Genetic variation of the mud crab *Scylla serrata* in relation to heavy metals pollution in Indonesia

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The Mud Crab *Scylla serrata* is the most important commodity of commercial fisheries in Southeast Asia and the South Pacific. Its market price is high compared to the other commodities, due to its good meat quality and impressive size. Its high abundance and easy cultivation method make *S. serrata* trade one of the busiest markets with increasing exploitation rate from 26,628 tons in 2008 to 33,910 tons in 2012. *Scylla spp.* are widely distributed in the mangroves of Indonesian. Unfortunately, the areas are suffering from the thriving coastal development, such as aquaculture, industrial and tourism activities. One major threat is heavy metals pollution as the result of poor wastewater treatment and management. At a cellular level, the exposure of mutagenic pollutants to *S. serrata* tissue might lead to chromosomal aberrations and gene mutations. The varied alteration due to the different degree of heavy metal pollution might lead to a noticeable physiological and morphological alteration that will interfere with the *S. serrata* fisheries. These genetic interferences lead to genetic diversity alteration by changing *S. serrata* population size and age structure.

The objectives of this study are (1) to determine the genetic variation and heavy metal concentration of S. serrata and (2) to define the correlation between those two parameters in different Indonesian mangrove ecosystems. Five sample sites were chosen to represent different degrees of heavy metals pollution. Thirty individuals and 100 grams of sediment samples were collected from each location. Pereopod tissues were preserved in 96 % of ethanol for molecular analysis. As for heavy metals analysis, the cheliped tissues and sediment samples will be dried in the oven (50 °C) for 4 days. Genetic variation will be analyzed by Polymerase Chain Reaction (PCR) using the mitochondrial DNA cytochrome oxidase subunit I (COI) as the marker. Genetic variation indices will be determined using the software Arlequin. Heavy metals concentration analysis will be carried out using Sector Field Inductively Coupled Plasma Mass Spectrometer (ICP-MS). The degree of contamination will be calculated using a biota-sediment bioaccumulation factor (BSAF) and metal pollution index (MPI). Correlation between genetic variation and heavy metals concentration will be determined by performing a Spearman's rank correlation test. The degree of genetic variation and its correlation with pollution in the different locations is expected to answer a question of decreasing size of wild catch crab in a highly polluted area. If this is happened to be the case, it is an urgent call for developing a better wastewater treatment and management plant in the affected locations.

Keywords: *Scylla* serrata; mtCO1; Heavy metals