MARINE FUNGI: POTENTIAL SOURCE OF PHARMACOLOGICAL COMPOUNDS

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Summary

Marine microorganisms are not well characterized than their terrestrial counter part and still little touched for natural product research. In recent years marine fungi is drawing attention for metabolite search. Published literature shows marine fungi is excellent source of compounds of bioactive potential in various therapeutic areas including cancer, inflammation and infective diseases etc. Marine fungi reflect a new area of interest in chemical and pharmaceutical research.

Keywords: Marine fungi; metabolites; cytotoxic; anti-inflammatory; antifungal.

Life is originated from the oceans that contain 99 percent of the living space on the planet and an area of about 361 million sq km that is, 71% of the globe and contains extreme biological diversity. Marine natural products fascinate researchers to an important area of drug development due to their structural rareness and their diverse biological activities. This untouched biological diversity has become new target of research for human welfare. To date approximately 16,000 different secondary metabolites have been isolated commonly from marine invertebrates such as sponges, coelenterates, tunicates, molluscs and from algae. But nowadays attention of natural products research is towards marine microorganisms because of availability problem of marine macroorganisms and less yield of metabolites that is unlikely to provide sufficient material for drug development studies. Marine microorganisms are not well characterized than their terrestrial counter part and still little touched for natural product research. Marine microbes have huge advantages over land-based microbes due to their successful survival in most difficult competition of life.

In recent years marine fungi is drawing attention for metabolite search. The discovery of the antibiotic cephalosporines[1] in 1948 started real interest of researcher in secondary metabolites produced by marine fungi. Published literature shows marine fungi is an excellent source of compounds of bioactive potential.

Marine fungus *Zopfiella marina* has been reported to produce zofimarin an antifungal diterpene glycoside[1] whereas another antifugal agent griseofulvin was detected in a marine strain of *Penicillium waksmanii.* Xestodecalactones B and polyester 15G256β (macrolide), polylactones and oxybis methyl phenol (polyketide), lipodepsipeptide are different anti-fungal compounds produced by marine fungus[2,3]. In many other therapeutic areas also marine fungus is reported to produce wide variety of compounds include antibacterial pestalone (halogenated benzophenone), sumiki's acid (macrolide); anthelmintic nafuredin (polyketide); antimalarial ascosalipyrrolidin one A (polyketided), aigialomycin D (macrolide), and halorosellinic acid (sesterterpene); anti-inflammatory oxepinamide A (alkaloid), antiviral sansalvamide (depsipeptide), immune system promoter perybysins A–D (sesquiterpenesd) and nervous system supporter molecule aspermytin A[2-8]. Zopfiellamides A and B, antimicrobial pyrrolidinone derivatives from the marine fungus *Zopfiella latipes* are two novel compounds[9].

Discovery of Anti-tumor compound are our major concentration of researcher nowadays and marine fungi are promising source of anti-neoplastic agent; halimide, sargassamide and avrainvillamide three new drugs are produced by marine fungi[10]. Sansalvamide and thiocoraline (depsipeptide), varitriol and panostatins A-E (polyketide), mangicols and ophiobolin K (sesterterpene), aspergillamides (peptide), rostratin C (alkaloid), danksterone (sterol), xylaria sesquiterpene and macrocyclic trichothecene toxins produced by *Myrothecium verrucaria* are few other anti-tumor compounds reported from marine fungus[4-6]. Fellutamides A and B, cytotoxic peptides from a marine fish-possessing fungus *Penicillum fellutanum* and epolactaene from marine sediment fungus *Penicillium* sp.[1] are different neurotrophic agents of distinct chemical structures, reflect a new area of interest in chemical and pharmaceutical research. New metabolites identified included gliocladiolide from a marine-derived *Gliocladium* sp. that is common and are most closely related to *Penicillium* and *Paecilomyces*; paecilosetin isolated from *Paecilomyces farinosus*[1]. Three polyketide roselipins, anthraquinone and amide pulchellalactam are compound reported to have miscellaneous mechanisms of action[2,7,8].

Recently investigations on marine fungi have been intensified more due to searching into new sources for bioactive metabolites. Polar environment and deep-sea ecosystem are another source to explore novel fungal species which will not only provide important information related to the origin of life and its evolution but also will be source of novel bioactive compounds. Day to day new enthusiastic results related to the search of novel cytotoxic, antibacterial, antiviral, antiprotozoal and other compounds of bioactive potential isolated from marine-derived fungi and their possible roles in disease cure focus the importance of the study of deep-sea fungus and polar fungus.

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