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Influence of species, source of origin and maturity stages on nutritional composition, bioactive compounds and antioxidant potentials of underutilised nettle (*Urtica* spp.) leaf

DEKEBA MOGES TOLA¹, YETENAYET TOLA², ÖZLEM ÖZMUTLU³, SMETANSKA IRYNA⁴

¹Arsi University, Ethiopia

²Jimma University, Dept. of Post-Harvest Management, Ethiopia

³University of Applied Sciences Weihenstephan-Triesdorf, Fac. of Horticulture and Food Technology, Germany

⁴University of Applied Sciences Weihenstephan-Triesdorf, Fac. of Agriculture, Food and Nutrition, Germany

Abstract

Urtica simensis and *Urtica dioica*, commonly known as ‘Nettles’ consumed as green vegetables and used for their medicinal benefit in Africa, Asia, Europe and North America. This study aimed to investigate the proximate, mineral, anti-nutrient, mineral bioavailability, total phenolics and flavonoids compounds, and antioxidant potential of *U. simensis* harvested from mature and immature leaf parts from Ethiopia and *U. dioica* (mature leaf) from Germany. Moisture, crude fat, crude fiber, crude protein, total carbohydrate, gross energy, minerals, phytate, oxalate, estimated mineral bioavailability, total phenolic, flavonoids, and antioxidant capacity showed significant differences ($p < 0.05$), while total ash and saponins showed insignificant. The result showed that both species alongside the leaf maturity stages were higher in nutrients (crude fat, crude fiber, crude protein, total ash, minerals, total polyphenols, and flavonoids), and antioxidant capacity. The molar anti-nutrients to minerals ratio for their bioavailability is below the critical limits which not hinder the bioavailability of the minerals. As compared to other leafy vegetables, results of the study showed that *U. simensis* and *U. dioica* are potential sources of valuable nutrients even though results of *U. simensis* were better than *U. dioica* in all profiles except in crude fat, crude fiber, total ash, magnesium, and antioxidant capacity. Unlike *U. dioica*, which is commercially produced, *U. simensis* is a wild edible plant in Ethiopia with comparable potential to supply essential nutrients to address under-nutrition in the country. Its domestication and commercial production is recommended to add to the nation’s diets to contribute to the country’s nutrition security efforts.

Keywords: Anti-nutrients, mineral analysis, mineral bioavailability, phenolic compounds, *Urtica dioica*, *Urtica simensis*