An association analysis between *PRL* genotype and milk production trait in Italian Mediterranean river buffalo

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Summary

This Research Communication describes the association between genetic variation within the *PRL* gene and the milk production traits of Italian Mediterranean river buffalo (*Bufala mediterranea* Italiana). High resolution melting (HRM) techniques were developed to genotype 465 animals. The association of polymorphism with milk production trait was analyzed and the effects of parity and calving season of production were evaluated. The results of sequencing showed single nucleotide polymorphisms at exons 2 and 5 and at introns 1 and 2. All the SNPs were in Hardy–Weinberg equilibrium, and statistical analysis showed intron1 was associated significantly (P <0.05) with milk yield over 270 days, milk protein content and peak lactation , whereas, The average contribution of the intron1 genotype (r^2_{intron1}) to total phenotypic variance in milk production traits was 0.119; by comparison, the TT genotype showed lower values. Exon 2 was associated significantly with fat content (P <0.05); the TT genotype showed an average fat content approximately 15.2 kg/lactation compared to the CT genotype. These findings provide evidence that polymorphisms of the buffalo *PRL* gene are associated with milk production traits and can be used as a candidate gene for marker-assisted selection in Italian Mediterranean river buffalo breeding.