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An Evaluation of Diversity in the Biochemical Composition of *Moringa oleifera* Seeds

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Abstract

Moringa oleifera is a pantropical multipurpose tree. It tolerates most common stress factors, propagates easily and has a very high biomass yield. The leaves are suitable for human or animal nutrition. The seeds are used for oil production and provide a flocculant applicable in water purification. The seed cake obtained after extraction of oil and flocculant has been evaluated for animal nutrition. Despite these multiple uses, little is known about the variation in composition and activity between material of different origin. We therefore analyzed different batches of *Moringa oleifera* seeds, covering three different geographical locations (Nicaragua, Indonesia, The Gambia), successive mixed harvests from the same plantation, and seeds collected at the same time from different plants in the same location. Crude nutrient composition, oil content and oil composition, and the protein pattern of the water extract were compared. Recent results indicated that the seeds also contain a component that modulates rumen fermentation *in vitro*. This component was originally detected in the water extract, but its chemical nature has not yet been identified. It effectuated a delay of ruminal protein degradation, when it was added to protein enriched substrates, such as wheat straw supplemented with soy protein or lyophilized alfalfa leaves. Selected samples were therefore incubated with rumen fluid to screen for this activity in the defatted seed cake, in the water extract, and in the corresponding extraction residue. Information about the variability of traits within the species is an important prerequisite to develop a strategy for the optimized exploitation of *Moringa oleifera*.

Keywords: Diversity, *in vitro* fermentation, *Moringa oleifera*, ruminant nutrition

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