Abstract

Introgressive hybridization leads to the incorporation of genes from one species into another species gene pool. To understand the importance of hybridization in events steering to raciation, inter-racial hybridizations were conducted between cross-fertile *Drosophila nasuta nasuta* and *D. n. albomicans*, which lead to the introgression of their genomes and resulted in the evolution of karyotypically stable hybrids called Cytoraces. These Cytoraces, along with their parents constitute *nasuta-albomicans* complex. Cytoraces are 500-550 generations old currently, exhibiting different levels of divergence. Previously, the extent of divergence among these races was assessed grossly involving their karyotypic composition, fitness traits, C-band DNA, mating preferences, and morphophenotypic traits. However, knowledge at protein/DNA level is lacking and that prompted the present study. To understand the impact of introgression on the course of evolution at the molecular level, markers such as isozymes, secretory proteins (larval glue proteins, male-specific accessory gland proteins and female-specific yolk proteins) and Inter Simple Sequence Repeats are screened among members of *nasuta-albomicans* complex in the present study. Isozyme analyses elucidated that newly evolved Cytoraces accumulated extensive genetic variation within a short duration and are mosaics of parental and novel alleles. Secretory proteins analyses showed the introgression of a glue gene and an accessory gland protein gene from one species chromosome into that of another species, suggesting that Cytoraces also contain mosaic linkage groups. Secretory proteins analyses
also revealed that the trend of rapid evolution of male reproductive proteins (accessory gland proteins) can be observed even in the early stages of evolution and the non-reproductive proteins (glue and yolk) were less diverged compared to reproductive proteins. ISSR markers have provided an indication that even the repetitive DNA regions of the parental races have mosaic pattern of distribution among Cytoraces. Present analyses along with the previous results clearly show that the introgression pattern for each trait shows lack of correlation for unrelated characters. Thus, the introgression of *D. n. nasuta* and *D. n. albomicans* genomes have given rise to a unique assemblage of closely related yet diversified forms within a span of 15 yrs, providing evidence for the catalytic role of hybridization in evolution.