

PHARMACOLOGICAL INVESTIGATION OF NOOTROPIC AND ANTIOXIDANT ACTIVITY OF *OPERCULINA TURPETHUM* (LINN.) SILVA MANSO EXTRACT USING ANIMAL MODELS

¹Shifa Ruhi, ²Dr. Syed Ahmed Hussain, ³Amreen Sultana

^{1,3}Students, ²Professor
Shadan Women's College of Pharmacy

Abstract: Extricates of takes off, natural products, bloom and roots were exposed to physical estimations to determine their chemical constituents, colours and behavioural activity. Albino mice were chosen arbitrarily and employed for the cognitive performance. The standard medicate, piracetam was taken as the standard drug.

The Elevated plus maze, Y maze, Digital actophotometer were utilized for screening of upper drugs. 60 min prior to the experiment, the medicate and extricate within the measurements of methodological data were administered. The extricate of natural product appeared to be noteworthy for enhancement of cognition and memory in mice in all the models at the measurements. Thus showing Nootropic activity.

From the ponder performed, we are able to conclude that *Operculina turpethum* (Linn) Silva Manso plant extricate emerged to have higher preserving impact in group 5 and group 6 with quick affecting considers. The extricate appeared less viable in group 4 consider as they are managed with moo measurements.

Keywords: Nootropic activity, *Operculina turpethum* (Linn) Silva Manso

INTRODUCTION

Plant kingdom provides an infinite source of biologically active elements useful in dealing with many of the incurable ailments. Since ages, plants are the main origin of substances and medication for producing new drugs of considerable benefit to the mankind. Just with the progression of life, there is also the progression of medical field. Scientific research with the use of traditional plants produced a few curative components, which can be used as a support for exploring more data of the bioactive plants.

One such plant, *Operculina turpethum*, greets the analysts all over the world for its medicinal applications starting from antidiabetic to anticancer uses. *Operculina turpethum* (Linn) Silva Manso is a huge sturdy perpetual medicinal plant also known as “Indian Jalap” has a place to family *Convolvulaceae*. Owing to the existence of triangle shaped stem it is also known as “*Trivrit*”. There are two grades of *Trivrit*, named as Shweta or white Turpeth (OT Silva Manso) and *Krishna* or black Turpeth (*Ipomoea petaloidea*). It is extended randomly in the tropical regions of India at an elevation of 1000 square feet on roadsides periodically grown as an ornamental plant (Kohli KR). The root bark and seed of this herb is utilized in the therapy of skin illness such as vitiligo and various ailments such as stasis of lower bowel, jaundice, tumors, hunger, chest flu, high temperature, fatness, piles (Nadkarni KM).

AIM AND OBJECTIVES

AIM: The current consider has been pointed for the evaluation of beneficial effect of the herbal extract for nootropic and antioxidant activity that has not been investigated by employing albino mice as an exploratory model.

OBJECTIVES

1. Collection and Authentication of plant
2. Separation of plant by Maceration process
3. Preliminary phytochemical screening of plant
4. Confirmation of chemical constituents
5. Screening of nootropic and antioxidant activity
6. Biochemical estimations such as Acetylcholinesterase levels, MDA assay, Antioxidant activities like SOD, Glutathione
7. Histopathological determination of Brain tissue
8. Result and conclusion
- 9.

MATERIALS AND METHOD

PLANT AUTHENTICATION.

The dried root bark powdered of *Operculina turpethum* (Linn) Silva Manso is acquired and established from Dr. K. Madhava Chetty assistant educator, Branch of Botany, Sri Venkateshwara College, Tirupathi, A.P India.

EXPERIMENTAL ANIMALS

The investigatory considers will be accomplished at shadan established of therapeutic sciences, peerancheru. Mice (18-25gms) of either sex housed under standard husbandry environment of room temperature $26\pm 2^{\circ}\text{C}$, relative humidity 45-55% and light /dark cycle of 12hours is set. Under precise hygienic conditions all the creatures ought to be bolstered with standard pellet diet and water advertisement libitum. Creatures are selected arbitrarily and all tests is to be executed in accordance to the shapes of moral conditions (CPCSEA).

PHYTOCHEMICAL SCREENING OF EXTRACT:

The plant extricate will be screened by standard methodology for the closeness and non attendance of subsidiary metabolites such as flavonoids, tannins, alkaloids, phenols, glycosides, terpenoids, anthraquinones, saponins and steroids etc.

SCREENING METHODS

- a. Elevated plus maze method
 - b. Y- maze method
 - c. Locomotor activity
- Serum biochemical estimation
- AchE levels
- Oxidative stress parameter
- Malondialdehyde
- Antioxidant parameters
- Superoxide dismutase (SOD)
 - Glutathione levels (GSH)

PLANT PROFILE



It grows throughout India very often referred to as “Indian Jalap” at an altitude of 1000 square feet and at times cultivated in gardens as an ornament.

Broadly found in tropical regions of India, Bangladesh, Nepal, Pakistan, Sri Lanka (Kohli KR et al. 2010). It is the perpetual twinner and a huge climber with simple leaves varying in shape, pubescent on both sides with 5-10 cm long and 1.3-7 cm wide leaf base. The flowers are white with long sepals few flowers borne in cymes giving rise to globose capsules containing brittle sepals overlapped. The capsule is 1 to 1.5 cm rounded carrying usually four smooth black seeds. The stems are lengthy twisted, pubescent which becomes tough and brown when old. The roots are greatly branched, long, fleshy and slender¹⁶. The detached roots from the plants are shed dried to be used as medication for various ailments.

CHEMICALS AND REAGENTS:

- Normal saline (0.9% w/v) - Solvent to disperse the test and standard drugs
- Diazepam (1mg/kg) – Toxicant control drug to induce amnesia
- Piracetam (200mg/kg) – Standard control drug for Nootropic
- Ethanol 99% v/v - preparation of plant extract

EXPERIMENTAL DESIGN

GROUPS	DRUGS	DOSE & ROUTE
Group-1	Normal control	1 ml -p.o
Group-2	Toxicant control	1mg/kg-i.p
Group-3	Toxicant control+standard control	200mg/kg-i.p
Group-4	Toxicant control+Test Dose 1	100mg/kg- p.o
Group-5	Toxicant control+Test Dose 2	200mg/kg- p.o
Group-6	Toxicant control+Test Dose 3	400mg/kg- p.o





HISTOPATHOLOGICAL STUDIES

The impacts of diverse plant extricates and histopathological highlights of treated mice will be decided.

RESULTS

PHYTOCHEMICAL SCREENING

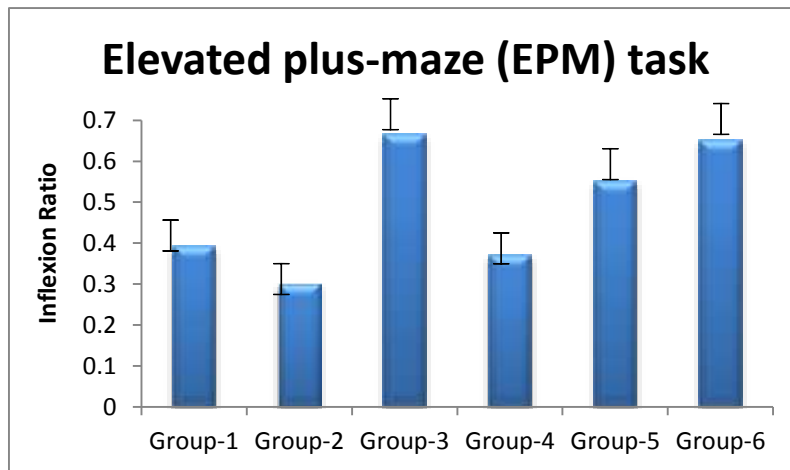


Chemical constituents	Test	<i>O. TURPETHUM</i>
Alkaloids	Dragendroff's test	+
	Tannic acid test	-
Tannins	Ferric chloride test	+
	Gelatin test	+
	Vanillin-HCl test	-
Cardiac glycosides	Keller-Killiani test	+
	Salkowski test	+
Steroids	Liebermann-Buchard test	+
Flavonoids	Alkaline Reagent test	+
	Lead Acetate test	+
Terpenoids	Salkowski test	+
Proteins	Ninhydrin test	-
Reducing sugars	Fehling's test	+
Saponins	Froth test	+

Elevated plus-maze (EPM) task

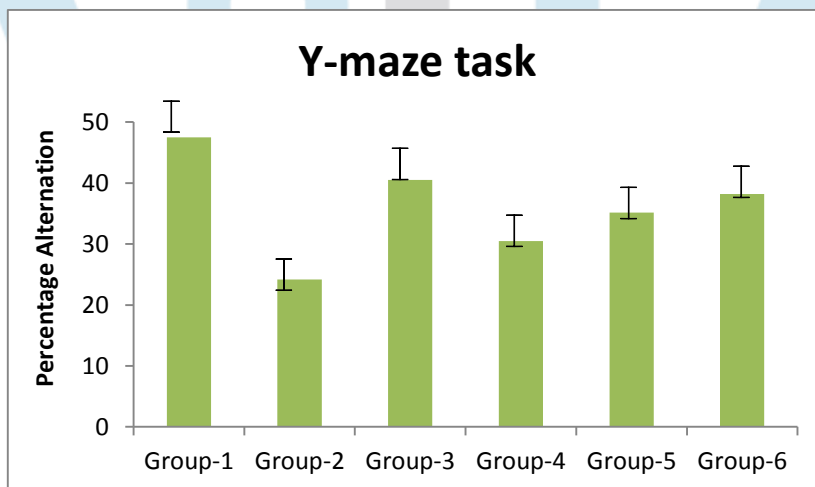
Treatments	Inflexion ratio
Group-1	0.392±0.023
Group-2	0.301±0.037
Group-3	0.666±0.017**
Group-4	0.37±0.020
Group-5	0.551±0.030**
Group-6	0.650±0.029**

All values are expressed as Mean ± SEM, P<0.05 compared to toxicant, * = p<0.05 compared to toxicant, ** = p<0.01 compared to toxicant, *** =p<0.001 compared to toxicant.



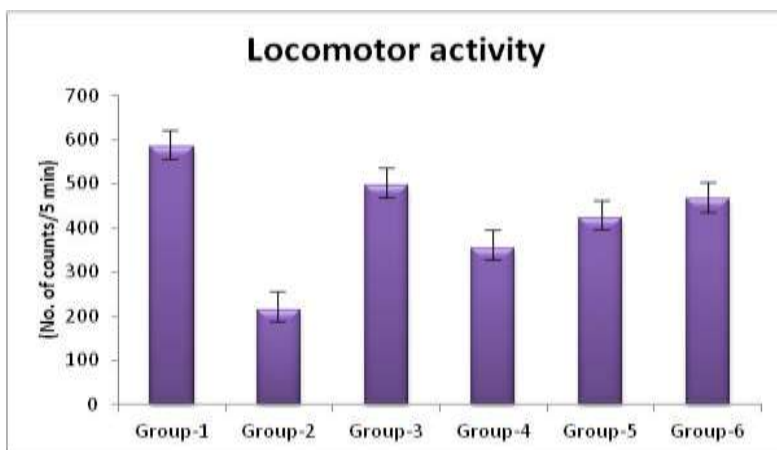
Y-maze task

Treatments	Percentage alternation
Group-1	47.52±0.2311
Group-2	24.20±0.2951
Group-3	40.51±0.2209**
Group-4	30.51±0.2941**
Group-5	35.15±0.09457**
Group-6	38.18±0.1738**



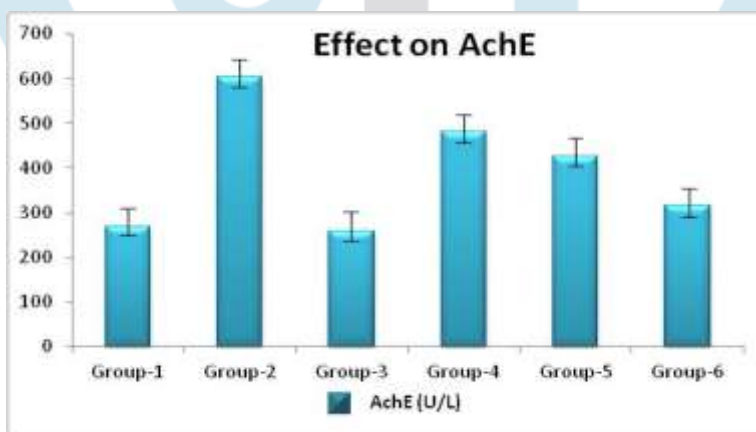
Locomotor activity

Treatments	(No. of counts/5 min)
Group-1	583.8±38.18
Group-2	214.7±15.71
Group-3	495.8±12.17***
Group-4	354.3±14.16
Group-5	422.7±15.09**
Group-6	466.3±17.06**



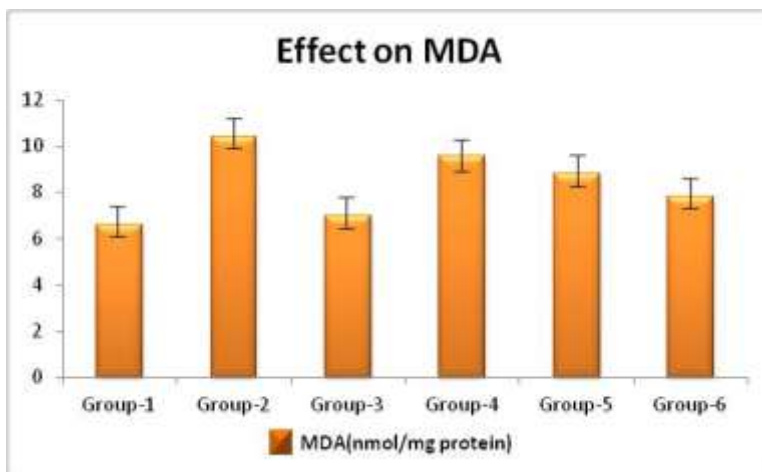
EFFECT ON AchE LEVELS

Treatments	AchE (U/L)
Group-1	268.9±28.58
Group-2	604.5±15.63
Group-3	257.1±17.29***
Group-4	481.3±12.89
Group-5	427.3±38.22**
Group-6	317.1±7.28**



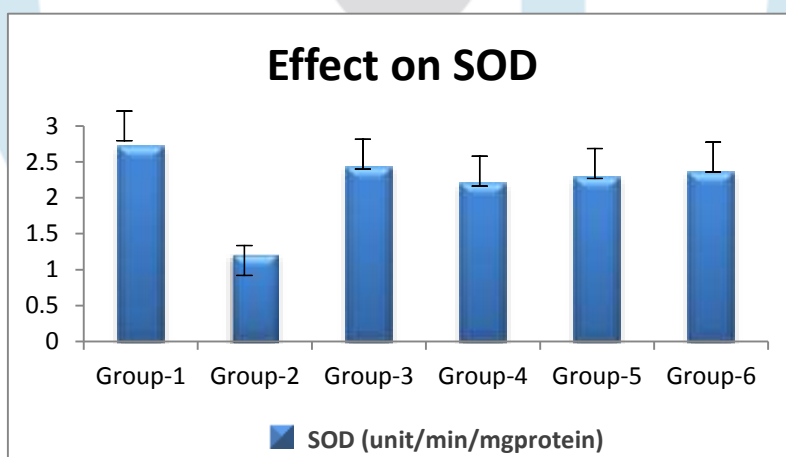
EFFECT ON MALONDIALDEHYDE (MDA) LEVELS

Treatments	MDA(nmol/mg protein)
Group-1	6.58 ±0.13
Group-2	10.43 ±0.17
Group-3	6.97 ±0.12***
Group-4	9.6 ±0.24
Group-5	8.8 ±0.27**
Group-6	7.8 ±0.17**



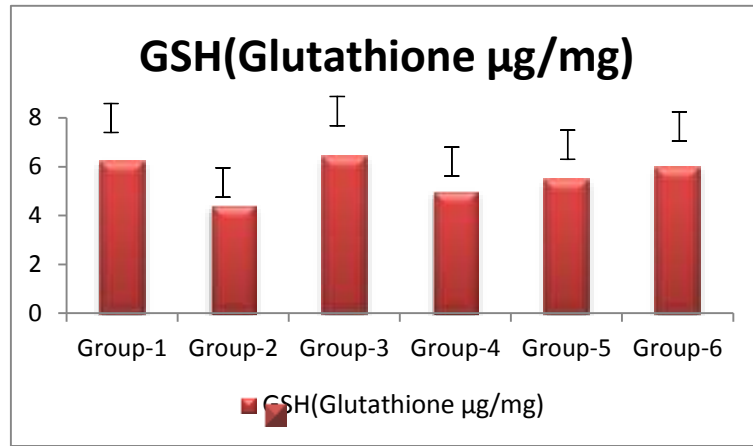
EFFECT ON SOD LEVELS

Group	SOD (U/mg protein)
Group-1	2.71 ±0.11
Group-2	1.21 ±0.09
Group-3	2.43 ±0.13***
Group-4	2.20 ±0.09
Group-5	2.29 ± 0.08**
Group-6	2.36 ±0.10**



EFFECT ON GSH LEVELS

Group	GSH(Glutathione µg/mg)
Group-1	6.22±0.02
Group-2	4.42±0.34
Group-3	6.41±0.06**
Group-4	5.00±0.30*
Group-5	5.48±0.20**
Group-6	5.98±0.03**

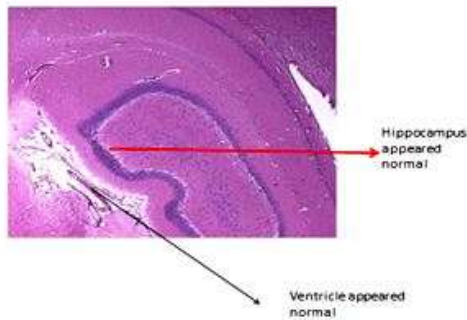


HISTOPATHOLOGICAL STUDIES

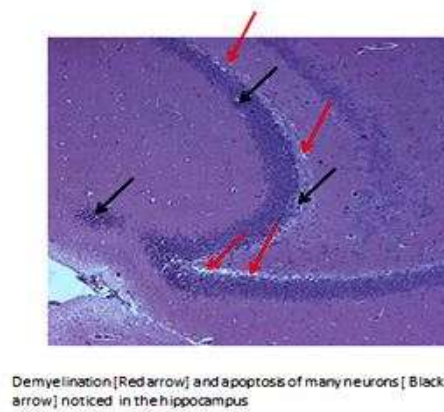
The effects of plant extracts on cognitive performance and histopathological features of treated mice will be determined.

Purpose of Histopathological studies: Brain histopathological studies will showcase that the exposure of drug doses may cause pathological changes in the form of neurodegeneration, mild necrosis, or inflammation.

GROUP: 1



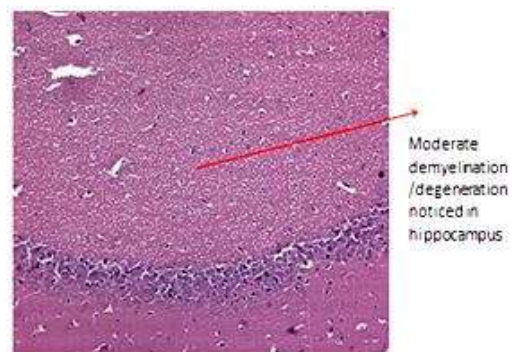
GROUP: 2

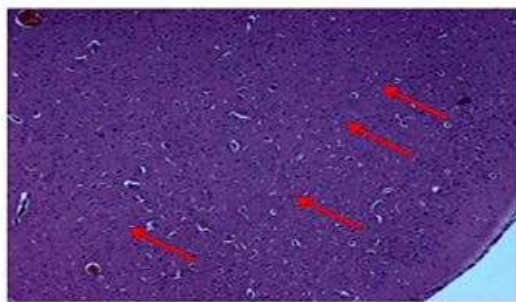


GROUP: 3

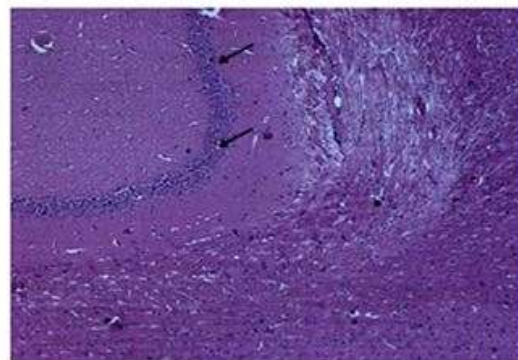


GROUP: 4



Group: 5

Frontal cortex- cerebral hemisphere appeared normal-
Arrow. No necrosis or inflammation noticed

Group: 6**DISCUSSION AND CONCLUSION****DISCUSSION**

Forgetfulness is universal and foremost symptom to come out in majority of patients suffering from Alzheimer's disease. It is a disabling ongoing brain disorder accompanied by disruption in the cortical functions including remembrance, orientation, learning and decision. Remembrance is one of the composite task of the brain and eventually incorporates several neurotransmitters and neuronal paths. As a consequence of impairment in cognition and remembrance several cognitive disorders like Alzheimer's disorder, insanity, memory loss and misery occurs and they have immense load on society and their occurrence is still rising.

It has been assessed that by 2050, more than 115 million people will be assumed to have dementia. Currently, stressful way of life leads to poor memory, delayed recollection. Mental illness is customarily treated with upper solutions to improve remembrance, mood and behaviour presently nootropic agents like Piracetam, Aniracetam, Pramiracetam and choline esterase inhibitors like Donepezil are helpful. The foremost side impacts of these agents incorporate gastrointestinal disruptions and issues related with their bioavailability have limited their use.

Nootropic drugs are utilized as food supplements, nutraceuticals to improve cognitive awareness, attentiveness, inspiration, thinking and remembrance as they act by elevating brain's supply of neurotransmitters, enzymes that intensify the accessibility of oxygen to brain resulting in nerve growth.

Researchers are looking forward for herbal formulations to get the better of the side impacts of synthetic drugs. To explore new cure for these disorders, herbal plants can be a better origin as they allocate more specific and cost effective therapy. Within the show believe about plant have been evaluated for behavioural action. Customarily this plant as the writing appears can be utilized for several ailments mentioned in ayurveda and unani systems. The plant materials for the display ponders were commercially secured and solvents such as chloroform, ethanol, petrol ether, and distilled water were engaged for the extraction.

Extricates of takes off, natural products, bloom and roots were exposed to physical estimations to determine their chemical constituents, colours and behavioural activity. Albino mice were chosen arbitrarily and exercised for the mental performance. The standard medicate, piracetam was taken as the standard drug.

The Elevated plus maze, Y maze, Digital actophotometer were utilized for screening of upper drugs. 60 min prior to the experiment, the medicate and extricate within the measurements of methodological data were administered. The extricate of natural product appeared to be noteworthy for enhancement of cognition and memory in mice in all the models at the measurements.

CONCLUSION:

Amid this investigate about work, it is described that the extricate of natural product have expressed critical behavioural action within the animal models. For the advancement of reasonable medicate for human utilization more assist is recommended to investigate more on the work. For accumulation of more strong evidences for memory enhancing movement it is moreover suggested to conduct human clinical trials and to set up its sedate security and toxic profile quality.

From the ponder performed, we are able to conclude that *Operculina turpethum* (Linn) Silva Manso plant extricate emerged to have higher preserving impact in group 5 and group 6 with quick affecting considers. The extricate appeared less viable in group 4 consider as they are managed with moo measurements.

BIBLIOGRAPHY:

1. C.K.Kokate, A.P.Purohit, S.B.Gokhale, Pharmacognosy: History and scope of Herbal medicine. Pragati Books pvt.ltd. Pune: 2001: 1-2.
2. Vaidya B. Nighantu aadarsha. Vol. 2. Varanasi, India: Chaukhamba Bharti Publishers; 2005. pp. 101–6
3. D’Hooge R, De Deyn PP. Applications of the Morris water maze in the study of learning and memory. Brain research reviews. 2001 Aug 1;36(1):60-90.
4. Lynch G. AMPA receptor modulators as cognitive enhancers. Current opinion in pharmacology. 2004 Feb 1;4(1):4-11.
5. Harvey JA. Role of the serotonin 5-HT_{2A} receptor in learning. Learning & Memory. 2003 Sep 1;10(5):355-62.

