ABSTRACT

Responses to *in vitro* culture of explants taken from shoot tips from juvenile and adult shoot tips, axillary buds, leaves, ovules and embryo or endosperm of clonal selections of nutmeg and clove were tested. Complete plant regeneration with higher rate of multiplication was achieved with shoot tip culture of juvenile plants of both species. Partial success was achieved in axillary bud culture in clonal trees of both species.

Shoot tip explants taken from juvenile plants of clove and nutmeg were established successfully in Anderson's culture medium supplemented with 2.0 mg/l BA with or without 0.1-0.2 mg/l NAA. Multiplication of juvenile nutmeg (4-5) and clove (6) was obtained within an eight week period in Anderson's solid medium supplemented with 2.0 mg/l BA. Agitated liquid medium with the same nutrient composition gave the highest rate of multiplication (6) with greater shoot growth of nutmeg, whereas, for clove liquid media were found to be not suitable. The best subculture period for nutmeg cultures was about four weeks and the most suitable portion of the shoot to achieve highest multiplication was 0.5-2.5 cm from the apex. Shoot elongation of clove could not be induced by GA_3 or NAA. Nutmeg shoots were successfully rooted in Anderson's medium containing 0.2% activated charcoal with 0.5 mg/l IBA,

whereas for clove rooting took place in 1/3 strength of Anderson's with 0.2% activated charcoal with either 2.0 mg/l IBA or 1.0 mg/l NAA. Plantlets were successfully transferred to soil.

Shoot tips from three physiological stages of clove clonal selections became established in culture only at a low percentage (5%) and produced axillary bud growth in Anderson's medium supplemented with 0.05 mg/l yeast extract, 0/01 mg/l glutamine, 0.01 mg/l biotin 6-10 mg/l BA and mixture of four antibiotics (6.0 mg/l Polymixin B, 6.0 mg/l Rifampicin, 25 mg/l Cephotaxime and 25 mg/l Tetracycline). Higher percentage of culture establishment and low rate of contamination were observed when nodal explants were taken at the end of the major rainy season (December, January). Selected nodal portions with swollen axillary buds took less time to produce axillary bud growth, and with an even higher percentage of success. Although unfertilized ovules were expected to be more suitable for clonal multiplication through somatic embryogenesis, they failed to produce callus.

Shoot tips or nodal explants from plagiotropic or trunk-sprouted orthotropic shoots of nutmeg at different stages gave negative results not only due to a higher rate contamination but also probably to the unsuitability of the

physiological stage of the explants.

Clonal grafted materials maintained in the greenhouse gave a very low rate of contamination but in all the attempts shoot tip cultures failed to regenerate plantlets. Single nodal explants from the grafted plants could be established in 1/3 Anderson's medium supplemented with 0.05 mg/l yeast extract, 0.01 mg/l glutamine, 0.01 mg/l biotin and 1.5 mg/l BA. Incorporation of even a very little quantity of NAA (0.1 mg/l) was not suitable for nodal culture establishment. Nodal explants at two different physiological stages were tested , and it was found that nodes with emergence of axillary buds (about 5-15 mm long) were more suitable for culture establishment. Initial incubation for three weeks in complete darkness was not effective for axillary bud elongation.

Other explants tested in nutmeg such as leaves, endosperm and embryo gave negative results. Micrografting was also difficult and a failure. Only a limited number of experiments could be done with re-grafted nutmeg plants due to unavailability of explant materials.