

A139 Choline-esterase inhibitory effects of some diterpenoids from the Chinese medicinal plant *Salvia miltiorrhiza*

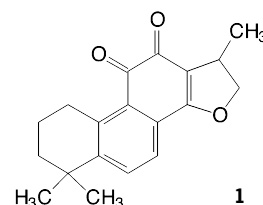
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The dried root of *Salvia miltiorrhiza* Bunge, known as "Dan Shen", has been used in treatment of cerebrovascular disease for over one thousand years in China, especially in older patients. In this study the effect of *Salvia miltiorrhiza* and some of its constituents on human erythrocyte acetylcholinesterase (AChE) were studied *in vitro* since a decline in acetylcholine levels in the CNS is associated with cognitive decline in old age. An acetone extract of the root was tested for choline esterase inhibitory effects using the modified Ellman method (1) and showed strong activity. The acetone extract was fractionated using vacuum liquid chromatography and two active fractions were obtained. From these two fractions three compounds cryptotanshione **1**, tanshinone I **2** and tanshinone IIA **3** were obtained and their inhibition of human erythrocyte choline esterase was measured (see Table) The most active compound, cryptotanshione **1** was shown to be a competitive inhibitor by increasing inhibition associated with decreasing substrate concentration and by the intersections in the Dixon plots. This is the first time diterpenoids have been shown to be AChE inhibitors.

Table. Inhibition of acetylcholine esterase by compounds

Compound	IC ₅₀ value μ M
1	0.4
2	2.7
3	139.0



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References: **1.** Perry, N.S.L et al. (2000) J. Pharm. Pharmacol. 52: 895-902.

A140 A study of Korean herbal medicines relevant to Alzheimer's diseaseM.H. Oh^{a,b}, P.J. Houghton^a, W.K. Whang^c and J.H. Cho^b

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This study was carried out as part of our search for new classes against Alzheimer's disease. Seven herbal medicines used traditionally in Korea to treat memory-related disorders have been selected (1) and examined. The results presented concern Korean medicinal plants: *Acorus calamus* root (AC), *Acorus gramineus* root (AG), *Bupleurum falcatum* root (BF), *Dioscorea batatas* root (DB), *Epimedium koreanum* herb (EK), *Phachyma hoelen* fungus (PH) and *Zizyphus jujuba* fruit (ZJ). Methanolic extracts of the herbal medicines were tested for inhibitory activity on human erythrocyte acetylcholinesterase (2). AG, BF, DB, PH and ZI showed insufficient activity for the IC₅₀ to be calculated. The methanolic extracts of AC and EK were fractionated between water and dichloromethane (DCM) and the fractions were also tested for anticholinesterase activity. DCM fraction of EK showed the most potent effect with an IC₅₀ of 82 μ g/ml. The isolation of active compounds from the EK DCM extract is in progress.

Table. Inhibition of human erythrocyte acetylcholinesterase by Korean herbal medicines:

Herbal medicine	IC ₅₀	Herbal medicine	IC ₅₀
AC-MeOH	188 μ g/ml	EK-MeOH	258 μ g/ml
AC-Water	174 μ g/ml	EK-Water	507 μ g/ml
AC-DCM	-	EK-DCM	82 μ g/ml

-: not assessed

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References: **1.** C.M. Kim et al. (1998) Korean version of Chinese Materia Medica. 2989, 3404, 2678, 4403, 2321, 1297 Jung Dam Press. Seoul, Korea. **2.** Perry, N.S.L et al. (2000) J. Pharm. Pharmacol. 52: 895-902.