

ISSR MARKER FOR ANALYSIS OF MOLECULAR DIVERSITY AND GENETIC STRUCTURE OF EIGHTEEN *Dendrobium* CULTIVARS IN SRI LANKA

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The genus *Dendrobium* is one of the largest genera in the family *Orchidaceae* having more than thousand species over the world with diverse morphological characters. *Dendrobium* is a popular ornamental plant with complex genetic background which emphasize on the species identification at molecular level. The present study was aimed to identify Inter-Simple Sequence Repeat (ISSR) markers capable of detecting genetic polymorphism to characterize 18 hybrid, commercially available *Dendrobium* cultivars. Genomic DNA of each cultivar were extracted using CTAB method. A total of 17 different ISSR primers were evaluated. Only the reproducible bands were scored and number of different alleles (Na), number of effective alleles (Ne), Shannon's Information Index (I), Expected heterozygosity (He), Unbiased expected heterozygosity (UHe), polymorphic percentage and polymorphic information content (PIC) of each primer were calculated. The highest Shannon's Information Index (0.537 ± 0.08) was recorded by the primer UBC 826 while the highest polymorphic information content (PIC) was generated by primer UBC 807. The PIC values of the primers were ranged from 0.0068 to 0.451, indicating that primers are moderately informative. In total, 631 bands representing 120 loci were amplified showing 85.71% - 100% polymorphism. The genetic similarities between individuals were compiled in the Nei's genetic identity matrix in order to construct the UPGMA dendrogram. Principle component analysis (PCA) and clustering analysis were done to divide different cultivars into groups. The analysis revealed the presence of four major clusters and two minor clusters among the cultivars. The study suggested that the ISSR markers originated from eight primers 12, 155, UBC 807, UBC 812, UBC 826, UBC 835, UBC 841 and UBC 842 can be used in the detection of molecular variation among cultivars in the genus *Dendrobium*.

Keywords: *Dendrobium*, Genetic diversity, ISSR markers, Polymorphism