Crude extracts of some fresh water Cyanobacteria have auxin-like activity on potato tissue culture

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ABSTRACT

The effect of crude extracts of ten fresh water cyanobacteria numbered (1-10) on the morphogenic responses of potato nodal explants in vitro was investigated. In order to study the auxin-like effect of cyanobacterial extracts, a new simple technique, employing potato tissue culture was applied. Both Murashige and Skoog (MS) basal medium or MS supplemented with 20% (v/v) algal crude extracts were used. MS medium containing 4 mg/l GA_3 was considered as positive control. The obtained data clearly indicated an auxin-like effect of crude extracts of five algal species (n° 1,4,5,7,10) out of the ten species used. A healthy strong potato plantlet (6.9-cm shoot length, 4-cm root length and 4 leaves per shoot) was proliferated from nodal explant (1 cm length) when cultured onto basal MS medium supplemented with 20% algal extract n°4. The growth parameters of plantlets onto positive control medium were 9 cm shoot length, 5 cm root length, and 7 leaves per shoot. Chromatographic analysis using TLC and GC/MS confirmed the presence of indolic substances in the five-algal extracts. It could be concluded that cyanobacteria have a strong auxin-like activity.

Abbreviations: IAA - Indole-3-acetic acid; IBA - Indole-3-butyric acid; ICA- Indole-3-carboxylic acid; IP - isopentenyl adenine; 2,4-D - 2,4-dichlorophenoxyacetic acid; GA3 - Gibberellic acid; GC/MS - Gas chromatography/Mass spectrometry; Kin - Kinetin; NAA - Naphthalene I-acetic acid; PAA- Phenyl acetic acid; TLC - Thin layer chromatography.

Key words: *Solanum tuberosum, micropropagation, algal extract, growth regulators, GC/MS*

INTRODUCTION

It is of interest to know whether or not the chemical substances acting as hormones in the most highly evolved land plants, such as the angiosperms, are already present in the more primitive plants such as algae. If such chemicals are present in algae, do they function as hormones, or do their hormonal function appear only in land plants? These questions have been answered to some extent concerning the angiosperm hormone IAA (Jacobs, 1986). Regarding the algal production of IAA, there have been numerous reports of auxins-like activity in different algal species. Du Buy and Olson (1937) recorded the presence of auxin in various parts of *Fucus vesiculosus*, and Van der Weij