

# Identifying vegetable lablab types by participatory assessment: panelists' perceptions of morphological traits and organoleptic taste assessment

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## Abstract

Lablab (*Lablab purpureus*) is one of the underutilized crops in Africa that have multi-purpose uses. Despite its wide ecological adaptability and ability to cope with different environmental adversities, it is neglected in research and development as human food. Such lack of interest threatens existing landraces by genetic erosion. Participatory evaluation of 29 lablab accessions included 25 core-collection members and 4 local landraces. Panelists included a broad range of farmers and extension workers from East African countries. Leaf and pod-meal organoleptic taste assessments as well as visual evaluation of pod morphology were conducted at The World Vegetable Centre's Regional Centre for Africa (AVRDC-RCA) near Arusha, Tanzania. Logistic regression parameters were used to compare the acceptability of accessions. In addition, principal component analysis (PCA) was applied to reveal patterns of variation among them. It was found that the acceptance of lablab accessions varied considerably for meals made from leaf (very low selection intensity) or pod (very high selection intensity) as well as for pod morphology. Participants highly appreciated meals prepared from leaves of accessions ILR111632, CPI30212, CPI76996 and CPI29398, whereas pod morphology of accessions CPI106002 (cv. Valore) and CPI81626 was particularly liked due to their long and slender pods. The acceptance of the pod-meal of accession CPI100602 was also outstanding.

## Key Words

Lablab, vegetable, participatory evaluation

## Introduction

Lablab (*Lablab purpureus*) is one of the underutilized crops in Africa that have multi-purpose uses. Despite its wide ecological adaptability and ability to cope with different environmental adversities, lablab is neglected in research and development towards human consumption. Resource-poor farmers have not benefited from formal plant breeding. Farmers' participation in varietal development has been advocated as a solution to the pitfalls of formal plant breeding in developing countries. Participatory evaluation at an early stage could shape the variety being developed and, thus, resource-poor farmers could enjoy increased productivity. In line with this, participatory evaluation was used to identify leafy and/or pod-vegetable types of lablab.

## Methods

Participatory evaluation of 29 lablab accessions included 25 core-collection members developed by Pengelly and Maass (2001) and 4 local landraces. The evaluation was conducted in 2004 at AVRDC-RCA, Arusha, Tanzania (03.38°S, 36.87°E and 1262 m asl.). Meals were prepared according to local customs from leaf and pod for organoleptic taste assessments. Pod morphology of accessions was visually evaluated. Panelists included a broad range of farmers and extension workers from different African countries, mainly from East Africa. Visual evaluation of pod morphological traits was conducted in groups, with two respondents each. Organoleptic taste assessment of leaf or pod meals was conducted individually. Panelists gave their opinion by rating each accession on a scoring questionnaire with options of 9 taste levels (like extremely, 1; to dislike extremely, 9) for both leaf and pod organoleptic taste

assessments. Pod morphology was evaluated to 5 acceptability levels (like extremely, 1; to dislike extremely, 5).

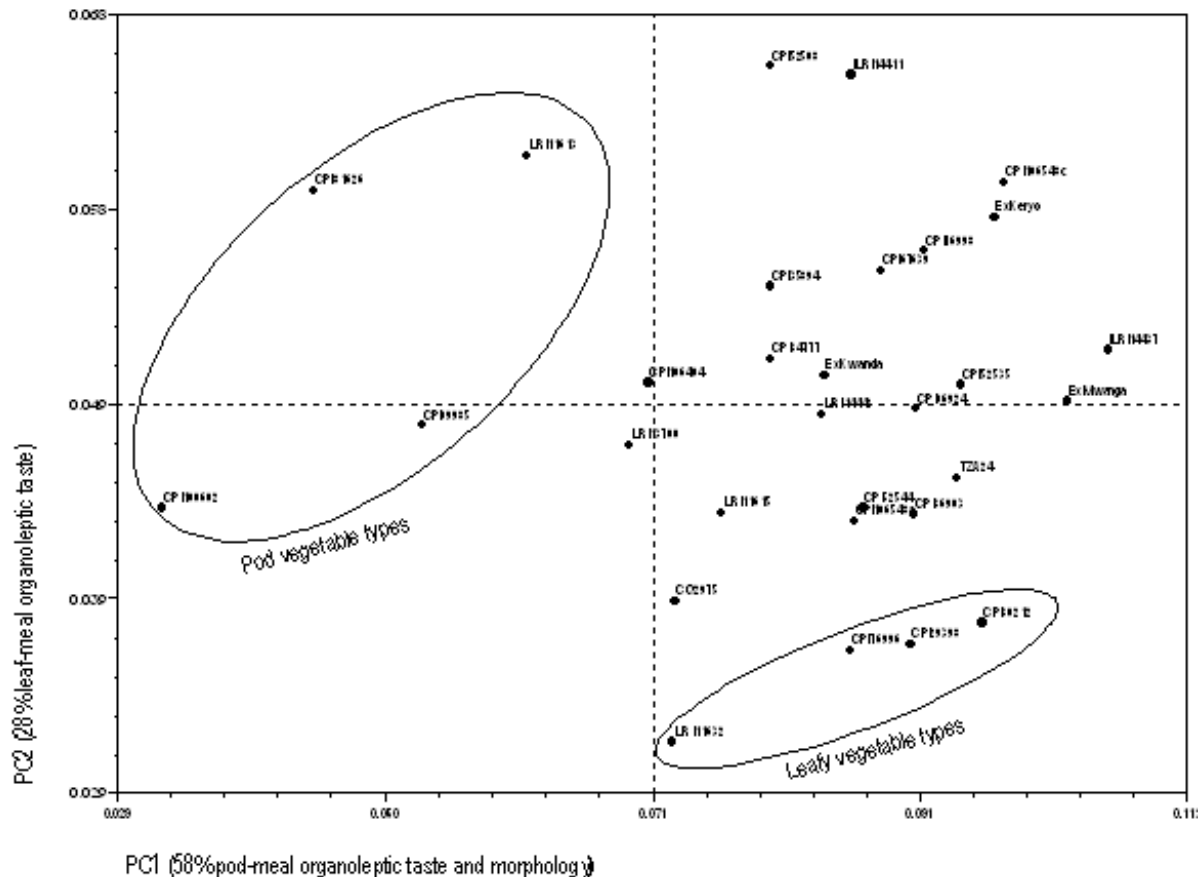
A frequency table was developed from the questionnaires and subjected to logistic preference ranking analysis (LPRA) developed by Hernandez-Romero (2000). LPRA generates the slope of a regression line that connects the cumulative probability at different acceptability levels. An accession with a high likelihood of acceptance would relatively have the lowest slope value. If rejected, this is vice versa. The slope value was used to rank preferences for accessions. The slope values of the traits were subjected to principal component analysis (PCA) (NTSYSpc Rohlf, 2000).

## Results

Accessions ILRI11632, CPI30212, CPI76996 and CPI29398 had highest leaf-meal acceptability with slope values ranging from 0.06 to 0.07 (data not shown). On the other extreme, accessions ExKeryo, CPI106548c, CPI52508 and ILRI14411 had the highest slope values (0.11 to 0.12) indicating that their leaf was unsuitable for vegetable use.

For pod-meal organoleptic taste, accession CPI100602 (cv. Valore) had the lowest slope of 0.06, identified as pod-vegetable types. The pod-meals of other accessions (CPI52508, ExKeryo, CPI52535 and CPI76998; had slope values 0.13 to 0.12) were disliked. Morphologically, the lowest slope was from accessions with long and slender pods (CPI100602 and CPI81626; slope 0.03 and 0.04, respectively).

The PCA clearly separated the leafy and the pod-vegetable types from the remainder of lablab accessions (Fig. 1).



**Fig. 1 First (PC1) and second (PC2) principal components derived from slope values generated by LPRA of 4 traits assessed in 29 lablab accessions.**

Selection intensity for organoleptic taste of a leaf or pod-meal was 66 or 25%, respectively, while that for pod shape and size was 51 or 43%, respectively. It showed that panelists could discriminate accessions more for a pod-meal than for the other three traits. Genetic differences of pod fibrousnesses among accessions were probably the main basis for the observed variation because panelists disliked fibrous pod-meals.

**Conclusion**

Lablab has a potential to be a vegetable crop and could play a vital role in the farming system of many African countries. The ability of the panelists to identify different accessions for different products as well as the level of selection intensity shows readiness of the clients to adopt lablab. In order to make lablab competitive with crops like snap bean and to increase yield levels, more research is required. Therefore, in other lablab research works, like soil fertility improvement or forage crop use, aspects of human consumption should also be incorporated.

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