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Biostimulant potential of microalgae extracts on auxin and cytokinin-like activities

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Modern agriculture is increasingly seeking alternatives towards the use of biostimulants to enhance plant growth and maximize crop productivity against conventional treatments methods such as pesticides, which adversely affects crops by leading to the accumulation of toxic compounds in plant tissues and bolstering the resistance of key phytopathogens. A viable alternative is the utilization of microorganisms with biostimulatory potential, such as microalgae. Beyond their energy potential, microalgal biomass is rich in macromolecules and secondary metabolites. These components can be utilized across industrial, pharmaceutical, food, renewable energy, and agricultural sector. The latter being especially prominent due to the unique composition of the biomass and the urgent need for more sustainable farming practices. Based on this potential for agricultural application, the objective of the present study was to evaluate 4 biomass extracts obtained from the microalgal species *Chlorella sorokiniana*, *Haematococcus pluvialis*, *Porphyridium cruentum*, and *Desmodesmus subspicatus* on cucumber cotyledons bioassay. The microalgal biomass was subjected to aqueous extraction and subsequently utilized to determine cytokinin-like activity in newly germinated cotyledons. Concurrently, an auxin activity assay was conducted to evaluate radicle growth within the cotyledons. The results indicated a positive effect on the development of cucumber cotyledon radicles using microalgals extracts, especially *D. subspicatus*, with an increase of up to 71.92% compared to the control group, pointing that the extracts have biostimulating activity related to the presence of auxins, which implies in a higher rate of radicle development.

KEYWORDS: Plant growth promotion, *Desmodesmus subspicatus*, Biomass, Sustainable agriculture

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