A comparative study on the leaf structural characteristics of commonly used Indian medicinal plants

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32 leafy drugs (*Acalypha indica, Achyranthus aspera, Adhatoda vasica, Aegle marmelos. Alternanthera sessilis, Andrographis paniculata, Azadirachta indica, Bacopa monnieri, Basella alba, Boerhavia diffusa, Cassia angustifolia, Centella asiatica, Cinnamomum tamala, Coccinia grandis, Cyanodon dactylon, Eclipta prostrata, Gymnema sylvestre, Hibiscus rosa sinenesis, Indigofera tinctoria, Lagerstroemia speciosa, Lawsonia inermis, Leucas lavendulifolia, Mangifera indica, Moringa oleifera, Ocimum tenuiflorum, Phyllanthus amarus, Piper betel, Plectranthus amboinicus, Solanum nigrum, Solanum trilobatum, Tephrosia purpurea,* and *Tylophora asthmatica)* belong to 22 families are studied for their pharmacognostic features. Key features are tabulated. 6 drugs (*Alternanthera sessilis, Basella alba, Centella asiatica, Moringa oleifera, Solanum nigrum,* and *Solanum trilobatum*) are consumed as food. Prominent macroscopic and microscopic characters are presented. 30 epidermal peel line diagrams are illustrated. 5species are having compound leaves. 17 species are herbs, 3 are shrubs, 6 are climbers and 6 are trees. 4 are hydrophytes. Anamocytic stomata is found in 12 species, Paracytic is found in 8 species, diacytic stomata is found in 6 species, anisocytic stomata is found in 5 species. Cystolith crystals observed in 14 species. The leaves are glabrous in 20 species. Some leaves are having unique structure, eg 1. Stomata and resin canals of Aegle marmelos. 2. Stomata, epidermal cells and venation of Cinnamomum tamala. 3. Two layered epidermal cells of Lagerstroemia speciosa, 4. larger guard cells of Mangifera indica. 5. In case of Indigofera tinctoria and Tephrosia purpurea (Fabaceae members) single colourless cell layer separates palisade and spongy tissue. Trichome structure shows so much diversity in the leaves which are often important tool for the identification of the powdered drugs and species. Parameters like vein islet number, vein termination number and palisade ratio are very much useful in the characterization of the leafy drug. Single layered palisade is found in 7 species, In Basella , Plectranthus and Bacopa mesophyll tissue is not differentiated in to palisade and spongy.

Amplification and partial sequencing of phytoene gene from *Rhodotorula glutinis*: A suitable selectable marker in the development and selection of transgenic plants

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Rhodotorula glutinis MTCC 1151 is an intracellular red pigment producing oleaginous yeast. It produces pink to red colonies to block out certain wavelengths of light that would otherwise be damaging to the cell. The gene responsible for the color is phytoene synthase, a transferase enzyme involved in the biosynthesis of carotenoids which catalyzes the conversion of geranylgeranyl pyrophosphate to phytoene. A set of degenerate primers were designed to amplify phytoene synthase gene using iCODEHOP (interactive COnsensus-DEgenerate Hybrid Oligonucleotide Primer). The degenerate PCR was carried out at six different temperatures ranging from 52 °C to 63 °C and 600 bp PCR product was amplified. The PCR product was subjected to sequencing and was confirmed as partial phytoene synthase gene.

Phytoene synthase gene thus can be applied as selectable markers in the development and selection of transgenic plants. Further, the role of phytoene synthase gene as phenotypic selectable marker can be proved by transforming plants with the construct having gene of interest inserted within phytoene synthase gene. The disruption of the gene will lead to the loss of pigmentation making it suitable tool for selecting transformed plant cells.

Biography

Savithri Bhat is currently working as associate Professor in the Department of Biotechnology, BMS College of Engineering, Bangalore, India. She has completed her Ph.D. at the age of 28 years from Department of Biotechnology, DAVV, Indore, India and worked in CSIR (CIMAP, and NBRI, Lucknow, India) for her Ph.D. She has done her post doctoral research in neurodegenerative disorder at National Institutes of Health, NIH, Maryland, USA. She has published more than 21 papers in reputed journals and conferences.

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