Deep-reef coral hates the light, prefers the shade

October 17 2011

Coral reefs are among the most diverse ecosystems on the planet, second only to tropical rain forests. Bird's nest coral (*Seriatopora hystrix*) is common throughout the Indo-Pacific and is able to live across a range of depths. However, there is little gene flow between the coral populations at each depth and even the algal endosymbionts (Symbiodinium), which provide energy for the corals to survive, are genetically different across habitats. New research published in BioMed Central's open access journal *BMC Evolutionary Biology* used genetic and photosynthetic analyses to demonstrate that these genetic differences reflect adaptations to the different environmental conditions encountered at different depths.

A team of researchers from the ARC Centre of Excellence for Coral Reef Studies and The University of Queensland looked at coral populations from three habitats on coral reefs: the sheltered back reef (Back Reef), the wave-exposed top of the reef slope (Upper Slope) and the dimly lit deeps (Deep Slope). Despite the fact that corals in the Deep Slope habitat only receive a fraction of the light available in shallow habitats (about 10 times less), the coral S. hystrix was found to be far more abundant at these depths and was also observed to grow faster. Transplantation of coral fragments to different habitats did not alter the algae-host symbiosis. Dr. Sophie Dove explained, "The corals we looked at exhibited distinct physiological strategies - while normally corals are dependent on light for their energy requirements, the deep corals, appeared to have adapted to low light conditions by having an increased capacity to exploit nutrients and plankton."

Dr Pim Bongaerts, lead author of the paper, continued, "The different selective pressures across reef environments pose an ecological barrier to migration and further promote genetic divergence of these coral populations by limiting the extent of interbreeding. This case study of S. hystrix clearly shows how ecological processes of selection can play an important role in the diversification of corals."

More information: Adaptive divergence in a scleractinian coral: physiological adaptation of Seriatopora hystrix to shallow and deep reef habitats, Pim Bongaerts, Cynthia Riginos, Kyra B Hay, Madeleine JH van Oppen, Ove Hoegh-Guldberg and Sophie Dove, *BMC Evolutionary Biology* (in press)

Provided by BioMed Central