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Comparative Study of Old Culture (14 Years Old) and Newly Established (8 Months Old) in Catharanthus Roseus (L.) G. DON

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Abstract—*Different strategies were developed globally to conserve plant germplasm by propagating plants. One most important strategy is invitropropagation and preservation via tissue culture techniques. In severalplantsinvestigated till date, the long invitro conservation is limited by different problems like genetic variations, developmental errorsinduceddue to stress etc. This provoked us to conduct a comparative study of Catharanthus roseusmaintained for a long time (14 years) and a newly established culture (8 months old). The proteomic study revealed more than 120 high abundance or upregulated proteins in old culture as compared to newly established one. The upregulatedproteins identified were, heat shock proteins (HSP),stress protein 69, pyruvate dehydrogenase, isocitrate dehydrogenaseand others. These proteins were involved instress related activities,antioxidant activities, a fewwere related to respiration. Our study reveals 51.94%, 78.8% and 61% higher superoxide dismutase, ascorbate peroxidase and catalase activities in older cultures (S1) as compared to newly established tissues (S2). The strong antioxidant defense systemdeveloped in old cultures in the culture conditions for years adds resilience and enables culture to revive growth quickly (within 1-2 days) following transfer to new mediumas compared to new culture (7-10 days). The fresh biomass accumulation was observed more (37.08 %) in old tissues as compared to newly established culture. No ploidy level changes were noted in old culture as the 2C DNA content of old culture regenerantswas1.516 picogram, which is very similar to new culture regenerants and fieldgrown plants.*

Keywords: *Longterm cultures, invitro stress, dead cell analysis,antioxidant defense proteins.*