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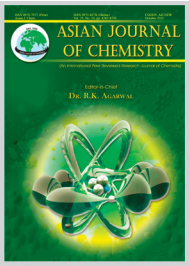

NOTE

Free Radical Scavenging Activities of the Extracts from *Lysimachia foenum-graecum Hance*

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Under ultrasound, *Lysimachia foenum-graecum Hance* herbs were extracted with ethanol to offer concrete and oil. The free radical scavenging activities of concrete and oil were evaluated against DPPH, ABTS, hydroxyl and superoxide anion radicals, respectively. It can be found that both of concrete and oil show good radical scavenging activities, while oil is superior to concrete. It is a pity that both of concrete and oil show less scavenging activity than BHT in DPPH and ABTS assay with IC_{50} 44.3 and 29.5 μg/mL, respectively.

Key Words: *Lysimachia foenum-graecum Hance*, Free radical scavenging activity, Ultrasound-assisted extract.

It is known that free radicals play an important role in the pathogenesis of some age-related and degenerative diseases[1]. The normal metabolic processes in the human body constantly generate free radicals. However, the continuous cumulative effects of free radicals can cause oxidative damage of proteins, lipids and DNA, as well as small cellular molecules, which may attribute to age-related and degenerative diseases, including atherosclerosis, Alzheimer's disease and cancers[1]. Supplementation with radical scavengers or antioxidants could prevent or repair these damages, thus they can delay or inhibit the initiation or propagation of oxidative chain reaction[2].

In previous work[3-7] considerable investment in efforts to develop cost-effective and efficient free radical scavenging agents from different types of plant materials such as vegetables, leaves, oilseeds, fruits and herbs have been taken, which have demonstrated that the development and isolation of natural radical scavengers or antioxidants from natural plants is a feasible method. It is learned from nature could help to overcome the toxicity problem of synthetic radical scavengers or antioxidants, for instance, butylated hydroxyanisole (BHA) and butylated hydroxytoluene and to develop new excellent radical scavengers or antioxidants. *L. foenum-graecum Hance*, which is one of the most important commercial herbal species grown in Guangxi and Yunnan province of China, is mainly treated as a spice, insectifuge and medicinal plant[8]. Its dried aerial parts are traditionally used as the treatment of headache, toothache, rheum and the digestive diseases[9]. Recently, the extracts of *L. foenum-graecum Hance* were unexpectedly found to exhibit good radical scavenging activity against DPPH˙ radical in the initial test and it aroused our interest. Therefore, in this present study, the free radical scavenging activities of the extracts from *L. foenum-graecum Hance*, were investigated.

L. foenum-graecum Hance herbs, which were collected from Jinxiu county of Guangxi Province (China) in November, 2010, were cut into the 2-4 cm long fragments. Under ultrasound, the fragments (100 g) were refluxed with 80 % aqueous ethanol solution (300 mL) at 90 ºC for 0.5 h and filtered to offer the extract solution. The procedure was repeated for three times and all the extract solution was collected and then decoloured by hot active carbon and finally evaporated to offer concrete in 30.2 % yields. The oil was then obtained in by stream distillation of the concrete in 25.7 % yields.

The scavenging activities of concrete and oil from *L. foenum-graecum Hance* were evaluated against DPPH, ABTS, hydroxyl and superoxide anion radicals (Figs. 1 and 2), respectively[3-7]. The values of IC_{50} for extracts, the effective concentration at which 50 % of DPPH, ABTS, hydroxyl and superoxide anion radicals were scavenged, were tested to evaluate the radical activity (Table-1). The IC_{50} of butylated hydroxytoluene was also determined for comparison. As shown in Table-1, both of concrete and oil exhibited good potent inhibition of DPPH, ABTS, hydroxyl and superoxide anion radicals, since that all their IC_{50} were less than the standard value[10] 10 mg/mL. It was a pity that both of concrete and oil showed less scavenging activity than BHT in DPPH and ABTS assay with IC_{50} 44.3 and 29.5 μg/mL, respectively.

For concrete, the IC_{50} against DPPH, ABTS, hydroxyl and superoxide anion radicals were 360.0, 44.3, 2893.0 and 1050.0 μg/mL, respectively, while that of oil were 160.0, 29.5, 1620.0 and 903.0 μg/mL, respectively. Since that all the IC_{50} of oil in the four methods were less than that of concrete, it could be concluded that the oil showed better radical scavenging activities than concrete. Based on the above observation, it can be suggested that isolation of natural radical scavengers or antioxidants from *L. foenum-graecum Hance* should be feasible.

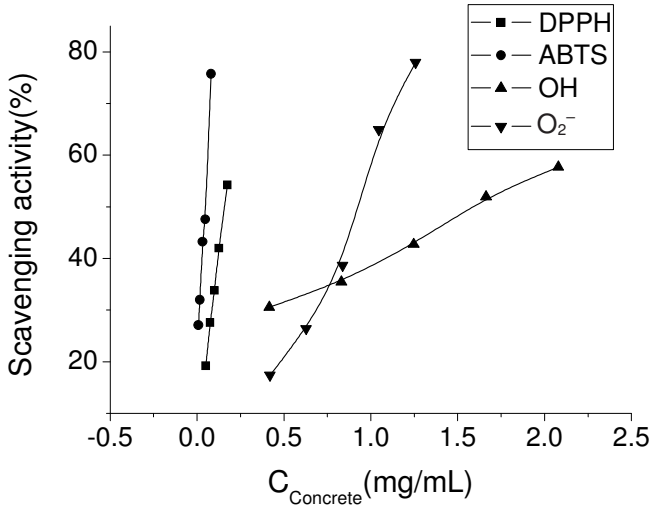

Fig. 1. Radical scavenging activities of concrete from *L. foenum-graecum Hance*. Values are means ± SD of three determinations. P < 0.05, when compared with control

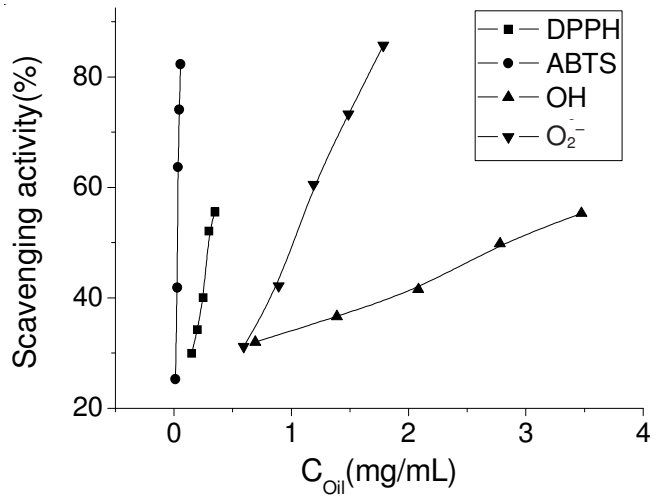

Fig. 2. Radical scavenging activities of oil from *L. foenum-graecum Hance*. Values are means ± SD of three determinations. P < 0.05, when compared with control

TABLE-1
IC_{50} (μg/mL) OF THE CONCRETE AND OIL FROM *L. foenum-graecum Hance*

Extracts	$DPPH^{\bullet}$	$ABTS^{\bullet}$	$OH^{\bullet}$	$O_2^{\bullet-}$
Concrete	360.0	44.3	2893.0	1050.0
Oil	160.0	29.5	1620.0	903.0
BHT	14.5	81.5	ND	ND

*Not done

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