Genetic diversity of cavy populations used as source of protein in DR Congo

Domesticated cavies (Guinea-pigs) are commonly used in sub-Saharan Africa for meat consumption, income generation and manure production in mixed crop-livestock systems. It has been used for several millennia and continues to be used as an animal for slaughter by the natives of the Andean countries and is used as a laboratory and pet animal worldwide. However, it was not until the 20th century that these rodents begun being domesticated in Africa and currently many countries in SSA are rearing cavies for meat consumption, and cavy production systems in several countries is known. In this work, we evaluated the genetic diversity and population structure of cavies from four regions (South and North Kivu, Katanga and Kinshasa) of Democratic Republic of Congo (DRC). We screened 343 samples with 16 Simple Sequence Repeats (SSR). A total of 113 alleles were detected, and the number of alleles (Na) per marker ranged from 4.69 to 7.23 (Kinshasa and South Kivu respectively) with an average of 5.77 alleles. Thirteen out of sixteen loci were found to be polymorphic with PIC ranging from 0.31 to 0.84 with a mean of 0.58. The mean observed heterozygosity (Ho) and expected heterozygosity (He) was 0.34 and 0.58 respectively. Heterozygosity and inbreeding coefficient levels (FST = 0.080 and FIS = 0.464) indicate a higher level of inbreeding in the studied populations. The analysis of molecular variance (AMOVA) showed a greater genetic diversity within individuals than between populations.. These results are supported by population structure results revealing that individuals from the same population are genetically more similar to individuals from far away population, than from individuals from the same population. The dendrogram, genetic distance and STRUCTURE results divided the 343 individuals into three distinct groups and generated similar results. The results derived from analysis of genetic diversity could be used for designing effective breeding programs through selecting representative genotypes and manage cavy breeding programs.

**Key words: guinea pig; microsatellites; genetic diversity; small stock; sub-Saharan Africa**