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Comprehensive Insight into the Medicinal Potential of Psyllium Husk (Isabgol)

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Abstract:

The soluble dietary fiber known as psyllium husk, which comes from the Plantago ovata plant, is often used as a laxative and to encourage regular bowel movements. Psyllium husk (Isabgol) dietary fibers are widely utilized in the food sector and have medicinal qualities. Beyond its conventional application, psyllium husk may provide a number of health advantages, according to current research. The possible therapeutic uses of psyllium husk in disease management were examined in a number of articles, with an emphasis on the benefits it has for a number of illnesses, such as diabetes, heart disease, constipation, weight loss, diarrhea, hypertension, and high cholesterol.

Keywords: psyllium husk, laxative, health benefits, pharmaceutical properties, therapeutic application

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1. Introduction

2. West Asia is home to psyllium, which was first grown in Pakistan's Lahore and Multan areas. Psyllium gained popularity once people learned about its advantages, and it is now grown in the Indian coast states of Bengal, Mysore, and Coromandel. The portion of Plantago ovate is made up of the whole plant, crust, and seed. It is referred to as "psyllium." Plantago ovata is the scientific name for Psyllium, which is a member of the Plantagiaceae family (Theuissen, 2008). The Latin term "plantago ovata" refers to the sole of the foot, while "ovata" denotes the form of the leaves. The Greek word psyllium refers to the "Flea" in relation to the size, color, and form of seeds. The word "isabgol," which comes from the Persian language, means "horse ear" since the seed resembles a boat (Rehana et al., 2015). Its meaning in Sanskrit is "horse flower," which symbolizes the seed's form (Theuissen, 2008). The seed is around 2 to 3 mm in length and 0.8 to 1.5 mm in width. Rehana (2015).

3. Global scenario of psyllium husk

4. The United States of America dominates the worldwide market for psyllium husks, which are manufactured in India. Because of the favorable atmospheric conditions for the growth of husk plants, psyllium is mostly produced in the Indian states of Rajasthan, Gujarat, Madhya Pradesh, and Bengal. Marketing data indicates that 35% of the farmed Plantago psyllium husks are processed and manufactured, mostly in the Gujarat region (Mogra, 2015). In Gujarat, it is grown on 61,000 hectares of land. Kumar (2017). Psyllium husk is now widely utilized in food products to enhance the nutritional value of goods with lower fiber content. Additionally, it has the ability to thicken and bind food ingredients together. It serves as astabilizer in ice cream products and in beverages. Industry uses it as an alternative, thicker and binding agent in food items commonly like health drinks, fruit juices, and bakery products such as biscuits, cake, bread and instant noodles (Martin et al., 2008; Perrigue et al., 2009). It not only helps to improvise the fibre content but also increases the bulk of the food items and improves the texture and softness of the product along with the regular health benefits. It gives the full feeling to the person who

consumes it and improves bowel movement and helps in weight management. Psyllium husk work as a food additive, it has the property of water - binding capacity and stability at a variety of pH levels and temperatures and also improves the shelf life of the product (Majmudar et al., 2002).

5. Composition and nutritive value

The chemical composition of psyllium husk is containing 0.94% of protein and other amino acids 35.8% albumin and 23.9 % globulin, 6.83% moisture, 4.07% ash and 84.98 % of total CHO. The oil profile of plantago seed is linoleic acid 40.6% and oleic acid 39.1% and a less proportion of linolenic acid 6.9% (Mogra, 2015). The seed of psyllium is a dried ripe seed of Plantaginaceae. The colour of the psyllium seed is light brown to moderately brown and the odour of psyllium husk is faint. The essential fatty acid i. e., linoleic acid, the seed is made of 40 per cent. The composition of psyllium seed is about 30 % insoluble fibre and 70 % soluble fibre present. The contain of other nutrients are protein - 18.8 percent, triglyceride about 10 - 20 percent, linoleic acid - 40 percent and fibre content 19 percent (Manivel, 2020). The coating of psyllium is the mucilage around the seed is known as husk that is purely dietary fibre. The outer covering of psyllium is used for the products to increase the fibre content. In psyllium husk, 80 percent of fibre is present as compared to the fibre in oat bran as just 15 per cent. It is used in many industries like cosmetics, textile industries pharmaceuticals and food product companies (Singh et al., 2022). The grades of purity are 99%, 98%, 95%, 85% and the Mesh Size are 100, 80, 60, 40, 30 (Khaliq, 2015). To make the psyllium powder, the husk is crushed in the machine to make the fine particles. The grades of purity are classified into four types. These are Pure 99 %, Pure 98 %, Pure 95 %, and Pure 96 %. The seed of psyllium contains 35 per cent of soluble and 65 per cent of insoluble polysaccharides including lignin, cellulose and hemicellulose (Shah et al., 2020). The psyllium husk is mainly composed of hemicellulose. Psyllium seed husk has water - holding and gel - forming properties due to the presence of xylose, arabinose and other sugars (Fischer et al., 2004).

6. Therapeutic application

Isabgol has been extensively used in the prevention and treatment of constipation, diarrhoea, hypercholesterolemia, irritable syndrome, colon cancer and diabetes.

Constipation: Constipation is a problem of gastrointestinal in which passing of the bowel is difficult and it became painful. Isabgol has both soluble and insoluble fibre that promotes the laxative effects which increase colonic contents. The moisture absorbed by the husk does not get absorbed in the intestine which gives lubricant to the stool mass and makes it softer and passes easily (Shabbir, 2019).

A stated that people who are suffering from constipation can be given about 15 - 30 grams of isabgol daily with their meal or drink. And results show that they were relieved from constipation by about 85 % and the rest 15 % of participants showed a slow recovery. Intake of Plantago psyllium husk in the types of disorder of defecation with anismus, rectocele, internal prolapse and rectal hyposensitivity problems show relief from these disorders about 37 per cent (Madgulkar, 2014).

It was found that type 2 diabetes mellitus patients, those are suffering from constipation in day - to - day life. After consuming the psyllium husk in the diet that helps in making their stool softer and smoothing the defecation process. It also affects other factors in their body like weight loss, control of the level of cholesterol and increase the HDL in the body (Shabbir, 2019).

Diarrhoea: In diarrhoea, the stool is like the faecal water does bind together. The Plantago psyllium husk has the property paradoxical property which improves the ameliorating diarrhoea condition by having the ability to retain water. A combination of the husk and calcium is effective in binding the insoluble so - lid of stool (Manivel, 2020). Studies, it is shown that the consumption of isabgol and gum both decrease the liquid stool and bind them together (Madgulkar, 2014).

Haemorrhoids: Whether constipation or chronic diarrhoea problem, if exists then they both harm the haemorrhoids veins of the anus which cause the bleeding and pain from rectum area or while passing the stool. Psyllium husk improves the condition of haemorrhoids and it gives cushion anus and prevent the condition to getting worse. (Xing et al., 2017).

A study was undertaken and performed on the haemorrhoid patients, 50 in number. The patients of haemorrhoid were separated into two groups. Consuming the isabgol supplement in the diet with the medicine was the one group. It showed that 5 out of 22 haemorrhoid patient's bleeding was controlled and in the other group, there were no differences found. This experiment helped to determine that intake of isabgol fibre with the medicine can help in the healing of internal bleeding of haemorrhoid (Anju &Idris M., 2018)

A study stated that the consumption of isabgol husk regularly about 5 to 6 tsp with 600 ml of water can help to stop bleeding and prevent the surgery of critical haemorrhoids. In the case of non - constipation patients who were suffering from the haemorrhoid, it is recommended that should not take psyllium husk before the endoscopy (Xing et al., 2017).

Xing et al., (2017) suggested for pregnant women who are in the 3rd trimester should be suggested to consume psyllium husk. The intake of psyllium husk should be monitored by the doctor and dietician so there might not be some complications. It helps in pregnancy to prevent from haemorrhoids, constipation as well as fissure.

GERD: Gastroesophageal reflux disease is a digestive disease in which the stomach produces bile and it flow through the oesophageal tube and creates irritation in the stomach. Consumption of psyllium husk supplementary dietary fibre can reduce the effects of oesophageal (Xing et al., 2017)

Hypocholesterolemic agent: Hypocholesterolemic increases cardiovascular disease and leads to heart attack or death. Psyllium husk soluble fibre manages to bind to the bile juice in the intestine and reduces cholesterol absorption. (Madgulkar, 2014).

A study showedthat people suffering from hypocholesterolemia can be controlled by taking dietary fibre. The inclusion of psyllium husk in the low - fat diet is about 10.2 grams per day. It shows a decreased level of serum total cholesterol of about 4 % and 7% in low - density lipoprotein

cholesterol in the blood report (Xing et al., 2017).
Bakery products that are made by using different proportions of psyllium husk can greatly help in hypocholesterolemic and also help to balance the hormonal changes in men and perimenopause and post - menopause in women. Consumption of isabgol 15 grams per day in the period of 6 weeks cholesterol levels to be reduced in post - menopause. They concluded that psyllium husk has positive effects on postmenopausal women to reduce the risk of coronary diseases (Ganji and kuo 2008).

Moreno et al., 2003 found that psyllium is responsible to reduce the serum LDL and triglycerides levels in hypercholesterolemic children and improves the HDL level.
Blood pressure/ hypertension: Moreno (2019), studied stated that consuming 7 - 15 gm of psyllium soluble fibre daily in the Western diet can control the systolic and diastolic blood pressure in the patient. It helps in normalizing the blood pressure in patients if they include dietary supplements in the diet.

Diabetes: The high dietary fibre diet or food for the type 2 diabetes disease patient can reduce the postprandial blood glucose level and the cholesterol level in the patient. Psyllium fibres slow down the rate of carbohydrates absorption in the blood which helps to normalise the blood glucose values and HbA1C (Madgulkar, 2014). Due to the gel - forming nature of psyllium husk, it significantly reduced the serum glucose level in diabetic patients (Singh, 2006). The psyllium husk fibre supplementation changes the glucose levels in range from - 12 to 20 % (Moreno, 2009). By controlling cholesterol and glucose level, it also reduces the weight of the patient (Madgulkar, 2014).
In a research article in European Journal of Clinical Nutrition, it was studied that consumption of isabgol in the diet can control the insulin sensitivity and reduced the excretion of glucose urinary. The total number of 20 people who suffered from type 2 diabetes took part for the study. There was 3 phase protocol followed for this. In phase 1, they give diet with sulphonylurea for the 1 week. Second phase was for the 6 weeks, they incorporated 3.4 gm of psyllium husk to four times (take in 250 ml of water) in a day with the sulphonylurea and diet. Third phase was the 4 weeks was carried out after a two - week washout interval. Result show that in second phase glucose absorption was decreased about 12.2 % and changes in insulin level was 5%. In 24 hours, the reduction was about 3.8 %, 14.9 % and 22.5% in urinary glucose, HbA1c and the C - peptide bond. And sodium percentage is increased only not other vitamin and mineral (Sierra, 2002).

Weight Control: Studies have shown that consumption of psyllium husk pre - meal 20 gm and the post - meal 20 gm gives the feeling of fullness to the person after the mean. it reduces the energy intake, when person does not eat extra food due to the satiate effect on appetite (Moreno et al., 2009).

7. Side effects of Psyllium Husk

When the patient is suffering from abdominal pain, difficulty of swallowing food or liquid, oesophageal structuring, or vomiting then the psyllium husk does not consume because it can worsen the condition. When a person takes isabqol, then it is recommended only for one weekend if there is no relief in symptoms or blood is coming from the anus, stop taking it is quietly seen in the case of constipation. And notify your doctor about your condition. Psyllium husks have some gastrointestinal side effects like as intestinal bloating, vomiting, diarrhoea, nausea, and mild abdominal cramping. It suggested takinga high intake of water in the situation of choking (Narayan, R.2005).

A study revealed that psyllium husk should be consumed a minimum amount of 150 ml of water or other liquid like milk, or juices. If a person does not follow the recommendation that can harm the oesophagus tube and block the passage which can cause intestinal obstruction. Overdoses of the husk can be created flatulence problem, constipation, diarrhoea (Sharma, 2009).

Conclusion

The fiber from psyllium husks is essential to human health. It is utilized as a fiber supplement that has several benefits, including preventing sickness and reversing its effects. In summary, psyllium husk's potential therapeutic benefits extend beyond treating constipation and diarrhea; it also aids in the management of blood pressure, weight, GERD, IBS, and blood cholesterol levels, all of which improve heart-related issues. Further investigation into the health advantages of psyllium husk in terms of its medicinal qualities to treat illnesses and provide value to food items is suggested.

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