

Genetic and environmental effects on chemical composition related to sensory traits in common beans (*Phaseolus vulgaris*L.)

Abstract

The chemical composition determines plant-derived foods' sensory traits; genetic and environmental effects and their interactions determine chemical composition. Understanding the importance of each factor should help characterise foodstuffs according to the variety and place of cultivation. We studied the effects of variety (five landraces + two checks) and environment (five locations and two years) on some molecules important for beans' (*Phaseolus vulgaris* L.) sensory value. The greatest location effects were on protein and starch content and variety effects were due to combinations of traits (mainly sucrose, protein, and malic acid). The variety × location interactions detected in protein, sucrose, citric acid, and malic acid were difficult to associate to the gastronomic success of a particular variety cultivated at a particular location. Our results showed that protected designation of origin (PDO) in beans could be delimited on the basis of chemical composition, derived from the particular environmental characteristics of a region and the genetic characteristics of the varieties admitted.

Keywords. Chemical composition; Bean; *Phaseolus vulgaris* L.; Genetic effects; Environmental effects; Interaction effects; PDO

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