

## BIVALVE *Glycymeris pilosa* AS DATA ARCHIVE OF THE GLOBAL ATMOSPHERIC <sup>14</sup>C CHANGE AND THE SUESS EFFECT

Melita Peharda<sup>1</sup>, Andreja Sironić<sup>2</sup>, Damir Borković<sup>2</sup>, Krešimir Markulin<sup>1</sup>

<sup>1</sup>Institute of Oceanography and Fisheries Šetalište Ivana Meštrovića 63, 21 000 Split, Croatia

<sup>2</sup>Institut Ruđer Bošković, Bijenička cesta 54, 10 000 Zagreb, Croatia

Corresponding author: [asironic@irb.hr](mailto:asironic@irb.hr)

Investigation of geochemical composition of bivalve shells can provide information on the changes in marine environment occurring during the organism's life span. *Glycymeris pilosa* is a relatively large (>8 cm) and a long-lived bivalve (>60 years) that is locally abundant in the Adriatic Sea. Its growth increments are annual and clearly visible in shell cross sections, which enable correct temporal positioning of geochemical data obtained from different shell parts.

In this study we present results of <sup>14</sup>C and <sup>13</sup>C analyses in carbonates of five individual shells that grew in period 1948-2015 in the north Adriatic Sea. Samples were collected by SCUBA diving from ~10 m depth near Barbariga, Istria. In laboratory, shells were measured, area of the hinge of one shell valve was cut, acetate peel replicas of shell cross section were prepared following procedure from Peharda et al. (2016) and longevity of shells was estimated. Carbonate samples were drilled from the external surface of the second valve, each sample covering between one and five growth increments depending on the width of the increment. Four live collected and one fossil individual were analyzed. <sup>14</sup>C analyses of shell carbonates from all individual shells revealed <sup>14</sup>C increase characteristic for a reflection of atmospheric <sup>14</sup>C bomb peak. Calendar years corresponding to growth increments of the fossil shell from which carbonate samples were collected were determined by using the trend of <sup>14</sup>C increase along its growth line compared to a temporal <sup>14</sup>C curve obtained from live samples. The comparison was made by means of finding the best fit between two curves by implementing the least square method. This was also verified by the sclerochronological fit.

The intensity of the <sup>14</sup>C peak observed in the shells is damped and delayed compared to the atmospheric bomb peak in the northern hemisphere. Suess effect is indicated in a temporal decrease of δ<sup>13</sup>C values in the umbo of the shells. Results of this study clearly illustrate the potential of *G. pilosa* as geochemical data archive.

**Keywords:** *Glycymeris pilosa*, <sup>14</sup>C bomb peak, Suess effect, north Adriatic.

**Acknowledgments:** Research has been supported by the Croatian Science Foundation under the project SCOOL (IP-2014-09-5747).

### References

Peharda M., Black B.A., Purroy A., Mihanović H. (2016) The bivalve *Glycymeris pilosa* as a multidecadal environmental archive for the Adriatic and Mediterranean Seas. *Marine Environmental Research* 119:79-87.