



## Ricebean: A less Popular Pulse with well-known Benefits

(\*Pankaj Sharma)

Plant Breeder, Department of Plant Breeding & Genetics, Punjab Agricultural University, Ludhiana-141004

\*Corresponding Author's email: [pankaj-pbg@pau.edu](mailto:pankaj-pbg@pau.edu)

### Abstract

For many years, tiny and marginal farmers in Southeast Asia have relied on the ricebean, as a source of food security. Ricebean is a nutritionally rich pulse used as food and fodder. It is a good source of protein, vitamins and minerals. It is a source of various genes for biotic and abiotic stress tolerance i.e, drought, soil acidity and storage pest. Ricebean crop contributes to household food security along with its cultural importance and can be used as green manure to improve soil fertility.

**Keywords:** Ricebean, Economic value, Orphan pulse crop, Nutrition, Soil fertility

Rice bean [*Vigna umbellata*, ( $2n - 2x = 22$ )] also known as red bean and climbing mountain bean. It is a warm-season annual vine legume with yellow flowers and small edible beans. Grown mainly for its beans, it is equally important as vegetable (green pod), fodder and folk medicine. Its area under cultivation is very low compared to other pulses. The dried beans are rich source of protein. It is rich source of lysine. Rice bean has many useful traits such as disease resistance, drought tolerance, aluminium toxicity tolerance. It is rich in nutrients so this can address micro-nutrient deficiencies in affected areas. This pulse has been little studied probably because of its use within isolated communities and consequent low economic value.

### Origin

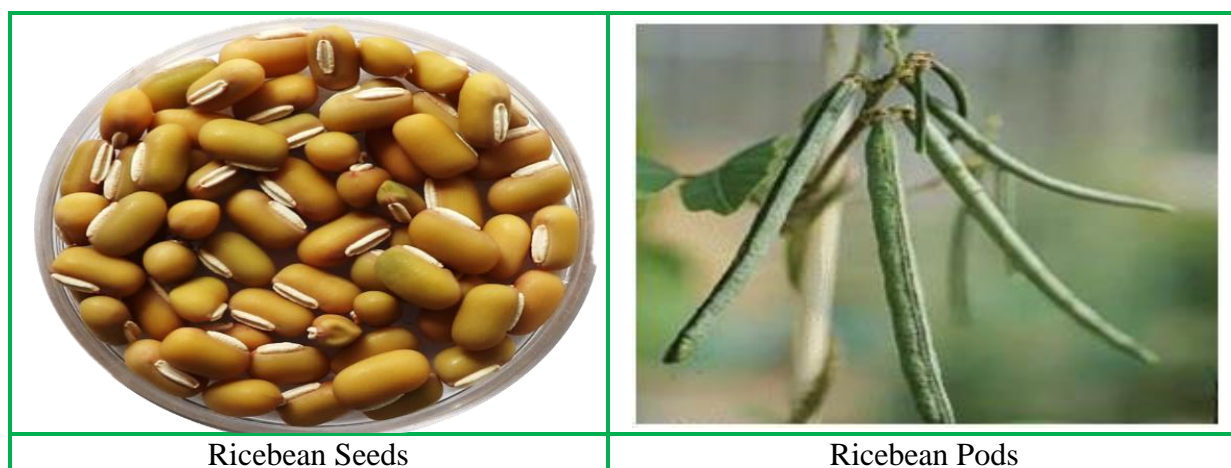
Ricebean is considered to be of South and Southwest Asian origin. It was probably domesticated in the Indo-China region.

### Morphology

Rice bean is an annual with semi-erect, erect or twining habit, stems up to 3 m long, usually covered with fine hairs. Root system is extensive with a tap root that can go up to 1.5 m deep. Stems are branched and leaves are alternate 1.2-1.5 cm long, petiole 5-10 cm long. The flowers are borne on 5-10- cm axillary racemes and peduncle up to 20 cm long. Stamens are ten in number (two groups of nine and one); ovary is superior, one celled with broad and curved style. Five to sixteen seeded pods (5-15 cm) are linear and seeds are oblong.

### Nutritional composition

Ricebean is highly nutritious pulse. Its dry seeds contain good amount of carbohydrates, proteins, minerals and vitamins. Protein content in ricebean is rich in methionine and tryptophan. Ricebean seeds are also rich valine, tyrosine and lysine. Its seeds contain vitamins such as thiamine, riboflavin, niacin and ascorbic acid.



### Sources for novel genes for resistance and adaptability

Ricebean has high level of resistance to the major storage pest bruchid beetles (*Callosobruchus* spp.). So it is used as donor for bruchid resistance in various mungbean breeding programs. Ricebean has also resistant to mungbean yellow mosaic virus so it has great importance in various mungbean improvement programs. Ricebean also showed high level tolerance to soil acidity via release of citric acid on exposure of roots to aluminum. So overall, ricebean is a potential candidate which can be used in various mungbean improvement breeding programs for transfer of various resistance from ricebean to other related species.

**Table. 1 Ricebean varieties released in India**

Variety	Year of release	Developed by	Yield (q/ha)	Maturity
RBL-1	1987	PAU, Ludhiana	15.0	Normal duration (135-145 days)
PRR-1	1995	GBPUAT, Ranichauri	16.0	Normal duration (135-145 days)
PRR-2	1997	GBPUAT, Ranichauri	15.0	Normal duration (135-145 days)
RBL-6	2000	PAU, Ludhiana	15.0	Early Type (120-125 days)
RBL-50	2003	PAU, Ludhiana	15.5	Normal duration (135-145 days)
RBL-35	2003	PAU, Ludhiana	15.0	Normal duration (135-145 days)
BRS-1	2003	ICAR-NBPGR, Bhowali	17.0	Normal duration (135-145 days)
VRB-3	2013	ICAR-VPKAS, Almora and ICAR-NBPGR, Shimla	17.1	Normal duration (135-145 days)

### Conclusion

Ricebean is a versatile crop which can be used as pulse, fodder and green manure crop. Thousands of accessions of ricebean have been maintained by NBPGR, New Delhi. There is great opportunity for improvement in this pulse crop for wider adaptability by selection of genotypes having synchronous pod maturity, non-shattering types and exploring its biotic resistance potential against bruchids and diseases like YMV, Aschochyta etc. Ricebean contain good amount of vitamins, proteins and minerals in seed. Therefore, by promoting this

crop through farmers markets and field demonstrations and creating agronomically superior varieties for commercial production, it can aid in reducing the nutritional shortage in poor areas. This crop also aids in maintaining the health of deteriorating soils and achieving India's nutritional self-sufficiency.

### References

1. Somta P, Kaga A, Tomooka N et al (2006) Development of an interspecific *Vigna* linkage map between *Vigna umbellata* (Thunb) Ohwi & Ohashi and *V. nakashimae* (Ohwi) Ohwi & Ohashi and its use in analysis of bruchid resistance and comparative genomics. *Plant Breed* 125:77-84
2. Sudha M, Karthikeyan A, Anusuya P, Ganesh N M, Pandiyan M, Senthil N, Raveendran M, Nagarajan P, Angappan K (2013) Inheritance of resistance to Mungbean yellow mosaic virus (MYMV) in inter and intra specific crosses of mungbean (*Vigna radiata*). *Am J Plant Sci* 4:1924-1927
3. Singh I, Sandhu J S, Gupta S K, Singh S (2013) Introgression of productivity and other desirable traits from rice bean (*Vigna umbellata*) into black gram (*Vigna mungo*). *Plant Breed* 132:401-406