

## Nutraceutical composition of selected genotypes of *Plantago ovata* for vigorous genotype selection as health food

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### SUMMARY

Isabgol (*Plantago ovata*) is an important medicinal plant. The most important part of seed which is medicinally important is husk which is commonly used as laxative in stomach disorder. The dehusked seed which constitute about 70% of the whole seed by weight does not find an effective use other than animal feed. So, nutritional quality is very important in this respect. A comparative experimental study of the 6 selected genotypes of *plantago ovata* revealed the fact that RI-129, Ahamadabad-2 and GI-2 are best genotypes from nutritional point of view as they were found to possess highest percentage of fat and protein respectively among the selected genotypes. However both these fall outside the standard range of ash content as an anti-nutritional factor. But the main use of dehusked seed is as animal feed not as human food at present, so negligible amount of tannin and high ash content is not very much important in this context. From medicinal point of view swelling factor of the husk is an important criterion. Among the selected genotypes HI-5 and GI-2 were found to be best from medicinal point of view as they were found to possess highest swelling factor. However highest husk yield/ha has been reported in HI-34. In terms of keeping quality, on the basis of moisture and fat content Ahamadabad-2 was found to possess longer shelf life than the rest of the selected genotypes. The present study shows that among the six selected genotypes, RI-129 and HI-34 are the best from nutritional point of view due to high fat and protein content in terms medicinal value. Besides this their shelf-life is also good as moisture content is not very high, so consumption and cultivation of superior genotype of isabgol (RI-129 and HI-34) should be encouraged for human consumption as well as live-stock.

Key words: Anti- nutritional, Husk, Nutraceutical, *Plantago ovata*.

Abbreviations: AACC (American association of cereal chemist), FMBRA (Flour Milling and Baking Research Association), AOAC (Association of official Analytical Chemist)

**P**syllium (*Plantago ovata*) is an important medicinal crop plant. This Aurvedic herb is found in India and Iran and is also native to the surrounding Mediterranean region including Northern Africa and Pakistan. India is the sole exporter of psyllium husk and seed to the world market. In India, at present the crop is grown in an area over 50,000 ha and about Rs.160 billions is earned annually through its export (Maiti and Mandal, 2000).

The seed husk (epicarp of seed) is medicinally important part which is mainly used for treatment of a number of stomach disorders viz chronic constipation, dysentery (Voderholzer *et al*, 1997) and many other like inflammation of the mucous membrane of gastro-intestinal, genito-urinary tracts, ulcerative colites and internal bleeding hemorrhoids ((Thomas and Anon, 1992; Fernandez *et al*,1999; Perez and Gomez, 1996). The medicinal nature of husk is because of its ability to form a gel in water, emollient poultice (Mhaskar *et al*, 2000). The mucilage acts very much like liquid paraffin. It is cheaper and is free from side effects produced by habitual use of liquid paraffin like eczema, malignant disease of the colon, paraffin pains, etc. (Chopra R.N. Ind. Med.Gazette).

The Psyllium husk contains a high proportion of hemicellulose, composed of a xylan backbone linked with arabinose, rhamnose, and galacturonic acid units (arabinoxylans). The dehusked seed, about 70% by weight

of annual seed crop does not find an effective use other than animal feed. Proximate composition of psyllium seed is known for a long time, mucilage (arabinoxylan), acubin, protein, enzymes, xylose, galactose, oil (linoleic, oleic, palmitic), oxo fatty acid and starch being the primary chemical constituent (Jamal *et al*, 1987). Lack of concise information regarding nutraceutically important biochemical parameters precludes proper exploitation of dehusked seeds.

Recent interest in the Western countries for psyllium as cholesterol reducing agent (Kanitkar and Pandse, 1969; Hicks and Chen, 1995) as well as for enhancing the humoral immune responses of human body (Rezaeipoor *et al*, 2000) has led to renewed interest in its detailed composition. Therefore it was thought worthwhile to conduct a comparative study on biochemical parameters, important in terms of nutritional and medicinal value of selected genotypes of *Plantago ovata* for the vigorous genotype selection to be exploited for nutraceutical application.

### MATERIALS AND METHODS

#### *Experimental Material:*

Seeds of different genotypes were collected from Aromatic and Medicinal Plants Division, Department of Plant Breeding, CCS, HAU, Hisar. 6 genotypes of isabgol were taken for bio-chemical profiling which included 3 released varieties (GI-1, GI-2, HI-5) and 3 advanced lines

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