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RESEARCH ARTICLE

A REVIEW ON ANTIBIOTICS OBTAINED FROM MARINE SOURCE

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ABSTRACT

Marine microorganism has required setting up opinion based on bioactive metabolites and approaches a unique possibility to both enhance the amount of aquatic natural foodstuffs in clinical trials as well as speed up their progress. This review focuses especially on those molecules originated from marine microorganism these days in the medical pipeline that have been expected or highly required to be identified based on growing casual confirmation. especially karlotoxin class compound isolated from dinoflagellate *Karlodinium veneticum* offer chances to create new molecules for control of cancer and high serum cholesterol levels.

INTRODUCTION

Marine drugs are compound acquired from marine plant animals and microorganism. About 70% of earth surface is covered with water and it include 5, 00,000 live caste divide into 30 different phyla. The world ocean has a coastline of about 3,12,000 km and a volume of 137 km³+106 km³ texture it the largest Ecosystem on earth thus these statistics prove that there is a large source which still has been utilized. It grips an outstanding probable for finding and development of bioactive natural products. The ocean is muffled with peerless organisms. Most natural products. From the ocean are structurally narrative and many be able receive potentate biological activity (Acebal, 1998) We also provide an update on the current state the art of deep-sea bioprospecting discussing bottlenecks and current advances in the field from sampling techniques and cultivation to metagenomic approaches (Good fellow, 2010)

MATERIALS AND METHODS

Marine sediment sample were collected from east coast of Chennai, Bay of Bengal, India at a depth of 400cm. The sediment sample were dried in laminar air floe for 8-12 h and then kept at 42°C for 10-30 days in a sterile petri dish and these preheated samples were used for the isolation of actinomycetes.

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The international streptomyces project (IPS) No. I media, starch casein agar and Bennett's agar with 25% sea water 25% sediment extract was used for the isolation of actinomycetes and the growth media was supplemented with antibiotics cycloheximide (25 mg/ml) and nalidixic acid 25 mg/ml. Plates were incubated at 28 degree C for 7-14 days. The isolates were subculture and maintained in slant culture at 4°C as well as in 20 % (v/v) glycerol stock at 80 degree C.

Screening for antibiotics production: Antibacterial activity of the potential isolate was studied by agar plate diffusion assay. Briefly, 10µl of the cell free supernatant was applied to filter disks (6mm in diameter) (Kala, 2012).

Marine microorganism as resource of antibiotics is as follows: The oceans are a resource of biodiversity that proceed that of terrestrial environment. The marine environment provides 95% of habitat space on the plant and the sea offer terrible diversity with two thirds of phyla exclusively or cardinal marine organisms (Patrzykat, 2003).

Marine producers of bioactive compounds: Most of the evolved and undeveloped countries have since shifted their focus to the marine habitat and new marine oriented programs are emerging worldwide. Major classes of microbes like bacteria and fungi are now the target of biomedical study and intriguing novel metabolites are being produced. Sponges, algae, marine bacteria, marine fungi (Pathirana, 1992).

Marine sponges: Sponges have often shows the greatest percentage of active samples. However, the sponges are notoriously difficult to identify and thus many sponges having antimicrobial activity still remain unidentified (Argulis, 2009)



Figure 1 Marine sponge

Marine algae: Algae are an informal term for a large diverse group are not radically closely related and is thus polyphyletic. The largest and most complex marine algae are called seaweeds, while the most complex freshwater forms are the charophyta, a division of green algae which includes, for example: spirogyra and stone worts (Lee, 2008).



Figure 2. Marine Algae

Marine bacteria: Marine define by their habitat as the microorganisms living in a marine environment that is in the saltwater of a sea or ocean or the brackish water of a coastal estuary (Nabors, 2004).



Figure: 3 Marine bacteria

Marine fungi

The study of marine fungi has proven a rich source of pharmaceutically interesting secondary metabolites, and it has been postulated that marine fungi will also become an important source of secondary metabolites. Higher marine fungi are distributed in littoral and deep water. These fungi are morphologically different and have different growth requirements from terrestrial fungi (Madigan, 2006).

Different types of marine pollution

The marine pollution occurs when harmful effects result from the entry into the ocean of chemicals, industrial, agricultural and residential waste, noise, or the spread of invasive organisms. Eighty percent of marine pollution has proven to be harmful to marine life and its habitats. Some of the types of marine pollution have been mentioned (Holler, 2000).

Ocean Acidification

The oceans are normally a natural carbon sink, absorbing carbon dioxide from the atmosphere. Because the levels of atmospheric carbon dioxide are increasing, the oceans are becoming more acidic (Department of Commerce, 2015)

Eutrophication

Eutrophication is an increase in chemical nutrients, typically compounds containing nitrogen or phosphorus, in an ecosystem. It can result in an increase in the ecosystem's primary productivity (excessive plant growth and decay), and further effects including lack of oxygen and severe reductions in water quality, fish, and other animal populations. (Unep, 2009)

Need of marine derived antimicrobial agents

As serious infectious disease and multidrug resistance are emerging repeatedly novel antimicrobials are needed to warfare these bacterial pathogens, but the progress of discovery embarks relatively slowly. Most chemical scaffolds of antibiotics used now were just introduced between the mid-1930s and the early 1960s. To summarize, the need for novel antimicrobials is due to resistance of the existing drugs, exhaustion of terrestrial bioprospecting, and quest for novel scaffolds for antimicrobial drug (Gerlach, 1975).

Biodiversity of marine environment

Marine environment is a natural habitat for an expanded variety of living organisms having different physiology and capacity to adapt their environment. Out of over 33 animal phyla known today a total of 32 phyla are comprised in the marine environment out of which 15 varieties are exclusively present in the marine environment. Such genetic diversity renders chemical diversity. Which is liberal of promises for new drug development? (Margulis, 1998)

Marine drugs in clinical pipeline

Marine bacteria derived and other compounds are in clinical pipeline. Molecules in clinical or preclinical evaluation and prototype natural product are karlotoxin. Trabectedin is produced by symbiotic bacteria and recently approved for cancer treatment (Penseyan, 2010).

Classification of drug molecules of obtained from marine organisms

(Sudheer Kandibanda, ?; Murti, 2010). The enormous amount of recent and potent drug molecule derived the wide spectrum of marine organism across the world may be judiciously and logically classified based on their specific pharmacologic action.

- Anti-inflammatory drug
- Antibacterial
- Neuroprotective
- Antiparasitic
- Antiviral agent.

Anti-inflammatory

The anti-inflammatory function of extracts and other parts of a Mediterranean sponge species *Spongia officinalis* in the in vivo study on rat model of carrageen an-induced paw edema assay (Dellai, 2011)

Antibacterial

Eicosapentaenoic acid a polyunsaturated fatty acid isolated from a diatom of marine origin *Phaeodactylum tricomutum* which has shown activity against an array of gram-positive and gram-negative bacteria, which also includes a multidrug-resistant variety of *Staphylococcus aureus* (Desbois, 2009)

Neuroprotective

The extracts of south Indian green seaweed *Ulva reticulata* has shown neuroprotection by inhibiting acetyl- and butyryl-cholinesterases, efficacy comparable to agents currently approved for Alzheimer's disease treatment. (Suganthi, 2010).

Antiparasitic

Extracts of *Sarcotragus* species, known as Tunisian sponge prepared in dichloromethane has demonstrated in vitro anti-leishmanial active by demonstrating the associated morphological alterations in promastigotes of *Leishmania major* (Ben Kahla-Nakbi, 2010).

Antiviral agent

Anti-herpes simplex virus-1 (HSV) active found in high molecular weight exo-polysaccharides extracted from the *Celtodoryx* (Rashid, 2009)

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Conflict of interest

The author declares no conflict of interest

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