



## METABOLIC FINGERPRINT OF VETIVER ESSENTIAL OIL

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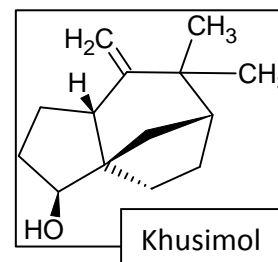
Vetiver essential oil is highly valued and is widely used as a fragrance in the perfume industry. It is obtained from the roots of *Chrysopogon zizanioides* (L.) Roberty, a perennial grass from the Poaceae family, which is commonly known under the name vetiver. The plant originates from Southern Asia, but is now used in many countries especially to avoid soil erosion. The essential oil extracted from its roots through hydro distillation possesses unique characteristics and has a wooden odor. It is a complex mixture mainly consisting of oxygenated sesquiterpenes [1]. In this study the chemical composition of the essential oil from vetiver grown in Brazil is compared with the composition of a series of commercial samples.

The commercial samples were originating from different countries: from Brazil, Haiti, India and Indonesia. The analysis of the chemical composition was performed with different techniques. The fingerprints were obtained by gas chromatography coupled to mass spectrometry (GC-MS), and by Nuclear Magnetic Resonance (NMR). With NMR both the  $^1\text{H}$  and  $^{13}\text{C}$  NMR spectra were obtained.

Three different types of essential oil samples could be distinguished, but all oils were clearly different. In the most common type khusimol occurred as main component. Also the oil obtained by hydro distillation khusimol was the main component.

One essential oil was clearly different and contained a high amount of glycols, which are commonly used in the perfume industry but should not present in the vetiver essential oil, characterizing adulteration.

GC-MS,  $^1\text{H}$  NMR and  $^{13}\text{C}$  NMR were all found to be excellent for the metabolic fingerprinting of the vetiver oil, but they provide clearly different images.  $^1\text{H}$  NMR is by far the most rapid and convenient method, but GC-MS and  $^{13}\text{C}$  NMR provide much more structural information. The detection of adulterants is directly obvious from the fingerprints.



### References:

[1] Weyerstahl, P., Marshall, H., Splittgerber, U. 2000. Constituents of Haitian vetiver oil. *Flavour and Fragrance J.* 15: 61-83.