Trophic plasticity of scleractinian corals under contrasted environmental conditions: evidence from stable isotope analysis

Nicolas Sturaro[1,2*], Yun Li Eric Hsieh[1], Ling-Wen Liu[1], Pei-Ling Wang[1], Vianney Denis[1]

[1] Institute of Oceanography, National Taiwan University, Taipei 106, Taiwan

[2] Current address: Laboratory of Oceanology, FOCUS, University of Liège, 4000 Liège, Belgium

* Corresponding author. E-mail: nicolas.sturaro@uliege.be

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 intrinsic ability to acclimatise through trophic plasticity. Despite the ecological importance of these corals, our understanding of their trophic plasticity is currently impaired by a lack of rigorous research approaches; a failure to consider the intraspecific variability of coral species and an oversimplification of the proxies of heterotrophic habits (e.g. corallite diameter). In order to understand how trophic plasticity could allow them to acclimatise, this study proposed to assess the trophic plasticity of morphologically contrasted coral species (e.g. *Stylophora pistillata*, *Porites sp*, *Isopora palifera*). We determined the stable isotope ratios of carbon and nitrogen in the coral host tissues and algal symbionts and compared these in corals inhabiting areas around Taiwan characterised by contrasted temperature (from high to low latitudes) and light levels (from shallow to mesophotic waters). For each area, we evaluated the intraspecific trophic variability by estimating and comparing coral isotopic niches as a proxy for trophic niches. Our results on *Stylophora pistillata* revealed no overlap of the isotopic niches for the host and symbiont from different locations, suggesting that these coral colonies are supported by different core resources. Moreover, the isotopic niche of higher latitude coral colonies was larger than those from the lower latitudes, highlighting a certain trophic plasticity that may be related to more variable environmental conditions in the higher latitudes. 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.

ORAL

SESSION: 2. “How animals face global change: plasticity, resilience, adaptation”