

# Main energy storage substances in soybeans

To understand how the biosynthesis of soybean storage substances in seeds is regulated, we cloned soybean TFs that are homologs to these functionally characterized counterparts from

The putative targets of GmLEC2a were seed-specifically expressed genes which revealed to be regulated by GmLEC2a in transgenic hairy roots, thus reflecting the functions of GmLEC2 in soybean seed development and seed filling of various storage substances. An overview of storage substances synthesis in soybean seed is shown in Supplementary ...

Soybean meal is one of the most important and preferred protein feed sources for poultry due to the capability of providing up to 40% protein and 20% oil, as well as its high nutritional value for ...

Soybean protein accumulates mainly in the maturation stage of seed development (Le et al. 2007). Storage protein in soybean seeds is composed of 2S, 7S, 11S and 15S proteins, according to their sedimentation properties (Kinsella 1979).  $\alpha$ -Conglycinin (7S) and glycinin (11S) are the major components of soybean protein, accounting for 70%-80% of total protein (Singh et al. ...

Thus, soybeans constitute important nutritional components. Soybeans are considered to be a good substituents of protein (essential amino acids), amongst other major vegetables, for animal products. This chapter reviews secondary metabolites isolated from soy and soy products that show interesting biological activities. 3.1. Isoflavones

Soybean is a main source of edible plant protein (70%) and oil (30%) in the human diet and meets more than 25% of the world's food demand and animal feeding supply (Zhou et al., 2015). Soybean seeds contain roughly 37% protein, 30% carbohydrates (9% of which are fiber), 19% oil (84% unsaturated), 9% moisture, and 5% ash.

infrastructure, high energy consumption, and safety and environmental concerns over flammable solvents. Recently, farmers in North America are increasingly building extrusion-expelling (E-E) facilities to add value to their soybean products rather ...

Soybeans contain a wide variety of triacylglyceroles, however LC-MS analyses revealed that fatty acids incorporated in soy triacylglycerols are stearic acid, palmitic acid, oleic acid, linoleic acid, and linolenic acid (Neff et al. 1995). Fatty acids in soybeans are considered to be stored as triacylglycerides.

Effects of Ca<sup>2+</sup> on yield and nutritional qualities of soybean sprout were investigated. Ca-treated sprouts had higher yield than water-treated ones. Metabolism of selected storage materials and bioactive substances in soybean sprouts was strengthened by Ca<sup>2+</sup>. The phytic acid and saponin content of Ca-treated soybean sprouts were lower than those of control.

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About 90% to 95% of the soybean is a storage protein, where the 2 subunits,  $\alpha$ -conglycinin (7S) and glycinin (11S), constitute about 35% and 52% of the seed total protein, respectively (Silva et al. 2017). Both soybean storage protein structures are highly conserved to maximize protein packaging in the protein bodies (Shewry et al. 1995).

The development of plant-based meat analogs is currently hindered by the beany flavor generated by raw soybean protein and extrusion processing. Wide concern has led to extensive research on the generation and control of this unwanted flavor, as an understanding of its formation in raw protein and extrusion processing and methods through which to control ...

The changes in total phenolic and flavonoids contents of germinated soybeans during storage are shown in Fig. 2. When keeping at 4 °C, the total phenolic content of germinated soybeans sharply increased during the first day and then gradually decreased during 1-7 d, which remained relatively higher than that under 25 °C during entire storage process (Fig. 2 A).

Isoflavones, a class of substances with high biological activity, are abundant in soybeans. This study investigated isoflavone biosynthesis in soybean cell suspension cultures under UV-B radiation. UV-B radiation enhanced the transcription level and activity of key enzymes involved in isoflavone synthesis in cell suspension cultures. As a result, the isoflavone contents ...

Silencing of soybean seed storage proteins results in a rebalanced protein composition preserving seed protein content without major collateral changes in the metabolome and transcriptome Plant Cell. . 2.11 polymers of biological origin?

The RFOs found in most soybean cultivars were stachyose and raffinose. They made up to approximately 4-6% of soybean flour on a dry weight basis (Grieshop et al., 2003). Kennedy et al. (1985) reported that the coefficient of variation for the soybean samples were 3.5%, 5.3%, and 10.5%, respectively, for sucrose, stachyose, and raffinose. The ...

As a significant protein source for humans and animals, soybean (*Glycine max*) has experienced a fast growth with the rapid development of population and economy. Despite broad interest in energy consumption and CO<sub>2</sub> emissions generated by soybean production, there are few impact-oriented water footprint assessments of soybean production. This study ...

Commodity soybeans, which make up a significant portion of global soybean production, typically have a composition of ~9% carbohydrates, 18% oil, and 32% to 35% protein, with glycinin and  $\alpha$ -conglycinin as the predominant storage proteins (Silva et al. 2017).

Background Soybean is the main oil crop in Northeast China. Continuous monocropping is more commonly

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used for soybean production due to rising market demand and arable land constraints. However, autotoxic substances, such as phenolic acids, produced by continuously cropped soybean can reduce yield and quality. The mycorrhiza formed of ...

In crude soybean oil, the main substrates for lipid oxidation are triacylglycerols (TAGs) and free fatty acids (FFAs), which make up 95-97% and 0.3-0.7% of oil, respectively [10,11].

Soybean (*Glycine max*) is an important crop in Asia for more than 7000 years now. Soybean was cultivated first in China between 7000 and 6600 BCE, in Japan between 5000 and 3000 BCE and then in Korea from 1000 BCE [1] was eventually introduced to Europe in the 18th century and then to the United States in the 19th century [2]. As of 2018, soybean has total ...

Soybean (*Glycine max* L.) originated in China and was known as "Shu" (Shu means legumes) in ancient China has a cultivation history longer than 5000 years. Having the largest planting area in the world among legume crops, soybean is the main source of edible vegetable oil and high-quality vegetable protein and provides a high-quality raw material for ...

The major storage proteins of soybeans, glycinin (11S) and  $\beta$ -conglycinin (7S), represent 80% of soybean protein extracted in soy milk. Glycinin is a hexameric protein, and its subunit (A-SS-B) is composed of one acidic polypeptide (A) and one basic polypeptide (B) linked by a disulphide ...

As the name referred, plant-based proteins are proteins found in the plant food sources, such as whole grain, legumes, and nuts. Among them, soy protein from soybeans (legumes), historically identified in the Asian region, is considered as an important food source to meet protein demand for the human body [4]. Due to its numerous advantages, the ...

Soybean is an important oilseed crop that is used as a feed for livestock and has several industrial uses. Lipid biosynthesis and accumulation primarily occur during seed development in plants. This process is regulated by several transcription factors and interconnected biochemical pathways. This study investigated the role of *glycine max* LEAFY ...

Soybean seed lipids function as energy storage for the plant, constituents of membranes, signaling molecules, defense against pathogens, etc. Storage lipids are deposited mainly in the form of triacylglycerols in oil bodies. ... (myo-inositol-1,2,3,4,5,6-hexaphosphoric acid) is the main storage form of phosphorus in legumes and cereals. It ...

Among these soybean components, protein and fatty acid content account for about 40% and 20%, respectively. The remaining components consist of carbohydrate conjugates, inorganic constituents, and the minor components of biologically interesting small molecules (molecules highlighted below).

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Soybeans contain approximately 40 % protein, 20 % oil, 25 % carbohydrate and 5 % crude fiber and are rich in multiple bioavailable nutrients such as isoflavones, minerals, lecithin and phytosterols [13]. Among these elements, SPs are high-grade plant proteins with multiple potential bio-functional effects and are in growing demand in the global food industry [14].

Chlorophyll is important for absorbing light energy and forming photosynthetic protein complexes that are responsible for plant adaptation to changing light conditions (Simkin et al., 2022; Yuan et al., 2010, 2017). Chlorophyll is a "double-edged sword" for plant cells (Wietrzynski and Engel, 2021) because an excess of free chlorophyll and its synthetic ...

Ruminant animals, dogs, cats, and others account for the remaining portion of this usage. The main reason for the popularity of SBM is the unique composition of Amino Acids (AAs) that complements the AA compositions of many cereal grains. ... Because of the relatively high oil content in full-fat soybeans, the energy concentration of diets ...

The ontogeny of seed structure and the accumulation of seed storage substances is the result of a determinant genetic program. Using RNA interference, the synthesis of soybean (*Glycine max*) glycinin and conglycinin storage proteins has been suppressed. The storage protein knockdown (SP-) seeds are overtly identical to the wild type, maturing to ...

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