INTRODUCTION
Plants are sessile organisms and at any particular stage of growth and development they experience a variety of external as well as internal signals. Plant cells can respond to all these signals in a precise and specific manner due to the presence of a complex but efficient perception and signal transduction apparatus.

When plant cells receive a signal, it is decoded following perception via changes in concentration of a plethora of second messengers like inositol phosphates, cADPR, diacylglycerol and calcium. Role of calcium ions is central to the theme of signalling in both plant and animal systems. Calcium ions are one of the most widely accepted second messengers which couple a large number of diverse stimuli to their characteristic responses.

Changes in intracellular calcium levels are perceived by various calcium binding proteins (e.g. CaM and CaM like proteins), which either by themselves or by modifying some other proteins and/or factors, transduce the calcium signal downstream to elicit the final response. Protein kinases are one of the main targets of calcium and calcium-binding proteins and these by modulating reversible phosphorylation status of various substrates, activate other constituents of signal transduction pathways.

In animal systems, calcium is known to regulate two different families of protein kinases viz. Ca\(^{2+}\)/phospholipid-dependent protein kinases and Ca\(^{2+}\)/CaM-dependent protein kinases. In plants a biochemically distinct family of protein kinases i.e. the Ca\(^{2+}\) dependent protein kinases (CDPK) is more common. These CDPKs do not require either lipid or CaM for their activation. Existence of this family of kinases has been reported from many plants and they are shown to be involved in various regulatory processes. Reports of existence of other two families of calcium-dependent protein kinases e.g. Ca\(^{2+}\)/lipid-dependent kinases and Ca\(^{2+}\)/CaM-dependent kinases are still limited in plants.

With the discovery of CaM in plants, its similarity to animal CaM, multifunctional role played by it and its regulated expression in response to various environmental cues, along with importance of Ca\(^{2+}\) signalling in plants, there have always been attempts to identify Ca\(^{2+}\)/CaM-dependent kinase homologue(s) in plants. Though existence of this type of kinase activity has been reported from some plants, in most of the studies only
indirect evidences have been provided. Recently, cDNA homologues of animal Ca\textsuperscript{2+}/CaM-dependent kinases have been reported from some plants e.g. apple, lily and maize. All these homologues show considerable similarity with their animal counterparts at cDNA level. However, the biochemical properties of the encoded proteins are not studied. Nevertheless these results along with other studies give clues for the presence of Ca\textsuperscript{2+}/CaM-dependant kinases in plant.

In view of their importance in Ca\textsuperscript{2+} signalling pathway the present study was undertaken with the following objectives:

1. To purify and biochemically characterize a Ca\textsuperscript{2+}/CaM-dependent protein kinase from maize to demonstrate conclusively the existence of this class of kinases in plants.

2. To raise polyclonal antibodies against the purified kinase and check for the presence of immunohomologues in other systems as well as study its regulation under different conditions.

3. To clone and characterize the cDNA for this kinase.