



EVALUATION OF ANTINUTRIENTS AND SECONDARY METABOLITES IN SPROUTED *GLYCINE MAX* CULTIVARS FOR ENHANCING FOOD QUALITY

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ABSTRACTS: Seeds of five cultivars [JS-20-29 (V₁), JS-20-34 (V₂), JS-97-52 (V₃), JS-93-05 (V₄) and JS-95-60 (V₅)] of *Glycine max*. were sprouted in seed germinator under controlled conditions. Raw seeds and sprouted seeds were evaluated for their anti-nutrients (trypsin inhibitors, peroxidases and lyxoxygenases) and secondary metabolites (phenols, flavonoids and saponins). A comparison was made to find out the variations in their antinutrients and secondary metabolites to study the enhancement in their food quality. The results showed that in sprouted seeds, the antinutrients and saponin content were significantly reduced and phenolic content was significantly increased.

Keywords: *Glycine max*, seeds, anti-nutrients, secondary metabolites

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Soybean [*Glycine max* (L.) Merr.] is one of the most important crops worldwide for producing oil and protein. The seeds of the soya plant are an excellent source of macronutrients (protein, carbohydrate and lipid). Its composition may vary depending on the cultivars and the growing conditions. Soybean seeds are the rich source of functional metabolites or secondary metabolites. These metabolites, when ingested in prescribed quantities, provide health benefits for humans such as protection from cancer, coronary diseases, cardiovascular diseases, HIV, diabetes, obesity, osteoporosis etc further than those attributed to macronutrients and micronutrients (Saxena et al., 2013, Hasler and Blumberg, 1999). However, the nutritional value of soybean seeds is much lower than expected, in spite of its protein content and amino acid profile of the proteins. This is largely attributed due to the presence of anti-nutritional factors such as trypsin inhibitors, peroxidases, lyxoxygenases, lectins, phytates, tannins, saponins etc. Of these, trypsin inhibitors are the most important anti-nutritional factor in soyabean seeds (Bajpai et al., 2005).

Objective of the present investigation is an attempt to remove/ minimize the antinutrient factors - trypsin inhibitors (TI), peroxidases (POD), lyxoxygenases

(LOX) and also to evaluate the some of the important secondary metabolites such as phenols, flavonoids and saponins in order to enhance the food quality of soybean seeds.

MATERIAL AND METHODS

Collection of the cultivars of *Glycine max*

Seeds of five popular soybean cultivars named as JS-2029 (V₁), JS-2034 (V₂), JS-9752 (V₃), JS-9305 (V₄) and JS-9560 (V₅) were collected from Soybean Research Unit (BSP), JNKV, Jabalpur (MP) during Kharif season, 2013.

Sprouting of soybean seeds

300 gm seeds of all five cultivars were rolled in wet muslin cloths and kept in BOD seed germinator at 25 °C and 90% humidity for 96 hours. Sprouted seeds were counted for percentage estimation.

Processing of raw and sprouted soybean seeds

Raw and sprouted seeds of all five cultivars were dried in cabinet dryer at 65°C for 5-6 hours for constant moisture content and then milled using laboratory hammer mill. The milled materials were packed in Zip-lock polyethylene bags and stored at 4°C in refrigerator for further analysis.