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In vitro propagation and callus formation of *Amomum subulatum* Roxb. A plant of ethnomedicinal value

Abstract.

Black Cardamom (*Amomum subulatum* Roxb. Family: Zingiberacea) is an ethnomedicinal value plant of Esten Himalyas. It opposes to callus induction and clonal propagation due to the heavy secretion of phenolic compounds and inherent soil pathogens. Given this problem, efficient callus induction and clonal propagation protocol were developed, and subsequent GC-MS analysis was successfully carried out in germplasm growing under the non-native habitat of plains of Uttar Pradesh to explore the possible richness in bioactive compounds. The rhizome used as explant for the callus induction and micropropagation. Calli were induced after 5 weeks of inoculation on Lloy and McCown Woody Plant medium (WPM) supplemented with 2.5-3.5 mg^{-L} 2,4-D and 2.0 mg^{-L} KN. WPM supplemented with 2.0 mg^{-L} KN and 2.0 mg^{-L} IBA) showed a higher success rate (80%) for clonal propagation (micropropagation) than WPM with 1.0 mg^{-L} BAP and 0.1 mg^{-L} NAA with a success rate of 65% only. The clonally propagated plantlets, along with roots, were successfully acclimatized and hardened in coco peat, supplemented with 2.0 mg^{-L} KN+2.0 mg^{-L} Indol butyric acid (IBA) for an initial 45 days, with 100% survival. GC–MS profiling of parent plant part (Rhizome) and calli indicated different medicinally important biomolecules to be abundant in the explant such as Betulin (8%) and E-Labda-8(17)-12,diene-15,16-dial (10%) and in the calli being 1,3-Propanediol, 2-(Hydroxymethyl)-2-nitro (14%), respectively.

Keywords: Callus induction, GC-MS (Gas Chromatography-Mass Spectroscopy), Micropropagation, PGRs (Plant Growth Regulators).