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Study on effect of *Gelsemium sempervirens* potencies on central nervous system of experimental animals

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Abstract
The work on clinical study and research work is to show the biological activity of *Gelsemium Sempervirens* on Central Nervous System using Actophotometre. One dose of *Gelsemium Sempervirens* 6, 200(0.1ml/kg), One dose of Nux vomica6x, 200 (0.1ml/kg) is administered orally to the Albino mice once in a day. The effect CNS locomotor activity is measured using the Actophotometre. The study that the action of drugs *Gelsemium Semperiverens* has signicant depressant activity on central nervous system, when compared with the Nux vomica.

Keywords: *Gelsemium sempervirens*, CNS activity, actophotometre, albino mice

Introduction
Gelsemium Sempervirens, parts of this plant contain the toxic strychnine-related alkaloids Gelsemine and Gelseminine. Which has a historical usage in the treatment of facial and other neuralgias, cardiac depressant and in spasmodic affections, but in this study we going to analyze the active principle of *Gelsemium Sempervirens* in central nervous system with Nux vomica,which has strychnine as alkaloid as using Actophotometre and Albino mice. 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. The GABA receptors are a class of receptors that respond to the neurotransmitter gamma-amino butyric acid (GABA), the chief inhibitory neurotransmitter in the vertebrate central nervous system. GABA is the chemical messenger that widely distributed in the brain. It reduce the activity of neuron to which it binds and also serve to control fear and anxiety experienced when neurons are overexcited. GABA receptors are probably the most common kind in the mammalian nervous system. It is estimated that close to 40% of the synapses in the human brain work with GABA and therefore have GABA receptors.

Aims and Objectives
To evaluate the effects of Drugs in Experimental Animals.
To evaluate the efficacy of potencies of Nux vomica and *Gelsemium semperiverens* on Central nervous system of Experimental animals.

Material and Methods
1. Preparation of Drugs
The plant of *Gelsemium Sempervirens* was collected from Ooty under the supervision of Dr. D. Suresh Baburaj, Asst Director, medicinal plants survey and collection unit, CCRH Ooty. The mother tincture of *Gelsemium Sempervirens* extracted as per the directions given in Homoeopathic Pharmacopoeia of India (Vol-1, 1971). The 6x potency of *Gelsemium Sempervirens* was prepared and 200C was brought from reputed firm used in this experiment.
The seed of Nux vomica plant is collected from was collected from Ooty under the supervision of Dr. D. Suresh Baburaj, Asst Director, medicinal plants survey and collection unit, CCRH Ooty. The mother tincture of *Nux vomica* extracted as per the directions given in Homoeopathic Pharmacopoeia of India (Vol-1, 1971). The 6x potency of *Nux vomica* was prepared and 200C was brought from reputed firm used in this experiment.

2. Experimental design
Male albino mice (swiss strain) were procured from Sri Venkateswara Enterprises, Bangalore and bred in animal house of Vinayaka Mission's College of Pharmacy, Salem. They were fed with commercial diet (Hindustan lever, Bangalore) and water adlibitum during the experiments. The pellet food containing 22.5% protein, 72.55% carbohydrate, 5% fat, and sufficient vitamins and minerals. The cages were placed in well ventilated place in the laboratory and were provided with 1.5 inches rice bran bedding, which was changed every day. The room temperature maintained at 25± 10c. The animals were selected randomly. The animals were divided into Four groups (I-IV), each comparising of six animals each weighing between 25- 30gms were selected.
Each group is given with 0.1ml/kg of *Gelsemium Sempervirens* 6,200 and Nux vomica 6,200 and standard 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 mice) and activity is tested using Actophoto meter. The instrument used for testing CNS activity, which operates photo electric cell.The beam of light is cut by the animal. The mice in each group is tested for prior to administration of drug for normal activity and after 30mins re-test each mouse for activity scores for 10mins after administration of corresponding drug in each

group. Note the difference in the activity, before & after is noted for each group.

Gamma-aminobutyric acid (GABA) is an amino acid which is the primary inhibitory neurotransmitter in the brain and a major inhibitory neurotransmitter in the spinal cord. It exerts its primary function in the synapse between neurons by binding to post-synaptic GABA receptors which modulate ion channels, hyperpolarizing the cell and inhibiting the transmission of an action potential.

Screening Methods for CNS Activity

The blind screening methodology, well known in psyco-neuro pharmacology was utilized for central nervous system action investigations.

Drug Administration

1. *Gelsemium Sempervirens*

GROUP-1-Control group without any treatment

GROUP-11-Group treated with standard drugs (dose according to drugs used)

GROUP-111-Group treated with *Gelsemium Sempervirens* 6X (0.5ml/p.o) once in a day.

GROUP-1V-Group treated with *Gelsemium Sempervirens* 200C (0.5ml/p.o) once in a day.

2. NUX vomica

GROUP-1-Control group without any treatment

GROUP-11-Group treated with standard drugs (dose according to drugs used)

GROUP-111- Group treated with Nux vomica 6X (0.5ml/p.o) once in a day.

GROUP-1V- Group treated with Nux vomica 200C (0.5ml/p.o) once in a day.

The test with different drugs is made in two different occasions. The tests were made three hours after administration of drug.

Observation

1. The experimental animals used for the study, showed the loco motor activity at different levels and the findings are below.
2. The mice with Control group showed the hyper active behavior.
3. The mice treated with Standard drug showed the decrease in loco motor activity.
4. The mice treated with Gelsemium semperiverns 6 has the hypo motility in action
   The mice treated with Gelsemium semperiverns 200 also has decrease in loco motor action.
5. The mice treated with Nux vomica 6 has the moderate action of hypo motility

The mice treated with Nux vomica 200 has the slight hypo motility in action

The mice taken for the experimental studies are fed with appropriate food and water

Result

The loco motor activity before and after treatment is compared with the standard drug during the process of the experiment. The experimental results were tabulated below and the percentage has been estimated.

Table 1: Evaluation of CNS activity of Extracts of Nux vomi**ca**

S.no	Treatment	DOSE	Loco motor activity score for 10mins		Percentage change in activity
			Before T/t	After T/t	
1.	Control	0.1ml	590.4±76.72	592.16±62.13	-------
2.	CPZ (Standard)	3mg/kg	590.6±94.79	88.33±28.20	85.04
3.	Nux vomica 6	0.1ml	553.33±64.47	253.0±93.44**	54.02
4.	Nux vomica 200	0.1ml	579.20 ± 50.48	385.0±18.57*	33.52

All values are expressed as mean ± S.E.M. p*<0.05 considered significant (n=6).Data will be analyzed by ANOVA followed by Dunnett's multiple comparison test

Data 1: Efficacy of nux vomica on cns activity

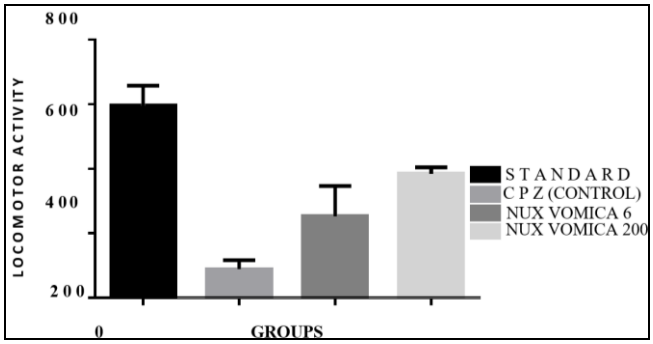

Fig 1

Table 2: Evaluation of CNS activity of Extracts of *Gelsemium Sempervirens*

S.no	Treatment	Dose	Loco motor activity score for 10mins		Percentage change in activity
			Before T/t	After T/t	
1.	Control	10ml/kg	342.20±15.30	340.30±5.8	---------
2.	CPZ (Standard)	3mg/kg	320±35.20	76.6±4.1	67.27
3.	Gels semp 6	0.1ml	337± 80.08	168±9.3***	50.14
4.	Gels semp 200	0.1ml	513.33±40.46	169 ± 8.17***	67.27

All values are expressed as mean ± S.E.M. p*<0.05 considered significant (n=6).Data will be analyzed by ANOVA followed by Dunnett's multiple comparison test.

Data 2: Efficacy of gels semperiverns on cns activity

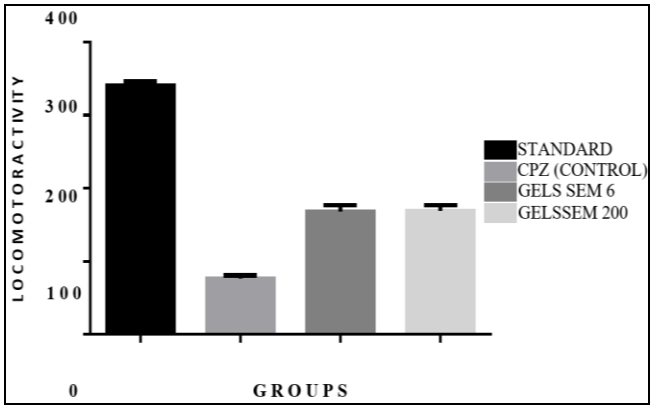

Fig 2

Stastical Analysis

The results were statically processed by Analysis of variance test ANOVA to compare the effects on treatment groups before and after treatment with control group Dunnett's *t* test were used to determine the effect of each treatment against the control group.

Discussion and Conclusion

Every drug has its action on the Human physiological system and here the drugs used for the study has its effects on the Central nervous system of experimental animals.

In Nux vomica has its action on different parts of the body but most probably on CNS, which causes paralysis and convulsions. In short it can be used to depress central nervous system activities. The work of the study also suggests that it can be used for the depressant activity.

Gelsemium semperiverens, As said earlier Barthlow says "I have demons trated that Gelsemium is a paralyzer of motility and sensibility, that sensibility is first affected in cold blooded animals (frog) and latter motility. The study shows that Gelsemium semperiverns has most significant activity on CNS depressant activity.

The study that the action of drugs Gelsemium Semperiverens has signicant activity on central nervous system, when compared with the Nux vomica.

The result of the study gives the opportunity for future researches.

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