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Presence and Toxicity of 2,4-D Herbicide in Coral *Galaxea fascicularis* of Java Coast, Indonesia

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Abstract: The increasing use of herbicides in agriculture sectors have received great attention with respect to their potential toxic effect on reef-building corals of Indonesia. One chlorinated compound, 2,4-dichlorophenoxyacetat (2,4-D), has been widely used as a herbicide and has become a substantial environmental pollutant. Contamination of 2,4-D was assessed in stressed or dead coral tissues of *Galaxea fascicularis* from the coastal waters of Java Sea. Controlled tolerance experiment testing 2,4-D was performed on this coral. The effects of 2,4-D on coral mortality were investigated. Comparison of the residue levels in coral tissues showed that the highest presence of 2,4-D concentrations was detected in a sample collected from Jepara coastal waters. While small amounts of a contaminant 2,4-D can still lead to detectable in West Java and East Java coastal waters. Contamination of 2,4-D was not found in coral samples collected from Karimunjawa islands. The toxicity of 2,4-D on corals showed that short duration (48 h) laboratory test demonstrated dramatic effects on sloughing and death of coral. The $LC_{50\text{-}96}$ was determined to be 18.82 mg L^{-1} 2,4-D. These results demonstrated the possibility that 2,4-D herbicide could act and lead to coral mortality in the Java coastal waters.

Key words: Dichlorophenoxyacetic acid, *Galaxea fascicularis*., Java Coast, median lethal concentration (LC_{50})

INTRODUCTION

Indonesia is the world's largest archipelagic country with approximately 17,508 islands containing valuable coastal and marine resources such as coral reefs. About 85.707 km^2 or 14 percent of total corals in the world extending all the way in the Indonesian sea (Tomascik *et al*., 1997). The Java Sea is Indonesia's second largest and most polluted among Indonesia's seas. It is 162,662 square nautical miles and is bounded by Sumatra to the west, Borneo to the north and Java to the south (Fig. 1). Java Island, with 2,885 km long shoreline, has a dominantly humid tropical climate with an annual mean

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