

*Introduction*



## INTRODUCTION

The *Bougainvillea* is one of the most important, vigorous growing heavy climbing shrubs of the tropics and sub-tropics. In India, it is grown as a popular ornamental plant in gardens and appreciated for its attractive, brightly coloured bracts and profuse flowering almost through out the year. The best time of flowering is during February to March and August to September in Southern India and February to June and September to December in Northern India (Pal and Vishnu Swarup, 1974).

The *Bougainvillea* native to South America, was first collected by French botanist Commerson at Rio-de-Janerio, Brazil. It was named after a French navigator, **Louis-Antoine de Bougainville**, who made a voyage round the world during 1766-1769 with Commerson. The generic name was first published as '*Buginvillea*' by de Jussieu (1789) in 'Genera Plantarum' and further it is described as *Bougainvillea* and published in Index Kewensis by Spachs (1841).

According to Holttum (1955) it was *Bougainvillea spectabilis* that was first introduced into Europe. It was brought from Peru to France in 1829 as reported in 'Paxton's Botanical Magazine'(Anon., 1846 ) and flowered in Paris as early as 1835. *Bougainvillea spectabilis* was brought to Britain from Southern Brazil in 1844. In India also *Bougainvillea spectabilis* was the first species introduced from Europe in 1866.

*Bougainvillea spectabilis* is a large thorny extensively climbing shrub native of Brazil with pubescent branches and leaves bearing in the hot season. A profusion of pale yellow flowers supported by large purple or magenta coloured bract which render the plant most conspicuous object a perfect blaze of colour in the hot weather. The plant was introduced in Bengal by Sir E. Perry and now common in gardens as a covering to trellises (Cooke, 1799).

*Bougainvillea spectabilis* has the best performance on dry sides, in full sunshine. It is an important horticultural plant belonging to family Nyctaginaceae. It is a fast growing shrub and has many cultivars; some dwarf and others large and some scrambling shrubs and still others as climbers (Bansal and Nanda, 1983). It increases scenic beauty of formal as well as informal gardens. It is a tropical plant which requires full sunshine or a light level of at least 4000fc.

An optimum temperature is required for the better growth and development of plants. According to IFAS (Institute of Food and Agricultural Science, University of Florida) a minimum temperature of 65<sup>0</sup>F at night and 75<sup>0</sup>F - 95<sup>0</sup>F required during daytime. Due to minimum requirement of fertilizers with high phosphate and balanced liquid fertilizer (150-500ppm), *Bougainvillea* becomes wonderful addition to landscape gardening in semitropical or in cooler climates.

Leaf senescence is the sequence of biochemical and physiological events comprising the final stage of development from the mature, fully

expanded state (Smart, 1994). Wareing and Seth, (1967) defined senescence as a deteriorative events and according to Thomas and Stoddart, (1980) leaf senescence is as the series of events concerned with cellular disassemblance in the leaf and the mobilization of the materials released during this process. The term aging or senescence is usually related to accumulation of somatic structure and increase in metabolic failures (Woolhouse, 1967). According to Nooden (1980), the leaves and other parts of polycarpic plants, senescence is in correlative manner. The colour change is due to both to preferential degradation of chlorophylls compared with carotenoids and to the synthesis of new compounds such as anthocyanins and phenolics (Matile, 1992). According to Stoddart and Thomas (1982) the plant growth regulators exert a controlling influence over leaf senescence.

In the present investigation some of the aspects related to organic and inorganic status of *Bougainvillea spectabilis* have been studied. The fate of some organic constituents like chlorophyll, polyphenols, crotenoids were studied during the course of senescence. Total carbohydrates (starch, reducing sugar and total sugar) and enymes such as nitrate reductase, peroxidase, polyphenol oxidase and superoxide dismutase were also studied.

The 'Chapter-I' includes brief 'Review of Literature' and general account of *Bougainvillea spectabilis* (Willd.) and its morphology. Physiology of leaf senescence along with role of external factors and hormonal regulation has been studied in the present investgation.

The 'Chapter-II' is of 'Material and Methods' which includes methods and procedures followed for the present investigation. The leaf material at different age and growth stages such as premature, mature, onset of senescence and senescent are selected for the analysis of the different organic constituents such as moisture content, photosynthetic pigments, polyphenols, carbohydrates and inorganic constituents like major inorganic element Na, K, Ca, Mg and P and trace elements such as Fe. The effects of hormonal treatments of gibberlic acid (GA), Indole-3-Acetic Acid (IAA) and Kinetin have been studied separately. The enzymes of antioxidant metabolism such as peroxidase (POX), polyphenol oxidase (PPO) and superoxide dismutase (SOD) were studied. An enzyme from nitrogen metabolism i.e., nitrate reductase (NR) has also been studied in the present investigation.

The core part of investigation i.e., important findings and discussions are depicted in the 'Chapter-III' as 'Results and Discussion'. The achievements of present investigation are briefly summarized in the 'Chapter-IV' as 'Summary and Conclusion'.

The present investigation gives an idea about the senescence, organic, inorganic and some of enzymes in *Bougainvillea spectabilis* (Willd.) under natural field conditions and with treatment of growth hormone