



Cloning and characterization of a β -amyrin synthase gene from the medicinal tree *Aralia elata* (Araliaceae)

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ABSTRACT. *Aralia elata* is an important medicinal plant in China; it produces large amounts of oleanane type triterpene saponins. A full-length cDNA encoding β -amyrin synthase (designated as *AeAS*) was isolated from young leaves of *A. elata* by reverse transcription-PCR. The full-length cDNA of *AeAS* was found to have a 2292-bp open reading frame, encoding a protein with 763 amino acid residues. The deduced amino acid sequence of *AeAS* showed the highest identity (97%) to *Panax ginseng* β -amyrin synthase. When *AeAS* cDNA was expressed in *Escherichia coli*, an 87.8-kDa recombinant protein was detected by SDS-PAGE and Western blotting. The sequence was also heterologously expressed in the yeast *Pichia pastoris*, and production of β -amyrin was detected by HPLC. Tissue expression pattern analysis by real-time reverse transcription-PCR revealed that *AeAS* is strongly expressed in leaves and stems, and weakly expressed in roots and flowers.

Key words: *Aralia elata*; β -amyrin synthase; *Pichia pastoris*; PNY1; Triterpenoid saponins; Real-time RT-PCR