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Natural cholinesterase inhibitors isolated from Anatolian plants

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Alzheimer's disease (AD) is a progressive neurodegenerative disorder accompanied by dementia which affects about 38 million people worldwide by 2014. The pathogenesis of AD is fairly complex and besides genetic factors, environmental factors may play important role. Since the cholinergic system plays an important role in the regulation of learning and memory processes, it has been targeted for the design of anti-Alzheimer's drugs. Cholinesterase inhibitors enhance cholinergic transmission directly by inhibiting cholinesterase enzymes particularly acetylcholinesterase. However, both AChE & BuChE enzymes may play an important role in amyloid β aggregation during the early stages of senile plaque formation. The major AD therapeutics available on the market are acetylcholinesterase inhibitors; tacrin, donepezil, rivastigmin and galanthamine besides an NMDA receptor antagonist memantine. But, none of them can provide a satisfactory cure for Alzheimer's disease. Therefore, there is an immediate requirement more efficient drugs than ones prescribed by the physicians at the moment. In our ongoing studies on natural products in drug discovery, we have investigated potential anti-cholinesterase compounds isolated from several plant families. Among them, terpenoids, particularly abietane diterpenoids take an important place in both prevention and treatment of AD as well as some flavonoids and other phenolics. In this study, a number of compounds including a series terpenoids, flavonoids and a few phenolics isolated from namely Anatolian Lamiaceae family plants have been assayed for anticholinesterase activity tests besides antioxidant and antiradical properties *in-vitro*. The compounds which showed at least 50% inhibition against one of the cholinesterase enzymes at 200 μ M were tested in five concentrations to determine their IC_{50} values.

Biography

Gulacti Topcu obtained her PhD in 1985 from Faculty of Pharmacy at Istanbul University on Natural Product Chemistry and worked at the University of Illinois at Chicago, College of Pharmacy in the Department of Medicinal Chemistry and Pharmacognosy as a Post doctorate from 1986-88. She became a Full Professor in Organic Chemistry specifically in Phytochemistry in 1999. Since 2011, she is the Dean of Faculty of Pharmacy, Bezmialem Vakif University at Istanbul. She has published more than 165 papers in reputed journals with more than 2400 citations (h-index: 27). She has been serving as the Editor-in Chief of the "Records of Natural Products" which is a SCI journal.

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