

D207

Characterization of *Phy1* Encoding Protein Interaction with Homeodomain-Leucine Zipper Proteins, Phz2 and Phz4 of *Pimpinella brachycarpa* Using Yeast Two-Hybrid System

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Homeodomain-leucine zipper (HD-Zip) protein is a transcription factor found only in dicotyledonous plants. We isolated genes encoding the proteins interacting with *Pimpinella brachycarpa* HD-Zip proteins, Phz2 and Phz4, and characterized them using yeast two-hybrid system. Using shoot-tip total cDNAs constructed in pADGAL4 vector containing an activation domain, yeast two-hybrid screening was performed. *Phy1* full-length cDNA isolated by shoot-tip library screening contained 1,041 bp insert with an open reading frame of 732 bases which encodes 244 amino acids. *Phy1* was very hydrophobic and contained a nuclear targeting signal. *Phy1* encoded a protein of unknown function. Interestingly, the *Phy1* interacted with N-terminal and preferentially C-terminal region of Phz4, and not with HD-Zip motif of Phz4.

D208

Quantitative and Qualitative Changes in Cell Wall Polysaccharides during Somatic Embryogenesis and Plantlet Development of Asparagus (*Asparagus officinalis* L.)

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Changes in the amount of cell wall polysaccharides were determined during somatic embryogenesis and plantlet development of asparagus. Percentage of cellulose was maintained 15% during the somatic embryogenesis. It increased in root and shoot after plantlet development, while that of pectic polysaccharides decreased. Hemicellulose was maintained at the constant ratio. Neutral sugar composition of pectin and hemicellulose was determined by GLC. Arabinose in the pectin and hemicellulose decreased after plantlet development, while galactose, xylose, and glucose in both fractions increased. Methylation analysis of hemicellulosic polysaccharides revealed that 4-linked xylose (xylan backbone), and 4-glucose (xyloglucan backbone) increased, while 3-galactose, 3-arabinose and 3-glucose decreased in the ratio. These data suggest that somatic embryos of asparagus contained high amount of callose and arabinogalactans side chain of acidic polysaccharides and xyloglucan and xylan were actively synthesized during the plant development.