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Research Article

Antidepressant Activity of Methanolic Extract of *Vitis vinifera*

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ABSTRACT

The present study was determined to evaluate the effect of methnolic extract of *Vitis vinifera* (*MEVV*) as well as its interaction with conventional antidepressant drug using tail suspension test (TST) and forced swim test (FST) and to evaluate the possible mechanisms involved in its actions. The extract was found to reduce the explorative tendencies of the rats in the tail suspension test and forced swim test the extract caused a significant reduction in immobility time and increased swimming time. The leaf of the plant were collected and authenticated. The methnolic extract of *Vitis vinifera* (*MEVV*) showed the significant antidepressant activity comparable to the standard drug. The oral administration of methnolic extract of *Vitis vinifera* (*MEVV*) at 100, 200 and 400 mg/kg respectively as compared to the control treated group showed an antidepressant activity comparable to that of standard drug. The antidepressant effects of methnolic extract of *Vitis vinifera* (*MEVV*) having a particular quality to be mainly associated with the activation of dopamineergic system and possess potential antidepressant activities.

Introduction

Depression is an affective disorder which results in a state of low mood and aversion to activities that can have a negative effect on a person's thought behavior, worldview and physical well-being [1]. Many psychiatric syndromes feature depressed mood as a main symptom, hence it has become the major global psychiatric problem [2]. About 350million people suffer from depression globally [3]. People suffering from depression struggle with loss of energy and motivation, which influence their ability to be productive, making depression the leading cause of disability worldwide [4].Synthetic antidepressants taken in appropriate doses are often associated with their anticipated side effects like dry mouth, inability in driving skills, constipation and sexual dysfunction and majority of patients are reluctant to take this treatment. Accordingly, natural medicinal plants may be important sources of novel antidepressant drugs and the usage of plant extracts may be proven better in the management of stress and depression. [5] *V. vinifera* is a perennial woody plant its leaves are consumed in some in traditional foods use in various food. [6] From the different parts of this plant, in particular from the fruits, several preparations used in folk medicine have been derived. More recently, procyanidins have been demonstrated to be among the most interesting antioxidant agents from Plant Kingdom, and are considered for the preventive therapy of chronic degenerative diseases and the modulation of skin unattr activeness linked to the aging process. It is also used as a nervine tonic . The chemical analysis has shown the presence of procyanidins, anthrocyanins, flavanoids, hydroxylcinnamic acid derivatives, triterpenes, sterols, tannins, polysaccharides, monosaccharides, and non alkaloid nitrogen containing compounds.[7]

MATERIALS AND METHODS

Drugs and chemical used: Imipramine depsonil, S.G. pharmaceutical, Vadodra . 1% tween solution prepared. All the other chemicals used were of analytical grade and purchased from commercial sources. Other chemicals used for extraction purpose and phytochemical tests were of laboratory grade.

Collection and authentication of plants: The leaves of the plant were collected from the Balaji nursery, jagatpura, jaipur district, Rajasthan state, india in month of march 2009. The identity of the collected plant was confirmed by P.J.Parmar, joint Director in Botanical survey of india (BSI) Jodhapur (rajasthan, india) the herbarium of the plants was deposited in the BSI gainst voucher specimen NO. JNU/JPR/PC/JS-1.

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Preparation of plant extract: The leaves of plant were washed, shade dried and powdered. The powdered material was defatted with petroleum ether and extracted with methanol by cold maceration process. The extract was concentrated at reduced pressure and temperature in a rotary evaporator. Methanolic extract was tested for presence of secondary metabolites by different phytochemical tests.

Experimental animals: Wistar albino rates of either sex (150-200 gm) were taken for study. They were housed in polypropylene cages in air- conditioned area at 25±2 ºC with 12/12 h light/dark cycle. All animals had free access to standard pellet diet (Mahavir industries, Delhi) and clean water *ad libitum*. The norms for Good Laboratory Practice (GLP) were followed for care of laboratory animals. The present studies were duly approved by IAEC (Institutional Animal Ethical Committee clearance) 002/2009/IAEC/jnu.

Acute toxicity test:[8] Acute oral toxicity study for the test extract of the plant was carried out using OECD/OCED guideline 425. The test procedure minimizes the number of animals required to estimate the
oral acute toxicity. The observation of signs of toxicity and can also be used to identify chemicals that are have low toxicity. Healthy, young adult albino Wistar rats of either sex (200 -250 g) were used for this study. Animals should be fasted prior to dosing (food but not water should be withheld Overnight). The fasted body weight of each animal is determined and the dose is calculated according to the body weight.

Forced Swim Test (FST)

Experimental Design for anti-depressant activity

To perform this activity 30 overnight starved wistar albino rats (either sex) of 150-200gm body weight. The rats were divided five groups (n=6). Drugs/ vehicle were administered to the animals 60min prior to study.

Group I: Negative control, administer (saline 10 ml/kg of 1% tween) orally.

Group II: Positive control and receive standard drug imipramine (5 mg/kg orally).

Group III: Receive MEVV (100 mg/kg) orally

Group IV: Receive MEVV (200 mg/kg) orally

Group V: Receive MEVV (400 mg/kg) orally

Forced Swim Test: For the forced swim test (FST), Observing the motoric activity of the rats, either sex were individually forced to swim in an open cylindrical container (diameter 10 cm, height 25 cm constructed) containing 20 cm of water at 25±1°c. Treatment was given 60min prior to study as described by study design. All animals were forced to swim for 6 min and the duration of immobility was observed and measured during the final 5 min interval of the test. Each mouse was judged to be immobile when it ceased struggling and remained floating motionless in the water, making only those movements to keep its head above water. A decrease in the duration of immobility is indicative of an antidepressant like effect.[9] Immobility time is the time during which the animal located on the surface with front pows together and made only those movements which were necessary to keep afloat. [10]

Tail Suspension Test: The tail suspension test was carried out as rats were allowed to adjust to the room for 3.5-5 h before the test. Groups of six rats either sex were treated with *MEVV* (100, 200 and 400 mg/kg, p.o.), imipramine (5 mg/kg, p.o.) Treatment was given 60 min prior to study as described by study design. Mice were suspended on the edge of the table, 40 cm above the floor, with the help of adhesive tape placed approximately 1 cm from the tip of the tail. The total duration of immobility induced by tail suspension was recorded during a 5 min of the 10 min period. Animal was considered to be immobile when it did not show any movement of the body, hanged passively and completely motionless.[11]

All the results were expressed as Mean ± S.E.M; 6 animals in each group. The data was analyzed using statistically by one-way ANOVA followed by Dunett Multiple comparison test, $P<0.05$ was considered significant.

Results

Phytochemical screening: Phytochemical screening revealed the presence of saponins, flavonoids and tannins, carbohydrate and phenolic compound in methanolic extract.

Acute toxicity test: Acute toxicity studies revealed that *V. vinifera* extract did not produce any toxic symptoms when administered(2000mg/kg) orally to rats.

Antidepressant Activity: The antidepressant effects of methanolic extract of *V. vinifera* (100, 200 and 400 mg/kg) and imipramine were studied by observing the changes in the duration of immobility in the two models: Forced swim test (FST) and Tail suspension test (TST). In both Forced swim test and Tail suspension test, MEVV 100, 200 and 400 mg/kg, p.o. produced significant decreased the immobility period when compared with that of control group animals.

The results are analyzed in Table 1

Table 1: Antidepressant effect of *MEVV* on immobility using swimming despair test.

Treatment	Dose (mg/kg)	immobilty time (sec)
Tween	10 ml/kg	110.33±4.82
MEVV	100	88.16±6.15*
MEVV	200	66.0±3.44**
MEVV	400	55.16±5.75**
Imipramine	5	42.66±3.81**

Values are expressed as mean ±S.E.M. (n=6) statistical analysis was carried out by one way ANOVA followed by dunnett,s test *p>0.05 (significant); p<0.01(highly significant) when compare to control rats.

Table 2: Antidepressant effect of *MEVV* on immobility using tail suspension test

Treatment	Dose (mg/kg)	immobilty time (sec)
Tween	10 ml/kg	135.33±5.45
MEVV	100	114.16±3.84*
MEVV	200	106.83±6.59**
MEVV	400	101.5±5.90**
Imipranine	5	90.33±5.98**

Values are expressed as mean ±S.E.M. (n=6) statistical analysis was carried out by one way ANOVA followed by dunnett,s test *p>0.05 (significant); p<0.01(highly significant) when compare to control rats.

Discussion

Depression is a common, debilitating, life threatening illness with a significant incidence in population. Depression is an important psychiatric disorder that affects individuals' quality of life and social relations directly. Depression is characterized by emotional symptoms such as hopelessness, apathy, sense of guilt, loss of selfconfidence, indecisiveness, and amotivation, as well as biological symptoms like psychomotor retardation, loss of libido, sleep disturbances, and loss of appetite. When the symptoms are very severe, major depression is considered.Medications such as tricyclic antidepressants (TCAs), selective serotonin reuptake inhibitors (SSRIs), selective reversible inhibitors of monoamine oxidase A (RIMAs), and specific serotonin–noradrenaline reuptake inhibitors (SNRIs) are clinically employed for drug therapy (12) However, these drugs can impose a variety of side-effects including cardiac toxicity, hypopiesia, sexual dysfunction, body weight gain, and sleep disorder(13).The forced swimming and tail suspension tests are behavioral despair tests useful for probing the pathological mechanism of depression and for the evaluation of antidepressant drugs [14]. These tests are sensitive to all major classes of antidepressant drugs including tricyclics, serotonin reuptake inhibitors, monoamine oxidase inhibitors, and atypical [9]. Characteristic behavior scored in both tests is termed immobility, reflecting behavioral despair as seen in human depression [11]. The methnolic extract of *V. vinifera* producedsignificant antidepressant effect in forcedswimming test, as is evident from the reduced in the immobility timeand the effect was comparable to the standard drug. Numerous neural pathway are involved in the pathophysiology of depression state. Therefore a great number of neurotransmitters are thought to involved in underlying mechanism of these diseases as evident by anti depressant drugs. [15] antidepressant-like effect of the extract is not related to a psycho stimulant effect. Immobility in the FST represent a state of hopelessness in the animal which correlate to negative mood when place in an inescapable place. The immobility time is decreased by various types of antidepressants.

Conclusions

The results obtained in the present study suggested that methnolic extract of *V. vinifera* produced antidepressant-like effects in rats, when subjected to forced swim and tail suspension test. Therefore, the methnolic extract of *V. vinifera* may have potential therapeutic value for the management of depression.

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References

1. American Psychiatric Association (APA, 2013). Diagnostic and Statistical Manual of Mental Health Disorders 5th ed. (DSM-5).
2. Pillemer, K., Suitor J., Pedro S., and Henderson J., Mothers Differentiation and suppressive Symptoms Among Adult Children. Journal of Marriage and Family 2010;72 (2): 333-345.
3. World Health Organization (2012). Media Centre Depression. Fact sheet N° 369, Oct., http://www.who.int/mediacentre.factsheets /fs369/en/.
4. Kessler R., Aguitar-Gaxiola S., Alonso J., Chatterji S., Lee S., Ormel., Ustun T and Wang P., The Global Burden of Mental Disorders: An Update from WHO World Mental Health (WMH) Surveys. Epidemiol. Psychiatric Society 2009;18(1): 23-33.
5. Singh R, Jain R, Mishra R, Tiwari P. antidepressant activity of hydroalcoholic extract of zingiber officinale IRJP 2012; 3 (2):32-34.
6. Gharib MKN., heidari A., bronchodilatory activity of vitis vinifera leaf hydro alcoholic extract in rats. Iranian biomedical journal 2006;10(2):79-83.
7. Aziz R., popescu ML., mihele D., contibution to the pharmacognostical study on grapes Hamburg cultivar. Farmacia 2008;5:571-576.
8. OECD guidelines for the testing of chemicals (acute oral toxicity – up and down procedure). Adopted 23rd march 2006. {cited 2008 mar 20}; available from URL: www.oecd.org.

9. Porsolt R., Bertin A., Jalfre M., Behavioral despair in mice: a primary screening test for antidepressants. Arch Int Pharmacodyn Ther. 1977; 229:327–36.
10. Gersner R., Kiwkowitz MG., Zangen A., automated behavioral analysis of limbs activity in the forced swim test. Journal of neuroscience methods 2009;180:82-86.
11. Steru R., Chermat B., Thierry and Simon P., The tail suspension test: a new method for screening antidepressants in mice Psychopharmacology 1985; 85:(3)367–370.
12. Schechter L., Ring R., Beyer C., Hughes Z., Khawaja X., Malberg J., Innovative approaches for the development of antidepressant drugs: current and future strategies. NeuroRx 2005; 2:5 90–611.
13. Fava M., Diagnosis and definition of treatment-resistant depression. Biol Psychiatry 2003;53:649–59.
14. Antai-Otong, D. Antidepressant-induced insomnia: treatment options Perspect Psychiatr Care, 2004;40:29–33.
15. Willner P. The validity of animal models of depression. Psychopharmacology (Berl) 1984; 83:1–16.

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