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DETECTION OF ANTIDEPRESSANT EFFECT OF ALCOHOLIC EXTRACT OF *ALHAGI MAURORUM* MEDIK ON MICE

Meison Abdulbary[1]*, Ikhlass A.Al-Hilaly[2], Sara Zuher Ghani[1] and Abeer Fhadil[1]

[1*]Department of Pharmacognosy and Medicinal Plant, Faculty of Pharmacy, University of Kufa, Republic of Iraq.
[2]Department of LAB Investigations, Faculty of Sciences, University of Kufa, Republic of Iraq.

Abstract

The treatment of depression by antidepressants is efficacious to improve the health that they help in reduction the signs of disease. The constant searching for natural safe and effect antidepressant agents is important role especially this effect in the plants extracts. This study was conducted to detect the presence of some active compounds in the extract of *Alhagi maurorum* Medik plant, which was extracted by soxhlet using methanol (95%) as a solvent. The chemical survey by phytochemical tests showed the presence many active secondary metabolites as glycoside and phenolic compounds.

The plants extracts have been studied by knowing its antidepressant activity on albino mice ((24) mice) by two methods, the tail suspension test and open field test. Results showed the effectiveness of the *Alhagi maurorum* plant extract with compared to standard medicine (Imipramine 10mg) and negative control group (normal saline) in the two methods with increased plant extracts concentration.

Key words: *Alhagi maurorum*, antidepressant, Imipramine.

Introduction

The psychological term (depression) is called to a problem of the persons which appear sad with guilty feeling in addition to other symptoms include loss of interest, poor concentration and low energy (WHO, 2012). Depression can occur in individuals of both sexes but female more than males in all backgrounds, living standards and especially ages between (15-30) years (Bhowmik *et al.*, 2012 ; Rahman *et al.*, 2008).

Depression may be hereditary and its importance increased nowadays because of the pressures of daily life as well as problems of study and work also chronic and intractable diseases, in addition to some treatments have side effects one of them the growing feeling of depression (Schmidt, 2005; Guaiana *et al.*, 2007; Perveen *et al.*, 2016).

The treatment of depression by antidepressants is efficacious to improve the health that they help in reduction the signs of disease (Khushboo, 2017). The constant searching for natural safe and effect antidepressant agents is important role especially this effect in the plants extracts (Surana and Wagh, 2018). In this study, to evaluate the antidepressant activity of medicinal plants, *Alhagi maurorum* plant was selected since it used as laxative, diuretic and for rheumatic pains treatment (Al-Snafi, 2018).

***Author for correspondence :** E-mail: maysoona.abdullah@uokufa.edu.iq

Materials and Methods

Plant material

Alhagi maurorum was used in this study. The plant was elected according to its healing assets and its ease of use in Iraq.

Preparation of the plant extract

The whole plant (*Alhagi maurorum*) was collected from Al- Najaf city desert, crushed to powder by mixer grinder. Soxhlet was used to extract plants by adding 250 ml of solvent (methanol 95%) to 25 gm of plant powder for 24 hours, filtration, concentration and dried then stored in refrigerator until used and for detecting the presence of active constituents the phytochemical tests occurred to investigate about secondary metabolites (Harborne, 1984).

Experimental animals

(24) mice male which weight (21-28gm) have the same age (8-10 weeks), obtained from Faculty of

Sciences, Kufa University. The animals were retained in large airing cages in groups of 6 animals per cage with free access to water and food. They were kept under typical ecological situations (25 + 2°C and relative humidity of 45 to 55%) and were fed with standard food.

Drugs

Imipramine hydrochloride (Tofranil 10 mg, NOVARTIS) was dissolved in normal saline (10 mg in a final volume of 10 ml).

Experimental Design for anti-depressant activity

The fasting mice for one night were selected on the midday of experiment. (24) mice were divided in to (4) groups and the mice were separated into four groups (n=6). Behavioral tests were maintained in case of intraperitoneal injection.

Group I: +ve control and receive standard drug Imipramine (15 mg/kg intraperitoneal injection).

Group II: Receive plant extract 2000 µg/ml intraperitoneal injection.

Group III: Receive plant extract 1000 µg/ml intraperitoneal injection).

Group IV: -ve control, receive saline 2 ml/kg intraperitoneal injection

Behavioral tests

• Tail suspension test (TST): It utilized for investigation about the antidepressant like activity in mice (Santosh *et al.,* 2011) by transferring the mice to the experimental area in their boxes and allowed to acclimate to the laboratory environments for 12 hr., Singly, each animal was suspended to the edge of a table, 50 cm overhead the ground, by glued stripe put approximately 1 cm from the tip of the tail. The entire time of stability for 5min was recorded.

• Open Field test: The open field test was executed on the dark tan ground sectioned into 25 equal parts in a cartoon box (40 cm × 40 cm × 8 cm). Treatment to the mice was given respectively and half hour later the animals were singly put in corner square of the open field (Dominguez *et al.,* 2005). For 5 min must notice that: grooming (No. of central squares crossed); ambulation (No. of peripheral squares crossed); Rearing (the times which mice stands on the rear paws) and latency time (time taken to move).

Statistical analysis

The experiments were conducted and analyzed as factorial experiments with three replications at level 0.05 ($p \leq 0.05$) by using Statistical Package for the Social Sciences (SPSS) statistical program.

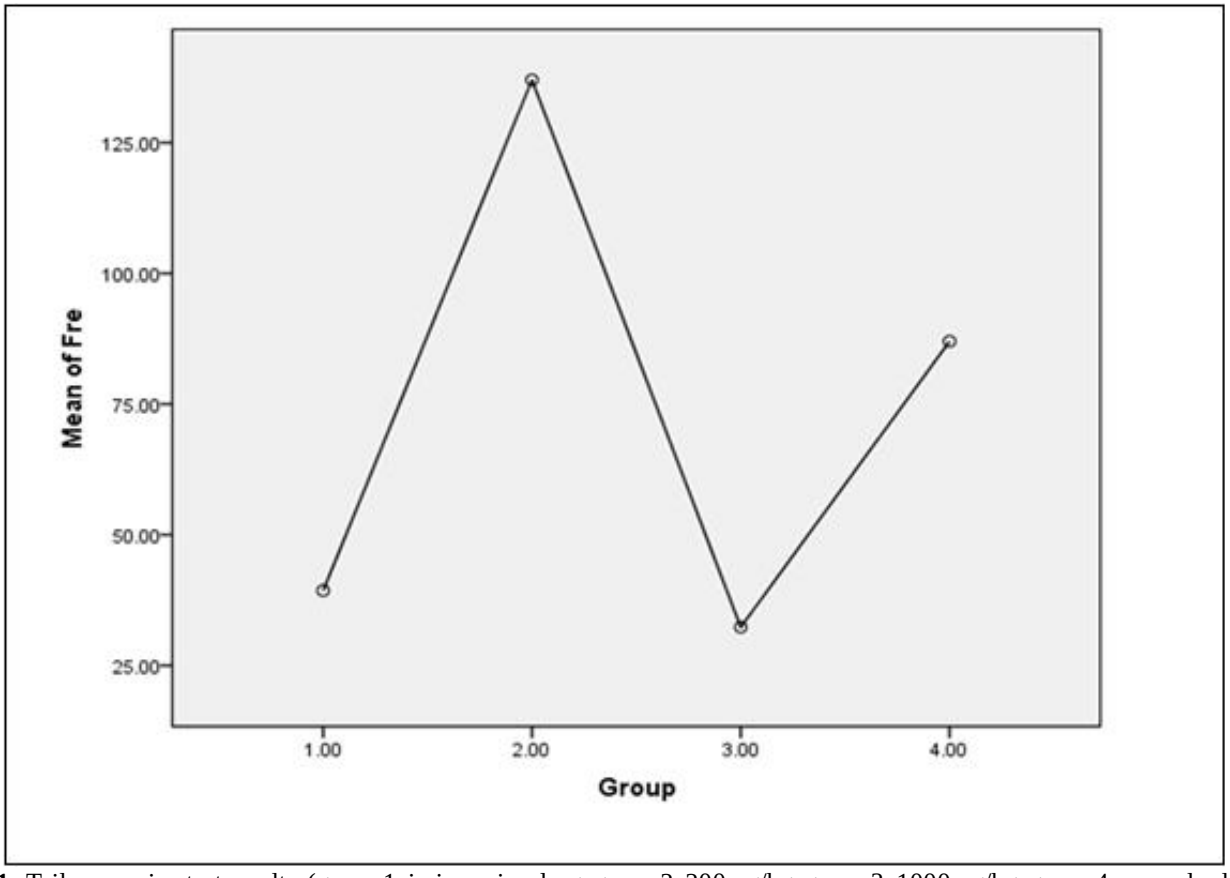

Fig. 1: Tailsuspension test results. (group 1: imipramine drug; group 2: 200 µg/kg; group 3: 1000 µg/kg; group 4: normal saline).

Results and discussion

Active compounds presence

Phytochemical tests to alcoholic extracts of *Alhagi maurorum* by reagents exposed the presence of glycosides, tannins, alkaloids and phenolic compounds as indicated in previous studies (Amani *et al.,* 2006).

Tail suspension test (TST)

The results of the present study showed a high significant ($p<0.05$) antidepressant effect of methanolic extract of *Alhagi maurorum* in 2000 µg/ kg in contrast to both the positive and negative control (imipramine drug and normal saline) (Fig. 1).

The results above showed the interest that the high level of locomotion reflects a high rate of anxiety and fearfulness also the tail suspension test is low stressful and very effective in therapeutically sensitivity (Can *et al.*, 2012).

Open field test

The results fig. 2 showed a high significant ($p<0.05$) antidepressant effect of methanolic extract of *Alhagi maurorum* in 1000 and 2000 µg/ kg in contrast to both the positive and negative control (imipramine drug and normal saline).

The open field test gives concurrent measures of movement, fearfulness and anxiety. The rearing frequency is usually applied as a mean for exploration and anxiety measurement that the high rate of the behavior suggested the excess of locomotion and investigation and/or reduce the level of anxiety (Thierry *et al.,* 1986). The rate for grooming indicates the exploratory and anxiety thus the high value of grooming duration suggests high exploratory and low anxiety rates while the low rate of ambulation behavior indicates the high exploratory and low anxiety rates. The grooming must be decrease in contrast to concentration increasing (Blanchard *et al.,* 2001).

Many studies showed that serotonin play a role in the depressant that lead to indicate the antidepressant effect of *Alhagi maurorum* may be belong to the alkaloids present in it which is act as reversible monoamine oxidase inhibitors and regulates the metabolic

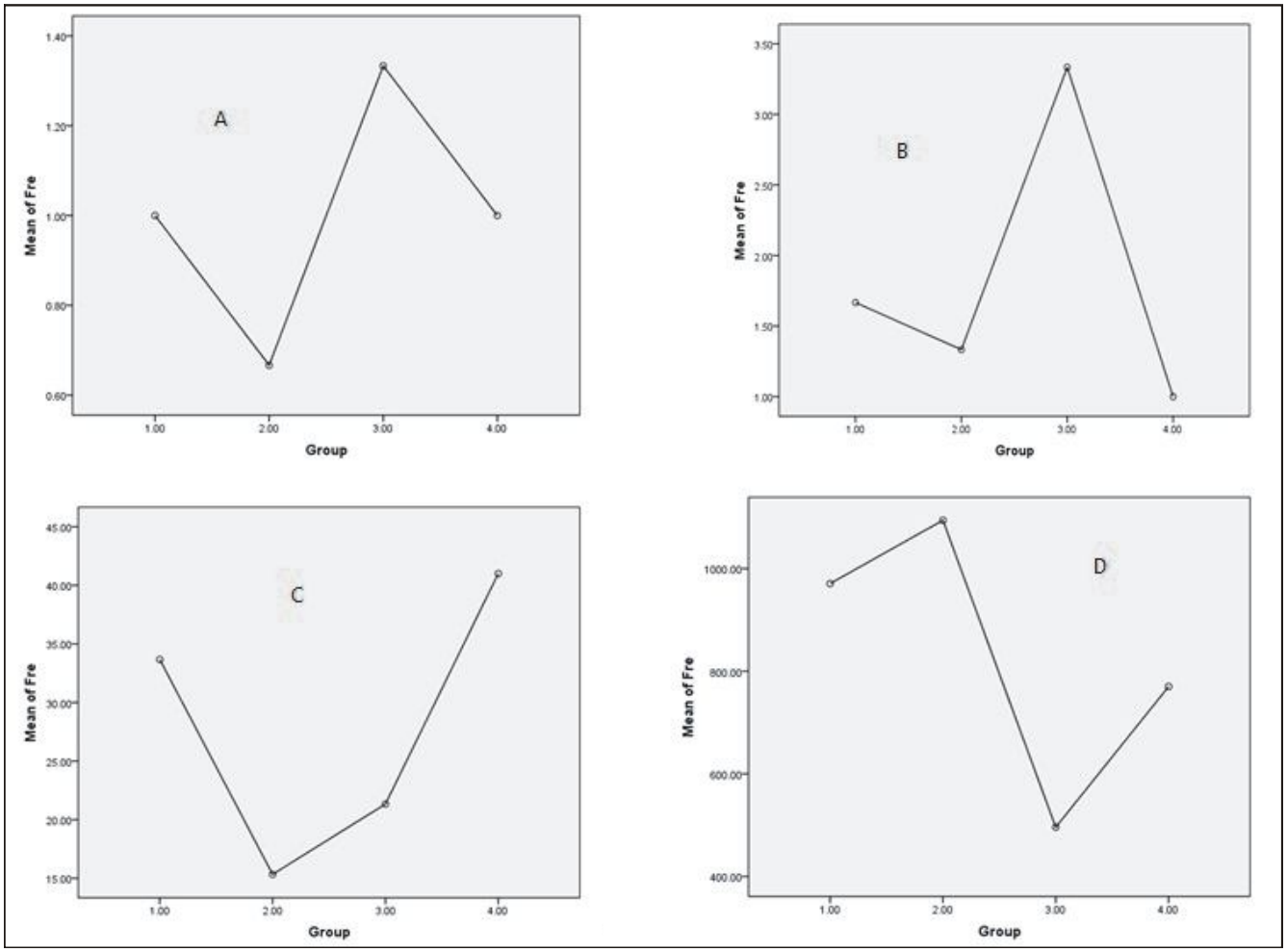

Fig. 2: Open field test results. (group 1: imipramine drug; group 2: 200 µg/kg; group 3: 1000 µg/kg; group 4: normal saline). (A: ambulation frequency; B: rearing ; C: grooming and D: latency time).

degradation of catecholamines, serotonin and other endogenous amines in central nervous system (Brunello *et al*., 2002). The use of*Alhagi maurorum* to enhance the antidepressant treatment may start a new work for medication because the plant is safe and nontoxic for human (Amani *et al*., 2006).

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