Proceedings International
Platinum Open Access Journal (ISSN 2668-6384)

Proceedings, Abstract
Volume 2, Issue 1, 2020, 66
https://doi.org/10.33263/Proceedings21.066066

In-vitro Assessment of Biological Properties of Lipids Isolated from Gonads of *Stomopneustes variolaris* †

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† Presented at International e-Conference on Bioengineering for Health and Environment (ICBHE 2020)
Received: 5.07.2020; Revised: 10.07.2020; Accepted: 12.07.2020; Published: 15.07.2020

Abstract: Lipid fractions of gonads present in sea urchins serves as a source of bioactive agents with potent pharmaceutical properties. The present study reports the *in-vitro* biological effects of lipids isolated from gonads of sea urchin: *Stomopneustes variolaris* collected from the East coast of India. The extracted lipids were characterized by spectroscopic techniques such as GCMS and FTIR and tested for *in-vitro* biological effects. GCMS analysis of the lipid extract detected high levels of hexa triacontane (17.023 %), tetratetracontane (15.913%), and octacosane (15.628%) and low concentrations of oleic acid (2.206%) and sulfurous acid, pentadecy 2-propyl ester (1.744%). FTIR analysis identified rich composition of functional groups present in the lipids such as 3418.93 cm^{-1} (hydroxyl), 2921.08cm^{-1} and 2854.81 cm^{-1} (alkane), 2660.69 cm^{-1} (carboxylic acid), 1596.11 cm^{-1} (amine), 1291.76 cm^{-1} (aromatic amine). The lipid fraction evaluated by agar diffusion assay measured in terms of zone of inhibition showed bactericidal effects against gram-positive bacteria: *Streptococcus aureus* (30 mm); *Pseudomonas aeruginosa* (28.5 mm) and gram-negative bacteria: *Escherichia coli* (29.5 mm); *Klebsiella pneumonia* (27.5 mm) and *Vibrio cholera* (28 mm) respectively. The lipid fraction also showed an effective anti-fungal effect against *C.albicans* (25 mm). Further, the lipid fractions showed good radical scavenging effect against total phenolic, flavonoid content (15.12 mg GAE/g and 32.72 mg QE/g), and hydrogen peroxide radicals (IC_{50}- 48.28mg/ml) confirming its anti-oxidant potential. Based on the observed results, it was identified that the lipid fraction of gonads of *Stomopneustes variolaris* demonstrated various biological effects such as bactericidal, anti-fungal and radical scavenging activities which could have a great scope in the formulation of biopharmaceutical agents.

Keywords: *Stomopneustes variolaris;* Gonads; lipid fractions; FTIR; anti-bacterial.

Funding

This research received no external funding.

Acknowledgments

This research has no acknowledgment.

Conflicts of Interest

The authors declare no conflict of interest.