

Exploring the genetic diversity of wheat landraces of Campania region using SNP and SSR markers

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Introduction

Thanks to the different pedoclimatic areas that characterize South Italy, a wide array of well-adapted indigenous landraces can be found, constituting an interesting reservoir of favorable alleles useful for breeding purposes. However, since their seeds are mainly produced, stored, and exchanged among farmers, it is extremely hard to keep them pure, thus generating also huge confusion. In order to preserve these local resources and to solve ambiguities within populations, the genetic diversity of wheat landraces from Campania was investigated through SSR and SNP markers.

Results

Both SSRs and SNPs allowed us to discriminate *Triticum durum* landraces from *T. aestivum* (Figure 1; Figure 2). Among *T. durum* landraces, the ancient populations of Saragolla were grouped in three clades, whereas a single cluster was found within Marzellina. Both datasets confirmed that Marzellina Castelfranco, Marzellina Baselice and Marzellina Fortore were indistinguishable from each other, with a low genetic distance, thus revealing a synonymy case. Similarly, Saragolla Bioland, Saragolla Lucana Lacivita, and Saragolla Pennulo were indistinguishable from Khorasan, suggesting that they could be the same genotype. By contrast, Saragolla Castelfranco, Saragolla old CREA, Saragolla del Sannio, and Saragolla Rossa were clearly different, although Saragolla Castelfranco and Saragolla old CREA were highly similar in both SSR and SNP datasets.

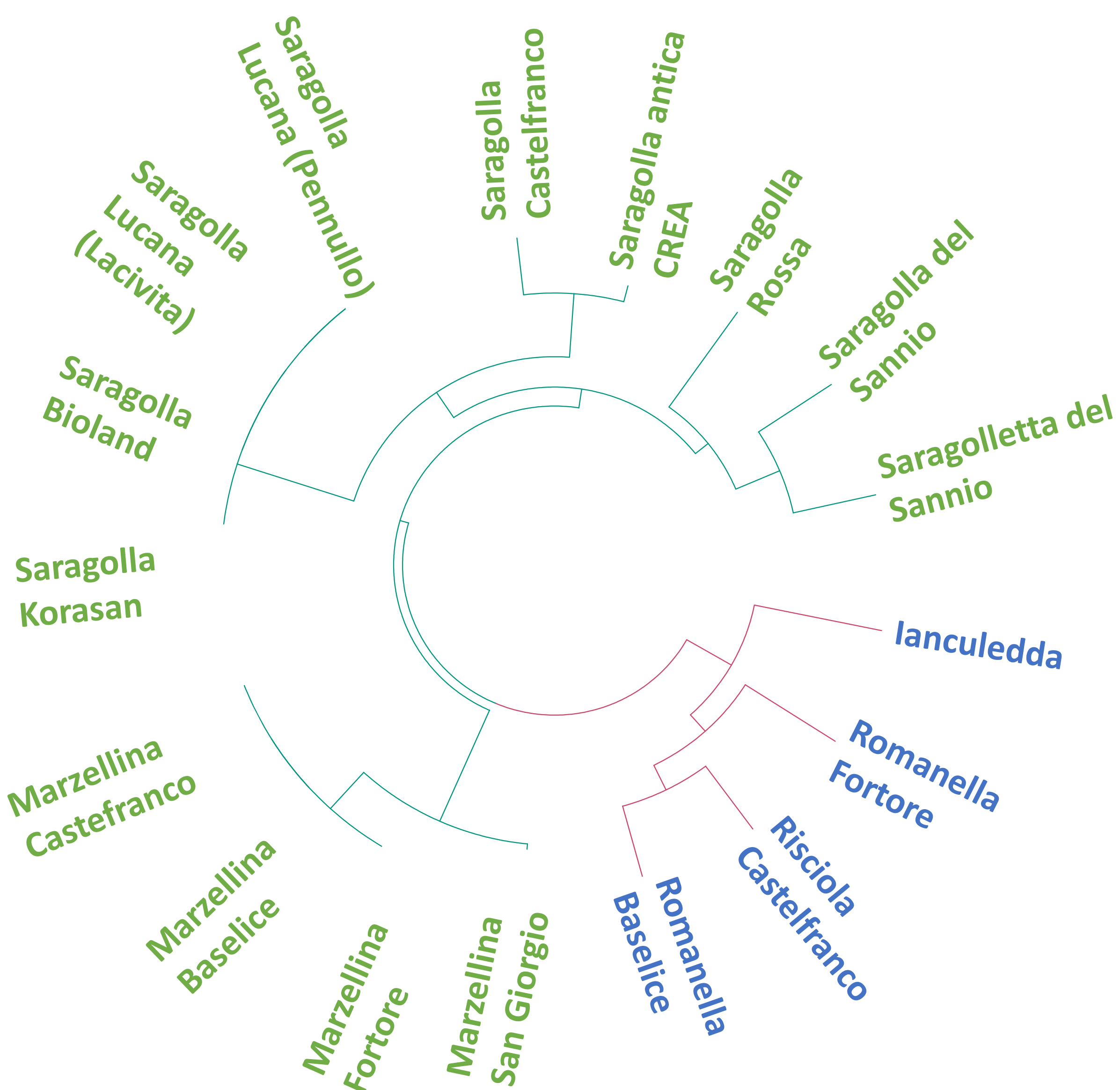


Figure 1 Phylogenetic tree using five SSR markers.

Conclusions

Both SSR and SNP markers showed their effectiveness in assessing the genetic diversity within local *T. durum* wheat landraces. Both markers confirmed that Saragolla from farmers could be identical to Khorasan, thus revealing a synonymous case.

Similarly, Marzellina Castelfranco, Baselice and Fortore could be the same genotype.

Given the high reliability of both types of marker, SNPs markers could be selected as the main strategy to preserve these local resources from genetic erosion, and to register some of them in the Italian National Register of crop varieties as 'conservation varieties'.

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Figure 2 Phylogenetic tree using SNP marker.