Microsatellite variation in populations from Sudan

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Africa is considered the motherland of humans, and its populations have the highest genetic diversity compared to populations in other continents, which was confirmed by evidence from both archeology and genetic studies. Studying the levels and patterns of genetic diversity among the ethnically diverse African populations is a key part to answering questions about human evolutionary history, the genetic basis of phenotypic variation and genetic associations with diseases. Sudan is located at the northeastern part of Africa and constitutes major part of the Nile valley with linguistically and ethnically diverse populations. I sampled 498 individuals representing different ethnic, linguistic, and geographic regions of Sudan. I amplified the samples using 15 microsatellite loci (short tandem repeats of DNA sequence scattered throughout the human genome where each locus is a specific site of a gene with a variant form called an allele) included in the AmpFℓSTR Identifiler PCR Amplification Kit. I used the generated data to determine forensic standard statistics and to study the genetic variation among the populations together with previously published data for Ugandans, Egyptians and Somali.

The results indicate that the locus D18S51 is the most polymorphic and discriminating for Sudanese population. The genetic variation among the populations was the highest within populations, and individuals from Sudanese populations were assigned to two clusters. The Zagawa and Nuba populations were observed to have the highest number of distinct alleles and together with the Nilotics to have the highest number of private and uniquely shared alleles. The informativeness level for inference of ancestry for the 15 loci was low compared to previously studied microsatellites. The multivariate statistics (Principal Component Analysis) showed similarity between the Copts and Nubians with Egyptians and between Nuba, Zagawa and Nilotics with Ugandans. My results reflect the usefulness of these loci for human identification within the Sudanese population. They also reflect the importance of further research including other populations and more informative loci to better understand the population structure of African populations from this region.

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