Acacia senegal (L.) Willd is an economically and ecologically important species. It produces gum arabic, which is highly sought for its diverse qualities by food industry and others. The bark and leaves are used to treat gastric disorders, haemorrhage, opthalmia, diarrhoea and colds. Foliage and pods provide good fodder for goats and sheep. Seeds can be dried and eaten as vegetables. Ropes are manufactured from root bark fibres. The tree improves soils mineral content through symbiosis with rhizobia and mycorrhiza and is one of the characteristic of the African Sahel where rainfall varies from 250-750 mm. In Kenya, *A. senegal* is confined in the Magadi/Garba Tula and Wajir climate types. *A . senegal* is not a prolific seeder sometimes going for five years between peak production with little or no seeds produced. Germination of the seed is poor. This calls for establishment and refining of alternative multiplication techniques.

The method described here in permitted production of micropropagules of gum, Arabic tree (*Acacia senegal*) from uninodal and shoot tip explants via direct regeneration from explants (direct organogenesis). The explants were taken from plants produced either in a sterile environment or 16-month old glasshouse grown seedlings. The plants were from Machakos, Kibwezi and Turkana provenances. Zeatin, Kinetin, 6-benzlylaminopurine or a combination of these cytokinins with auxins (IBA, NAA and 2, 4-D) were mixed at different concentrations in full strength Murashige and Skoogs (MS) Medium or modified MS medium. The modification consisted of decreasing by half the amount of macronutrients.

BAP and kinetin were less effective than zeatin for the sprouting of auxiliary buds from explants and for stimulating growth of new shoots. The lowest concentration of Zeatin (0.1 mg/1) scored the highest mean for shoot height after 60 days of culture. In contrast the highest mean of BAP and kinetin (1mg/1) scored highest means of height growth compared to the other concentrations of these two cytokinins.

With *A. senegal* under the present experimental conditions, the auxiliary buds produced single shoots, which lengthened and produced several nodes suitable for microcutting in contrast to other species which show a proliferation of many shoots. I mg/1 NAA supplemented in modified MS medium scored significantly longer roots than all the NAA concentrations. On the other hand, Img/1 IBA registered significantly longer roots than all the other IBA concentrations. There was no significant difference in rooting response between IBA and NAA.

Indirect organogenesis (callus culture) was carried out using shoot tips, uninodal explants and hypocotyl segments of aseptically germinated *A. senegal*. The explants were cultured in modified MS medium supplemented with NAA or 2, 4-D at different concentrations or a combination of these auxins with cytokinins explants between 10 and 15 days after transfer to culture media. Although virtually all explants produced some callus, there were considerable differences between explants types, growth regulators and their concentrations. However no shoots regenerated from the callus. Of the three explants types used. Hypocotyls formed callus earliest and this callus continued to grow fastest. Explants cultured on media with 2, 4-D either singly or in combination with cytokinin was generally yellow white in colour and friable. Callus grown on media containing NAA was dark yellow with green islands and had a more compact texture. *In vitro* performance variation in relation to provenance revealed no significant differences for all the parameters considered.

Vegetative propagation (Macropropagation) of *Acacia senegal* was possible from cutting from 16 month old plants grown in the green house and from cuttings taken from mature trees. The cutting were 15 cm long with a diameter of 10 $\pm$ 5mm. They were dipped in 2, 4, 6, 8 or 10mg/1 IBA to induce rooting. None of the cutting from mature trees rooted. Only cuttings from the juvenile stock rooted. Despite lacking roots, cutting from mature trees sprouted from auxiliary buds.

Acacia senegal plantlets derived from micro-propagation, rooted cuttings and seeds were assessed for their green house performance after four months. Growth parameters measured were height of shoot, length of petiole, length of nodes, number of leaflets diameter at the base of shoot, number of roots and their length. Apart from plagiotropism observed in some plantlets raised through *in vitro* propagation, no other differences in phenotype could be registered. Micropropagated plants scored higher means for all the parameters considered apart from the length of node in original shoot where cutting propagated plants were superior over micropropaged plants.