica*, *H. czernohorskyi*, *H. dalmatina*, *H. kaufmanni*, *H. subintegra*, *H. subjuncta*, *Limnebius fallaciosus*, *L. paganettii*, *Ochthebius dalmatinus*, *O. hebaueri*, *O. montanus*, and *O. montenegrinus*.

Especially noteworthy are *Hydraena chiesai* and *H. czernohorskyi*, which are endemic resp. subendemic to the Istrian Peninsula. The distribution of five hydraenid species is in Croatia obviously more or less restricted to the Konavle Region at the southernmost tip of the country: *Hydraena dalmatina*, *H. kaufmanni*, *Limnebius fallaciosus*, *L. paganettii*, and *Ochthebius striatus*.

With regard to the biogeographical regions of Croatia (Fig. 6) (https://www.eea.europa.eu/data-and-maps/figures/biogeographical-regions-in-europe-2), the majority of the 65 hydraenid species occurs in the Mediterranean Region (47), followed by the Continental (28) and the Alpine (14) regions. Only five species have been recorded from all three biogeographical regions: *Hydraena gracilis*, *H. morio*, *H. nigrita*, *H. riparia*, and *Ochthebius metallescens*. 32 species (ca. 50 %) are currently regarded as confined to the Mediterranean Region, 10 to the Continental Region, and only two, *Hydraena alpicola* and *H. truncata*, to the Alpine Region.

Fig. 6. Map of Croatia, showing the biogeographical regions of Croatia (from left to right: Mediterranean (MED), Alpine (ALP), Continental (CONT)) and the type localities/type regions of the ten species that have originally been described from Croatia. MED: Pula, Primorje Region, Zadar, Metković, Dubrovnik, Konavle Region, CONT: Ludbreg.

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