

# Population Structure of *Vitellaria paradoxa* Gaertn. F. and *Parkia biglobosa* (Jacq.) Benth. in the Agroforestry Parklands of Nigerian Humid Savanna

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## Abstract

The distribution and population of *Vitellaria paradoxa* (shea tree) and *Parkia biglobosa* (locust tree), two savanna parkland priority non-timber forest products, were studied in the cultivated and fallow land uses in three ecozones (moist woodland or derived savanna, dry woodland or southern guinea savanna and northern Guinea savanna) all in the Nigerian humid savanna. Lamina morphology of *Vitellaria* population in the region was also studied for possible varietal delimitation. The overall average densities for *Vitellaria* and *Parkia* in the area studied were 8.4 plants/ha and 6.6 plants/ha, respectively. The two species were equally dominant in the cultivated land use. In the fallow land use *Vitellaria* was more dominant than *Parkia* with a stand ratio of 1: 0.6. In the southerly study location (Lanlate) there was preponderance of *Parkia* (12 plants/ha). However, Kontagora in the northerly study area had a preponderance of *Vitellaria* (11.5 plants/ha) in the vegetation. Saplings of the two species were absent in all the agro-ecozones studied. Large trees (>168 cm GBH) of *Vitellaria* were absent in the southerly moist woodland savanna, but present in the dry woodland (15.4%) and northern Guinea savanna (13.5%). All size classes, except saplings, were represented in the *Parkia* population in the ecozones. While the large trees of *Parkia* accounted for 39% and 38% of the population in cultivated and fallow land uses, respectively, the large trees of *Vitellaria* accounted for 20% and 4% of the population in the cultivated and fallow land uses, respectively. Same species replacement and regeneration of *V. paradoxa* and *P. biglobosa* are low. With respect to lamina morphology, especially vestiture of the abaxial surface/petiole and petiole length, two variants may be identified within the *Vitellaria* population in Nigerian humid savanna. Concerted effort should be directed at domestication and plantation establishment of the two species to enhance their productivity and curb the threat of extinction.

## Introduction

A number of tree species in the savanna, which include *Vitellaria paradoxa*, *Parkia biglobosa*, *Prosopis africana*, *Moringa oleifera*, *Jatropha curcas*, *Adansonia digitata*, *Termarindus indica*, *Vitex doniana*, etc. provide a range of forest products and play vital roles in the rural economy (Okafor, 1980; Kio *et al.*, 1989). These trees/shrubs are neither domesticated nor established in organized plantations as the timber species and exotic fruit trees. Rather, the species are endangered and are

facing threat of extinction due to continued exploitation without replacement, and pressure on the land and forest resources as a result of ever-increasing population and faulty farm practices that hamper their regeneration. Incidentally, the modifications in the focus of the system improvement programme of ICRAF to prioritize farmers' needs has encouraged investigations into the potentials of indigenous tree species with better nutrition and cash values for inclusion in agroforestry parklands. This re-focusing has made relevant the trees listed