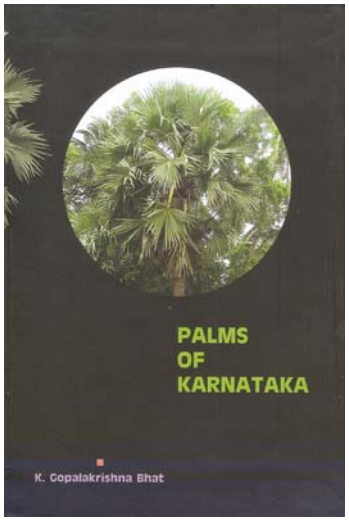

Palms of Karnataka. K. Gopalakrishna Bhat (Author and Publisher). 'Madhuca', Srinivasa Nagara, Chitpady, Udupi 576 101. 2011. 100 pp. Price: Rs 500.

Plant resources are the wealth of a nation. Scriptures and the literature in India have held plants in great esteem. India being one of the mega-biodiversity countries and signatory to the Convention on Biological Diversity (CBD), has enormous stakes in preserving its ecosystems, bio-resources and their fragile webs. Towards this goal, further floristic work assumes greater importance today than before to assess the plant wealth and diversity of the country, region or a state.

Situated along the Western Ghats, one of the biodiversity hotspots in India, the State of Karnataka is gifted with immeasurable plant diversity confined to different forest types and unique niches. While enormous amount of knowledge is being generated on the vegetation of the state from time to time, the group of palms (palms and canes), both indigenous and introduced, in natural forests as well as in the man-made settings, have remained neglected largely because of difficulties in their collection and identification. Several exotic palms have gained entry from near and far-off lands, particularly from the New World tropics and have mingled with the indigenous ones, further complicating their study. In the words of E. J. H. Corner, an expert on palms, '… palms are too massive and intractable for ordinary scientific approach. So, we find that few scientists have been able to cope with palms and that fewer still have made the effort to build up palm science. We find, in fact, no major group of plants so neglected in its study.'

In the landscape mosaic of the forests in Karnataka, the indigenous palms and canes manifest a wonderful natural heritage. Their species richness may be numerically sparse, yet they form an abundant and conspicuous element of the vegetation and function in a critical fashion in the ecology. A number of palms are introduced into gardens, parks or planted along avenues as decorative plants.

The author of this book, K. Gopalakrishna Bhat, had discovered the immense gaps in our knowledge on palms in Karnataka, particularly of the elusive canes, and so turned to their exploration and study. This slim but extremely valuable book gives a vivid picture of a blend of the wild and domesticated diversity of palms in the state.

In the natural history of palms, some names are distinctive. In this book we encounter the oil palm (*Elaeis guineensis*), the only palm to which an entire scientific journal is dedicated, namely *The Journal of the West African Institute for Oil Palm Research*; the areca nut palm (*Areca catechu*); the teddy bear palm (*Dypsis leptocheilos*) having leaf sheaths covered with fine reddish-brown hairs; the palmyra palm (*Borassus flabellifer*) that yields sap which is converted into jaggery; the talipot palm (*Corypha umbraculifera*) that flowers only once and then dies; the widely cultivated Indo-Pacific coconut palm (*Cocos nucifera*); the most historic of all palms, the date-palm (*Phoenix dactylifera*); the highly ornamental lady palm (*Rhapis excelsa*); the royal palm (*Roystonea regia*); the queen palm (*Syagrus romanzoffiana*), and the tangled and treacherous canes. The book indeed is an admirable effort that would not be possible without intense field work and critical laboratory study on this fascinating group of palms. It is informative, botanically accurate, and is copiously supported with elegant colour photographs, a work of great passion, deep commitment and scholarship of Bhat. It is also a welcome and timely contribution that greatly adds to our knowledge of plant diversity in general and palms in particular in Karnataka.

Moving through a detailed study, Bhat introduces the various species of this extraordinary group of plants and their distribution with a note on their importance as a valuable bio-resource to mankind and other life forms. Both palms and canes are an immense source of raw material for they are part of the truly productive photosynthetic income of the world. They are next only to cereals and legumes in importance to mankind. They contribute more carbohydrate, lipids, pollen, honey and fruit to tropical wildlife than any other family of plants. Bhat then moves on to the most pertinent information required, that is, the characteristics (morphology) that makes a plant a palm or a cane. While the palms are most distinguished with their characteristic columnar stem crowned with giant leaves, the abundant rattan palms (canes) hang from the trees, turning and twisting about on the ground, often in inextricable confusion. The chapter concludes with a key to the various genera to resolve identification pitfalls of the difficult-to-identify members of this group.

The bulk of the book is devoted to extensive notes on 79 species of palms and canes from 42 genera, their systematic treatment, and clear-cut differences among species followed by information on each one of them in crisp botanical terms. With his characteristic attention to detail, Bhat has picked such features in each species that set it apart from others. To highlight some, occurrence of milky latex in the leaf stalk of *Calamus prasinus*, fruit scales channelled in *Calamus dransfieldii*, fruit scales black and shiny in *Calamus huegelianus*, three-veined nature of leaflets in *Calamus karnatakensis*, flagella modified into suckers in

Washingtonia filifera (desert fan palm).

Calamus lacciferus, fruit beaked in *Calamus viminalis*, fruit turning black when ripe in *Phoenix loureiroi* var. *pedunculata*, radially spreading leaf blade lobes in *Rhapis excelsa*, stem clothed with delicate black fibres in Formosa palm (*Arenga engleri*), stem strongly marked with spiral ridges and furrows in Gebang palm (*Corypha utan*), long and gracefully arching leaves of bottle palm (*Hyophorbe lagenicaulis*), simple forked leaves of metallic palm (*Chamaedorea metallica*), and ringed stem and red leaves in sealing-wax palm (*Cyrtostachys renda*). Bhat also provides details such as preferred habitat, common name, economic importance for each species and additionally the country of origin in the case of exotic species. A useful glossary of botanical terms that explains the meaning of scores of technical terms used follows. The book concludes with references and indices of scientific and common names.

This book, no doubt, has a great reference value. The endeavour of bringing out a good reference document on the palms of Karnataka, a precious component of the state's flora, seems to have been achieved with this publication. The readers will find that Bhat not only writes with great authority, but also with clarity – one that very few botanists would have been qualified to do. The book design and layout are also aesthetically appealing and it is moderately priced. This guide will help recognize every palm one is likely to come across in our cities and/or in the wild. It should be in the collection of every student of botany, as well as ecologist and conservationists. Aakrithi Prints need to be complimented for the impressive design and printing of the book. I would not, of course, conclude without offering a suggestion or two that might make a second edition more informative. A map marked with location of collections made for indigenous palms and canes would have been a valuable addition, for it helps in their conservation and sustainable exploitation.

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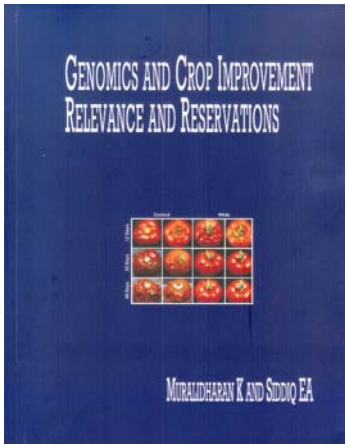

Genomics and Crop Improvement: Relevance and Reservations. K. Muralidharan and E. A. Siddiq (eds). Institute of Biotechnology, Acharya N. G. Ranga Agricultural University, Rajendranagar, Hyderabad 500 030. 2011. x + 438 pp. Price not mentioned.

The last 20 years have seen a spurt in the quantum and quality of crop improvement research in the country using molecular biology tools and techniques. This change was probably triggered in the early 90s by liberal grants from international organizations like the Rockefeller Foundation, for crop biotechnology research and capacity building. Even after the international donors disappeared from the scene the pace has not slackened, thanks to the increasing support from our Government, most significantly through the Department of Biotechnology (DBT).

The major outcomes of this two-decade old thrust on molecular approaches for crop genetic enhancement are more-or-less captured in this book, which is a collection of articles discussed at a national symposium organized a few years ago. The editors, Muralidharan and Siddiq, have done well to group these articles under major topics like genetic resources, yield, stress tolerance and quality improvement. There are two articles on genetic resources – one on the sequencing and genotyping technologies and resources for improving semi-arid tropics legume crops, and the other on strategies for genetic enhancement of rice leveraging the whole genome sequence now available from several rice lines. The former gives a fair glimpse of the facilities and competence that is available at the Centre for Excellence in Genomics (CEG) at the International Crop Research Institute for Semi-Arid Tropics (ICRISAT), Hyderabad, a centre extensively supported by DBT. This centre is mandated to provide genotyping services to researchers all over the country, and therefore the information in this article would be particularly useful to scientists at other centres who are engaged in marker aided selection (MAS) and other genomic technologies for crop improvement.

The seven articles grouped under the general title 'Yield', deal with diverse research programmes ranging from the use of quantitative trait loci (QTLs) for yield and yield components to transgenic approaches for protecting yields under abiotic stresses by the ectopic expression of proteins involved with the unwinding of nucleic acids. The exploitation of hybrid vigour or heterosis to boost yields in the hybrid varieties of crop plants is an age-old strategy to increase crop productivity. The challenge, however, has been to fix the hybrid vigour through generations so that the need to cross specific parents in every seed production cycle is obviated. One of the approaches towards this end has been to induce apomixes (seed formation without sexual fusion) in the vigorous hybrids; however, this has met with limited success so far. A conceptual note on engineering apomixes for fixing hybrid vigour by Imran Siddiqui, Centre for Cellular and Molecular Biology (CCMB), Hyderabad, whose group has recently published some seminal papers on the formation of gametes without the normal reduction division, is included in this section.

A majority of the articles in this book deal with the development of stress

Polished seeds of primary transgenics (T_1) showing yellow endosperm of golden rice due to integrated carotenoid pathway. White seeds represent the non-integration of the carotenoid gene due to meiotic segregation. (Datta *et al.*, 2006.)