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Congruence of RAPD and ISSR Markers for Evaluation of Genomic Relationship Among 28 Populations of Podophyllum hexandrum Royle from Himachal Pradesh, India

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Abstract: Twenty eight populations of Podophyllum hexandrum Royle were selected to study genetic relationship using RAPD and ISSR markers from north-western Himalayas, Himachal Pradesh, India. Nineteen RAPD primers and 11 ISSR primers amplified a total of 131 and 68 scorable bands, of which 92.37% and 83.82%, respectively, were polymorphic. The mean coefficient of gene differentiation (Gst) was 0.6933 and 0.6296, indicating that Nei´s gene diversity of 33.77% and 29.44% reside in all the populations. Estimated value of gene flow for RAPD (Nm = 0.11059), for ISSR (Nm = 0.1470) individually, and the combination of RAPD+ISSR (Nm = 0.1211) markers indicated that there was limited gene flow among the populations. The dendrogram obtained from UPGMA analysis revealed grouping of populations with respect to their forest division, except with Kullu forest division. The existence variation among 28 populations based on percentage of polymorphic bands (PPB) was proved to be coupled with geographical altitude (r = 0.474). The genetic similarity matrices generated by ISSR and RAPD markers were highly correlated (r = 0.721 at P = 0.001), showed similar estimation between the 2 systems. Both markers were equally useful in providing some understanding about the genetic relationship of different populations in Podophyllum L.

Key Words: Podophyllum hexandrum, RAPD, ISSR, RAPD+ISSR, Genetic Diversity

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