

Are minute moss beetles (Coleoptera: Hydraenidae) still overlooked beetles in Croatia?

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0.8 - 3.2 mm

true water beetles
(sensu Jäch, 1998)

World: ~1300 species
Europe: > 400 species



MINUTE MOSS BEETLES - INSECTA: COLEOPTERA: HYDRAENIDAE

inhabit various habitats: springs, clean running waters, small ponds, hypersaline pools or hygropetric

water and habitat quality indicators

• the Mediterranean region - biodiversity hotspot •

• local endemism and presence of still undescribed species is highly expected

• poorly studied insects in the Balkan Peninsula •



preliminary checklist of Croatian Hydraenidae

detailed revision: literature data
entomological collections



sampling throughout Croatia

definition by traditional taxonomy

definition by molecular taxonomy

“comparative collection of Croatian species habitus”

DNA barcoding

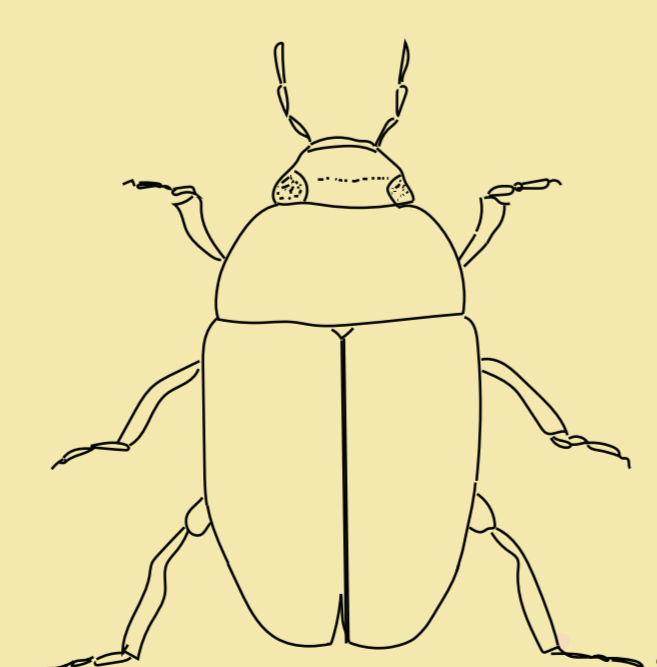
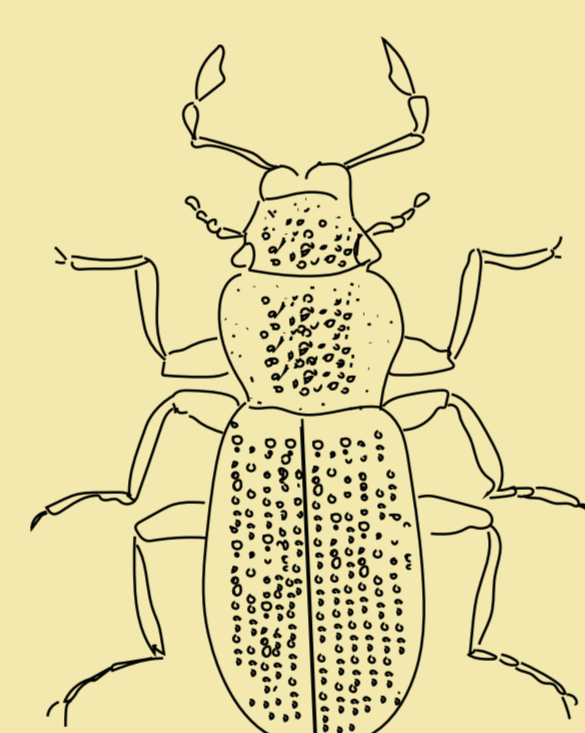
(scarce data on European hydraenids
in BOLD database)



We recorded 83 species in Croatia

Our results indicate / contribute:

- high species diversity
- presence of rare and / or potentially endemic species
- first DNA barcode for many species
- eg. *Limnebius paganetti* Ganglbauer, 1904
Hydraena morio Kiesenwetter, 1849
- represents the base for future studies on the speciation processes of Hydraenidae in the eastern Mediterranean
- to the knowledge of freshwater diversity in Croatia
- the importance of implementation of integrative taxonomy in biodiversity conservation procedures



RECORDED HYDRAENIDAE SPECIES IN CROATIA	
<i>Hydraena alpicola</i>	Pretner, 1931
<i>Hydraena angustata</i>	Sturm, 1836
<i>Hydraena belgica</i>	d'Orchymont, 1930
<i>Hydraena bosnica</i>	Apfelbeck, 1909
<i>Hydraena chiesai</i>	Janssens, 1965
<i>Hydraena croatica</i>	Kuwert, 1888
<i>Hydraena czernohorskyi</i>	Müller, 1806
<i>Hydraena dalmatina</i>	Ganglbauer 1901
<i>Hydraena devincta</i>	d'Orchymont, 1940
<i>Hydraena egoni</i>	Jäch, 1986
<i>Hydraena excisa</i>	Kiesenwetter, 1849
<i>Hydraena gracilis</i>	Germar, 1824
<i>Hydraena hungarica</i>	Rey, 1884
<i>Hydraena kaufmanni</i>	Ganglbauer, 1901
<i>Hydraena lapidicola</i>	Kiesenwetter, 1849
<i>Hydraena melas</i>	Dalla Torre, 1877
<i>Hydraena minutissima</i>	Stephens, 1829
<i>Hydraena morio</i>	Kiesenwetter, 1849
<i>Hydraena nigrita</i>	Germar, 1824
<i>Hydraena paganetti</i>	Ganglbauer, 1901
<i>Hydraena palustris</i>	Erichson, 1837
<i>Hydraena pulchella</i>	Germar, 1824
<i>Hydraena pygmaea pygmaea</i>	Waterhouse, G.R., 1833
<i>Hydraena reyi</i>	Kuwert, 1888
<i>Hydraena riparia</i>	Kugelann, 1794
<i>Hydraena rugosa</i>	Mulsant, 1844
<i>Hydraena schuleri</i>	Ganglbauer, 1901
<i>Hydraena sicula</i>	Kiesenwetter, 1849
<i>Hydraena subintegra</i>	Ganglbauer, 1901
<i>Hydraena subjuncta</i>	d'Orchymont, 1930
<i>Hydraena sublamina</i>	d'Orchymont, 1945
<i>Hydraena truncata truncata</i>	Rey, 1885
<i>Limnebius aluta</i>	Bedel, 1881
<i>Limnebius atomus</i>	Dufschmid, 1805
<i>Limnebius crinifer</i>	Rey, 1885
<i>Limnebius fallaciosus</i>	Ganglbauer, 1904
<i>Limnebius furcatus</i>	Baudi di Selve, 1872
<i>Limnebius myrmidon</i>	Rey, 1883
<i>Limnebius nitidus</i>	Marsham, 1802
<i>Limnebius oblongus</i>	Rey, 1883

RECORDED HYDRAENIDAE SPECIES IN CROATIA	
<i>Limnebius paganetti</i>	Ganglbauer, 1904
<i>Limnebius papposus</i>	Mulsant, 1844
<i>Limnebius parvulus</i>	Herbst, 1797
<i>Limnebius stagnalis</i>	Guillebeau, 1890
<i>Limnebius truncatellus</i>	T hunberg, 1794
<i>Aulacochthebius exaratus</i>	Mulsant, 1844
<i>Aulacochthebius narentinus</i>	Reitter, 1885
<i>Ochthebius bicolor</i>	Germar, 1824
<i>Ochthebius corcyraeus</i>	Jäch, 1990
<i>Ochthebius crenulatus</i>	Mulsant & Rey, 1850
<i>Ochthebius dilatatus</i>	Stephens, 1829
<i>Ochthebius hebaueri</i>	Jäch, 1983
<i>Ochthebius hungaricus</i>	Endrödy-Younga, 1967
<i>Ochthebius minimus</i>	Fabricius, 1792
<i>Ochthebius montanus</i>	Frivaldszky, 1881
<i>Ochthebius peregrinus</i>	d'Orchymont, 1941
<i>Ochthebius striatus</i>	Castelnau, 1840
<i>Ochthebius steinbuehleri</i>	Reitter, 1886
<i>Ochthebius colveranus</i>	Ferro, 1979
<i>Ochthebius exsculptus</i>	Germar, 1824
<i>Ochthebius gibbosus</i>	Germar, 1824
<i>Ochthebius halbherri</i>	Reitter, 1890
<i>Ochthebius montenegrinus</i>	Ganglbauer, 1901
<i>Ochthebius adriaticus adriaticus</i>	Reitter, 1886
<i>Ochthebius caudatus</i>	Frivaldszky, 1883
<i>Ochthebius celatus</i>	Jäch, 1989
<i>Ochthebius dalmatinus</i>	Ganglbauer, 1904
<i>Ochthebius evanescens</i>	Sahlberg, 1875
<i>Ochthebius foveolatus</i>	Germar, 1824
<i>Ochthebius lividipennis</i>	Peyron, 1858
<i>Ochthebius marinus</i>	Paykull, 1798
<i>Ochthebius mediterraneus</i>	Ienistea, 1988
<i>Ochthebius meridionalis</i>	Rey, 1885
<i>Ochthebius metallescens metallescens</i>	Rosenhauer, 1847
<i>Ochthebius nanus</i>	Stephens, 1829
<i>Ochthebius nobilis</i>	A. Villa & G.B. Villa, 1835
<i>Ochthebius pedicularius</i>	Kuwert, 1887
<i>Ochthebius pilosus</i>	Waltl, 1835
<i>Ochthebius punctatus</i>	Stephens, 1829
<i>Ochthebius pusillus</i>	Stephens, 1835
<i>Ochthebius subinteger</i>	Mulsant & Rey, 1861
<i>Ochthebius subpictus deletus</i>	Rey, 1885
<i>Ochthebius viridis viridis</i>	Peyron, 1858

