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## Preface

*Momordica* is a genus of under-utilized and wild-gathered vegetables of importance as food, medicine and ecosystem functions. With the probable exception of bitter gourd, other *Momordica* species are little known outside Asian and African consumers. Rich in minerals and vitamins, bitter gourd (*M. charantia*), teasel gourd (*M. subangulata* subsp., *renigera*) and spine gourds (*M. dioica* and *M. sahyadrica*) are reported nutritionally the best among cucurbits. Sweet gourd (*M. cochinchinensis*) is known as ‘the fruit from heaven’ in South-East Asia, due to its acclaimed properties in enhancing longevity, vigour and vitality. Of course, it is the richest source of  $\beta$ -carotene, the precursor of vitamin A. There is an incredible wealth of traditional knowledge, especially medicinal uses, though not scientifically validated in most cases, among the forest dwelling tribal and native populations. All are extensively used in indigenous systems of medicine including Siddha, Unani, Ayurveda and even Homeopathy.

The biodiversity rich Asia is home to most tropical vegetables and vegetables are the primary source of vitamins and minerals, utilisation of native biodiversity for combating this ‘silent hunger’ afflicting a sizeable population in these countries is still a major challenge for agricultural researchers and administrators alike. Sagacious bio-prospection and judicious utilisation of the natural resources can indeed offer simple and cost-effective solutions to many of our long-standing problems. An exemplary case study is the nutritional supplementation trials in Vietnam by Dr. Vounng using the traditionally cultivated gac fruit (*M. cochinchinensis*), which was demonstrated to be an ideal tool for managing chronic cases of vitamin A deficiency in children. This is an example of a highly successful long-term and sustainable strategy by using the indigenously available food resources.

Although bitter gourd is vulnerable to pest problems demanding chemical control and consequent pesticide residues, other *Momordicas* are largely grown in an organic way and hence deserve promotion in the context of the present market demand for green organic foods. Evidently, given the limited information available on their nutritional and nutraceutical value, these crops are not given the due importance they richly deserve. Most of these semi-domesticated crops are endowed with resistance/tolerance to some of the common diseases and pests of

cucurbits. Species like *Momordica balsamina* is least demanding and adapted to suboptimal conditions like dry arid climate and *M. sahyadrica* can be cultivated as a high-value component of cardamom-coffee plantations in the Western Ghats. *M. dioica* and *M. subangulata* subsp. *renigera* are equally prospecting candidates for domestication. At least one of these species can be profitably grown as an ideal homestead vegetable in every home, across extreme environments and diverse ecosystems of the region present interesting opportunities for diversified and nutrition-rich diet.

However, there is a long way to go as most of the species except bitter gourd are in the domestication interphase. Incidentally, Van Rheed's *Hortus Malabaricus*, the first ever printed account of the flora of Malabar or Indian plants for that matter, describe four entities of *Momordica*, which formed the basis for Linnaeus and subsequent botanists to describe the genus and some of the species. However, the irony is that all the four entities (*paval*, *pandipaval*, *erumapaval* and *bempaval*) described and illustrated by him still remain in the wild-undomesticated stage even after 450 years.

Problems like non-availability of adequate high quality planting materials and a comprehensive package of agro-management techniques need greater research attention. If the research gaps are addressed, they can be promoted as major vegetables, thus serving the nutritional and nutraceutical needs of Asian population.

We have endeavoured to give an insight into the present state of knowledge on bitter gourd and other *Momordicas* of South and South-East Asia. Available information on biosystematics, origin and domestication, genetics and crop improvement efforts, ethnobotany and nutritional profile and crop management have been collated thematically under eight chapters. Admittedly, professional and personal experience of the authors spanning over more than a decade forms the bulwark of this book. The authors owe full responsibility for the viewpoints and statements made in the book and in no case the same to be construed as that of the Indian Council of Agricultural Research (ICAR).

We earnestly hope that this will serve as a reference book for all *Momordica* lovers in the world over, especially students in tropical horticulture, crop botany and vegetable breeding. It is our ardent desire that this book will trigger an insatiable quest in the minds of user community to explore deeper into various research gaps in this group of plants.

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