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## The relative role of soil, climate, and genotype in the variation in nutritional value of *Annona senegalensis* fruits and leaves

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### Abstract

*Annona senegalensis* Pers is a multipurpose tree species valued for food and medicinal uses of its leaves and fruits in Africa. As a traditional food plant in Africa, *A. senegalensis* plays an important role in the context of food security, and its domestication has the potential to improve nutrition, foster development, and support sustainable land use. Although there have been attempts to document the proximate composition of its fruits and leaves, little is known about the relative role of soil, climate, and genotype on the nutritional quality. The present study evaluated the variation of the proximate composition in its fruits and leaves in populations from Benin and Mozambique. It further assessed the impact of soil, climate and genotype on the proximate composition. Data were collected from four populations genetically different and analysed using descriptive statistics, analysis of variance (ANOVA), principal component analysis and redundancy analysis (RDA). Results revealed significant variation in the proximate composition of the fruits and the leaves between the studied populations. Moisture and lipids were respectively six times and 1.27 times higher in the fruits than in the leaves, while ashes, fibers and proteins were approximately twice higher in the leaves than in the fruits. Genetic groups, climate and soils were found to influence this variation. Soil (47.56 %) and genotype (38.87 %) better explained the variability in the proximate composition of the fruits and the leaves than climate (13.56 %). Our study provides essential information that could be harnessed in the domestication and breeding programme of *A. senegalensis* for its edible parts.

**Keywords:** *Annona senegalensis*, proximate composition, macronutrients, variability