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## Chemical Composition of Tuberous Roots and Leaves of Yacon [*Smallanthus sonchifolius* (Poepp. et Endl.) H. Robinson]

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### Abstract

Yacon [*Smallanthus sonchifolius* (Poepp. et Endl.) H. Robinson] a native tuberous plant of the Andes, belongs to the family *Asteraceae*, is cultivated for its tuberous roots and medicinal infusions obtainable from the leaves. It is very rich in phenolic components with strong antioxidant activities. Most of tuberous root biomass is constituted by water usually almost 70 % of the fresh weight. When grown under its native climatic conditions yacon tuberous roots contain saccharides, especially oligofructans (with favourable effect on diabetes), form 70–80 % of dry weight (d.w.), otherwise protein contents range between 0.3–3.7 % d.w. The overground part of yacon contains a great amount of proteins (up to 25 % d.w.) and can be used like forage.

Yacon was introduced in Czech Republic 11 years ago, where at the present time it is cultivated successfully. It reaches relatively high yields of biomass: up to 34 t ha<sup>-1</sup> of tuberous roots, t/ha of overground part, 14 t ha<sup>-1</sup> of fresh leaves and 2 t ha<sup>-1</sup> of dry leaves.

The purpose of this work was to determine the chemical composition in primary and secondary metabolites in the tuberous roots and leaves of yacon cultivated under Czech climatical condition.

Yacon tuberous roots, grown in Czech Republic contain saccharides: inulin (179 g kg<sup>-1</sup> d.m.), fructose 193 g kg<sup>-1</sup> d.m.), saccharose (28.6 g kg<sup>-1</sup> d.m.) and glucose (69.3 g kg<sup>-1</sup> d.m.).

Phenolic acid content was measured in the roots: chlorogenic acid (942 mg kg<sup>-1</sup> d.m.), caffeic acid (329 mg kg<sup>-1</sup> d.m.), 3,5-O-dicaffeoylquinic acid (249 mg kg<sup>-1</sup> d.m.). Protein content in the tuberous roots is 154 g kg<sup>-1</sup> d.m.

Phenolic acid content of yacon leaves was measured too, it demonstrated to be definitely different than the root's one in each of the component measured but in the chlorogenic acid. In fact acid content in dry leaves was: chlorogenic acid (779 mg kg<sup>-1</sup> d.w.), caffeic acid (699 mg kg<sup>-1</sup>), 3,5-O-dicaffeoylquinic acid (9018 mg kg<sup>-1</sup> d.w.). The content of protein in leaves is 252,5 g kg<sup>-1</sup> d.w. It is interesting to underline that compared with potato tubers (834 mg kg<sup>-1</sup> d.m.), yacon tuberous roots (8489 mg kg<sup>-1</sup> d.m.) are 10 times richer in polyphenolic antioxidants.

**Keywords:** 3,5-O-dicaffeoylquinic acid, phenolic acid, proteins, saccharides, yacon