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Use of Clumped carbonate thermometry in terrestrial mollusc from Indian region

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An important characteristic of a good paleoclimate archive is its large-scale availability in time and space, together with its ability to record environmental condition of growth with confidence. Molluscs are the ruling phylum ever since Cambrian, having outlived several events of extreme of climate changes experienced during the geological past, hence they fall into the category of good paleoclimate archive for understanding the past environmental informations. In this study, we have used the novel technique of clumped carbonate thermometry (δ_{47}) in the extant molluscs- gastropods and bivalves. Terrestrial gastropods (n= 17) covering a myriad of species - *Pila sp.* , *Lymnaeinae sp.*, *Physa sp.* and one tidal flat inhabiting species *Telescopium sp.* and the freshwater bivalve *Uninodae sp*. (n=22) are analysed for stable and clumped isotopes. The bivalve of riverine origin are characterized by the δ_{47} values covering a wide range (0.6474‰ to 0.803‰) and resembling the $\delta^{18}O$ of water established using equilibrium fractionation relationship. The factors like biased seasonal growth due to long period of aestivation in adverse temperature condition and deep burrowing habit (as deep as 20 cm) during the summer are sued to interpret the clumped isotope values. Burrowing habit of bivalve is significantly linked with the strength of water flow (river discharge), day length, and water temperature, but current velocity appeared to be the dominant factor driving their vertical movement in the water column. While in case of gastropods, the δ_{47} (0.66 ‰ to 0.772‰) values matches with the observed annual average temperature. Either way, the study derives important information as to how the use the δ_{47} vales in mollusc carbonate to infer about their habitat and project about their strategy to survives in any stressed environment.