



Department of Biochemistry, University of Karachi

**Oral Administration of *Rauwolfia*
Serpentina Plant Extract Mitigated
Immobilization Stress-induced Biochemical
and Behavioral Deficits in Rats**

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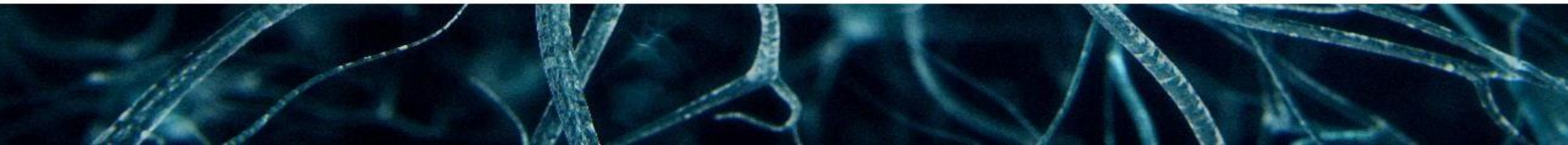
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Oral Administration of *Rauwolfia Serpentina* Plant Extract Mitigated Immobilization Stress-induced Biochemical and Behavioral Deficits in Rats



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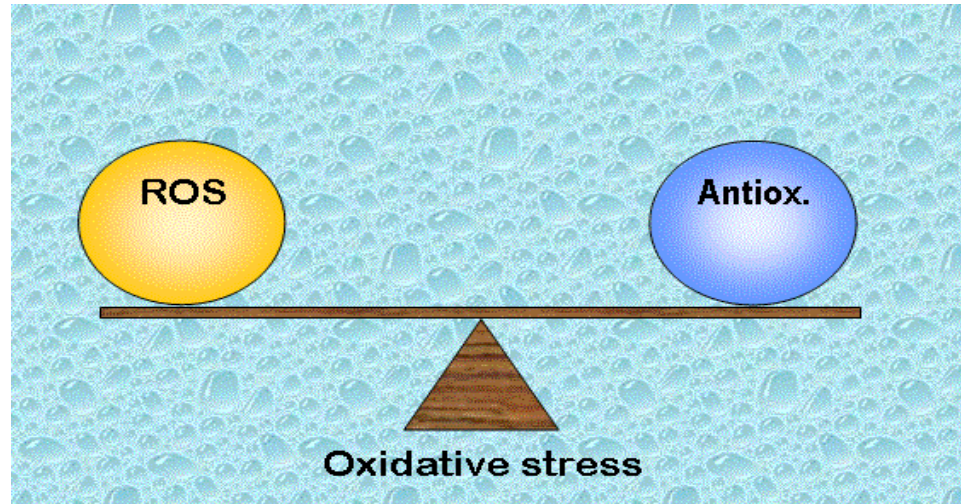
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Introduction



- **Oxidative stress:** disturbance in the balance between the production of reactive oxygen species (free radicals) and antioxidant defenses

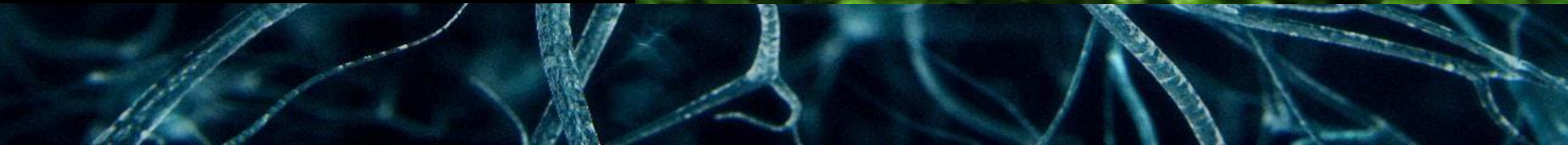
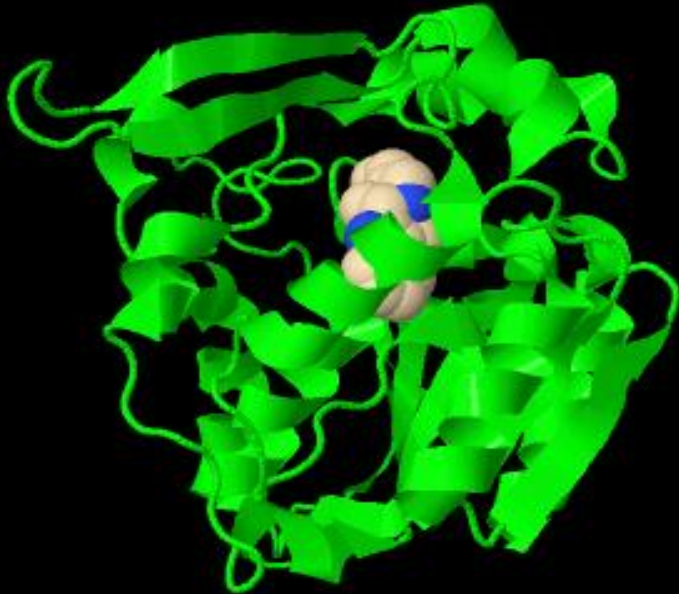


- Antioxidant mechanisms and enzymes such as, **superoxide dismutase (SOD)**, **catalase (CAT)** and **glutathione peroxidase (GPx)** are activated.
- **Body's first line of defense** against ROS by catalyzing their conversion to less reactive or inert species

Introduction



- Now a day's global population is moving towards the ***HERBAL MEDICINES***, which contain bioactive compounds to cure the diseases



Introduction



- ***Rauwolfia serpentina*** (family: Apocynaceae), is an important medicinal plant.
- Having **therapeutic properties**.
- The **antimicrobial** and **antioxidant activities**
- Effective in the treatment of **hypertension** and **psychotic disorders**
- Various **indole alkaloids** have significant **biological activities**.
- The principle alkaloid of *Rauwolfia serpentina* is **reserpine**.



Plan of Study

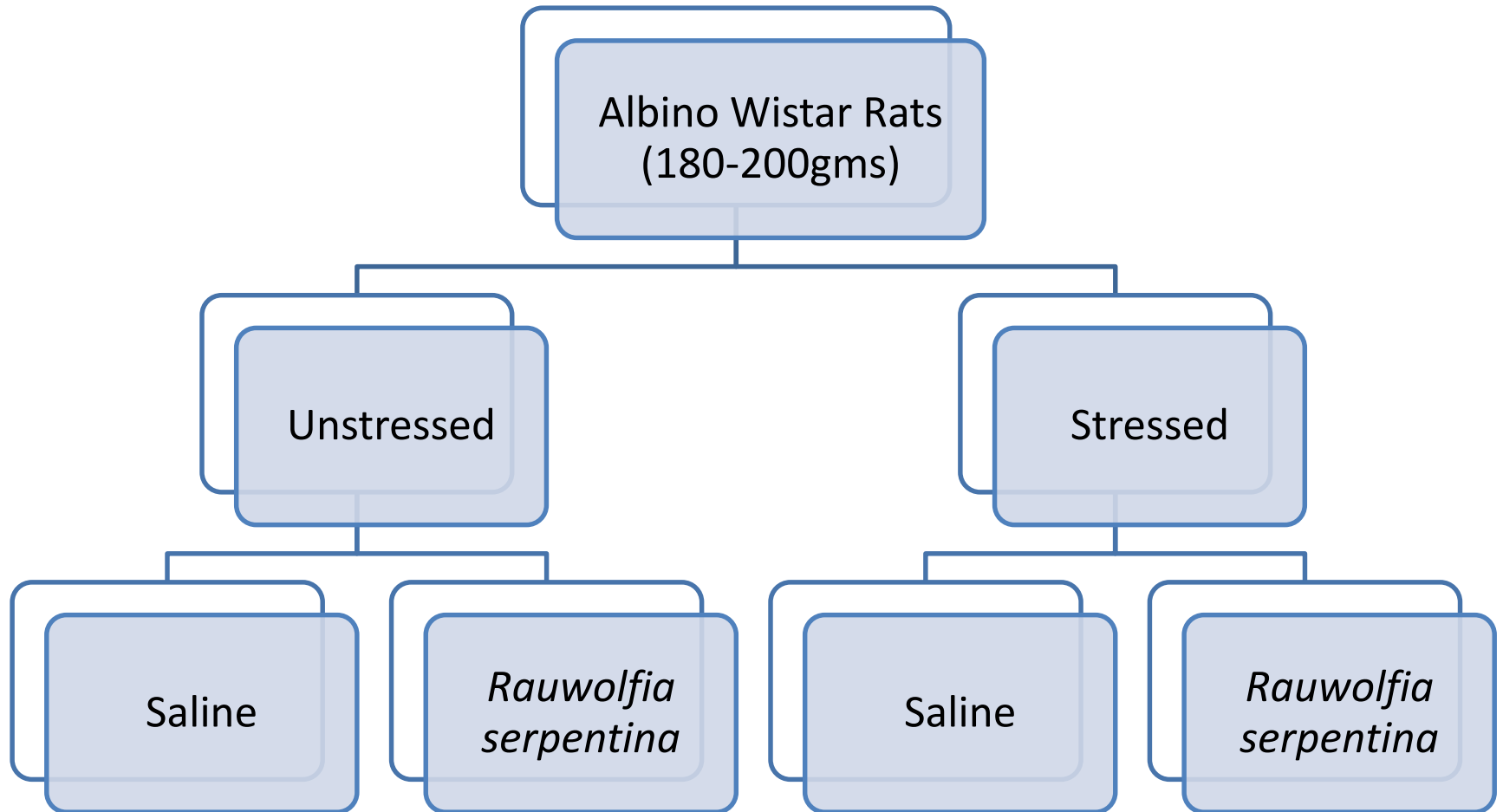


The present study was designed to investigate the neuroprotective effects of *Rauwolfia serpentina* on immobilization induced stress.

Plan of Study



Experimental Protocols



Experimental Protocols



Oral administration of **Saline** and **R.Extract** (30mg/kg) to unstressed and stressed rats

Animal were **immobilized** on wire grid for 2 hrs and after **2 hrs** animal were released and returned to their home cages

Activities were monitored for 5 min.

1. **Open field**
2. **Light dark transition box**

Plasma samples were collected for **leptin**, **corticosterone** and **antioxidant enzymes** such as **CAT** and **SOD** estimation

Immobilization Procedure



- Immobilized by wire grids affected by pressing the legs of the rats through the gaps in the metal grid



Behavioral parameters:



- **OPEN FIELD**



- **LIGHT- DARK TRANSITION TEST**

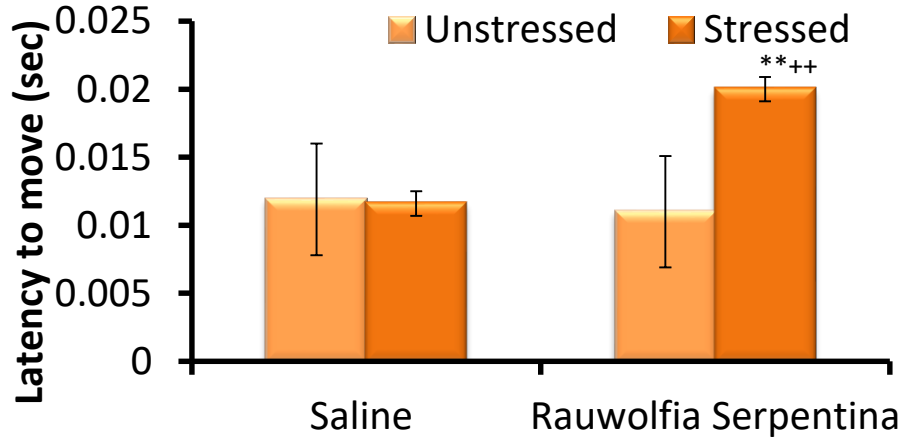


- **BLOOD SAMPLE COLLECTION**

- Blood was collected from rats.
- Centrifugation was done 10 minutes.
- Plasma was collected for the estimation of the plasma corticosterone, leptin, CAT and SOD.

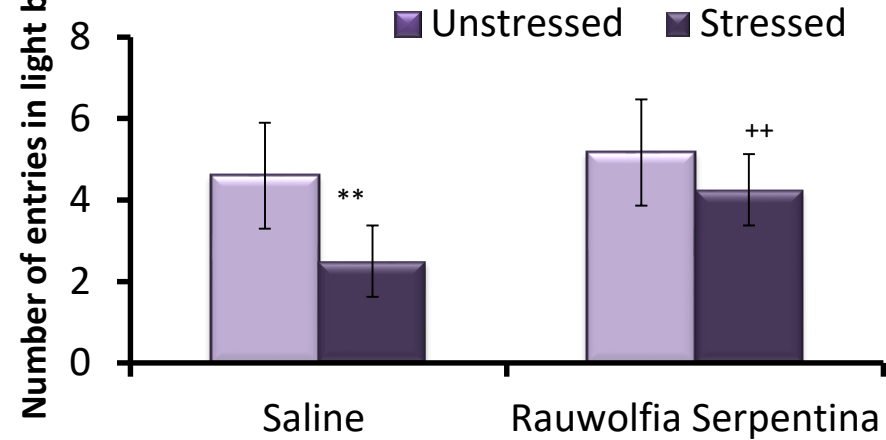
Open Field Activity Test

LATENCY TO MOVE

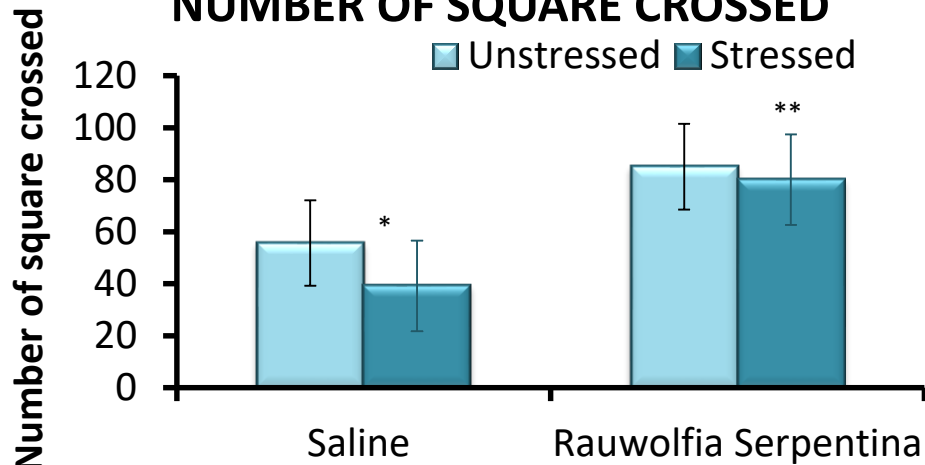


Light Dark Box Test

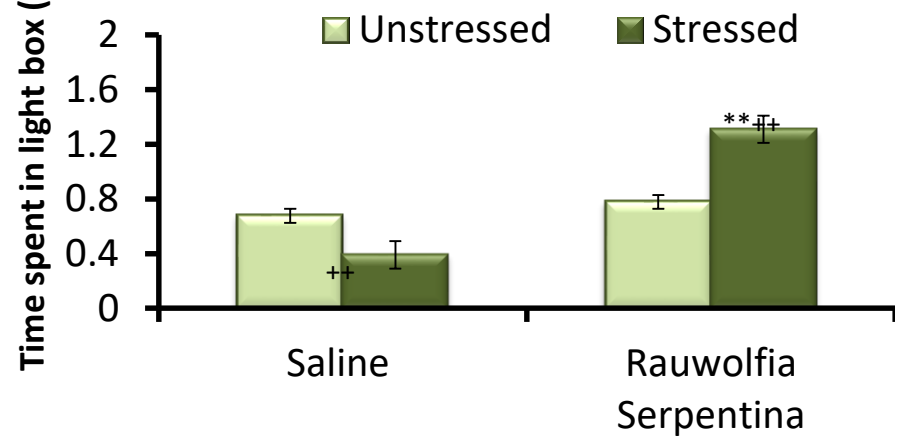
NUMBER OF ENTRIES IN LIGHT BOX



NUMBER OF SQUARE CROSSED

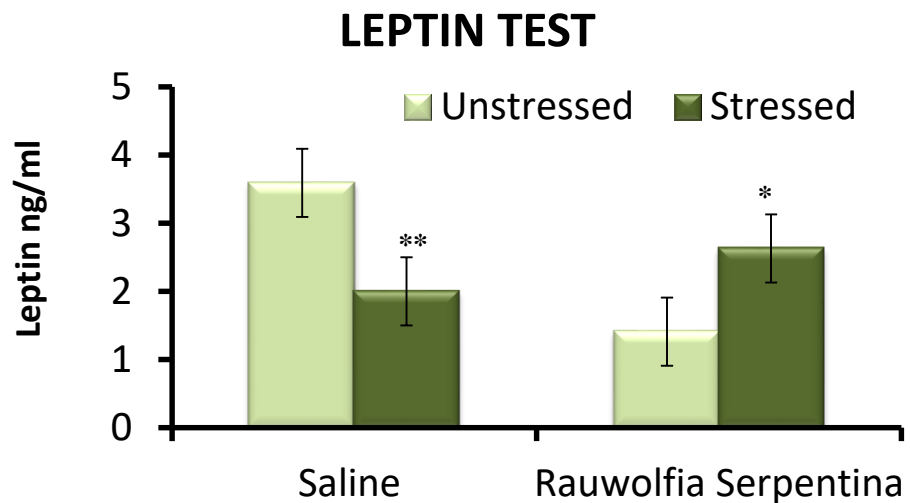
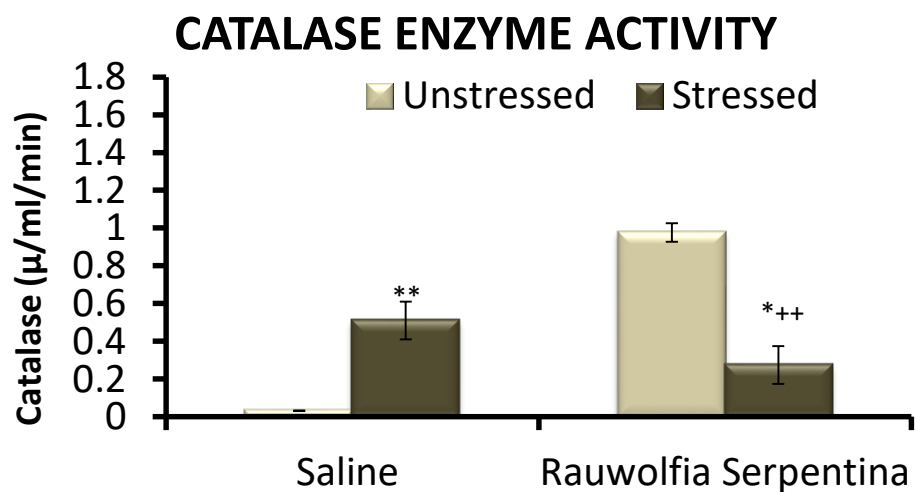
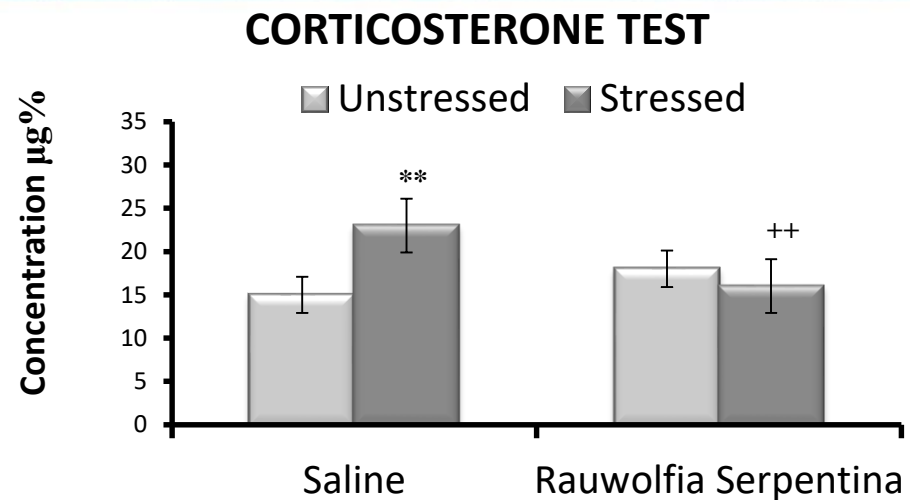
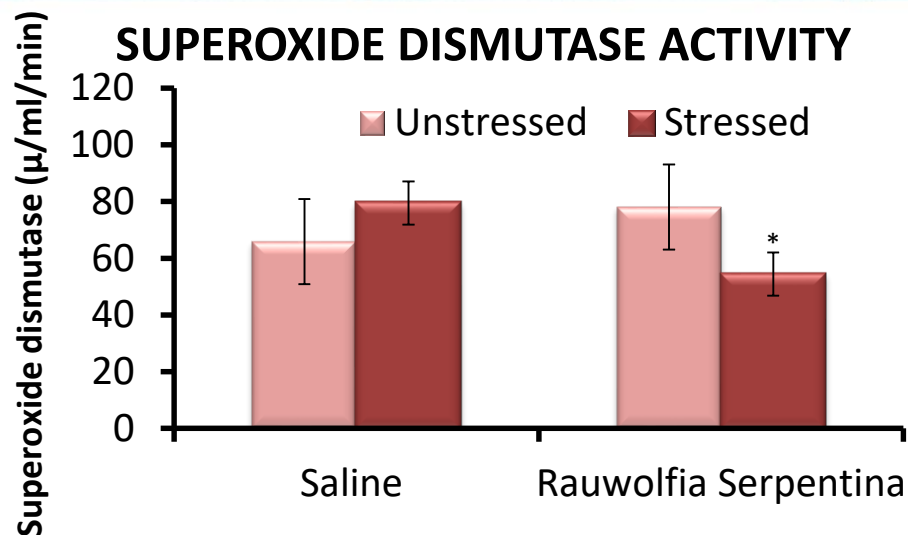


TIME SPENT IN LIGHT BOX



Antioxidant enzymes Activity

CORT & Leptin Test

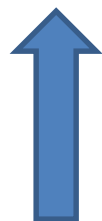


Discussion

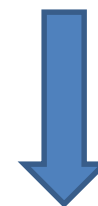


- Oral administration of *Rauwolfia serpentina* result in:

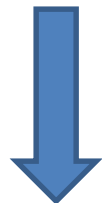
Suggested:



number of square crossed in open field
numbers of entries in light box
time spent in light compartment



novel environment induced anxiogenic effects.



Attenuation in stress causing increase in antioxidant enzymes CAT and SOD activities



antioxidant capacity of plant extract component particularly flavonoids and ascorbic acid

- Many studies evidenced that majority of the antioxidant activity of plants may be from compounds such as phenolic acids, flavonoids and ascorbic acids that can provide protection against ROS.

DISCUSSION



Immobilization stress exhibits



corticosterone levels

***Rauwolfia Serpentina* administration**



corticosterone levels



Previous Studies Reported:

- stress-induced releases of corticosterone has an opposite influence on leptin expression.
- stress-mediated stimulation of plasma corticosterone and ACTH in mice were inhibited by the leptin

Oral Administration of *Rauwolfia serpentina* Shows:



- plasma leptin levels but inhibit corticosterone levels.
- Leptin could elicit a feedback effect on the HPA axis activity.

Conclusions



***Rauwolfia serpentina* has capability to antagonize the unpleasant effects of acute immobilization stress by reducing stress perception.**

Despite, the mechanism of action at molecular level remains to be determined.



Thank You!

