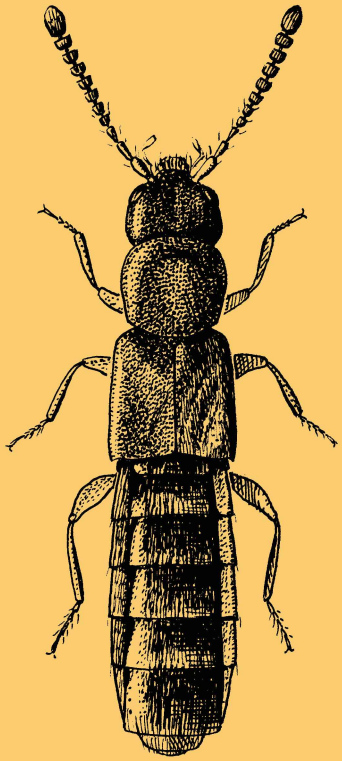
HUNGARIAN NATURAL HISTORY MUSEUM



Gravelbank habitats in the Carpathians

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Hungarian Natural History Museum, Budapest

Conservation of Wetlands in the Carpathians,

Tatranská Štrba

16-19 November 2009

What is a gravelbank?

It is not a wetland ...
but it is wet land!
neither a terrestrial,
nor an aquatic habitat

It is wet:
- immediately on the border of water
- constantly wet because of capillary forces

It is land:
- inhabiting species cannot survive in water

What type of organisms live there?

- Collembola, Crustacea, Insecta

- within Coleoptera: Staphylinidae, Ptiliidae, Elateridae

- most of these are small, length less than 5 mm; 10% of them is around 1 mm or even less

- such small beetles usually have very hidden life: they live in soil (under leaflitter) or in sunny gravelbanks (often under stones)

- they are exclusive to these habitats.

Thinobius hummleri (Scale = 1 mm)

Study of Carpathian gravelbanks

- approximately 100 different sites were sampled in the Romanian Carpathians from 1999 to 2008

Where are the most species-rich gravelbank habitats in the Carpathians?

- streams and rivers originating in high mountains (1500-2500 m) and suddenly reaching valleys, flat landscape
- near limestone mountains or mountains with varied base rock
- in water systems without water reservoirs – or only above the reservoir; under the reservoir the fauna is very poor until further confluences
- in situations where organic material is abundant, with uninterrupted flow of mineral and vegetal debris

1600-1800 m

600-800 m

300-500 m

Sampling from a gravelbank 1.

- flotation method

Sampling from a gravelbank 2.

Sampling from a gravelbank 3.

- insects are so small that they can easily be lost or damaged
- carried on a cotton layer covered by a tissue paper

From the point of view of natural protection

- most endangered are the gravelbanks of middle part type rivers - these are the most rich in species
- usually outside national parks or other protected areas
- heavily influenced by human activities and settlements
- deterioration of habitat is not visible at once, often caused by changes far from the actual site
- whole water system needs to be protected, difficult to implement

Valea Viseului
(Maramures, RO)
site intensively studied
between 2002-2007

COLEOPTERA

suborder Myxophaga

Sphaeriusidae

Sphaerius acaroides Waltl, 1838

suborder Adephaga

Carabidae

Nebria picicornis (Fabricius, 1801)

Tachys turkestanicus Csiki, 1928

suborder Polyphaga

Ptiliidae

Acrotrichis (Acrotrichis) brevipennis (Erichson, 1845)

Ptenidium (Gillmeisterium) reitteri Flach, 1887

Ptenidium (Wankowiczium) brenskei Flach, 1887

Staphylinidae

Stenus incanus Erichson, 1839

Aleochara haematoptera Kraatz, 1858

Aloconota cambrica (Wollaston, 1855)

Aloconota currax (Kraatz, 1856)

Aloconota insecta (Thomson, 1856)

Aloconota mihoki (Bernhauer, 1913)

Aloconota sulcifrons (Stephens, 1832)

Apimela macella (Erichson, 1839)

Apimela mulsanti (Ganglbauer, 1892)

Atheta (Philhygra) hygrotopora (Kraatz, 1856)

Atheta (Philhygra) malleus Joy, 1913

Atheta (Philhygra) volans (Scriba, 1859)

Carpelimus erichsoni (Sharp, 1871)

Carpelimus obesus (Kiesenwetter, 1844)

Dasygnypeta velata (Erichson, 1837)

Deleaster dichrous (Gravenhorst, 1802)

Atheta (Hydrosmecta) tenuissima Eppelsheim, 1892

Atheta (Hydrosmecta) tristicolor G. Benick, 1969

Neobisnius prolixus (Erichson, 1840)

Ocalea rivularis Miller, 1851

Ochthephilus omalinus (Erichson, 1840)

Philonthus atratus (Gravenhorst, 1802)

Philonthus coerulescens (Lacordaire, 1835)

Philonthus rufimanus Erichson, 1840

Platydomene distinctiventris (Koch, 1939)

Tachyusa coarctata Erichson, 1837

Tachyusa coarctatoides Pasnik, 2006

Tachyusa concinna (Heer, 1839)

Taxicera deplanata (Gravenhorst, 1802)

Tetartopeus terminatus (Gravenhorst, 1802)

Thinobius angusticeps Fauvel, 1889

Thinobius bicolor Joy, 1911

Thinobius brigitteae Schülke, 1998

Thinobius brunneipennis Kraatz, 1857

Thinobius ciliatus Kiesenwetter, 1844

Thinobius comes Smetana, 1959

Thinobius crinifer Smetana, 1959

Thinobius gurzoeszterae Makranczy, 2009

Thinobius hummleri Bernhauer, 1940

Thinobius ligeris Pyot, 1874

Thinobius linearis Kraatz, 1857

Thinobius minor Mulsant & Rey, 1870

Thinobius petzi Bernhauer, 1908

Thinodromus arcuatus (Stephens, 1834)

Thinodromus dilatatus (Erichson, 1839)

Thinodromus distinctus (Fairmaire et Laboulbéne, 1856)

Thinodromus hirticollis (Mulsant et Rey, 1878)

Limnichidae

Limnichus incanus Kiesenwetter, 1851

Elateridae

Adrastus kryshtali Dolin, 1988

Zorochros dermestoides (Herbst, 1806)

Zorochros meridionalis (Laporte de Castelnau, 1840)

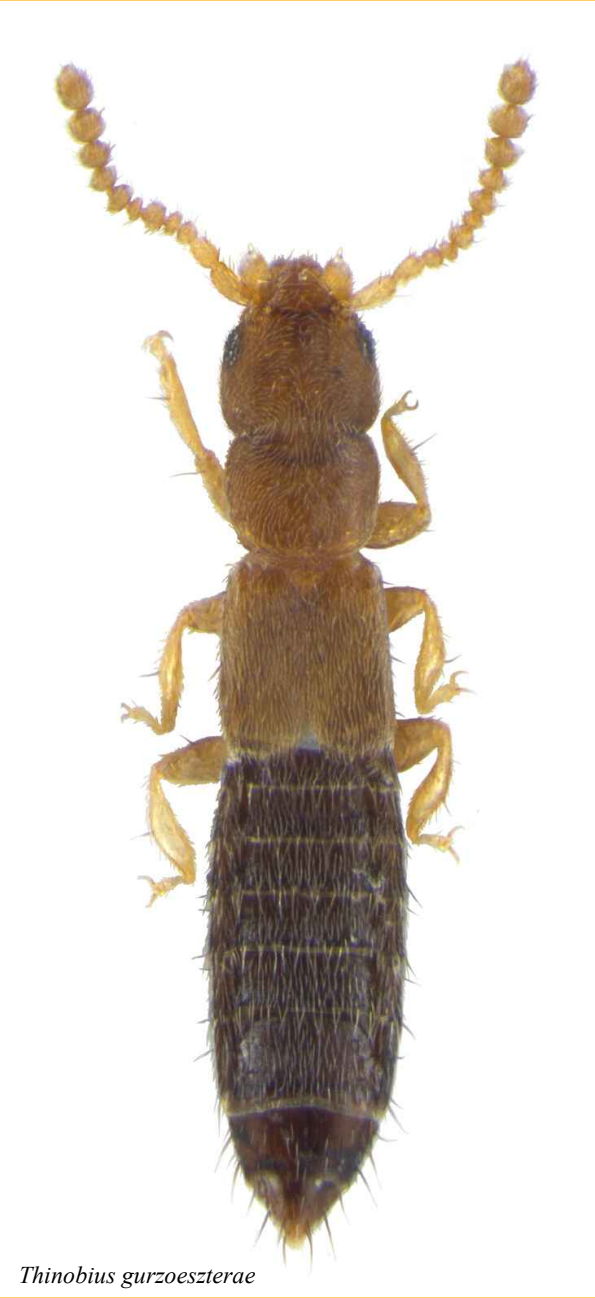
Anthicidae

Notoxus brachycerus (Faldermann, 1837)

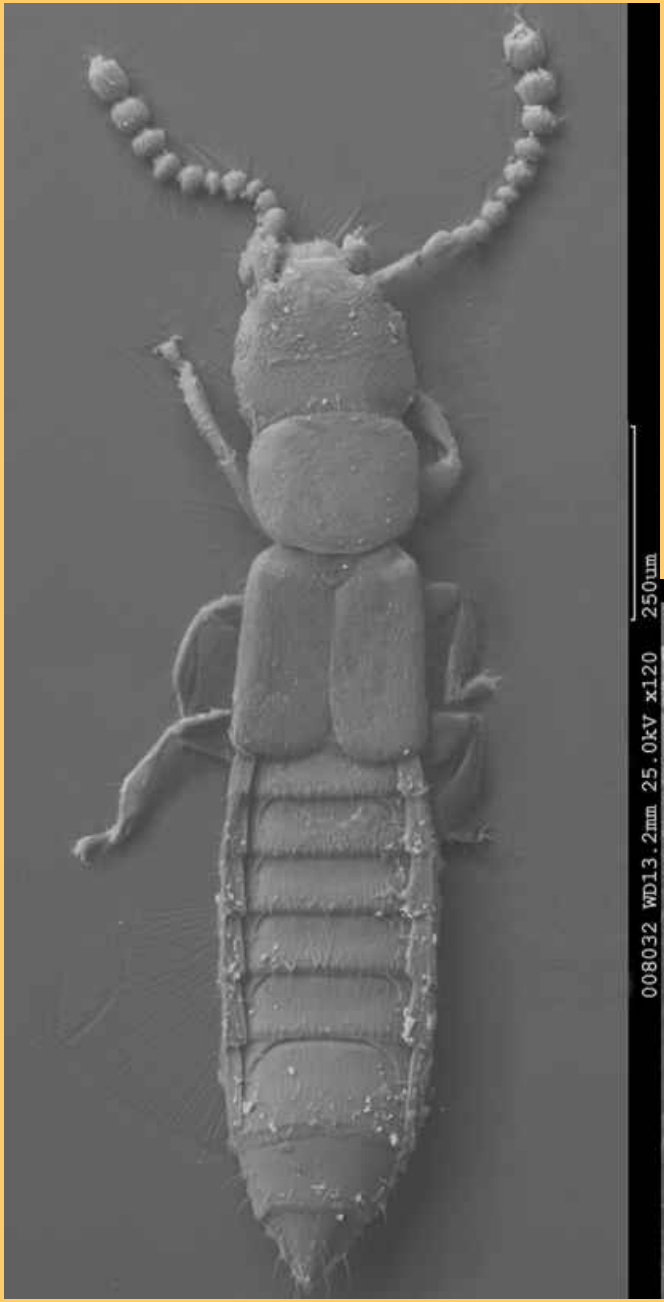
Sphaerius acaroides

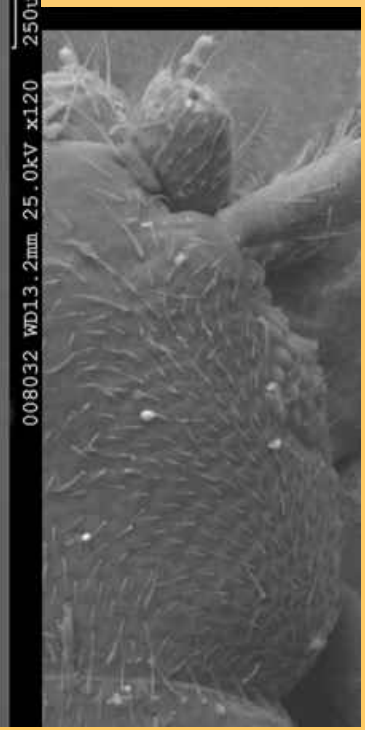
List of beetle species from Valea Viseului and neighbouring habitats along the river Viseu

Species exclusive to gravelbank habitats are marked in red. These species cannot find a secondary habitat



Thinobius gurzoeszterae





A new beetle species from Valea Viseului, found in 2007

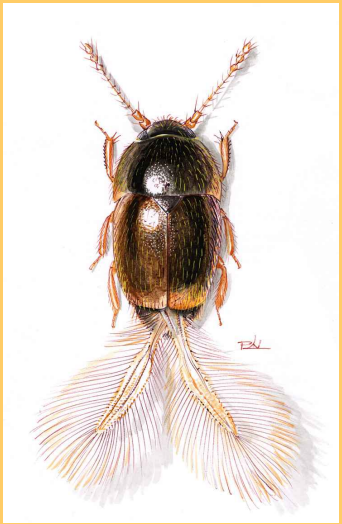
(length = 1.2 mm)

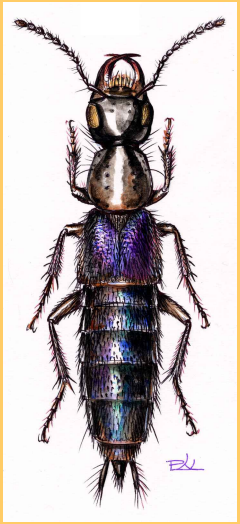
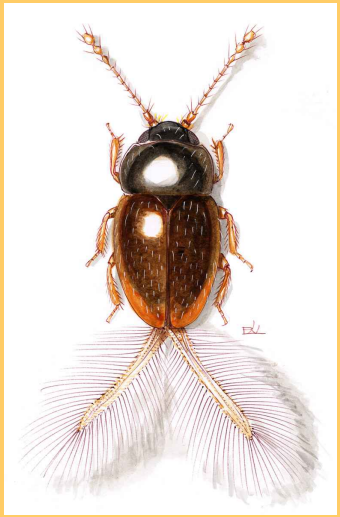
Importance in the diversity of life

- in the family Staphylinidae (1400 species in the Carpathians) 4-5% of the species live **exclusively** on gravelbanks

- the genera ***Apimela***, ***Thinobius*** and ***Hydrosmecta*** contain altogether 30-40 species in the Carpathians

- this is a very significant number to be lost with the destruction of the gravelbank habitats



- wildlife in the gravelbank follows the water level to find suitable habitats
- in stormy weather the water level is changing rapidly
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- animals are forced to move up with the raising water level
- even those that live under large stones can be captured

Endangering factors

Physical factors:

- overflow gates, channels/tubes, dams, water reservoirs
- unnatural streambed and lines of trees
- gravel mining
- disturbance by livestock

Chemical pollution:

- gasoline from engines
- sawdust from wood processing
- animal wastes, chemicals from fields and gardens
- detergents from households

Thank you for your attention!