

Evaluation of Mechanisms of Biomediated Fractionation of ^{13}C and ^{18}O : Physiology and Minerology

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Introduction

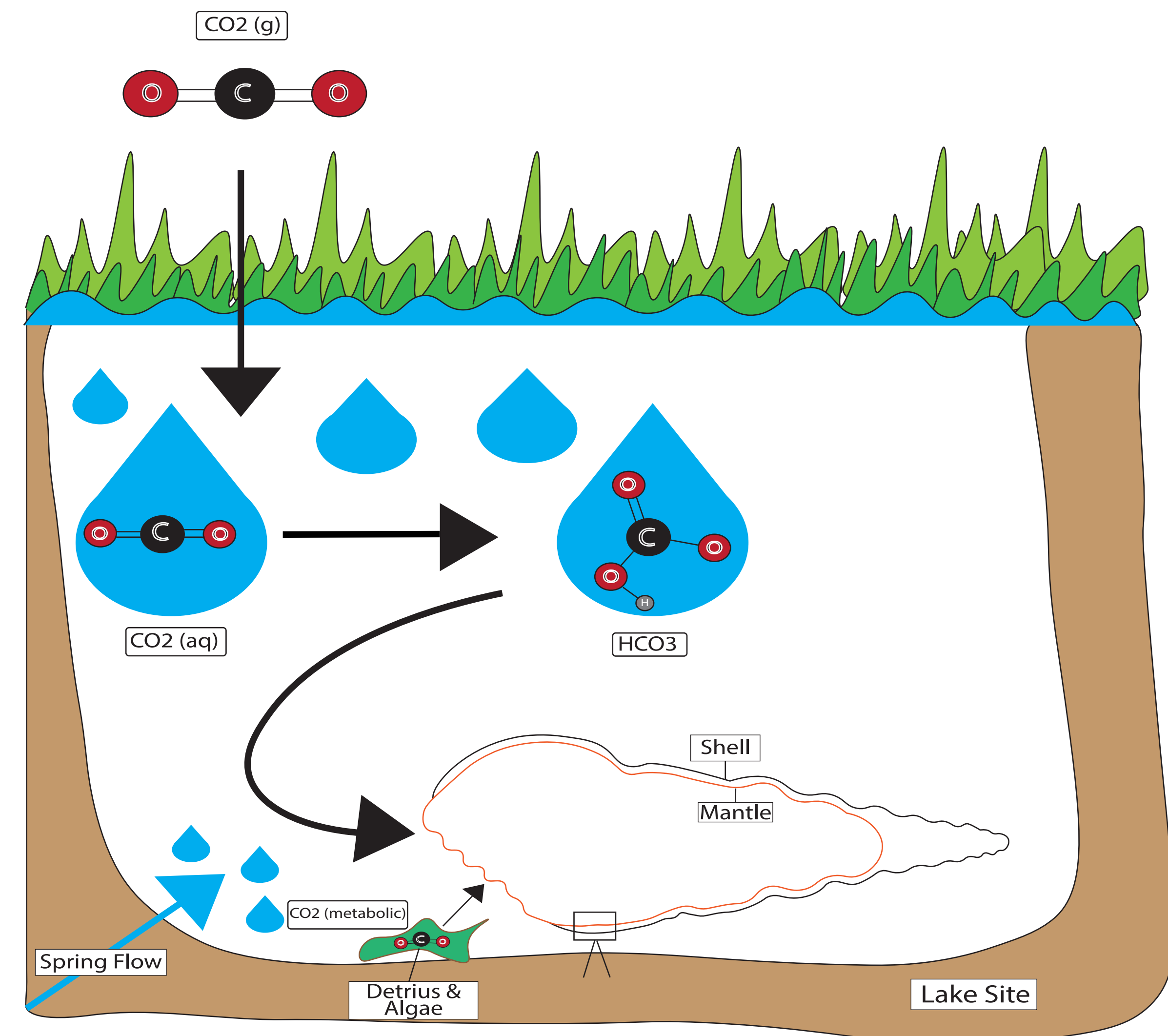


Fig. 1 This study characterizes fractionation from the incorporation of ^{13}C and ^{18}O from water into gastropod shells from spring locations in the West Desert region of Utah.

Hypotheses

- 1) Shell vs water: Do the shell isotopes reflect the water isotopes?
- 2) Species vs Site: Do species isotopes vary within spring sites?
- 3) Intershell: Is there any variation in isotopes along the shells?
- 4) Gill Breathing vs Lung Breathing: How do isotopes vary with respiration physiology?
- 5) Aragonite shell vs Calcite shell: Is the shell

Conclusions

- 1) Shells reflect water ^{13}C and ^{18}O isotope values.
- 2) Species were uniform at each site for ^{13}C , ^{18}O species at BL-Marsh & BL-Lake were less uniform
- 3) Intrashell values showed no significant variation in ^{18}O , but ^{13}C is depleted at the tip of the shell.
- 4) TDB- Study still in progress
- 5) TDB- Study still in progress

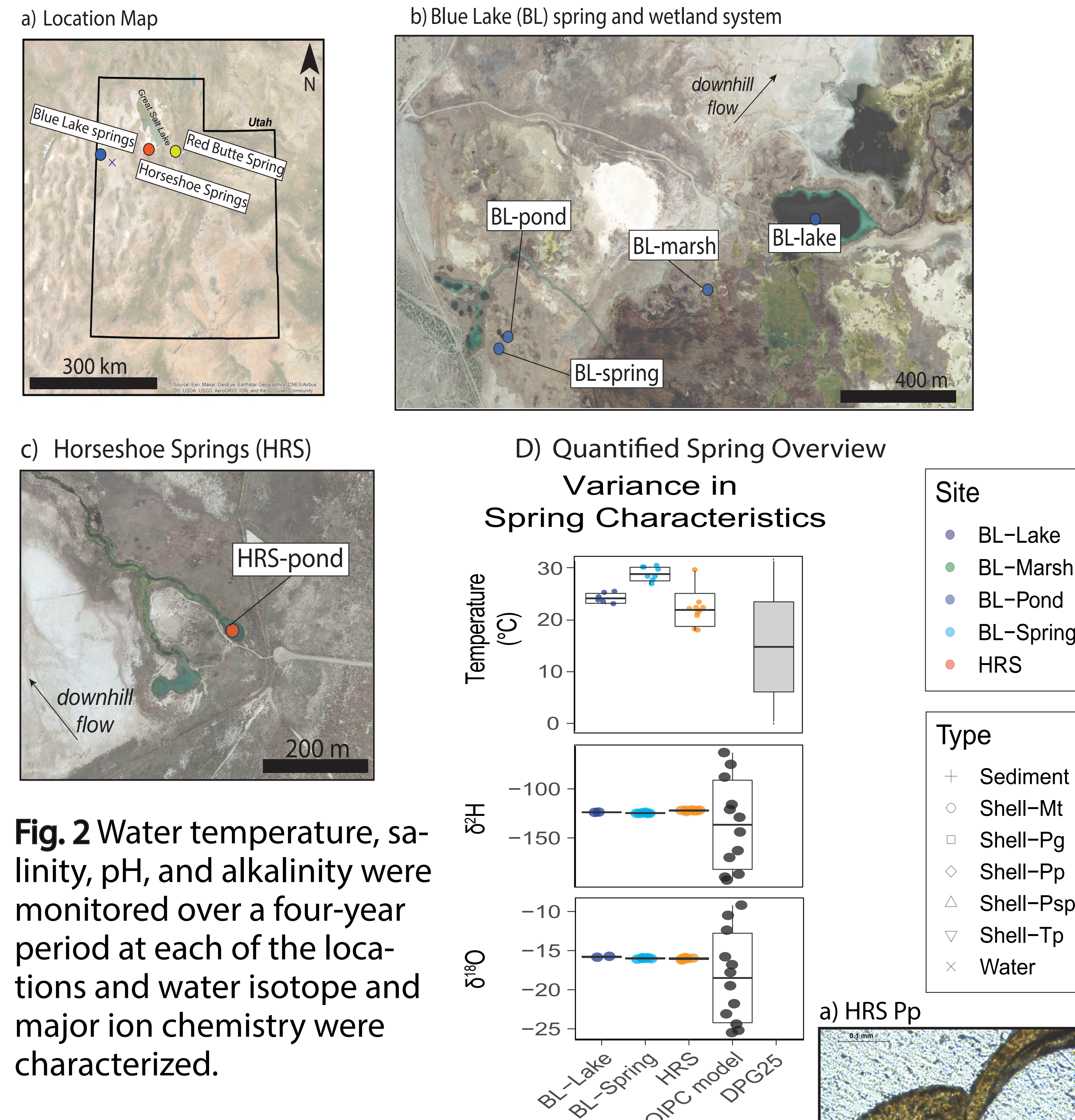


Fig. 2 Water temperature, salinity, pH, and alkalinity were monitored over a four-year period at each of the locations and water isotope and major ion chemistry were characterized.

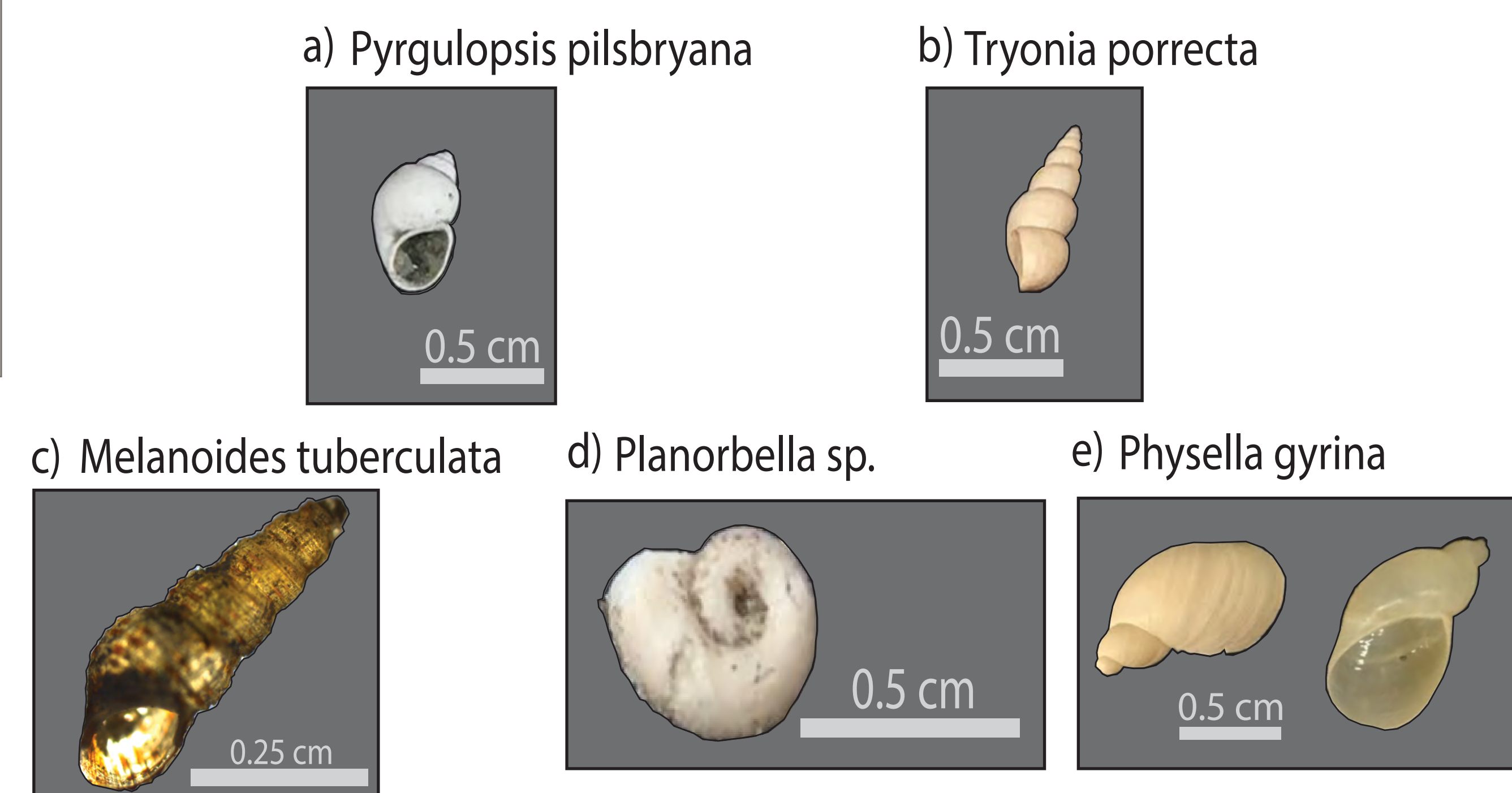


Fig. 3 a) Pp is gill breathing & endemic. b) Tp is gill breathing & endemic. c) Mt is invasive & gill breathing. d) Psp is lung breathing & endemic. e) Pg is gill breathing & endemic.

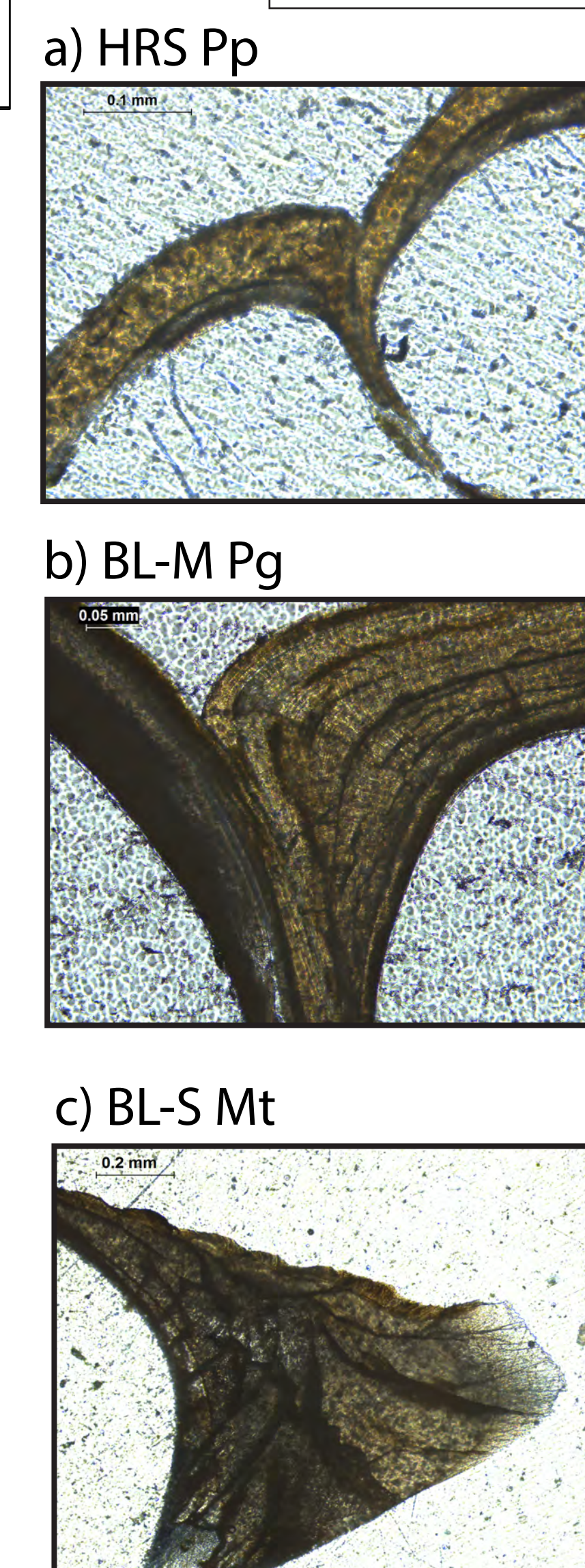


Fig. 4 Thin sections of three species. c) is 100% aragonite, others still being analyzed.

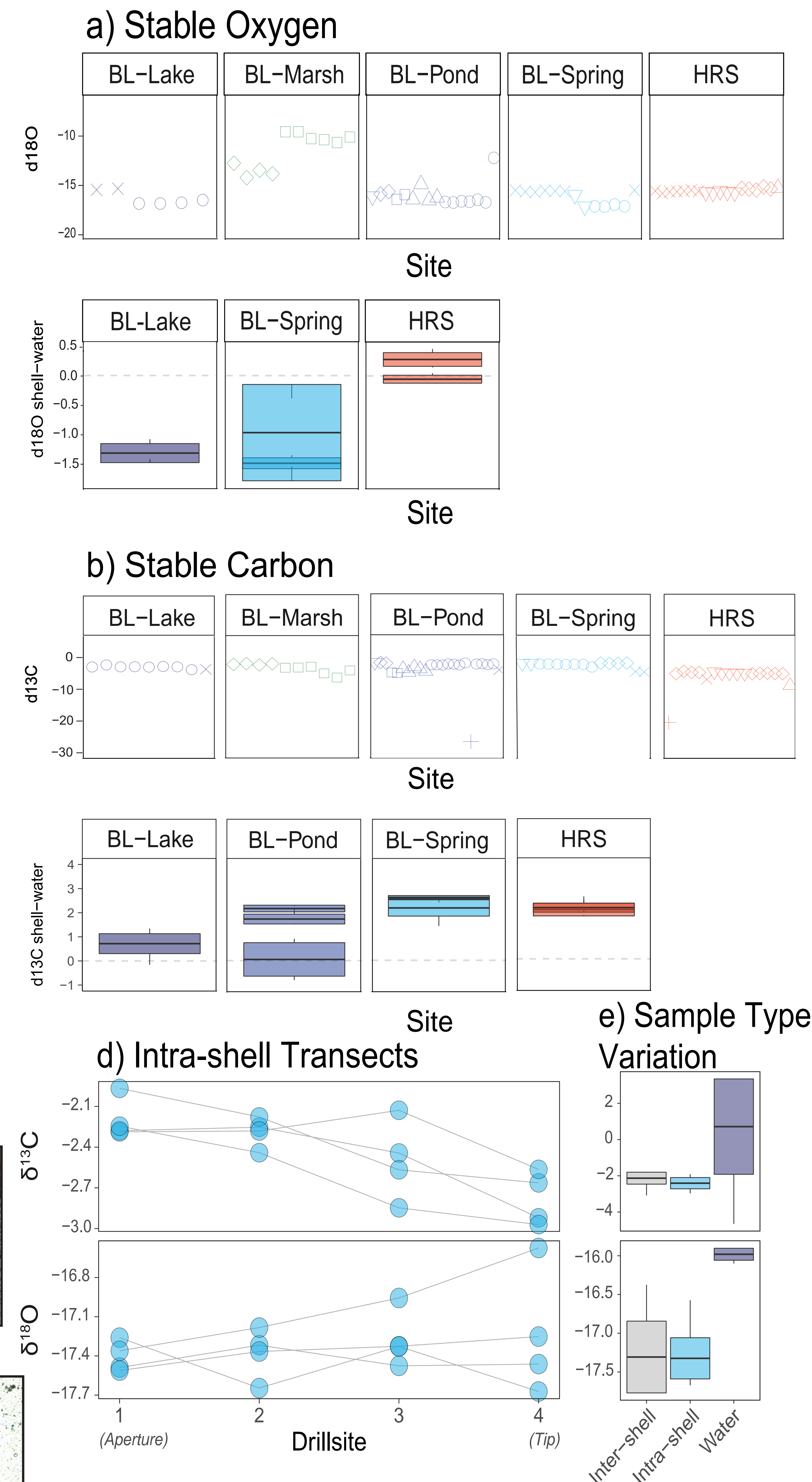


Fig. 5 a) b) Isotope values (^{18}O , ^{13}C) in species at sites & water-to-shell differences of stable isotopes between site. d) Stable isotope intrashell variations of 4 Mt shells. e) Variation of the transects and homogenous shell samples.