Chapter I

INTRODUCTION

The genus Phaseolus L. of the order Leguminosae and tribe Phaseoleae, with the help of Rhizobium species in their root nodules fix atmospheric nitrogen and improve the soil fertility and also occupy an important place in the human diet for supplying high percentage of vegetable protein. Some of the Phaseolus groups serve as fodder and green manure. Being short duration crops, they are also grown as catch crops preceding or following the major cereal like rice or wheat.

The genus consists of 230 species of which 20 are cultivated for their edible pods or seeds (Zukovskij, 1962). After removing the synonymy, the number of species may be reduced to 150-200 (Bailey, 1957). The genus can be divided into two main groups, the Asiatic and the American. The Asiatic species have small cylindrical pods without a beak, small seeds and broad spur-like stipules and most of the plant body is pubescent e.g., mungo, aureus, radiatus, sublobatus, calcaratus, trilobus, aconitifolius and angularis. The American species have large flat pods with a beak, large seeds and small cuneate stipules, which include vulgaris, coccineus, lunatus, acutifolius, caracalla and a few other minor species.

On the basis of some morphological and biochemical evidences, Verdcourt (1970) proposed the transfer of Asiatic Phaseolus species to Vigna and also according to Westphal (1974) the old

world phaseoli should be assigned to Vigna. However, there exists not much of cytological evidences to support the genus change of former Phaseolus species to Vigna (Gunn, 1973) and also no successful hybridization between any species of Phaseolus and Vigna has yet been reported. Therefore in the present investigation the Asiatic species are mentioned under the old nomenclature of the genus Phaseolus.

Mungo and aureus are two widely cultivated grain legumes in India. The genetic improvements of these two crops have been attempted only through the methods of selection and partly through induction of mutation, while largely neglecting the genetic resources of these plants as presented in its wild relatives. This neglect stems chiefly from the ignorance on putative progenitors of the crops. All the authorities on evolution of crop plants agree that India (Hindustan Centre of Vavilov) is the centre of origin of both mungo and aureus. The paucity of the information however, concerns the recognition and identification of the progenitor and more specific idea on the centre of diversity of the crop. These information would greatly activate the plant breeders for incorporation of desirable characteristics from the wild plants to the cultivated crops through interspecific hybridization. Interspecific hybridization may be helpful in transferring desirable traits from one species to another, combining desirable traits into their hybrids and in determining phylogenetic relationship and speciation.