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LIST OF ABBREVIATIONS

Hg	:Mercury
Pb	:Lead
Cd	:Cadmium
Cr	:Chromium
Ni	:Nickel
As	:Arsenic
Cu	:Copper
Zn	:Zinc
K	:Potassium
Co	:Cobalt
Ca	:Calcium
mg	:Milligram
kg	:Kilogram
L	:Liter
mL	:Milliliter
µg	:Microgram
µL	:Microliter
ROS	:Reactive oxygen species
RNS	:Reactive nitrogen species
RCS	:Reactive chlorine species
H_2O_2	:Hydrogen peroxide
DPPH	:2,2-diphenyl-1-picrylhydrazyl
DNA	:Deoxyribonucleic acid
Ao	:Absorbance of control
A1	:Absorbance in presence of sample extracts
nm	:Nanometer
g	:Gram
M	:Molarlity
$NaHCO_3$	:Sodium hydrogen carbonate
IC_{50}	:50% Inhibition concentration
pH	:Potential hydrogen

ppt	:Parts per thousand
UV	:Ultraviolet
TPH	:Total phenolic content
%	:Percentage

Summary

Seaweeds are the primary producers of all aquatic ecosystems. They are large and diverse group of organisms which play vital ecological roles in marine communities. It falls into three broad categories as brown, red and green seaweed based on pigmentation. The Phaeophyceae or brown seaweeds are a large group of multicellular algae. Worldwide there are about 1,500species of brown seaweeds and they produce vast numbers of useful bioactive components In Indonesia there are many types of seaweed, including economic value is enough high like *Sargassum* and *Padina* brown seaweed. *Sargassum* and *Padina* species are very abundant and scattered wide in indonesian waters. *The purpose of this study is to determine the levels of heavy metal, phytochemical,antioxidant activity and toxicity in seaweed (Sargassum duplicatum And Padina tetrastromatical) through a DPPH test, phytochemical screening, AAS, and brine shrimp lethality test. This study compared between seaweeds from two different sites; Camplong beach at Sampang district and Jamiang beach at Tanjung Village, both are located in East Java Province of Indonesia by utilizing methanol solvent.*

The antioxidant activity and total phenolic content from non-oil extraction site were generally greater than oil extraction site in both these species. The value of antioxidant activity showed by methanol extracts of *P.tetrastromatica* (IC_{50} 53.5693 ± 1.214 µg/ml) and methanol extracts of *S. duplicatum* (IC_{50} 265.91 ± 1.358µg/ml) in non-oil extraction site. In case of the oil extraction site, the antioxidant activity of methanol extract from *P.tetrastromatica* (IC_{50} 120.866± 3.138µg/ml) and methanol extracts of *S.duplicatum* (IC_{50} 1208.574± 12.136 µg/ml).Alkaloid, flavonoid and steroid were observed from both these species in two different sites. But, terpenoid was not found. In *both these species*, the total phenolic content was observed from non-oil extraction site (24.67 ± 3.47 and 102.36 ± 5.77 mg/g) was greater than compared with those that obtained from oil extraction site (15.95 ± 0.44 and 89.28 ± 7.74 mg/g).

In the case of Cd, both these species were higher in oil extraction site than in non-oil extraction site The maximum level of Cd 0.382 ± 0.09 mg/kg from *P.tetrastromatica* was recorded in oil extraction site and a minimum of in 0.157 ± 0.05 mg/kg in non-oil extraction site. Similarly, *S. duplicatum* was observed 0.2511 ± 0.170 mg/kg in oil extraction site and a minimum of 0.1337 ± 0.015 mg/kg in non-oil extraction site. The amount of Cu in *P.tetrastromatica* was also higher in oil extraction site than in non-oil extraction site. The amount of Cu in *P.tetrastromatica* was found to be a maximum of 0.741 ± 0.211mg/kg in oil extraction site and a minimum 0.056 ± 0.008 mg/kg in non-oil extraction site. Similarly another species, *S. duplicatum* was not found in non-oil extraction site and oil extraction site. Similarly, *S. duplicatum* was not found in non-oil extraction site and oil extraction site. Briefly, Pb concentration were not observed from both *P.tetrastromatica* and *S. duplicatum* seaweed in non-the oil extraction site and oil extraction site.

The higher toxicity content for both species were also observed in oil extraction than non-oil extraction. The highest toxic content in *P.tetrastromatica from* oil extraction site in 1000 µg/ ml concentration was observed 30 ± 10 % at 24 h and 57 ± 6% at 48 h than which that are from the non-oil extraction site found 13 ± 6 % at 24 h and 37 ± 6% at 48 h. Similarly, *S.duplicatum* was found 37 ± 6 % at 24 h and 70

± 10 % at 48 h from oil extraction site in 1000 µg/ml concentration than which are from non- extraction site in 1000 µg/ml was observed 23± 6 % at 24 h and 40 ± 40 % at 48 h from the non-oil extraction site. According to this research, the two species is useful in pharmacological preparations. The research can give suggestion to do isolation of bioactive compounds, determination bioactivities in vivo and vitro, creating cosmetic product and making food because of les less toxic heavy metal and toxicity in future.