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## Coral-associated microbes as a bioindicator of the occurrence of global warming in a tropical marine ecosystem

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Marine ecosystem plays an important role for nurture and biodiversity of living thing in Tropical Ocean. Elevated ocean temperature and CO<sub>2</sub> concentrations were monitored in the last few decades and it is believe due to global warming. These become concerned of governments in over the world, especially in tropical regions. Disturbance of tropical coral ecosystem is become a serious problem in the last recent years. Determination CO<sub>2</sub> level in Tropical Ocean continuously in some parts in Indonesia is very important to documented. However, it is very difficult to conduct due to laboratory equipment restricted. Better understanding of symbiotic association between coral animal and microorganisms are potential to use as a bioindicator to elaborate the occurrence of global warming

impacts on tropical marine. Shift of native coral associated microbial and their dynamic in related to cumulative marine environmental factors pressure (temperature, CO<sub>2</sub>) have reported by several authors. For instance some literature reported that the appearance of microbial community occurring between 2-4oC different temperature level and different CO<sub>2</sub> concentrations. The presence of coral pathogen bacterial such as *Vibrio coralliilyticus*, *Serratia marcescens* and coral healthy bacteria such as *Pseudomans spp* are important to know. When those bacteria are dominant in related to temperature and CO<sub>2</sub> concentrations. 16 S rRNA is useful to identification coral-associated microbial, its relative applicable.

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