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Genetic Studies on Major Genes Concerned in the Lifespan of Adult Silkworm

Kwang-Ho Choi[1], Tea-Won Goo[1], Yong-Soon Kim[1], Bong-Hee Sohn[1], Pil-Don Kang[1], Byung-Rae Jin[2] and Seok-Woo Kang[1]

[1]Department of Agricultural Biology, National Institute of Agricultural Science and Technology, RDA, Suwon 441-100, Republic of Korea; [2]College of Natural Resources and Life Science, Dong-A University, Busan 604-714, Republic of Korea

Longevity is one of the most fascinating and challenging research subjects in life sciences. Because the duration of adult lifespan significantly differs among various silkworm strains, it has been suggested that the long or short silkworm adult lifespan may be genetically controlled. In general, the mean adult lifespan of silkworm is approximately 8 days and 5 days for female and male, respectively. However, the adult lifespan of the J037 strain is remarkably long in both sexes. On the contrary, the Daizo strain adult has a very short lifetime. In this study, therefore, the different expressed genes were investigated between the long and short lifespan inbreed strains. We constructed the full-length cDNA library from the adult male of the J037 strain. A total of 3,000 clones were randomly selected, and performed the differential display-hybridization with cDNA probes generated by J037 and Daizo adult males, respectively. As a result, 152 individual cDNA clones were identified as different expressed genes, indicating that these genes probably related to the lifespan-related genetic factors. In addition, we characterized the expressional characteristics of the several identified genes during the silkworm developmental stages. However, it is not confirmed yet that these genes really have an affected on the silkworm's longevity. To get a final conclusion, further studies such as transgenic animal studies are required.