Title: Valorisation of the Italian biodiversity: specialised metabolism in the Rosid clade

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The prosperity and survival of living organisms depend on their ability to adapt to their environment. Plants faced abiotic and biotic stimuli by producing phytochemicals classified as secondary/specialised metabolites.To date, more than 400,000 different specialised metabolites have been identified in plants and this number might be greatly underestimated since only few species have been analysed so far. The largest part of the world global flora, which include more than 400,000 vascular species and 20,000 bryophytes, is still chemically underexplored, constituting a precious source of novel secondary metabolites. This project aims to valorise the Italian biodiversity flora by following a bioprospection strategy on the Rosid cluster, in order to get insights on how plant secondary/specialised metabolic pathways have spread, evolved and diversified within this clade. The Italian flora include more than 12,000 species and 2427 species belong to the Rosid clade, representing the 20% of the total. Rosid clade can be furtherly splitted in two main branches, as suggested by the recent APGIV classification. In detail, in Italy, most of the species belong to the Malvids crown clade, representing the 54,3% of total Rosid, whereas Fabids include less species (45,0%). Based on these data, we decided to sample a total number of 169 Rosid species and 102 belong to the first branch, 65 to the second one. The bioprospection has been performed by sampling plants in nature, in botanical gardens and in nurseries. In particular, the bioprospection in nature was carried out in Sicily (Palermo's zone), Sardinia (Sassari's zone), Lombardy (Pavia's and Mantova's zone) and different areas of Veneto, as Verona, Padua, Altopiando of Asiago, Monte Baldo and Monti Berici. The untargeted metabolomics analysis by UPLC-HRMS are still in progress.