Provisional Book of Abstract

ASPA 26th Congress
Turin (ITALY), June 17–20, 2025

#ASPA2025
ASPA 26th Congress Book of Abstract
The 26th congress of the Animal Science and Production Association
***"Innovations in animal sciences: shaping the way for a sustainable future is under patronage* of**

Turin (ITALY),
June 17–20, 2025

Venue
Campus SAMEV (Scuola di Agraria e medicina Veterinaria)
Largo Braccini 2, Grugliasco (TO)– ITALY

0424

Mapping the phenotypic and genomic landscape of Montanina cattle

Viviana Floridia[1], Arianna Bionda[2], Vincenzo Chiofalo[1], Matteo Cortellari[2], Vincenzo Lopreiato[1], Annalisa Amato[1], Antonino Nazareno Virga[3,4], Paola Crepaldi[2], Luigi Liotta[1], Mario Barbato[1]

[1] *Department of Veterinary Sciences, University of Messina, Messina, Italy, Messina, Italy*
[2] *Department of Agricultural and Environmental Sciences - Production, Landscape, Agroenergy, Milan, Italy*
[3] *Department of Agricultural, Food and Forestry Sciences, University of Palermo, Palermo, Italy*
[4] *Meat and Agribusiness Chain Research Consortium, Messina, Italy*

Corresponding author: viviana.floridia@unime.it

In 1927, the Italian zoologist Mascheroni classified cattle from the Italian island of Sicily into three varieties based on geographical location: the Modicana (plains), the Mezzalina (hills), and the Montanina (mountains) ecotype. These varieties were described to differ in size, horn length, and production traits. Modicana and Mezzalina (the latter currently known as Rossa Siciliana) were described for having good milking ability, whereas the small sized Montanina presented limited milk production but superior fattening potential. Currently, Montanina is reared in the Nebrodi mountains (northeastern Sicily) using extensive farming systems. Although no official estimate of the current Montanina population size exists, the most recent estimate suggests ~1,500 individuals. Montanina cattle have a characteristic red coat with black shades and a reddish stripe on the back, and white horns with black tips. To date, limited information exists on the Montanina ecotype. Here, we combined phenotypic and genomic investigations to provide a first assessment of this neglected local population. Phenotypic evaluation involved 32 adults Montanina from three farms in the Nebrodi region, recording body weight and ten morphometric traits. We recorded an average body weight of 495 kg and exhibit variability in body conformation, classified as mesomorphic or dolichomorphic, which aligns with their adaptation to mountainous environments. A genomic investigation, performed using the Affymetrix 65k SNP array on 61 Montanina and 1,036 animals from 35 Italian and French breeds, revealed moderate heterozygosity (0.33) and low inbreeding (0.04). Neighbour-Net analysis grouped Montanina with Sicilian breeds but on a separate branch. Admixture, haplotypes sharing, Treemix and f3-statistics highlighted introgressions from Limousine and Modicana. Notably, introgression patterns varied across farms, reflecting differences in breeding practices. Some farmers crossbreed Montanina with Limousine to enhance meat yield, while others preferred crossbreeding with Modicana for its recognized breed status. Selection analysis applying the nSL approach identified 18 genes associated with productive and reproductive traits. Finally, demographic reconstruction clarified the genetic hierarchy among Sicilian autochthonous cattle populations, further supporting the phenotypic and genetic distinctiveness of the Montanina cattle.

Research supported by CoRFilCarni through the BIOSAVE project (PSR SICILIA 2014-2020, MISURA 10, Sottomisura 10.2 - Operazione 10.2.b - Conservazione delle risorse genetiche animali in agricoltura).