



**Comunicação oral - Quinta Sessão: Evolução e biogeografia**

**The future of corals told by mito-phylogenomics**

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Scleractinian corals are basal metazoans pertaining to phylum Cnidaria, which is characterized by having urticating cells denominated nematocytes. Approximately half of these corals have a symbiotic relationship with dinoflagellates of family Symbiodiniaceae (zooxanthellae). Ocean acidification and global warming are a threat to this order, being associated to either loss or death of zooxanthellae (i.e. coral bleaching) as well as to the dissolution of coral carbonatic skeleton. The order Scleractinia is currently divided in three main clades based on molecular data: Basal, Complex and Robust. However, the evolutionary history of Scleractinia has not been completely resolved yet, as its monophyly has been previously questioned and the phylogeny of its suborders is still under debate. This uncertainty is likely due to the small number of taxa used, especially from azooxanthellate species, as well as the use of few molecular markers in phylogenetic analyses. Such discrepancies seem to have led to variations among topologies of different evolutionary reconstructions. Therefore, the aim of the present project is to recover the evolutionary history of Scleractinia based on complete mitochondrial genome (mitogenome) sequences of approximately 100 species of scleractinian corals. Specimens have been sequenced using Next Generation Sequencing (NGS) on Illumina platform, followed by assembly and annotation of complete mitogenomes. Data from 80 species have already been obtained, from which thirteen complete mitogenomes were successfully circularized to date and another four had the majority of genes annotated. Gene sequences from the obtained mitogenomes were aligned and used in phylogenetic analyses. Divergence times of each lineage will be estimated by molecular clock followed by mapping of palaeo-environmental data to the obtained tree. By using this technique, it should be possible to determine when some morphological and ecological features emerged or disappeared in representatives of this order, as well as to hypothesize about the fate of corals towards future anthropogenic impact. Preliminary results indicate that the Basal clade, which is composed of families Micrabaciidae and Gardineriidae, may not be monophyletic. All three species of Micrabaciidae (*Rhombopsammia niphada*, *Letepsammia superstes* and *Letepsammia formosissima*) were recovered as monophyletic and sister to Gardineriidae+Complex+Robust. Even though molecular phylogenies support Basal clade monophyly, there are anatomical similarities between Micrabaciidae and Corallimorpharia, as well as morphological dissimilarities to Gardineriidae that reinforce the pattern recovered in the present study.

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