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# Entomopathogenic Nematodes and Their Symbiotic Bacteria

**A Laboratory Manual**

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## Foreword

The use of chemical pesticides in agriculture raises the concern about their hazardous effects on the environment. There is a need for a change in crop protection methods that are safe to humans and environment.

Entomopathogenic nematodes with their symbiotic bacteria play an important role in the field of insect pest management. As these nematodes are eco-friendly, they are used worldwide as biocontrol agents as an effective alternative solution to chemical pesticides. Entomopathogenic nematodes are currently receiving most attention for their bio-efficacy.

This book is a complete systematic approach to various entomopathogenic nematode procedures which help in identifying and characterizing them for agricultural pest management.

The commitment and the efforts put forth by the authors Dr. S. Sivaramakrishnan, Professor and Head, Department of Biotechnology, Bharathidasan University, Tiruchirappalli, and Dr. M. Razia, Assistant Professor, Department of Biotechnology, Mother Teresa Women's University, Kodaikanal, in designing this manual is highly appreciated and welcomed. Thoughtfully planned and expertise care is taken to pool all the relevant features of entomopathogenic nematodes and their symbiotic bacteria in a single manual in a well-organized manner, signifying the uniqueness of this manual. The contents are lucid and noteworthy. The protocols included are clearly defined and stepwise. This book will surely meet the laboratory challenges and will be a valuable resource to the readers.

This laboratory manual is an excellent contribution of the authors to the discipline of nematology and will definitely do good to the hands of bio-application.

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*P. Manisankar*  
29/08/2020

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## **Preface**

Realizing the importance of the entomopathogenic nematodes and their symbiotic bacteria as biocontrol agents, it was our desire and dream to pen our knowledge and research experience and give it a shape in the format of this laboratory manual. This manual focuses on the potential application of an array of laboratory methods and techniques for studying and evaluating entomopathogenic nematodes and their symbiotic bacteria.

The available study materials on practical approach for work with the entomopathogenic nematodes are very much scattered. The descriptions provided in other chapters and books are in a broader sense. At times, there is a difficulty to find a set of techniques in a required time in a single book. In some instances, the protocol varies with different scientists. So a necessity was felt to produce a new resource in this area, and this manual was intended to fill the need. In this manual, we provide simple procedures to execute the experiments in an easiest way.

This book is a compilation of the basic works necessary for insect pest management using entomopathogenic nematodes research. The important aspects and techniques for EPN and their symbiotic bacteria are compiled into a single book with modifications to suite our laboratory conditions in a nutshell, described in a simplified, clear, and understanding manner. The protocols are adapted from various published protocols. This book concisely deals with host insect rearing, nematode sampling, isolation techniques, characterization including morphological, molecular, and ecological studies, mass production, virulence bioassay, field application, and efficacy. It also includes similar methods and techniques for their associated symbiotic bacteria. This will not only give a comprehensive knowledge to the reader but also provides a practical guideline to those who are seeking to learn and apply the techniques.

It is highly expected that this book will definitely meet the requirements of researchers, nematologists, entomologists, microbiologists, and any scientist who are working at insect pest management research laboratories as well as different industries and academic institutions. This book will surely find its wider application for current as well as for future researchers as an easy reference handy material.

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*M. Razia*

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We thank all the nematologists and the scientists for their contributions which served as a basement for our book.

Dr. S.S. extends his sincere appreciation to his student, Dr. R. Karthik Raja for his diligence, loving assistance, and cooperation in this project and at all times.

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