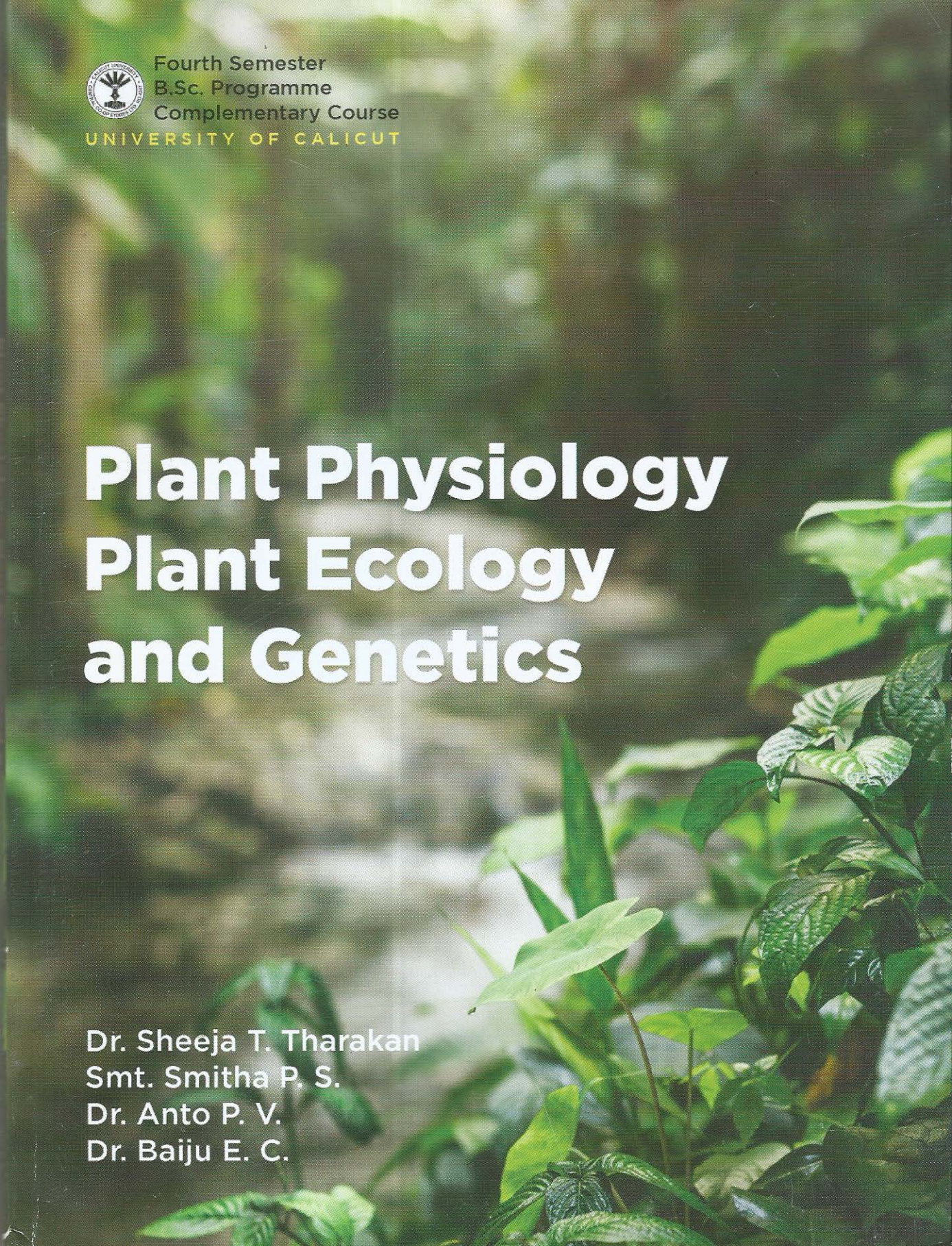

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UNIVERSITY OF CALICUT

B Sc PROGRAMME IN BOTANY

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CONTENTS

PLANT PHYSIOLOGY

MODULE 1

CHAPTER 1

STRUCTURE OF PLANT CELL AND CELL ORGANELLS

Introduction

Discovery of plant cell in 1665 was a fruit full finding in the field of biology. Robert Hooke first observed plant cell through his crude microscope as a small chambers or honey comb patterns from cork cells. Cells are fundamental unit of life. All living organisms are made up of small cells. Cells are originated from preexisting cells by cell division. Cells are the structural and functional unit of living organism. Each plant cell has totipotency and performs multiplication and other physiological phenomenon. Unicellular and multicellular organisms can perform their function individually or coordinately. In multicellular organisms, cells do not function as independent units but always in close co-ordination and mutual dependence. The single cell of a unicellular organism can carry out all biological functions. But, in multicellular organisms, one type of cells can carry out only a specific function. Thus, there is *division of labour* among the different kinds of cells. A living cell always functions as an *open steady-state system.* It is an open system, since it constantly exchanges energy and matter with its external environment. In a steady state system, the rate of inflow of energy and matter is equal to the rate of outflow As a result, the internal environment of a cell remains almost unchanged. Maintenance of a proper and constant internal environment is called *homeostasis.*

Structure of a Plant Cell

Plants are multicellular organisms composed of millions of cells with specialized functions. Each cell may differ from one another in their structures but all cells have the same basic eukaryotic organization at maturity. Each plant cell made up of cell wall and protoplast. Cell wall is the non-living outer covering and protoplast is the living fluid inner part. Protoplast consists of plasma membrane and cytosome. Cytosome consists of the cytoplasm and nucleus. Cytoplasm contains a fluid part, known as cytosol or hyaloplasm. It is formed of water, mineral ions, RNA molecules, proteins, carbohydrates, lipids, enzymes, etc. Suspended in the cytosol are two groups of cellular components, namely cytoplasmic inclusions and cytoplasmic organelles.