

Phylogenetic Analysis of Indigenous Dwarf Cattle Population in Sri Lanka

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The Sri Lankan indigenous cattle population is under a threat of genetic admixing in the context of production-oriented breeding policies. Genetic differentiation of existing populations and identifying the uniqueness are important for the sustainable utilization of the indigenous genetic resources in attempts taken to curb losing adaptive genetic characteristics of house populations. Hence, this research was conducted to construct phylogenetic structure to identify the placement of the phenotypically short, local non descriptive cattle population in Northern Province of Sri Lanka (Northern Local Cattle; NLC) compared to selected Sri Lankan local cattle populations and different populations of genus *Bos*. A total of 11 DNA sequences with 708 bases long segments of mtDNA D-loop region were generated from genetically unrelated Sri Lankan local cattle populations which includes five samples of NLC population, three samples of Lankan cattle and three samples of Thawalam cattle. Molecular variance analysis recorded 14 variable sites among local cattle populations producing eight singleton variable sites and six parsimony informative sites. Six of the eight singleton variable sites were unique to NLC population which is relatively a high polymorphism. The 11 DNA sequences of local cattle were aligned with 23 cattle D-loop sequences from countries in the region available in the National Center for Biotechnology Information database to analyze evolutionary development and diversification. The phylogenetic tree assigned the NLC population under the distinct clade of *Bos indicus* with close evolutionary divergence of two South Indian dwarf cattle populations (Kasaragod and Trinket) which are in geographical proximity with each other. This observation suggests a genomic inheritance of NLC population could be traced back to South Indian cattle. Thus, the clearly distinguishable short body morphology in NLC population might be a result of their genomic inheritance from the South Indian dwarf cattle populations as well as the generations of isolated breeding.

Keywords: Northern Province local cattle, Polymorphism, Phylogenetic analysis, Genomic inheritance