EVALUATION OF ANTIANXIETY EFFECT OF DRIED FRUITS OF PRUNUS AMERICANA MARSH

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INTRODUCTION

Plants are an essential piece of the Indian arrangement of prescription (Ayurveda) which is an antiquated and standard framework. India has one of the wealthiest plants medicinal conventions. There are evaluated to be around 25,000 compelling plant-based details, utilized as a part of pharmaceuticals. In the western world, people are aware about herbs and there is an expanding enthusiastic approach toward the nature [1]. Human nervousness is characterized as a sentiment worry or strain stemming from the reckoning of envisioned or incredible danger. This uncertainty influences one-eighth population worldwide and has turned into a critical research region in the field of psychopharmacology. Barbiturates, tricyclic antidepressants (TCAs), and benzodiazepines (BZDs) have been utilized for long time to treat nervousness. The genuine reactions related with these medications, to be specific sleep deprivation, sedation, muscle unwinding, withdrawal and resistance (BZDs) have been utilized for long time to treat nervousness. The antianxiety activity was observed in ethanol extract at the dose of 200 mg/kg in both models.

METHODS

Phytochemical screening was performed on various extracts of the fruits. Elevated plus maze and light/dark choice tests were used for screening of antianxiety activity. Diazepam (2 mg/kg) was used as the standard drug.

RESULTS

Phytochemical screening has shown the presence of various constituents such as flavonoids, carbohydrates, tannins, alkaloids, phenols, and saponins. Different concentrations (100 and 200 mg/kg) of the ethanolic extract of P. americana have shown promising results. Significant antianxiety activity was observed in ethanol extract at the dose of 200 mg/kg in both models.

Conclusion: The present study suggests that ethanolic extract of P. americana contains certain chemical components that are responsible for the antianxiety effect of the fruits of the plant. The plant may be considered for the management of various disorders related to anxiety.

Keywords: Prunus americana, Alkaloids, Phenols, Chlorogenic acid, Antianxiety, Rosaceae.

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ABSTRACT

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Antianxiety activity

**Elevated plus maze**

The apparatus comprising of two open arms (16×5 cm) and two shut arms (16×5×12 cm) having an open rooftop was utilized to watch anxiolytic conduct in animals [8,9]. Each mouse was put at the focal point of the raised apparatus (25 cm from ground) with its head confronting the open arms. Amid this 5 minutes try, the mice were watched for: (a) The quantity of passages beyond any confining influence arms, (b) normal time spent by the mouse in the open arms (normal time=add up to time spent in open arms/number of sections in arms). Extracts of *P. americana* were administered only using a tuberculin syringe fitted with oral canula. The animals were allowed to socialize during the time of experiment and care was taken that only height of apparatus invokes anxiety in the animals.

**Light/dark choice test**

The light/dark box apparatus consisting of two compartments (light/dark) was used. The dark box has six divisions and light box had nine divisions. The light box (white polyvinyl chloride (PVC), 27×27×29 cm) was illuminated by a white light. The dark box (dark PVC, 27×18×29 cm) had a red light. There was a small door to connect two compartments. Every creature was put in the light box with its head confronting the entryway of the dull box. The creatures were watched for number of sections in light compartment and the aggregate time burned through there [10].

For both models, six mice were randomly allocated to the following groups: Vehicle control (physiological saline, 0.9% NaCl), (ethanolic extract of *P. americana*, 100 mg/kg and 200 mg/kg) in carboxymethyl cellulose, diazepam 2 mg/kg [11].

**Statistical analysis**

The qualities are communicated as mean ± standard error of the mean. ANOVA followed by Dunnett test was used for the statistical analysis.

**RESULTS AND DISCUSSION**

The antianxiety capacity *P. americana* was assessed utilizing two models of uneasiness, elevated plus maze, and light-dark choice test. These models are generally utilized as trial models for assessing the antianxiety capability of natural products and their compounds. It produces reproducible outcomes. The models were picked as these are successful, straightforward, less tedious, and do not require the mice to be prepared for the test; furthermore, do not make much inconvenience to the creatures while dealing with. The dread because of tallness (acrophobia) creates nervousness in the creatures when these are set on the lifted in addition to labyrinth. The sign of uneasiness and dread in the creatures is displayed by a decrease in movement. This is measured by the time spent by the creature in the open arms. In light-dark choice test, exploration of mice or rats is inhibited by bright illumination, which is highly aversive for rodents. Anxiolytics create a dosage subordinate increment in intersections. Table 1 shows results of phytochemical screening of various extracts of *P. americana*. Phytochemical screening showed the presence of flavonoids, carbohydrates, tannins, alkaloids, and phenols in ethanol extract of *P. americana* whereas the petroleum ether extract showed tannins and chlorofrom extract was found to have alkaloids, tannins, and saponins to some extent. The mean number of entries and time spent by mice in open arms after oral administration of two doses viz. 100 and 200 mg/kg of ethanol extracts of *P. americana* fruits are given in Table 2. Table 3 shows the mean entries in light compartment and the time spent by mice in that compartment after oral administration of ethanol extract of *P. americana* fruits, diazepam (2 mg/kg), and the control (vehicle). Significant antianxiety activity was observed in ethanol extract at the dose of 200 mg/kg in both models. The plant is reported to have polyphenolic phytotoxicals (caffeic acid, coumaric acid, rutin, chlorogenic acid, and neochlorogenic acid). Chlorogenic acid, in a dose of 20 mg/kg has shown anxiolytic effect in mice models of anxiety. Identification of compound(s) responsible for biological activity could be used as a prototype(s) to design new substances with antianxiety activity.

**CONCLUSION**

The present antianxiety study suggests that the ethanol extract of *P. americana* fruits contain certain promising antianxiety substances and may be considered for the purpose of managing the anxiety disorders.

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Table 1: Results of phytochemical screening of various extracts of *P. americana*  
| Phytoconstituents | Chemical test | Petroleum ether extract | Chloroform extract | Ethanol extract |
|-------------------|---------------|-------------------------|-------------------|----------------|
| Flavonoids        | Shinoda test  | -                       | -                 | +              |
| Alkaloids         | Dragendorff’s test | -                | +                 | +              |
| Tannins           | Lead acetate  | +                      | +                 | +              |
| Phenols           | Ferric chloride test | -               | +                 | +              |
| Carbohydrates     | Molisch’s test | -                       | -                 | -              |
| Saponin           | Foam test     | -                       | -                 | -              |

Table 2: Antianxiety activity of *P. americana* ethanol extract on elevated plus maze model  

| Treatment | Dose     | Mean entries in open arm | Mean time spent in open arm |
|-----------|----------|--------------------------|----------------------------|
| Control   | Vehicle  | 0.90±0.11                | 2.92±0.28                  |
| Diazepam  | 2 mg/kg  | 8.25±0.21**              | 12.73±0.66**               |
| EEPA      | 100 mg/kg| 3.08±0.25*               | 4.62±0.30*                 |
| EEPA      | 200 mg/kg| 5.96±0.32**              | 8.97±0.50**                |

EEPA: Ethanolic extract of *Prunus americana*, n=6; The data is expressed as mean±SEM, *p<0.05 versus control, **p<0.001 versus standard, ANOVA followed by Dunnett test, *P. Americana: Prunus americana*

Table 3: Antianxiety activity of *P. americana* ethanol extract in light-dark box  

| Treatment | Dose     | Mean entries in light compartment | Mean time spent in light compartment |
|-----------|----------|-----------------------------------|-------------------------------------|
| Control   | Vehicle  | 2.66±0.33                         | 17.50±0.56                          |
| Diazepam  | 2 mg/kg  | 7.83±0.30**                       | 36.33±0.66**                        |
| EEPA      | 100 mg/kg| 6.33±0.33*                        | 19.67±1.02*                         |
| EEPA      | 200 mg/kg| 6.16±0.30**                       | 30.50±0.61**                        |

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