

A CHALLENGE OF CORAL REEF RESTORATION IN THE GULF OF THAILAND IN RELATION TO CLIMATE CHANGE

Thamasak Yeemin, Chaipichit Saenghaisuk, Sittiporn Pongsakun and Makamas Sutthacheep
Marine Biodiversity Research Group, Department of Biology, Faculty of Science
Ramkhamhaeng University, Huamark, Bangkok 10240, THAILAND

Introduction

Many coral reef conservation activities have been carried out in Thai waters but the degradation of coral reefs has been obviously observed. One of the main causes of coral reef deterioration is coral bleaching. Mass coral bleaching events and subsequent high coral mortality are potentially linked to global climate change (Huges et al., 2003). The frequency and intensity of coral bleaching have increased over the last decades (Yeemin et al., 2009). It is also believed that coral bleaching could become an annual event within the next 30-50 years (Hoegh-Guldberg, 1999). Effects of bleaching on coral populations range from total recovery in a few months to mortality rates of nearly 100%. Coral reef restoration efforts have expanded in recent years, however, only a few coral reef restoration projects have considered the long-term impacts of climate change during planning and implementation phases.

Coral reef restoration methods and case studies

Coral transplantation is the most common and widespread method used in Thailand and other countries in the South China Sea (Chou et al., 2009). The demonstration sites for coral reef restoration were established in Mu Koh Chang National Park, Thailand by employing certain restoration methods. This paper aims to show lessons learned from the coral reef restoration projects in Thailand with emphasis on a future planning in the light of global climate change.

Major concerns for the coral reef restoration projects were simple and cheap methods and public participation (Yeemin et al., 2006). The project planning did not play much attention on selecting high tolerant coral species for coral bleaching events (Table 1). Most coral species were bleached or partially bleached during the severe mass coral bleaching phenomenon in 2010 (Figure 1). It is suggested that the coral species which are high vulnerability to bleaching, such as *Acropora* spp., *Pocillopora damicornis*, *Montipora monasteriata*, etc. should not be transplanted in the future coral reef restoration projects.

Table 1 List of transplanted coral species at the demonstration sites in Mu Koh Chang National Park

Attaching corals with screws to PVC pipe frames	Attaching corals on clusters of concrete blocks	Attaching corals on special designed concrete blocks
<i>Acropora formosa</i> <i>Acropora nobilis</i> <i>Acropora millepora</i>	<i>Acropora formosa</i> <i>Acropora nobilis</i> <i>Acropora millepora</i> <i>Porites lutea</i>	<i>Acropora formosa</i> <i>Acropora nobilis</i> <i>Acropora millepora</i> <i>Porites lutea</i> <i>Pavona decussata</i> <i>Pocillopora damicornis</i>

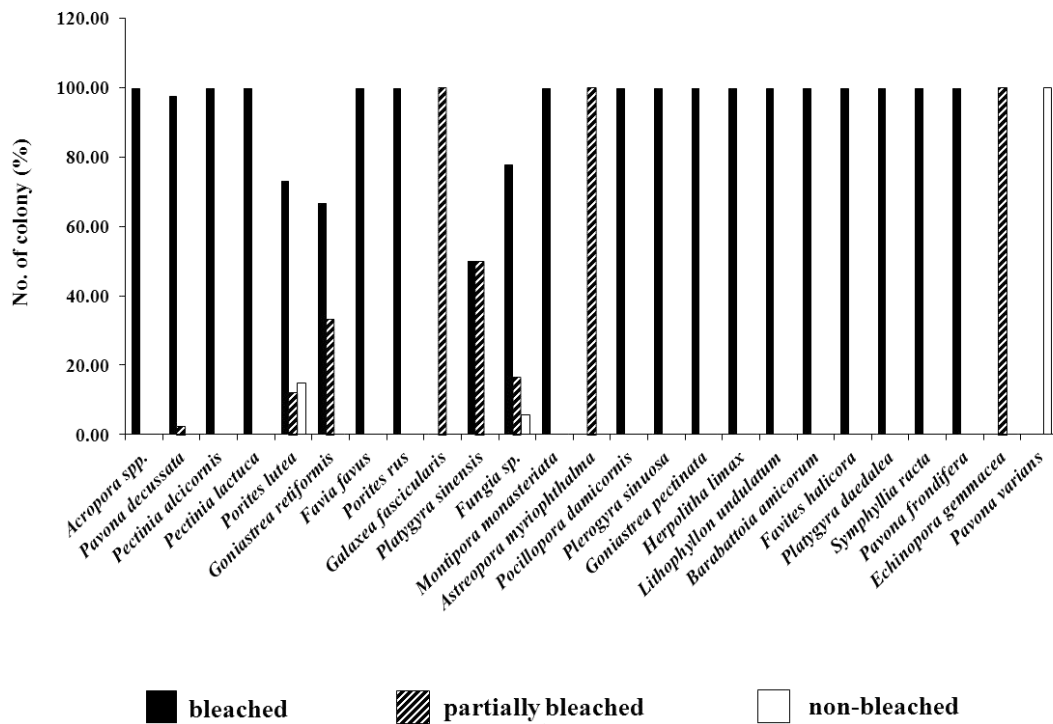


Figure 1 Status of coral bleaching in 2010 at Koh Yak, Mu Koh Chang National Park

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Corresponding author:

Thamasak Yeemin
 Marine Biodiversity Research Group
 Department of Biology, Faculty of Science
 Ramkhamhaeng University
 Huamark, Bangkok 10240, THAILAND
 thamasakyeemin@yahoo.com