

Structural Analysis of Ribosomal DNA Cluster in *Bombyx mori*

Hideaki Maekawa¹, Yuki Ejiri^{1,2}, Junko Nobata³, Kazuei Mita³, Hirofumi Fujimoto^{1,4}, Emiko Yamauchi^{1,2}, Mai Mizorogi^{1,5}, Kazuo Hashido¹, Koza Tsuchida¹, Masahiko Kobayashi⁴ and Naoko Takada¹

¹National Institute of Infectious Diseases, Toyama 1-23-1, Shinjuku-ku, Tokyo 162-8640, Japan, ²Tokyo University of Agriculture and Technology, Saiwaicho, 3-5-8, Fuchu 183-8509, Japan, ³National Institute of Agrobiological Science, Owashi 1-2, Tsukuba, Ibaraki 305-8634, Japan, ⁴The University of Tokyo, Yayoi 1-1-1, Bunkyo-ku, Tokyo 113-8657, JAPAN, ⁵Nihon University, Kameino 1866, Fujisawa, Kanagawa 252-8510, Japan

Ribosomal RNA genes (rDNAs) are included in a nucleolus of a cell nucleus. In silkworm, *Bombyx mori*, tandem arrayed 240 copies of a 10.6kb basic unit including 18S, 5.8S and 28S RNA genes construct a cluster. While two major retrotransposons, R1Bm and R2Bm, classified in a non-LTR type are specifically integrated at the 28S RNA region. The ratio of rDNA genes integrated retrotransposons to the basic units(non-integrated) of rDNA gene was fixed on each strain of *B. mori*. This cluster was distinguishably visualized using FISH analysis at the first meiosis stage in testis. During this pachytene stage, all chromatin except rDNA cluster condensed and rRNA was still synthesized at the opening cluster. R1Bm and R2Bm were fundamentally located at both boundaries with the flanking region of rDNA cluster. BAC clones containing a tandem array of this rDNAs had characteristic *EcoRI* digesting pattern while some clone had different patterns from the basic unit-containing clone. We suggested these clones including either boundary region of the rDNA cluster. Any transcripts of these retrotransposons could not be detected even in EST database for several tissues and stages of *B. mori*. We suggest these boundary regions including R1Bm and R2Bm may function as a protective structure to chromosome condensation. The result regarding the gamma ray irradiation will be discussed at the point of the cluster structure.