

# Research Journal of Pharmaceutical, Biological and Chemical Sciences

## A Review on Ispaghula.

**A Aswin Kumar\*, Sankara Narayanan B, Sandiya Ravi, and A Abi Selvi.**

Sree Balaji Medical College & Hospital No. 7, Works Road, Chromepet, Chennai, Tamil Nadu 600044, India.

### ABSTRACT

Ispaghula is a traditional plant that had been used widely as a home remedy in many cultures, for various diseases like chronic constipation, inflammation of mucous membrane of GI and genitourinary tracts, diarrhea, gonorrhoea, duodenal ulcer, piles, etc., and also as non-irritant laxative drug, demulcent, bulk forming, cervical dilator.

**Keywords:** ispaghula, demulcent, traditional plant

*\*Corresponding author*

## INTRODUCTION

The word 'Ispaghula' is derived from Persian language in which the word 'ISAP' means 'horse' and 'GHULA' means 'ear', as the seeds look like the shape of the ear of the horse. India had been the major production/supplier of Ispaghula globally. In India it is cultivated mainly in North-West Rajasthan, North-Gujarat covering approximately 16,000 hectares. Approximately 50,000 hectares of land has been used for its cultivation in India. So far natural carbohydrates are used in modern dosage form for coating material, in the form of matrix material, encapsulating excipients, release control, as a carrier of the target drug to tissue or site-specific drug delivery system (1-4).

### Chemical constituents:

Psyllium husk contains very high proportion of hemicellulose, which composes xylan backbone linked with arabinose, rhamnose, and galacturonic acid units (arabinoxylans). The seed consists of 65% insoluble and 35% soluble polysaccharides (cellulose, hemicellulose, and lignin). Psyllium due to its powerful ability to form a gel in water, is classified as a mucilaginous fiber. This ability is mainly due to its role as the endosperm of the *P. ovata* seed, where it functions to retain water in order to prevent the seed from drying out.

### Therapeutic uses:

Psyllium, as discussed earlier had been used for the treatment of constipation, diarrhea, inflammatory bowel disease-ulcerative colitis, irritable bowel syndrome, hypercholesterolemia, diabetes and colon cancer (5).

### Constipation:

Constipation (also known as costiveness or dyschezia (6)) refers to bowel movements that are infrequent or hard to pass. Constipation is a common cause of painful defecation. Severe constipation includes obstipation (failure to pass stools or gas) and fecal impaction, which can progress to bowel obstruction and become life-threatening. Psyllium has paradoxical property of improving constipation by increasing stool weight and ameliorating chronic diarrhea. Studies have suggested that psyllium may provide benefits for treating constipation. In a study of 149 patients with chronic constipation, the consumption of 15-30 grams daily of a psyllium seed preparation provided bowel relief in 85 percent of participants who had no known pathological cause for their constipation. Only 20 percent of individuals with slow transit responded to psyllium. A slightly greater percentage (37%) of those with disorders of defecation – including rectocele, internal prolapse, anismus, and rectal hyposensitivity found improvement (7).

### Diarrhoea:

Diarrhoea is defined as the passage of three or more loose or liquid stools per day (or more frequent passage than is normal for the individual). Stool looseness in diarrhea is determined by the ratio of fecal water to water holding capacity of insoluble solids. Psyllium helps in increasing the number of normal stools and decreasing the number of liquid stools. A combination of psyllium and calcium is a cheap alternative to conventional treatment of chronic diarrhea. Fecal consistency was markedly different in psyllium calves as compared to control (8) (9).

### Hemorrhoids:

Hemorrhoids are abnormally enlarged vein mainly due to persistent increase in venous pressure, occurring inside the anal sphincter of the rectum and beneath the mucous membrane or outside the anal sphincter and beneath the surface of the anal skin. With the known benefits of psyllium for both constipation and loose stools, it is not surprising it would also be of benefit for hemorrhoids. Fifty persons with internal bleeding hemorrhoids were given either a placebo of vitamin B or 11.6 grams of Metamucil® daily for 40 days. Individuals in the psyllium group had significant improvement in reduction of bleeding and a dramatic reduction of congested hemorrhoidal cushions. Bleeding stopped after treatment in the psyllium group, while those in the control group experienced no difference. (10) It also appears psyllium treatment for this problem must be done for a minimum of one month, as a study of 30-day fiber supplementation failed to show improvement; (11) whereas, when taken for 40 days significant improvement was noted. (12).

**Appetite:**

Psyllium was found to have an effect on appetite. A triple-blind study was done on 17 women with 20 grams of psyllium seed three hours pre-meal and immediately postmeal during three-day study periods. The subjects showed a significant increase in feelings of fullness one hour after meals and exhibited a significant lower fat intake with those meals. (13).

**ulcerative colitis:**

The two primary sites for Crohn's disease are the ileum (ileitis, regional enteritis), and the colon (Crohn's colitis). In an open label, randomized, multi-center trial of subjects with ulcerative colitis, 10 grams of psyllium seed supplementation given twice daily was found as effective as mesalamine in maintaining remission (14). This effect may however be due to increased levels of butyric acid with psyllium supplementation.

**Diabetes:**

Psyllium has been proposed as a possible treatment for high blood sugar levels. Human studies showed moderate reductions in blood sugar levels after a single dose of psyllium, with unclear long-term effects. Water-soluble dietary fibers decreased postprandial glucose concentrations and serum cholesterol concentrations in men with type 2 diabetes. Studies have shown that soluble fibers had the ability to reduce postprandial glucose response to meals eaten several hours after fiber ingestion (second meal effect) in non-diabetic individuals (15) (16).

**cholesterol lowering:**

Researches have proved that ispaghula lowers serum cholesterol as a result of the binding of bile acids in the intestinal lumen and reduced the risk of coronary heart disease. Psyllium was shown to stimulate bile acid synthesis by increasing the hydroxylase activity in animal and human models (17) (18). Sprecher et al demonstrated a 3.5-percent reduction in total cholesterol and a 5.1% reduction in LDL levels after consuming 5.1 grams of psyllium husk twice daily for eight weeks (19).

**CONCLUSION**

The review shows the various therapeutic uses of psyllium husk. It has been used as home remedy for several years in different cultures. Still it is being used for various diseases like chronic constipation, diarrhea, gonorrhoea, duodenal ulcer, piles, inflammation of mucous membrane of GI and genitourinary tracts. There is also a need for further studies on experimental animals and human beings that may provide definitive and sure data regarding its usefulness, exact mode of action, and therapeutic utilization. Hence ispaghula may have a promising role in clinical implication in the future.

**REFERENCES**

- [1] Stephen AM, Phillips GO, Williams PA. Food polysaccharides and. 2nd edition, CRC Press, Boca Raton, FL, USA (2006).
- [2] AC, Ellison. Carbohydrates in food. 2nd edition, CRC Press, Boca Raton, FL, USA (2006).
- [3] Kokate CK, Purohit AP, Gokhale SB. Text book of pharmacognosy. [ed.] Budhwar peth Nirali prakashan. 31st edition. p. 149.
- [4] Evans, Trease and. Text book of pharmacognosy. 15. s.l. : Elsevier, 1997. p. 99.
- [5] Martindale, Reynolds and. The Extra Pharmacopeia. 30. s.l. : The Pharmaceutical Press, 1993. p. 990.
- [6] Chatoor D, Emmanuel A. Constipation and evacuation disorders. s.l. : Best Pract Res Clin Gastroenterol, 2009.
- [7] Clinical response to dietary fiber treatment of chronic constipation. Voderholzer WA, Schatke W, Muhlendorfer BE, et al. s.l. : Am J Gastroenterol, 1997, Vol. 92, pp. 95-98.
- [8] Treatment of chronic diarrhoea: loperamide versus ispaghula husk and calcium. Qvitzau S, Matzen P, Madsen P. s.l. : Scand. J. Gastroenterol, 1988, Vol. 23, pp. 150-155.
- [9] Functional bowel disorders and functional abdominal pain. Thompson WG, Longstreth GF, Drossman DA, Heaton KW, Irvine J, Muller-Lissner SA. s.l. : Gut, 1999, Vol. 45, pp. 1143-1147.

- [10] Effect of fiber supplements on internal bleeding hemorrhoids. Perez-Miranda M, Gomez-Cedenilla A, Leon Colombo T, et al. s.l. : Hepatogastroenterology, 1996, Vol. 43, pp. 1504-1507.
- [11] Evaluation of a bulk-forming evacuant in the management of hemorrhoids. Broader JH, Gunn IF, Alexander-Williams J. s.l. : Br J Surg, 1974, pp. 142-144.
- [12] The use of bulk evacuant in patients with hemorrhoids. Webster DJ, Pugh DC, Craven JL. s.l. : Br J Surg, 1978, Vol. 65, pp. 291-292.
- [13] The effect of Plantago ovata seed containing preparation on appetite variables, nutrient and energy intake. Turnbull WH, Thomas HG. s.l. : Int J Obes Relat Metab Disord, 1995, Vol. 19, pp. 338-342.
- [14] Randomized clinical trial of Plantago ovata seeds (dietary fiber) as compared with mesalamine in maintaining remission in ulcerative colitis. Fernandez-Banares F, Hinojosa J, Sanchez Lombrana JL, et al. s.l. : Am J Gastroenterol, 1999, Vol. 94, pp. 427-433.
- [15] Low-glycemic index foods improve long-term glycemic control in NIDDM. Brad JC, Calagiuri S, Crossman S, Allen A, Robertes DC, Truswell AS. s.l. : Diabetes Care, 1995, Vol. 14, pp. 95-101.
- [16] Dietary fiber, glycemic response, and diabetes. CS, Brennan. s.l. : Mol. Nutr. Food Res, 2005, Vol. 49, pp. 560-570.
- [17] Cholesterol and mortality: 30 years of follow-up from the Framingham study. Anderson KM, Castelli WP, Levy D. s.l. : JAMA 257, 1987, pp. 2176-2128.
- [18] Ten different dietary fibers have significantly different effects on serum and liver lipids of cholesterol-fed rats. Anderson JW, Jones AE, Riddell-Mason S. s.l. : J. Nutr, 1994, Vol. 124, pp. 78-83.
- [19] Efficacy of psyllium in reducing serum cholesterol levels in hypercholesterolemic patients on high- or low-fat diets. Sprecher DL, Harris BV, Goldberg AC, et al. s.l. : Ann Intern Med, 1993, Vol. 119, pp. 545-554.
- [20] Symptoms in chronic constipation. Koch A, Voderholzer WA, Klauser AG, Muller-Lissner S. s.l. : Dis. Colon Rectum, 1997, Vol. 40, pp. 902-906.
- [21] Cholesterol-lowering effects of psyllium hydrophilic mucilloid. Bell LP, Hectorne K, Reynolds H, Hunninghake DB. s.l. : JAMA, 1989, Vol. 261, pp. 3419-3423.