

Reintroduction and in vitro Propagation of Declapeis aryalpathra: A Critically Endangered Plant of Western Ghats, India

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Abstract : The present studies describe a protocol for high frequency in vitro propagation through nodal segments and shoot tips in *D. aryalpathra*, a critically endangered medicinal liana of the Western Ghats, India. Nodal segments were more responsive than shoot tips in terms of shoot multiplication. Murashige and Skoog's (MS) basal medium supplemented with 2.5 μ M 6-benzyladenine (BA) was optimum for shoot induction through both the explants. Among different combinations of plant growth regulator (PGRs) and growth additive screened, MS medium supplemented with BA (2.5 μ M) + indole-3-acetic acid (IAA) (0.25 μ M) + adenine sulphate (ADS) (10.0 μ M) induced a maximum of 9.0 shoots per nodal segment and 3.9 shoots per shoot tip with mean shoot length of 8.5 and 3.9 cm respectively. Half-strength MS medium supplemented with Naphthaleneacetic acid (NAA) (2.5 μ M) was the best for in vitro root induction. After successful acclimatization in Soilrite™, 92 % plantlets were survived in field conditions. Acclimatized plantlets were studied for chlorophyll and carotenoid content, net photosynthetic rate (PN) and related attributes such as stomatal conductance (Gs) and transpiration rate during subsequent days of acclimatization. The rise and fall of different biochemical enzymes (SOD, CAT, APX and GR) were also studied during successful days of acclimatization. Moreover, the effect of acclimatization on the synthesis of 2-hydroxy-4-methoxy benzaldehyde (2H4MB) was also studied in relation to the biomass production. Maximum fresh weight (2.8 gm/plant), dry weight (0.35 gm/plant) of roots and 2H4MB content (8.5 μ g/ ml of root extract) were recorded after 8 weeks of acclimatization. The screening of in vitro raised plantlet root was also carried out by using GC-MS analysis which witnessed more than 25 compounds. The regenerated plantlets were also screened for homogeneity by using RAPD and ISSR. The proposed protocol surely can be used for the conservation and commercial production of the plant.

Keywords : 6-benzyladenine, PGRs, RAPD, 2H4MB

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