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**Regenerative competence in root explants of *Rhynchosstylis gigantea*, an endangered species: *In vitro* study**

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Orchids constitute one of the largest and diverse family of angiosperms families with 30,000-35,000 species in 600-800 genera, still in an evolutionary flux. They have out-smarted and out-numbered their counterparts due to their long-lasting flowers of myriad shapes, sizes and colors. Their latter utility accounts for a highly lucrative trade in floriculture. Tissue culture technique has been exploited as means of *ex situ* conservation, particularly in outbreeders like orchids which generate a great deal of heterozygosity in the progenies Beechey (1970) suggested possibility of using aerial roots in micro-propagating orchids. The utility of roots as explant source is being increasingly realized due to their easy availability, low oxidation rate & ease with which they can be planted. Keeping this in view, presently we report the pioneer attempt to use root explants from *in vivo* grown fox tail orchid, *R. gigantea* (Lindl.) Ridl, a native of Thailand. *R. gigantea* exhibit free fertility within and beyond the taxonomic limits and has been used as breeding material for raising floriculturally significant hybrids. Besides being victim of its own beauty & utility *R. gigantea* is progressively losing its natural habitat and is getting rarer with every passage of time and figures prominently in Appendix II of the Convention on International Trade in Endangered species of Wild Fauna and Flora (CITES,2012,2017). The neo-formations in the *in vivo* root explants of *Rhynchosstylis gigantea* depend upon their location, maturity level and chemical regime. The regeneration is affected by polarity showing basipetal gradient. The distal ones with intact tips with well-developed root caps showed an extended growth with sub-apical formation of globular structure whereas, the proximal explants responded to the presence of cytokinin (Kn) medium according to Mitra et al. (1976) The effect of cytokinins was accentuated in the additional presence of NAA and the higher organogenetic responses are observed in explants when BAP, Kn was used in dose double than that of NAA. The regenerated plantlets were acclimatized & transferred to pots filled with moss, pine bark, brick & charcoal pieces (2:4:1:1) with 90% survival. In conclusion, the results clearly indicate that the root segments as a reliable method of clonal propagation bereft of somaclonal as the root explants is an effective alternative to shoot meristem for micro-propagation due to their easy availability and does not require the sacrifice of mother plant and provide exciting opportunities to raise large numbers of true-to-type plantlets.

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