

Prithipalsingh

Perspectives in Plant Ecology and Environmental Biology



**PERSPECTIVES IN PLANT
ECOLOGY AND
ENVIRONMENTAL BIOLOGY**

PERSPECTIVES IN PLANT ECOLOGY AND ENVIRONMENTAL BIOLOGY

**KIRORIMAL COLLEGE
GOLDEN JUBILEE COMMEMORATIVE VOLUME**

Editor
PRITHIPALSINGH



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Foreword

“Peace on Earth depends on our ability to secure our living environment”

— Nobel Peace Prize Citation – 2004

“The environment is very important in the aspects of peace because when we destroy our resources, they become very scarce and we fight over that”

— Wangari Maatthai, Nobel Peace Prize Winner – 2004

Books such as “Silent Spring” by Rachael Carson, “Deserts on the March” by Paul Sears, and “The Quiet Crisis” by S.L. Udal attracted the attention of mankind on several important ecological issues. Similarly, compilations such as “The Global Environmental Outlook Series”, and “The Millennium Report on the Environment” have enlightened us on the need to understand the complex interrelationships in nature. The present volume commemorating the Golden Jubilee of Kirorimal College presents current knowledge in different areas of the environment. Dr. Prithipalsingh has done a commendable job in collecting the different contributions from eminent scholars. The volume shall serve as a very valuable source of information to teachers and students.

I.M. Kapahi

Convenor, Golden Jubilee Celebration Committee

Bhim Sen Singh

Principal

Kirorimal College

Preface

*“Knowledge is not gained through one means alone.
Whether that is talked of as Science or Religion
Or the Intuition that integrates all
Or Imagination, Emotion or Greater Reason”*

**“Years of Pilgrimage”
- a long poem by Tim Cloudsley**

Ecology is the oldest science and the most primitive humans must have been ecologists of some kind. They were required to understand where and when to look for their food and other needs as well as to protect the same. In this context, primitive humans learnt about the distribution and abundance of the plants and animals beneficial/harmful for their survival. This led to the management of their natural resources by allowing them to:

- maximize the rate at which food is collected from natural environments, and how this can be done repeatedly over time;
- how domesticated plants and animals can best be planted or stocked so as to maximize rates of return;
- how food organisms can be protected from their own natural enemies;
- how to control the populations of pathogens and parasites that live on us.

In the early days of this science, the term commonly used for referring to these activities of humans was ‘Natural History’. The term ‘Ecology (originally in German: *Oekologie*) was first defined in 1866 by Ernst Haeckel as “the comprehensive science of the relationship of the organism to the environment”. More recently, Ricklefs (1973) in his textbook (*Ecology*, Nelson, London) defined ecology as “the study of the natural environment, particularly the interrelationships between

organisms and their surroundings". This has led to the recognition of "Environmental Biology" as a sub-discipline encompassing ecology in all its facets.

In compiling this volume to commemorate the Golden Jubilee Year of the establishment of Kirorimal College, it has been my endeavour to focus on the growing awareness about plant ecology and environment biology. The different contributions present an up-to-date, detailed and balanced overview of the current knowledge within specific topics. The volume is meant to serve as a useful reference book for graduate and post-graduate students.

Planning and publishing a book is a challenging task. It becomes easy when one receives co-operation from different individuals. This must be acknowledged. It is therefore a pleasure to record my gratitude to the people who helped me in compiling this Golden Jubilee Commemorative Volume. First and foremost, I must acknowledge the fact that I learnt many aspects of Plant Ecology from my teacher, Professor K.M.M. Dakshini, an ecologist, plant taxonomist, field biologist, and a true naturalist. He has been a constant source of guidance and inspiration. The Principal of Kirorimal College, Dr. Bhim Sen Singh, and the Convenor of the Golden Jubilee Celebration Committee, Shri I.M. Kapahi encouraged me in this task and I am grateful to them. They provided me with all necessary support required for the successful completion of this endeavour.

I am grateful to all the contributors who readily responded to my request and shared my enthusiasm by sending me their articles for editing and inclusion in the volume. They very generously accepted the suggestions made by me and incorporated the same in their contributions. Without their support and co-operation, this task would have been impossible. I also thank the publisher (Shri Pawan Kumar Sharma and his team) for the concerted effort of taking this volume from manuscript into print and doing a commendable job.

I also thank all my colleagues in the Department of Botany, Kirorimal College, for their encouragement and valuable co-operation. Last but not the least, the support from my family helped me in this task. Very special thanks to my wife, Avinash and daughter, Ishleen for accepting my work schedule during the editing of this volume.

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