



## Psyllium Husk as A Natural Remedy Against Several Diseases – A Mini Review

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### Abstract

Psyllium husk commonly known as Isphaghol is one of the blessed food due to pharmaceutical properties. It has various species which have individual effect on health. However, *Plantago ovata* is the most common specie of Indo-Pak. It is a highly nutritious as it contains carbohydrates (84.98%), proteins (6.83%), ash contents (4.07%), xylose (75%), arabinose (23%), linoleic acid, oleic acid, linolenic acid and arabinoxylan which is helpful in curing various physiological health disorders. The dietary fiber present in psyllium play its positive role in the prevention and cure of several chronic diseases i.e cardiovascular diseases, certain cancers, stomach disorders and constipation problems. Its fiber used in diet therapy against diabetic patients as it binds with excessive glucose from blood and lower down the sugar level in blood. It is also proved that psyllium husk significantly reduced the body weight and overcome issue of obesity among children and adolescents. It also reduces the cholesterol level in body which ultimately reduces the risk of cardiovascular disease.

**Keywords:** Nutritious diet, dietary fiber, chronic diseases, diet therapy

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## 1. INTRODUCTION

The word psyllium is commonly used for the members of genus *Plantago*. It is famous as Isphaghol in Indo-pak subcontinent. In India, it is natively called "Isabgol" while in Pakistan it is known as Asphaghol. The genus *Plantago* contains nearly 275 annual and perennial species which are widely distributed around the world, among *Plantago ovata*, *Plantago psyllium*, *Plantago indica* L. and *Plantago ovata* Forsskaol are mostly grown<sup>1</sup>. *Plantago ovata* is commonly grown in India and Pakistan. These different species have various effect on health. Some species are valuable due to pharmaceutical properties while some are used in nutraceutical industries due to the mucilaginous forming property (psyllium) derived from their seed husk. Psyllium is also used as a dietary supplement to improve human health<sup>2</sup>.

Psyllium is considered as native to Persia and it was introduced in Indo-Pak subcontinent by Muslims of India as a medicinal plant and its seeds were collected from some wild species. Now it is commercially cultivated in India, Pakistan and some other European countries<sup>3</sup>. Firstly, it was cultivated in Lahore and Multan districts of Pakistan, from where it was moved to Mysore, Bengal and some Indian states. India has played its major role in its production and it is the major contributor of psyllium husk from Asia continent. In India, its major production is occurring in Gujrat state which contributes 35 % of total world production due to suitable agro-climatic conditions<sup>4</sup>. The other major psyllium producing areas of India are Gujrat, Madhya Pradesh and Rajasthan. In Pakistan, its cultivation is occurring in southern Punjab area of Hasilpur and Rahimyar khan while in Sindh, its major areas of production are Umerkot, Jamshoro, Mirpurkhas, Samaro, Kunri and Pithoro talukas. Before partition it was grown as garden crop in Sindh<sup>5</sup>.

It is a cool season crop that requires maximum 115 to 130 days for maturation. When the crop is mature, its husk turns yellow, spikes turn brownish and it starts to shed its seeds. Husk which is the most therapeutic and the main product of Isphaghol is outermost covering of the seed and about 25% of husk is recovered from seed<sup>6</sup>. It can be removed manually as well as mechanically. Its husk is eight times more soluble than that of oat's bran. It possesses pharmaceutical properties and can be used in producing low calorie foods<sup>7</sup>.

## 2. NUTRITIONAL IMPORTANCE

The psyllium husk is highly nutritious food. It contains carbohydrates (84.98%), proteins (6.83%) and ash contents (4.07%), respectively<sup>8,9</sup>. The psyllium seeds are used for extraction of oil as it contains linoleic acid, oleic acid and small quantity of linolenic acid<sup>4</sup>. Commercially psyllium seeds are used in the production of mucilage and are extracted through mechanical grinding/milling. The mucilage is mainly the product of seed coat. It is fibrous material which absorbs water and converts into mucilaginous gel<sup>10,11</sup>. Its molecular composition consists of 75% xylose, 23% arabinose, 35% non-reducing terminal residues and traces of sugar. In the xylan backbone both (1→4) and β-(1→3) glycosidic bonds are present<sup>12</sup>. Active fraction arabinoxylans present in psyllium have health caring properties. It contains a polysaccharide as well as monosaccharaides which contributed heteroxylan and arabinose respectively<sup>12,13,14</sup>. Primarily arabinoxylans considered as non-starch polysaccharides of cereals such as maize, rice, millet, oat, barley and sorghum<sup>15</sup>. Among plant sources psyllium husk is the richest source of arabinoxylan. The structure and composition of arabinoxylan varies amongst different sources. The arabinoxylan can be added in foods for the preparation of functional food to maintain and cure health physiological disorders<sup>16</sup>.

## 3. MEDICINAL IMPORTANCE

The natural source of fibers are the peels of fruits, vegetable, cereal brans and outer coverings of seeds<sup>17,18</sup>. The dietary fibers play their positive role on human health both in the prevention and curation of several diseases such as cardiovascular diseases, certain cancers, stomach disorders and constipation problems<sup>19, 20</sup>. It is also reported that it prevents from diarrhea, weight loss, obesity, high blood pressure, colon cancer, diabetes and hypercholesterolemia. However, people are unaware about the psyllium beneficial effects on human health due to lack of knowledge.

### 3.1 Diarrhea

According to the western diet clinical and most common definition of diarrhea “a stool weight of more than 200g per day”<sup>21</sup>. Normally, diarrhea is stool having liquid or semi formed which contain more amount of water per day even it also disturbs during night. There may be several reasons for diarrhea like foods having excess of milk lactose, sugars, fatty acids, hot peppers, food containing chemical laxatives compounds like sorbitol and phenolphthalein, used of any antibiotic drug and it may also occur due to infection by bacteria and viruses<sup>19</sup>.

Fiber used is suggested by physicians during diarrhea as it increases water absorption and improves stool consistency<sup>22</sup>. Several studies reported that psyllium husk is beneficial for people who are suffering from chronic diarrhea. The use of psyllium decreases liquid and helps in regulation of normal stools. It is the cheapest and effective alternate to conventional treatment of chronic diarrhea<sup>23</sup>. The psyllium husk in combination with calcium is also proved very effective in diarrhea<sup>24</sup>. It is not blessing only for human but also for animals. Dairy calves having age of 14 days suffered with uncomplicated diarrhea is treated with different oral electrolyte solution with psyllium content. It is also observed that fecal consistency in psyllium fed calves is more as compared with un feeder calves<sup>25</sup>.

### 3.2 Constipation

It is a problem of large intestine characterized by painful laxation having hard and dry stool, incomplete rectal elimination, abnormally small stools (50 g) per day and less than 3 per week<sup>22</sup>. In body stomach plays its important role in the food digestion. The digested food enters into the small intestine which ends in the right-lower abdomen where it enters the colon. Colon is the part of large intestine which extracts water or moisture from the liquid stool and when it reaches in the rectum there is a soft formed and bulky stool. Here in the colon if an excessive amount of water is extracted the stool can become hard and difficult to eject<sup>19</sup>.

Psyllium has proved as an active natural remedy against constipation as it relieves the symptoms of constipation<sup>26</sup>. The fiber contents increase the weight and size by soften it. A bulky stool is easier to pass and it reduces chance of constipation. In a research, 75 patients were investigated who have the chronic constipation. The patients were treated with psyllium husk for four weeks. After four weeks of treatments, the stool frequency was consistent and the abdominal pain was relieved with no side effect recorded.

Chronic constipation can be cured by simple changes in diet contents such as by adding fiber and bulking agent in the routine diet. In this term, Psyllium or Ispaghul is most frequently used as bulking agents against this remedy. It regularizes soft hard stool and reduces pain at defecation. Studies revealed on psyllium showed that it has superior effect as compared to sodium docusate chemical which was used in constipation treatment<sup>19</sup>.

### 3.3 Diabetes

Fluctuations in insulin production causes fluctuations in blood glucose level which leads to metabolic disease called diabetes. Abnormality in pancreatic activities causes fluctuations in insulin utilization by body in proper way. Here three types of diabetes known: Type 1 diabetes causes due to less production of insulin which can overcome by using insulin dosage externally on daily basis. In type 2 diabetes body becomes unable to use, while in type 3 occurs during pregnancy due to high glucose level in blood, it is gastrointestinal diabetes. High dietary fiber usually used as the supplement to control diabetes and to overcome nutritional imbalance. Soluble dietary fiber facilitated in absorbing inhibiting macronutrients due to its viscous and gel forming properties<sup>27</sup>. Diabetes has been treated with the diet balance by using dietary fiber and also physical therapy to regulate blood glucose level in human body<sup>28</sup>. Diet therapy against diabetes is a common practice by increasing fiber content in diet that it binds with excessive glucose from blood and slows down the sugar absorption. In diabetes, it is used against treatment of high blood sugar levels. Its consecutive and frequent used reduces sugar level in blood giving long term effect<sup>19,29</sup>.

### 3.4 Obesity

Obesity is the accumulation of fats in body abnormally up to the health risk level. Obesity causes many other linked diseases like diabetes, cardiovascular failure and chronic diseases. Obesity is one of the reason to increase insulin deposition and formation in our blood due to which its salutary action becomes restricted.

The problem is well established in developed countries where people have enough money to spend on their food habits. According to a survey of USA, during 2000, 30.5 % estimated adults were found obese (i.e., had BMI (body mass index) more than 30 kg/m<sup>2</sup>)<sup>30</sup> and 15.5% of adolescents found overweight with BMI (25-30 kg/m<sup>2</sup>)<sup>31</sup>. Physicians revealed that obesity also impacts on medical and psychological disturbance which makes their life difficult and also disturbs their diet and physical activity. The fact is not so much surprising that patients repeatedly turn to OTC (over the counter) proprietary weight losing products having high concentration of fiber and protein content these may be dietary supplements (e.g., herbs, minerals, vitamin, amino acids). A multi-state inspection held in 1998 revealed that 7 % of adults use OTC weight-losing supplements, young obese women (28 percent) found greater victim of obese<sup>32</sup>.

Fibre is the non-digestible part of food which is not breakable or absorb by our body. Most of the fibre passes through our digestive system remained unchanged. It also increases bulking and viscosity. The fiber bulk fills our stomachs and make us to eat less. It has been reported that psyllium husk significantly reduced the body weight and overcome issue of obesity among people especially children and adolescents<sup>33,34</sup>.

### 3.5 Cholesterol Lowering and Cardiovascular Diseases

There are many modern strategies regarding dietary habit focused on addition of fiber in diet or food bowl to treat cholesterol lowering and cardiovascular related diseases, such as hypercholesterolemia considered as major risk for heart disease. Daily diet and nutrition plays its important role in the etiology of cardiovascular diseases. The nutritional management of food bowl divided into three sections; dietary patterns, individual food intake, as well as nutritional supplements. The dietary pattern must include diet with low carbohydrate as well as low-fat. Similarly, second part of foods intake include dietary fiber, whole grains, fruits, vegetables, coffee, caffeine, tea, chocolate, garlic, nuts, soy, dairy products and eggs.

The United States Food and Drug administration recommended food products having soluble fibers like psyllium husk as it decreased risk of coronary heart disease. Further, soluble fiber has showed low cholesterol effect when consumed with low fat diets<sup>35</sup>. Psyllium husk regulated low cholesterol level by stimulating bile acid synthesis in humans. This mechanism effects on fat absorption by lowering cholesterol level<sup>36</sup>. HDL (High density lipoprotein) is good cholesterol and its low value i.e. below normal cause problem. LDL (low density lipoprotein) is bad cholesterol and its high value i.e. above normal cause health problems. Results show psyllium husk when taken with low fat diet decrease serum total cholesterol concentration 3-6% and serum LDL cholesterol (Harmful/Bad Cholesterol) concentration 5-9% relative to placebo<sup>37</sup>. Furthermore, another study shows that serum total and LDL cholesterol concentration were 4-7% and 6-7% lower in the psyllium group than in the placebo group. After 24-26 week with dose of 5.1 g twice daily is effective with diet therapy and may alternative of drug therapy in some patients<sup>38</sup>.

**Table 1.** Effect of psyllium husk on various chronic diseases.

Disease	Psyllium Husk Inference	References
Diarrhea	Psyllium husk considerably prevents from chronic diarrhea with lowering the liquid stools	Qvitzau et al. <sup>24</sup>
Constipation	It relieves the symptoms of constipation; frequency, stool consistency and abdominal pain.	Davies et al. <sup>26</sup>
Diabetes	Moderately affect diabetes found due to moderate reduction in blood sugar levels after dose of psyllium	Brennan <sup>29</sup>

Obesity	Supplemental psyllium husk significantly reduced body weight and can help in resolving the issue of obesity	Pal et al. <sup>33</sup>
Cardiovascular diseases	Dietary fiber (psyllium husk) decreased the risk of chronic heart diseases, it also aids in lowering the high blood cholesterol level and managed hypercholesterolemia	Anderson et al. <sup>35</sup>

## 5. CONCLUSIONS

The psyllium husk is highly nutritious food as it contains carbohydrates, proteins and ash contents. It is fibrous material which absorbs water and converts into mucilaginous gel. The use of psyllium decreases disease severity and helps in regulation of human health. It is the cheapest and effective alternate to conventional treatment of chronic diarrhea. The dietary fiber used as prebiotic ultimately reduces the cardiovascular diseases, certain cancers, stomach disorders and constipation problems.

## CONFLICT OF INTEREST

All authors declare no conflict of interest regarding this article.

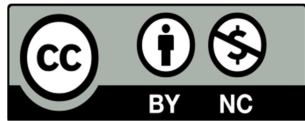
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