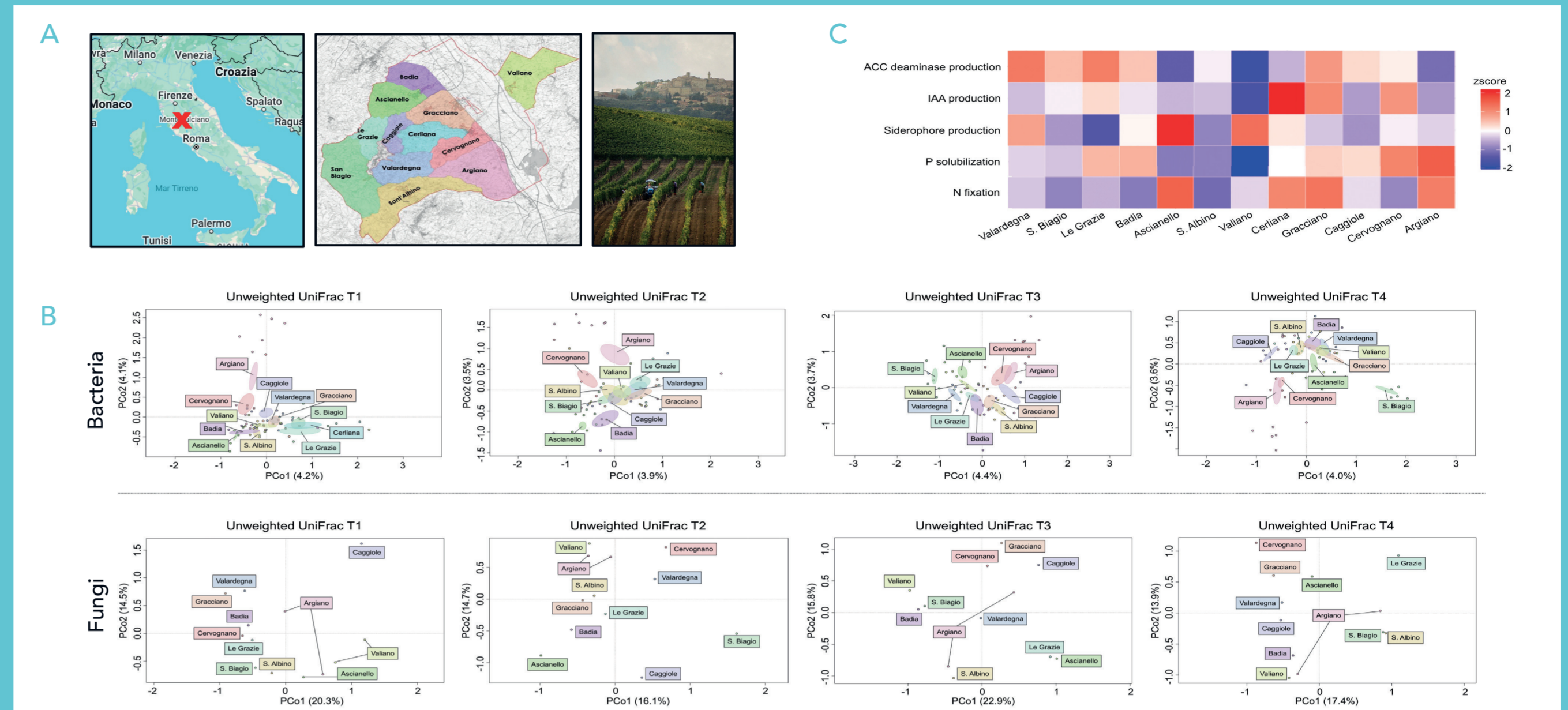




# Zonation of the *Vitis vinifera* microbiome in Vino Nobile di Montepulciano PDO production area



**Figure 1.** **A** - Map of the 12 production areas (i.e. Additional Geographical Units - AGUs) recognized by the Consorzio del Vino Nobile di Montepulciano DOCG (Tuscany, Italy). The production areas have different colors: Valiano, Valardegna, San Biagio, Sant'Albino, Le Grazie, Gracciano, Cervognano, Certiana, Caggiole, Badia, Ascianello and Argiano. **B** - PCoAs of bacterial and fungal composition of rhizospheric soil samples in Montepulciano AGUs at different time points (T1 to T4). **C** - Functional Plant Growth Promoting (PGP) profile of AGU rhizosphere microbiomes.

In the framework of the Circles project, we defined the microbial terroir of vineyards distributed in the 12 subzones (Additional Geographical Units - AGU) of the Consorzio del Vino Nobile di Montepulciano DOCG (Italy, Figure 1A), a world-famous wine region, with the aim of identifying those characteristics that represent microbiological aspects to be protected because they are related to plant health. To this end, rhizospheres of *Vitis vinifera* cultivar Sangiovese and soil samples were collected during the 2022 and 2023 vintages and analyzed using an integrated metabarcoding/shotgun metagenomic approach targeting both bacteria and fungi. While highlighting a peculiar taxonomic configuration of the Vino Nobile di Montepulciano terroir compared to other Italian and global vineyards, our data show that microbiomes are "AGU-specific" in terms of taxonomic abundances and plant growth-promoting functions (Figure 1B and 1C). The reconstructed metagenome-assembled genomes confirmed a high potential for plant growth promotion, with differences related to AGU, thus confirming the importance of protecting microbial terroir and biodiversity to ensure the production of high quality traditional wines.



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