DIFFERENTIAL RESPONSES OF KABULI AND DESI CHICKPEAS (*CICER ARIETINUM*) TO LOW WATER PROVISION AND THEIR MINERAL PROFILING

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Keywords: drought stress; underutilised crop; legumes

INTRODUCTION

Legume grains are of great importance for agriculture and the environment due to their ability to symbiotically fix atmospheric nitrogen and provide protein, minerals, vitamins, and other bioactive nutrients (Geraldo *et al*., 2022). Chickpea (*Cicer arietinum*) is one of the most consumed legumes worldwide and it has gained even more importance in recent decades. Production levels have increased, their incorporation as intercrops has been promoted, and they have been used in the formulation of novel food products (Saget *et al*., 2020). Nonetheless, the exploitation of traditional chickpea varieties, such as the Desi type (black coloured chickpea), has been overlooked, and the recovery of under-exploited traditional varieties could contribute to fostering biodiversity, and promoting environmental sustainability and diversifying diets. However, current knowledge on the nutritional profile of commercial and traditional chickpea varieties and their resilience degree to environmental stresses, such as water scarcity, is limited, thus being the focus of this work.

METHODS

Seeds of a commercial Kabuli (white) chickpea and a traditional Desi (black) genotype were analysed for mineral and protein composition (Nunes da Silva *et al*., 2022). Antioxidant capacity was determined spectrophotometrically as in Marinova *et al*. (2005). Seeds were also germinated and grown in a climate chamber under distinct water provision conditions. Water was provided three times a week, in variable amounts corresponding to 90%, 50% or 25% of the field capacity (N = 15). At pod filling, plants were analyzed for root and shoot fresh weight and number of seeds per plant.

RESULTS AND DISCUSSION

Both chickpea types had significant amounts of several macro- and micro-nutrients important for human nutrition, such as potassium (which averaged (?) 2 $mg.g^{-1}$), magnesium (? 600 $\mu.g^{-1}$), zinc (? 17 $\mu g.g^{-1}$) and iron (? 23 $\mu g.g^{-1}$) (Table 1). The Kabuli chickpea was richer in boron (by 30%), while the Desi black chickpea had a higher level of antioxidant compounds (by 32%), which comprise bioactive non-nutrients important for human health (Geraldo *et al*., 2021). These results support the inclusion of chickpea in novel food formulations, including, e.g., pasta (Saget *et al*., 2020).

Table 1. Nutritional profile of Kabuli (white) and Desi (black) genotypes. Values represent the mean ± SEM and letters indicate statistically different means at $p < 0.05$.

Financial Support

ACKNOWLEDGEMENTS This research was supported by the European Union's Horizon 2020 Research and Innovation Programme through project RADIANT, Grant Agreement number 101000622, and by the project HSoil4Food co-financed by FEDER through the Northern Regional Operational Program (NORTE-01-0145-FEDER-000066). The scientific collaboration under FCT project UIDB/50016/2020 and project LEGUCON (Fundação Calouste Gulbenkian, 238442) is also acknowledged.