SEQUENCE ANALYSIS OF A PARTIAL *HbSERK* GENE EXPRESSED DURING SOMATIC EMBRYO INITIATION IN *HEVEA BRASILIENSIS*

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Somatic Embryogenesis Receptor Kinase (*SERK*) genes are known to express during the transition of somatic cells to embryogenic cells, which have the capability to differentiate into somatic embryos at a later stage of development. In the past 20 years, *SERK* have drawn much research interest due to its crucial role in somatic embryogenesis. The aim of the current study was to isolate and characterize *HbSERK* gene through cDNA cloning and to perform comparative genomic analysis. The partial cDNA sequence of *HbSERK* was 408 bp in length and comparison with genomic sequence revealed the presence of two exons separated by one intron. *In silico* analysis of *HbSERK* predicted a protein of 136 amino acids that revealed high similarity (99%) to amino acid of *AtSERK1*. Multiple sequence alignment showed that *HbSERK* possessed partial sequences from the characteristic intracellular kinase domain containing the subdomains from V-X of the *SERK* family. Molecular phylogeny of *HbSERK* with *SERK* from other plant species showed that *HbSERK* was clustered most closely with *AtSERK1* and *MtSERK1.*

Keywords: *Hevea brasiliensis,* Intracellular kinase domain, *SERK* gene, Somatic embryogenesis

INTRODUCTION

Somatic embryogenesis pathway is considered as the best choice for a wide range of *in vitro* approaches including mass propagation and genetic engineering in many plant species. In this pathway, a large number of genes specific to each stage of development have been found to express differentially. Under favourable *in vitro* conditions, the somatic callus acquires embryogenic competence and has been reported to proliferate as individual embryogenic cells (Dodeman *et al*., 1997; Namasivayam, 2007; Gulzar *et al*., 2020). *SERK* is not only an activator of the transitional state of plant somatic cells, but also a potential marker characterizing single embryogenic cells in suspension cultures of carrot (Schmidt *et al*., 1997). The *SERK* gene belongs to a large plant receptor-like kinases (RLKs) family which consists of an extracellular domain having a minimum of five Leu-rich repeats (LRRs), a proline rich motif, a transmembrane domain and an intracellular kinase domain (Ma *et al*., 2012). The role of *SERK* genes in mediating somatic embryo induction was demonstrated in carrot (*DcSERK*), for the first time (Schmidt *et al*., 1997). Thereafter, a functional ortholog

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