GC and GCxGC-MS Composition of Volatile Compounds from Cuminum cyminum and Carum carvi by Using Techniques Assisted by Microwaves

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Abstract : The new methods as accelerated steam distillation assisted by microwave (ASDAM) is a combination of microwave heating and steam distillation, performed at atmospheric pressure at very short extraction time. Isolation and concentration of volatile compounds are performed by a single stage. (ASDAM) has been compared with (ASDAM) with cryogrinding of seeds (CG) and a conventional technique, hydrodistillation assisted by microwave (HDAM), hydro-distillation (HD) for the extraction of essential oil from aromatic herb as caraway and cumin seeds. The essential oils extracted by (ASDAM) for 1 min were quantitatively (yield) and qualitatively (aromatic profile) no similar to those obtained by ASDAM-CG (1 min) and HD (for 3 h). The accelerated microwave extraction with cryogrinding inhibits numerous enzymatic reactions as hydrolysis of oils. Microwave radiations constitute the adequate mean for the extraction operations from the yields and high content in major component majority point view, and allow to minimise considerably the energy consumption, but especially heating time too, which is one of essential parameters of artifacts formation. The ASDAM and ASDAM-CG are green techniques and yields an essential oil with higher amounts of more valuable oxygenated compounds comparable to the biosynthesis compounds, and allows substantial savings of costs, in terms of time, energy and plant material.

Keywords : microwave, steam distillation, caraway, cumin, cryogrinding, GC-MS, GCxGC-MS

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