

Recent Trends in Natural Product Research and Bangladesh Perspective

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Background: Natural products, especially those derived from higher plants, have attracted scientists from ancient time because of their potential therapeutic values. Drug development from natural sources showed that natural products or natural product-derived drugs comprised about 28% of all new chemical entities launched to the market. These are originated from terrestrial plants, microbes, marine organisms, etc. However, until recently an insignificant part of the plants has been scientifically evaluated for their medicinal properties. Bangladesh is a rich repository of medicinal plants, many of which are widely used in the Ayurvedic, Unani, herbal and other traditional systems of medicines. The study programs were initiated to investigate some of the traditionally used medicinal plants of Bangladesh, including *Corypha taliera*, the only living wild species of tali palm for the discovery of novel drug candidates as well as to isolate and identify bioactive compounds from several microbial strains and marine samples.

Methods: The samples were collected, properly authenticated and then extracted with solvents of various polarities. The concentrated extractives were subjected to repeated separation and purification processes, including HPLC. The structures of the purified molecules were elucidated by extensive spectroscopic studies and chemical derivatization, when required. The extractives were also subjected to appropriate assay techniques to establish the bioactivities.

Results: We have investigated over 50 medicinal plants and several microbial strains that have resulted in the isolation and characterization of 150 compounds, including 50 new molecules. Terpenoids, alkaloids, flavonoids and glycosides were the major classes of constituents. The crude extractives and several purified molecules demonstrated statistically significant inhibition of growth of microorganisms as well as cytotoxicity, antioxidant and antidiabetic activities. On the other hand, usnic acid, a lead compound obtained from the lichen, *Parmelia kamtschandalis*, showed potent antimicrobial activity, whereas dehydroaltenusin and ovatodiolide extracted from a *Streptomyces* sp. and *Anisomeles indica*, respectively exhibited significant HIV-inhibitory effects.

Conclusion: The series of studies which we conducted in our laboratory have resulted in the isolation and characterization of numerous chemically unique and biologically interesting secondary metabolites from medicinal plants, microbes and marine organisms. Some of these results are in conformity with the traditional and folk uses of the investigated plants.
