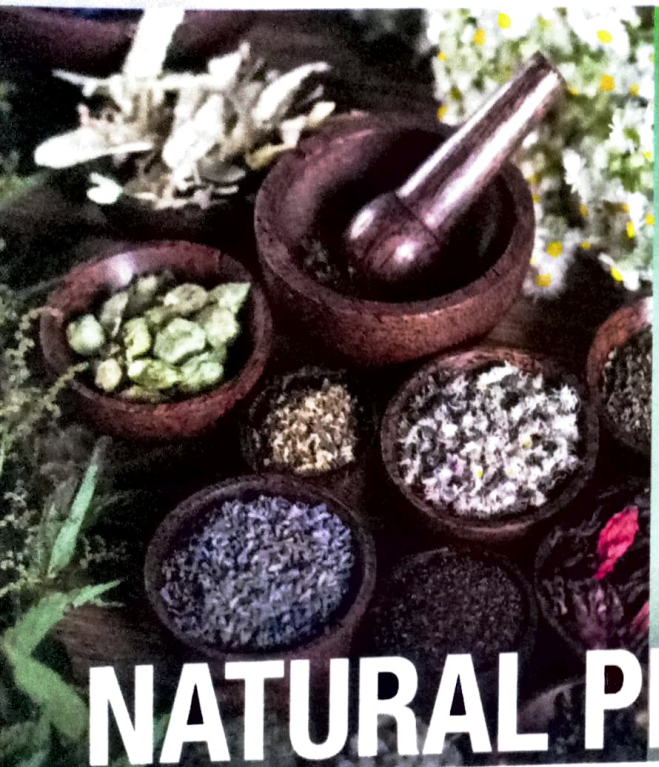

NATURAL PRODUCTS AND DRUG DISCOVERY

AN INTEGRATED APPROACH

Edited by

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An Integrated Approach

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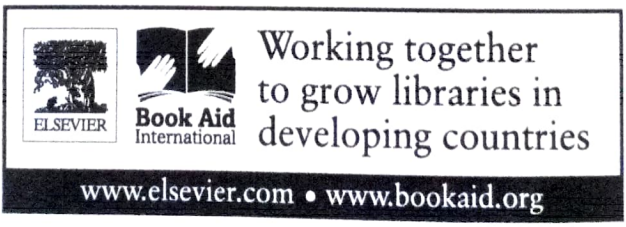

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Fundamentals of Microwave-Based Sample Preparation for Plant-Based Drug Discovery

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1. INTRODUCTION

Extraction is as simple as making a cup of tea, but rarely do we consider the steps involved in making of a cup of tea significant because the entire focus is on enjoying the flavor and taste of the tea prepared. Similarly, in natural product research rarely do we tend to realize the importance of selecting a judicious extraction process and the entire research is isolation or bioactivity driven. However, a few minutes of careful thinking can make us understand that an inappropriately selected extraction method is sufficient to jeopardize the entire objective of natural product research because any mistake can then make subsequent steps of isolation and bioactivity determination suffer heavily, thus leading to a shaky foundation. It is similar to optimizing the heating time for making tea. Imagine how tea would taste if heat were not applied at all but the ingredients were just macerated; equally, what would have been the taste if prolonged heating of a few hours were given for making tea. In today's modern technological era, no production line in the field of food and nutraceuticals is devoid of an extraction unit. After the recently concluded Paris Convention for Climate Change, strict protocols were drafted for limiting carbon contributions from each country, with heavy restriction being imposed on developed countries. In such a situation, technology and environment should be in tandem so that the greenness of planet earth is sustained by reducing emissions of greenhouse gases and the carbon load. This forms the backdrop for this chapter.

In recent times (from 2011) sufficient research has been done on designing and developing newer and greener extraction methods. In this regard, microwave-assisted extraction (MAE) needs no introduction. In one of our

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