AquaBOL.SK - barcoding of Slovak aquatic biota launched in the mountains

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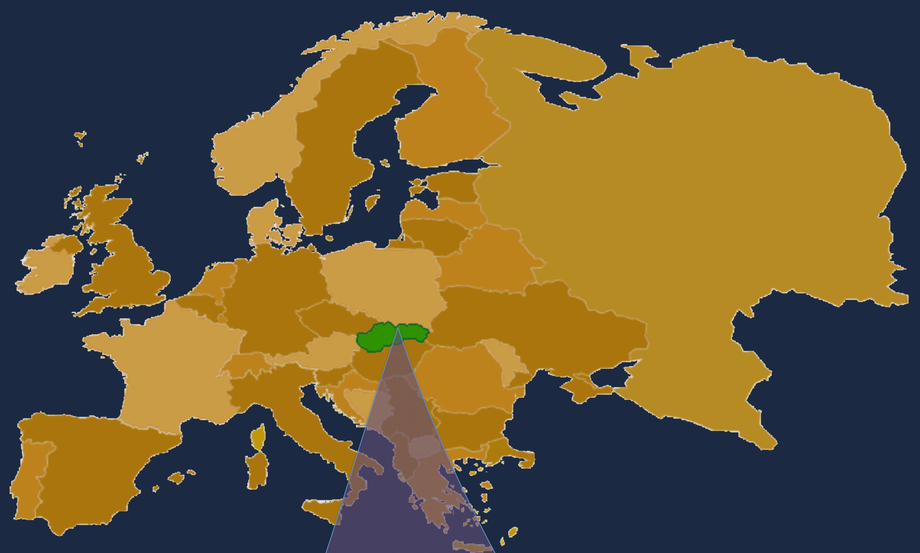
www.AquaBOL.SK



Reference barcode libraries

- comprehensive DNA barcodes reference databases for freshwater taxa present in European waters are essential for application of genomic tools in aquatic bioassessment
- barcode libraries of all main freshwater groups of organisms are built within several national DNA-barcoding campaigns
- there are still countries where such activities are only starting or are completely lacking

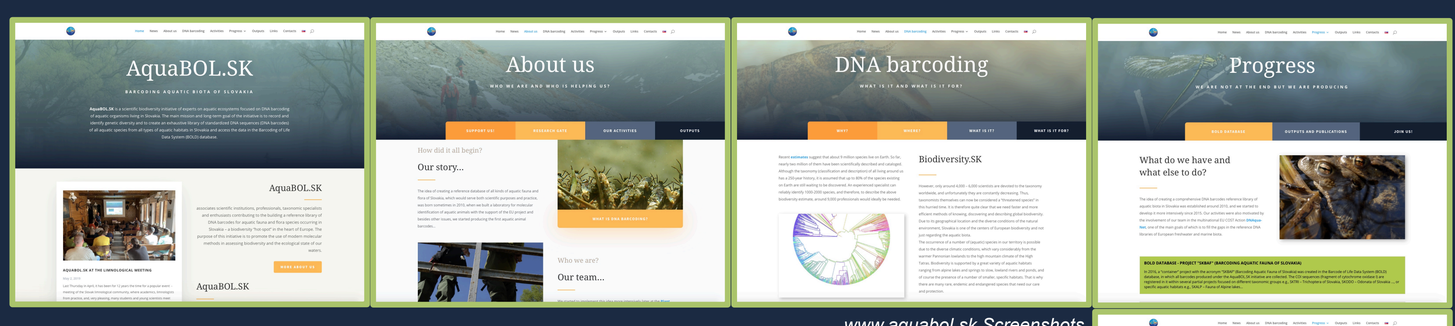
Tatra Mountains

Overview

Water quality monitoring and biodiversity assessment of the European fresh waters follow the EU-Water Framework Directive (WFD, 2000/60/EC), and the biological samples used are identified based on morphological characters. Since this process is not very effective, novel approaches and initiatives emerge aiming future implementation of modern genomic tools in bioassessment of European waters.
Recent detailed survey, arising from the DNAqua-Net EU COST Action (CA15219), has revealed significant gaps in the barcoding data on aquatic biota available, which are key for future DNA based monitoring of the European water bodies (Weigand et al, 2019). The differences in DNA barcodes coverage differs significantly among taxonomic groups or geographical location, with the least data being available from Central or Eastern European countries and the Balkans.

AquaBOL.SK – Barcoding aquatic biota of Slovakia

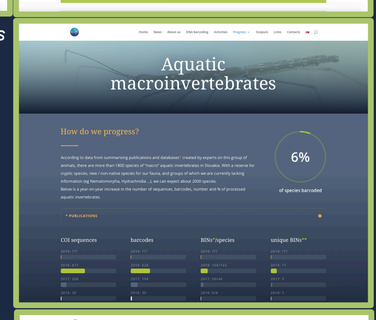
Due to its geographic location and various natural conditions, Slovakia is one of the centers of European biodiversity (including aquatic). However, the coverage of species by reference DNA data (BOLD, GenBank) is far from being complete.

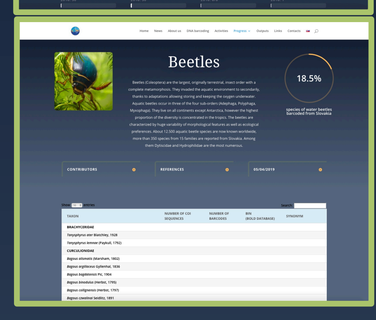


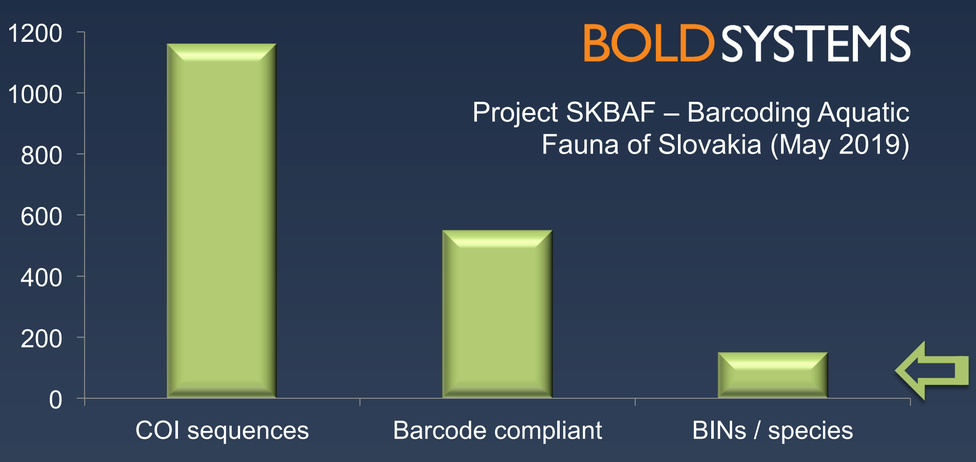
www.aquabol.sk Screenshots

AquaBOL.SK

is a scientific biodiversity initiative of experts on aquatic ecosystems. The main mission and long-term goal of AquaBOL.SK **is** to identify and record genetic diversity and build DNA barcodes library of all aquatic species from all types of fresh water habitats in Slovakia and publish the data on BOLD database.





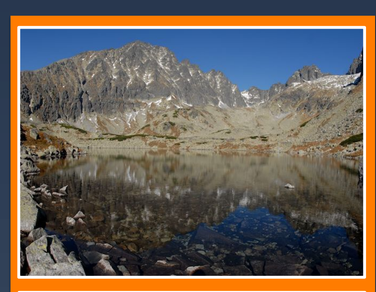


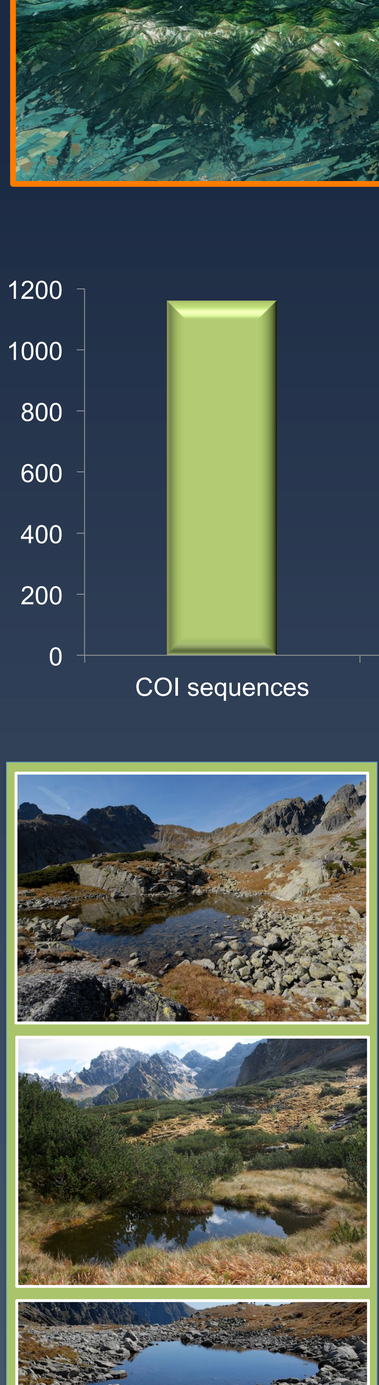
BOLD SYSTEMS

Project SKBAF – Barcoding Aquatic Fauna of Slovakia (May 2019)

AquaBOL.SK activities

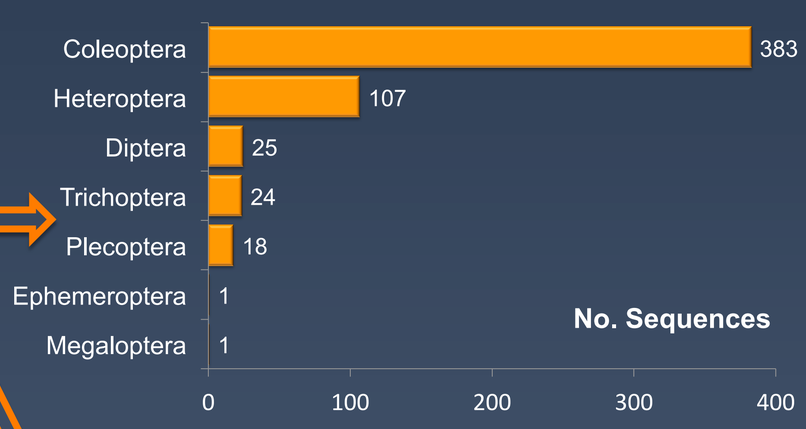
- currently focused on macroinvertabrates: based on present checklists, around 2000 macroinvertebrate taxa inhabit Slovak fresh waters, but only ca 6 % are barcoded
- building reference barcode library of macroinvertebrates collected in Slovakia (since end of 2016)
- container project on BOLD (www.boldsystems.org): SKBAF = Aquatic fauna of Slovakia



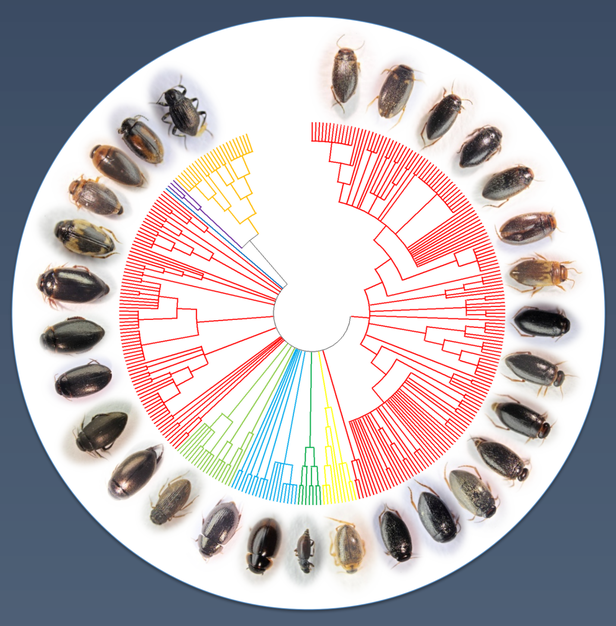


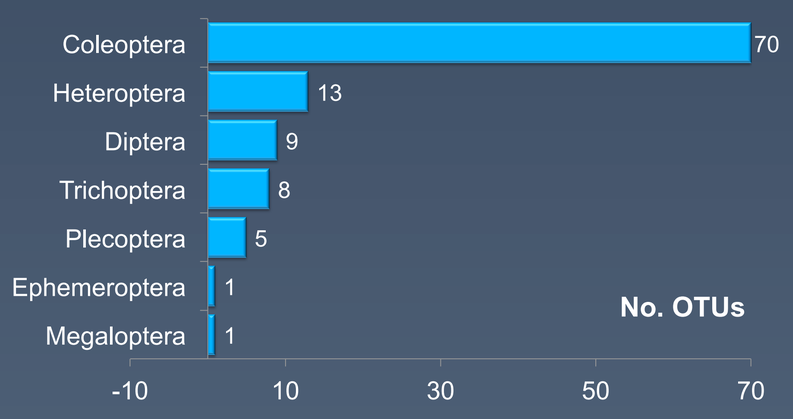
Current focus:

specific and valuable biotopes of alpine lakes and ponds in the Tatra Mountains – the highest and westernmost part of the Carpathian Arc



Coleoptera





Heteroptera

Tatra Mts lakes - recent outputs:

- aquatic beetles barcoding in Tatra Mts. revealed 23 new species for the mountain region and 3 new unique BINs on BOLD
- water bugs barcoding detected 12 species and 1 species new to Slovak fauna
- cryptic diversity suggested
  - *Crenobia alpina* flatworm – at least three deep lineages (potential species) detected in Tatra Mts
  - *Heterotrissocladius marcidus* non biting midge – likely complex of two cryptic species
- other groups of alpine lakes invertebrates are still processed

This study was made within the EU COST Action CA15219 “DNAqua-Net“ (Developing new genetic tools for bioassessment of aquatic ecosystems in Europe) and projects VEGA 2/0030/17 and 2/0101/16. Barcode was generated with TEC-IT Barcode Software.