Biopesticides are certain types of pesticides derived from such natural materials as animals, plants, bacteria, and certain minerals. Agricultural pesticides, properly used, are essential in supplying the food requirements of the world ever growing population. The use of synthetic pesticides affects the health of human being. The indiscriminate use of pesticides has adversely affected the health of the soil. The residual pesticides in the soil not only affect the soil quality but also the water quality, as they get leached into the ground water. Due to these reasons, role of biopesticides are very important for sustainable agriculture. The use of biopesticides for sustainable agriculture is a complex issue that at times is difficult to comprehend and plan. Biopesticides are usually inherently less toxic than conventional pesticides. They generally affect only the target pest and closely related organisms, in contrast to broad spectrum, conventional pesticides that may affect organisms as different as birds, insects, and mammals. They often are effective in very small quantities and often decompose quickly, thereby resulting in lower exposures and largely avoiding the pollution problems caused by conventional pesticides. Biopesticides, key components of integrated pest management (IPM) programmes, are receiving much practical attention as a means to reduce the load of synthetic chemical products being used to control plant diseases. In most cropping systems, biological pesticides should not necessarily be viewed as wholesale replacements for chemical control of plant pests and diseases, but rather as a growing category of efficacious supplements that can be used as rotation agents to retard the onset of resistance to chemical pesticides and improve sustainability. In organic cropping systems, biopesticides can represent valuable tools that further supplement the rich collection of cultural practices that ensure against crop loss to diseases. Some of the examples of biopesticides are triazino benzimidazol, thiophene sar, pyrazoles, hydroxyacetophenones, benzoylphénylureas, thiadiazolo S triazine etc. It is observed that India occupies a comparatively better position in the arena of biopesticides; in terms of growth of usage, percentage share of the total pesticide market and also in research publications. The driving forces behind this progress are identified as huge research infrastructure (universities and bio control labs) and favourable public support system/policies. Subsequently, it delves on strategies to incorporate the promotion of biopesticides into rural development efforts like recognition of the huge traditional knowledge base and use of biopesticides developed using indigenous technologies.

Some of the fundamentals of the book are synthesis of triazino benzimidazol as 1 biopesticides, synthesis and pesticidal activities of thiadiazolo S triazine and imidazol, synthesis and antimicrobial activities of pyrazoles, effects of penconazole on plasma membrane, metabolism of diclofop methyl, bleaching herbicides stimulate maize HMGR activity, soil transformation of acetochlor, propanil degrading amidase activity, inhibition of BTX B binding by RH 3421, KDR type resistance in German cockroach etc. This is the first book of its kind which provides different parameters about biopesticides. The book will not only be resourceful for new entrepreneurs but will also help the technocrats, research scholars and those who willing to know more about biopesticides.
Contents

1 SYNTHESIS OF TRIAZINO BENZIMIDAZOL AS 1 BIOPESTICIDES
   Antimicrobial Activity, Experimental

2. STUDIES ON COUMARIN DERIVATIVES
   Experimental Procedure

3. SYNTHESIS AND INSECT GROWTH REGULATING ACTIVITY OF BENZYLPHENYLUREAS
   Experimental Procedure, Synthesis, Insect Growth Regulating (IGR) Activity against Mosquito Vectors

4. SYNTHESIS AND PESTICIDAL ACTIVITIES OF THIADIAZOLO-S-TRIAZINE AND IMIDAZOL
   Fungicidal Activity, Bactericidal Activity, Herbicidal Activity, Experimental

5. SYNTHESIS AND FUNGICIDAL ACTIVITY OF THIAZOLIDINE AND 2-ARYL INDOLES
   Fungicidal Activity, Experimental

6. SYNTHESIS AND BIOLOGICAL ACTIVITY OF BENZOTHIAZOLE/BENZOXAZOLES/
   BENZIMIDAZOLES/IMIDAZOLIDINES
   Biological Activity, Experimental

7. ANTIMICROBIAL AGENTS
   Antifungal Activity, Experimental

8. SYNTHESIS AND ANTIMICROBIAL ACTIVITIES OF PYRAZOLES
   Biological Testing, Experimental Procedure, General Procedure

9. SYNTHESIS AND INSECTICIDAL ACTIVITY OF NEW SUBSTITUTED HYDROXYACETOPHENONES
   Insecticidal Activity, Experimental Procedure

10. SYNTHESSES OF SULFANILYL DERIVATIVES
    Biological Activity, Experimental Procedure

11. QSAR OF FLURIDONE
    Materials and Methods, Results and Discussion

12. INTERFERENCE OF FLURIDONE
    Materials and Methods, Results, Discussion

13. ABSORPTION AND METABOLISM OF CLOMAZONE
    Materials and Methods, Results, Discussion

14. ANTIDOTE MODE OF ACTION

15. DICLOFOP RESISTANCE IN AVENA FATUA
    Materials and Methods, Results, Discussion

16. EFFECTS OF PENCONAZOLE ON PLASMA MEMBRANE
    Materials and Methods, Results and Discussion, Conclusions

17. MECHANISM OF RESISTANCE TO ABAMECTIN
Materials and Methods, Results, Discussion
18. QSAR OF m-PHENOXYBENZYL ACRYLATES
Materials and Methods, Results and Discussion
19. CHLORIMURON ETHYL METABOLISM IN CORN
Materials and Methods, Chemical, Plant Treatment, Extraction of Tissue, Chromatography, Purification of Metabolites for Mass Spectrometry, Mass Spectrometry, Nuclear Magnetic Resonance (NMR) Spectrometry, \( \beta \)-Glucosidase Hydrolysis, Results, Uptake and Metabolism of Chlorimuron Ethyl, Detection of Metabolites, Chlorimuron Ethyl, Metabolite, Discussion and Conclusions
20. SUPEROXIDE DISMUTASE INHIBITION BY \( \beta \)-TERTHIENYL
Materials and Methods, Discussion
21. PARATHION METABOLISM BY SOYBEAN LIPOXYGENASE
Materials and Methods, Results, Discussion
22 DEPOLARIZATION STUDIES OF PYRETHROIDS
Materials and Methods, Results, Depolarization of the Resting Membrane, Depolarizing Activity in Axonal Membranes, Relationship between Neuroblocking and Excitatory Potencies and Depolarizing Potency, Relationship between the Insecticidal Potency and the Depolarizing Potency, Discussion
23. RATE OF KNOCKDOWN STUDIES OF PYRETHROIDS
Materials and Methods, Compounds, Hydrophobicity of Compounds, Knockdown Effect against House Flies, Membrane Potential of the Axon of American Cockroaches, Results, Knockdown Effect at the Earliest Stage and at the Steady State of Intoxication, Rate of Development of Knockdown, Effect of Structural Factors on the Rate of Development of Knockdown, Depolarization of the Axonal Membrane of American Cockroaches, Effect of Structural Factors on the Rate of Depolarization of Cockroach Axonal Membranes, Discussion
24. PHYSIOLOGICAL ROLE OF ARYL ACYLAMIDASE
Materials and Methods, Results, Discussion
25. THIOPHENE SAR
Materials and Methods, Results and Discussion, Toxicity of Thiophenes to Mosquito Larvae, Structure-Activity Relationships, Specificity of Thiophene Toxicity, Significance of Hydrophobicity to Phototoxicity
26. EFFECTS OF CHLOBENTHIAZONE ON AFLATOXIN BIOSYNTHESIS
Materials and Methods, Results, Discussion
27. BIOCHEMICAL STUDIES OF ESTERASES
Materials and Methods, Strains, Isoelectric Focusing, Molecular Weight Determination, Semipurification of Esterases, Kinetics, Results, Isoelectric Focusing, Molecular Weight Determination, Partial Purification of Esterases, Kinetic Analysis, Discussion
28. CYTOCHROME P450 IN P. ITALICUM
Materials and Methods, Results, Toxicity Studies, Isolation of Cytochrome P450, Stability of Cytochrome P450 at different PH, Type II Spectra, Displacement Tests, Discussion
29. PHARMACOKINETICS OF JHE IN INSECTS
Materials and Methods, Results and Discussion
30. OCTOPAMINERGIC ACTION OF CARBODIIMIDE METABOLITE OF DIAFENTHIURON
Materials and Methods, Results, Discussion
31. METABOLISM OF DICLOFOP-METHYL
Materials and Methods, Results and Discussion, Conclusions
32. HERBICIDAL STEROL BIOSYNTHESIS INHIBITOR
Materials and Methods, Plant Material, Yeast Material, Isolation of Microsomes, [14C] Mevalonate Labeling Studies, Chemicals, Sterol Extraction, Sterol Separation, Analytical HPLC, Identification of Sterols, Cytochrome P450 Spectra, Results, Discussion
33. ORGANOPHOSPHORUS AND CARBAMATE RESISTANCE
Methods, Results, Discussion
34. MODE OF ACTION OF N-PHENYLIMIDE
Materials and Methods, Results, Discussion
35. MODE OF ACTION OF FUNGICIDAL IMIDAZOLE-1-CARBOXYLATES
Materials and Methods, Fungicides, Antifungal Activity, Sterol Analysis, Binding Study, Results, Fungicidal Activity, Effect of Imidazole-1-Carboxylates on Sterol Biosynthesis, Binding of Imidazole-1-Carboxylates to Cytochrome P450, Discussion
36. DIAFENTHIURON HAS A NOVEL MODE OF ACTION
Materials and Methods, Chemicals, Animals, Topical Application and Toxicity Determination, In Vivo Distribution and Metabolites, Tests on Cuticle Formation, Acetylcholinesterase Assay, Ecdysone 20-hydroxylase Assay, Preparation of Mitochondria and Microsomes, Spectroscopy of Liver Cytochrome P450, Mitochondrial Respiration, Isolated Limulus Heart, Isolated Locusta Thoracic Neuronal Somata, Cockroach Giant Axon, Musca Larval Body Wall Neuromuscular Junction, Results, In Vivo Observations and Toxicity, In Vivo Distribution in Calliphora, Metabolism of Diafenthiuron and Binding to Cytochrome P450, Tests on Inhibition of Cuticle Formation, AChE, and Ecdysone 20-hydroxylase, Inhibition of Mitochondrial Respiration in Vitro, Isolated Limulus Heart, Isolated Locusta Thoracic Neuronal Somata, Cockroach Giant Axon, Musca Larval Body Wall Neuromuscular Junction, Discussion
37. RESPONSE TO METALDEHYDE IN SNAIL NEURONES
Materials and Methods, Results, Discussion
38. BLEACHING HERBICIDES STIMULATE MAIZE HMGR ACTIVITY
Materials and Methods, Results, Discussion
39. GLUTATHIONE S-TRANSFERASE AND DIAMONDBACK MOTH
Materials and Methods, Chemicals, Insects and Bioassays, In Vitro Degradation of some OPs, Inhibition of Acetylcholinesterase (AChE), Results and Discussion
40. SOIL TRANSFORMATION OF ACETOCHLOR
Materials and Methods, Results and Discussion
41. PROPANIL DEGRADING AMIDASE ACTIVITY
Materials and Methods, Results, Discussion
42. INHIBITION OF BTX-B BINDING BY RH 3421
Materials and Methods, Results, Discussion
43. KDR-TYPE RESISTANCE IN GERMAN COCKROACH
Materials and Methods, Results and Discussion

About NIIR

NIIR PROJECT CONSULTANCY SERVICES (NPCS) is a reliable name in the industrial world for offering integrated technical consultancy services. NPCS is manned by engineers, planners, specialists, financial experts, economic analysts and design specialists with extensive experience in the related industries.


NPCS also publishes varies process technology, technical, reference, self employment and startup books, directory, business and industry database, bankable detailed project report, market research report on various industries, small scale industry and profit making business. Besides being used by manufacturers, industrialists and entrepreneurs, our publications are also used by professionals including project engineers, information services bureau, consultants and project consultancy firms as one of the input in their research.

NIIR PROJECT CONSULTANCY SERVICES, 106-E, Kamla Nagar, New Delhi-110007, India. Email: npcs.india@gmail.com Website: NIIR.org