

Activity of Essential Oils and Individual Components against Acetyl- and Butyrylcholinesterase

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We have tested acetylcholinesterase (AChE) and butyrylcholinesterase (BChE) inhibitory activities of nineteen essential oils obtained from cultivated plants, namely one from *Anethum graveolens* L. (organic fertilizer), two from *Foeniculum vulgare* Mill. collected at fully-mature and flowering stages (organic fertilizer), two from *Melissa officinalis* L. (cultivated using organic and chemical fertilizers), two from *Mentha piperita* L. and *M. spicata* L. (organic fertilizer), two from *Lavandula officinalis* Chaix ex Villars (cultivated using organic and chemical fertilizers), two from *Ocimum basilicum* L. (green and purple-leaf varieties cultivated using only organic fertilizer), four from *Origanum onites* L., *O. vulgare* L., *O. munitiflorum* Hausskn., and *O. majorana* L. (cultivated using organic fertilizer), two from *Salvia sclarea* L. (organic and chemical fertilizers), one from *S. officinalis* L. (organic fertilizer), and one from *Satureja cuneifolia* Ten. (organic fertilizer) by a spectrophotometric method of Ellman using ELISA microplate-reader at 1 mg/ml concentration. In addition, a number of single components widely encountered in most of the essential oils [γ -terpinene, 4-allyl anisole, (–)-carvone, dihydrocarvone, (–)-phencone, cuminyl alcohol, cumol, 4-isopropyl benzaldehyde, *trans*-anethole, camphene, *iso*-borneol, (–)-borneol, 1-bornyl acetate, 2-decanol, 2-heptanol, methyl-heptanol, farnesol, nerol, *iso*-pulegol, 1,8-cineole, citral, citronellal, citronellol, geraniol, linalool, α -pinene, β -pinene, piperitone, *iso*-menthone, menthofuran, linalyl oxide, linalyl ester, geranyl ester, carvacrol, thymol, menthol, vanilline, and eugenol] was also screened for the same activity in the same manner. Almost all of the essential oils showed a very high inhibitory activity (over 80%) against both enzymes, whereas the single components were not as active as the essential oils.

Key words: Essential Oil, Anticholinesterase, Monoterpenes, Alzheimer's Disease