

Stable isotopes reveal trophic plasticity of the bushy scleractinian coral *Stylophora pistillata*

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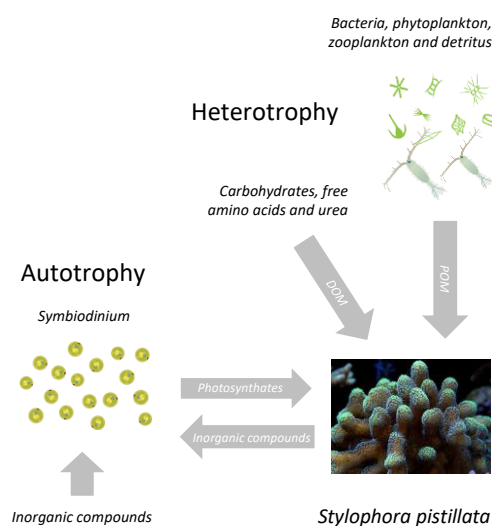
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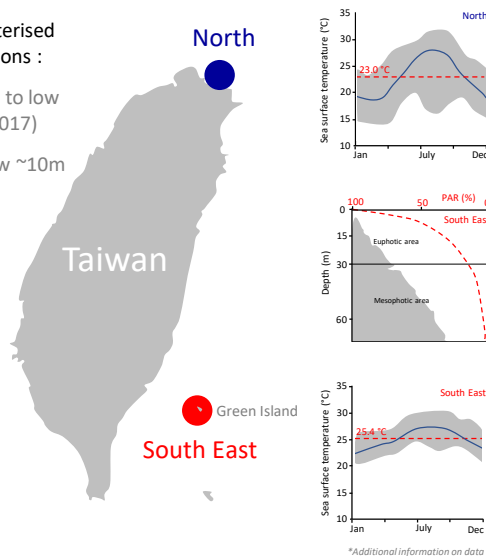
Most scleractinian corals can derive nutrition either autotrophically or heterotrophically, which allows them to use diverse trophic pathways. Therefore, when facing environmental changes, these organisms are expected to demonstrate an ability to acclimatise through trophic plasticity. This study proposed to **assess the trophic plasticity of the bushy scleractinian coral *Stylophora pistillata*** by investigating the spatial and temporal variations in $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ values of host tissues and their symbionts.

1 Coral nutrition



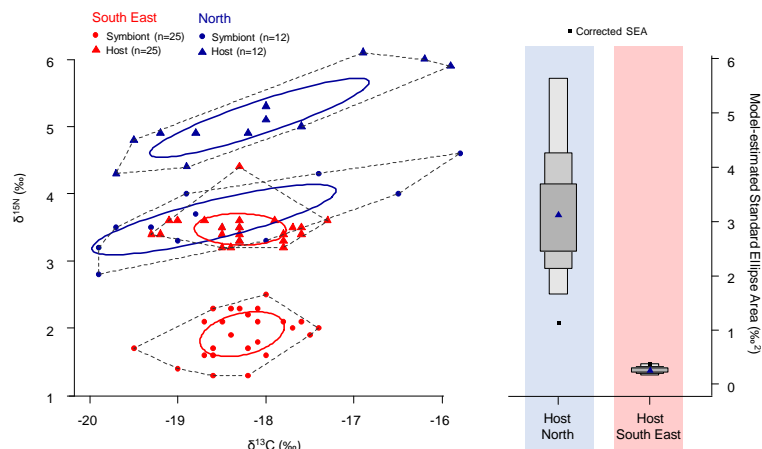
2 Assessment of trophic plasticity

- Comparison of two locations characterised by contrasted environmental conditions :
 - ▶ temperature (collection from high to low latitudes; in summer and winter 2017)
 - ▶ light levels (collection from shallow ~10m to mesophotic waters ~40m)
- Evaluation of intraspecific trophic variability by comparing coral isotopic niches



3 Exploring intraspecific isotopic niche variation

- No overlap of isotopic niches for the host and symbiont from the two locations
 - ▶ supported by different sources of C and N assimilated by symbionts and/or corals
- Similar ranges of N-enrichment with the change in trophic position between the host and symbiont
 - ▶ equivalent degree of heterotrophy;
 - ▶ or similar mechanisms by which the sources are fractionated in the two locations
- The area of the standard ellipse of northern colonies is larger than those from the South East
 - ▶ suggest a certain trophic plasticity that may be linked to more variable environmental conditions in the North



Take home message

- Isotopic analyses suggest that *Stylophora pistillata* present a certain degree of trophic plasticity and has the ability to change trophic mode according to variable environmental conditions
- Analyses of additional species and locations will provide essential insights into the trophic plasticity of scleractinian corals and how these species might adjust their nutrition in response to environmental changes

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*Data source: monthly average sea surface temperatures are from the Central Weather Bureau, Taiwan (www.cwb.gov.tw). The northern coast (1998-2013) and the eastern coast (2002-2013). Annual mean (red dashed line). Monthly maximum and minimum (grey shaded area). Light attenuation (Photosynthetic Active Radiation, PAR, in %) were measured in Green Island (South East) in April 2016. Picture of *Stylophora pistillata*: www.aquaportail.com.