

Introduction

Shea tree is one of the most important economically and socially tree species in the Sudano-Sahelian region. It is widely distributed in the northern Côte d'Ivoire. However, it is the object of many pressures such as demography, bushfires, and misuse of trees which cause genetic erosion of the species.

Objective

The objective of this study is to characterize the genetic variation of a collection of elite trees, based on their agro-morphological characteristics. This knowledge is essential for conservation and further improvement.

Material and Methods

- The study concerns 220 trees randomly sampled from an elite trees population of 639 trees in the Bagoué and Tchologo regions.
- Agro-morphological characterization was based on IPGRI shea descriptors (2006) as presented in Table 1.
- Observations and measurements were made during a reproductive cycle (February to June) (Figure 1). A total of 11 qualitative and 10 quantitative parameters were studied.
- The various analyses, both descriptive and multivariate, were carried out using STATISTICA version 7.1 software



Parameters	Abreviation	Unit
Crown shape	FCF	notification
Branching pattern	RB	notification
Branching density	DB	notification
Tree growth habit	PA	notification
Trunk circumference	CIR	dm
Leaf blade length	LL	cm
Leaf blade width	LgL	cm
Leaf blade shape	FL	notification
Leaf apex shape	FAL	notification
Leaf base shape	FBL	notification
Adult leaf colour	CFA	notification
Young leaf colour	CJF	notification
Petiole length	LP	cm
Seed length	LN	cm
Seed width	LgN	cm
Number of seeds per fruit	NNF	-
Seed weight	PN	g
Seed shape	FN	notification
Seed coat colour	CN	notification
Yield per tree	Yield	kg
Number of fruits per tree	NFA	-

Table 1: Shea tree descriptors studied

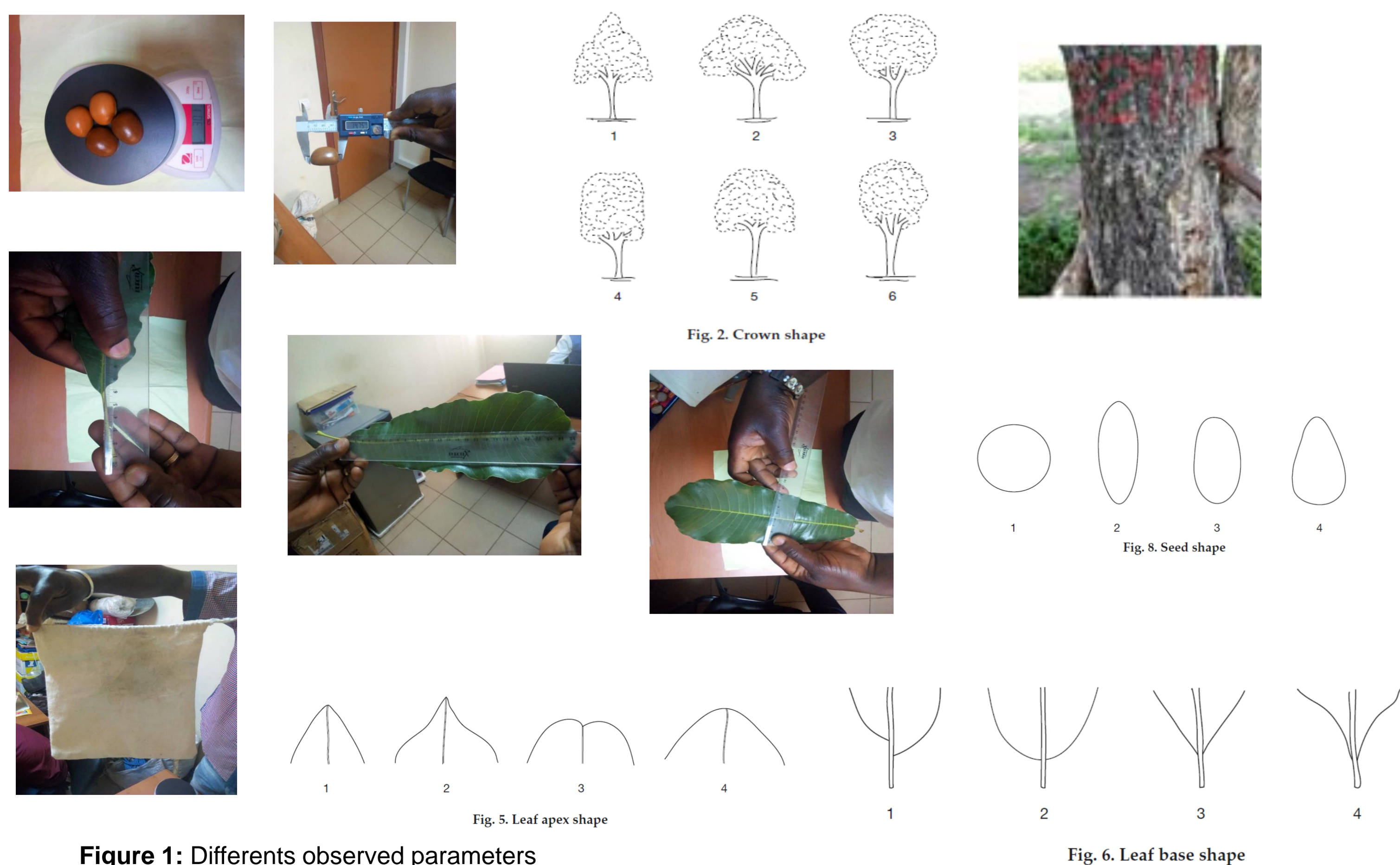


Figure 1: Different observed parameters

Figure 6: Leaf base shape

Results

QUALITATIVE TRAITS (Figure 3): Tree habit, branch density and leaf crown shape showed high variability. Nut color, mature leaf color and leaf blade shape showed low variability. The other characteristics showed moderate variability (Figure 2).

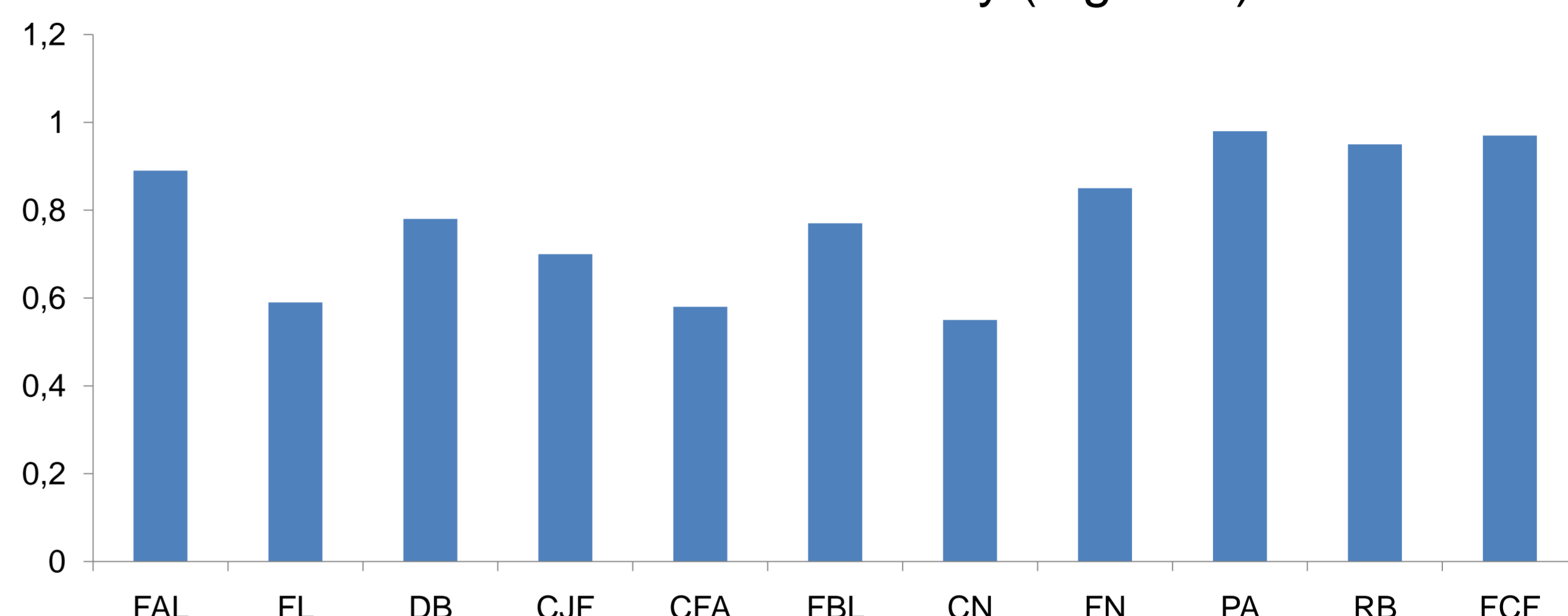


Figure 2: Shannon diversity index of qualitative traits

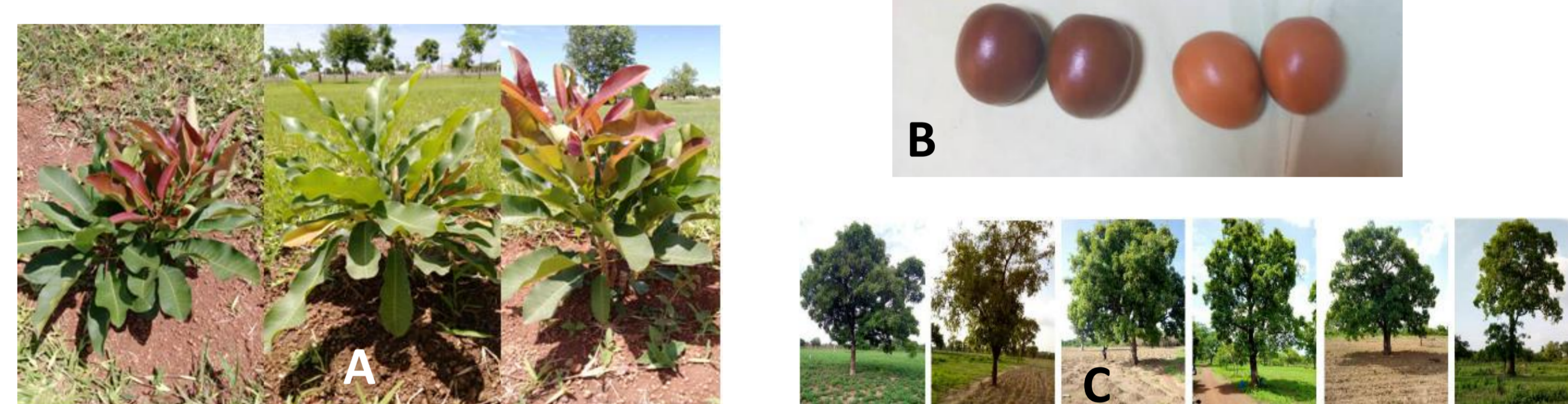


Figure 3: Some observed qualitative traits (A: Young leaf colour; B: Seed coat colour and C: Crown shape)

QUANTITATIVE TRAITS: The mean values and coefficient of variation are shown in Figure 4. Trunk circumference, nut weight, nut yield and number of fruits per tree have respective coefficients of variation of 30.71%; 28.54%; 49.01% and 39.91%. The lowest variation was observed in the number of nuts per fruit, length and width of the nut (CVs of 7.25, 12.58 and 9.24% respectively).

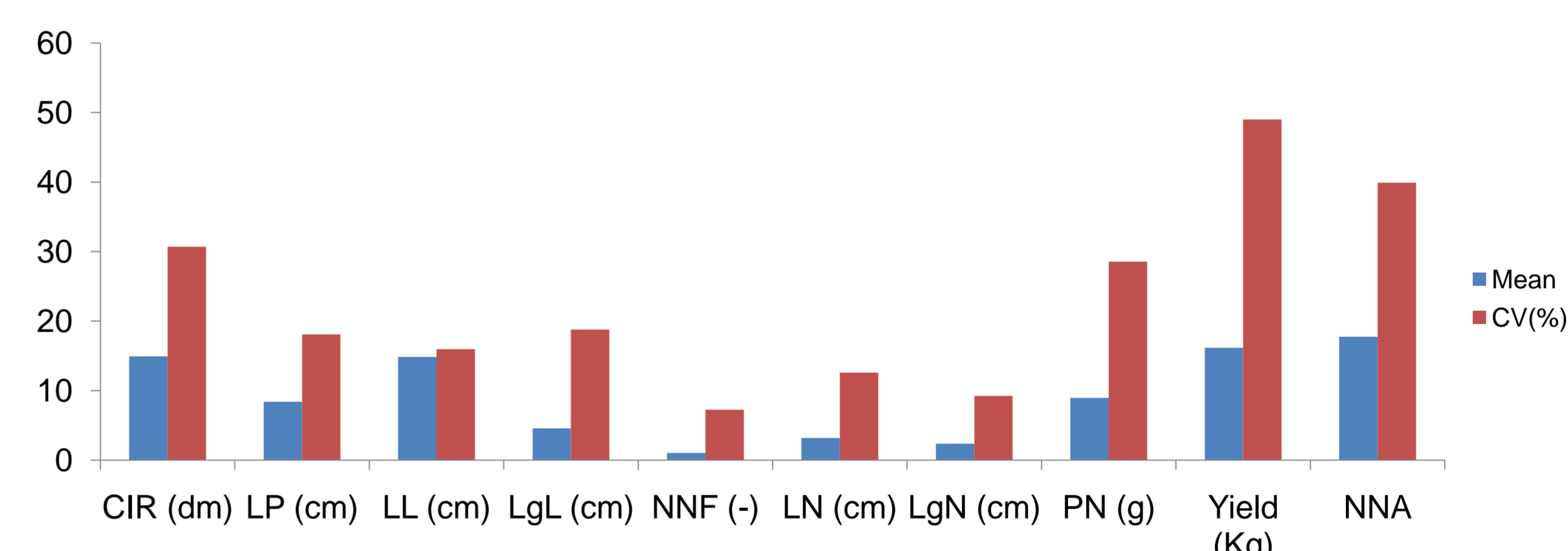


Figure 4: Mean value and coefficient of variation of quantitative traits

The study of the relationship between the different variables showed a strong correlation between trunk circumference and yield variables ($r=0.77$), between nut weight and nut width ($r=0.81$). The PCA and the hierarchical numerical classification carried out resulted in three groups of elite shea trees. The multivariate study carried out on the three groups obtained indicated that only trunk circumference differentiated the three groups (Figure 5).

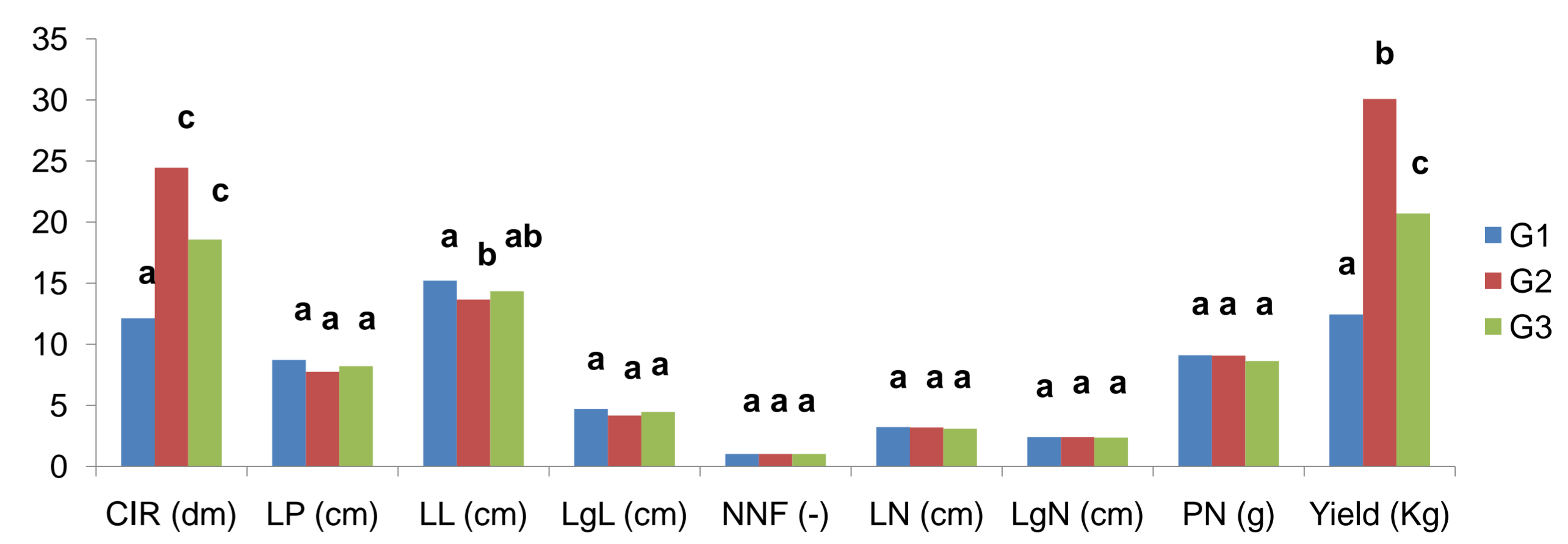


Figure 5: agromorphological characteristics of three groups of tree obtained from a numerical classification

Conclusion and perspectives

At the close of this study, the most diverse variables among shea elites in Côte d'Ivoire were branch density, leaf crown shape, tree bearing, trunk circumference, nut weight and yield. In order to complete the study of shea tree genetic diversity in Côte d'Ivoire, molecular markers will be used.