

ABSTRACT

In this current study, the two seaweed species of *Sargassum duplicatum* and *Padina tetrastromatica* were collected from oil extraction site and non-oil extraction site at Madura Island. The collected seaweeds were investigated for their phytochemical constituents, total phenolic contents (TPC), antioxidant activities, antidiabetic activities, anticancer activities, toxicities by using *Folin-Ciocalteus* method, the 2,2-diphenyl-1-picrylhydrazyl (DPPH), α -glucosidase enzyme, 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT) and Brine Shrimp Lethality Test (BSLT), respectively. The crude extracts (C), normal hexane (N), ethyl acetate (E), methanol residue fractions (M) were studied. The higher TPC (589.79 ± 7.14^g and 102.36 ± 5.77^e mg GAE/g) were observed in ethyl acetate fraction of *S. duplicatum* and *P. tetrastromatica* from non-oil extraction site. Meanwhile, crude extracts and all fractions showed potent antioxidant, antidiabetic and cytotoxic activities with ethyl acetate fraction of *P. tetrastromatica* from non-oil extraction site displaying with the best activity (IC_{50} $25.25 \pm 5.15^{a,b}$, 249.12 ± 1.77^b and 70.56 ± 2.56^a μ g/mL, respectively). In brine shrimp assay, all fractions of *S. duplicatum* and *P. tetrastromatica* from two different sites were non-toxic after 24 h of incubation times. However, normal hexane fraction of *S. duplicatum* and *P. tetrastromatica* from oil extraction site were considered to be mild toxic while those from non-oil extraction had nontoxic after 48 h of incubation. Based on the findings of the current study, it is factual to conclude that the marine seaweed extracts from Madura Island have antioxidant, antidiabetic, and cytotoxic activity, which could be recommended for future submission in medicinal way and exploring novel drugs from the marine products.

Keywords: marine algae; total phenolic content; antioxidant; antidiabetic; cytotoxicity; toxicity.