P17 – Metabolomic discrimination of genetic and geographical groups of grapevine varieties (*Vitis vinifera* L.)

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Abstract

An important aspect of wine geographic origin is related to grapevine varieties used for wine productionin specific winegrowing regions or countries. Grapevine germplasm is highly variable and classified into geographical groups. These classifications were recently confirmed by genetic studies, and further classified into genetic-geographic (GEN-GEO) groups. Secondary metabolites, namely polyphenolic and volatile organic compounds (VOCs), have crucial role in winemaking industry due to their influence on quality, colour, and sensory properties of wine. The aim of the research was to investigate the polyphenolic and volatile profiles of 50 grapevine varieties from different GEN-GEO groups. The groups are C2 (varieites from Italy and France), C7 (varieites from Croatia), and C8 (varieites from Spain and Portugal). Polyphenolic compounds analysed belonged to the classes of anthocyanins, flavan-3-ols, flavonols, phenolic acids, and stilbenes. Classes of VOCs analysed were carbonyls, alcohols, acids, esters, and terpenoids. The most abundant class of polyphenols were anthocyanins, followed by flavan-3-ols and flavonols, while carbonyls were the most abundant class of VOCs, followed by alcohols and sesquiterpenes. Using discriminant analysis, the GEN-GEO groups were clearly separated by their polyphenolic and volatile profiles. In the case of polyphenolic profiles, compounds contributing the most to the discrimination of groups belong to classes of hydroxycinnamic acids, flavan-3-ols, and flavonols. Furthermore, some of the compounds contributing to discrimination are found in relatively small amounts. Regarding the discrimination based on volatile profiles, GEO groups were discriminated by their overall volatile profile. C2 group contains higher amounts of carbonyl compounds and alcohols, while C8 group contains higher amounts of sesquiterpenes and acids. Group C7 is characterized by low content of VOCs. This data demonstrates that geographical origin, combined with genotype, also influences the overall polyphenolic and volatile profiles.

Keywords: secondary metabolites, grapevine varieties, GEN-GEO groups, discriminant analysis