Interspecific Hybridization of *Vigna radiata* x 13 wild *Vigna* species

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Abstract

With an objective to develop superior segregants for yield components coupled with pest and disease resistance interspecific crosses were attempted with thirteen wild relatives of mungbean (*V. radiata*) viz., *V. radiata* var. *sublobata*, *V. mungo* var. *silvestris*, *V. hainiana*, *V. umbellata*, *V. vexillata*, *V. trilobata*, *V. glabrescens*, *V. pilosa*, *V. aconitifolia*, *V. stipulacea*. *V. bourneae*, *V. khandalensis* and *V. dalzelliana*. For reciprocal cross combinations the following species viz., *V. radiata* var. *sublobata*, *V. mungo* var. *silvestris*, *V. hainiana*, *V. umbellata*, *V. vexillata* , *V. trilobata* were employed with *V. radiata* as male parent.

The highest pod set of 25 and crossability of 22% was recorded for the cross *V. radiata* x *V. radiata* var. *sublobata* and lowest pod set of 2% recorded by the cross *V. radiata* x *V. dalzelliana* in the direct cross combinations. The cross *V. hainiana* x *V. radiata* recorded highest crossing percentage of 11%. The cross *V. radiata* var. *sublobata* x *V. radiata* recorded highest pod set of 15 and 6.6% while *V. vexillata* x *V. radiata* possessed low crossability of 2.8%. Among the crosses made *V. radiata* x *V. hainiana* recorded the highest hybrid germination 80% and lowest germination per cent of 13.3% was recorded by the *V. umbellata* x *V. radiata*. Even though crossability barriers were predominant, it was possible to recover interspecific hybrids from all the thirteen direct and six reciprocal crosses. Hybrid break down was high in the cross combination of 43.8% where as *Vigna hainiana* x *V. radiata* recorded 100% low and inviable hybrids were also observed in the F_1 hybrids. Higher percentage of hybrid leathality was recorded in two crosses namely *V. radiata* x *V. mungo* var. *silvestris* and *Vigna radiata* x *V. khandalensis* in direct crosses combinations.

The highest pollen germination 69.7% was recorded from the cross *V. radiata* x *V. radiata* var. *sublobata*. The estimates of pollen fertility were sufficient to recover F_2 segregants in all the cross combinations.

For quantitative traits the interspecific cross *V. umbellata* x *V. radiata* exhibited high per se performance for two traits - number of branches per plant and hundred seed weight. For seed yield the hybrid of the cross *V. radiata* x *V. trilobata* registered the highest mean value among direct crosses. In the F_2 generation, for all the traits in the majority of the crosses the skewness was positive indicating the predominance of dominant alleles. Among the direct crosses *V. radiata* x *V. mungo* var. *silvestris* exhibited highest value for four characters - number of clusters per branch, number of clusters per plant, number of pods per plant and single plant yield. The cross *V. umbellata* x *V. radiata* showed better performance for the characters - number of branches and number of clusters in the reciprocal direction, The cross *V. trilobata* x *V. radiata* recorded best performance for two characters - number of clusters per plant and number of pods per plant.