

Optimization of a combined extraction process of active compounds: study of biological activity and synergistic effect

Achwak YAHIA, Houcine BEN DAOUED, Mehrez ROMDHANE

Laboratory environment, energy, water process of Gabes, University of Gabes, Street Omar Ibn El Khatab, 6029 Gabes, Tunisia

E-mail 1 - achoikyahia1997@gmail.com

E-mail 2 - Houcine.bendaoud@gmail.com

E-mail 3 - mehrez.romdhane@univgb.tn

The present work deals with the combined extraction from medicinal plants from southern of Tunisia *Thymus vulgaris* L. (*T. vulgaris* L.); *Rosmarinus officinalis* L. (*R. officinalis* L.) essential oils (EOs) was used in combined treatment by experimental design methodology (mixture design) with the aim of studying their synergistic effect. The chemical composition of EOs was firstly identified by GC and GC/MS and a series of biological activities were evaluated. The results of this first step have shown that thymol and borneol were the major compounds in *T. vulgaris* L. EOs, respectively, while α -pinene was found as major compounds in *R. officinalis* L. in addition of that, the results showed that both plants exhibit significant anti-inflammatory and anti-Alzheimer activities. Moreover, the study of their combinations revealed that the mixture possesses higher biological activity compared to each plant individually confirming the presence of a synergistic effect.

Key words: combined treatment, optimization, active compounds, synergistic, biological activities.

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