



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

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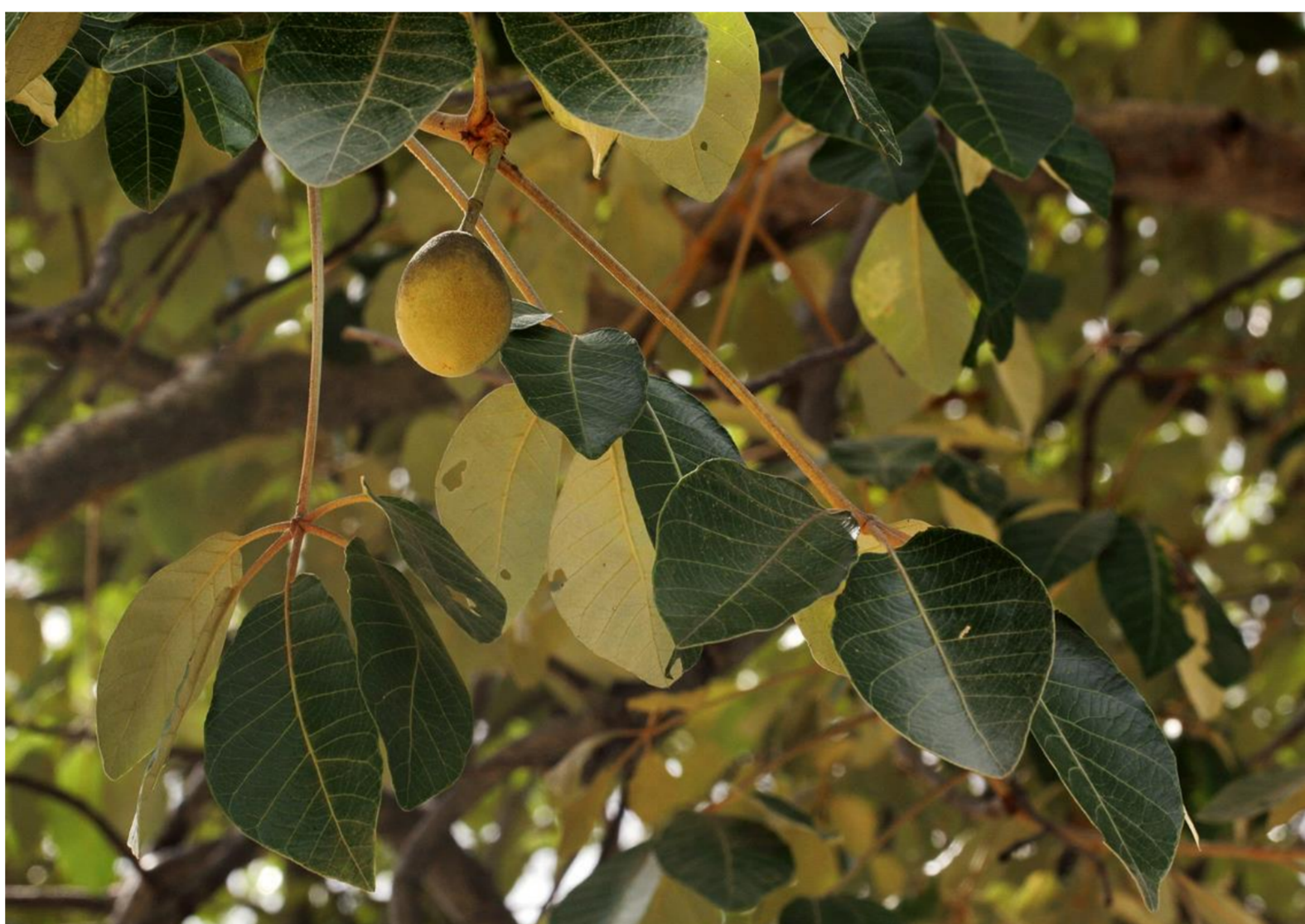
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INTRODUCTION

- About 75 % of the world's food is generated from only 12 plant species (mostly maize, rice and wheat), while the traditional food production systems quickly disappear at the expense of highly intensified agriculture. With the decline, agrobiodiversity is being lost together with wild plants, local crops and landraces.
- The re-discovery and support of the indigenous plants bring advantages to both developed and developing countries by identification of nutritionally rich and pharmacologically interesting species with sizeable economic potential.
- In Western Province of Zambia, most of the traditional crops were substituted by maize, mango and cashew nut. Having only limited access to nutritional and well-balanced food, local communities are threatened by malnutrition and hidden hunger.
- Our study focused on the chemical composition of oils and cakes of three traditional Zambian oil species, which are commonly utilized by local communities.



Parinari curatellifolia (mubula)



Schinziophyton rautanenii (mongongo)

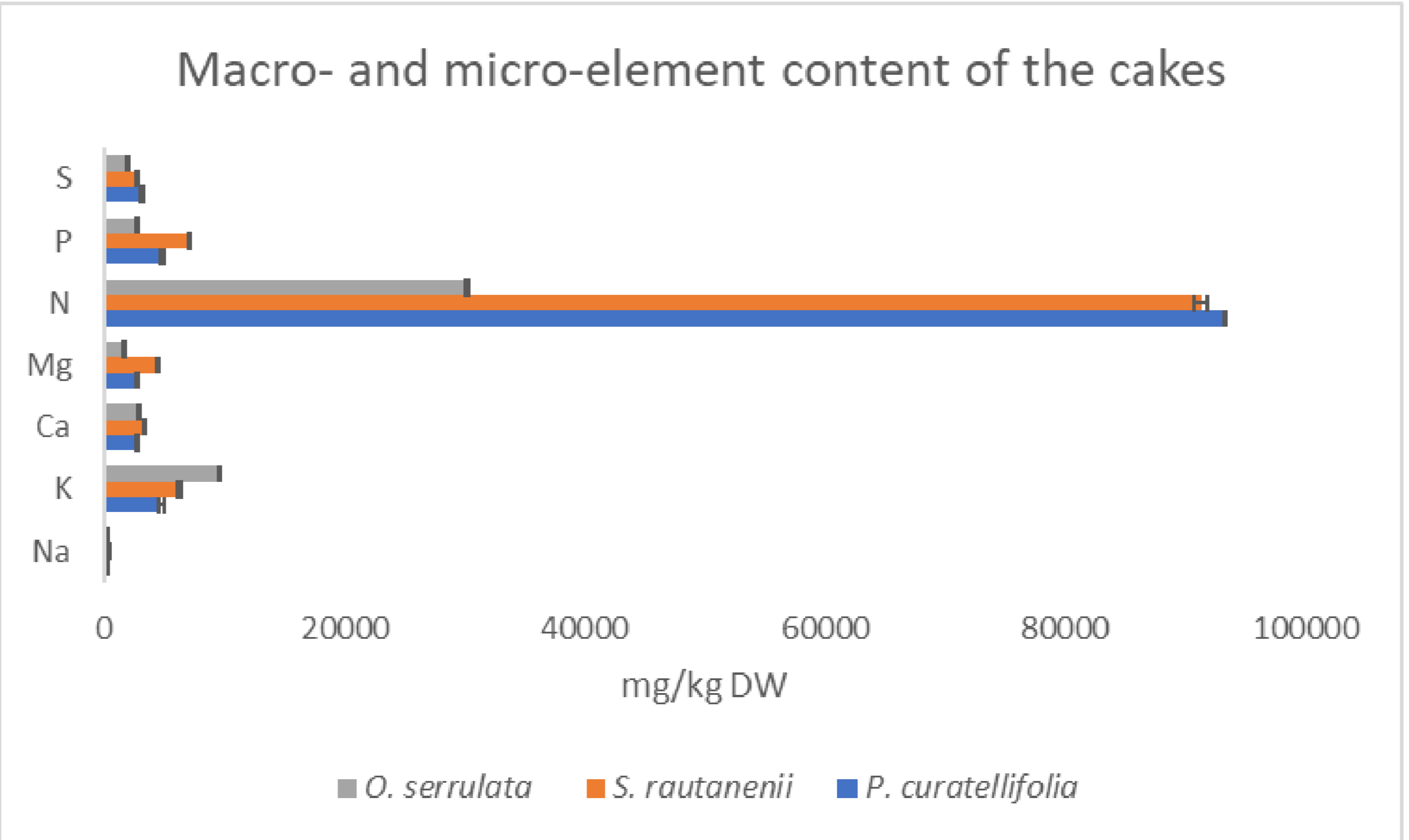
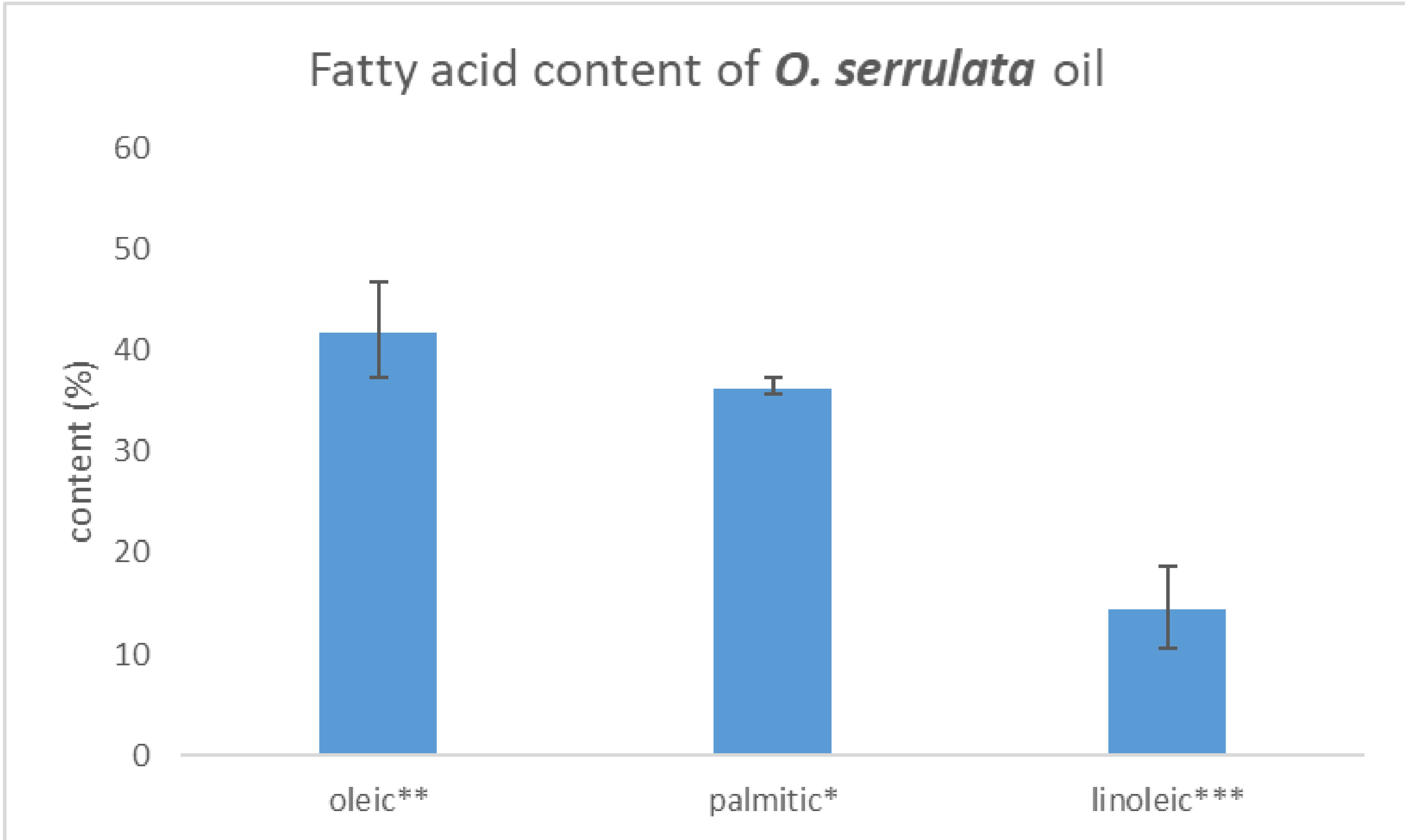
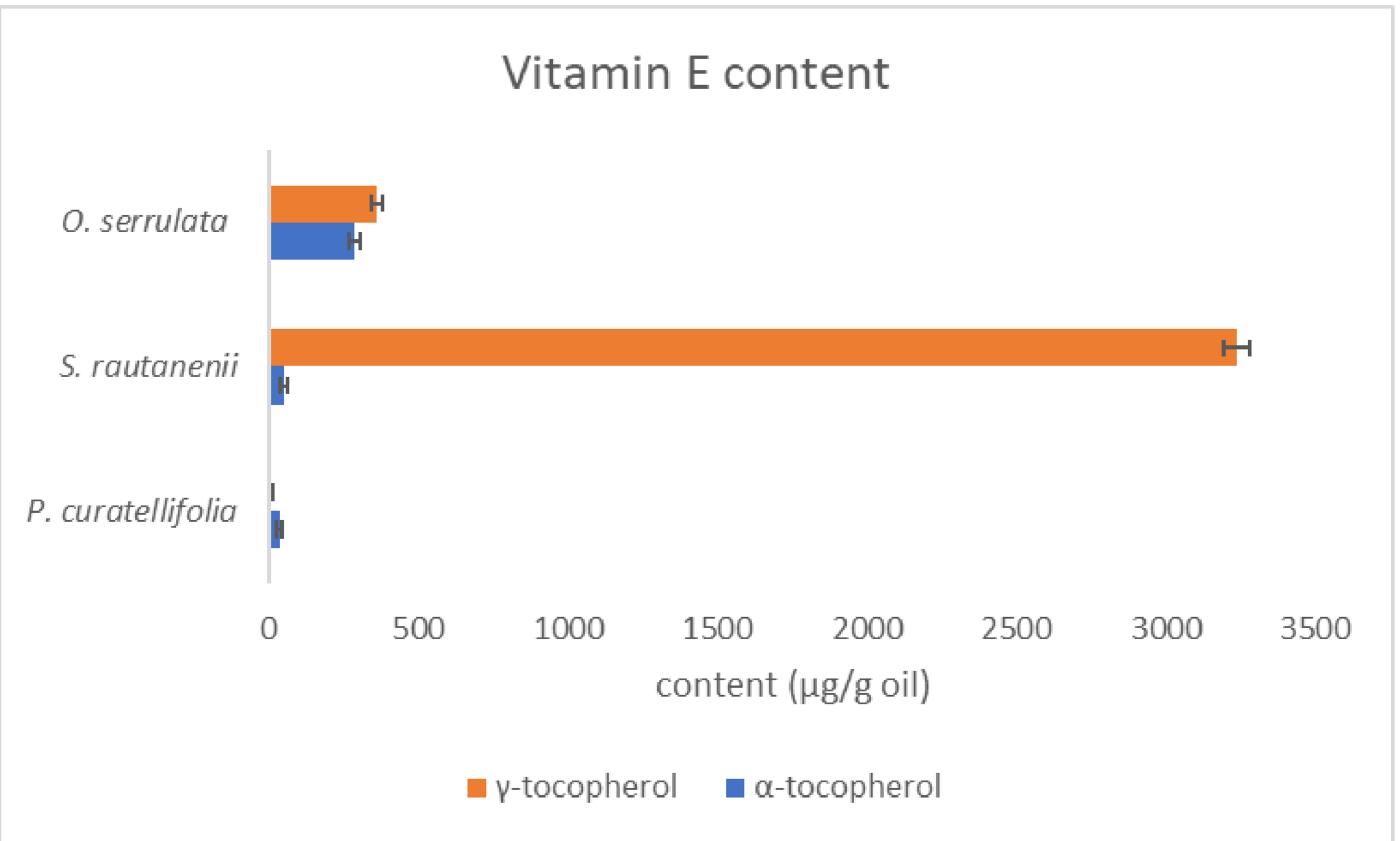
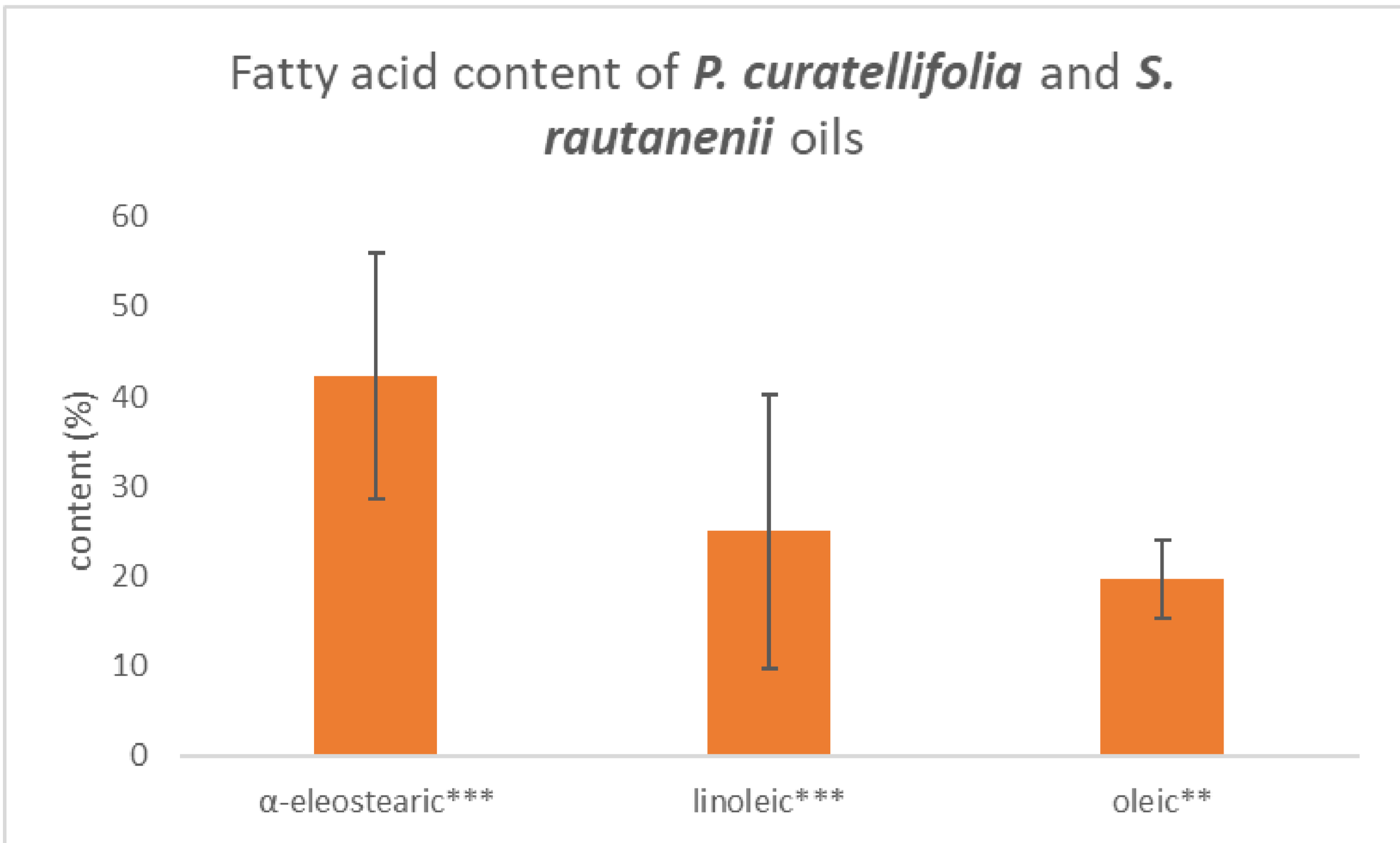


Ochna serrulata (munyelenyele)

HIGHLIGHTS

- P. curatellifolia* and *S. rautanenii* oil is chiefly composed of **poly-** and **monounsaturated** fatty acids (FA; such as tung oil), *O. serrulata* oil contains **monounsaturated** and **saturated** FA (such as palm oil)
- O. serrulata* oil was relatively rich in **α-tocopherol**
- S. rautanenii* had **the highest vit E content** (γ-tocopherol)
- The first study** on FA and vit. E content of *O. serrulata*
- All tested oil cakes are nutritionally equivalent to soya
- All oils and cakes have the potential of being introduced into the food industry as **cooking oils** and **animal feeds**

RESULTS



METHODOLOGY

- Two types of samples were compared: the traditional oils purchased at the local market (*O. serrulata*, *S. rautanenii*); and the oils from freshly collected fruits (*O. serrulata*, *S. rautanenii*, *P. curatellifolia*).
- Derivatization of fatty acids (FA) was done by alkaline transmethylation procedure. Quantitative Analyses of FA were performed on GC-FID and GC-MS. Mass spectra were identified with the use of NIST mass spectral library ver. 2.0f. Retention indices were calculated by linear interpolation.
- Tocopherol and tocotrienol content analysis was determined using HPLC coupled to RS fluorescence detector.
- Macro/microelements in the cakes were analyzed with the use of Inductively coupled plasma mass spectrometry or Kjeldahl method.
- All analyses were performed in three independent experiments, each in triplicate.

ACKNOWLEDGEMENTS



*saturated acid (SFA); **monounsaturated acid (MUFA); *** polyunsaturated acid (PUFA)