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

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1 Preliminary diversity assessment of an undervalued

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19 Abstract

20 Several large-scale metabolic profiling studies have been directed to prospect crops with a 21 major focus on yield-related traits and, ultimately, with the definition of specific markers for 22 plant selection in breeding programs. However, some of these technologies are expensive, 23 time-consuming and not easily feasible for a quick approach. Fatty acid profiling was 24 described as reliable biomarkers and as a chemotaxonomic tool allowing to study not only 25 the diversity in germplasm collections but also to discriminate their geographic origin. We 26 have used fatty acids profiling for a preliminary assessment of Lablab purpureus (L.) Sweet 27 (hyacinth bean) diversity and landraces discrimination. Hyacinth bean displays an enormous 28 variability of agro-morphological traits, probably linked to the multi-purpose uses in 29 different regions, i.e. as pulse, or as food with nutraceutical potential (Africa and Asia), 30 forage (Africa and Australia) and ornamental (Europe and USA). Only two forage cultivars 31 are widely marketed, cv. Rongai and cv. Highworth, with several landraces remaining to be 32 addressed in terms of diversity. We show that fatty acids profiling was able to distinguish 33 landraces, which display shared fatty acids with cultivars from the center of hyacinth bean 34 diversity origin (East Africa). We propose that fatty acid profiling is a tool that may be used 35 not only for nutritional value assessment but also as a chemodiversity tool in crop research.

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