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## Macrotyloma is Ablesed Pulse for Satna District in Madhya Pradesh India

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### ABSTRACT

Macrotyloma an annual herb can be grown in tropical and subtropical area with an average rain fall. It is drought tolerant and makes good growth in area with low rain fall too. The physiology of Satna is very rough, hilly, earlier horse gram tend to be neglected crop, and therefore it is called as poor man pulse. Due to recent research on Macrotyloma it was found that it serves the same proteinaceous value as other pulse grown in Satna, because of dense environment of Satna, it is well grown here. Macrotyloma also has medicinal value for the treatment of kidney stone. Kidney stone or Urolithiasis is one of the most prevailing diseases in Satna. By using its seed regularly, kidney stone can be cured.

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**Keywords-** Drought resistance, Urolithiasis, Macrotyloma uniflorum, Medicinal value.

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## INTRODUCTION

Production of high quality seeds is primary source to the success of Indian agriculture. Every farmer is sensitive to need for the rapid uniform seedling emergence and establishment of an even and productive stand. Seed quality is very essential for optimum stand establishment and maximum yield potential. Food legumes are second most important group of crops after cereals which have been a vital part of balanced human diet since millennia (Bhadana et al., 2013) and recognized as second most valuable plant source for human and animal nutrition (Bhatt and Karim, 2009).

*Macrotyloma uniflorum* (Lam.) is an annual or perennial herb, slender, climbing, prostrate or rarely sub erect belong to family fabaceae. The name *Macrotyloma* is derived from the Greek *makros* = large; *tylos* = knob and *loma*= margin in reference to knobby sutures on the pods (Blumenthal et al.1993).

It is slightly twining, downy stems and branches. Leaves are trifoliolate. Flower is pale yellow; pod is linear and flattened and contains 5-7 seed. Seeds are small, 3-6 mm

and flattened. Seed is shining and seed color ranges from light red, brown black or mottled. Horse gram is an important short duration pulse crop grown in many parts of India, cultivating both in khariff and rabi season. The optimum temperature for better growth of these crops ranges between 25 to 35 degree Celsius but it can tolerate up to 42 degree Celsius. It is sown late in the rainy season by resource poor farmers in marginal, drought prone areas of India. It is famous for its medicinal uses because different parts of the plants are used for the treatment of heart conditions, asthma, bronchitis, leucoderma, urinary discharges and for treatment of kidney stones. The seeds are important food for cattle's and horses are usually given after boiling. The stems, leaves and husk are used as fodder. *M. uniflorum* is found in India, Africa, Australia, Bhutan, Indonesia, Myanmar, Nepal, Pakistan, Philippine and Sri-Lanka (Nasir & E Ali 1977).

Mypropose Study area are Satna district, district is belonging to State of Madhya Pradesh. The State of Madhya Pradesh is centrally located and is often called as the "Heart of India".

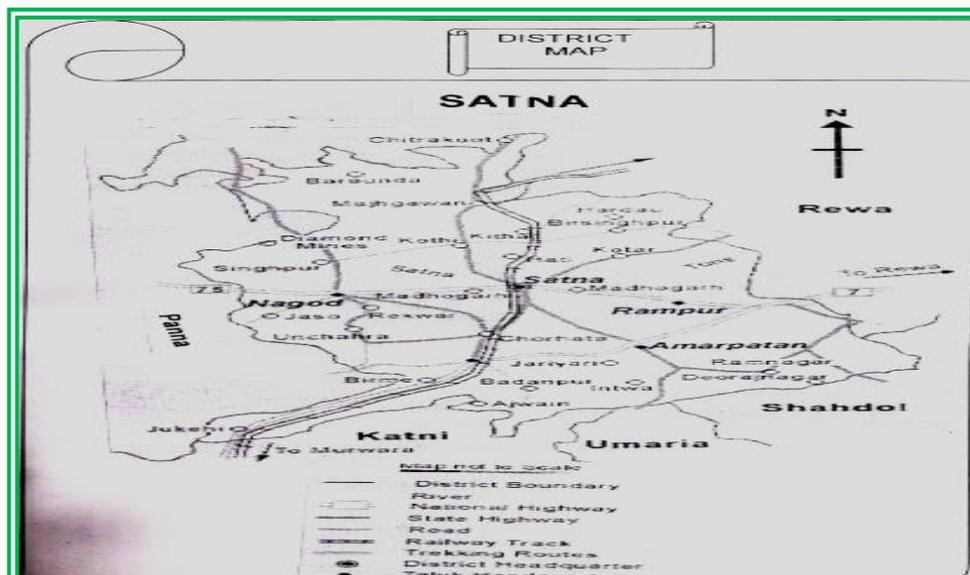


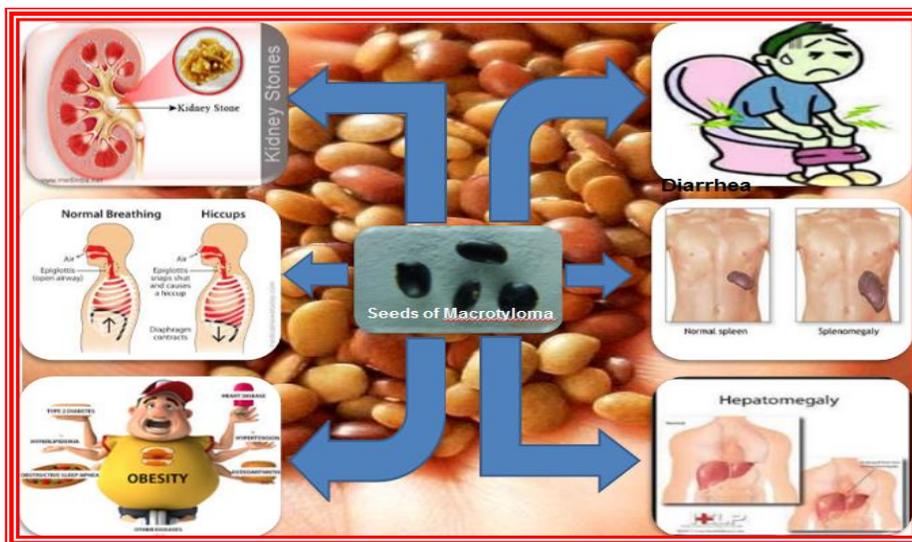
Fig-1: Map of Satna district.

**SCIENTIFIC CLASSIFICATION**

Kingdom: Plantae  
 Family: Fabaceae  
 Subfamily: Faboideae  
 Tribe: Phaseolae  
 Sub tribe: Phaseolinae  
 Genus: *Macrotyloma*  
 Species: *uniflorum*  
 Synonym: *Dolichos biflorus* & *Dolichos uniflorus*

**Table-1: Names of *M. uniflorum* in different languages.**

Languages	Names
Hindi	Kulthi
Bengali	Kurti-kalai
English	Horse gram, horse grain, kulthi bean, madras bean, madras gram, poor man’s pulse
French	Dolic biflore, grain de cheval
German	Kerderkorn, pferdebohne; pferdekorn
Italian	Dolico cavallino
Kumaon and Garhwal	<i>Gahot means</i> “which destroys stone at initial stage”
Botanical Name	<i>Macrotyloma uniflorum</i>
Malyalam	Muthira
Portuguese	Faveira
Sanskrit	Kulattha
Spanish	Frojol verde
Tamil	Kollu
Telgu	Ullavallu



**Fig-2: Use of *M. uniflorum* seed in various diseases.**

**Table-2: Morphological characters of *M. uniflorum*.**

S.N.	PARAMETERS	RANGE OF VARIATIONS
1	Seed shape	Seeds are small and round
2	Color	Grey to brown with pale fawn in color
3	Ornamentation	Smooth and ovoid
4	Flowers	6-12 mm long, cream –yellow with purple spot
5	Pod	Stipulate, slightly curved
6	Pod per plant	18-23 pods
7	Seed per pod	Usually bear 6-7 seed per pod
8	Sowing	Last June- first week July
9	Flowering and fruiting	Flowers and fruits between Aug. to Oct.

## MATERIAL AND METHODS

Horse gram an annual herb can be grown in tropical and sub-tropical area with an average annual rainfall ranging 600-1100mm. it appears to be adapted to a wide range of soils as long as they are well drained. It is drought tolerant and makes good growth in areas with rainfall as low as 380mm in growing season. Horse gram tolerates a wide range of temperature regimes from warm temperate to humid tropical. Argued that horse gram could be of greatest benefit to a beef production system when non shattering pods are used as a protein rich stand over feed in the dry season. It is dry season, drought tolerant and cannot tolerate water logging crop. The purpose of study is to grow the *M. uniflorum* in Satna. To study its productivity and viability of seed it is grown in different soil and different seasons of Satna and it was found that it has satisfactory result the geology of Satna plateau is a part of major vindhyan basin, which lies amidst the vast hilly expanse of central India. The vindhyan

system is divided in two parts upper division and lower division. So, far as the topographic expressions of the whole region are concaved it assumes the form. The upland of the plateau is bounded by the kaimur high landing the south of Satna. The district is located in between 23.58 degree North Latitude to 25.12 degree North Latitude and 80.21 degree East Longitude to 81.23 East Longitude. The District is situated about 305 meters above the mean sea level. Average climate is ranging from 05 degree Celsius to 46 degree Celsius in the district. The physiology of Satna is very rough and hilly. The area is cylindrical in shape and the drainage pattern is of centripetal type. The rivers are mostly originating from the south and running towards north structure. Conformity, earth surface behaviors and geodynamic process such as sitting and erosion. Consequently, tend to produce marked local climate or microclimate. The saucer shaped structure of this area clearly accounts the scanty vegetation. The soil of any place for its development depends on the

nature of the parent rock material that place and on the topography of that particular place Red Soil, Light Black, Alluvium and Hilly Soils are the predominant soil types available in the district. Soil of Satna derives its origin from the rocks of upper vindhyan system, which are more or less horizontal alternating between stratification of hard and soft bands of sand stone, limestone, and shale's. Limestone is the major mineral available in the district abundantly, which is concentrated in Raghuraj Nagar, Maihar and Amarpatan. Satna district is one of the major mineral producing districts in the state and having Major Minerals – Limestone, Ocher, Bauxite, White clay, Laterite. Also having Minor Minerals – Limestone, Ordinary Sand, Murrum Floor Stone, and Ordinary Stone. Climate includes not only an

analysis of average values of different variables but also the departure from the average value.

On site study it was found that *M. uniflorum* grown in Satna shows erect, sub erect or trailing, densely hairy annual herb. Tap root with smooth rounded nodules. Flowers are short and only 6-12mm long cream yellow with purple spot. Pods are 4-6 cm long, and 6mm broad with 7-23 per plant bearing 5-7 seeds per pod. Seed is small somewhat grey to brown. Seed coat is very thin. Light coloured seed showed better storability after three years storage whereas dark color seeds were poor in germination. Older seeds show less germination where as fresh seeds shows fast germination. Normal germination is 90+-1.50.



Fig-3: Field view of crop *M. uniflorum* Plant.

## RESULT AND DISCUSSION

*M. uniflorum* is also an important drought resistant pulse crop which mainly grown in India. It is also known as poor man pulse. It is one of the alternate source of protein and of low cost. As we heard that now a day's production of *Cajanus cajan* decreases and because of this its cost increases day by day in our area. And for that reason it is out of the reach of poor peoples. *Macrotyloma* serves the same protein content at low cost and also in less time too because normally *Cajanus cajan* take more time for production. There is one more reason to grow in Satna beyond its

proteinaceous aspect is its medicinal value. It is excellent source of iron and molybdenum. In Satna district there is abundance of limestone minerals and because of 6 big cement industries running around peoples suffering from a lot of kidney stone. *Macrotyloma* has great proficiency towards stone disease by using it regularly it cures the diseases without surgery too. Urolithiasis is a major health problem occurs in the peoples of Satna. The extract of horse gram cures and prevents the recurrent stone formation.

Thus, the aim of gaining knowledge over *Macrotyloma* is that it is not a neglected crop. It is very much beneficial especially to

the Satna district as nutritionally, economically and medicinally. In our India, it is mostly grown in hilly areas. However, it

is a time to explore this crop and people could know its importance.



Fig-4: Seeds



Fig-5: Flowers



Fig-6: Seedling

## CONCLUSION

The presented study describes the comprehensive, traditional medicinal uses, nutritional value, and drought resistance crop of *M. uniflorum*. Horse gram is an important food and feed crop traditionally grown in arid regions of the developing world and often considered as minor/ neglected/ underexploited/ poor man's pulse. Its innate climate resilience suggests its scope as a suitable alternative in the present climate change era. The health benefits of horse gram are being recognized in the western world recently, but have been known for its ability to prevent and cure various diseases by Indian "Ayurvedic" system since centuries. The presented in this study could provide insights for future research aimed at both ethnopharmacological validation of the popular use of *M. uniflorum* seeds and its exploration as a new source of active constituents.

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