

INTRODUCTION

maintainance

Germplasm[^] is the basic need of crop improvement. The progress made in the use of germplasm that resulted in improvement of agrihorticultural plants in various countries is greatly appreciated. The current world collections of crop plants available in the USA and USSRⁱⁿ particular have been adequate enough in meeting needs for germplasm with which improvement of major crop^s is possible. Even so it is felt necessary to have additional germplasm for more effective meaningful widespread screening.

In Vavilov's day^s genetic resources of cultivated plants and related wild species were being studied in their centres of genetic variability, the so called "gene centres" and were also being used as source material for plant breeding, though perhaps in most countries to a limited extent. The first survey of genetic resources in their centres of diversity was conducted in 1971 - 1972 and published early in 1973 (Frankel, 1973).

Plant breeding today aims at increasing the agronomic potential of a base material as reflected in increased yield, improved quality, disease resistance, wide adaptability and such other characters. This aim can be achieved by a systematic studies on introduction, acclimatization, conventional breeding, mutation breeding and non-conventional breeding too.

When a species is introduced in to a totally new production area or environment, it may be less adapted than

in the climatic area where it was accustomed to being grown. Acclimatization is a natural selection operating in a heterogeneous population of plants. It proceeds more rapidly in a cross pollinated crop, than a self pollinated one. In annuals the rate of acclimatization is faster than perennials. Thus the process is influenced by the mode of pollination, the range of genetic variability within the species and the longevity of the species.

The conservation of genetic diversity in wild herbaceous species has been less studied. Much work has been carried out on those wild species that are related to our major crops, since they have been collected for evaluation in respect of disease resistance or any other desirable attributes that may be transferred to the crop themselves. The prospects are promising but good basic work on their evaluation and relationships with each other is still lacking. However, minor crops have not attracted much human attention and little improvement has been achieved. Some of them are being derived from natural sources ^{to day} at the present time. Crotalaria juncea (Sunnhemp) ^b belongs to this category. Crotalaria juncea is one of the promising leguminous crops, cultivated for its fibre and as a green manure. However, other species of Crotalaria are important from the view point of their medicinal, ornamental, forage and cover crop values. With this view in mind an attempt has been made in present investigation to introduce exotic species of Crotalaria for evaluating their

performance in agroclimatic conditions of Western Maharashtra viz. of Kolhapur environ. Chromosomal constitution of all these species under investigation ~~in new environment~~ has been studied mitotically and meiotically. In order to study the growth ^{and development} performance of these species, replicated field experiments were designed. Since the nitrogen metabolism represents one of the noteworthy factor of overall metabolism of these legumes, the investigation has been further extended to study the nitrogen metabolism process by determining the activity of a key enzyme nitrate reductase in these species.

The thesis is divided into four Chapters. In Chapter I, "Review of Literature" on Crotalaria is presented, ^Materials obtained and methods for this investigation have been described in Chapter - II, "Materials and Methods". The findings of present investigation are discussed in Chapter - III, "Results and Discussion".

Finally the significant findings of the investigation are summarised in the last Chapter (Chapter IV) of the thesis. The literature cited in the thesis is presented in "Bibliography" part of thesis.
