

PREFACE

Investigations described in the present thesis entitled "Structural studies on polysaccharides from different parts of Bael (Aegle marmelos) tree" have been carried out by the author in the Department of Macromolecules, Indian Association for the Cultivation of Science, Calcutta-32 (India), during the period 1979-1982, under the guidance of Dr. Amal Kumar Mukherjee, Reader, Department of Macromolecules, I.A.C.S., Calcutta-32 (Present address : Department of Chemistry, Indian Jute Industries Research Association, 17 Taratolla Road, Calcutta-700088, India). These investigations deal with the purification and structural elucidation of the repeating unit of a hemicellulose fraction, a neutral polysaccharide of bael fruit pulp and polysaccharide obtained from cambium layer of bael tree. The thesis has been broadly divided into four parts.

Part-I contains a short introduction to the carbohydrate chemistry including a brief description of the theoretical aspects of some of the important chemical reactions used for the elucidation of the structure of polysaccharides. This part also includes a note on hemicelluloses and a short description of cambium layer. This chapter also surveys an up-to-date information of the results

of the previous investigations carried out on bael tree.

Part-II deals with the detailed investigations carried out on hemicelluloses obtained from trunk of a young bael tree. This includes isolation of two hemicellulose fractions, purification of hemicellulose IIA and detailed investigations for elucidation of the structure of this pure fraction. The linkages between the monosaccharide units were determined by methylation analysis of hemicellulose IIA and carboxyl-reduced hemicellulose IIA. The results were corroborated by those from periodate oxidation and Smith degradation. Some methylated sugars which could not be identified by g.l.c., were identified by converting them into suitable crystalline derivatives. The anomeric configurations were determined by chromium trioxide oxidation of the acetylated, carboxyl-reduced hemicellulose. The aldobiouronic acid obtained from graded hydrolysis was characterized. All these experiments clearly revealed the structure of the repeating unit of this hemicellulose.

Part-III consists of studies made on a neutral polysaccharide obtained from bael fruit pulp. A neutral fraction was obtained through a number of purification steps. Sugar analysis, methylation analysis, Smith degradation studies and chromium trioxide oxidation studies on the neutral polysaccharide have been reported in this section. Graded hydrolysis

studies on the polysaccharide were also carried out and the oligosaccharides were characterized by sugar analysis and methylation analysis. The results of these experiments are summarized in this section.

Part-IV describes the structural investigations on the polysaccharide obtained from cambium layer of bael tree. Methylation analysis, Smith degradation studies, chromium trioxide oxidation and characterization of oligosaccharides are reported in this part. At the end of part IV "concluding remarks" about the polysaccharides obtained from different parts of the bael (Aegle marmelos) tree have been made.

The thesis also complies a list of bibliography which covers an up-to-date collection of reference on the subject.

Reprints of papers entitled (1) "INVESTIGATIONS ON THE STRUCTURE OF A HEMICELLULOSE FRACTION ISOLATED FROM THE TRUNK OF A YOUNG BAEL (Aegle marmelos) TREE", Carbohydr. Res., 104, 309 (1982), and (2) "STUDIES ON A NEUTRAL POLYSACCHARIDE ISOLATED FROM BAEL (Aegle marmelos) FRUIT PULP", Carbohydr. Res., 97, 315 (1981) have been enclosed at the end of the thesis. Xerox copy of the final proof of the paper entitled

"STRUCTURAL STUDIES ON A POLYSACCHARIDE OBTAINED FROM THE CAMBIUM LAYER OF A BAEL (Aegle marmelos) TREE to be published in vol. 109 (1982) of Carbohydrate Research has also been enclosed.

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