INTRODUCTION
According to the World Health report, approximately 450 million people suffer from mental or behavioral disorders, yet only a small minority of them receive even the most basic treatment. This amounts to 12.3% of the global burden of disease and will rise to 15% by 2020. In the search for new therapeutic products for the treatment of neurological disorders, medicinal plant research, worldwide has progressed constantly demonstrating the pharmacological effectiveness of different plant species in a variety of animal models. Anxiety and depression are extremely dramatic and debilitating multifaceted disorders and it is now becoming clear that without knowledge of clinical and biological aspects of anxiety and depression, it is impossible to offer treatment strategies for the patients. Over the past decades, there has been intensive study of a variety of neurological aspects of depression and anxiety. Depression is an important health care problem in the world that is characterized by several signs such as intense sadness, despair and recurrent thoughts of death or suicide.

Prevalence of this disorder is about 13-20% of population. Approximately two third of depressed patients have suicide thoughts and 10-15% of whom attempt suicide before the age of 40. Although several synthetic drugs are available for treatment of depression, side effects such as dry mouth, hypotension, fatigue, sexual dysfunction and drowsiness limit the use of these treatments. In addition, the success rate of medication is low and at least 40% of the patients do not respond to the antidepressant drugs. Therefore, researches for new antidepressant drugs with fewer side effects are needed. Nowadays, medicinal plants are largely investigated for treatment of depression. Several plants such as Crocus sativus, Echium vulgare, Rosmarinus officinalis, Hypericum reflexum and Ginkgo biloba. It may have beneficial effects on stress, tension and depression. Animal had free access to food and water and maintained under standard laboratory conditions (Temp. 24±2°C and relative humidity 30-70%) with a natural light and dark cycle ratio of 12:12. The animals were acclimatized for at least 5 days before behavioural experiments. Experiments were carried out between 9:00 and 15:00 hrs. Experimental protocol was approved by the institutional animals‘ ethics committee before the start of the study.

Acute toxicity studies
The acute oral toxicity study was carried out according to OECD 423 guidelines which are based on a stepwise procedure with the use of a minimum number of animals (wistar rats of 150-200 g) per step. Absence or presence of compound related mortality and behavioural changes of the animal’s dose at one step were determined the next step. Mortality in each group within 24 h was recorded. The animals were observed for a further 14 days for any signs for delayed toxicity. The median lethal dose (LD50) was calculated using the second phase.

Selection of animals species:
Healthy young albino wistar rats of either sex weighing between 150-200 gms, procured from disease free animal house of Jaipur were used for the present study. Animals had free access to food and water and maintained under standard laboratory conditions (Temp. 24±2°C and relative humidity 30-70%) with a natural light and dark cycle ratio of 12:12. The animals were acclimatized for at least 5 days before behavioural experiments. Experiments were carried out between 9:00 and 15:00 hrs. Experimental protocol was approved by the institutional animals’ ethics committee before the start of the study.

MATERIALS AND METHODS:
Collection and authentication of plant materials
The plant materials leaves and stems of Commiphora mukul belonging to the family Burseraceae were collected in the month of May 2014 from the local areas of Jaipur district, Rajasthan, India. The plant material was identified and authenticated by Rajasthan University.

Preparation of the extract of Commiphora mukul
Plant material was collected in bulk, washed under running tap water to remove adhering dirt followed by rinsing with distilled water. The plant material was then shade dried and pulverized in a hand mill followed sieving (sieve no. 40) to obtain coarse powder.
Body weight: Individual body weight of the animals were recorded prior to test substance administration and again on day 7 and 14.

Cage Side Observations: The animals were observed for mortality, signs of gross toxicity and behavioural changes at 1 and 3 hrs. post-dosing and at least once daily there after 14 days. Observations included gross evaluation of skin and fur, eyes, respiration, somato-motor activity and behaviour pattern. Particular attention was direct-ed to observation of tremors, convulsions, salivation, diarrhoea and coma.

Dose selection: Dose was selected on the basis of maximum tolerable dose, as there was no lethality observed up to 2000 mg/kg. Thus dose took as 1/10 and 1/5 of 2000mg/kg (i.e.200mg/kg and 400mg/kg) for further investigation.

Drugs use
Fluoxetine hydrochloride was used in this study as standard. All drugs were dissolved in distilled water and administered either intra perito-neally (i.p.) or orally (p.o.) used. Distilled water was used as the vehi-cle.

Pre-treatment with drugs:
Commiphora mukul stem and leaves ethanolic extract was dosed at 200 and 400 mg/kg for 14 days, by oral route to the rat, FST and TST were carried out at 14th day, 1 hr after dosing the animals. Fluoxe-tine (10 mg/kg, P.O.) was used as reference positive standard and was dosed only at day 14. For interaction of Commiphora mukul etha-nolic extract with conventional antidepressant drugs, Commiphora mukul ethanolic extract was dosed at sub-effective dose for 14 day and conventional antidepressant were also administered at sub-effective doses only at 14th day and 1 hr after dosing, animals were sub- jected for forced swim test and TST.

STUDY DESIGN
The animals were selected randomly for each experiment and divided into 4 equal groups. Drugs (Fluoxetine) administered orally (P.O.) for 7 & 14 successive days. Sixty minutes after last dose, immobility period was recorded in two different animal models of depression. Overnight fasted animals were selected randomly on the day of experiment for administration of vehicle, standard drug and study drug. The animals were acclimatized one hour before for behavioural tests. Thirty min-utes and 1 hour time interval between drug administration and a be-havioural test were maintained in case of i.v. and oral administrations respectively.

The animals were divided into four groups of six animals in each as follows:
Group I (n=6) – Control, received distilled water,
Group II (n=6) – (Standard) Fluoxetine (TST and FST) 10 mg/kg,
Group III (n=6) – Ethanolic extract of Commiphora Mukul 200 mg/kg,
Group IV (n=6) – Ethanolic extract of Commiphora Mukul 400 mg/kg.

The antidepressant activity was carried out using two different mod-els. Further the effect of drugs was evaluated in both test.2

Assessment of Antidepressant activity: Forced swimming test (FST):
Rats of either sex were individually forced to swim in an cylindrical container (diameter 10cm, height 25cm), containing 19cm of water at 25±1°C. All the rats of either sex were divided in four different groups. The first group assigned as control receiving only vehicle.

Assessment of Antidepressant activity: Forced swimming test (FST):
Rats of either sex were individually forced to swim in an open cylin-drical container (diameter 10cm, height 25cm), containing 19cm of wa-ter at 25±1°C. All the rats of either sex were divided in four different groups. The first group assigned as control receiving only vehicle. The other third and fourth groups received acute dose of ethanolic extract of CM (200, 400mg/kg). The second group received standard drug Fluoxetine (10mg/kg). The total duration of immobility was recorded during the last 6min of the 10min period. 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 de-crease in the duration of immobility is indicative of an antidepressant like effect.28,31

Tail suspension test (TST):
Tail suspension test is behaviour despair model of depression, em-ployed in rodents to predict antidepressant potential by decreasing immobility period produced by several different classes of antidepres-sant drugs. It has been reported that tail suspension test is less stress-
ful and has higher pharmacological sensitivity than forced swim test, the other commonly employed model to study antidepressant activ-
ity. Treatment was given 60min prior to study as described by study design. Rats were suspended on the edge of the table, 50 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 6 min period. The animal was considered immobile when it did not show any movement of the body except for those required for respiration and hanged passively. Mice were considered immobile when they were completely remain motion.

OBSERVATION AND RESULTS
Commiphora mukul was extracted by ethanolic solvent extraction process.

The ethanolic extract of Commiphora mukul were subjected to pre-
liminary phytochemical screening.

Table.1: Phytochemical screening of chemicals in ethanolic extracts of Commiphora mukul:

<table>
<thead>
<tr>
<th>Sr. no.</th>
<th>Extract test for</th>
<th>Ethanolic extract</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>ALKALOIDS</td>
<td>Absent</td>
</tr>
<tr>
<td>2.</td>
<td>STEROLS</td>
<td>Present</td>
</tr>
<tr>
<td>3.</td>
<td>TRITERPINOIDS</td>
<td>Present</td>
</tr>
<tr>
<td>4.</td>
<td>TANNIN</td>
<td>Absent</td>
</tr>
<tr>
<td>5.</td>
<td>FLAVANOID</td>
<td>Present</td>
</tr>
<tr>
<td>6.</td>
<td>VOLATILE OIL</td>
<td>Absent</td>
</tr>
<tr>
<td>7.</td>
<td>RESINS</td>
<td>Present</td>
</tr>
<tr>
<td>8.</td>
<td>GUM</td>
<td>Present</td>
</tr>
<tr>
<td>9.</td>
<td>Acid</td>
<td>Present</td>
</tr>
<tr>
<td>10.</td>
<td>Alcohol</td>
<td>Present</td>
</tr>
<tr>
<td>11.</td>
<td>Carbohydrate</td>
<td>Absent</td>
</tr>
<tr>
<td>12.</td>
<td>Glosides</td>
<td>Absent</td>
</tr>
<tr>
<td>13.</td>
<td>Fatty acids</td>
<td>Present</td>
</tr>
</tbody>
</table>

A dose response antidepressant screening was performed using 200 and 400mg/kg of ethanolic extract of Commiphora mukul leaves and stems against depression by models. Depression were scored and analysed as described earlier. The study indicates a dose dependent anti depressant activity of ethanolic extract Commiphora mukul leaves and stems.

Table No.2: Results of the effects of the ethanolic and aqueous extract of Commiphora mukul leaves and stems against antidepressant by forced Swim Test in Rats.

Observation:

<table>
<thead>
<tr>
<th>GROUP</th>
<th>TREATMENT</th>
<th>DOSE (mg/kg)p.o</th>
<th>Mean Duration of immobility (sec.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Control</td>
<td>1ml/kg</td>
<td>149 ± 2.469</td>
</tr>
<tr>
<td>2</td>
<td>Fluoxetine</td>
<td>10mg/kg i.p</td>
<td>117 ± 2.875**</td>
</tr>
<tr>
<td>3</td>
<td>Ethanolic extract of Commiphora mukul</td>
<td>200mg/kg</td>
<td>134 ± 3.276*</td>
</tr>
<tr>
<td>4</td>
<td>Ethanolic extract of Commiphora mukul</td>
<td>400mg/kg</td>
<td>125 ± 3.055**</td>
</tr>
</tbody>
</table>

One way ANOVA followed by Dunnet’s test Values are mean ± S.E.M.
The effect of ethanolic extract of Commiphora mukul 1 and 2 are tabulated as shown in Table. Duration of immobility a measure of antidepressant activity was recorded in the last 6 minutes of 10 minutes test session. Statistically significant (P<0.05sand P<0.001) reduction in duration of immobility was observed in ethanolic extract Commiphora mukul-1 and -2 treated animals respectively. The effect of 400mg/kg was nearly equal to Fluoxetine treated animals (P<0.001), hence the effect of 400 mg/kg can be considered antidepressant dose of test formulation. Acute effect of ethanolic extract of Commiphora mukul-1 and 2 test formulation.

Table 3: Results of the effects of the ethanolic and aqueous extract of Commiphora mukul leaves and stems on Tail Suspension Test in rats at different time intervals.

<table>
<thead>
<tr>
<th>GROUP</th>
<th>TREATMENT</th>
<th>DOSE (mg/kg)p.o</th>
<th>Mean Duration of immobility (in sec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Control</td>
<td>1ml/kg</td>
<td>137.7 ± 14.96</td>
</tr>
<tr>
<td>2</td>
<td>Fluoxetine</td>
<td>10mg/kg</td>
<td>60.33 ± 4.310***</td>
</tr>
<tr>
<td>3</td>
<td>Ethanollic extract of Commiphora mukul</td>
<td>200mg/kg</td>
<td>96.67 ± 10.56*</td>
</tr>
<tr>
<td>4</td>
<td>Ethanollic extract of Commiphora mukul</td>
<td>400mg/kg</td>
<td>65.67 ± 12.42***</td>
</tr>
</tbody>
</table>

Values represents the mean ± SEM,*P< 0.05, **P<0.001, when compared to vehicle treated animals.

**Fig. 1. Graphical representation of Forced swimming test.**

**Fig. 2. Graphical representation of Tail suspension test.**

**Statistical analysis**

The results will be express as mean ± S.E.M. The differences will be compare using one way analysis of variance (ANOVA) and subsequently follow by Bonferroni’s test.

**DISCUSSION**

The prevention and management of stress disorders remains a major clinical problem. Hence it is very important to address these problems and find effective remedies. Though several drugs are available, all are associated with some limitations and there is an urgent need for alternative medications for these disorders. In this work, it was demonstrated that the administration of different doses of the ethanolic extract of Commiphora mukul in rats was able to induce antidepressant effects. In forced swimming test, the extract can decrease the immobility time in rats with mild sedative effect. It was found that Commiphora mukul can produce antidepressant like activity at a dose of 200mg and 400mg/kg body weight in a dose dependent manner. The decrease in the immobility time is accompanied with the increase in swimming time. Previous demonstrated that many neurotransmitters were involved in the pathophysiology of depression. Numerous studies have demonstrated that antidepressant drugs such as Fluoxetine, Imipramine stimulated the action of serotonin and act by inhibiting the reuptake of biogenic amines in CNS. These drugs were widely used as antidepressant drugs and agreed with studies in animal models, such as forced swimming test. An antidepressant drugs reduce the exploratory behaviour depending upon the concentration. At present, the study revealed that the ethanolic extract of Commiphora mukul significantly reduces the number of head dip pings and numbers of line crossings were the indicator of exploratory behaviour. The findings from the present investigation indicate that EECM (Ethanolic extract of commiphora mukul) possesses significant antidepressant activity as shown by its mitigating effects on different experimentally induced stress models in rats and mice. The widespread use of FST is mainly due to its ability to detect a broad spectrum of antidepressant agents. The test is based on the observation that rodents following initial escape oriented movements develop an immobile posture when placed inside an inescapable cylinder filled with water. The immobility is thought to reflect either a failure of persistence in escape directed behavior (i.e., despair behavior) or the development of a passive behavior, meaning the loss of the animal’s ability to cope with stressful stimuli. Markedly showed a significant decrease in the time spent immobile by rodents. By performing tail suspension test, the reduced immobility time directed the antidepressant effect.

**Conclusion**

Ethanolic extract of commiphora mukul has significant anti-depressant activity as shown by its effects on different experimentally induced different models.

**REFERENCES:**

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27. Mishra, S., Jena M. 1, Pal A.s “evaluation of antidepressant activity of eclipta alba using animal models" research article of asian journal of pharmaceutical and clinical research, vol. 6 Received: 18 May 2013, Revised and Accepted: 16 June 2013