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Characterization of buffalo Esx-1 gene: An X-linked homeobox protein

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The present study we have undertaken is to clone and express the partial length cDNA of extra embryonic tissue-spermatogenesis homeobox gene 1 (ESX-1). ESX-1 is an X-linked gene which encodes for a homeobox protein. The ESX-1 expressed specifically in extraembryonic tissues during development and in the adult testis as well. In particular, in situ hybridization experiments delimited ESX-1 transcription to preleptotene spermatocytes and round spermatids, suggesting a role in spermatogenesis. Available Bos taurus ESX-1 gene sequence was used to design the gene specific primers and used for amplification of Bubalis bubalus ESX-1 gene from the cDNA. Amino acid sequence has shown his hest identity with Bos taurus (91.6%). The homeobox region has shown the identity of 98.4%, 70.5%, 70.5%, 69.4% and 69.4% with Bos taurus, Homo sapiens, Pan troglodytes, Macaca mulatta and Mus musculus respectively. The ESX-1 cDNA was cloned and expressed in Escherichia coli and was purified in a single chromatographic step using Cobalt-Agarose gel affinity column. The purity and the molecular weight of the fusion protein were checked in SDS-PAGE which showed a purified product of molecular weight 27KDa. The purified product was confirmed by Western blot analysis using Ni- HRPase conjugate. As the ESX-1 protein is X-chromosome specific and expressed in only X-bearing spermatozoa the antibodies raised against the protein can be used for assessing the enrichment of buffalo spermatozoa in sex sorted semen.

Biography

N Vijay has completed his BVSc & AH degree from Veterinary College, Bangalore in the year 2008. He got selected in Indian Veterinary research Institute, Izatnagar to pursue Masters Degree in the discipline Animal Biochemistry in the year 2009 and completed the same with MVSc degree in 2011. Presently he is pursuing PhD from Deemed University, Indian Veterinary Research Institute, Izatnagar.

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Identification of nematode toxic Bacillus thuringiensis isolates using Caenorhabditis elegans as a model nematode

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Cry5, Cry6, Cry13, Cry14, Cry21 and Cry55 are crystal toxins produced by Bacillus thuringiensis and specifically toxic to nematodes. In the current study, seven (T32, T44, T73, T146, T161, T210 and T321 indigenous isolates of Bacillus thuringiensis) obtained from Bt collection of CPMB&B, TNAU were screened for their toxicity to nematodes using Caenorhabditis elegans as a model nematode. L4 worms of C. elegans were allowed to feed on the bacterial lawn individually grown on NGM (Nematode growth medium) agar plates and observed for growth retardation and mortality of nematodes. Nematode toxic Bt strain YBT1518 (obtained from BGSC, Ohio State University, USA) and E.coli strain OP50 expressing cry5 gene (obtained from UCSD, California, USA) were used as standard checks for comparison. Based on the lawn bioassay results, mortality of L4 worms was observed in T73 and T161 and retarded growth of nematodes was observed in T44, T146 and T210. Further PCR analysis using screening primers based on already known gene sequences indicated the presence of nematode toxic genes cry5 and cry55 in T44 and cry55 in T210. Though there was no amplification for any of the known genes screened (cry5, cry6, cry13, cry14, cry21 and cry55), there was retarded growth and mortality observed in nematodes fed on T73, T146 and T161 isolates indicating possibilities of getting novel genes from these isolates.

Biography

V. Balasubramani has completed his PhD from Tamil Nadu Agricultural University (TNAU), Coimbatore at the age of 27 years and Post doctorial studies from University of Sussex, UK and University of California, San Diego, USA. He is currently working as Associate Professor (Entomology), at the Department of Plant Biotechnology, Centre for Plant Molecular Biology and Biotechnology, TNAU, Coimbatore, India. He has published 20 research papers in reputed journals.

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