

ductance, foliar SO_2 content, buffering capacity, nitrate reductase activity, foliar protein, proline content and lipid peroxidation was studied. The authors have concluded that grassy weeds were studier than dicot weeds.

Chapters 6, 9 and 10 deal with vehicular pollution. Rao and coworkers, have presented data on monel metal and sponge iron catalysts for the control of emissions in spark-ignition engines. The conversion efficiency for CO was 65 and 70%; for sponge iron/monel and for hydrocarbons the conversion efficiency was 70 and 55% respectively.

However, vital questions such as life of the catalysts, recycling and poisoning aspects were not addressed. Bhatt and Washi have presented a study of the environmental impact assessment for Baroda-Ahmedabad expressway link using the Gaussian model, and air pollution index to predict Si values for CO, NO_2 , photochemical oxidants, total suspended particulates, SO_2 and noise levels. This is a review type of paper. Strategies to control diesel emission is also a review paper which lays stress on the combined use of EGR and methanol fumigation to control NO_x and particulate emissions.

Chapters 11, 12, 15, 17-19 address the ecological aspects of air pollution. Undoubtedly, these are the most informative chapters in the whole book with all the authors from the faculty of science at M. S. University of Vadodara. The most interesting article in this category is the study of aeromicroflora of an Egyptian mummy chamber. Among zygomycotina, ascomycotina and fungi imperfecti, only ascomycotina was found to be dominant which produced white-coloured patches on the fingers of the mummy. Among the eight fungi isolated, a new fungi type, *E. nivea* was detected. What is important is the confirmation of *E. nivea* by Agarkar Research Institute, Pune.

A similar study of the aerospora affecting ornamental plants indicated the presence of two potential plant pathogens, viz. *Colletotrichum gloeosporioides* and *N. sphaerica*. The identification was confirmed by the Indian Type Culture Collection, IARI, New Delhi. Again, this is a new occurrence in ornamental and medical plants.

In 1984, IPCL set up an eco-farm with a pond filled with treated effluents, and 70 varieties of plant species comprising grass, shrubs, trees, bamboo groves and roses were planted. A small forest area

was also created. Padate and Sapna conducted a survey of potential avifauna sheltering arboreal and terrestrial species. They identified 94 bird species. Of the total 123 species listed, 52 had been identified in a 1988 study and 44 new bird species were found during the present study. The impact of untreated effluents on birds is well-known and the fact that 31 species of aquatic birds were spotted all through the year is indicative of the success of the eco-farm using treated effluents. This could serve as a model for other industrial units. Chapter 18 deals with the removal of toxic metals by Gyanoderma, a fungal biosorbent. Since the binding capabilities of biomass are comparable to commercially available synthetic cation exchangers, biosorption is an effective means of concentrating and removal of toxic heavy metals. Unfortunately, the paper does not provide any experimental data even on laboratory-scale.

Chapter 19 refers to the effect of acid rain on wheat plants. The authors have presented results on simulated acid rain studies on a split plot under standard conditions of humidity and temperature. It is an exhaustive study recording the morphological parameters of two plant species, viz. *T. aestivum*, CVM 213 and Sonalica varieties. Using acid rain of pH 5.6, 4.5 and 3.0, the authors were able to quantify the yield reductions also. Such studies are important to understand the impact of acid rain on plants. More investigations are needed on a variety of plants. Probably, the yield quantity is also an important factor which could have been studied.

Section II is a collection of invited papers on pollution monitoring, assessment and solutions. Chapter 20 addresses these problems. Unfortunately, the paper does not contribute any additional knowledge. Environmental legislations, legal framework, pollution abatement policy and governance are briefly described in the next chapter. Details of ISO 14001 and 14031 are described in the next two chapters, which again disappoint in terms of contents. The same is true of the monitoring of man-made pollutants and environmental audits described in the next two chapters. Only elementary considerations are described in chapters 26, 27 and 29 on environmental health effects, role of monitoring and population explosion and pollution. On the other hand, chapter 28 on ozone depletion

is somewhat up-to-date within its technical concepts.

However, all this is not to say that the matter presented at the symposium is of poor quality. It is quite possible that the deliberations of the symposium might have contained state-of-the-art information, but when converted into the book form the value of the symposium stands diminished. Some typing and printing mistakes are also seen, but they are few and far between. I would recommend the book to libraries for keeping track of air pollution research in India.

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In Vitro Plant Breeding 2002. Acram Taji, Prakash Kumar and Prakash Lakshmanan (eds), Food Products Press, An Imprint of Haworth Press, 10 Alice Street, Binghampton, NY13904-1580, USA. 2002. 167 pp. Price not mentioned.

In Vitro Plant Breeding is one among several books published in this area of intense research. However, what makes it special is its attempt and approach at filling in the gap in understanding among the mushrooming number of molecular plant breeders. The emergence of plant biotechnology has resulted in the required impetus to the area of plant molecular biology. Yet what is often overlooked is that the success to genetically engineer plants with desired traits depends entirely on one's ability to regenerate plants from the transformed cells/tissues. Thus, for the modern-day plant breeder this book will form an integral source of the basic concepts of plant tissue culture and its applications, and complement the conventional methods of plant breeding.

This text serves multiple purposes. It serves as a reference book for the undergraduate students, highlighting the basic principle and the application of a diverse array of topics. It also acts as a guide to more experienced researchers in the areas of traditional plant breeding and modern molecular biology, wanting to learn the potential and applications of various *in vitro* tools and techniques.

The book encompasses a wide range of topics such as classic morphogenesis, haploid production, *in vitro* mutagenesis, cryopreservation to somatic hybridization, utility of cell cultures for desirable traits, source and significance of somaclonal variation. It also discusses *in vitro* micrografting, tuberization, flowering and molecular markers from the applied perspective.

The interdisciplinary nature of the book makes it especially appealing to the student community and introduces the specialists to the wide array of applications of *in vitro* techniques in plants. This compilation of techniques will thus serve as a handy reference book devoid of the usual series of recipes. It does not attempt to provide a comprehensive review of the subject. Rather, it focuses on the basic principles and is uncluttered with individualistic references.

The book is informative, well-written and offers a fine compilation of useful practical information. In short, it is a simple, straightforward yet elegant way of introducing the basic concepts of *in vitro* techniques and highlights their applications in the field of modern plant breeding. A handy reference book for the beginner and a ready reckoner for the professional plant breeder!

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Biological Control of Insect Pests.
Ignacimuthu, S. and Jayaraj, S. (eds)
Phoenix Publishing House Pvt Ltd, 21
Prakash Apartments, 5 Ansari Road,
Daryaganj, New Delhi 110 002. 2003.
363 pp. Price not mentioned.

Although insects are in an integral part of the ecological web, insect pests are responsible for 25–30% loss of the world's food production every year. The legendary method for their control is the use of insecticides. This is discouraged due to environmental and health risks. Bio-

logical control on the other hand, involves the manipulation of biological systems by deliberate intervention to achieve control of noxious organisms. The reason for over-population of a particular species is due to ecological disturbance caused by mass cultivation practices. At this point of time, it becomes inevitable to control them by various methods for the sake of human welfare. Constraints on the use of chemical pesticides may benefit the development of biological control options and their implementation in an integrated pest management (IPM) programme. Practically, all insect pests have one or more natural enemies. Conservation of these natural enemies will decrease the pest population. Use of insecticides will worsen the situation, as they cover a broad spectrum as well as affect genetic diversity; thus usage of insecticides with selective range is recommended. Further, identification of biological control organisms needs a thorough knowledge of pest biology and its natural enemies. Demand for biological control of insect pests is increasing in India. This approach is assumed to be legal and environmentally safe. However, large-scale on-farm trials are a prerequisite.

The book under review provides up-to-date information on the current status of basic and advanced aspects of insect pest control (IPC) in India. A national symposium on 'Biological control of insect pests' was organized at the Entomology Research Institute, Loyola College, Chennai during 7–8 February 2002. Crop losses due to insect pests and possibility of their control by microbial and botanical pesticide usage, pest management, natural pest control, availability of biocontrol agents, insect pheromones and role of taxonomy in biological control, and problems encountered in insect identification were discussed. The outcome of the symposium is the book under review. It contains research articles regarding management of various insect pests on commercial and forest plants, by well-known scientists from India. The book has 54 articles covering mostly the major crop pests. Each article reflects on an alternative remedy in the form of eco-friendly bioagent identification for IPC. The editors have authored seven papers. There are also useful review articles and

new research results. The most important aspect is the finding on compatibility of insecticides with bioagents as an IPM package. A solution for major plant pests of paddy, sugarcane, cotton, mulberry, tobacco, coconut, vegetables and forest inhabitants has been presented. The article regarding the role of taxonomy in pest control is interesting. There are also investigations involving more than one pest of the same crop, effectiveness of bioagent release on pest population and varietal resistance. Findings on transfer of technology demonstrate the beneficial effects of biological agents and ultimately provide light on cost-benefit returns to Indian farmers.

Among several books available on biological control of insect pests, this book gains special attention due to its latest updates on insect pests and their control. Limitations in the form of covering success stories of all Indian major/minor crops under field conditions and constraints regarding adaptation of biological control of insect pests could have enhanced the value of the book. Photographs of pests and their natural enemies would have helped in their identification.

The title should have been in the context of IPC in India, since the book concentrates on research in this direction, with selected plant pests under Indian conditions. However, the scenario at the international level has been presented in almost all articles and is well-illustrated with graphical representation. Only a few typographical errors can be found. The edited book contains an author index and also a pest, biocontrol agent and crop index, which have added to its value. The book may be useful to teachers, students and young researchers working on IPC. The editors have done an excellent job by compiling these scientifically impressive articles into a publication.

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