

# **RECONSTRUCTING THE ENVIRONMENTAL CONDITIONS IN THE COASTAL AREA OF THE SOUTHERN BIGHT OVER THE PAST MILLENNIUM USING *MYTILUS EDULIS* SHELLS**

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Global climate change is a big issue these days. To be able to predict changes and to have better monitoring of the climate in the future we need to know the climate of the present and past. Because measurements of seawater temperature, salinity and other environmental variables did not happen accurately in the past or simply do not exist, proxies are needed to obtain information about the palaeoenvironment. Much research has confirmed that the elemental and isotopic composition of calcareous skeletons are records of past and present environmental conditions and thus allow reconstruction of the environmental history. The calcareous skeleton of the bivalve *Mytilus edulis* is very useful to investigate global change because it is a cosmopolite. Sensitive microanalysis techniques, such as High Resolution Inductively Coupled Plasma-Mass Spectrometry (HRICP-MS) offer the possibility to analyse chemical compositions of calcareous skeletons at a high spatial and thus temporal resolution. Because the composition of biogenic carbonates is also clearly influenced by biological factors and not only by the environment, the correct interpretation of these chemical archives requires a precise understanding of the processes controlling the incorporation of elements.

Our contribution to this research branch consists of the investigation of recent and archaeological *Mytilus edulis* shells, the first were collected from the Belgian East-Coast (Knokke) and the latter were collected by Beatrijs Hillewaert in Brugge and the now non-existent village of Monnikerede. They have been dated and they range from the 13<sup>th</sup> until the 19<sup>th</sup> century. The calcareous skeletons are and will be analysed for their stable isotope composition of oxygen and carbon and their chemical composition of certain trace elements such as barium and lead. These parameters have been shown to be proxies of water temperature, salinity and pollution. But this reflection may be overshadowed by biochemical processes, boiling and diagenesis. To be able to assess the first artefact the chemical composition of organic material of the specimen (periostracum) will be studied. Because the mussels come from a waste pile, they were most likely boiled. The influence of boiling, if any, will be assessed by taking two series of recent mussels. Of one series half of the shell of each mussel will be boiled and one series will be kept as a control to see if there is no difference between the two halves of a shell. The level of diagenesis will be assessed by both chemical (Mn, Fe, Sr concentrations) and physical (state of crystal micro-structure) methods. Finally, a preliminary attempt of palaeoenvironment reconstruction of the Southern Bight over the past millennium will be given.