

CA18239 - Conservation of freshwater mussels: a pan-European approach

STSM details

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Networking tool reference	
Title	Taxonomic revision of freshwater mussels of Bulgaria
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Applicant

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Workplan summary

Abstract. Bulgaria is one of the regions in Europe where fundamental data on freshwater mussel diversity and distribution is still grossly incomplete, hampering effective conservation measures. This STSM would enable me to participate in a 10-day field expedition co-led by Dr Manuel Lopes-Lima, Chair of Confremus-WG 1, and the host Prof. Teodora Trichkova, Bulgarian Academy of Sciences. The expedition aims at collecting data and material of freshwater mussel populations across all the major river basins of Bulgaria. Subsequently, DNA sequence data will be generated to resolve taxonomy and improve our understanding of spatial distribution of species and genetic diversity. **Aim & motivation.** Field expeditions that aim to sample data and material to gather data on the diversity and distribution of freshwater mussel species offer a double benefit: the advancement of knowledge and the strengthening of ties within our scientific community. The motivation behind my request relate to both of these

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important aspects of our common research interest, which are particularly timely in poorly explored regions such as Bulgaria. The Mediterranean and Balkan countries are considerably less well studied than the Central and Northern European countries. A survey conducted in the Balkans in 2019 focused on the sampling of the main basins in Slovenia, Croatia and Albania. In 2020, the team completed a survey of the main basins in Greece. However, large areas in the region remain to be verified. Among these we have planned the sampling of the main basins of Bulgaria. According to our Bulgarian host, Teodora Trichkova, there is a lack of genetic information, especially on the Rivers from the Maritsa basin and isolated basins of the Black Sea, but also some of the Danube tributaries deserve to be checked. Unfortunately, the economic resources available to carry out these type of field surveys are becoming increasingly scarce. As a result, for many freshwater mussel species and populations, available data are insufficient to accurately determine their conservation status and develop appropriate conservation measures. Whilst not directly financing research activities, this STSM would offer the rare opportunity to support international exchange of knowledge and skills between the Bulgarian host institution (e.g. on local freshwater mussel ecology and how to conduct field surveys in Bulgaria) and myself (e.g. previous experience on conducting freshwater mussel surveys in other regions). By working together, we will maximise the speed at which these crucial data will be acquired in this region that has so far been grossly understudied due to the limitation of local resources. **Outcomes.** We anticipate to sample voucher material and tissue snips from mussel populations across all the major basins of Bulgaria. Subsequent morphological and genetic analysis of sampled specimens and specimens already available in local collections will be used to revise the taxonomy, and reveal spatial patterns of genetic diversity and differentiation patterns. Particular emphasis will be put on resolving the validity of *Unio* subspecies. Data on the spatial distribution of species and historical trends in species' ranges and population sizes will be used to revise/assess the IUCN Conservation Status of respective species. We anticipate a number of important publications will result from this STSM. **Integration with the COST action.** The study program falls within the scope of Confremus because it aims to investigate one of WG1 main tasks, i.e. contribute to improve knowledge of the biodiversity and distribution of freshwater mussels. **Techniques.** Whilst I am already experienced in conducting similar survey work in other regions, this STSM would provide the first opportunity for me to apply these skills in Bulgarian freshwater habitats. I am looking forward to working with and learning from Teodora about habitat requirements of and prevailing threats to local freshwater mussel species and populations. At the same time, I hope that the experience I bring will also prove beneficial to the future work of the Bulgarian team. **Planning.** Mussels will be collected in different catchments. Study sites will be selected on the basis of the available literature data and local knowledge. Search methods will be selected according to the type of habitats and other site characteristics. In shallow areas, mussels will be searched by hand or by snorkeling. In deeper sites mussels will be searched by scuba diving. Up to 20 specimens per species in each sampled population will be collected. For genetic analyses, foot tissue clips will be taken without killing the animals. All animals will then be returned in their original place. The genetic material will be analyzed using methods suitable for the specific purpose, i.e. the identification and / or delimitation of the species or the evaluation of the genetic variability of local populations. The completion of the survey activities takes at least ten days starting from 25th June to 4th July. The trip will be carried out by car for: 1) the need to transport the equipment necessary for sampling, 2) the need to move quickly from one sampling site to the next in order to minimise the time needed to explore an area large enough to provide the data necessary to achieve the intended purpose.

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