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Kumar Sudesh

# Polyhydroxyalkanoates from Palm Oil: Biodegradable Plastics

 Springer

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# Preface

Polyhydroxyalkanoates (PHAs) are very interesting polyesters synthesized by many types of bacteria. Numerous researchers from all over the world have carried out various studies on PHAs. There is already a wealth of knowledge about all aspects of PHAs in the literatures.

In this book, the focus is on the relatively recent efforts to use vegetable oils, especially palm oil and its by-products to synthesize PHAs. Palm oil is the world's most efficiently produced vegetable oil and Malaysia has been the pioneer in developing palm oil as a sustainable source of edible oil. Because of the high productivity of palm oil it costs less than other commercial vegetable oils. Therefore, it has been the preferred oil by most people from the low-income group. The production of palm oil is expected to increase to fulfill the growing demand. Besides Malaysia, Indonesia is also now a major producer of palm oil.

The palm oil industry generates large quantities of by-products and wastes rich in fatty acids that can be developed into potential feedstock for biotechnological applications such as for the production of PHA by microbial fermentation. Studies have also shown that the yields of PHAs from vegetable oils are generally better than those from sugars or other feedstock. Besides the yield of PHAs, there are many other factors that one will have to consider for large-scale production of PHAs. Of particular importance is the sustainability of the entire process of converting palm oil-based feedstock to PHA.

Malaysia is committed to the production of palm oil in a sustainable manner. The majority of Malaysians are also environmentally conscious and know the importance of biodiversity and forest conservation. Therefore, the pros and cons of developing palm oil-based feedstock for PHA production are being carefully scrutinized. This book is an attempt to provide a holistic view of the challenges involved in using palm oil and its by-products for the production of PHAs. In addition, several new applications for PHAs are also described.

This book was prepared in the midst of many other equally demanding tasks and therefore the help of many of my laboratory members was crucial. I am especially grateful to Dr. Sridewi Nanthini for compiling all the information necessary for this book. Mr. Yoga S. Salim had painstakingly drawn all the chemical structures of PHA monomers and Ms. Rathi Devi Nair did all the corrections based on inputs from all my graduate students. I am very grateful to all of them for their help in preparing this book.

Kumar Sudesh

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