

## CHAPTER 57

### ZOOLOGY

#### Doctoral Theses

468. DADHWAL (Mandeep)  
**Characterization of Culturable Bacterial Community from High Dose Point HCH Contaminated Soils and Proposal of Biostimulation as an Approach for HCH Decontamination.**  
Supervisor : Prof. Rup Lal  
Th 15612

#### *Abstract*

Heavily HCH contaminated area around IPL was found due to unregulated production of lindane during 1997-2006. A dumpsite of area 100 x 100 m<sup>2</sup> that was created during this period was also located. Surrounding agricultural field of area 600 x 250 m<sup>2</sup>, around the HCH dumpsite was also contaminated with HCH residues. Area closer to industry and dumpsite was found to contain ΣHCH up to 4.3 x 10<sup>3</sup> µg/g of soil and 1.25 x 10<sup>5</sup> µg/g of soil, respectively. There was decrease in bacterial population with high concentration of HCH in soil samples. HCH degrading sphingomonads were isolated from highly HCH contaminated soil samples. Although, bioaugmentation did not work for decontamination of HCH dumpsite but biostimulation of the indigenous HCH degrading microbial population appear to be a good method for decontamination of HCH residues from high dose point HCH contaminated soil. The preliminary studies on ε-HCH degradation by lin genes revealed that Lin enzymes, LinA1, LinA2 and LinB act on ε-HCH but the intermediates produced could be quite different. Two new intermediates E1 and E2 were formed by the action of LinB on ε-HCH.

#### *Contents*

1. Review of literature.
2. Materials and methods.
3. Results.
4. Discussion. Summary, references and appendices.

469. DUBEY (Gyanendra Prakash)  
**Molecular Studies on Mechanism of Sporulation in Bacillus Anthracis.**  
 Supervisors : Dr. Sharmila Basu-Modak and Prof. Yogendra Singh  
 Th 15608

*Abstract*

Deales with the identification, cloning and characterization of the putative genes involved in the sporulation initiation phosphorelay of B. anthracis, and the comparative and functional analysis of aspartyl-phosphate phosphatases.

*Contents*

1. Introduction. 2. Review of literature. 3. Aims and objectives. 4. Materials and methods. 5. Identification, cloning and characterization of the putative genes involved in the sporulation initiation phosphorelay of bacillus anthracis. 6. Comparative and functional analysis of aspartyl-phosphate phosphatases. 7. Summary and conclusions. Bibliography and appendices.

470. GUPTA (Bhawna)  
**Cellular and Molecular Studies in Rheumatoid Arthritis.**  
 Supervisors : Dr. Hasi R. Das and Dr. Anju Shrivastava  
 Th 15611

*Abstract*

Investigates the association of polymorphisms of the MBL2 gene and the serum level with RA in Indian population. Gene specific PCR for MBL2 gene is carried out to study two SNPs in the proximal promoter (at position -550 and -221) and three in exon 1 (at positions 223, 230, and 239) of the MBL2 gene. The association of novel SNPs in the human MBL2 with RA is also investigated. the presence of anti-MBL autoantibodies in the sera of 107 RA patients and 121 control subjects by enzyme immunoassay is assessed.

*Contents*

1. Introduction. 2. Materials and methods. 3. Results. 4. Discussions. 5. Summary and conclusions. 6. Bibliography. 7. Appendix.

471. GOSWAMI (Supriya)  
**Biodegradation of Endosulfan by Soil Bacteria and Fungi.**  
 Supervisor : Dr. D. K. Singh  
 Th 15809

*Abstract*

In this biodegradation of endosulfan has been studied with the help of bacteria and fungi isolated from the soil. The chlorinated cyclodiene insecticide endosulfan (IUPAC name 6, 7, 8, 9, 10, 10-hexachloro-1, 5, 5a, 6, 9, 9a-hexahydro-6, 9-methano-2, 3, 4-benzo(e)dioxathiepin-3-oxide) is a mixture of two stereoisomer i.e.  $\alpha$  and  $\beta$  endosulfan in ratio of 70:30.

*Contents*

1. Introduction. 2. Literature review. 3. Materials and methods. 4. Result. 5. Discussion. 6. Summary. 7. Bibliography.

472. JOSHI (Adita)  
**Mutational Analysis of the Wnt Gene Region on Chromosome 2L of Drosophila Melanogaster.**  
 Supervisors : Prof. M. M. Chaturvedi and Dr. Shanti Chandrasekharan  
 Th 15609

*Abstract*

Describes different mutational approaches along with their merits and demerits. Chemical mutagenesis using EMS continues to be the favoured methods to acquire point mutations in Drosophila. A brief history of the Wnt genes along with the overview of Wnt signaling pathway is described. An overview of the genes in the greater wingless region with special mention on the Wnt cluster is also presented.

*Contents*

1. Review of literature. 2. EMS mutagenesis- $F_2$  lethal screen and inter-allelic complementation. 3. Gene mapping : Finding gene identities. 4. Developmental studies : Lethal phases and in-situ hybridization. 5. Study of alleles in the DWNT4 region. 6. Overexpression studies using UAS-GAL4 system. Bibliography and appendices.

473. MUKESH KUMAR  
**Sanger/Pyrosequencing Hybrid Approach for Sequencing the Genome of Rifamycin-Producing Actinomycete Amycolatopsis Mediterranei S699.**  
 Supervisor : Prof. Rup Lal  
 Th 15610

*Abstract*

Determines the genome sequence of rifamycin-producing actinomycete *Amycolatopsis mediterranei* S699. Sanger/pyrosequencing hybrid approach can be used for bacterial genome sequencing for which reference genome is available. Sequencing gaps occurring between contigs and scaffolds need to be closed. Contig and scaffold misassemblies which may incorrectly bring together different regions of the genome need to be corrected. The availability of the finished genome sequence of *A. mediterranei* S699 will provide insight into its biology and facilitate development of *A. mediterranei* strains to generate high-titer producers of rifamycin.

*Contents*

1. Review of literature. 2. Materials and methods. 3. Results and discussion. Summary and references.

474. PANDEY SHASHIBHAL MATACHARAN  
**Studies on ATP Dependent Chromatin Remodeling : Analysis of Compositional Heterogeneity in SWI/SNF Like Complex in Chicken.**  
 Supervisor : Prof. M. M. Chaturvedi  
 Th 15808

*Abstract*

The BRG1 and INI1 of hSWI/SNF or BAF complex, are crucial to the activity of this complex. Purification of BAF complex from various tissues and identification of their subunit composition in each case provide valuable information regarding role of these subunits in gene regulation. In silico analysis data revealed that most of the ATP dependent chromatin remodeling complexes found in human are conserved in chicken. Other subunits of chicken BAF such as BRM, BRGI, BAF57, BAF53, BAF60 and BAF47 demonstrate high degree of homology with their human counterparts.

1. Introduction. 2. Materials and methods. 3. Results. 4. Discussion. 5. Conclusions and future perspectives. 6. Summary. 7. Bibliography.

475. PHARTYAL (Rajendra)  
**Vitellogenin in the African Catfish, *Clarias Gariepinus* (Burchell) : In Vivo and in Vitro Induction, Estimation and Partial Characterization.**  
 Supervisors : Prof. S. V. Goswami and Dr. Neeta Sehgal  
 Th 15615

*Abstract*

Studies the reproductive biology of African fish, so that strategies can be developed to regulate its population. Deals with isolation, purification and characterization of vitellogenin - a key component in the formation of the egg-yolk, A 2-year investigation of the annual reproductive cycle shows that breeding in this fish is not controlled by the monsoon rains.

*Contents*

1. Isolation and characterization of vitellogenin of the African Catfish, *Clarias gariepinus* and its estimation by ELISA. 2. Effects of steroid hormones on in vivo induction of vitellogenin in the African Catfish, *clarias gariepinus* and preliminary studies on its annual reproductive cycle. 3. Development and standardization of a technique for establishing a primary monolayer culture of hepatocytes of the African Catfish, *clarias gariepinus*. 5. Induction of vitellogenin synthesis in cultured hepatocytes of the African Catfish, *clarias gariepinus* by protein and steroid hormones. Summary and literature cited.

476. PUROHIT (Jogeshwar Satchidananda)  
**Purification and Characterization of a Novel Histone H3 N-terminus Specific Protease From Chicken and Bovine Liver.**  
 Supervisor : Prof. Madan Mohan Chaturvedi  
 Th 15832

*Abstract*

Identifies the H3ase to be glutamate dehydrogenase by sequencing using MALDI MS & PSD, follows by a series of biochemical analysis, and the H3ase was further identified to be a protease

having specificity for the N-terminus of histone H3, as revealed by N-terminal sequencing of the modified H3 product.

*Contents*

1. Introduction. 2. Materials and methods. 3. Results. 4. Discussion. 5. Conclusions and future perspectives. 6. Summary.

477. RAVI RANJAN  
**Functional Metagenomics to Identify Novel Genes for Biocatalysts.**  
 Supervisors : Prof. Rup Lal and Dr. Rakesh Sharma  
 Th 15607

*Abstract*

Deals with isolation of metagenomic DNA from different environmental samples, Construction of metagenomic libraries, Screening to isolate lipolytic clones, Identification and sequencing of lipolytic genes and Bioinformatic analysis of novel genes.

*Contents*

1. Introduction. 2. Review of literature. 3. Materials and methods. 4. Results and discussion. 5. Summary and conclusion. Bibliography and appendix.

478. ROY (Brototi)  
**Endocrine Control of Phagocyte Functions in Freshwater Teleost Channa Punctatus.**  
 Supervisor : Prof. Umesh Rai  
 Th 15831

*Abstract*

Explores the direct immunoregulatory role of leptin in *C. punctatus* following in vitro study. Leptin increased the phagocytic activity of splenic phagocytes in a concentration-dependent manner. It mediated its effect through the specific receptors (Ob-R). Downstream signaling cascade of leptin is investigated. The stimulatory effect of leptin on phagocytosis is completely attenuated by AK-2 inhibitor, AG-490 and partially blocked by P13K inhibitor, wortmannin, suggesting the involvement of JAK-2 and P13K in transducing the leptin effect on phagocytosis. On the other hand, involvement of p38MAPK, ERK 1/2 and JNK in transducing leptin effect is ruled out because the inhibitors of said enzymes failed to alter the leptin effect on phagocytosis.

1. Introduction. 2. Materials and methodology. 3. Role of adrenoceptor-coupled second messenger system in sympathoadrenomedullary modulation of splenic phagocyte functions in live fish channa punctatus. 3. Genomic effect of cortisol on phagocytosis in freshwater teleost channa punctatus : An in vitro study. 5. Day-night variation in phagocytic activity of splenic phagocytes in freshwater teleost channa punctatus : Melatonin and its signaling mechanism. 6. Leptin regulates phagocytic activity in channa punctatus via JAK-STAT and P13 kinase-dependent pathway : An in vitro study. 7. Summary.

479. SINGH (Ajaib)  
**Isolation, Identification and Phylogenetic Characterization of Novel Hexachlorocyclohexane Degrading Sphingomonads and Evidence of in Situ Horizontal Transfer of Haloalkane Dehalogenase Gene.**  
 Supervisor : Prof. Rup Lal  
 Th 15614

*Abstract*

Studies the horizontal gene transfer (HGT) of lin genes among sphingomonads indigenous to a hexachlorocyclohexane contaminated site. Presently taxonomical characterization of HCH degrading strain *S. ummariense* RL-3<sup>T</sup> and bioaugmentation of *S. indicum* B90A in HCH contaminated soil for its bioremediation.

*Contents*

1. Review of literature. 2. Materials and methods. 3. Results. 4. Discussion. References and appendices.

480. SINGH (Indrakant Kumar)  
**Host Selection Behaviour of Spodoptera Litura (Fab.) (Lepidoptera : Noctuidae) in Relation to Certain Crop Plants.**  
 Supervisor : Prof. A. K. Singh  
 Th 15613

*Abstract*

Undertakes to decipher behavioural and physiological factors that influence establishment of *Spodoptera litura* on certain economically important crop plants, i.e. groundnut, Arachis

hypogaea L. (family : Leguminosae), brown mustard Brassica juncea L. (family : Brassicaceae), sunflower Helianthus annuus L. (family Asteraceae) and maize Zea mays L. (family : Poaceae).

### Contents

1. Historical resume. 2. Materials and methods. 3. Orientational responses of larvae. 4. Feeding and utilization of food. 5. Growth and development. 6. Oviposition behaviour and adults. Discussion, summary and bibliography.

## M.Phil Dissertations

481. DALAL (Suman)  
**Morphological Changes of Indian Major Corps During Early Ontogeny and in Vivo Digestion of Live Food.**  
 Supervisor : Prof. Rina Chakrabarti
482. LAISHRAM DOLIE DEVI  
**Gene Expression Studies in Granulose Cells of Human PCOS Patients.**  
 Supervisor : Dr. Rita Singh
483. MISRA (Nisha)  
**Immunomodulatory Effect of Non-Steroidal anti-Inflammatory Drugs on Macrophages Functions.**  
 Supervisor : Dr. Anju Shrivastava
484. NGASHANO (Mases Rinchui)  
**Food Selection and Digestion of Live Food Organisms During Ontogenic Development.**  
 Supervisor : Prof. Rina Chakrabarti
485. PANDEY (Ashish)  
**Screening of Chickpea (Cicer Arientinum L.) Varieties Against Pulse Beetle (Callasobruchus Chinensis Linn.) and its Management.**  
 Supervisor : Dr. D. K. Singh
486. PIPIL (Supriya)  
**Electrophoretic, Immunological and Solubility Characteristics of the Eff-Chorion of the African Catfish, Clarias, Gariepinus.**  
 Supervisor : Prof. Neeta Sehgal

487. RAJ KUMAR  
**Effect of Estradiol on Superoxide Dismutase and Lipid Peroxidation in Gonads of the African Catfish, *Clarias Gariepinus*.**  
Supervisor : Prof. Neeta Sehgal
488. SINGH (Khwairakpam Subadas)  
**Bioefficacy of Gamma Radiation on Stored Grain Pest, *Callosobruchus Maculatus* (Fabricius) (Coleoptera Bruchidae).**  
Supervisor : Dr. R. K. Seth
489. SUMAN KUAMR  
**Evaluation of Anti-Tumoral and Antibacterial Activity of *Pongamia Pinnata* Leaves.**  
Supervisor : Dr. Anju Shrivastava
490. YADAV (Kavita)  
**Radio-Biological Studies on Malarial Vector *Anopheles Stephensi* Liston (Diptera: Culicidae) : Survival, Development and Adult Behaviour.**  
Supervisor : Dr. R. K. Seth