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MORPHOLOGICAL CHARACTERISTICS OF GREEN LENTILS

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Anotation: Legumes are indispensable for human diet in respect to their nutritive bioactive molecules and provide all nutritional and physiological beneficial effects on human health. Legumes are rich in proteins, carbohydrates, dietary fiber, vitamins and some valuable phytochemicals, which exhibit important biological activities. Protein-rich pulses are considered a staple food for a large portion of the Indian population, which satisfies everyone's protein and energy demands. Due to their high dietary fiber content and low-fat content, legumes aid in the maintenance of body weight and reduce the risk of cardiovascular disease. Additionally, legumes are a good source of minerals including potassium, calcium, magnesium, phosphorus, and iron as well as vitamins like folate, thiamine (vitamin B1), riboflavin (vitamin B2), and niacin (vitamin B3). Moreover, there are various potential health benefits due to phytochemicals, such as phenolics, flavonoids, phytates, lectins, tannins, saponins, oxalates, enzyme inhibitors, phytosterols, and antimicrobial peptides, present in pulses. These phytochemicals have anti-inflammatory, anticancer, anti-microbial, and anti-ulcerative effects. Pulses are often referred to as "poor people's meat" because of their high protein content and low price. This chapter covers the nutritional value, phytochemical composition, health benefits, agricultural production and productivity of legumes.

Keywords: Legumes, Food security, Nutritive value, Bioactive compounds, Health benefis.

Key words: Lentils, legume, nutritious, East Asia, history, red lentils, dahl, vitamin A and B, protein, iron, hypogeal, roti, rice, acropetal.

Demand for lentils (Lens culinaris L) is also increasing in Central Europe, most likely due tothe influxx of migrants. Today, the USA, China, Turkey, India, Nepal, Australia, Syria, Ethiopia and Morocco take the leading place in the cultivation of this grain.

The contribution of other countries in lentil production is insignificant. As a rule, the purchase of lentils is relevant for countries that buy other grains, for example, for countries in Southeast Asia and some Africans. 100 grams of lentils contain 25-35 grams of protein.

For cooking, as a rule, large-seeded grains called heller lentils are used. The name is derived from a coin used in ancient times Germany and Austria. Lentils are better

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digested than other members of the legume family, and their protein is much better absorbed than protein from meat.

Also, in terms of vitamins, microelements, especially iron, lentils are not equal. Flour is often made from grain, which is used for cooking. In addition, this plant has been used in folk medicine for a long time due to the high content of lentil proteins due to its nutritional value.

Lentils contain a number of vitamins, proteins, amino acids and carbohydraates. This grain is a functional legume rich in many bioactive compounds such as polyphenols, saponins and phytosterols.

In a number of studies, scientists have found that the consumption of lentils is potentilly important in reducing the spread of a number of chronic diseases due to biologically active substances.

Lentil flour is used for cooking in the world. In the cuisines of peninsular India, where lentils are a staple, lintils (often shelled) known as dal are cooked into a thick curry, often eaten with rice or roti.

Lentils are usually used in baking and soups. The genus vicia belongs tothe fabaceae family of flowering plants.

Before flowering, lentil plants in the field consisted of the former lentil genus cultivar L culinaris and six related taxa. Among the various taxa of wild lentils, Lens orientalis is commonly classified as lens culinarris subsp.

Here are some of the most common lentil types:

- **Brown.** These are the most widely eaten type. They have an earthy flavor, hold their shape well during cooking, and are great in stews and soups.
- **Puy.** These come from the French region Le Puy. They’re similar in color but about one-third of the size of green lentils and have a peppery taste.
- **Green.** These can vary in size and are usually a less expensive substitute in recipes that call for Puy lentils.
- **Yellow and red.** These lentils are split and cook quickly. They’re great for making dal and have a somewhat sweet and nutty flavor.
- **Beluga.** These are tiny black lentils that look almost like caviar. They make a great base for warm salads.
- **Highly nutritious**
- Lentils are often overlooked, even though they’re an inexpensive way of getting a wide variety of nutrients.
- For example, they’re packed with B vitamins, magnesium, zinc, and potassium.
- Lentils are made up of more than 25% protein, which makes them an excellent meat alternative. They’re also a great source of iron, a mineral that is sometimes lacking in vegetarian diets (1Trusted Source, 3Trusted Source).

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• Though different types of lentils may vary slightly in their nutrient content, 1 cup (198 grams) of cooked lentils generally provides the following.

• **Polyphenols in lentils may have powerful health benefits**

• Lentils are rich in polyphenols, a category of health-promoting phytochemicals (1Trusted Source).

• Some of the polyphenols in lentils, such as procyanidin and flavanols, are known to have strong antioxidant, anti-inflammatory, and neuroprotective effects (6Trusted Source, 7, 8Trusted Source).

• When tested in the lab, the polyphenols in lentils were able to stop cancer cell growth, especially on cancerous skin cells (6Trusted Source).

• Though it's not yet understood how, the polyphenols in lentils may also play a part in improving blood sugar levels (1Trusted Source, 9, 10Trusted Source).

• One animal study found that consuming lentils helped lower blood sugar levels and that the benefits were not solely due to the carb, protein, or fat content (11).

• It's also worth noting that the polyphenols in lentils don't appear to lose their health-promoting properties after cooking (6Trusted Source).

• This being said, these results are from laboratory and animal studies only. Human studies are needed before firm conclusions can be made about these health benefits.

• **May protect your heart**

• Eating lentils is associated with an overall lower risk of heart disease, as it has positive effects on several risk factors (1Trusted Source, 12Trusted Source).

• One 8-week study in 39 people with overweight or obesity and type 2 diabetes found that eating 1/3 cup (60 grams) of lentils each day increased levels of HDL (good) cholesterol and significantly reduced levels of LDL (bad) cholesterol and triglycerides (13Trusted Source).

• Lentils may also help lower your blood pressure. A study in rats found that those eating lentils had greater reductions in blood pressure than those eating peas, chickpeas, or beans (14Trusted Source).

• Furthermore, proteins in lentils may be able to block angiotensin I-converting enzyme, which normally triggers blood vessel constriction and thereby increases blood pressure (15Trusted Source, 16Trusted Source).

• High levels of homocysteine are another risk factor for heart disease. These can increase when your dietary folate intake is insufficient. Because lentils are a great source of folate, they may help prevent excess homocysteine from accumulating in your body (12Trusted Source).

Having overweight or obesity increases the risk of heart disease. Eating lentils may help decrease your overall food intake, which could contribute to weight loss or

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maintenance. Lentils are very filling and appear to keep blood sugar levels steady (9, 17Trusted Source, 18Trusted Source).

In addition to these nutrients, soybeans contain high levels of antioxidants called isoflavones, which are responsible for many health benefits.

Evidence suggests that consuming soybeans and their isoflavones is associated with reduced cancer risk.

However, many of these studies are observational, meaning the participants' diets weren't controlled so that other factors could affect the risk of cancer.

A large study combining the results of 21 other studies found that eating high amounts of soybeans was associated with a 15% lower risk of stomach and other gastrointestinal cancers. Soybeans' effectiveness appears especially significant in females (27Trusted Source).

Many of these benefits may be because soy isoflavones are phytoestrogens. That means they can mimic the effect of the hormone estrogen in the body, which tends to decline during menopause.

Research suggests that taking isoflavone supplements during menopause may help reduce hot flashes and prevent loss of bone mineral density (2Trusted Source8Trusted Source).

Dietary isoflavone consumption from soy may also help reduce heart disease risk in women (2Trusted Source9Trusted Source).

Navy beans appear to help reduce symptoms of metabolic syndrome, likely due to their high fiber content.

A 2017 study of 38 children with blood cholesterol outside of typical ranges found that those who ate a muffin or smoothie containing 17.5 grams of navy bean powder every day for four weeks had higher levels of healthy HDL cholesterol than a control group (35Trusted Source).

Similar effects have been found in adults.

A small study from 2015 of 14 adults with overweight or obesity found that eating 5 cups (910 grams) of navy beans per week for 4 weeks reduced waist circumference and total and LDL cholesterol levels in males compared to baseline (36Trusted Source).

Since these studies are small, we need more research on broader populations before we can draw strong conclusions.

Due to their high content of monounsaturated fats, peanuts have several health benefits, especially if they replace other diet components.

A few large observational studies have found that eating peanuts is associated with a lower risk of death from many causes, including heart disease, stroke, cancer, and diabetes (38Trusted Source).

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Interestingly, peanut butter doesn't seem to have the same beneficial effects (39Trusted Source).

However, these studies are only observational, so they can't prove that eating peanuts causes a reduction in these risks.

The bottom line

Beans and legumes are excellent sources of dietary fiber, protein, B vitamins, and many other important vitamins and minerals.Some evidence suggests they can help reduce blood sugar, boost heart health, and maintain a healthy gut.You can add them to soups, stews, and salads, or just eat them on their own for a nutritious vegetarian meal.

The rapid growth of the world's population and increasing food demands present challenges in providing nutritious diets. Food sustainability involves producing food that meets dietary

requirements and will be available in the future, which is a crucial goal for sustainable development. The importance of plant-based proteins is continually growing to address emerging

global food security concerns and accommodate the expanding population. Pulses, such as lentils and beans, are considered dominant and primary sources of plant-based protein in human diets.

They play a vital role in tackling these challenges and provide essential nutrients and health benefits. Additionally, pulses are crucial for improving protein malnutrition in underdeveloped and developing countries. However, compared to cereals, pulses have lower genetic yield potential, making them less profitable for farmers and less affordable for consumers. The Green Revolution focused on cereals and had minimal impact on the pulses sector. Therefore, there is a need to overcome the yield limitations in pulses. Efficient protocols for pulse transformation must be developed to leverage new breeding techniques like genome editing, considering the diverse

species of pulses available. Increasing pulse production and consumption is crucial at this time.

Doing so will provide affordable nutrition to the masses and promote environmental sustainability.

While soybean's nutritional and health potential has been extensively studied, research on other legumes is limited. Hence, comprehensive studies are necessary to explore the nutritional potential and health benefits of various legumes.

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