

mentation of pollution control standards. The authors suggest four institutional arrangements with varying degrees of State control; present marginal cost strategy for industrial water pollution control; list a long menu for further research; and recommend that CAC and MBIs mix be experimented in India, to evolve an optimal mix, over a timeframe of five years.

A substantial part of the book addresses itself to well-known economic theories on MBIs. While the attempt in 1997 should have been to assess the success, if any, of the 1992 policy statement with substantial data available on state of environment in India; the authors rely on limited information even from still-limited literature, and consultations they undertook in compiling information for research. The research is based on the normative theory of externalities while the internalization of environment concerns in the process of economic development is the stated policy of the Government of India. Even in this seemingly limited approach to the research, there is serious lack of comprehension on the part of the authors on the intricacies of the science and technology of pollution control, e.g. units of measurements, description of unit process and operations deployed for pollution control in industrial establishments, proxies deployed for pollution, and the differentiation between the hazardous and non-hazardous wastes. The seminal issue in pollution control of small and medium enterprises has not even been referred despite common knowledge on their contribution to economy, employment generation and pollution. So is the case with the nonpoint sources of pollution.

The authors generate a scenario in their research wherein a relationship is derived for incentive/reward system for corrupt inspectors of pollution control systems. Such prescriptions overlook the dire need for corruption-free governance of environment-related measures. The focus on lack of accountability and professionalism at the top of hierarchy in pollution control boards and other environmental management institutions is ignored in the research. Simplistic statistics has been deployed to describe complex nonlinearities, and even this statistics suffers from the problem of dimensionality (basic principle in mathematics of rational equations) arriving at conclusions which violate the

laws of thermodynamics, as also the commonplace commonsense.

The authors believe in neoclassical theory of unlimited growth without recognizing the limited carrying capacity of the biosphere, are unaware of the mandate of the Central Pollution Control Board on establishment of assimilative capacity-based ambient environment quality standards, existence of a mechanism of industry committee in establishment of Minimal National Standards (MINAS), and the concept of atomic economy in industrial operation. The research guided by *economic definition of waste* oblivious of the *ecologic* definition, and the fact that such wastes are the only renewable resource for economic growth in foreseeable future in India is ignored.

The emergence and acceptance of the concept of sustainable development over a decade now since its inception should have warranted an analysis of the visions of sustainability in India *inter alia* incorporating pollution prevention and atomic industrial economy on the premises of *nothing to waste* through environmental management tools like Life Cycle Assessment, structural economic change based on ecologic premises, cleaner production paradigms, and carrying capacity based planning for socio-economic development to minimize ecological loading ratio and environmental degradation index, while maximizing equity in quality-of-life.

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**Tropical Mycology.** K. K. Janardhanan, C. Rajendran, K. Natarajan, D. L. Hawksworth eds. Oxford & IBH Publishing Co. Pvt Ltd., 66 Janpath, New Delhi 110 001. Price: Rs 650. 315 pp.

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It is an honour and privilege to be invited to review this commemoration volume on *Tropical Mycology* dedicated to C. V. Subramanian, a distinguished Indian mycologist of international repute, on his seventieth birthday. The 20 chapters cover

a wide range of important and interesting mycological topics ranging from fungal biodiversity, ecology and systematics to molecular taxonomy, mycoses and secondary metabolites. The well-written articles bring out in perspective recent developments in combination with sufficient classical information to provide the reader with a focused knowledge base on basic as well as application-oriented aspects of mycology. The articles on fungal biodiversity clearly emphasize the urgent need for 'strengthening' and 'turning into reality' the intensive exploration and exploitation of the tropical mycoflora, which unfortunately has been largely neglected in the tropical countries themselves. Mycological studies under collaborative programmes such as BIONET- INTERNATIONAL require further amplification with a greater degree of participation from the laboratories located in the tropical regions, to make them more meaningful and for a better understanding of tropical mycology.

Understanding the ecology and distribution of fungi is a vital aspect of mycology and as pointed out by Natarajan and Kolandavelu (chapter 8), temperate fungi may also occur in the higher altitudes of tropical zones. There is a need for greater focus on this aspect from the tropical mycologists, as it will help in a better understanding of factors related to global fungal distribution.

Chapters related to specialized fungal groups like grass endophytic fungi (chapter 11 by Janardhanan and Absar Ahmad), thermophilic fungi (chapter 17 by Maheshwari), pathogenic groups like *Cryptococcus* (chapter 19 by Swinney and De Vroy), several fungal genera associated with tropical subcutaneous mycoses (chapter 20 by Rajendran and Ramesh), and mycotoxins in food (chapter 16 by Biligrani and Sinha) provide well-documented information to mycologists whose interest would be kindled to initiate new research projects after studying the respective chapters.

Relatively less investigated taxonomic groups in the tropics include aquatic fungi and slime molds and the chapters by Marvanova (chapter 12) on aquatic hyphomycetes and by Indira Kalyanasundaram (chapter 13) on slime molds would help focus better interest among tropical mycologists on these little studied groups. Molecular systematics is a topic of great importance and interest and at

present has been even advocated as a 'true' alternative to classical mycology based on morphological features, the basis on which Subramanian recognized and described numerous new genera and species of tropical fungi. Kurtzman (chapter 15) while discussing molecular systematics of yeasts and yeast-like fungi has rightly sounded the note of caution on drawing 'erroneous' conclusions from molecular data without due recognition of the 'extent of natural variation'. Moncalvo (chapter 1) has extensively discussed the molecular biological methods applicable to fungal systematics and has made an optimistic statement that 'technical improvements will make molecular biological methods easier, faster and cheaper' (p. 20) while admitting, 'we

urgently need modern monographs for all taxa already existing'.

Reflecting on these statements, I would like to comment that there is urgent need to explore natural fungal diversity from diverse habitats around the globe and make comparative *in vitro* studies on different strains to assess their biological and genetic diversity. Many genera described have remained monotypic and often not observed or cultured for a second time. Naturally the knowledge base on their biodiversity is almost non-existent. This unfortunate situation has to improve, which can only happen when tropical mycologists take up the exploration and *in vitro* cultural studies of tropical fungi with a missionary zeal.

Two additional chapters that in my

opinion would have made this informative book even more precious to mycologists are (i) a chapter on the relative merits and demerits of both classical and molecular taxonomy of fungi and how to decide on a blend of both the aspects for meaningful results, and (b) fungal biotechnology products including use of fungi as hosts for heterologous expression of eukaryotic proteins—a topic of great importance and significance to the advancing frontiers of commercial biotechnology in the 21st century.

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