PROJECT: BRACHY-PHENO-DROUGHT

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PROJECT TITLE

Linking intraspecific and intergenerational phenomic diversity of Brachypodium distachyon genotypes collected from the wild with other multi-omic variations in driving adaptation to drought

CONSORTIUM

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SUMMARY OF THE REPORT

A new population of *Brachypodium distachyon* accessions, derived from five environmentally distinctive regions in Turkey was subjected to a drought stress experiment in the National Plant Phenomics Centre, Aberystwyth, UK. Previously conducted genetic and epigenetic analyses we differentiated this population into two subpopulations, which we called central and coastal, based on their origin within the country. To link such variation to phenotype, advanced phenomic and metabolomic analyses were conducted to 1) determine differences in plant response to environmental stresses and to 2) investigate whether there are adaptive traits related to the origin of these subpopulations. Following drought experiments, the percentage of yellow pixels as an indicative of stress associated leaf senescence was significantly lower in central compared to coastal subpopulations. This was consistent with the central populations being more tolerant to drought stress. This aligned with bioclim models of species distribution that indicated that the dispersal of the central population was best explained by the variable “precipitation of driest month”. For the coastal population, phenotypic analysis showed that the coastal subpopulation tended to exhibit relatively delayed flowering.