

## A PRACTICAL GUIDE ON PHYTOHORMONES FOR G.C.E. ADVANCED LEVEL BIOLOGY STUDENTS

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This study was carried out with the aim of developing a practical guide for the G.C.E. Advanced Level Biology students, on phytohormones, as there are no laboratory exercises recommended in the present Advanced Level guide under this section. As the commercially available purified plant hormones are very expensive, natural sources and commercially available artificial sources of hormones were tested. Rooting powder is composed of auxins such as IBA (Indole Butyric Acid) and NAA (Naphthalene Acetic Acid). In Sri Lanka rooting powder is available by the trade names "Hormone rooting powder", "Secto" and "Rooton". These can be used as a source of auxin in some experiments. Ethylene was obtained from natural sources such as ripe bananas and ripe passion fruits and from the chemical preparation of Ethrel (a commercial spray for initiation of flowering in pineapples) with sodium hydroxide.

Phototropism shown by plants due to action of auxins was demonstrated using mung seedlings. Apical dominance of balsam (*Impatiens* sp.), root initiation of African violet (*Saintpaulia* sp.) leaves and the influence of hormone concentration in rooting of onions and garlic using rooting powder as source of auxin were studied. Particular emphasis was paid to recording observations in these experiments. The effect of ethylene on fruit ripening was studied using ripe 'Embul' bananas as the source of ethylene and the same experiment was repeated using passion fruit as the natural ethylene source. Passion fruits were found to be more effective in these experiments. Using passion fruit as the source of ethylene, leaf senescence of 'Kankun' (*Ipomoea aquatica*) and flower senescence of temple flower (*Plumaria acuminata* and *Plumeria rubra*.) were studied. The ethylene generated by the reaction of Ethrel with sodium hydroxide could be used to ripen 'Embul' banana in the laboratory.

Other plant hormones tested out were cytokinins and abscisic acid. Coconut water was not effective as a natural source of cytokinins as it tends to ferment. Crude extracts from the dormant buds of potato were not a good substitute for abscisic acid, as typical symptoms of abscisic acid such as leaf senescence or chlorophyll breakdown were not observed when applied on Geranium (*Pelargonium* sp.) leaves.

A practical guide on phytohormones was prepared, which included nine laboratory exercises to demonstrate the action of auxin and ethylene using natural and artificial sources.