

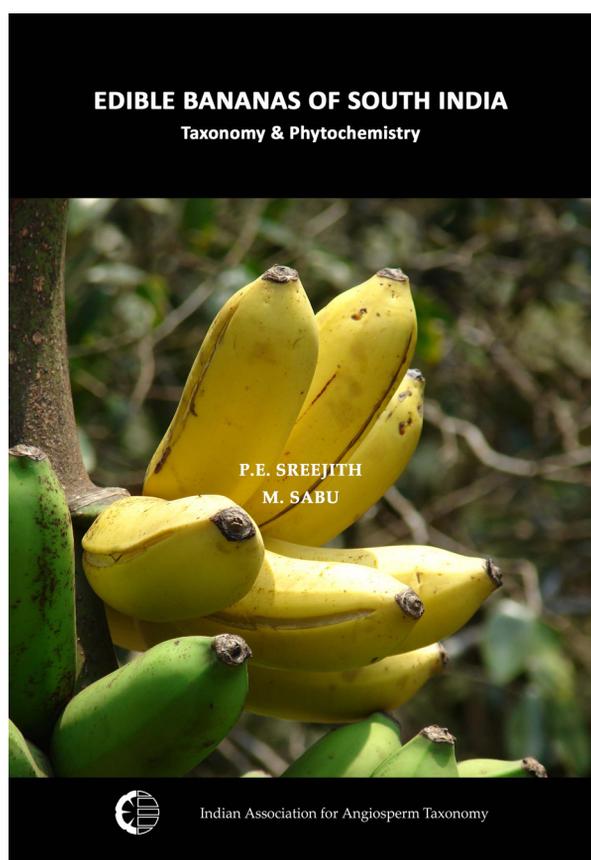
Book Review

P.E. Sreejith and M. Sabu, 2017

Edible Bananas of South India: Taxonomy & Phytochemistry

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Taxonomy of the family Musaceae, genus *Musa* and its sections, species and subspecies is complex, given the multifarious phylogeny, reproductive mechanisms, enormous diversity (especially in the primary centres of origin and diversity: Southeast Asia and South Asia), hybridization, polyploidization, spatial and temporal separation, vegetative propagation and domestication of the edible fruit bearing cultivars. These multitudes have given rise to a very complex group, which defies some of the basic tenants used for classical taxonomic classification followed for other plants.

Due to its immense economic value (for trade and subsistence food), cultivated bananas have received a lot of research attention in several areas, but the taxonomy still remains a domain that has received inadequate consideration. A major constraint has been lack of good quality specimens in herbaria, primarily due to fleshy nature of the plant, especially the floral parts. Another reason is the application of chromosome count and assignment of genomic group along with morphological traits to determine the classification of cultivars. The application of increasing robust molecular tools (SSR, DArT and SNP) and discovery of new species from centres of diversity, further adds to the fluidity surrounding taxonomic classification of Musaceae. The exceptional intra-specific variability of the progenitors of cultivated bananas is more complex than is understood from its current subspecies classification. Clearly, the overall classification of the genus *Musa* and its cultivated subgroups is a challenge!

Early workers Ernest Cheesman, Norman Simmonds and Kenneth Shepherd realized that classification of the cultivated varieties of *Musa* requires a separate approach/technique from general taxonomy of the genus, wherein use of Latin names for cultivars would have to be abandoned. Thus, the 'genome group' nomenclature system to classify banana cultivars was developed in 1955, which classifies cultivated bananas into genome groups, according to the relative contribution of their ancestral wild species into subgroups and sets of closely related cultivars. However, there are inconsistencies due to difficulties in assigning certain cultivars to a subgroup, and to a lesser extent to a group. Also, traditional taxonomists still prefer to use Latin binomials to classify cultivated bananas, as in the case of the present work.

Globally, some 1,000 cultivars are reportedly grown and some cultivars have many different

local names that vary from region to region. Also the presence of numerous cultivar names and synonyms in different languages and dialects poses a challenge to document the unambiguous status of diversity in this crop. In many cases, the same cultivars are known by different names in different countries. Occasionally, the same name is applied to distinct cultivars or phonetic variations result in differences in spelling. There is need for the morphological taxonomy of all these cultivars, along with chemotaxonomy, cytology and molecular data, for arriving at a systematic harmonious classification system adapted to the special nature of edible banana diversity.

In the light of above, the present book has great importance. It provides the taxonomical research done by the authors in 24 distinct edible cultivars of banana from southern India. The authors have made a scholarly introduction about *Musa* taxonomy, after a study of the historical and contemporary literature in relation to floristics, phylogeny and evolution, cytology, phytochemistry, cultivation practices and uses. Subsequent couple of chapters define the area of study covered and methods followed for the data presented in the book. Morphological description is based more or less on the existing system of IPGRI descriptors/descriptor states.

The genomic grouping derived from the morphological characterization is successfully used for phenetic analysis to show genetic relatedness among cultivars investigated. A detailed phytochemical analysis datum undertaken in fruit pulp of 13 cultivars has been provided in the work, which is new information. Most of the fatty acids and volatile compound profiles were distinct, adding to the uniqueness of the cultivars investigated. The authors have also provided a useful key for identification of the selected 24 cultivars.

The detailed botanical descriptions of all the cultivars are supported by very good quality photographs of the diagnostic plant parts and

reference to authentic herbarium specimens. Names and synonyms of *Musa* cultivars have been provided in Table 6 (p. 192 onwards), though source of this information has not been cross-referenced (largely drawn from Uma & Sathiamoorthy, 2002). Whether all these named cultivars are treated as 'synonyms', need to be substantiated by molecular fingerprinting data, as this would have important implications in genetic resource management of this genus.

The book is a valuable contribution to an important aspect of a crop of immense national as well as global importance. The book has high quality printing, and text is supported by excellent reproduction of photographs. Although most popular AA, AB, AAA, AAB, and ABB cultivars had been fairly well-classified and typified by their salient characteristics, the present attempt to revisit some of the major cultivars by taxonomists has reconfirmed the existing groups, while adding new phytochemical information in selected cultivars. A useful aspect is the taxonomic key generated for the 24 cultivars, which along with the coloured pictures would be a useful tool for students, researchers and breeders.

While appreciating the enormous efforts of the authors in carrying out the work and publishing this book, I would like to point out one critical observation. The use of the word "South India" is technically inappropriate, both in terms of political geography and civics! Probably the use of the words 'Southern States of India' or 'Southern India' is more accurate. However, notwithstanding this observation, I congratulate the authors for this fine publication, emanating from some long and arduous studies on a very important species that is as useful as its diversity!

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