Understanding the relationship between morphological traits and genetic diversity of *Vitellaria paradoxa* (Sapotaceae) in Cameroon

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I- Background

❑ *Vitellaria paradoxa* is a keystone species of the parkland agroforestry extending across the wooded savannah of Cameroon.
❑ Identified as a priority tree species by the World Agroforestry (CIFOR-ICRAF) under the tree domestication program.
❑ Constraints (weak regeneration, deteriorating ecological conditions, anthropic pressure)
❑ Bioactive compounds for anticancer, antibacterial, anti-diabetic, antioxidant, anti-inflammatory, anti-diarrhoeal.
❑ The objective was to assess the morphological features in the characteristics of the shea tree and fruit in the selected sampling locations in Cameroon.

II-Material and methods
II.1- Study locations

❑ The study was carried out in the western highlands, Guinean high savannah, Soudano-Sahelian areas (West and Northern regions).

Figure 1: *V. paradoxa* tree in agroforestry parkland

Clusters
- Banga Fokam
- Manga
- Ndjola
- Ngong
- Plaine du Noun
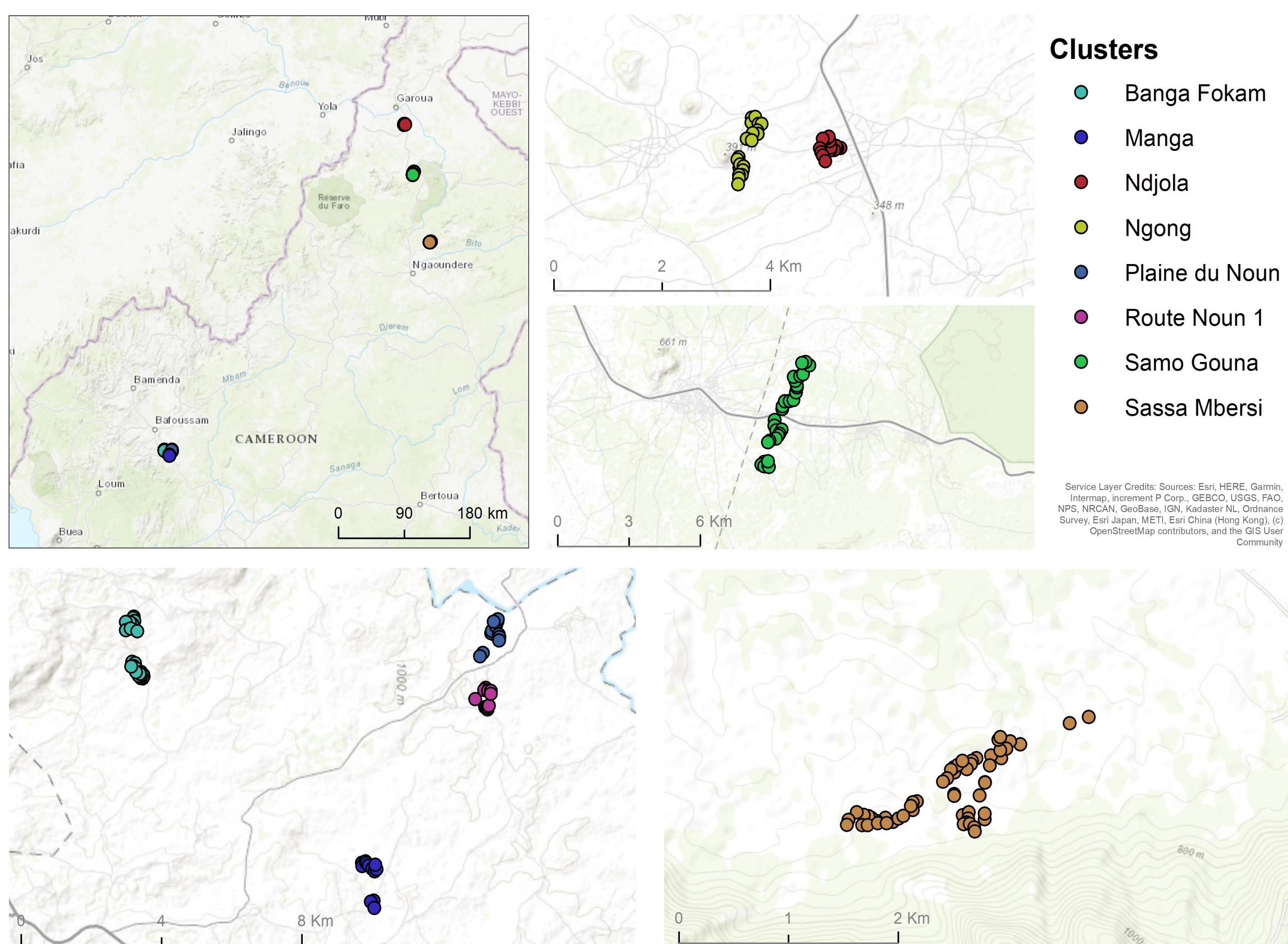- Route Noun 1
- Samo Gouna
- Sassa Mbersi

Figure 2: Map showing sampled *V. paradoxa* trees for fruit morphology and tree characteristics

II.2-Sampling strategy

❑ Data collection (June – September 2021)
❑ Tree parameters assessed were height, DBH, crown shape + fruit characteristics (size, length, width and weight).
❑ Samples of leaf tissue from trees selected areas were collected and stored in silica gel (n=181) for further sequencing analysis and DNA extraction.

Figure 3&4: Fruits and dried leaves of *V. paradoxa*

Outcome

❑ Preliminary results show that a strong correlation exist between parameters.
❑ Clustering the populations.
❑ Kernel parameters are close (difference).
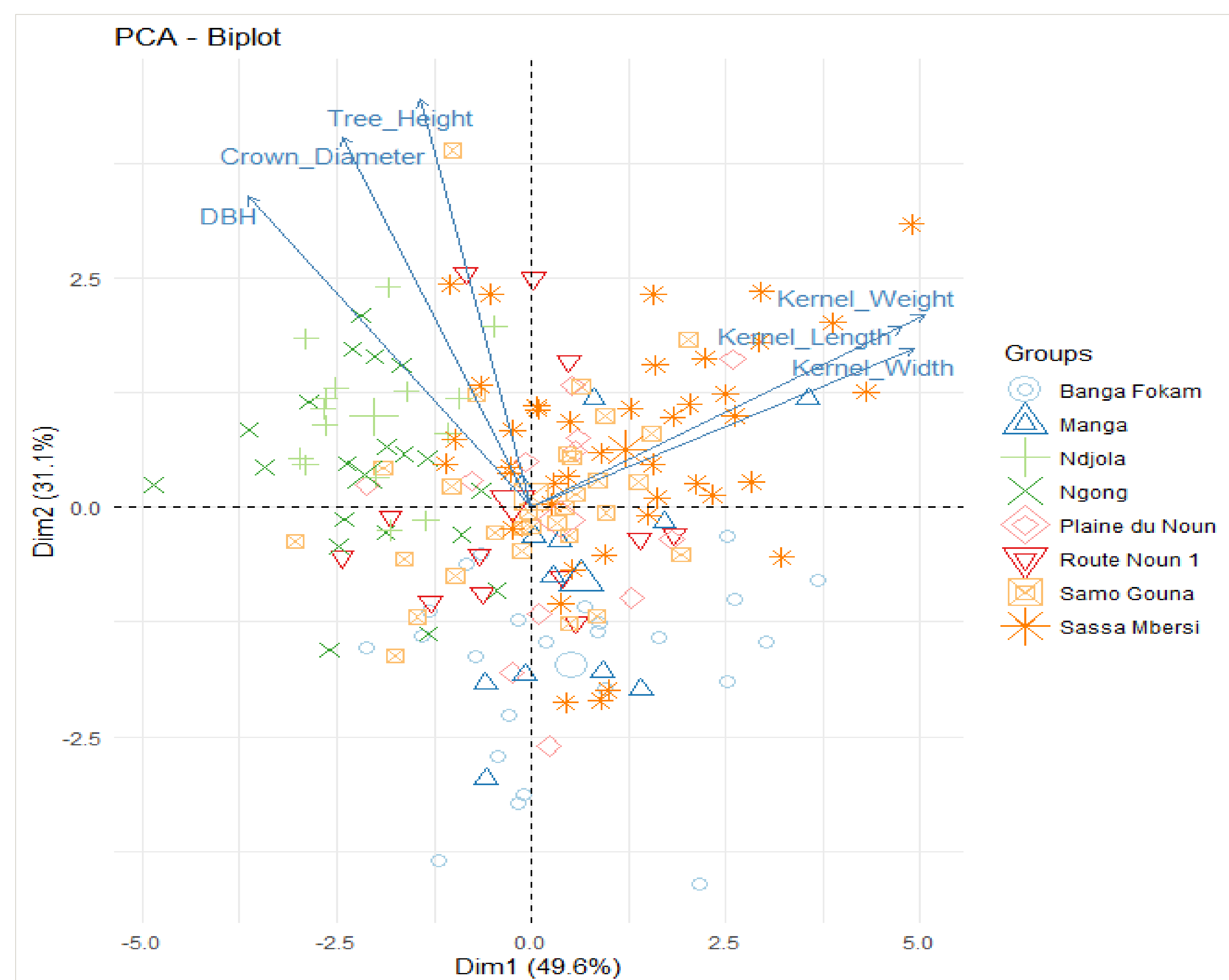❑ There is an influence of environment/location on the phenotype of fruits.

Figure 5: Principal component Analysis with morphological parameters

Conclusion

❑ The results presented are a step forward in bridging the current gap related to management and genetic diversity of the specie.
❑ Contribute to sustainable management of existing germplasm which will lead to more economic security of vulnerable rural population.
❑ Results on the diversity and genomic characterization are still ongoing.

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