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MATERNAL TRANSMISSION RATIO DISTORTION IN IBERIAN PIGS FROM TWO DIFFERENT VARIETIES

ALREADY PUBLISHED !!

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Vázquez-Gómez M [1], Martín de Hijas-Villalba M [1], Varona L [1], Ibañez-Escriche N [1], Noguera J [1], Negro S [1], Rosas J [1] and Casellas J [1]

[1]Universitat Autònoma de Barcelona, Bellaterra Catalunya, Spain [2]Universidad de Zaragoza, Zaragoza Aragón, Spain [3]Universitat Politècnica de València, València València, Spain
[4]Institut de Recerca i Tecnologia Agroalimentàries, Lleida Catalunya, Spain [5]INGA FOOD S.A., Almendralejo Extremadura, Spain

ANYTHING ELSE?

WHY IS IT INTERESTING?

Transmission ratio distortion (TRD) is defined as the deviation from the expected Mendelian genotypic frequencies in the heterozygous parents.

Although TRD can be a confounding factor in genetic mapping studies, this phenomenon remains mostly unknown in pigs, particularly in traditional breeds (i.e., the Iberian pig), and without maternal data.

OBJECTIVES

Maternal allelic TRD prevalence and its genomic distribution in two Iberian varieties: Entrepelado & Retinto

MATERIALS & METHODS

247 FAMILIES (dam & daughter)

129 Entrepelado dam Families

97 x E sire 32 x R sire

118 Retinto dam Families

57 x E sire 61 x R sire

Geneseek Genomic Profiler Porcine HD

After filtering (family consistency rate, MAF, within-variety dam heterozygosity):

16,246 SNPs Entrepelado (25.8%)

9,744 SNPs Retinto (15.5%)

4,187 common SNPs

MODEL

Inheritance probabilities (biallelic markers)

$p_{offspring}(A1A1) = p_{dam}(A1)\, p_{sire}(A1)$

$p_{offspring}(A1A2) = p_{dam}(A1)\, p_{sire}(A2) + p_{dam}(A2)\, p_{sire}(A1)$

$p_{offspring}(A2A2) = p_{dam}(A2)\, p_{sire}(A2)$

Heterozygous dams

$p_{dam}(A1) = 0.5 + \alpha$

$p_{dam}(A2) = 0.5 - \alpha$

Dam TRD ← α [-0.5,0.5]

Ungenotyped sires by variety $p_{sire}(A1) = \pi = 1 - p_{sire}(A2)$

Standard LR test SNP-by-SNP using FORTRAN90

KEY IDEAS

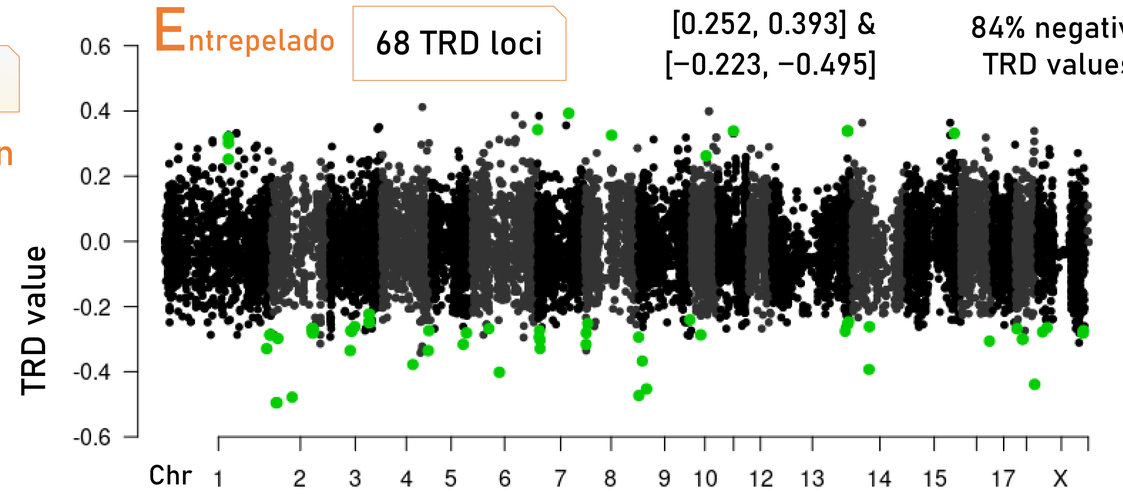
The Entrepelado variety showed more TRDLs with wider ranges and more extensive distribution than the Retinto variety, with more negative TRD values (promoting minor allele) in both varieties

Some biological processes could be affected (i.e., embryogenesis and lipid metabolism)

RESULTS

10 common TRD loci

Entrepelado — 68 TRD loci — [0.252, 0.393] & [−0.223, −0.495] — 84% negative TRD values



Retinto — 24 TRD loci — [0.313, 0.436] & [−0.241, −0.495] — 92% negative TRD values