EXPERIMENT NO.: 20 **DATE:**

AIM: TO STUDY THE CNS DEPRESSANT PROPERTY OF DIAZEPAM ON THE LOCOMOTOR ACTIVITY OF MICE USING ACTOPHOTOMETER OR PHOTOACTOMETER (ACTIVITY CAGE)

Drug: Diazepam 2 mg/Kg (i.p), Stoke solution – 0.2 mg/mL

Animal: Mice (20 – 25 G)

Equipment: Actophotometer

Principle:

Most of the CNS acting drugs influence the locomotor activity in man and animal. The CNS depressant drugs such as barbiturates and alcohol reduces the motor activity while the stimulant such as caffeine and amphetamines increases the activity. In other words, the locomotor activity can be an index of wakefulness (alertness) of mental activity.

The locomotor activity (horizontal activity) can be easily measured using an actophotometer which operates on photoelectric cells which are connected in circuit with a counter. When the beam of light falling on the photo cell is cut off by the animal, a count is recorded. An actophotometer could have either circular or square arena in which the animal moves. Both rats & mice may be used for testing in this equipment.

PROCEDURE:

1. Weigh the animals (20-25 g mice) & number them.
2. Turn on the equipment (check & make sure that all the photo cells are working for accurate recording) and placed individually each mouse in the activity cage for 10 minutes. Note the basal activity score of all the animals (6).
3. Inject the drug chlorpromazine hydrochloride (Dose: 3 mg/kg, ip; make a stock solution containing 0.3 mg/ml of the drug & inject 1 ml/100 g body wt of mouse), and after 30 mins re-test each mouse for activity scores for 10 mins. Note the difference in the activity, before & after chlorpromazine.
4. Calculate percent decrease in motor activity.

Dose calculation:

Mice weight 30 G = 30 X 10^{-3}Kg Dose of diazepam is 2 mg/Kg

1 Kg animal required ---------- 2 mg dose

30 X 10^{-3}Kg animal required ---------- (?) = 60 X 10^{-3} mg = 0.6 mg

Stoke solution = 0.2 mg/mL

0.2 mg drug required -------- 1 mL dose

0.6 mg drug required ------- (?) = 0.3 mL dose

OBSERVATIONS:

S.NO	Body weight (GM)	Drug treatment dose	Volume of drug injected (mL)	Locomotor activity(Scores) in 10 min		% decrease in activity
				Before drug	After drug	
1.	40	Diazepam 2mg/kg (i.p)	0.40	717	201	71.96
2.	34		0.34	787	194	75.34
3.	30		0.30	696	298	55.91
4.	30		0.30	780	156	80

CONCLUSION:

Reduction in the motor activity indicates CNS depressant property of the drug.

Increase in the motor activity indicates CNS stimulant property of the drug.

OTHER DRUGS:

- CNS depressants:
  - Chlorpromazine hydrochloride (3 mg/kg, ip in case of both rat & mice)
  - Fluoxetine (10 mg/kg, ip in case of rat)
  - Imipramine (10-20 mg/kg, ip in case both mice & rat)
  - Phenobarbitone sodium (10 mg/kg, ip in case of both rat & mice)
  - Alcohol (0.5-2 g, ip, po in case of both mouse & rat)
- CNS stimulants:
  - Caffeine (8-10 mg/kg, ip in case of mice & 30 mg/kg, ip in case of rat)
  - Amphetamine (1.5 mg/kg, ip in case of mice & 3-5 mg/kg, sc, ip in case of rat)

TEACHER'S SIGNATURE