

---

# INTRODUCTION

---

## INTRODUCTION

18000 spp. ?  
Legumes are widely distributed all over the world as food, oil & forage crops. About 1700 Sp. of legumes are known and among these 200 are cultivated by man (Smartt 1976)

These are like -

<u>Arachis hypogea</u> L.	(ground nut)
<u>Cajanus cajan</u> ?	(Pigeon Pea/red gram)
<u>Cicer arietinum</u> L.	(Chickpea)
<u>Glycine max</u> ?	(Soyabean)
<u>Phaseolus</u> Sps.	(bean) spp.
<u>Pisum</u> Sps.	(Pea) etc. spp.

According to Hinson and Hartwig (1977), legumes provide seed pods for man and forage for livestock. They supply 20% food diet to the world.

Among the legumes there are about 18 <sup>the</sup> Sps of genus <sup>spp.</sup> Phaseolus are cultivated. Among these Phaseolus aureus (Linnacius) has 6 modern varieties cultivated in Maharashtra viz, TAP-7, BAM-4, 12 and 114 which are resistant to disease and more yielding. PDM-11, 54 are also resistant varieties for yellow mosaic and more yielding. Pusa vaishakhi is also improved variety which is disease resistant and more yielding.

In some districts of Maharashtra Phaseolus aureus <sup>P</sup> is cultivated on large scale. There are several cultivars which are popular among the farmers under local name like yellow mung or green mung or chamaki. Phaseolus aureus is a pulse crop which is more important in diet. Some problems like salt tolerance and senescence in P. aureus as a local variety and Pusa Vaishakhi as an improved variety are under taken in the present investigation.

In recent years much information regarding senescence, its regulation, nature and implication is concerned with productivity senescence is due to series of events concerned with cellular disorganisation in the leaf and mobilization of materials released during this process or it is physiological process which leads to cellular breakdown and death of organ (Sacher 1973). According to him loss of membrane integrity degeneration of cell organelles and accelerated hydrolytic activities are some of the causes of onset of senescence. The term (aging) or senescence is usually related to accumulation of somatic structure and increase in metabolic failures (Woolhouse 1967). It is also stated that senescence is degradative running down of change from juvenile to adult form in species showing different growth phases. Thus the reproductive phase is destination of senescence.

aging

The senescence mainly evolved decline in protein and chlorophyll content and photosynthetic efficiency and all vital functions (Okatan et al 1981). It is constructive process as it evolves redistribution of considerable quantities of carbohydrate, protein and mineral elements to be transferred from vegetative sites to the developing organs and seeds. Concerning the period of leaf senescence studies on groundnut it indicates that percentage of leaf senescence is comparatively more during monsoon season than in post monsoon season due to high incidence of leaf diseases like pest and leaf spot (Narayanan et al 1986).

The growth regulators like cytokinin, ethylene and ABA plays an important role in senescence. It is concluded that cytokinins coming from roots via xylem are known to delay leaf senescence and their decline may be important in soybean plant (Larry D. et al 1990). The ABA accumulation plays direct and important role in both the membrane of primary root elongation and inhibition of shoot elongation at low water potential (Imad, et al 1990). It is also concluded that ethylene plays an important role in carnation (Dianthus caryophyllus L.) flower senescence (Goldstrough, et al 1990). The physical and chemical nature of the soil also plays an important role in senescence and plant growth and ultimately in yield.

It is wellknown to man for centuries that salinity has deleterious affect on crop growth (Poljakoff - Mayber, 1982). Salinity also known to affect the mineral absorption which may induce abnormalities in the plant metabolism and this altomately affects growth and yield adversely. In India about 7 million hactprs of productive land has become salty due to heavy use of chemical fertilizers over irrigation and poor drainage. In Maharashtra about 3 to 4 lakh hactprs of land is saline. The distribution and causes for development of saline and alkaline soils in Maharashtra have been investigated by several investigators (Basu and sirur, 1936; Uppal et al. (1961), Raychaudhari, 1966 and Puranik et al. (1972).

Salt tolerance is an ability of the plant to tolerate high concentrations of soluble salts in the root medium. It is usually expressed with reference to the salinity level that causes a certain decline in the yield. It varies not only widely from species to species and from salt type to salt type but also within the different varieties of the same species (Bernstein and Ayers 1951, Pearson et al, 1966, Torres and Bingham, 1973; Shannon, 1978 and Rathert 1982).

Although overall growth retardation due to salinity is well established, a systematic analysis of various growth

parameters under saline conditions is performed by few workers only, therefore with this view, attempts has been made to study some aspects regarding organic and inorganic status of mature and senescent leaves of P. aureus local and pusa vaishakhi. The fate of some organic constituents like chlorophyll, carotenoids, TAN were studied during the course of leaf senescence. The morphological changes, physical properties of leaves, relative water content, density, and total yield calculated by pod also studied during the course. we have selected local yellow variety and improved Pusa Vaishakhi (green) variety of P. aureus.

Senescence

Chapter I includes brief review of pulse crop phaseolus aureus. The chapter is divided into three sections. First section includes the details of morphology and cultural practices like climate, soil, land preparation, sowing, manuring, plant protection and harvest and yield because it is necessary to study the cultural practices of crop for its general nature of climatic response. The physiology of senescence is given in the second section under the heading 'Physiology of senescence'. In third section scope and present investigation is discussed.

Manuring

The methodology followed for the present study is covered under Chapter II entitled material and methods. The materials used for salinity tolerant studies (NaCl) are studied separately. During the study different growth

parameters, organic constituents like moisture, relative water content (RWC), TAN & chlorophyll and carotenoids, density and physical properties of leaf. The organic elements like Na, K, Ca, Mg, Fe, Cu, Mn, Zn are estimated by using flame photometer and atomic absorption spectrophotometer (Perkin - Elmer Model 3030) and chloride by titration with AgNO<sub>3</sub>.

The results and discussion are depicted in the Chapter III. It includes salt tolerant studies. Each part is studied with respect to growth parameters, physical properties of leaves, organic constituents and inorganic constituents.

The important findings<sup>s</sup> of the present investigation are briefly summarised in the chapter IV, summary and conclusion.

The present study gives preliminary idea of senescence of Phaseolus aureus under the effect of NaCl treatment. Hence only detailed studies will throw more light on senescence of P. aureus. P