

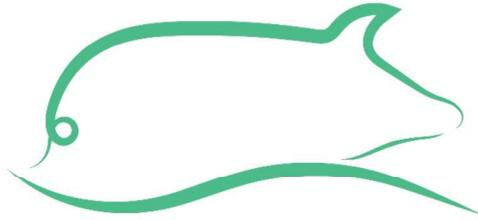
# BOOK OF ABSTRACTS



## XI. International Symposium on the Mediterranean Pig

October 11 – 14, 2022

Vodice, Croatia



***XI International Symposium  
on the Mediterranean Pig***

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**BOOK OF ABSTRACTS**

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Sveučilište Josipa Jurja Strossmayera u Osijeku

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## Monitoring major gene polymorphisms in Italian pig breeds

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Morphological and productive traits are considered quantitative traits that are affected by many genes, a few of which can explain a quite relevant fraction of the genetic variability for the corresponding phenotypes. In pigs, several major genes affect breed-specific traits or traits that have been targeted by the domestication and selection processes. The monitoring of the variability at these major genes can be useful to evaluate if and how selection pressure generated by running breeding programs and genetic drift and bottleneck effects are driving allele frequency changes towards the fixation of the favorable alleles in the relevant breeds. In this study, we selected seven major genes that affect i) coat colour and colour patterns (*MC1R* and *KIT*), ii) growth rate and lean meat/fat deposition (*IGF2*), iii) vertebral and teat number (*NR6A1* and *VRTN*), iv) meat quality (*RYS1*) and v) hairless phenotype (*FOXN3*) and genotyped them in relevant pig breeds where a breeding or a conservation program has been designed or is considering to take into account the variability in these genes for the same purpose. A total of 752 boars and sows belonging to two cosmopolitan pig breeds (Italian Large White and Italian Duroc) and five autochthonous pig breeds (Apulo-Calabrese, Casertana, Cinta Senese, Mora Romagnola and Nero Siciliano), sampled in 2021, were included in this monitoring analysis. Allele and genotype frequencies in the different breeds provided information on the outcome of the running programmes and on the needs, in some cases, to re-address conservation and selection strategies. For example, as the favourable allele at the *VRTN* gene, associated with

increased number of vertebrae and teats, was the most frequent one in Italian Large White (0.56) and Italian Duroc (0.52), it is possible to envisage a good potential of improvement by selecting at this gene. The fixation of the *IGF2* g.3072A allele (associated with higher muscle mass deposition and growth rate) in the Italian Duroc breed is positive, considering the imprinted effects of this allele in crossbreeding programs. In Cinta Senese breed, the presence of the *KIT* g.43597545T allele (0.06) that when in heterozygous state does not produce the belted phenotype, calls for a culling action of the few heterozygous pigs in this population. A similar culling activity should be applied in the Nero Siciliano breed, where the relatively high frequency (0.15) of the defective *RYR1* c.1843T allele, causing the pale-soft-exudative defect of the meat, can increase the problem of poor meat quality. In conclusion, the monitoring strategy designed by genotyping a few targeted major genes in some Italian pig breeds should be further expanded to obtain additional genotyping information for other genes, which might be helpful to refine conservation and selection programs in these pig genetic resources.

Keywords: Autochthonous pig, candidate gene, SNP, *Sus scrofa*.

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