Karyotyping of a sheep-goat hybrid born under natural conditions

Karyotyping of a goat-sheep hybrid born under natural conditions

Pauciullo A.[1,2,3,*], Knorr C.[4], Perucatti A.[3], Stölzl A[5]., Iannuzzi A.[3], Iannuzzi L.[3], Erhardt G.[2]

[1] Department of Agricultural, Forest and Food Sciences, University of Torino, Grugliasco, Italy
[2] Institute for Animal Breeding and Genetics, Justus-Liebig-University Ludwigstraβe 21b, D-35390 Giessen, Germany
[3] National Research Council (CNR), ISPAAM, Laboratory of Animal Cytogenetics and Gene Mapping, Naples, Italy
[4] Department for Animal Science, Biotechnology and Reproduction of Livestock, Georg-August-University, Burckhardtweg 2, D-37077 Göttingen, Germany
[5] Department for Animal Science, Livestock Production Systems, Georg-August-University, Albrecht-Thaer-Weg 3, D-37075 Göttingen, Germany

[*] Email: alfredo.pauciullo@unito.it
Phone: +390116708598

The natural occurrence of live hybrid offsprings between domestic goats and sheep is well documented in the literature, although many studies report on goats mated with rams, whereas the reciprocal cross is much less documented. In this study, we report a cytogenetic characterization of a healthy female geep hybrid (ewe mated with a buck) born in a flock under natural conditions.
Peripheral blood samples were collected and treated with normal cultures and R-banding preparations by late-incorporation of BrdU and Hoechst 33258, simultaneously added 6 h before harvesting. After the fixation, normal cultures were used for GTG-banding (by 0.05% of trypsin solution and Giemsa staining) and C-banding, whereas R- preparations were used for sequential RBA-banding (by acridine orange staining) and NORs identification (by Ag-Nitrate staining).
All cells showed 57 chromosomes in total (3 metacentrics and 54 acrocentric chromosomes) as confirmed by C-banding. G- and R-banding karyotypes revealed that the autosomes involved in the hybrid combination were CHI1,3; CHI2,8 and CHI5,11 corresponding to the metacentric chromosomes OAR1, OAR2, and OAR3. The sex chromosomes were correctly arranged. NORs were identified on OAR1p (CHI3), OAR2q (CHI2), OAR3q (CHI5), OAR4 (CHI4) and OAR25 (CHI28). No further morphological differences were evidenced by a classical cytogenetic investigation, whereas molecular cytogenetic and genetic analysis are still in progress to clarify the recombination events occurred in this rare interspecies hybrid.

Keywords: Interspecies hybridization, Goat-sheep hybrid, Geep, karyotyping