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Comparative Analysis of Marjoram Essential Oils from Serbia and Egypt

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The chemical composition of essential oils from commercial marjoram (*Origanum majorana* L.) sourced from southeastern Serbia and Egypt was investigated using GC and GC-MS techniques. The major volatile compounds in both oils were terpinen-4-ol and *γ*-terpinene, constituting approximately 50% of the oils based on GC peak areas. However, significant differences between the two oils in terms of their *cis*- and *trans*-sabinene hydrate content, which are commercially important monoterpenes were determined. The Egyptian oil contained 12.1% *trans*-sabinene hydrate and 3.5% *cis*-sabinene hydrate, while the Serbian oil contained a total of 7.2% *cis*- and *trans*-sabinene hydrates in a 1:1.7 ratio. We also performed a complete and comprehensive ^{1}H and ^{13}C NMR assignment of sabinene hydrates, that includes *J*-values obtained by computer spin simulation and molecular modeling. Interestingly, we found that the literature NMR data on these compounds were mostly incomplete and usually lacked a thorough multiplet analysis.

Keywords: *Origanum majorana* L., *trans*-sabinene hydrate, *cis*-sabinene hydrate, NMR, spin simulation.

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