INTRODUCTION

For regulating cellular functions, cells communicate with each other and also perceive extracellular signals. These external signals, perceived by the cells, get translated into a chemical message through which a process of amplification sets in which result ultimately into a specific cellular activity. One of the most versatile and suitable intracellular messenger is the calcium ion. Role of calcium has been well establish in animal system to couple an external signal into a response (Means et al., 1982). It is known to regulate processes like muscle contraction, endocytosis and exocytosis, cell motility, cell division and various other responses. The role of calcium as a second messenger gained importance after the discovery of a calcium receptor, calmodulin, in animals which appears to be a calcium receptor sensor, scavenger and regulator, all together (Cheung, 1982). Calmodulin is known to be a pleiotropic regulator of metabolic activities in the cell. The apparent ubiquitous distribution and the highly conserved structure of calmodulin suggest that it may play a fundamental role in mediating intracellular calcium-dependent effects.

Based on the evidences from animal systems, people started looking into the role of calcium in mediating external signals in plants. Light is an important external stimuli which controls a
number of developmental processes in plant systems. Light, through its receptor phytochrome, has been shown to regulate various enzymes which in turn might effect a specific response. However, it is not yet very clear as to how the light signal is perceived by the plant cells, and what are the sequence of events which result in the ultimate response.

One of the possibilities suggested was that calcium might act as a second messenger for the light signals in plants (Roux, 1982). The calcium binding protein, calmodulin could mediate some of the calcium functions in plants by activating the target enzymes.

The present work was undertaken to find out the role of calcium in light mediated processes in plants, especially those which are mediated by phytochrome. To check this following points were looked into

i) whether Ca$^{2+}$ fluxes across plasma membrane are regulated by phytochrome;

ii) to establish the presence of calmodulin in maize;

iii) to check if any enzyme regulated by Ca$^{2+}$ is also regulated by calmodulin and phytochrome, and

iv) to check on the role of calmodulin in a physiological process that is controlled by light also.