CYTOGENETIC ANALYSIS OF THE CHROMOSOME REGIONS WHICH ATTACH TO THE NUCLEAR ENVELOPE

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We studied the linear and spatial organization of polytene chromosomes from ovarian nurse cells of an African malarial mosquito An. funestus. We have developed a cytogenetic map for all chromosomes and compared the banding patterns with An. gambiae. To study the attachment of chromosomes to the nuclear envelope, unsquashed nuclei were examined with the light microscope. We found that pericentromeric locus of the chromosome X and region 39A of the chromosome 5 attached independently of each other to separate domains of the nuclear envelope in An. funestus. In contrast, pericentromeric loci of all arms are attached to the nuclear envelope in An. gambiae. To study whether chromosomal relocations of M/SARs occur during species formation, in situ hybridization of the lamin-binding DNA of D. melanogaster with salivary gland chromosomes of several melanogaster subgroup species was performed. The sequences homologous to this DNA were found in the D. simulans, D. mauritiana, and D. sechellia genomes. They are localized in the chromocenter of all species and in other sites which are species specific and strain specific. Species specific features of linear and spatial organization of polytene chromosomes may be used for study of speciation mechanisms.