Abstract of the 52nd Annual Meeting Yonago

O-14. Structures and chromosomal distribution of novel avian highly repetitive DNA sequences : Yoichi MATSUDA^{1, 2, 3}, Chizuko UMEHARA^{1, 2, 3}, Mami SHIBUSAWA² and Kazuhiko YAMADA¹ (¹Lab. Anim. Cytogenet., Center Advanced Sci. Tech.,

²Grad. Sch. Environ. Earth Sci., ³Fac. Sci., Hokkaido Univ.)

To characterize the chromosome structure in Aves, we cloned various types of novel highly repetitive DNA sequences from three Galliformes and two Struthioniformes species. By filter hybridization, FISH and sequence analyses, they were classified into the following three types of DNA sequences: (1) microchromosome-specific stDNAs (Chinese painted quail, and lesser and greater rhea), and (2) macrochromosome-specific (Chinese painted quail and Guinea fowl) and (3) W chromosome-specific (Japanese quail and Guinea fowl) repetitive DNA sequences. The microchromosome-specific stDNAs and macrochromosome-specific repetitive DNA sequences were also found in the soft-shelled turtle. These results indicate that the stDNA and site-specific highly repetitive DNA sequences is one of the major components of avian chromosomes and that the chromosome sin the two orders used in this study. In addition, a possibility is shown that the chromosome structure of the turtle is similar to those of Galliformes and Struthioniformes species.

O-15. Comparative analysis of bird karyotypes by Zoo FISH with chicken chromosome painting probes : Chizuko UMEHARA^{1, 2, 3}, Junko ANDO¹, Atushi FUJIWARA⁴, Yoichi MATSUDA^{1, 2, 3} (¹Lab. Anim. Cytogenet., Center Advanced Sci. Tech., ²Grad. Sch. Environ. Earth Sci., ³Fac. Sci., Hokkaido Univ., ⁴Dept. Aquat. Biosci., Tokyo Univ. Fish.)

Comparative chromosome painting is a robust method for direct comparison of chromosome homology between phylogenetically distant species. We applied Zoo FISH to a comparative study on the karyological relationship among four different avian orders. Chicken paints of chromosomes 1-8 and Z were hybridized to chromosomes of the Darwin rhea (*Pterocnemia pennata*), elegant crested tinamou (*Eudromia elegans*), Blakiston's fish owl (*Ketupa blakistoni*) and mountain hawk eagle (*Spizaetus nipalensis*). Eight macrochromosomes showed complete homology between the Darwin rhea and elegant crested tinamou. In the Blakiston's fish owl, chicken paint 1 hybridized to chromosomes 2 and 4, and paint 2 hybridized to acrocentric chromosome 1. In the mountain hawk eagle, which is the first case of Accipitridae species analyzed by Zoo FISH, the painting signals of chicken paints 1, 2 and 3 were detected in several pairs of small chromosomes. Chicken paint 4 hybridized to two pairs of chromosomes and paint Z to Z chromosomes in all the four species. These results indicate that Zoo FISH with chicken chromosome paints is quite useful for analyzing chromosome evolution in avian species.