

## Characterization of an Aquaporin Gene *ZpPIP2* from *Zygophyllum potaninii* Maxim. (Zygophyllaceae)

Bayarmaa Gun-Aajav\*, Munkhbileg Enkhbat and Oyuntsetseg Batlai

Department of Biology, School of Arts and Sciences, National University of Mongolia,  
Ulaanbaatar 14201, Mongolia.

### Abstract

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**Correspondence\*:**

g.bayarmaa@num.edu.  
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*Zygophyllum potaninii* Maxim. is a medicinal plant, distributed in arid regions of southern Mongolia. Full length of a cDNA clone, which was identified as a stress induced gene by suppression subtractive hybridization was obtained by 5'RACE-PCR, and named *ZpPIP2* as deduced amino acid sequence shows high homology to plant aquaporin PIP2. *ZpPIP2* is expressed in leaf and stem under normal conditions, and it is accumulated in the root in response to drought stress in *Z. potaninii*.

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### Introduction

*Zygophyllum potaninii* Maxim. is a medicinal plant, widely distributed in arid regions of southern Mongolia. In Mongolia this species grows on debris tailings of mountains and hills, the sandy-pebble bottom of dry river beds, stony slopes of hills and pebble deserts (Fig. 1) in Gobi-Altai, Zhungarian Gobi, Trans-Altai Gobi, and Alashaa Gobi, and has acquired the ability to adapt to arid environments (Nyambayar *et al.*, 2011).

Plants, being sessile, have evolved specific acclimation and adaptation mechanisms to respond to and survive short- and long-term drought stresses. Analysis of these protective mechanisms will contribute to our knowledge of plant tolerance and resistance to stress (Harb *et al.*, 2010). Although drought responsive genes have been studied intensively in model plants, it

is important to analyze drought-inducible genes and their expression in drought-tolerant plants. Plant respond to environmental stresses such as drought by the induction of both regulatory and functional sets of genes and relevant genes have been identified either by reference to physiological evidence or by differential screening (Krishnan & Pereira, 2008).

Aquaporins are water channel proteins of intracellular and plasma membrane that play a crucial role in plant water relations. Plants contain a large number of aquaporin isoforms with distinct cell type- and tissue-specific expression patterns (Johansson *et al.*, 2000). Presently, 35 aquaporin encoding genes in *Arabidopsis thaliana* (Johanson *et al.*, 2001), and 34 members of the rice aquaporin gene family have been identified (Nguyen *et al.*, 2013). On