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HORSE GRAM (KULTHI): PULSE OF RURAL PEOPLES IN CHHATTISGARH

Popular Article

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ABSTRACT

Horse gram *(Macrotyloma uniflorum* Lam.) is a popular pulse, locally known as kulthi belongs to the family Fabaceae that still remain an under exploited legume crop. Horse gram (*Macrotyloma uniflorum*) is one of the inexpensive sources of protein, calcium and iron. Different parts of the plants are used for the treatment of heart disease, asthma, bronchitis, urinary discharges and for treatment of kidney stones. The present paper is article on its botany, medicinal uses and pharmacological properties.

Introduction

Horse gram [*Macrotyloma uniflorum* (Lam.) Verdc.] known as a poor man's pulse crop is used for human consumption in Africa and India. Its centre of origin is south west India (Arora and Chandel, 1972). *Macrotyloma* is among potential dry season livestock feed of Australia and dry regions of Africa, indicating the ability of *Macrotyloma* in withstanding drought and being a suitable candidate for studying moisture stress tolerance and potential source of genes/QTLs for the same. In India, horse gram is cultivated as a pulse crop contributing about 0.33% of the total food grain production. Reports on nutritive value of horse gram indicate it as an excellent source of protein (up to 25 %), carbohydrates (60%), essential amino acids, energy, and low content of lipid (0.58%), iron and molybdenum (Bravo *et al*., 1999). Horse gram is an excellent source of dietary fiber. As known have positive effects on intestine and colon, besides other homoeostatic and therapeutic functions in human nutrition (Yadahally *et al.,* 2012). Horse gram is a hardy and a potential crop of future for dryland areas as well as a fodder crop of economic importance. It grows and thrives in a wide range of geographical locations varying in water availability, thus, providing the basis to search for genetic variability and the mechanism of stress tolerance in horse gram.

Nutritional and Medicinal Uses

1. Horse gram has high non-digestible carbohydrate content which cause lower glucose release into the blood stream with potential beneficial effects in the dietary management of diabetes and this resistant starch is regarded as a prebiotic among the new generation of dietary fibres (Samanta *et al*., 2011).
2. Horsegram protein comprises higher lysine content than pigeonpea and chickpea making it a good complement to a cereal based diet (Venkatesha, 1999).
3. The high content of dietary fibre in horsegram flours might be helpful in terms of maintaining positive effects on intestine and colon physiology, besides other homoeostatic and therapeutic functions in human nutrition (Sreerama *et al*., 2012).
4. The horse gram plant exhibits the properties of astringent, diuretic and antioxidant. It is used in the treatment of many health problems especially to treat diarrhea, hemorrhage and hemorrhoids.
5. In curing the menstrual problems, leucorrhea and bleeding during the pregnancy period horse gram plant works effective.
6. The regular intake of horse gram helps to flush out the worm infections, it regulates the digestive system and ward offs acidity and flatulence. (Zhang *et al*., 2008).
7. Horse gram also helps in lowering cholesterol levels.

8. As known have positive effects on intestine and colon, besides other homoeostatic and therapeutic functions in human nutrition (Yadahally *et al.*, 2012).

9. Anticalcifying inhibitors of crystallization present in seed extract of horse gram are water soluble, heat stable, polar, nontannin and non-protein in nature (Peshin and Singla, 1994) and hence, it is being used in treatment of kidney stones.

10. Horse gram is an inexpensive source of protein; rich in minerals such as calcium, phosphorus, iron and vitamins such as carotenes, thiamine, riboflavin, niacin and Lascorbic acid.

11. Horse gram water is prescribed for treating jaundice in Andhra Pradesh.

12. It is famous for its medicinal use because different part of the plants are used for the treatment of heart disease, asthma, bronchitis urinary discharges and for treatment of kidney stones (Ghani, 2003).

Table 1. Physicochemical and nutritional parameters of the seeds of *Macrotyloma uniflorum*.

Physicochemical parameters	**Reported value**
Total ash	4.68% w/w
Sulphated ash	9.68% w/w
Acid insoluble ash	0.47% w/w
Water soluble ash	5.03% w/w
Emulsifying capacity	52.15- 52.60 %
Emulsion stability	48.20 - 50.32 %
Foaming capacity	38.16 - 45.0 %
Foaming stability	35.12 - 38.00 %
Oil absorption capacity	80.76 %
Swelling capacity	1.43 ml
Swelling index	0.46%
Water absorption capacity	135.80 - 142.14 g/l00g
Water solubility index	7.56 - 7.60 %
The nutritional value of the seeds of *Macrotyloma uniflorum*	
Category	**Values**
Basic composition(%age)[8]	
Ash	3.34
Crude fat	1.30
Crude protein	18.15
Moisture	8.9
Total carbohydrate	15.59
Essential minerals(mg/g)[9-12]	
Macro-minerals	
Calcium	1.01
Magnesium	0.40 - 1.90
Phosphorus	0.13 - 4.20
Potassium	2.63 - 14.78
Sodium	0.11 - 0.16
Micro-minerals	
Copper	0.006-0.020
Iron	0.06 - 1.79

Manganese	0.09 - 8.21
Zinc	0.02 - 0.07
Amino acids(% dry weight)[13]	
Arginine	8.80
Cysteine	1.96
Histidine	3.15
Isoleucine	6.14
Leucine	8.96
Lysine	8.63
Methionine	1.16
Phenylalanine	6.31
Threonine	3.82
Tryptophane	1.16
Valine	6.47
Soluble sugar content g/100 dry matter	
Arabinose	0.12
Fructose	0.03
Galactose	0.08
Inositol	0.04
Maltose	0.53
Oligosaccharides (inuline + raffinose +stachyose)	3.69
Sucrose	1.2
Xylose	0.64
Fatty acids(%age)[11]	
Linoleic acid	40.3 – 45.6
Linolenic acid	11.6 – 14.3
Oleic acid	8.9 – 16.8
Starch(g/100 g dry matter)[14]	
Total starch	36.0
Vitamins(mg/100gm)[13]	
Niacin (B3)	1.5
Riboflavin (B2)	0.09
Thiamin(B1)	0.42
Dietary fibers (% dry matter)[15]	
Cotyledon	16.7(T);15.38(I);1.32(S)
Embryonic axe	22.6(T);19.5(I); 3.1(S)
Seed coat	36.4(T);32.5(I);3.9(S)
Caloric value(kcal/g)[8]	4.31
Key: T= total dietary fiber; I= insoluble fiber; S=soluble fiber	

Conclusion

Underutilized legumes make a significant contribution to the diet of the rural households particularly, during drought, famine and dry season. Being a quick growing pulse under rainfed areas of Chhattisgarh there is vast potential to exploit, traditional medicinal, nutritional and pharmacology uses of horse gram (*Macrotyloma uniflorum*). However, in urban regions use of kulthi as

a protein source has been not proclaimed due to misconsumption of ant nutritional compounds.

References

Arora, R.K. and K.P.S. Chandel. 1972. Botanical source areas of wild herbage legumes in India. *Trop. Grassland*, **6**: 213-221.

Bravo, L., P. Siddhuraju and F. Saura-Calixto. 1999. Composition of underexploited Indian pulses. Comparison with common legumes. *Food Chem.*, **64**: 185-192.

Ghani, A. 2003. Medicinal Plants of Bangladesh with chemical constituents and use, 2nd Edn. Asiatic Society of Bangladesh Dhaka p. 603.

Peshin, A. and S.K. Singla. 1994. Anticalcifying properties of *Dolichos biflorus* (horse gram) seeds. *Indian J. Exp. Biol.*, **32**: 889-91.

Samanta, A.K., A.P. Kolte, S. Senani, M. Sridhar and N. Jayapal. 2011. Prebiotics in ancient Indian diets. *Current Sci.*, **101(1)**:43-46.

Sreerama, Y.N., V.B. Sashikala, V.M. Pratape and V. Singh. 2012. Nutrients and antinutrients in cowpea and horsegram flours in comparison to chickpea flour: Evaluation of their flour functionality. *Food Chem*., **131**: 462–468.

Venkatesha, R.T. 1999. Studies on molecular aspects of seed storage proteins in horsegram (*Dolichos bifiorus* L.). Ph.D. thesis. Department of Food Microbiology Central, Food Technological Research Institute, Mysore, India.

Yadahally, N.S., B.S. Vadakkoot, M.P. Vishwas and Vasudeva Singh. 2012. Nutrients and antinutrients in cowpea and horse gram flours in comparison to chickpea flour: Evaluation of their flour functionality. *Food Chem.*, **131**: 462–468.

Zhang, J., X. Shi, J. Shi, S. Ilic, S.J. Xue and Y. Kakuda. 2008. Biological properties and characterization of lectin from red kidney bean (*Phaseolus vulgaris*). *Food Rev. Intern.* **25(1)**:1–34.

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