Molecular characterization of a new 1-deoxy-D-xylulose-5-phosphate reductoisomerase (DXR) transcript from Vanda Mimi Palmer.

Abstract

A 1-deoxy-d-xylulose 5-phosphate reductoisomerase (DXR) transcript was successfully isolated from the floral cDNA library of Vanda Mimi Palmer (VMPDXR). The full-length cDNA of clone VMPDXR was predicted to encode a polypeptide of 473 amino acid residues with 15 bp of 5′ UTR and 230 bp of 3′ UTR including a poly-A tail. VMPDXR was predicted to have a molecular mass of 51.4 kD and a pI value of 6.04. It has two conserved domains, an N-terminal NADPH binding site (GSTGSIG) and an N-terminal proline-rich region(PPPPAWPGR). It also contains two highly homologous regions, a 78–207 amino acids stretch at the N-terminal and a 221–304 amino acids stretch at the C-terminal domain. The putative plastid transit peptide is not found in VMPDXR and it is clustered into the plant DXRs in the phylogenetic tree. VMPDXR was differentially expressed in roots, leaves, sepals, petals and column. The VMPDXR transcript levels were preferentially high in blooming and fully bloomed flowers compared to the bud. The expression of VMPDXR at different times did not appear in a rhythmic manner and no drastic fluctuation was observed at night except at 2 pm during the day.

Keyword: Orchid; Vanda; Fragrance; Reductoisomerase; 1-deoxy-D-xylulose-5-phosphate; MEP pathway.