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Preliminary diversity assessment of an undervalued tropical bean (*Lablab purpureus* (L.) Sweet) through fatty acid profiling

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Abstract

Several large-scale metabolic profiling studies have been directed to prospect crops with a major focus on yield-related traits and, ultimately, with the definition of specific markers for plant selection in breeding programs. However, some of these technologies are expensive, time-consuming and not easily feasible for a quick approach. Fatty acid profiling was described as reliable biomarkers and as a chemotaxonomic tool allowing to study not only the diversity in germplasm collections but also to discriminate their geographic origin. We have used fatty acids profiling for a preliminary assessment of *Lablab purpureus* (L.) Sweet (hyacinth bean) diversity and landraces discrimination. Hyacinth bean displays an enormous variability of agro-morphological traits, probably linked to the multi-purpose uses in different regions, i.e. as pulse, or as food with nutraceutical potential (Africa and Asia), forage (Africa and Australia) and ornamental (Europe and USA). Only two forage cultivars are widely marketed, cv. Rongai and cv. Highworth, with several landraces remaining to be addressed in terms of diversity. We show that fatty acids profiling was able to distinguish landraces, which display shared fatty acids with cultivars from the center of hyacinth bean diversity origin (East Africa). We propose that fatty acid profiling is a tool that may be used not only for nutritional value assessment but also as a chemodiversity tool in crop research.