

Diadema savignyi, a key prospect in pharmaceuticals
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As a consequence of the alarming rate of antimicrobial resistance and the increase built-up of ROS, this study aimed at evaluating the potential antimicrobial and antioxidant property of local sea urchin, *Diadema* species. Two different tissues, shells and gonads and two different solvents, chloroform and methanol were used. Since the drying methods will eventually influence the extractability, stability and activity of secondary metabolites, two different drying methods were compared; freeze drying and non-freeze drying. Statistically significant synergistic effect was observed between the different tissues, drying methods and solvents used. The highest extraction yield was obtained using methanolic non-freeze dried gonadal and shell extract, 8.23 ± 0.92 % and 9.13 ± 0.87 % respectively. Qualitative analysis revealed the presence of both phenols and saponins. Using the Folin-Ciocalteu method, phenolic content amounted to 420 mg GAE/g DW and 688.1 mg GAE/g DW in both non-freeze dried shell and gonadal extract respectively. The agar disc diffusion method showed promising inhibitory effect against two Gram negative bacteria, *Escherichia coli*, 16.3 ± 1.37 mm and *Acinetobacter* spp., 11.1 ± 1.29 mm using non-freeze dried methanolic shell extract. Bioactivity against Gram positive bacteria, *Staphylococcus aureus* was observed only using freeze dried methanolic gonadal extract, 17.1 ± 0.23 mm. Antioxidant activity was evaluated using DPPH scavenging capacity assay. Non-freeze dried methanolic shell extract revealed excellent activity reporting an IC₅₀ of 3.77 µg/ml. These results demonstrate that shells are a potential source of novel antimicrobial compounds and suggest its possible use as a natural food-grade antioxidant. They also showed non-freeze drying method and methanol as the recommended solvent for the production of an antimicrobial and an antioxidant rich extract.