PHYSIOLOGICAL STUDIES ON THE PROPAGATION OF SOME TIMBER TREES GROWN IN EGYPT

By

NASR RAGHEB SAID

A thesis submitted in partial fulfillement

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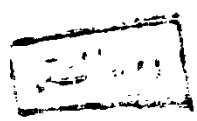

DOCTOR OF PHILOSOPHY

In

Agricultural Science

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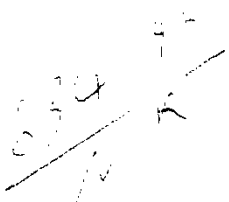

Department of Horticulture

Faculty of Agriculture

Ain Shams University

1991

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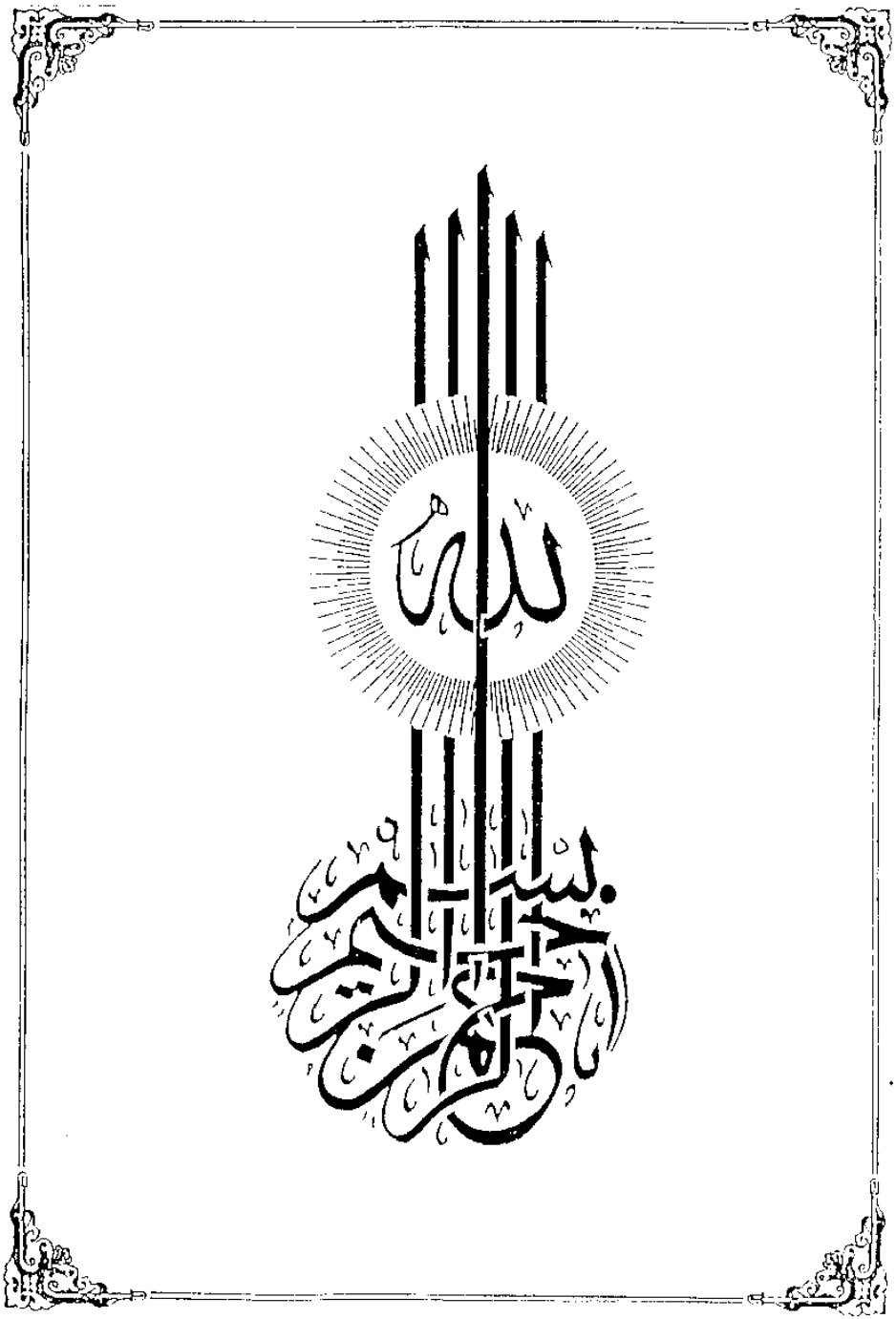

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ABSTRACT

This study was undertaken during the years from 1985 to 1987 to study the best method of vegetative propagation of some timber trees grown in Egypt namely: Eucalyptus citriodora, Populus x canadensis and Pinus eldarica.

I. Stem cuttings were collected in early February, March and April and treated with different methods of IBA application. The results obtained favoured the cuttings in March for E. citriodora, P. canadensis and Pinus eldarica is accurate. Mature cuttings could be treated successfully by soaking cuttings for 24 hrs in IBA solution at 400 ppm. for E. citriodora and at 800 ppm. for Populus x canadensis stem cuttings, accompanied with higher root number, and best length was produced. Pinus eldarica stem cutting treated with tooth pick soaked for 24 hrs in IBA solution at

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4000 ppm., dried and inserted into the basal end of cuttings increased rooting percentage, and induced more roots than those treated with quick dipping for 15 second in IBA or soaked for 24 hrs in higher concentrations of IBA. Root promotion activety in basal cuttings of the three species was determined by HPLC and cow pea bioassay, positive correlation was found between rooting ability of cuttings and cow pea rooting promotor at R_f 0.9-R_f 1.0 of the chromatograms.

II. The second experiment was carried out to investigate the best procedure of tissue culture technique that can be used for propagating the timber trees under investigation: Eucalyptus citriodora, Populus x canadensis and Pinus eldarica.

The obtained results reveal that shoot tip segments collected from 3 years old trees for E. citriodora and Pinus eldarica and from adult trees for Populus x canadensis were cultured on M & S basal medium supplemented with BA and NAA combination. Multiple shoots were obtained most consistently in test with NAA and BA. The production of shoots increased with BA concentration up to 1 mg/l for E. citriodora and Populus x canadensis, and up to 2.5 mg/l for Pinus eldarica. The shoots could be separated and rooted in medium supplemented with NAA was. The best rooting percentage was obtained when NAA at 0.1 mg/l was applied to Eucalyptus citriodora and Populus x canadensis rooting medium. The best rooting percentage was obtained from Pinus eldarica when NAA applied at 1.0 mg/l. Plantlets could be successfully hardened and grow outdoor. The microscopic examination of different sections reveal that root primordia were originated from callus cell.

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