CHAPTER 48

ZOOLOGY

Doctoral Theses

388. DHINGRA (Gauri)
Manipulations of Rifamycin Gene Cluster in Amycolatopsis mediterranei and its Partial Characterization in Amycolatopsis rifamycinica.
Supervisor : Dr. Rup Lal
Th 14222

Abstract

Provides a methodology for substitution of individual domains from the rifamycin gene cluster. Failure of AT6 substitution hints at the inability to bring a change at the AT6 level but successful replacement at At8 position could be helpful for either introduction or deletion of a moiety. Discovery of a new type I PKS from A. rifamycinica could be used to substitute modules in a PKS system using this novel sequence which could be producing a polyketide of unknown characteristics. Linking the conclusions to the objectives proposed in the light of rifamycin, these results could be helpful for reprogramming of the PKS genes in rifamycin and lead to the production of analogs with better antibiotic potenatial.

Contents

1. Introduction. 2. Review of Literature. 3. Materials and Methods. 4. Results. 5. Discussion. Summary. Bibliography adn Appendix.

389. DOGRA (Charu)
Organization of lin genes and IS6100 in Hexachlorocyclohexane (HCH)-Degrading Soil Bacterium, Sphingomonas paucimobilis B90A and an evidence for natural horizontal transfer.
Supervisor : Prof. Rup Lal
Th 14323

Abstract

Investigates the establishment of γ-HCH degradation pathway in S. paucimobilis B90A (which was the chosen subject of study

as it is noteworthy for the development of bioremediation technology for decontamination of HCH contaminated sites given to its capability of metabolizing all isomers of HCH). In this regard, the overall organization of HCH degradative (lin) genes and insertion sequence, IS6100 is examined in the strain. The organization of lin genes is concurrently compared with the available data on lin genes in S. paucimobilis strain UT26 to highlight the similarities and differences in the lin genes constitution and organization among the two HCH-degrading strains, isolated from geographically distinct areas but possessing similar metabolic pathways. The copy number of lin genes and insertion element is also analyzed in the three S. paucimobilis strains, UT26 and B90A and Sp+ to ascertain the role of horizontal gene transfer in dissemination of lin genes mediated by IS6100, among them. To validate this incidence of lateral transfer of lin demonstrated in Sphingomonas species by constructing a series of vectors carryoing a copy of IS6100 and an antibiotic resistant gene and conducting transposon mutagenesis using these non-replicating vectors in non-HCH degrading Sphingomonas species, S. chlorophenolica. The role of the developed transposon system as a tool for carrying out mutagenesis for the identification of yet unidentified genes, such as those involved in ß-HCH degradation pathway, adn for introduction of lin gene(s) (for instance, linA gene) into non-HCH or HCH-degrading strains for initiating or enhancing HCH degradative ability, is indicated.

Contents

1. Introduction. 2. Review of Literature. 3. Materials and Methods. 4. Results. 5. Discussion. Summary. Bibliography and Appendix.

390. NAQVI (Ilmas)
Characterization of Soil and Aquatic Ciliates of the Sub-family Oxytrichinae (Hypotrichida; Oxytrichidae) by Conventional and Molecular Methods.
Supervisor : Prof. G R Sapra
Th 14223

Abstract

The study is devoted to the description, characterization and development of ciliates belonging to the sub-family oxytrichinae. The study is based on morphometric and morphogenetic analysis. It shows that the genus Oxytricha comprises three

distinct groups. Group I includes the species with 18 FVT cirri, group II with 17 FVT and group II I III with 16 FVT cirri. The analysis based on partial rDNA sequences shows that the separation of the members of the genus in three distinct groups is justified. Phylogenetic tree generated by NJ method shows that Oxytricha species with 18, 17 and 16 FVT Cirri do indeed are different and their separate categorization is fully justified. Antoher phylogenetic tree constructed to see the realtionship of genus Oxytricha with the genus Notohymena and Rubrioxytricha could not resolve the generic relatedness between these genera. In this tree the position of O. longa (17 FVT) with respect to N. australis is ambiguous and this ambiguity may be because of small sample size used in the present investigation. Thus, comprehensive studies involving larger number of species are required to infer the phylogenetic relationships.

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391. RANJU KUMARI

Studies on the Molecular Mechanism of Acetyl CoA Independent Protein Acetylation.

Supervisors : Prof. K Muralidhar and Prof. H G Raj

Th 14220

Abstract

Isolates Acetoxy drug : Protein Transacetylase from rat liver microsomes to homogeneity. Studies TAase mediated acetylation of proteins. Establishes the identity of TAase. Demonstrats biological implications of TAase mediated protein acetylation by polyphenolic acetates (PA).

Contents

392. SHARMA (Sandeep Kumar)
Development of Food Biosensors and Characterization of Lactase from the Catfish, Clarias Gariepinus.
Supervisors : Dr. Ashok Kumar and Dr. Neeta Sehgal
Th 14221

Abstract

Lactose intolerance and galactosemia are diseases in which the person can not digest lactose/galactose present in food. The level of galactose in blood also increases due to higher concentration of galactose in diet. People sufferintg from these diseases cannot tolerate lactose and galactose in their diets. Therefore they have to depend upon food with reduced levels of these carbohydrates or take specific enzymes along with food. Several enzymatic and chemical methods are available to detect these analytes which are expensive and time consuming. Therefore, a quick, sensitive and economical method is required to analyze them. Biosensor is a good tool which can be used for detection. The present work deals with development of two types of biosensors, one is based on measurement of colour and second senses the change in current in the presence of analyte. Both type of the biosensors are designed, developed and tested. For detection of any food analyte enzymes are required, therefore a new source of enzyme was selected. Lactase (converts lactose to glucose and galactose) from eatfish Clarias gariepinus, was partially purified and characterized which can be immobilized onto a suitable matrix or transducer for development of biosensor. Studies incorporated in the thesis reports on genomics of the catfish, Clarias gariepinus.

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