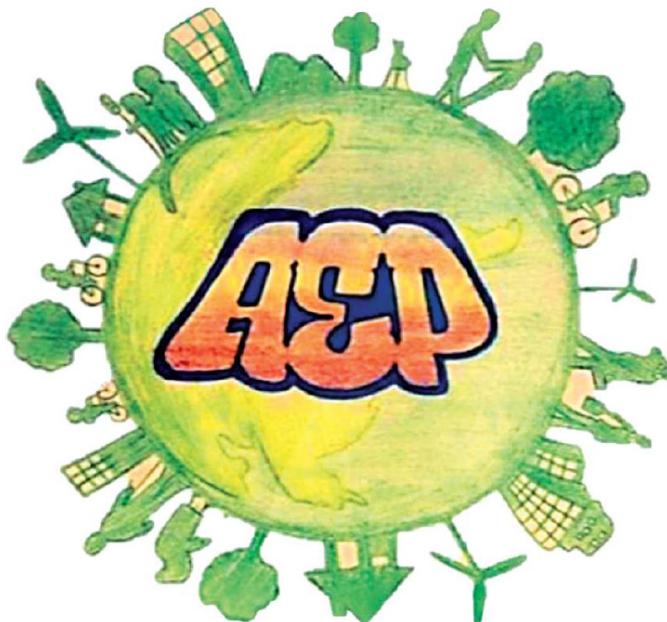


Establishment of Education  
«International Sakharov Environmental Institute»



# **ACTUAL ENVIRONMENTAL PROBLEMS**

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# BIOACTIVE PROPERTIES OF LUPINE (*Lupinus albus L.*) SEEDS AND ITS IMPORTANCE IN HUMAN NUTRITION

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As well as being used in human and animal nutrition for many years, lupen also plays a role in disease prevention and treatment due to its bioactive components. In addition to its high protein content, lupine flour is an important additive for grain products due to its high water and oil retention capacity and a good emulsifying agent. It is used in products such as lupine, bread, biscuit, cake, pasta, confectionery, soy sauce, in the production of high-quality vegetable oil with high antioxidant content, as gluten-free flour, emulsifier, alternative products to milk and cookies. Lupen is particularly useful for human health against conditions known as metabolic syndrome, which includes a number of factors such as obesity, high blood pressure, insulin resistance, high cholesterol in the blood.

**Keywords:** Lupine, bioactive properties, antioxidant activity, polyphenols, use in foods, nutrition.

Lupine (*Lupinus albus L.*) is an annual herbaceous plant that contains about 300 species of the Legumineceae family, including the *Lupinus* species. The lupine seeds contain about 36-52 % protein, 2-20 % fat and 30-40 % fiber. The fatty acid composition of the lupin oil consists mainly of oleic and linoleic acid. The mineral contents of

the lupine seeds and in addition to this rich content, it is in a position that can compete with soy (about 40 %) with its high protein content and it has been found that it has the potential to meet a significant portion of the mineral substances that should be taken daily. Dietary fiber makes up 40 % of the grain weight of the sweet lupine and is at a higher level than other legumes. The antioxidant activity of the lupin varieties does not depend on the color or polyphenol content of the seeds. Lupen flour is an ideal food component because it has a high content of protein, dietary fiber and bioactive compound and low lipid and starch content.

In this study, the bioactive properties of loupes and loupes and their importance in human nutrition will be explained. In addition to its high protein content, lupine flour is an important additive for grain products due to its high water and oil retention capacity and a good emulsifying agent. It has become an alternative raw material for gluten-free products because it does not contain gluten and gluten-like proteins and has a high nutritional value for the diets of celiac patients. Lupen can be used as a supplement in existing products or as a source of protein or fiber in new products. Protein extracts obtained from lupine are used as food additives in the USA in the range of 1-10 % in many food products, especially bakery products, dairy products, frozen milk desserts, jams, puddings and meat products. Lupine is especially beneficial for human health in cases known as metabolic syndrome, which includes a number of factors such as obesity, high blood pressure, insulin resistance, high cholesterol in the blood. It gives fullness (appetite suppression) and provides energy balance. It affects glycemic control. It regulates blood lipids, hypertension, intestinal health.

A minor component of the lupine lipid fraction lupeol is a triterpene alcohol that promotes differentiation as well as promoting dilution of epidermal cells and inhibits the growth of melanoma cells. Lupine usually contains 36-52 % protein, 5-20 % fat and 30-40 % fiber. The composition varies depending on genetic and environmental conditions. Sodium and calcium are low compared to lupine other legumes. Carotenoids and zeaxanthin are high and give bright yellow color. While other legumes contain as much as 50 % starch, the rate of starch in lupene is low (2.3 %). The lupen protein contains high levels of lysine amino acid and low levels of methionine and cystine amino acid. Lupine is a potential source of bioactive plant components with antioxidant activity due to the chemical composition of its seeds. Seeds of low alkloid lupen varieties are a valuable source of protein. As a valuable component of functional food, interest in lupine is growing. Lupine cotyledon is the source of antioxidant components. As in other oil plants, alpha-(85.5 %) and gamma-tocopherol (86.1 %) are dominant in lupen species. The loupe's vitamin E content is similar to soy, but its rate is lower than that of sunflower or rapeseed oil. The tannin content of lupen flour is several times higher than the tannin content in seeds. The antioxidant activity of the lupen varieties does not depend on the color or polyphenol content of the seeds. A lupine flour protected by irradiation can be considered a functional food additive to prevent negative oxidative changes during storage. The antioxidant effect of tocopherol depends on the temperature and the amount of tocopherols lost in competitive reactions with phenolics. Vitamin E prevents oxidation of cholesterol and cholesterol carrier proteins and prevents damage to the vessel wall, which leads to the development of atherosclerosis in the future.

**Conclusion.** It is able to compete with soy with its mineral content and high protein content in addition to this rich content, and it has been shown that it has the potential to meet a significant portion of the mineral substances that should be taken daily. This case demonstrates the importance of the work for recovering the development and dissemination of planting and breeding in the region via Turkey. Lupene seeds can be a potential source of nutritious cellulose for dietary food production. Since it contains minimal starch, its glutemic index is very low. It is extremely nutritious and easy to digest. The loupe's essential amino acids are high, cholesterol-free, contain trypsin inhibitors in an insignificant amount, saponins and lectins known as stomach irritants are very low, no chemical or heat treatment is required before consumption.

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