

Endosymbionts of Plants and Marine Organisms: A Search for Lung Cancer Drug

Vartika Mathur* and Garima Sharma

Animal-Plant Interactions Laboratory, Department of Zoology,
Sri Venkateswara College, University of Delhi,
Benito Juarez Marg, Dhaula Kuan, New Delhi-110021, India

*E-mail: vmathur@svc.ac.in

ABSTRACT: Lung cancer is one of the lethal forms of cancer world-wide, contributing 28% of the total cancer related deaths. In India, it is the most commonly occurring cancer form in males. Proactive research strategies for its treatment and management have led to major advancement in surgery, chemotherapy and radiotherapy. Chemotherapy, among these, is the most prevalent treatment. However, treatment complexities such as genetic and environmental factors, tumour heterogeneity, resistant tumour and secondary health problems are biggest hurdles in effective chemotherapy. Owing to these challenges, the need for novel, effective and safer therapeutic agents has led to evaluation of natural compounds from traditional medicinal plants especially bioactive compounds. However, production of bioactive compounds from host organism depends on specific stage, nutritional, stress and environmental conditions. Due to these limitations, exploring endosymbiotic microorganisms from the host having medicinal properties provides a prospect of, inexhaustible and cost-effective source for bioactive compounds. Endophytes (plant's endosymbionts) produce similar metabolites as the host, as a result of their adaptation strategy. Compounds such as vinblastine, taxol, camptothecin, podophyllotoxin, topotecan and vincristine, are some of the examples of metabolites from endophyte origin used as anticancer agents. Another rich source of bioactive secondary metabolites is animals and plants of marine origin. Endosymbiotic microbes present in marine animals such as sponges, corals, starfish, bryozoans, sea urchins, fishes and prawns have recently emerged as rich sources of anti-cancer bioactive compounds. Since, marine biodiversity, are hardly explored, these sources may provide metabolites that may be used for therapeutic drugs against ailments, with minimum side effects. This review provides an insight to the symbiotic microbes with bioactive compounds with a potential in lung cancer therapy.