

## Performance of Mucuna Germplasms under Lucknow Conditions

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### ABSTRACT

A field experiment was carried out entitled "Performance of Mucuna germplasms under Lucknow conditions" in Randomized Block Design with three replications. The experiment was conducted at the Horticulture Research Farm of the Babasaheb Bhimrao Ambedkar University, Lucknow-226025 during Rabi season of 2016. The analysis of performance was studies in seven diverse germplasm of Mucuna. Considerable variation was recorded for all the characters. The observations were recorded on sixteen characters viz. plant height (m), length of leaf (cm), petiole length (cm), leaf/ petiole ratio, number of seed per pod, weight of dry pod/ plant, girth of stem (cm), yield per plant (g), number of branches/ plant, pod number per plant, weight of 100 Seed (g), number of cluster/ plant, moisture (%), crude Protein (%) and ascorbic acid (mg/100g). Overall greater performance under Lucknow conditions of significantly superior in all characters i.e. growth, yield and quality was recorded in Arka Danjanthri.

**Key words:** Growth, Yield, Quality, Mucuna

### INTRODUCTION

*Mucuna pruriens* (Linn.) DC. (MP) also known as Velvet bean or Cowhage or Kawanch is an annual herbaceous twining belonging to the family Leguminosae. It is originated from Southern China and eastern India, where it was at one time widely cultivated as a green vegetable crop. On the one hand it is a nutritive source of food, as it is rich in crude protein, essential fatty acids, starch content and certain essential amino acids. Velvet beans have great potential as both food and feed as suggested by experiences worldwide. The velvet bean has been traditionally used as a food source by

certain ethnic groups in a number of countries. It is cultivated in Asia, America, Africa and the Pacific Islands, where its pods are used as a vegetable for human consumption and its young leaves are used as animal fodder. It includes approximately 150 species of annual and perennial legumes. Among the various under-utilized wild legumes, the velvet bean *Mucuna pruriens* is widespread in tropical and sub-tropical regions of the world. It is considered a viable source of dietary proteins<sup>4,5</sup> due to its high protein concentration (23–35%). In addition to its digestibility, this is comparable to that of other pulses such as soybean, rice bean and lima bean<sup>4</sup>.

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It is therefore regarded a good source of food. Cultivated *Mucuna* spp. found in the tropics probably result from fragmentation deriving from the Asian cultigen and there are numerous crosses and hybrids. The main differences among cultivated species are in the characteristics of the pubescence on the pod, the seed color and the number of days to harvest of the pod. The roasted ground seeds are used as a substitute of coffee in Brazil. It is also used as green manure and animal fodder. Velvet bean is a commercial source of this substance which is used in the treatment of Parkinson disease. “Cowitch” and “cowhage” are the common English names of *Mucuna* types with abundant and long stinging hairs on the pod. Human contact results in an intensely itchy dermatitis, caused by mucunain. The non-stinging types known as “Velvet bean” have appressed, silky hairs. All parts of *M. pruriens* possess valuable medicinal properties and it has been investigated in various contexts, including for its anti-diabetic, aphrodisiac, anti-neoplastic, anti-epileptic, and anti-microbial activities<sup>9</sup>. Its anti-venom activities have been investigated by Guerranti *et al.*<sup>3</sup> and its anti-helminthic activity has been demonstrated by Jalalpure. *M. pruriens* has also been shown to be neuroprotective<sup>6</sup>, and has demonstrated analgesic and anti-inflammatory activity.

#### MATERIAL AND METHODS

The experiment was conducted at the Horticulture Research Farm Babasaheb Bhimrao Ambedkar University, Lucknow-226025 during Rabi season of 2016. A field experiment was carried out entitled “Performance of *Mucuna* germplasms under Lucknow conditions” in Randomized Block Design with seven treatments with three replications. The experiment comprises of seven germplasms i.e. IIHR Sel-2, IIHR Sel-8, IIHR Sel-10, Arka Ashwini (IIHR), Arka Danjanthri (IIHR), CIM-Ajar and CIM-Nijom. The plant to plant and row to row spacing were maintained at 45cm to 30cm. All agronomic/ cultivated practices were adopted homogeneously. The observations were recorded

on sixteen characters viz. plant height (m), length of leaf (cm), leaf length (cm), petiole length (cm), leaf/ petiole ratio, number of seed per pod, weight of dry pod/ plant, girth of stem, yield per plant (g), number of branches/ plant, pod number per plant, weight of 100 Seed (g), number of cluster/ plant, moisture (%) crude Protein (%) and ascorbic acid (mg/100g).

#### RESULTS AND DISCUSSION

The analysis of variance showed significant differences among the genotypes for all characters studied except leaf length (cm), Petiole length (cm), Leaf petiole ratio, number of seed per pod, weight of dry pod per plant and moisture (%). The mean performance of genotypes in respect to sixteen characters has been presented in Table- 1. Maximum plant height (11.12 m), was observed in IIHR Sel-8 followed by (10.71 m) in Arka Ashwini, Maximum length of leaf (30.24cm), observed in IIHR Sel-2 followed by 26.18cm in (IIHR Sel-8), Maximum petiole length (91.89 cm), was observed in CIM-Nijom followed by 29.52cm in (IIHR Sel-1). Maximum leaf/ petiole ratio in Arka Ashwini (2.18) followed by IIHR Sel-2 (0.88) Maximum number of seed per pod (5.66), was observed in CIM-Nijom followed by Arka Danjanthri (5.55) Maximum weight of dry pod / plant (1429.98) in Arka Danjanthri was observed followed by (1200.40) in IIHR Sel-2, Maximum girth of stem (21.34), was observed in CIM-Ajar followed by 20.43 in (IIHR Sel-10) where as Maximum Yield per plant (2749.88g) was observed in Arka Danjanthri followed by (2464.72g) in IIHR Sel-2 and Maximum number of branches/ plant (11.56) was observed in IIHR Sel-2 followed by (IIHR Sel-8) 8.89 . Maximum pod number per plant (105.89) was observed in IIHR Sel-2 followed by (92.22) in IIHR Sel-10 and Maximum Weight of 100 Seed (146.55g) was recorded in Arka Danjanthri followed by (136.22g) in IIHR Sel-8 and Maximum Number of cluster/ plant (29.22), was recorded in IIHR Sel-8 followed by (27.00) in IIHR Sel-2. Among the quality parameter maximum

moisture (9.80%) was observed in IIHR Sel-10 followed by IIHR Sel-8 (27.00%) . Maximum crude protein (33.05%) was recorded in Arka Danjanthri followed by CIM-Ajar 32.04 and

maximum ascorbic acid (42.03mg/100g), was recorded in Arka Danjanthri followed by CIM-Ajar cultivar (41.50mg/100g).

**Table-1: Performance study of Mucuna germplasms under Lucknow condition**

Germplasms/ Variety	Plant height (m)	Length of leaf(cm)	Leaf length (cm)	Petiole length (cm)	Leaf/ petiole ratio	Number of seed per pod	Weight of dry pod/ plant	Girth of stem	Yield per plant (g)	Number of branches/ plant	Pod number per plant	Weight of 100 Seed (g)	Number of cluster/ plant	Moisture (%)	Crude Protein (%)	Ascorbic acid (mg/100g)
IIHR Sel-2	9.33	30.24	10.59	15.71	0.88	5.33	1200.40	17.56	2464.72	11.56	105.89	105.44	27.00	8.20	30.20	40.02
IIHR Sel-8	11.12	26.18	11.66	13.58	0.85	5.44	929.63	13.32	2115.64	8.89	74.89	136.22	29.22	9.25	28.60	38.02
IIHR Sel-10	7.68	18.91	6.66	29.52	0.39	5.33	1109.54	20.43	1437.85	7.44	92.22	121.77	20.44	9.80	25.30	35.60
Arka Ashwini	10.71	22.18	31.043	13.95	2.18	5.55	932.85	13.57	1355.56	6.11	80.11	118.22	19.44	7.50	22.06	32.02
Arka Danjanthri	7.66	20.16	6.32	14.18	0.44	5.55	1429.98	10.76	2749.88	4.33	59.33	146.55	22.33	8.50	33.05	42.03
CIM-Ajar	7.42	25.19	7.93	16.32	0.48	5.44	630.79	21.34	2138.72	5.33	50.22	104.88	12.88	8.66	32.04	41.50
CIM-Nijom	6.24	20.94	6.64	91.89	0.32	5.66	811.36	13.73	1863.77	7.11	69.67	102.77	18.22	9.26	20.52	33.01
SEM+-	0.13	0.22	7.39	25.470	0.511	0.20	222.96	0.40	57.41	0.30	4.35	1.59	1.04	0.23	0.56	0.89
CD	0.40	0.67	N/S	N/S	N/S	N/S	N/S	1.22	171.90	0.89	1.455	4.78	3.12	0.47	1.14	1.81

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