

Abstract

The purpose of this study is to know the differentiation of two species of seaweed (*Sargassum duplicatum* and *Padina tetrastrumatica*) in two different regions that have different environment. The indicator used for differentiation is the content of the methanol extract of the species analyzing: (1) phytochemical screening results, (2) total phenolic content, and (3) heavy metal content. The methanol extract were also tested for its antioxidant activity and toxicity using BSLT test to check the differentiation. Each species was taken at two different locations, namely Jumiang beach and Camplong beach. Where Camplong beach is adjacent to the oil drilling industry and Jumiang beach is far away. The phytochemical results showed that alkaloid, flavonoid, and steroid compounds were present in the brown seaweed of *Padina tetrastrumatica* and *Sargassum duplicatum* from different places. Terpenoid was found to be absent in both these from different places. This study demonstrated that species found in non-oil extraction site contain significantly higher amounts of phenolic than those found in oil extraction sit. The higher level of Cd and Cu was recorded to be 0.382 ± 0.098 mg/kg and 0.741 ± 0.211 mg/kg from *P.tetrastrumatica* found in the oil extraction site and the lower level of in 0.157 ± 0.05 mg/kg and 0.056 ± 0.008 mg/kg for the one which was from non-oil extraction site. Similarly, the Cd concentration of *S. duplicatum* was observed to be higher content of 0.251 ± 0.17 mg/kg in areas of oil extraction site and a lower content of 0.134 ± 0.015 mg/kg in area of non-oil extraction site. In both of non-oil extraction and oil extraction sites, the Cu concentration of *S. duplicatum* was not found. The Pb concentration was not found in both *P.tetrastrumatica* and *S. duplicatum* seaweed from non-oil extraction and oil extraction sites. The antioxidant activity for non-oil extraction site were generally greater than the oil extraction site in both these species , and the toxicity content in both these species was significantly higher in oil extraction site than in non-oil extraction site.

Keywords: *Sargassum duplicatum*, *Padina tetrastrumatica*, Phytochemical, Total phenolic, heavy metal, Antioxidant activity, and Toxicity.