"Examining the influence of ocean acidification on coral calcification"

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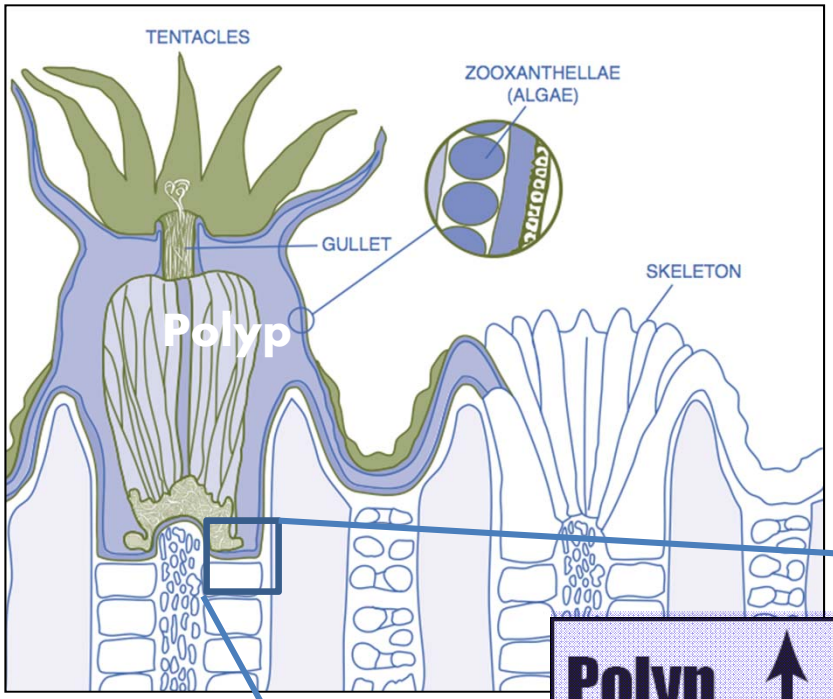
Coral calcifcation :



1. **pH regulation at the site of calcification**

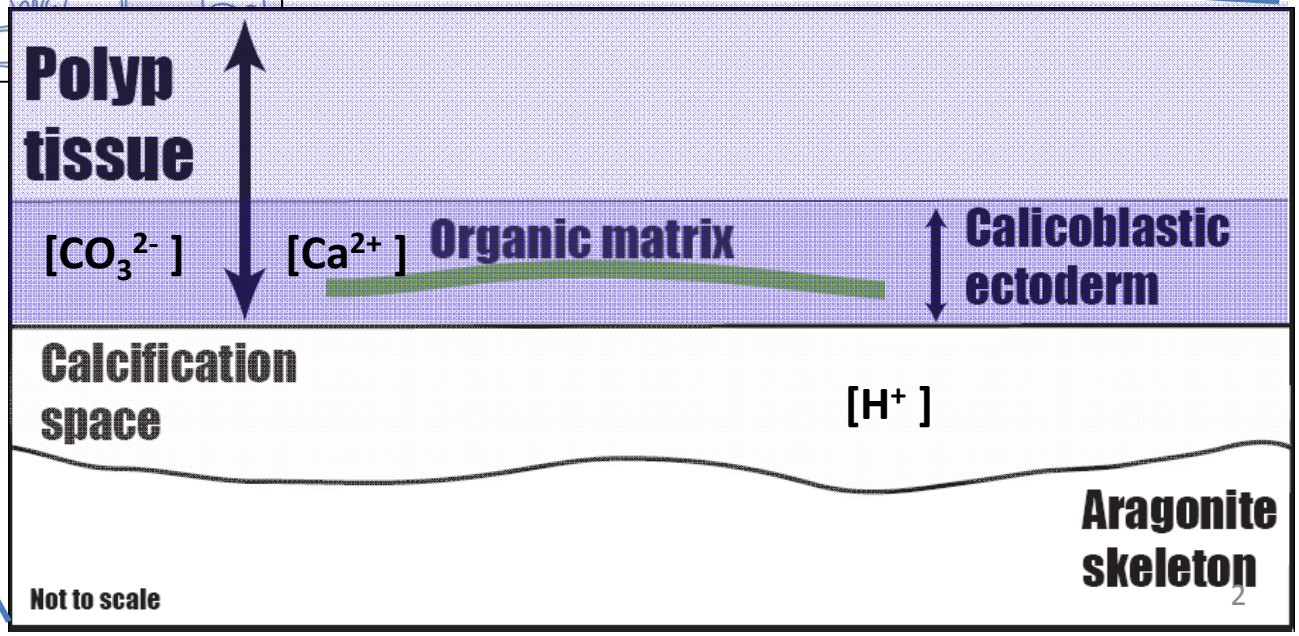
Need to:

- **Supply Ca^{2+} and CO_3^{2-}**
- **Expel H^+**
- **Regulate pH**

2. **The organic matrix:**

Calcification is biologically controlled

The Organic Matrix is fundamental to calcification.



How do changes in seawater pH influence:

1. **pH regulation in the internal calcifying fluid, as deduced from the boron isotopic composition of the coral skeleton.**

Technique:

MC ICPMS at the University of Bristol.

Krief et al. 2010

Results:

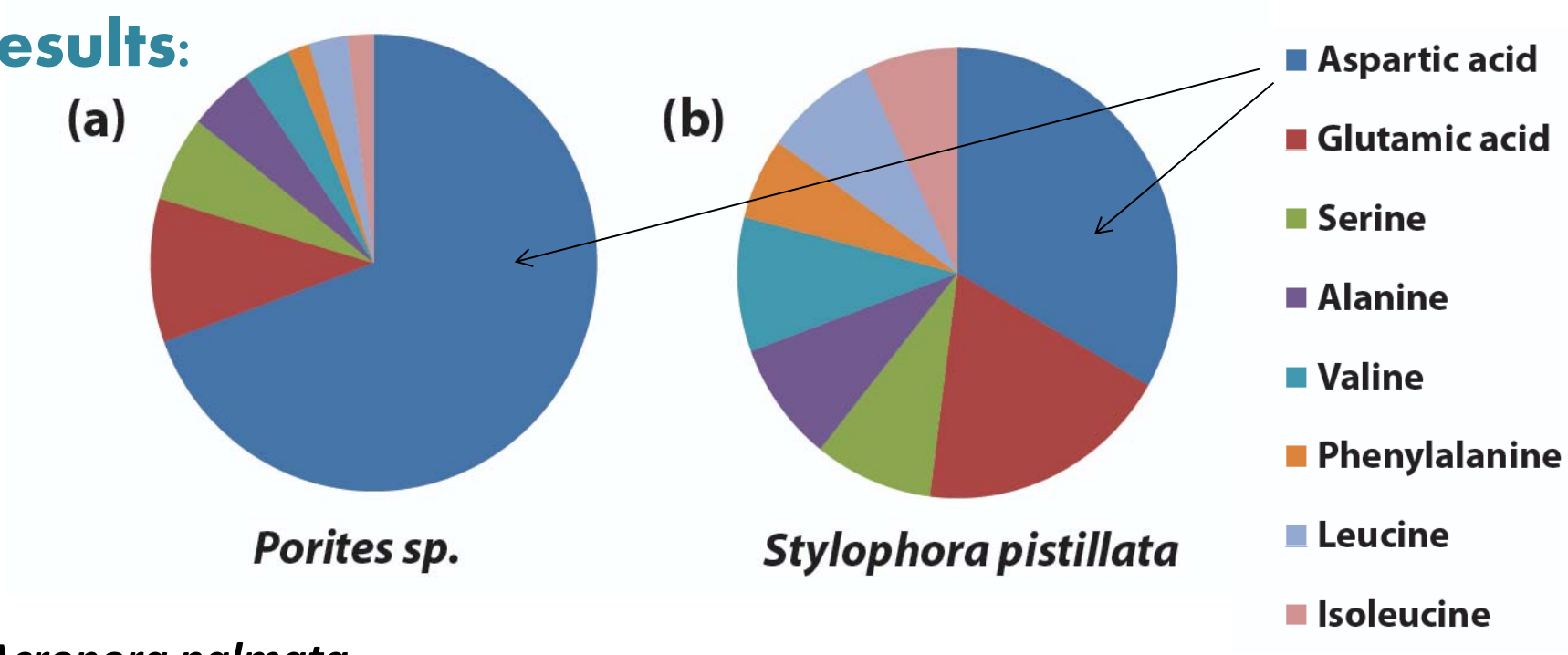
- ***Stylophora pistillata*** **and massive** ***Porites sp.*** **calcify in undersaturated SW**
- **Both species raise pH at site of calcification relative to SW**
- **Slow growing massive** ***Porites*** **demonstrate greater manipulation of pH**
- **Identify vulnerable species?**
- **Implications for palaeo-pH proxy in** ***Porites***

2. **The composition of the organic matrix.**

Technique:

RP HPLC at the North East Amino Acid Racemization lab, University of York.

Results:



Acropora palmata

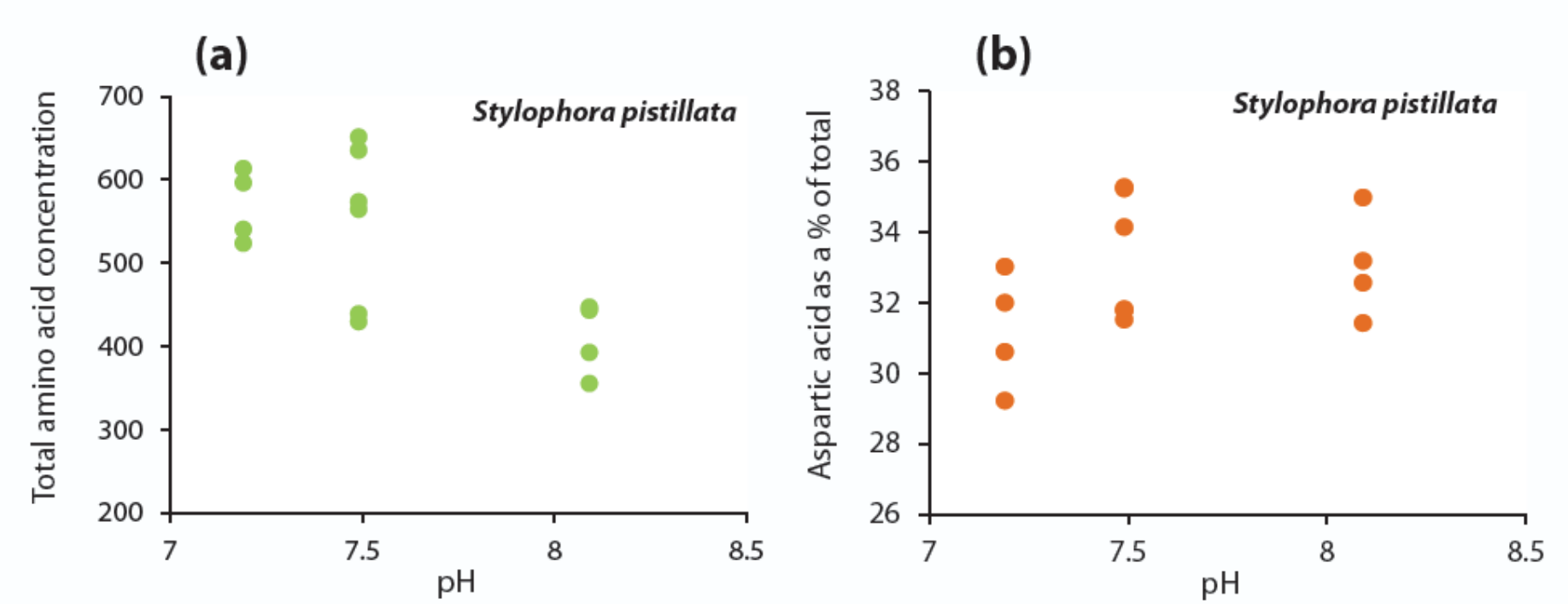
Are these compositional differences morphological or phylogenetic?

It has been demonstrated that:

1. **The organic matrix if fundamental to calcification**
2. **The structure of the skeleton changes under low SW pH**

Therefore we hypothesize a shift in OM composition under low SW pH

Preliminary results:



An increase in the total concentration of protein laid down per mg of skeleton

Change in composition = lower aspartic acid contribution?