

SHORT COMMUNICATIONS

Genetic Improvement of Dolichos Bean (*Lablab purpureus* (L.) Sweet) through Use of Exotic and Indigenous Germplasm**P Mahadevu and M Byre Gowda***AICRP on Pigeonpea, University of Agricultural Sciences, GKVK, Bangalore-560 065, Karnataka***Key Words: Dolichos, Genetic Resources, Photosensitivity, Growth Habit**

Dolichos bean (*Lablab purpureus* (L.) Sweet) is a multi purpose crop grown for green and dry seeds, green pods, fodder and cover crop. The crop is mainly grown as field crop in the states of Karnataka, Tamil Nadu, Andhra Pradesh, Madhya Pradesh and Maharashtra and as a garden crop in many parts of India. The garden types (*Typicus*) are perennial, grown for green pods as vegetable and require cool season. Determinate and busy varieties are also available in this category. The field types (*Lignosus*) are exclusively grown as dry land crop mostly in low rainfall areas as a mixed crop with finger millet, sorghum and castor. The existing local varieties are long duration, photosensitive and low yielding (5-6 q/ ha) types.

Major research efforts in improving field bean crop have been done at the University of Agricultural Sciences, Bangalore. New genetic stocks introduced from USA, Hungary, and Belgium became indirect source for photo-insensitivity and determinate growth habit (Sreekantaradhya *et al.*, 1973). Exotic genotypes 'US 67-31' and 'US 67-44' of USA were observed to be photo-insensitive by Shivashankar *et al.*, (1971) and were incorporated in breeding programme. Hybridization between the exotic and indigenous types led to the evolution of HA-1 from the segregating material of the cross 'Local Avare' and 'Red *typicus*'. Further, selection in the segregating material generated from 'HA-1', and 'US 67-31' resulted in identification and release of 'Hebbal Avare-3 (HA 3)', which besides being photo-insensitive and early, is with determinate growth habit and green pod yield up to 100-120 q/ ha (Shivashankar and Kulkarni, 1992). This variety became very popular in all Dolichos growing areas in India and utilized for further crop improvement (Kabir *et al.*, 1992). The genotypes with protein content of 30 % as compared to 24 % in HA 3 have also been identified (Viswanathan *et al.*, 1972). However, the green pods of this variety are flat and devoid of 'Sogadu', the characteristic odour and hence with less consumers' preference.

Systematic attempts have been made for collection of Dolichos gene pool in different parts of peninsular India and evaluation for utilisation in genetic improvement. Wide genetic variations observed in morphological types and cultivated land races in traditional Dolichos growing areas (Basavarajappa and Byregowda, 2000).

In the present study, an attempt was made to transfer high sogadu character with constricted pods from indigenous germplasm to HA 3. Hybridization involving HA 3 with 14-1 and 'Local mani avare', which were collected previously as well as during the year 2003 by our team, were carried out by using HA 3 as female parent. Based on the morphological and visual observations, we could successfully isolate segregate plants with high sogadu and constricted pods with determinate growth habit and photo insensitivity. The new genotype was found to be superior with the other salient features, such as average number of pods (71/ plant), high green pod yield and grain yield

Similarly, exotic Dolichos bean in Australia became an important annual forage legume in tropical and subtropical regions. Introduction of two cultivars i.e., Rongoi from Kenya in 1962 and 'Highworth' from Coimbatore (India) in 1976, made an inroad into Australian sustainable cropping systems as legume forage crop. These varieties are being used as short term summer growing forage species in semi intensive livestock and crop-livestock farming systems of Queensland (Pengelly and Maass, 2001).

Dolichos bean combines a great number of qualities that can be used successfully in various conditions. With its ability to out yield conventional crops especially during the dry season and enhanced nutritive value as a fodder crop, Dolichos bean is of great significance for introduction into new areas in the tropical and subtropical regions of the world.

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Evaluation of Winged Bean Germplasm

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Winged bean (*Psophocarpus tetragonolobus*), also called as God-sent vegetable, originated in South-East Asia perhaps Papua New Guinea and is an important leguminous vegetable in Bangladesh, Burma Thailand, Vietnam, Malaysia, Indonesia, Ghana, Nigeria and Sri Lanka. It is commonly grown in Southern India. All parts of the plant like immature pods (2.9-21.5% protein), tender shoots (2.8-5.6% protein), flowers (2.92% protein), young leaves (3.24% protein) and tuberous roots (8-20% protein) are consumed as protein, calcium and iron rich vegetable (Shanmugavelu, 1989; Long *et al.*, 1993; Neeliyara *et al.*, 2001). Boiled ripe seeds are also consumed as protein (31.8 %), fat (17.5 %), energy (757 KCal/ 100 g) and calcium (86.3 mg/ 100 g) rich food (Neeliyara *et al.*, 1999). To fight protein malnutrition of the vast population, its cultivation and use as food in Jharkhand was the need of the hour. Keeping this in view, nine germplasm of winged bean were introduced from NBPGR, Regional Station, PKV Campus, Akola (Maharashtra) and evaluated at HARP, Ranchi to know the genetic variation for green pod yield and its components in addition to some qualitative characters and also to identify the promising

lines suitable for cultivation in this Chotanagpur plateau region of Jharkhand.

Nine germplasm lines were grown in RBD with three replications with a spacing of 100 cm x 60 cm during *kharif* seasons of 2001, 2002 and 2003. Recommended cultural practices were followed to raise a successful crop each year. The observations were recorded on plant height, number of branches/ plant, days to 50% flowering, pod length, pod breadth, pod weight, number of pods/ plant and green pod yield/ plant. The analysis of variance for mean data considering a single year's mean value of three replications as a single replication was calculated by the method suggested by Panse and Sukhatme (1985).

The analysis of variance for eight characters indicated non-significant differences among the nine genotypes of winged bean for all the characters studied except number of branches/ plant. Maximum and minimum number of branches/ plant were recorded in EC-178331 (3.74) and AKWB-1 (2.77), respectively. However, the characters like plant height, number of pods/ plant, days to 50% flowering and pod weight exhibited considerable