2. SECTION 2: EXCLUSIVE SUMMERY OF THE PROJECT:

Santalum album (Sandalwood) is a valuable tropical plant belongs to family Satalaceae. Because of its fragrant heartwood and oil along with its medicinal qualities this species has been threaten by over exploitation. Therefore it is important to establish a protocol for clonal propagation through tissue culture using elite trees for establishment of Sandalwood plantations.

Nodal segments, cotyledonary parts from *in vitro* germinated mature and immature seeds were tested for callus induction and it was observed that MS medium supplemented with 1.0 mg/L 2,4-D found to be the best medium for induction of callus from cotyledonary parts. Single node explants found to be better over double node explants for shoot induction. Best shoot induction medium was MS medium supplemented with 0.5 mg/L BA while decreasing the level of BA to 0.25 mg/L enhances the multiple shoot induction. Although *in vitro* rooting was less successful *ex vitro* root induction was successful. However the percentage rooting was low. Plantlets regenerated survived well in the potting mixture (Sand: coir dust 2: ½) during acclimatization.

The objective of the current project is to obtain plants for commercial scale plantations, thus it is necessary to consider about the cost per plant. Therefore some other alternatives options were tested such as use of low cost media for shoot induction. For shoot growth use of 18% sago as gelling agent was better over 8% commercial agar and the shoots were more healthy and greener in the presence of sago. Albert solution: Maxicrop at the ratio of 2: 1 could be an alternative to MS basal medium for induction of shoots of *S. Album*.

As root induction was less successful possibility of obtaining plantlets through somatic embryogenesis has been tested. Nodal segments and mature seeds were the best explants sources for embryonic callus induction. Embryonic callus induction was successful in MS medium supplemented with 2.5 mg/L 2,4 D and 3.0 mg/L kin after 4 weeks of incubation. MS medium supplemented with 0.5 mg/L BAP, 1.0 mg/L IAA and 0.5 mg/L kin induced somatic embryos from embryonic calli. While MS medium supplemented with 2.0 mg/L GA_3 found to be the best medium for somatic embryo germination. Plantlet regeneration was observed in MS medium supplemented with 0.4 mg/L BAP and 0.2 mg/L IAA

Establishment of cell and hairy root cultures was tested and when callus was placed in liquid medium in 100 rpm on a shaker it was observed that this speed is not suitable, however increasing the speed to 250 rpm is better for cell culture establishment. Hairy root cultures could be established by transferring the callus in to MS medium supplemented with 2.5 mg/L 2,4-D, 2.0 mg/L kin and 1.0 mg/L IAA