



Tropentag, September 10-12, 2025, hybrid conference

“Reconcile land system changes
with planetary health”

Micronutrient density of neglected and underutilised African crops

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Abstract

The world's food security largely relies on a few highly developed major crop species, while many edible plant species remain neglected and underutilised. This trend can lead to one-sided and unbalanced diets. Within the project HealthyDiets4Africa, we aim to combat malnutrition in Africa by diversifying the entire food system. This includes analysing and promoting neglected and underutilised crop species, also called opportunity crops. To this end, we have compiled a list of 23 priority species from four different countries based on the following criteria: (i) perceived untapped potential in combating malnutrition; (ii) representation of fruits, seeds, leafy vegetables, and root crops; and (iii) limited information available in the scientific literature regarding nutritional values. Samples of these species were collected from farmers' fields or markets in Cameroon, Nigeria, Benin, and Côte d'Ivoire in 2023 and 2024 using a standardised protocol and documentation. The freeze-dried samples of the edible parts were subjected to nutrient analyses, focusing on protein, essential microelements such as zinc and iron, phytate, phenolics, and vitamins (especially B vitamins and vitamin C). Our initial results demonstrate the outstanding potential of some species to provide essential nutrients. Seeds of the leguminous tree species *Parkia biglobosa* (African locust bean) contain almost 35 % protein. Leafy vegetables such as *Basella alba* (vine spinach) and *Crassocephalum crepidioides* (Fireweed) scored particularly high in terms of micronutrients like iron, zinc, and B vitamins. Fruits of *Canarium schweinfurthii* (African elemi) were particularly high in phenolics, indicating high antioxidative potential. However, we also observed substantial intra-species variation in nutrient concentrations, suggesting that factors such as variety and growing conditions, harvesting time and storage, can significantly affect the nutritional values of these plant

foods. To harness the immense nutritional potential of these neglected and underutilised crop species, we need to target the entire food chain by developing growing systems, productive varieties, value chains, recipes, products, and consumer acceptance.

Keywords: Diversification, malnutrition, micronutrients, underutilised crops