

MARINE SCIENCE RESEARCH AND TECHNOLOGY CONFERENCE

Poster



22 - 23 MAY 2017
KUALA LUMPUR, MALAYSIA

Yohan D. Louis
University of Mauritius, Mauritius

<https://www.clytoaccess.com/journal-marine-science-research-and-technology>

Spatio-temporal changes in expression of hsp70 and hsp90 genes in the branching coral *Acropora muricata*

Abstract :

Rising sea surface temperature, as a result of global warming, in combination with high light intensity is a prominent cause of widespread coral bleaching. The vulnerability of corals to bleaching tends to be highly variable within geographical locations, between and even within cnidarian genera resulting in differential bleaching patterns. Such differential bleaching susceptibility has been attributed to host and/or symbiont factors in response to environmental conditions. Of these responses, in-situ variation of the expression of genes involved in heat responses remains to be thoroughly studied. In this study, we examined spatial and seasonal variation in gene expression of the coral heat shock proteins (Hsps), hsp70 and hsp90, by quantitative real-time PCR, in *Acropora muricata* colonies that harbor Symbiodinium clade A, along a coast-reef scale in Belle Mare lagoon, Mauritius in 2014. The lagoon is characterized by coast-reef scale (< 1 km) differences in daily thermal fluctuation and light intensity. *A. muricata* colonies closer to the shore

experience comparable maximum temperatures, but daily temperature variation was 2-fold greater compared to the reef colonies. The *A. muricata* colonies at these two sites also have different bleaching histories as bleaching of *A. muricata* colonies occurred only at the reef site during the 2009 bleaching event. Results show that both during summer and winter, coast colonies had higher expression of the hsp70 gene compared to reef colonies. Contrarily, coast colonies showed less hsp90 expression compared to reef colonies both in summer and winter. In winter, both hsp70 and hsp90 transcript levels were lower than in summer, in both coast and reef colonies. These observations suggest that the expression of Hsps genes in *A. muricata* varied both spatially and seasonally under the influence of prevailing environmental conditions. Furthermore, results may imply potential involvement of hsp70 gene in local acclimatization in *A. muricata* and thus may possibly explain in part the previously reported differential bleaching pattern at this coast-reef scale.

Bio :

Mr Yohan D. Louis is a PhD student at the University of Mauritius. He completed his B.Sc. in Biology with Specialization in Cell and Molecular Biology in 2011 at the University of Mauritius. He was the Top-ranking student of his cohort. His actual research focus is the different adaptation and acclimatization responses/mechanisms employed by corals against heat stress and bleaching. He studies gene expression, DNA microsatellites, zooxanthellae typing, photo-physiology and coral physiology to probe into the acclimatization/adaptation processes of corals. The purpose of his research is to further our understanding of differential coral bleaching patterns, in an attempt to help coral conservation efforts. Mr Y.D. Louis is a member of the West Indian Ocean Marine Science Association (WIOMSA) and the International Society for Reef Studies (ISRS).