RESPOND THREE TROPICAL CALCIFYING MICROALGAE (EMILIANIA HUXLEYI, GEPHYROCAPSA OCEANICA AND ONCHOSPHERA SP) TO LEVEL OF CO2

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ABSTRACT :
Over the last 200 years, fossil fuel burning has released more than 250 billion tons of carbon in the form of CO2 into the atmosphere. The ocean has taken up an excess of inorganic carbon from the atmosphere equivalent to approximately 25 – 30% of the total emission of CO2 and 80% of which is stored in the upper 200 m of the water column (Houghton et al., 2001; Sabine et al., 2004 and Canadell et al., 2007). This oceanic carbon uptake slows the growth rate in atmospheric CO2 on the other hand the ocean has lower surface water pH. This condition lead to ocean acidification may directly impact marine organisms and ecosystem (Feely et al., 2004; Orr et al., 2005). Bijma et al (1999) found that decreasing in carbonate saturation state on the calcification rates of individual species and communities in both planktonic and benthic habitats due to seawater acidification. Calcification involves the precipitation of CaCO3 from Ca2+ and CO32- ions in solution. The most striking feature of calcification in the oceans is that it occurs almost by biogenic processes (Brownlee and Taylor, 2002). The ocean is supersaturated with Ca2+ and CO32-. Calcification can be found in both freshwater and marine species. A variety of marine multicellular macrophyte algae also produce CaCO3, including Corallinas spp and Halimeda spp. The most abundance calcifying algae are the free living unicellular members of the Haptophyte division collectively known as the coccolithophores (Brownlee and Taylor, 2002). Recent laboratory and field studies have revealed that there is decreasing in calcification with increasing CO2 concentration at Foraminifera, coccolithophores and corals (Riebesell et al., 2005). It is crucial to understand the effect of increasing CO2 concentration to calcification rate of microalgae especially coccolithophores species in the tropical system due to the changing of seawater carbonate chemistry as a result of increasing CO2 concentration in the atmosphere.

Keywords: Ocean acidification, calcifying microalgae, calcification rate, Spermonde Islands