Studies on secondary metabolites obtained from Antarctica sponge-derived fungi: Structures and biological activities.

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Abstract (300 word limit)

The oceans have spectacular involvement in drug discovery and drug development, giving quality pharmaceuticals to the community. The natural products produced by marine-derived microorganisms are of specific importance. Antarctica is a predominantly interesting biosphere due to the unusual climatic conditions. Antarctica derived microbes can generate new metabolic products by confronting natural stressors like low temperature, lack of nutrients and high UV radiation, needs a diverse array of biochemical and physiological adaptations for survival. These adaptations are often associated with alterations to both gene regulation and metabolic pathways, enhancing the possibility of discovering unique bioactive metabolites of pharmaceutical importance. In this study, the potential of secondary metabolites from Antarctica sponge-derived fungi were explored by optimization of culturing conditions guided by the so-called OSMAC (One Strain-Many Compounds) approach, while advance separation, isolation and elucidation techniques were used to discover secondary metabolites with new structural framework and significant biological activity which are further processed as lead compound for new drug developments. During our efforts to explore new bioactive molecules from Antarctica sponge-derived Microorganisms. Three new polyketides, ketidocillinones A–C (1–3), were discovered from the extract of an Antarctica sponge-derived fungus *Penicillium sp.* HDN151272. All the structures were deduced by spectroscopic data, including NMR and HRESIMS. The absolute configuration of compound 3 was established by using ECD calculation. Compounds 1−3 can be slowly oxidized to quinone form when exposed to air. Ketidocillinones B and C (2 and 3) exhibited potent antibacterial activity against *P. aeurigenosa, M. phlei*, and MRCNS with MIC values ranging from 1.56 to 25.00 µg/mL. In addition, 200 fungi were screened on PDA medium and *P. brocae* were also chemically investigated. Total 51 compounds were elucidated and biologically checked.

Recent Publications (minimum 5)

Mudassir Shah, Chunxiao Sun, Zichao Sun, Guojian Zhang, Qian Che , Qianqun Gu , Tianjiao Zhu, and Dehai Li. (2020). Antibacterial Polyketides from Antarctica Sponge-Derived Fungus *Penicillium* sp. HDN151272. *Marine Drugs*, pp. 1-9 (Impact factor: 3.8)

Chunxiao Sun, Xueping Ge, **Mudassir Shah**, Luning Zhou, Guihong Yu, Qian Che, Guojian Zhang, Jixing Peng, Qianqun Gu, Tianjiao Zhu and Dehai Li. (2019). New Glutamine-Containing Azaphilone Alkaloids from Deep-Sea-Derived Fungus *Chaetomium globosum* HDN151398. *Marine Drugs*, pp. 1-11 (Impact factor: 3.8).

Sun, Chunxiao; **Mudassir Shah**; Zhang, Zhenzhen; Feng, Yanyan; Chang, Yimin; Che, Qian; Gu, Qianqun; Zhu, Tianjiao; Zhang, Guojian; Li, Dehai. (2019). Secondary Metabolites from Deep-sea Derived Microorganisms. *Current Medicinal Chemistry*, pp. 1-20 (Impact factor: 3.5).

Jun-Xiao Wang, Chun-Xiao Sun, **Mudassir Shah**, Guo-Jian Zhang, Qian-Qun GU, Tian-Jiao Zhu, Qian Che & De-Hai Li. (2019). New Metabolites from a Mariana Trench-Derived Actinomycete *Nocardiopsis* sp. HDN17-237. *Journal of Asian Natural Products Research*, pp. 1-7 (Impact factor: 1.24).



Biography (150 word limit)

Mudassir shah is PhD scholar in laboratory of marine natural products chemistry at school of medicine and pharmacy, Ocean university of china,. He is lecturer in Deptt of pharmaceutical sciences, Abbottabad University of science and technology, Pakistan. He has B. Pharm and master of philosophy from Gomal University and Hazara University. He is trained in fungal fermentation, isolation, purification and elucidation of natural compounds.

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