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Isolation of endophytic fungi from marine algae and their antimicrobial activity

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Marine macro algae or seaweeds have been shown to contain endophytic fungi which produce novel bioactive compounds with the potential to be exploited in the fields of medicine, agriculture, and industry. The current study was carried out to isolate and identify endophytic fungi from selected marine algae and to screen the biological activity of fungal endophytic isolates. A few species of seaweeds were collected from the Mt. Lavinia beach and identified according to their vegetative and reproductive characteristics, using available keys. The thalli were plated in Potato Dextrose Agar (PDA) medium with sea water. The emerging fungal colonies from inner tissues were picked up and plated in the same medium separately, to obtain pure cultures. According to the colony morphology and microscopic features and with the help of available keys, several genera of fungi such as *Penicillium* spp. Isolate (I) and (II), *Aspergillus* spp., *Colletotrichum* spp., *Rhizopus* spp., were identified as endophytes of the algae *Chaetomorpha antennnina, Ulva fasciata, Gracilaria corticata* and *Caulerpa racemosa,* respectively. Isolated endophytes were separately cultured in Potato Dextrose Broth (PDB) medium with sea water and the culture filtrates were separated using Ethyl acetate, except those of *Penicillium* spp. Isolate (I) and *Aspergillus* spp. which did not cause much colour change in the broth. The organic fractions were evaporated to dryness and dissolved in Ethyl acetate to yield a concentration of 40 mg/ml each. Bioassays were done in a Completely Randomized Design, using the disc diffusion method to test the biological activity of those extracts against pathogenic fungi *viz. Curvularia* spp. and *Fusarium* spp. and pathogenic bacteria *viz. Escherichia coli* (Gram -) and *Bacillus* spp. (Gram +). Results revealed that the *Fusarium* spp. was significantly and highly affected by the crude endophytic extracts than *Curvularia* spp and the crude extracts of *Penicillium* spp isolate 1 were highly effective than those of *Aspergillus* spp. against the two fungal pathogens ($P<0.05$). Also, organic fractions of the endophytic extracts were significantly and highly effective than inorganic fractions against pathogenic bacteria, and significantly and highly effective on *E coli* ($P<0.05$). Further, *Penicillium* spp. isolate 2 extracts had a significantly higher effect on pathogenic bacteria ($P<0.05$).

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