



Characterization of the alkaline/neutral invertase gene in *Dendrobium officinale* and its relationship with polysaccharide accumulation

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ABSTRACT. *Dendrobium officinale* is one of the most well-known traditional Chinese medicines, and polysaccharide is its main active ingredient. Many studies have investigated the synthesis and accumulation mechanisms of polysaccharide, but until recently, little was known about the molecular mechanism of how polysaccharide is synthesized because no related genes have been cloned. In this study, we cloned an alkaline/neutral invertase gene from *D. officinale* (*DoNI*) by the rapid amplification of cDNA ends (RACE) method. *DoNI* was 2231 bp long and contained an open reading frame that predicted a 62.8-kDa polypeptide with 554-amino acid residues. An alkaline/neutral invertase conserved domain was predicted from this deduced amino acid sequence, and *DoNI* had a similar deduced amino acid sequence

to *Setaria italica* and *Oryza brachyantha*. We also found that *DoNI* expression in different tissues was closely related to DoNI activity, and more importantly, polysaccharide level. Our results indicate that *DoNI* is associated with polysaccharide accumulation in *D. officinale*.

Key words: *Dendrobium officinale*; Polysaccharide; Alkaline/neutral invertase