Investigation of the anti-Phytopathogenic activities of seaweed extracts: biochemical characterization and effects on plant diseases.

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Résumé

Pesticides, as chemical compounds, are used to control a variety of plant diseases. However, their excessive use in the croplands shows a toxicity in the living systems and causes an increased risk of pesticide resistance and toxicological implications to human and environmental health. Nevertheless, the deployment of alternative approaches would seem to be necessary.
Natural bioactive molecules derived from seaweeds are recognized for their several biological activities and can help plant survival by providing protection against stress imposed by pathogens. The purpose of this study was to investigate the anti-Phytopathogenic activities of seaweed extracts collected from the coast of El Jadida, Morocco. In this study, we analyzed the in vitro antimicrobial activity of seaweed extracts and their ability to protect plants in vivo against fungal and bacterial diseases. Defense-related enzyme activity analyses were conducted to determine whether these extracts could stimulate resistance mechanisms.

The extracts significantly inhibited the growth of the strains (*Bipolaris sorokiniana, Fusarium culmorum, Alternaria alternata, Sclerotium rolfsii, Pectobacterium carotovorum,* and *Pectobacterium brasiliensis*) in vitro; on the other hand, the use of seaweed extracts directly by spraying significantly reduced plant disease severity by up to 90%. This protective ability was associated with the activation of growth parameters. Pre-treated plants exhibited significantly higher activity levels of the defense enzymes.
In conclusion, seaweed extracts showed promising anti-Phytopathogenic activities; they are a source of bioactive compounds with potential agricultural applications that could be of considerable economic interest to sustainable agriculture.

Mots-Clés: Pesticides, antiPhytopathogenic activities, seaweed extracts, coast of El Jadida Morocco, resistance mechanisms, bioactive compounds.

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