Substratum preferences of macroinvertebrates in a Mediterranean-type intermittent river: a tool to predict habitat suitability under future scenarios of climatic change
Katarzyna Sroczyńska1, Marília Claró2, Victor García3, Dimitra Tsinkidou4, Pedro Range5, Radhouan Ben-Hamadou6 and Luís Chicharo7

1Faculty of Science and Technology, Campus of Gamelas, University of Algarve 8005-139, Faro, Portugal 2Centro de Ciências do Mar, Universidade do Algarve, Campus de Gamelas 8005-139 Faro, Portugal 3Faculty of Biology, University of Barcelona, Barcelona, Spain 4Department of Marine Science, University of Aegae, Lesvos Island, Greece

SUMMARY
Intermittent rivers are characterized by seasonal variations in hydrological dynamics, discharge and temperatures that influence habitat structure and associated biota. Physical and chemical habitat alterations are therefore responsible for different taxonomic composition and abundance of invertebrates in the stream. Since macroinvertebrates display strong habitat preferences, relating environmental parameters to species occurrences is crucial to determine suitable habitats within the river network that could later be used to forecast climate change impacts on patterns of invertebrate biodiversity at different spatial scales.

AIM
Investigate habitat preferences for macroinvertebrates based on species composition and abundance between different habitats in near- natural study reach

METHODS

88 samples were taken from 9 different habitats, naturally encountered in the study reach, from which 5 were classified as mineral habitats and 4 as organic habitats. All specimens were identified and taxonomic-adjustment was made for further data analysis (AQUEM, 2002). The SIMPER routine (PRIMER-E) was used to examine the contribution of each taxa to each habitat. An indicator (INDVAL) of the strength of that association was also calculated (Dufrène & Legendre, 1997). The taxa with highest INDVAL and highest % of contribution to similarity within a given habitat were tested for differences in abundance (one-way ANOVA for habitat).

RESULTS

- From 104 taxa, 11 meet the defined criteria
- Seven were significantly associated to 1 or 2 habitats (specialists) from which 5 taxa were also major contributors to assemblage structure in these habitats.
- Four taxa were found to be present in all habitats, without significant association to any of them (generalist species) [Tab.1].

APPLICATION

- Establish empirical relationships between habitat conditions and the presence and abundance of “key taxa” in the entire River Basin
- Predict invertebrate composition and abundance on different substrates under future scenarios of climate change

ACKNOWLEDGEMENTS
This is a contribution of the IMPACT project, which is part of the European Commission RTD programme (WWM-NET). Funding was provided by the Foundation for Sciences and Technology (FCT) and the COST Action (FA0706). PR was also supported by a post-doctoral grant from FCT (SFRH/BPD/69959/2010)

REFERENCES

CONCLUSIONS
- Among all substrate types CPOM showed smaller values of abundance and number of taxa
- All other habitat types are equally important for macroinvertebrates
- Hydraulic conditions are important driver for habitat structuring and therefore macroinvertebrate communities
- Granulometry is a strong determinant of species associations in mineral habitats
- Species with significant associations will help to provide information about “key taxa” for further studies

CONCLUSIONS
- Among all substrate types CPOM showed smaller values of abundance and number of taxa
- All other habitat types are equally important for macroinvertebrates
- Hydraulic conditions are important driver for habitat structuring and therefore macroinvertebrate communities
- Granulometry is a strong determinant of species associations in mineral habitats
- Species with significant associations will help to provide information about “key taxa” for further studies

FUTURE WORK
- Establish empirical relationships between habitat conditions and the presence and abundance of “key taxa” in the entire River Basin
- Predict invertebrate composition and abundance on different substrates under future scenarios of climate change

ACKNOWLEDGEMENTS
This is a contribution of the IMPACT project, which is part of the European Commission RTD programme (WWM-NET). Funding was provided by the Foundation for Sciences and Technology (FCT) and the COST Action (FA0706). PR was also supported by a post-doctoral grant from FCT (SFRH/BPD/69959/2010)

REFERENCES