



Drugs From the Deep

The use of therapeutic products has been widely explored since ancient times

- most bioactive products are derived from terrestrial plants and animals
- shift to marine environment given limited land resources

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- marine resources are used as alternative source of drugs
- extraction of metabolites for anti-microbial, anti-hemolytic, mito-depressive properties and many more continuous to date

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Algae as Source of Metabolites

- screening of algae for the presence of metabolites such as terpenes, flavonoids, steroids, alkaloids, anthraquinones, tannins to cite a few

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Biological Activities of Algae


- cytotoxic and antitumor activity
- ichthyotoxins and feeding-deterrent substances
- nematocidal activity
- antifungal activity



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Biological Activities of Algae


- anti-inflammatory activity
- algicidal activity
- hepatoprotective activity
- antiviral activity
- protection against herbivore animals



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Biological Activities of Algae


- free radical scavenger and antioxidant activity
- anti-diabetic activity
- antihypertensive activity
- morphological abnormality in the plant pathogen



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Biological Activities of Algae


- Anti-helminthic activity
- gamete-releasing, gamete-attracting and sperm attractant pheromone



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Seaweed Research in the Ilocos


- presence of alkaloids, saponins, flavonoids, tannins and anthraquinones in *Halimeda* species (Locsin and Tungpalan, 2013)
- antioxidant property of *Hydroclathrus clatratus* ethanolic extract (Agngarayngay et. al., 2010)



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Seaweed Research in the Ilocos

- presence of bioactive secondary metabolites from *Hormophysa triquetra* ethanolic extract such coumarins, flavonoids, tannins and xanthroprotein (Espiritu and Tungpalan 2015)



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Seaweed Research in Ilocos

- presence of bioactive compounds and trace elements in *Dictyota dichotoma* (Phaeophyta) with antioxidant and cytotoxic properties (Batara and Tungpalan, 2016)

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Seaweed Research in the Ilocos

- efficacy of *Padina crassa* as mitodepressive and cytotoxic agent (Duque and Tungpalan 2017)

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Marine Animals as Source of Drugs

- anti-cancer, anti-oxidant, antileukemia, anti-fatigue and anti-inflammatory properties from sea urchin (Heng Jiao, et. al., 2015)

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Marine Animals as Source of Drugs

- toxins and compounds that repel and deter predators from sponges (Belarbi, et. al., 2003)

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Marine Animals as Source of Drugs

- Screening of marine products for compounds derived, primary chemical component and mechanism action from sponges, ascidians, echinoderms, and bryozoans.

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Conclusion

- marine-based drug discovery approach show promising results
- the need for further testing to ascertain specific targets using other technologies

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Issue no 1:

Depending upon the compound of interest, do you recommend specific type of HPLC or other techniques to maximize production?

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Issue no 2:

Studies show that for most algae, season and specific part of the thallus and depth of location show variable compound extracted. Could this be also true to marine animals the fact that most are nocturnal and sessile?

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Issue no 3:

The production of novel compounds from the natural ground entails effect in the food chain/food web process. What interventions are to be proposed to avoid possible detrimental effect?

Other Issues and Concerns

- Potentials drugs from the oceans and seas could pose an issue of availability and sufficiency without harming the environment. What interventions are proposed to address economic and ecological concerns

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Marine Organisms screened as prospective sources could be related to one another taxonomically. Do we have genetic barcoding activities to assist future researchers in search of novel bioactive compounds

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Thank you very much!