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Management and Genetic Characterization of Local Sheep Breeds for Better Productive and Adaptive Traits

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Abstract : The sheep (Ovis aries) was domesticated, approximately 11,000 years ago (YBP), in the Fertile Crescent from Asian Mouflon (Ovis Orientalis). The Northern African (NA) sheep is 7,000 years old, represents a remarkable diversity of sheep populations reared under traditional and low input farming systems (LIFS) over millennia. The majority of small ruminants in developing countries are encountered in low input production systems and the resilience of local communities in rural areas is often linked to the wellbeing of small ruminants. Regardless of the rich biodiversity encountered in sheep ecotypes there are four main sheep breeds in the country with 61,6 and 35.4 percents of Barbarine (fat tail breed) and Queue Fine de l'Ouest (thin tail breed), respectively. Phoenicians introduced the Barbarine sheep from the steppes of Central Asia in the Carthaginian period, 3000 years ago. The Queue Fine de l'Ouest is a thin-tailed meat breed heavily concentrated in the Western and the central semi-arid regions. The Noire de Thibar breed, involving mutton-fine wool producing animals, has been on the verge of extinction, it's a composite black coated sheep breed found in the northern sub-humid region because of its higher nutritional requirements and non-tolerance of the prevailing harsher condition. The D'Man breed, originated from Morocco, is mainly located in the southern oases of the extreme arid ecosystem. A genetic investigation of Tunisian sheep breeds using a genome-wide scan of approximately 50,000 SNPs was performed. Genetic analysis of relationship between breeds highlighted the genetic differentiation of Noire de Thibar breed from the other local breeds, reflecting the effect of past events of introgression of European gene pool. The Queue Fine de l'Ouest breed showed a genetic heterogeneity and was close to Barbarine. The D'Man breed shared a considerable gene flow with the thin-tailed Queue Fine de l'Ouest breed. Native small ruminants breeds, are capable to be efficiently productive if essential ingredients and coherent breeding schemes are implemented and followed. Assessing the status of genetic variability of native sheep breeds could provide important clues for research and policy makers to devise better strategies for the conservation and management of genetic resources.

Keywords : sheep, farming systems, diversity, SNPs.
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