

The FASEB Journal

www.fasebj.org

April 2014

The FASEB Journal vol. 28 no. 1 Supplement LB542

In silico Assessment of Antihypertensive Potential of Sweet Proteins (LB542)

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Abstract

The consumption of low-calorie artificial sweeteners by patients affected by diseases linked to sugar consumption may be associated with diverse side effects. Hence, sweet proteins derived majorly from under-utilized plants have been proposed as good replacements. The ability of sweet proteins to release Angiotensin-Converting Enzyme (ACE)-inhibitory peptides was investigated. ACE mediates arterial vasoconstriction and elevation of its activity is an important pathogenic mechanism of hypertension. The protein sequences of six sweet proteins, Thaumatin from *Thaumatococcus danielli* (NCBI accession number, gi|209473), Brazzein from *Pentadiplandra brazzeana* (NCBI accession number, gi|218218145), Monellin from *Dioscoreophyllum cumminsii* (NCBI accession number, gi|381144434), Madinlin from *Capparis masaikai* (NCBI accession number, gi|1817546), Curculin from *Curculigo latifolia* (NCBI accession number, gi|11225520) and Miraculin from *Richadella dulcifica* (NCBI accession number, gi|253735645) were selected for sequence alignment using Basic Local Alignment Search Tool (BLAST) analysis and biological activity search using BIOPEP. Although BLAST analysis gave no homologous similarity among the proteins, BIOPEP analysis showed that they demonstrated either di- or tri-peptide with a total of 51, 14, 40, 28, 30 and 59 potential ACE inhibitory peptides from Thaumatin, Brazzein, Monellin, Madinlin, Curculin and Miraculin respectively. The combined digestion with pepsin, trypsin and chymotrypsin A, a simulation of human gastrointestinal digestion released 8, 2, 9, 2, 5 and 11 ACE inhibitory peptides from Thaumatin, Brazzein, Monellin, Madinlin, Curculin and Miraculin respectively. These results add value to these proteins by demonstrating their innate nutraceutical potential in their ability to reduce hypertension. Table of Contents

