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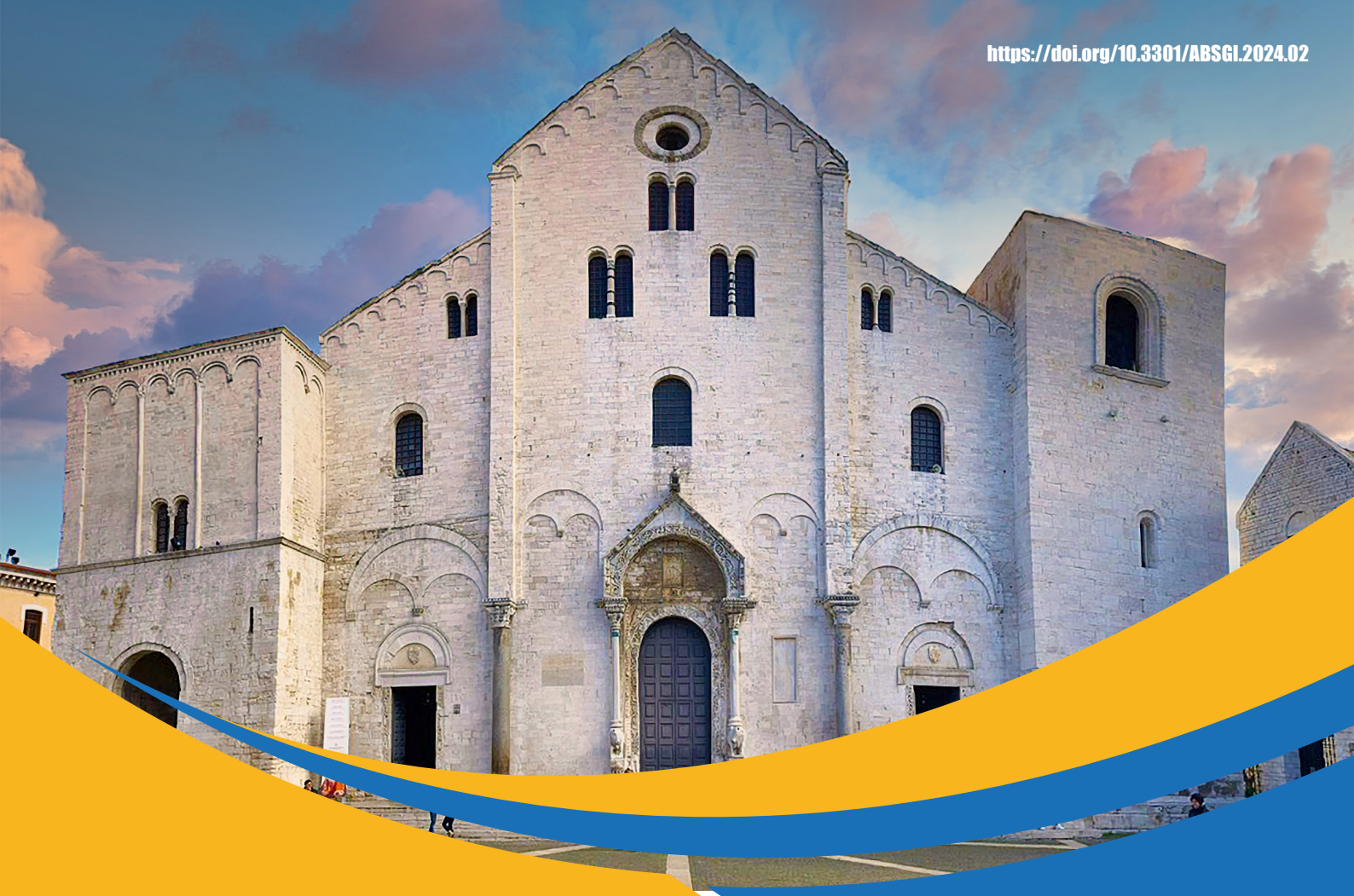

Bari, 2-5 September 2024

ABSTRACT BOOK

a cura della Società Geologica Italiana

BARI 2024

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Comparative soil-to-plant fractionation of Rare Earth Elements in chlorophyll-deficient wheat mutants

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The concentrations of Rare Earth Elements (REEs) in soils reflect those of the geological substrate of origin, and their bioavailability depends on soil pH, organic matter and weathering conditions, as well as on relatively low mobility of REEs as compared to other elements. Although some beneficial effects of REEs have been reported in plants, the REEs do not play any known specific role (Gonçalves Egler et al., 2022). Accordingly, plants do not have specific root absorption systems for lanthanides, which are absorbed approximately proportional to their concentration in the soil, likely using calcium channels (Tao et al., 2022). With the exception of Eu, for which plants tend to show a low affinity, it is generally assumed that the different REEs do not undergo element-specific fractionations from soil to leaves, but all merely decrease in concentration. Consequently, the relative proportion of REEs in leaves is expected to be almost the same as in the soil, i.e., the leaf/soil concentration ratio should be very similar for each REE. In this work, the REEs concentrations have been analysed in a soil parcel of the Botanical Garden of Ferrara and compared with that in leaves of a minipanel of four bread and four durum wheat lines, each comprising the wild-type cultivar and three chlorophyll-deficient mutants (Colpo et al., 2023). The mutation affects with variable severity the absorption of Mg, which is promoted in the mutants, the element being required for the chlorophyll synthesis. Analysis was conducted by inductively-coupled triple-quadrupole plasma-mass spectrometry (QQQ-ICP-MS) with special reference to REEs. As expected, it was found that in the soil samples the lanthanides with even atomic numbers were more represented than the adjacent odd atomic numbers, and the overall concentrations decreased according to increasing atomic numbers. In wild-type leaves, the same general trends were also found, but with two noticeable anomalies: selective absorption of Eu and selective exclusion of Tm. In general, the mutants tended to accumulate more REEs in relation to the severity of chlorophyll depletion. Concerning Eu, there were no consistent changes in the mutants, while the selective exclusion of Tm was instead completely lost. At the extreme, the most severe mutant absorbed REEs without any selectivity. These results indicate that the common assumption about the absence of element-specific fractionation of REEs during plant absorption and translocation cannot always be met, and therefore should be verified case by case.

Colpo A. et al. (2023) - Long-term alleviation of the functional phenotype in chlorophyll-deficient wheat and impact on productivity: A semi-field phenotyping experiment. Plants, 12(4), 822.

Gonçalves Egler S.et al. (2022) - Effects of rare earth elements (REE) on terrestrial organisms: current status and future directions. Ecotoxicol., 31(5), 689-699.

Tao Y. et al. (2022) - Distribution of rare earth elements (REEs) and their roles in plant growth: A review. Environ. Pollut., 298, 118540.

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