ISSN 0975-6299 Vol 3/Issue 2/April – June 2012

International Journal of Pharma and Bio Sciences

RESEARCH ARTICLE CYTOLOGY

INVESTIGATIONS ON SALIVARY GLAND AND ECTOPIC PAIRING IN *DROSOPHILA IMMIGRANS*

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ABSTRACT

Drosophila immigrans were examined using the air-dried technique and a salivary gland map of *Drosophila immigrans* was constructed. The polytene chromosomes exhibit various ectopic associations and it is assumed that these sites of ectopic paring are the active sites of various protein targets; several identifiable landmarks on salivary chromosomes arms were recognized along with the nucleolar chromatin threads (NCTs), Nucleolar Organizer Regions (NORs) of Drosophila *immigrans.*

KEY WORDS

Ectopic pairing, Nucleolar Organizer Regions (NORs), Drosophila

INTRODUCTION

The science of Cytogenetics is based on the fact that the hereditary material of an organism, whether a virus, bacterium, or mammal, is ordered into one or more chromosomes. By means of a wide variety of physical, chemical, and biological techniques, it has been possible to examine the structure and function of these organelles, and to correlate chromosomal characteristics with pattern of genetic function and of phenotypic inheritance and distribution. Such an ordered arrangement of heritable material possesses obvious advantages. Cytogenetic evaluation can be used to detect chromosome abnormalities responsible for birth defects and developmental problems. Out Millions of species that inhabit the earth, biological researchers tend to concentrate on relatively few organisms that subsequently become "model systems."The reason is obvious: Research builds on past research. To advance the forefront of knowledge, the system that one selects for studies must be so well known up to that forefront. Obviously not all the millions of species can be so well known, so a few have been chosen for intense "vertical" study. The faith is that what holds for one species holds for all, a mindset captured in the famous (or infamous) dictum "what is true of *E. coli* is true of elephants." While today this native faith is rarely embraced in a literal, in-depth approach to understanding biological systems still rests on confidence that what is found for one species applies in some degree to all (or at least many) living systems. Indeed, the advances in biology of the last thirty years attest to the fact that the vertical approach is extremely powerful in advancing biological knowledge at a certain level of organization.

MATERIALS AND METHODS

Drosophila immigrans flies were collected from different geographical localities in Kumaon region *viz.,* Kausani (Bageshwar district), Dunagiri (Almora district) of Uttarakhand by exposing fermenting fruits as baits and the stock culture was established in the laboratory. The metaphase chromosome preparations were made from neuroblast cells of colcemid fed larvae following the air-dried technique of (1).

RESULTS AND DISCUSSIONS

The mitotic metaphase chromosomes of *D. immigrans* consists of one pair of V, one pair of J, one pair of long rods and one pair of small rods. The J-shaped pair represents the Xs in the female, with the Y-chromosome appearing deeply stained V- shaped (2-3).The nuclei of larval salivary gland cells of this species contain three moderately long arms, one long arm, and one very small arm representing the shortest pair of rods. No arm corresponding to the small arm of the J-shaped chromosome was seen. Our recognition of different arms of salivary gland chromosomes **(Fig.1)** in this species was identical with that of (3).The Nucleolar Organizer Region (NOR) in *Drosophila immigrans* is present in X and microchromosomes. **(Fig. 2).**The polytene chromosomes exhibit numerous ectopic associations such that spreading of the chromosome arms was precluded (4-7) mapped

the sites of ectopic pairing along the polytene chromosome arms and found a correlation with sites of intercalary heterochromatin. The ectopic pairing in different strains of *Drosophila immigrans* collected from different geographical localities in Kumaon region was studied through the observation of salivary gland chromosomes and various regions, the observations made on the ectopic pairing (**Fig. 3-5)**

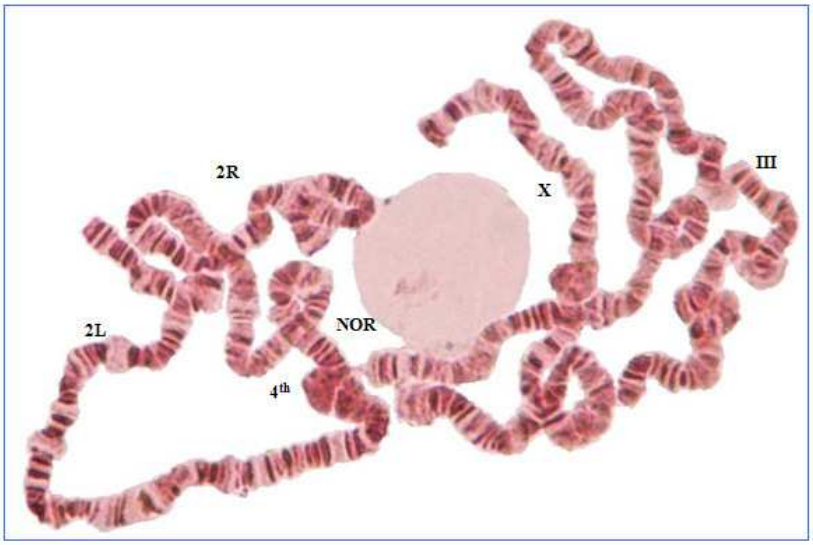

Figure . 1
Salivary gland chromosome of Drosophila immigrans

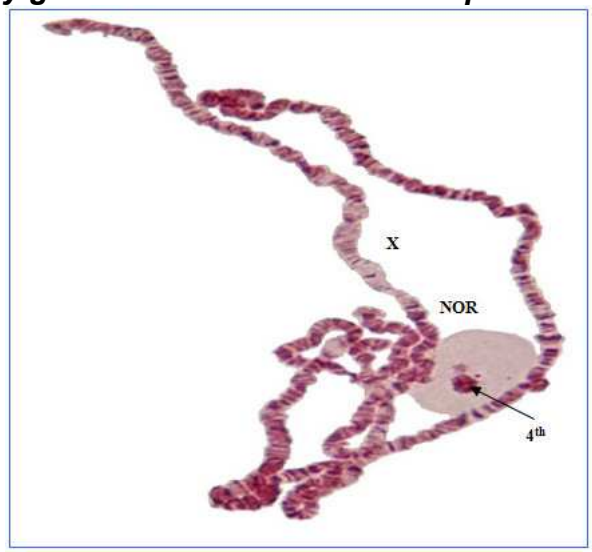

Figure . 2
Location of Nucleolar Organizer Region (NOR) in X and 4th chromosomes

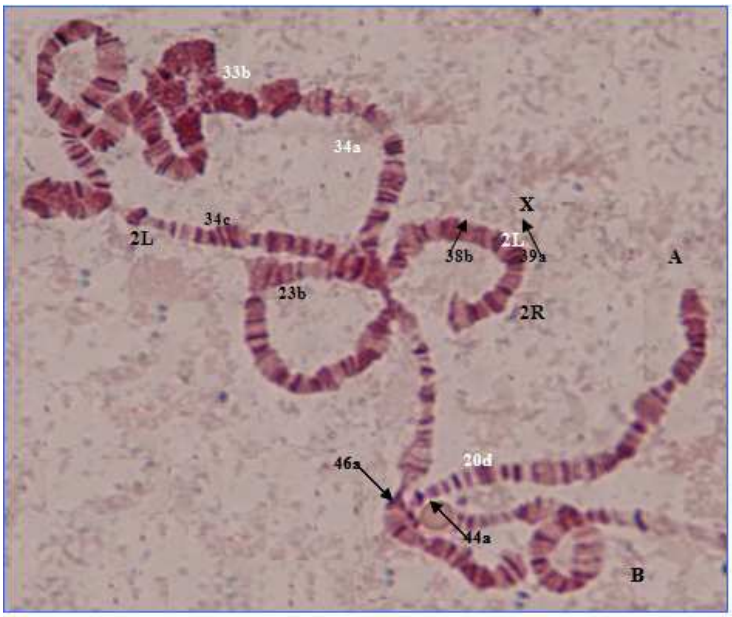

Figure .3
Ectopic pairing in salivary gland chromosomes of Drosophila immigrans

Figure .4
Ectopic pairing between 18c and 20a regions of the 2R chromosome of Drosophila immigrans

Figure . 5
Ectopic pairing in salivary gland chromosomes of Drosophila immigrans

ACKNOWLEDGEMENTS:

The authors are grateful to the administration of Kumaun University,Nainital for providing advanced laboratory facilities.

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