

# Whole Genome Association Study for Reproductive Seasonality Trait in the Rasa Aragonesa Sheep breed

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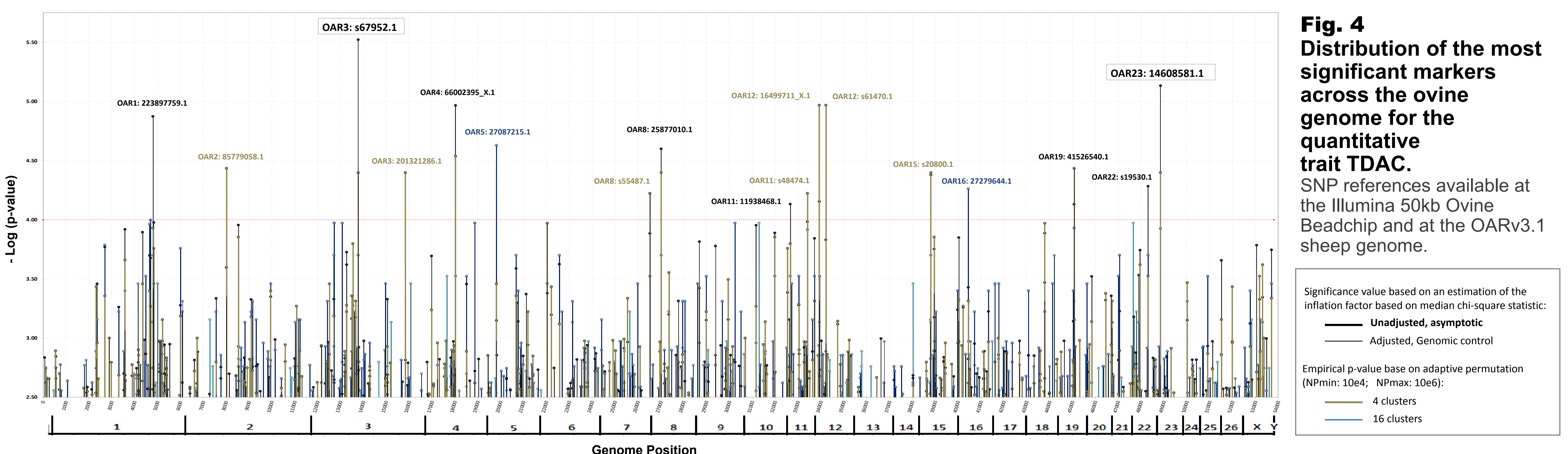
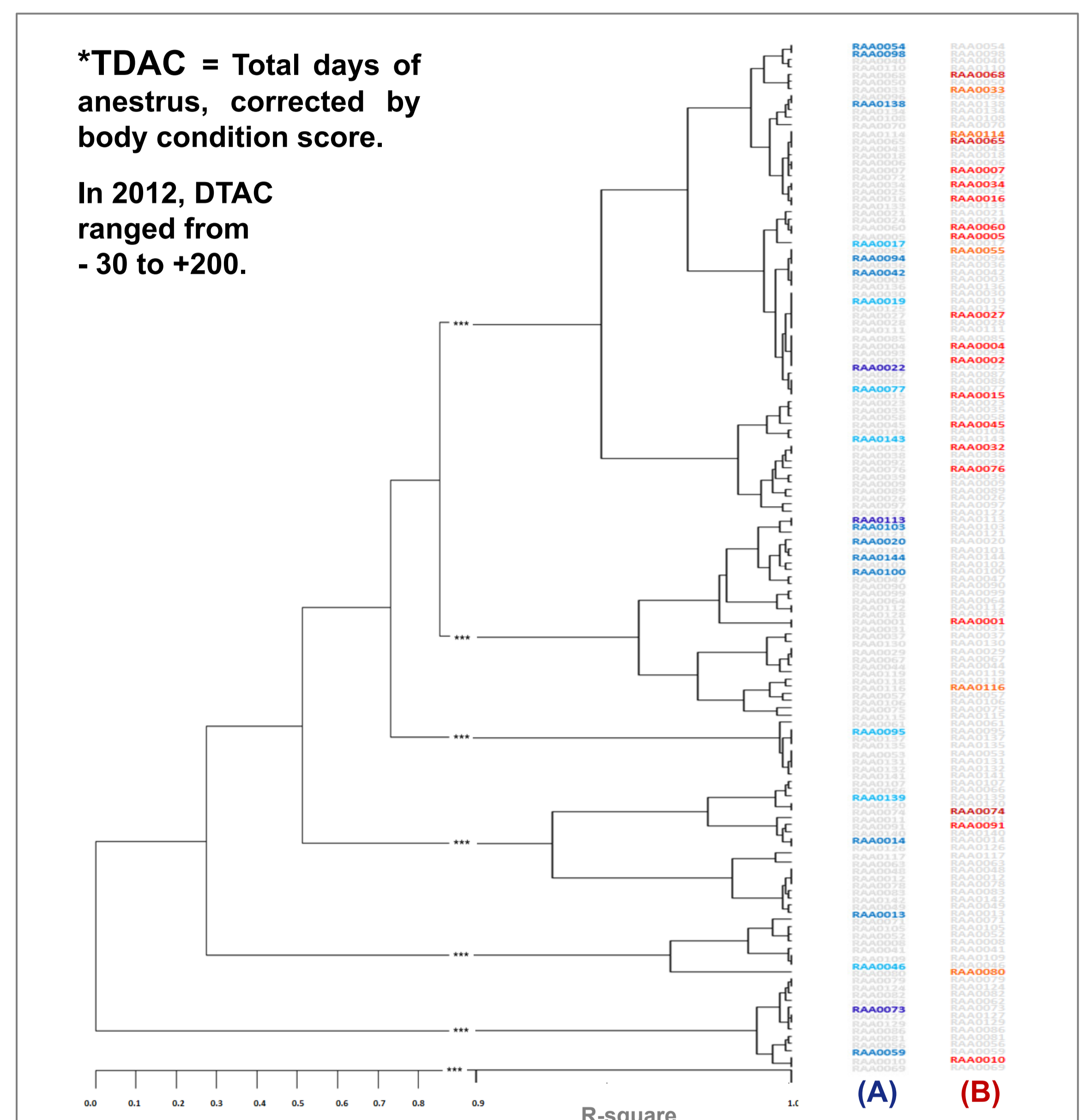
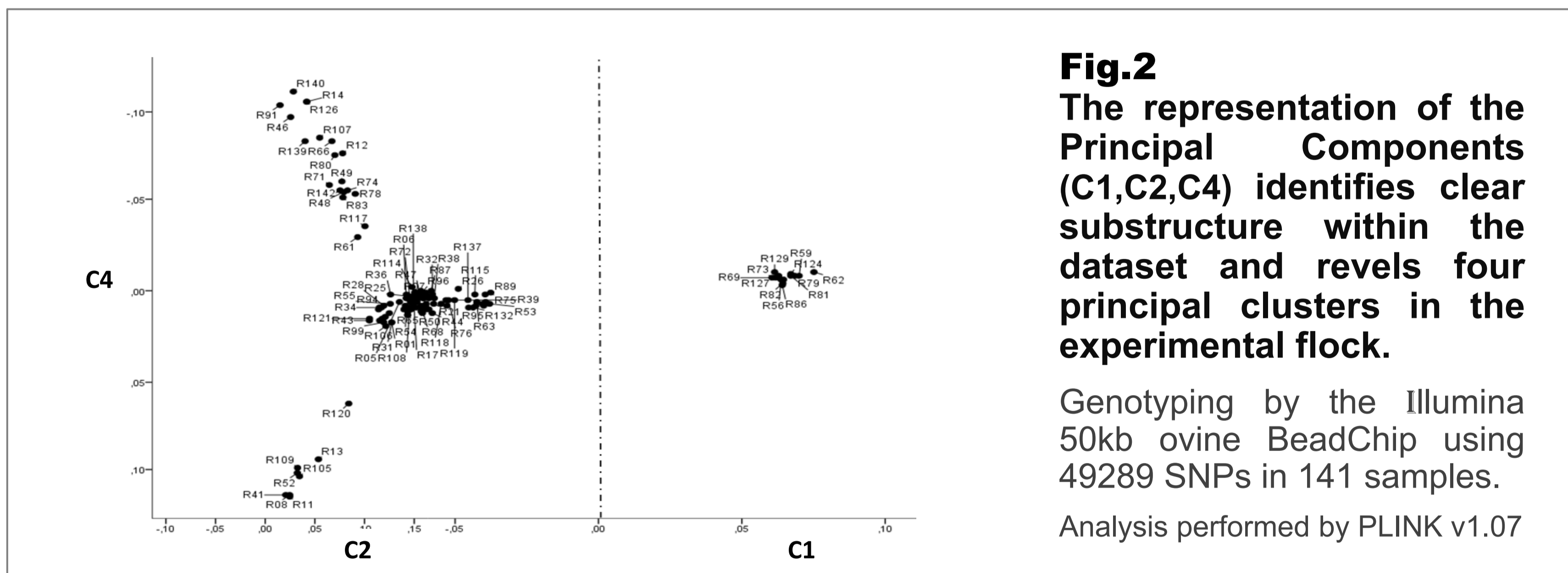
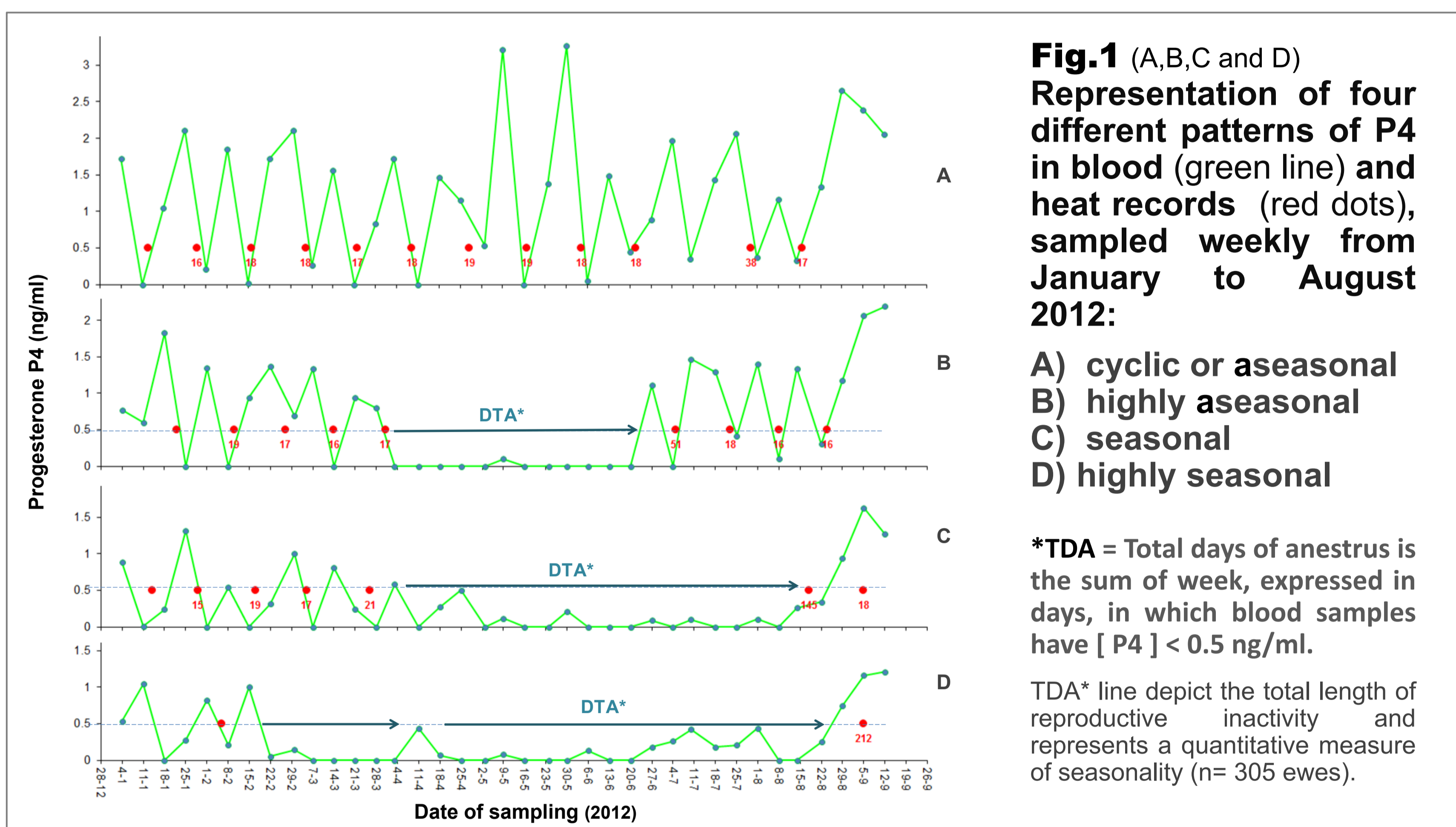
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Many sheep breeds from Mediterranean area have seasonal breeding patterns due to reduction of reproductive activity, generally from February to August. However, in the Rasa Aragonesa breed around 20% of ewes show spontaneous ovulation in springtime. The present work focuses on the characterization of the phenotype "seasonal" vs. "cyclic" by recording progesterone levels in plasma and heat data, and on the presentation of some preliminary whole genome association studies to pinpoint candidate regions related to reproductive seasonality.



High significant effect ( $p < 0.00001$ ; asymptotic) was found in two SNPs: s67952.1 ( $p = 3.01e-6$ ) and 14608581.1 ( $p = 7.38e-6$ ) mapping on OAR3 and OAR23, respectively. Additionally, up to 15 markers were significant at  $p < 0.0001$  level depending on different association tests accounting for cluster. Although they were scattered individually along the ovine genome in chromosomes 1, 2, 3, 4, 5, 8, 11, 12, 15, 16, 19, 22 and 23, we identified groups of genes associated with circadian rhythms, photoperiod and reproductive activity in mammal species (data not shown). Further studies must be undertaken in order to determine positional and functional candidate genes related to reproductive activity which could be in linkage equilibrium with significant markers in the Rasa Aragonesa sheep breed.