



Introduction



INTRODUCTION.

About 25% of the earth's surface area can be considered as 'Saline' (Thorne and Peterson, 1955). Salinity is one of the major problems of arid, semiarid regions as well as irrigated regions of the world. Accumulation of saline water, as well as high adsorption % of sodium in the soil, are the initial stages in the formation of salines. Salines on the basis of their specific nature and location can be divided into five types: Marine salines, Coastal salines, Inland salines, Areogenic salines and Anthropogenic salines (Waisel, 1972). The problem of soil salinity has attracted the attention of ecologists, agriculturists and plant physiologists since long time.

Salines which are formed on coast and which are directly affected by the proximity of the sea are the coastal salines. Salt composition of such coastal salines is very similar to sea water. Coastal salines can be classified into three classes - 1) Salt water swamps. 2) Salt marshes. 3) Salt bogs.

Since soil salinity is a serious agricultural problem there have been continuous attempts to screen various crop species and varieties for salt tolerance and to attempt selection and breeding of salt tolerant crops. But this is a time taking approach and the work for last 50 years has not yielded very promising results. Instead of this strategy, it

will be better to grow the plants which are naturally present in those areas successfully and having some economic value (O'Leary, 1985.)

Pallas (1809) gave the name 'halophyte' for the group of plants which can grow under saline habitat. Various mechanisms have developed in halophytes on different lines during the course of evolution. These include elucidation of structural and functional adaptations which enable these plants to tolerate the saline environment. The ecophysiological studies of different halophytic species help in understanding these different kinds of mechanisms.

It is noticed that many of these species have considerable economic importance (Aronson, 1989). A swamp in temperate and subtropical regions supports a woody plant community occurring in an area where the soil is saturated and covered with surface of water during a good parts of the growth season (Penfound, 1952). The most typical ones are mangrove swamps with plant cover of Rhizophora sps., Avicennia sps. or Sonneratia communities. The mangroves and mangrove associates in the coastal salines greatly protect the ecology of the estuarine zone. The plants growing away from sea are protected from saline treatment due to the presence of mangrove zone. Hence the mangrove zone is ecologically very important. Extensive studies on different aspects of mangroves have been performed in our laboratory for last 30 years under the leadership of late Dr. G.V. Joshi

and Dr. I. J. Bhosale.

Number of mangrove species and mangrove associates are growing in salt water swamps. But only few species of Derris, Canavalia, Caesalpinia, Cynometra, Pongamia etc. from Leguminosae are found growing in such swamps.

The leguminous plants are very important in general as a source of food, fodder, fuel, oil, timber, alkaloids etc. Hence study of legumes growing in coastal salines is very important. Among the legumes some reports are available on the work of Derris species. But very little information is available about Caesalpinia crista L., a perennial climber growing alongwith Derris in most of the mangrove swamp borders. Hence it was thought worthwhile to study different aspects of C. crista plant. These include study of seed germination, mineral nutrition and fate of organic constituents in this species.

The dissertation is divided into four chapters. In chapter I review of literature on leguminous halophytes is taken, which includes information about leguminosae in general and halophytic legumes in particular. The economic importance and physiological studies conducted elsewhere related to leguminous halophytes have also been recorded. Details about Caesalpinia crista are specifically mentioned in this chapter. Chapter II deals with the methodology followed for the present investigation. The findings of the present investigation are recorded and discussed critically

in the light of available literature about halophytes in chapter III. This chapter mainly includes observations about germination studies, mineral nutrition and role of organic constituents in this species to adapt to the saline environment where it commonly grows. The significant findings of the present work are summarized in the last chapter. Literature cited in the dissertation is systematically presented in the bibliography.

The author is fully aware of the preliminary nature and limited significance of the present investigation. However it is sincerely felt that many such investigations on different halophytic species are highly essential in order to have a better understanding of the salt tolerance mechanism. This is particularly true for leguminous halophytes in view of the vast economic importance of the members of this family.