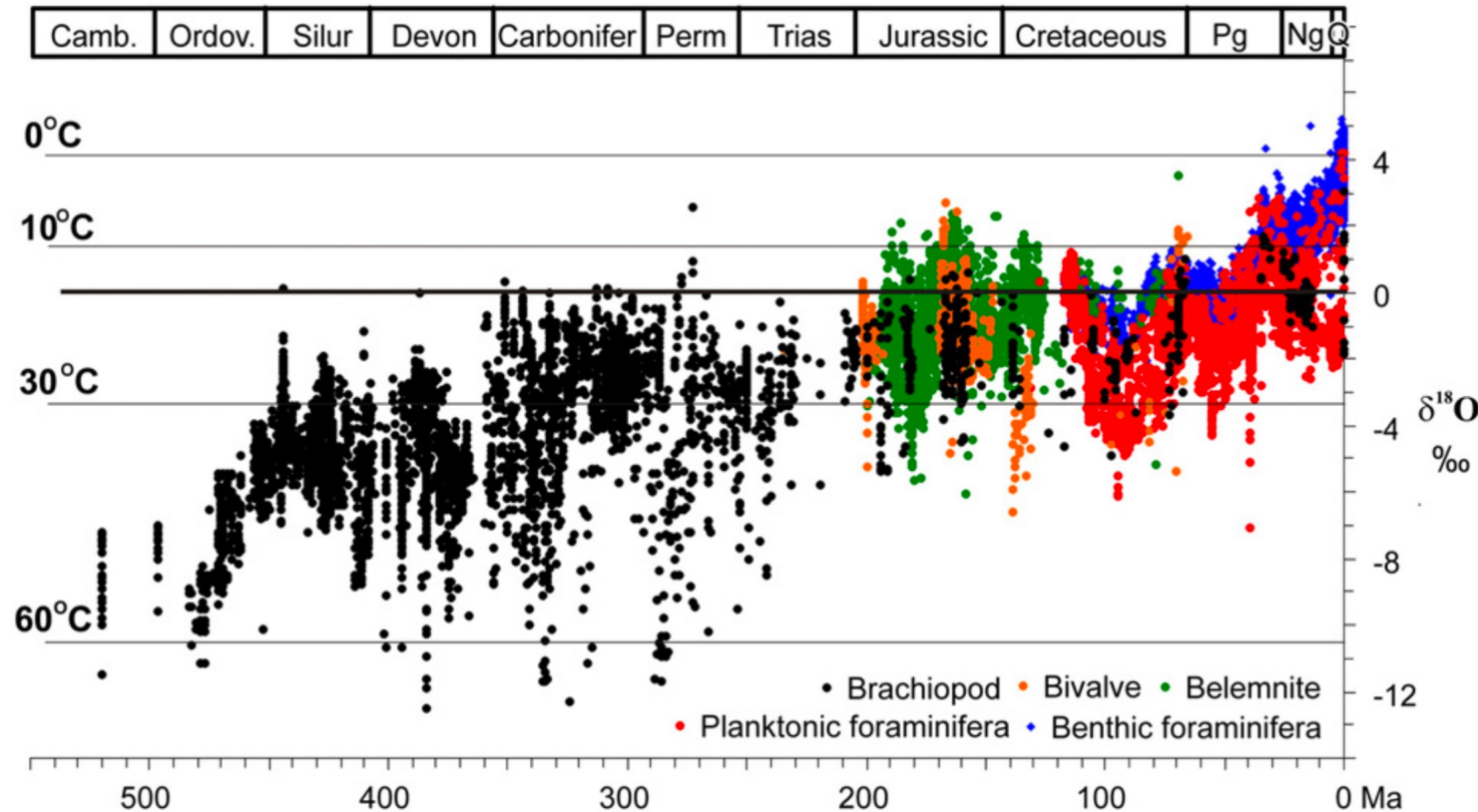


Carbonate triple oxygen isotope analyses of brachiopod shells

David Bajnai, Oliver Jäger, Andreas Pack

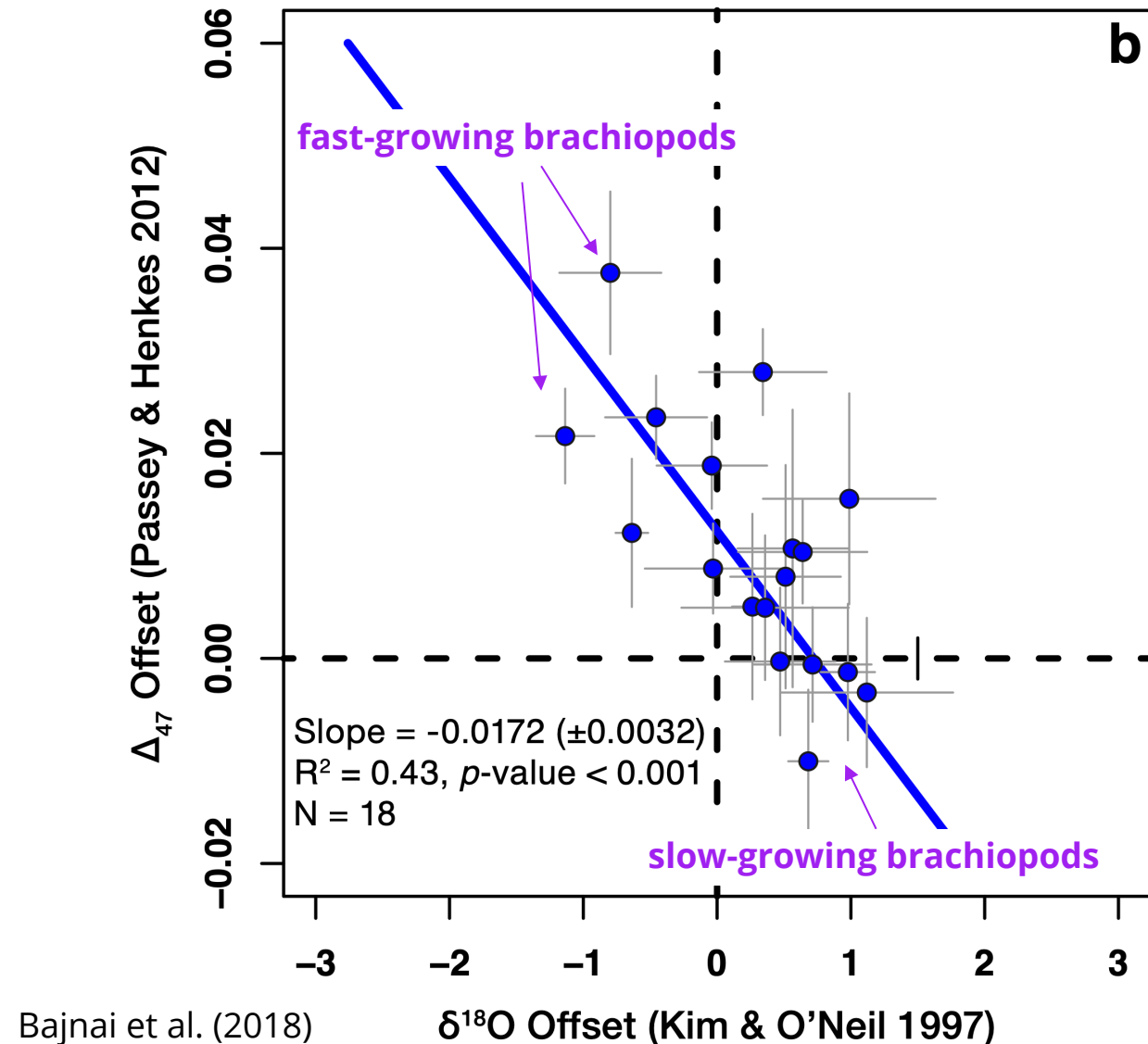
Why are brachiopods interesting?

- Most used archive of deep time paleoclimate



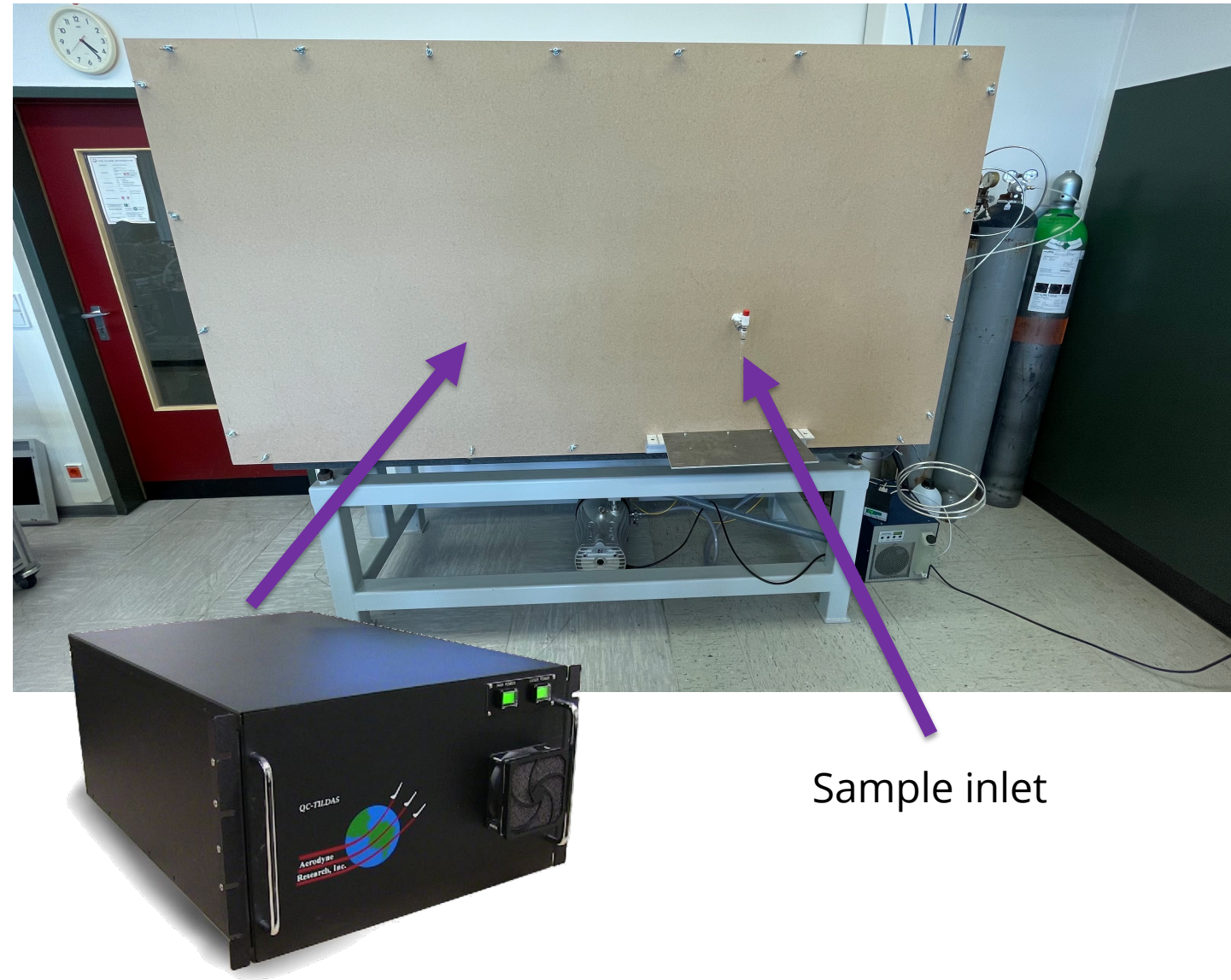
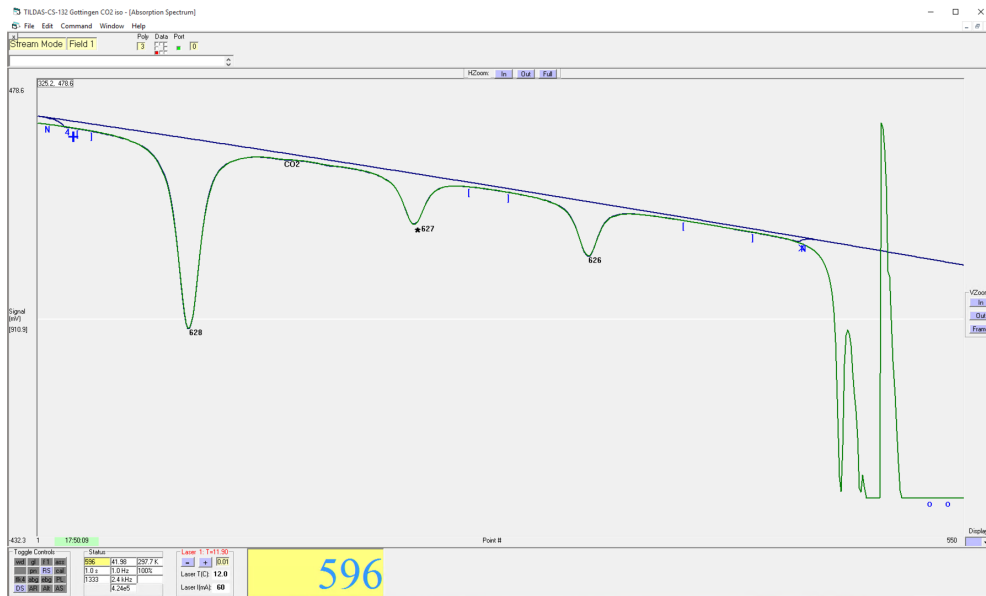
Clumped isotope data suggest kinetic effects

- Brachiopods show departures from equilibrium $\delta^{18}\text{O}$ and Δ_{47} values
- Offsets are due to growth-rate related kinetic effects
- Are the kinetics related solely to CO_2 absorption?

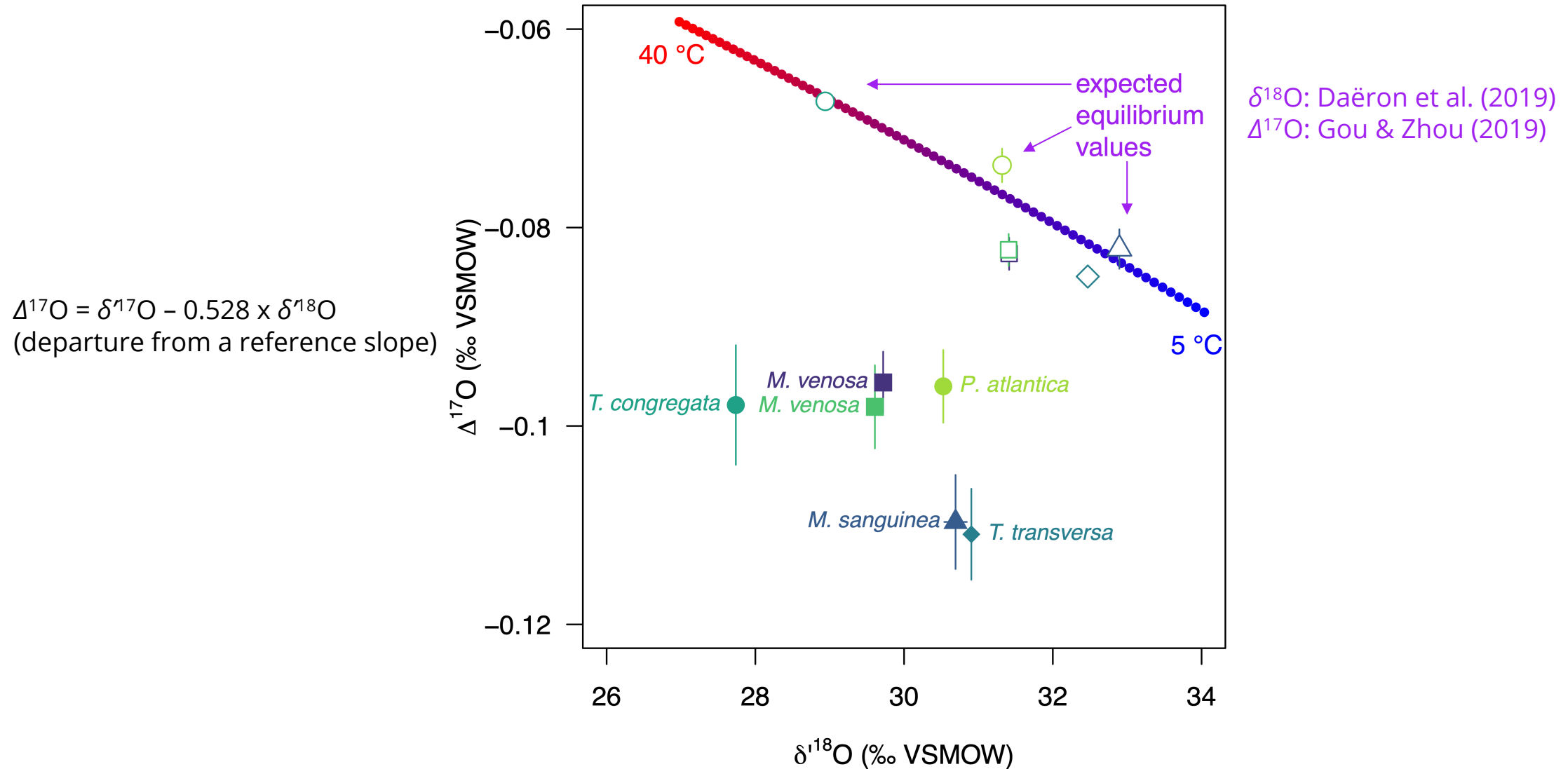


Triple oxygen isotope analyses using TILDAS

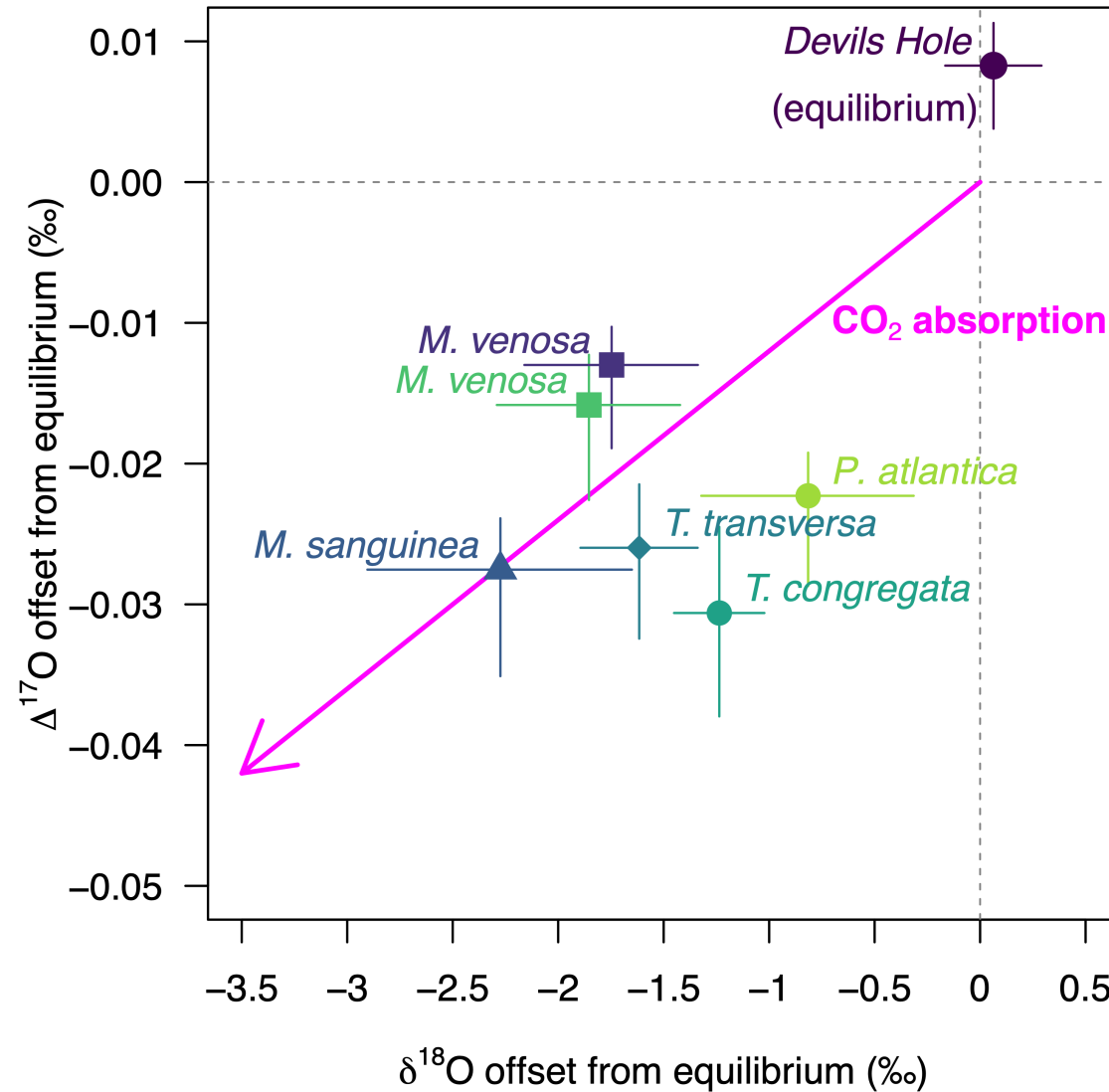
- Measuring $^{17}\text{O}/^{16}\text{O}$ ($\delta^{17}\text{O}$)
- Laser Absorption Spectroscopy
- Analyte: CO_2 from acid digestion
- Standards: NBS-18, NBS-19
- External 68% CL: $\pm 0.005\text{‰}$



Brachiopods are out of isotope equilibrium



Direction of offsets confirm CO₂ absorption kinetics...



Offset $\delta^{18}\text{O}$ and $\Delta^{17}\text{O}$ correlation:
Gou & Zhou (2019)