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### Pharmaco chemical characteristics of [*Glycine max* (L.) Merrill] 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 medifactors. Seeds owing 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, antipyretics, antimalarial, stimulant, anti-HIV, antileukmic, cardio tonic, fat lowering, antiulcer, hepatoprotective, anti-inflammatory, antineoplastic, antimicrobial, and hypoglycemic activity, lowers the risk of heart certain free radical related pathophysiology (Duthie, *et al.* 2000) [5]. Soybeans phenolics compound are tremendous potential for antimicrobial, strong antioxidant and antimutagenic. Soy saponins acts as antineoplastic, hypocholesterolemic and antidiabetic 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) [13]. 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 (V<sub>1</sub>), JS-20-34 (V<sub>2</sub>), JS-97-52 (V<sub>3</sub>), JS-93-05 (V<sub>4</sub>) and JS-95-60 (V<sub>5</sub>) purchased from BSP Unit, JNKVV, (MP) India. Seeds dried in on 55°C till the equilibrium moisture content, cooled and grinded 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.* [3]. Peroxidase determined as method of Gomori [7], and Ghaemmaghani [6]. Total phenolic, total flavonoides and total saponins were estimated method described by Sadasivam and Manickam [15].

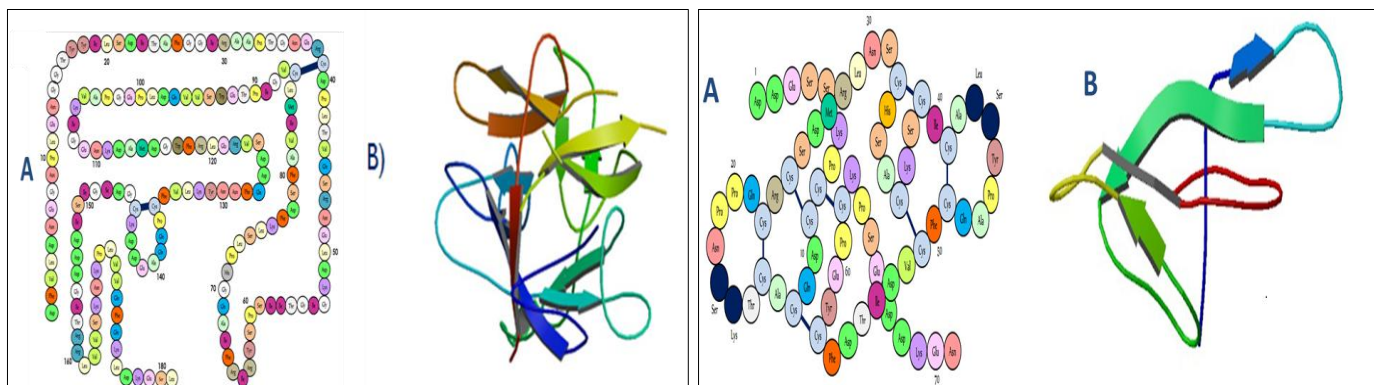
**Results and Discussion**

Trypsin inhibitor content of soybean seeds was significantly differed (Fig.5) cultivar V<sub>2</sub> recorded TI 19.50 mg/g protein significantly higher variety V<sub>4</sub> 17.51 and V<sub>3</sub> 17.19 at par with V<sub>1</sub> was 17.84 and V<sub>5</sub> 14.46 TI mg/g protein respectively as Dixit *et al.* (2011) [4]. Lipoxygenase found significantly differed among themselves cultivar V<sub>5</sub> has 12.10 LOXU/g protein significantly higher followed by V<sub>4</sub> 11.92, V<sub>1</sub> 11.12 and V<sub>3</sub> 10.96 however, variety V<sub>2</sub> 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 V<sub>4</sub> recorded 22.99 PODU/g protein was significantly higher and at par with cultivar V<sub>1</sub> 22.60, V<sub>2</sub> 22.39 and V<sub>3</sub> 22.02 are superior to cultivar V<sub>5</sub> 20.44 PODU/g protein respectively. Total phenolic contents (Table-1) variety V<sub>1</sub> recorded 1573mg/100g in raw seeds was significantly higher closely by cultivars V<sub>4</sub> 1536 and V<sub>2</sub> 1497mg/100g seeds and superior

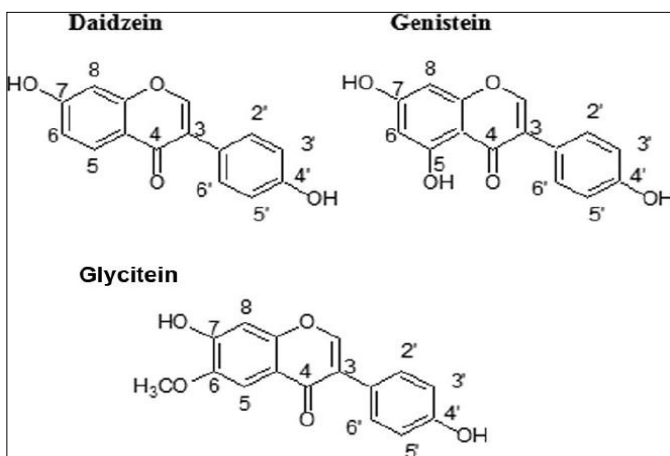
than cultivar V<sub>3</sub> 1450mg/100g were over the cultivar V<sub>5</sub> 1350mg/100g in soybean seeds, which occurs naturally during seed development and bound to sugars McCue and Shatty (2004) [12], and Houghton (2006) [8]. Total flavonoids content in the cultivar V<sub>4</sub> was 617.55mg/100g seeds estimated significantly higher followed by cultivars V<sub>1</sub> 547.55, V<sub>2</sub> 473.52, V<sub>5</sub> 444.56 and V<sub>3</sub> 443.10 mg/100g in raw seeds Asl *et al.* (2008) [2]. Saponins contented a variety V<sub>3</sub> 649 mg/100g seed was significantly higher followed by V<sub>1</sub> 549.50, V<sub>2</sub> 485.80, and V<sub>5</sub> 461mg/100g respectively hence cultivar V<sub>4</sub> 459.10 mg/100g was estimated.

**Conclusion**

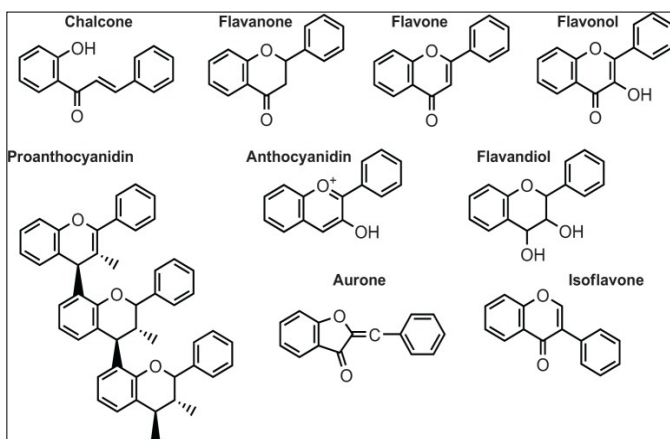
Limilinnng qualities Phytochemicals especially peroxidase, lipoxygenase and trypsin inhibitor of soybean be used as medicinal factor for good health by the processing industries as pharmaceutical and pharmacological demands.



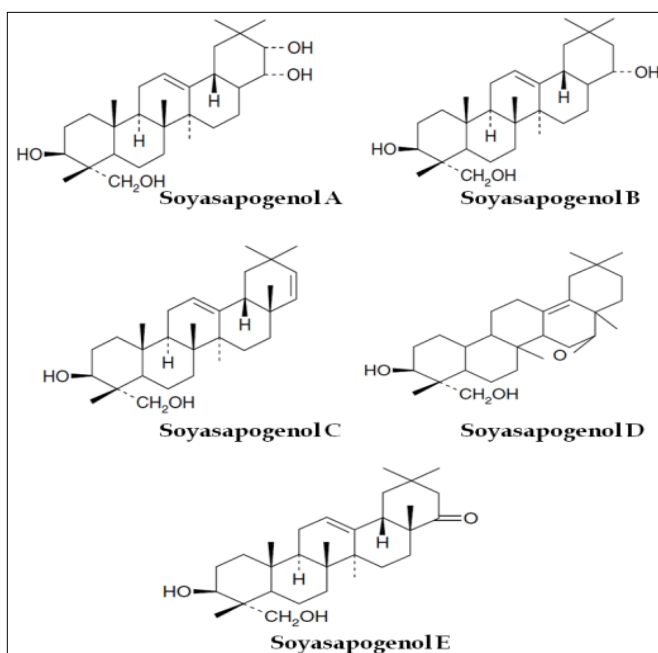
**Fig 1:** Chemical Structure SKTI &BBI



**Fig 2:** Pharmacological Soybean Isoflavons



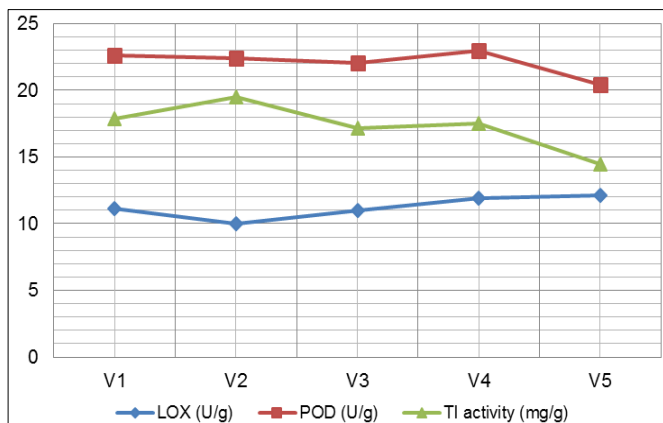
**Fig 3:** Lifestyle Flavonoids of Soybean Seeds



**Fig 4:** Healthful Saponins of Soybean Seeds

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

Cultivars	Total Phenolics	Total Flavonoids	Total Saponins
V1	1559.85 ±135	621.8 0±27	549.54 ±17
V2	1490.47 ±105	537.73 ±19	485.81 ±11
V3	1450.59 ±88	545.22 ±23	649.03±22
V4	1539.61 ±77	701.29 ±17	459.12 ±19
V5	1350.25 ±98	591.42 ±24	461.13 ±13



**Fig 5:** Pharmaco phytochemicals in soybean Seeds

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