Pharmaco chemical characteristics of [Glycine max (L.) Merril] cultivars of India

Manoj Kumar Pathak, Kakkar Arun and Abhishek Sharma

Abstract

Naturally occurring pharmacological phytochemicals in soybean seeds are healthful and preventive played therapeutic role for several diseases. Several phytochemicals are potential in heart problems, cancers, obesity, osteoporosis, HIV’s and especially female menopause. These non-nutrients phytochemicals are natural products acts antioxidative and biological functional known as mediators. Seeds owning richest naturally antioxidants properties contains mostly 1350-1573mg/100g total phenolic contents in which total flavonoids are 443-617mg and saponins 459-649mg respectively. Trypsin inhibitors are 14.46-19.50mg/g protein which affects its proteins quality. Soybean seeds are richer source of peroxidase enzyme estimated 20.40-22.99PODU/g protein and lipoxygenase is 10.03-12.10 LOXU/g protein they contribute to important food quality characteristic such fresh beans and green odor.

Keywords: Trypsin inhibitors, peroxidase, lipoxygenase, pharmaco phytochemicals

Introduction

Soybean seeds have an excellent source of natural pharmacological bio functions bioactive antioxidant phenolics, flavonoids, (Fig.2&3) saponins (Fig.4) Phytochemicals protect from most of the chronic diseases great deal of medicinal potential with pharmacological effects like as antiarrhythmic, anticholinergic, analgesic, antitumor, antihypertensive, antipterycids, antimalarial, stimulant, anti-HIV, antileukemic, cardio tonic, fat lowering, antiulcer, hepatoprotective, anti-inflammatory, antineoplastic, antimicrobial, and hypoglycemic activity, lowers the risk of heart certain free related pathophysiology (Duthie, et al. 2000) [3]. Soybeans phenolics compound are tremendous potential for antimicrobial, strong antioxidant and antimitagenic. Soy saponins acts as antineoplastic, hypocholesterolemic and anti diabetic properties (Rupasinghe et al. 2003) [14] nutraceutical dietary supplements used as heart drugs and anticancer (Asl.2008) [2]. Phytochemicals in soybean cultivars are varies by genotypic characteristics, soil types and climatically variations (Ali.2005) [1]. Most important phytochemical trypsin inhibitors (Fig.1) known anti-nutritional a serious problem affects protein quality in soybean (Yadav and Chauhan 2005) [17]. These bioactive protein compounds have some very important medicinal activity and act as anti tumor, anti HIV, anti fungal and anti microbial (Oluwafunmilayo et al. 2012) [15], required ranged from 1-1.5 mg per day as medicine have good source from soybean seeds. Peroxidase and lipoxygenase enzymes are main barriers for food acceptability of whole grain products interested of demands (Wu et al. 1995 and Loiseau et al. 2001) [16-11]. Soybean contributes with 25 percent edible oils are source of energy producing in India. Objective of present research was the study of phytochemicals in soybean seeds.

Material and Methods

Cultivars namely JS-20-29 (V₁), JS-20-34 (V₂), JS-97-52 (V₃), JS-93-05 (V₄) and JS-95-60 (V₅) purchased from BSP Unit, JNKVV, (MP) India. Seeds dried in on 55°C till the equilibrium moisture content, cooled and ground by mini-mill, pack into airtight plastic containers analysis were carried out of raw seeds flour. Trypsin inhibitor activity was determined method by Keshun Liu and Pericles Markakis [10]. Lipoxygenase was estimated by the method of Axelrod et al. [5]. Peroxidase determined as method of Gomori [3], and Ghaemmaghami [6]. Total phenolic, total flavonoids and total saponins were estimated method described by Sadasivam and Manickam [15].

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Results and Discussion

Trypsin inhibitor content of soybean seeds was significantly differed (Fig.5) cultivar V2 recorded TI 19.50 mg/g protein significantly higher variety V4 17.51 and V3 17.19 at par with V1 was 17.84 and V5 14.46 TI mg/g protein respectively as Dixit et al. (2011) [4]. Lipoygenase found significantly differed among themselves cultivar V3 has 12.10 LOXU/g protein significantly higher followed by V4 11.92, V1 11.12 and V3 10.96 however, variety V2 was 10.03 LOXU/g protein respectively similarly Wu et al. (1995) [16], Loiseau. et al. (2001) [11] and James et al. (2015) [9]. Peroxidase cultivar V4 recorded 22.99 PODU/g protein was significantly higher and at par with cultivar V1 22.60, V2 22.39 and V3 22.02 are superior to cultivar V5 20.44 PODU/g protein respectively. Total phenolic contents (Table-1) variety V1 recorded 1573mg/100g in raw seeds was significantly higher closely by cultivars V4 1536 and V2 1497mg/100g seeds and superior than cultivar V5 1450mg/100g were over the cultivar V5 1350mg/100g in soybean seeds, which occurs naturally during seed development and bound to sugars McCue and Shatty (2004) [12], and Houghton (2006) [8]. Total flavonoids content in the cultivar V1 was 617.55mg/100g seeds estimated significantly higher followed by cultivars V1 547.55, V2 473.52, V3 444.56 and V5 443.10 mg/100g in raw seeds Asl et al. (2008) [2]. Saponins contented a variety V3 649 mg/100g seed was significantly higher followed by V1 549.50, V2 485.80, and V3 461mg/100g respectively hence cultivar V4 459.10 mg/100g was estimated.

Conclusion

Limiting qualities Phytochemicals especially peroxidase, lipoygenase and trypsin inhibitor of soybean be used as medicinal factor for good health by the processing industries as pharmaceutical and pharmacological demands.

Table 1: Pharmacological Phytochemicals (mg/100g) in Soybean Seeds

<table>
<thead>
<tr>
<th>Cultivars</th>
<th>Total Phenolics</th>
<th>Total Flavonoids</th>
<th>Total Saponins</th>
</tr>
</thead>
<tbody>
<tr>
<td>V1</td>
<td>1559.85 ±135</td>
<td>621.8 0±27</td>
<td>549.54 ±17</td>
</tr>
<tr>
<td>V2</td>
<td>1490.47 ±105</td>
<td>537.73 ±19</td>
<td>485.81 ±11</td>
</tr>
<tr>
<td>V3</td>
<td>1450.59 ±88</td>
<td>545.22 ±23</td>
<td>649.03±22</td>
</tr>
<tr>
<td>V4</td>
<td>1539.61 ±77</td>
<td>701.29 ±17</td>
<td>459.12 ±19</td>
</tr>
<tr>
<td>V5</td>
<td>1350.25 ±98</td>
<td>591.42 ±24</td>
<td>461.13 ±13</td>
</tr>
</tbody>
</table>
Fig 5: Pharmacof phytochemicals in soybean seeds

References