Tropentag, September 9-11, 2020, virtual conference

"Food and nutrition security and its resilience to global crises"

Zambian Neglected Species: Oils and Cakes Composition of Traditional Oil-Bearing Trees

Anna Manourova[1], Jan Tauchen[2], Adela Frankova[3], Ondrej Drabek[4], Vladimir Verner[5], Mukelabai Ndiyoi[6]

[1] *Czech University of Life Sciences Prague, Fac. of Tropical AgriSciences, Dept. of Crop Sciences and Agroforestry, Czech Republic*

[2] *Czech University of Life Sciences Prague, Fac. of Agrobiology, Food and Natural Resources, Dept. of Food Science, Czech Republic*

[3] *Czech University of Life Sciences Prague, Fac. of Agrobiology, Food and Natural Resources, Dept. of Food Science,*

[4] *Czech University of Life Sciences Prague, Fac. of Agrobiology, Food and Natural Resources, Dept of Soil Science and Soil Protection, Czech Republic*

[5] *Czech University of Life Sciences Prague, Fac. of Tropical AgriSciences, Czech Republic*

[6] *University of Barotseland, School of Natural Resources, Zambia*

Abstract

Due to the increased contact between disparate human populations and the development of a global trading system, the number of species upon which global food security and agricultural incomes depend narrowed drastically. More than half of today's needs for energy are met by maize, wheat and rice. The impact of the species base narrowing is mostly felt most by the rural communities in marginal areas, where the set of livelihood options is limited. Many neglected/underutilised species occupy important niches, perfectly adapted to the local fragile conditions, contributing to sustainable production with minimal inputs as well as to the diversity and the stability of agro-ecosystems. The scientific community, as well as the food industry, know the only a minimal share of Zambian food plants. Therefore, our study focused on the chemical composition of oils and cakes of three neglected but traditionally important oil-bearing plants, namely: *Parinari curatellifolia*, *Schinziophyton rautanenii* and *Ochna serrulata*, in surroundings of Mongu, Western Province, Zambia. *P. curatellifolia* and *S. rautanenii* oils were chiefly composed of -eleostearic acid (28.58–55.96 %), linoleic acid (9.78–40.18 %), and oleic acid (15.26–24.07 %), whereas *O. serrulata* contained mainly palmitic (35.62–37.31 %), oleic (37.31–46.80 %), and linoleic acid (10.61–18.66 %). Vitamin E of *S. rautanenii* oil was mainly composed of -tocopherol (3236.18 g/g); *O. serrulata* contained similar proportions of - (287.37 g g^{-1}) and -tocopherol (361.11 g g^{-1}), whereas *P. curatellifolia* had negligible levels of vitamin E. All three species can be considered as a good source of essential minerals. The results suggest great potential of the traditional Zambian species to be introduced into food, technical and/or pharmaceutical industry. Especially *O. serrulata* deserves deeper research attention, because of the considerable quantities of -tocopherol in its oil which exhibits non-rancid properties. Due to the nutrient-rich cakes, the tested species might be also promising for animal fodder fortification.

Contact Address: Anna Manourova, Czech University of Life Sciences Prague, Fac. of Tropical AgriSciences, Dept. of Crop Sciences and Agroforestry, Prague, Czech Republic, e-mail: manourova@ftz.czu.cz

Keywords: Cooking oils, neglected crops, sustainable diet, underutilised species, Zambia, -eleostearic acid