ISSN:0975-3583,0976-2833 VOL11, ISSUE04,2020

EVALUATION OF ANTIDEMENTIA POTENTIAL OF SOME HERBAL DRUG EXTRACTS IN SCOPOLAMINE AND DIAZEPAM INDUCED RATS AND MICE

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Abstract: Research on plant materials has been conducted based on a study of the relevant literature. Botanists have done the work of identifying and verifying the legitimacy of plants. The gathered plants have been entirely shade dried and coarsely pulverised using a mixer. After the plant matter was extracted using a Soxlet apparatus, the product was produced using the hot percolation technique, and finally, they were put through several phytochemical screening procedures to determine the presence of fundamental chemical ingredients. Column and TLC chromatography were used to separate the plant extract. The study's screening framework has been decided upon. I believed that by doing this research, I may find a way to make better use of these extracts to combat dementia.

1. Introduction

The leaves of Digitalis purpurea (Fox glove) and Filipendulaulmaria (Meadow sweet) were collected and authentified by the botanist. The fresh leaves of the plants were collected as per the guidance of botanist & air dried & reduced to coarse powder. The air dried powdered plant material (200gm) was extracted with methanol by using soxlet apparatus for 3 days. Then the concentrated extracts were kept in a desicator and were used for further experiment. Each extract was weighed and its percentage in terms of air dried weight of plant material was calculated and also the consistency of the extracts was noted. The dried extract was stored in a sterile bottle at room temperature.

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- The leaves of Digitalis purpurea (Fox glove) and Filipendula ulmaria (Meadow sweet) were collected and authentified by the botanist.
- The fresh leaves of the plants were collected as per the guidance of botanist & air dried & reduced to coarse powder. The air dried powdered plant material (200gm) was extracted with methanol by using soxlet apparatus for 3 days. Then the concentrated extracts were kept in a desicator and were used for further experiment. Each extract was weighed and

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its percentage in terms of air dried weight of plant material was calculated and also the consistency of the extracts was noted. The dried extract was stored in a sterile bottles at room temperature.

- Phytochemical analysis was conducted on the plant extract revealed the presence of phytochemical constituents like Flavonoids, Phenols, Terpenoids, Alkaloids. The analysis was carried out for both the plant extracts.
- Further confirmation of presence of Phytochemical constituents like Flavonoids and Phenols were confirmed by performing column and TLC chromatography with the selected mobile phase.
- Screening methods were selected and the test procedures are carried out according to relevant procedures by dividing the animals in to different groups.

Preliminary phytochemical screening:

Preliminary phytochemical screenings in the plants were performed.

Table 1: Phytochemical screening of the Plant extracts:

S no	Name of the test	Methanolic extract of plant-1	Methanolic extract of plant-2
1	Alkaloids	Absent	Absent
2	Glycosides	Present	Present
3	Flavonoids	Present	Present
4	Tannins	Present	Present
5	Phenolic compounds	Absent	Present
6	Proteins & Amino acids	Absent	Present

2. Literature Survey

Based on a review of the available literature, scientists have investigated several plant materials**.**

In Ayurveda, Bacopa monnieri has been considered a "Medhya Rasayan" for many years. Bacopa monnieri standardised extract 300 mg twice day for 6 months in an open label non-randomized experiment on cognitive performance in patients with Alzheimer's disease. Patients' orientation, attention, and language component scores on the Mini Mental State Examination Scale (MMSES) improved significantly from baseline to study's conclusion, and the same was true for MMSES scores in the context of writing, reading, and understanding. In three separate studies [3, Goswami et al., 2011]

Using the Morris water maze scale, researchers in another study evaluated the memory-impairing effects of scopolamine and the protective effects of B. monniera. Bacopa monniera extract reduces both the anterograde and retrograde amnesia caused by scopolamine. As a result, B. monniera's effects on the cholinergic system may be useful in the research and development of novel therapeutic strategies for the treatment of learning and memory problems. ([4,Saraf et al., 2011])

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Researchers found that giving rats 20 mg/kg, 40 mg/kg, or 80 mg/kg of a standardised extract of bacopa monniera improved their performance on a test of spatial learning (a T-maze) and memory retention (a passive avoidance test). The evidence for this is presented in [5, Vollala et al., 2010].
The memory loss that occurred after the mice were given topiramate to treat their epilepsy was investigated. By lowering escape delay Time and increasing time in the target quadrent in the Morris water maze test, as well as lowering AChE levels, Bacopa effectively restored Topiramate-induced impairment [6,Kotadia et al, 2011].
Coarse powders of dried B. monnieri leaves, E. caryophyllus flower buds, E. cardamomum seeds, C. zeylanicum inner bark from shoots, and P. longum and P. niger fruit make up Brahmi Rasayana. For young mice, Brahmi Rasayana not only prevented the amnesia caused by scopolamine (0.4 mg kg i.p.) and ageing, but also dramatically enhanced learning and memory. Seven, Joshi et al., 2006
Seventy-0.8 percent of the child population showed significant changes in baseline value of working memory and short time verbal memory after taking Bacomind, an enriched phytochemical preparation from Bacopa monnieri, for four months. Additionally, significant improvement was seen in logical memory related to personal life, indicating that the supplement had cognitive enhancing activity. References: [8,Usha et al.,2008]

When it comes to traditional Indian medicine, one of the most popular herbs is ashwagandha (Withania somnifera: solanaceae), often known as Indian ginseng. Ashwagandha is used as a general tonic and as a "adaptogen" to help the body deal with the stress of everyday life. Ashwagandha leaves contain alkaloids, saponins, and steroidal lactones [10, Konar et al,2011] that are responsible for the plant's immunological modulatory, anti-stress, anti-oxidant, analgesic, adaptogenic, and immunostimulant activities. Ashwagandha's withanones and withanolides have been studied for its potential to aid in nerve cell regeneration, a topic explored by a number of writers.

After isolating it from an Ashwagandha methanol extract, researchers produced withanoside IV, which, when processed by an enzyme, yielded the active ingredient sominone. Phosphorylation of RET (a receptor for glial cell line-derived neurotrophic factor) has been demonstrated to reverse the memory loss caused by amyloid beta in mice. Specifically, [9, Tohda et al., 2009]
Ashwagandha ethanol extract prevented the scopolamine-induced reduction in BDNF and GFAP. Additionally, cytotoxicity mediated by scopolamine was seen in both IMR32 neuronal and C6 glioma cells. The upregulation of DNA damage-cH2AX and oxidative stress-ROS markers, as well as the reversal of down regulation of various neuronal cell markers such as NF-H (Neurofilament NF-H), MAP2 (Microtubule-associated protein), PSD-95 (Postsynaptic marker protein), and GAP-43 (Growth-associated protein), are all effects of scopolamine treatment. Ten, Konar, et al., 2011.

3. Methodology:

Acute toxicity study:

Procedure:

The acute toxicity study of Digitalis, Filipenducularia extract in albino rats, mice was performed as per Organization for Economic Cooperation and Development (OECD) guidelines (No 423). Both male and female albino rats weighing 130- 170g, Mice of weighing 20-30 gms were used.

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Rats were divided into the groups of 3 animals per group. A single dose study was conducted to determine the acute toxic of Digitalis, Filipenducularia extract as per OECD 423guideline Rats were fasted overnight prior to dosing with free access to water. After the fasting session, the rats were weighed and the extract of Digitalis, Filipenducularia was administered to 3 rats at a dose of 0.5 mg/kg and the animals were observed for mortality. In this study; no mortality was observed and higher doses of 50, 300, 2000 mg/kg were employed for further toxicity studies.

The rats were then observed for clinical signs, gross behavioral changes, morbidity and mortality. Animals were also observed for occurrence of clonic convulsion, tonic extension, muscle spasm and catatonia for 1 hour, 2 hours, 4 hours, 8 hours and 24 hours after administration of extracts. After observing mortalities and behavioral profile, the maximal safe dose for the study was noted. In accordance with the OECD guidelines the doses for the study were narrowed down. The results were shown in the table 2, table 3,table 4,table 5.

Table 2: Acute toxicity studies of Methanolic extract of the plants Digitalis purpurea (MEDP):

S.No	Treatment	Dose(mg/kg)	Sign of toxicity	On set of toxicity	Weight of Rats		Duration of study
					Before	After	
1	MEDP	2000	Nil	Nil	136	137	14 Days
2	MEDP	2000	Nil	Nil	145	145	14 Days
3	MEDP	2000	Nil	Nil	165	164	14 Days
4	MEDP	2000	Nil	Nil	149	150	14 Days
5	MEDP	2000	Nil	Nil	158	158	14 Days
6	MEDP	2000	Nil	Nil	162	162	14 Days

Table 3: Acute toxicity studies of Methanolic extract of the plant Filipenducularia(MEFC):

S.No	Treatment	Dose(mg/kg)	Sign of toxicity	On set of toxicity	Weight of Rats		Duration of study
					Before	After	
1	MEFC	2000	Nil	Nil	134	136	14 Days
2	MEFC	2000	Nil	Nil	143	146	14 Days
3	MEFC	2000	Nil	Nil	165	162	14 Days
4	MEFC	2000	Nil	Nil	149	148	14 Days
5	MEFC	2000	Nil	Nil	155	154	14 Days
6	MEFC	2000	Nil	Nil	160	161	14 Days

Table4: Acute toxicity studies of Methanolic extract of the plants Digitalis purpurea (MEDP):

S.No	Treatment	Dose(mg/kg)	Sign of toxicity	On set of toxicity	Weight of Mice		Duration of study
					Before	After	
1	MEDP	2000	Nil	Nil	36	35	14 Days
2	MEDP	2000	Nil	Nil	35	35	14 Days
3	MEDP	2000	Nil	Nil	25	26	14 Days

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4	MEDP	2000	Nil	Nil	29	28	14 Days
5	MEDP	2000	Nil	Nil	28	29	14 Days
6	MEDP	2000	Nil	Nil	32	31	14 Days

Table 5: Acute toxicity studies of Methanolic extract of the plant Filipenducularia(MEFC):

S.No	Treatment	Dose(mg/kg)	Sign of toxicity	On set of toxicity	Weight of Mice		Duration of study
					Before	After	
1	MEFC	2000	Nil	Nil	30	28	14 Days
2	MEFC	2000	Nil	Nil	25	27	14 Days
3	MEFC	2000	Nil	Nil	28	28	14 Days
4	MEFC	2000	Nil	Nil	35	36	14 Days
5	MEFC	2000	Nil	Nil	29	29	14 Days
6	MEFC	2000	Nil	Nil	30	30	14 Days

METHOD: SCOPOLAMINE-INDUCED AMNESIA

PRINCIPLE: Dementia (loss of memory) is one of the age related mental problem and charecteristic symptom of various neuro degenerative disorders including Alzheimer‟s disease. Certain drugs also interfere with memory processes. Drugs like diazepam, barbiturates and alcohol disrupt learning and memory in animals and man Similarly there are drugs particularly amphetamine that are known to enhance learning abilities. However, A new class of drugs known as Nootropic agents are now used specifically in situations where there is organic disorder in learning abilities. It is now well recognised that inhibition of cholinergic neurotransmission plays a predominent role is dementia. Scopolamine cholinergic muscarinic receptor anatagonist, is known to produce short term amnesia in humas and animals. The behavioural expession of amnesia is difficult to measure in animals. The amnesic drugs like scopolamine increase the latency of animals.

Animals:

Adult Albino Wistar rats (180 - 250 g) were used for the study. They were obtained from the animal house Sri Venkateswara College of Pharmacy, Chittoor the animals were maintained under standard laboratory conditions. The animals were maintained under normal laboratory condition and kept in standard polypropylene cages at room temperature of 30° and 60 to 65% relative humidity and a 12-h light: dark cycle the subjects of this experiment were conducted on adult Albino Wister rats (both sexes). The animals were housed in plastic and metal mesh home-cages) with ad libitum access to rodent pellets and water. The rats were then divided into four groups of five animals each.

Y-MAZE

Y-maze test is used to measure the spatial working through the spontaneous alternation of behaviour. The maze is made of black painted wood. Each arm is 40cm long, 13 cm high, 3 cm wide at bottom, 10 cm wide at heigh top and converges at an equal angle. Each mouse is placed

ISSN:0975-3583,0976-2833 VOL11, ISSUE04,2020

at the end of one arm and allowed to move freely through the maze during an 8 min session. Rats tend to explore the maze systematically, enetering each arm in turn. The ability to alternate requires that rats know which arm they have already visited. The series of arm enteries, including the possible returns into the same arm are recorded visually. Alternation is defined as the no on successive enteries into the three arms, an overlapping triplet sets. The percentage of alternation is calculated as the mice of actual alternations, defined as the total number of arm enteries minus two, and the multiplied by 100.

Procedure:

In the present study animals were divided into 3 groups each group comprise of 5 animals.

STANDARD: Treated with standard (400mg/kg i.p), was used as Nootropic agent and was injected for 8 days. After 60 minutes of the administration of the last dose (i.e on 8 day), the dementia inducing agent scopolamine (0.4mg/kg) was injected i.p. The alteration was measured after 24 hours for the duration of 8 mins by using Y-maze paradigm.

CONTROL: Served as the control the alteration was tested on 8hour.

TEST: Treated with Methanolic extract (400mg/kg) orally for 8 successive days. After 60 minutes of the adminstration of the last dose (i.e on 8scopolamine (0.4mg/kg) was injected i.p. The alteration was measured after 24 hours for duration of 8 mins by using Y maze paradigm.

The results were discussed in the table no 6, table 7, table 8, table 9

Table 6: Tranfer latency by using Y-MAZE of Methanolic extract of Digitalis purpurea(MEDP)in Rats :

S.No	Group	Transfer latency on last day treatment(sec)	Transfer latency after 24 hours by using YM
1	Standard	67.5 ± 1.705***	59.106 ± 1.267***
2	Test	26.17 ± 1.406***	23.32 ± 1.506***
3	Control	57.733 ± 3.010	45.20 ± 1.512

All values shown are mean ± SEM and n=5, Statistical significant test for comparison was done by ANOVA, followed by Dunnett‟s test.. ***P<0.001, **p<0.01, *P<0.05 Compared to control Group; Values expressed in seconds(sec,) YM-Y maze.

Table 7: Tranfer latency by using Y-MAZE of Methanolic extract of Digitalis purpurea(MEDP)in Mice :

S.No	Group	Transfer latency on last day treatment(sec)	Transfer latency after 24 hours by using YM
1	Standard	67.5 ± 1.705***	55.067 ± 1.627***
2	Test	25.27 ± 1.406***	22.12 ± 1.605***
3	Control	56.473 ± 3.010	41.20 ± 1.312

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All values shown are mean ± SEM and n=5, Statistical significant test for comparison was done by ANOVA, followed by Dunnett‟s test.. ***P<0.001, **p<0.01, *P<0.05 Compared to control Group; Values expressed in seconds(sec,) YM-Y maze.

Table 8: Tranfer latency by using Y-MAZE of Methanolic extract of Filipenducularia (MEFC)in Rats :

S.No	Group	Transfer latency on last day treatment(sec)	Transfer latency after 24 hours by using YM
1	Standard	65.5 ± 1.705 ***	54.106 ± 1.667 ***
2	Test	26.07 ± 1.006***	22.32 ± 1.416 ***
3	Control	54.377 ± 4.110	43.20 ± 1.412

All values shown are mean ± SEM and n=5, Statistical significant test for comparison was done by ANOVA, followed by Dunnett‟s test. ***P<0.001, **p<0.01, *P<0.05 Compared to control Group; Values expressed in seconds (sec,) YM-Y maze.

Table 9: Tranfer latency by using Y-MAZE of Methanolic extract of Filipenducularia (MEFC)in Mice :

S.No	Group	Transfer latency on last day treatment(sec)	Transfer latency after 24 hours by using YM
1	Standard	67.5 ± 1.705 ***	59.106 ± 1.267 ***
2	Test	26.17 ± 1.406***	23.32 ± 1.506 ***
3	Control	57.733 ± 3.010	45.20 ± 1.512

All values shown are mean ± SEM and n=5, Statistical significant test for comparison was done by ANOVA, followed by Dunnett‟s test. ***P<0.001, **p<0.01, *P<0.05 Compared to control Group; Values expressed in seconds (sec,) YM-Y maze.

ELEVATED PLUS MAZE [EPM]

The elevated plus maze of mice consists of two open arms (16x5cm) and the two covered arms (16x5x12cm) extended from the central platform (5x5 cm and the maze was elevated to a height of 25cm from the floor. On the first day (i.e. 8 treatment), each rat was placed at the end of an open arm, facing away from the central platform. Transfer latency (TL) was defined as the time (in seconds) taken by the animal to move from the open arm into one of the covered arms with all its four legs. TL was recorded on the first day (training session) for each animal. The mouse was allowed to explore the maze for another 2 minutes and then returned to its home cage. Retention of this learned task (memory) was examined 24 hours after last dose.

Experimental Design and Procedure: In the present study the animals were divided into 3 groups. Each group of 5 animals.

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STANDARD: Served as the standard, Treated with Scopolamine (0.4 mg/kg) was inject day and retention was measured after 24 hours (on 9 elevated plus-maze.

CONTROL:
Served as control. Tansfer latency was tested on the 8 hours (on 9 elevated plus-maze.
TEST:
Treated with Methanolic Extract (400 mg/kg) orally for eight successive days. After 60 minutes of the administration of the last dose (i.e.on 8th day), the dementia inducing agent scopolamine (0.4mg/kg) was injected i.p. The animals were exposed to the training session after 45 minutes and the retention was measured after 24 hours by using elevated plus maze.

The results were shown in the table no 10, table11, table 12, table 13

Table 10: Transfer latency (Last day treatment and after 24 hrs) by using elevated plus maze of Methanolic extract of Digitalis purpurea(MEDP) in Rats :

S.No	Group	Transfer latency on last day treatment(sec)	Transfer latency after 24 hours by using EPM
1	Standard	66.5 ± 1.708***	57.166 ± 1.167***
2	Test	28.33 ± 1.701***	27.66 ± 1.705***
3	Control	60.833 ± 2.810	50.33 ± 1.308

All values shown are mean ± SEM and n=5, Statistical significant test for comparison was done by ANOVA, followed by Dunnett‟s test.. ***P<0.001, **p<0.01, *P<0.05 Compared to control Group; Values expressed in seconds(sec,) EPM-Elevated plus maze.

Table11: Transfer latency(last day treatment and After 24 hrs) by using elevated plus maze of Methanolic extract of Filipenducularia (MEFC) in Rats :

S.No	Group	Transfer latency on last day treatment(sec)	Transfer latency after 24 hours by using EPM
1	Standard	67.5 ± 1.705***	56.166 ± 1.167***
2	Test	26.33 ± 1.601***	26.12 ± 1.605***
3	Control	59.833 ± 3.810	51.33 ± 1.312

All values shown are mean ± SEM and n=5, Statistical significant test for comparison was done by ANOVA, followed by Dunnett‟s test.. ***P<0.001, **p<0.01, *P<0.05 Compared to control Group; Values expressed in seconds(sec,) EPM-Elevated plus maze.

Table12: Transfer latency(Last day treatment and after 24 hrs) by using elevated plus maze of Methanolic extract of Digitalis purpurea(MEDP) in Mice :

S.No	Group	Transfer latency on last day treatment(sec)	Transfer latency after 24 hours by using EPM
1	Standard	66.5 ± 1.708***	57.166 ± 1.167***
2	Test	26.33 ± 1.701***	25.66 ± 1.705***
3	Control	60.833 ± 2.810	50.33 ± 1.308

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All values shown are mean ± SEM and n=5, Statistical significant test for comparison was done by ANOVA, followed by Dunnett‟s test.. ***P<0.001, **p<0.01, *P<0.05 Compared to control Group; Values expressed in seconds(sec,) EPM-Elevated plus maze.

Table13: Transfer latency(last day treatment and After 24 hrs) by using elevated plus maze of Methanolic extract of Filipenducularia (MEFC)in Mice:

S.No	Group	Transfer latency on last day treatment(sec)	Transfer latency after 24 hours by using EPM
1	Standard	67.5 ± 1.705***	56.166 ± 1.167***
2	Test	25.27 ± 1.601***	24.32 ± 1.605***
3	Control	59.733 ± 3.810	44.33 ± 1.312

All values shown are mean ± SEM and n=5, Statistical significant test for comparison was done by ANOVA, followed by Dunnett‟s test.. ***P<0.001, **p<0.01, *P<0.05 Compared to control Group; Values expressed in seconds(sec,) EPM-Elevated plus maze.

HEBB-WILLIAMS MAZE [HWM]

It is a incentive based ext;eroceptive behavioral model useful for measuring spatial working memory of rodents. HWM consists of mainly three components, (I)Animal(Rat) chamber (or) start box, which is attached to (II) different chamber and (III) a reward chamber at the other end of the maze in which reward (food) is kept. Time taken by the animal to reach reward chamber (TRC) was recorded in 24 hour for the animals of all the groups. On the first day (i.e 15 was placed in the animal chamber and the door was opened to facilitate the entry of animal into the next chamber. The door of the start box was closed immediately after the animals moved into the next chamber so as to prevent back entry. Time taken by the animal to reach the reward chamber (TRC) from first box on 1 reflected the learning index. Each animal was allowed to explore the maze for 3mins with all doors opened before returning to home cage. Retention (memory score) of this learned task was examined 24 hours after the first day trail. Significant reduction in TRC value indicated improvement of memory [77].

Procedure:

In the present study the animals were divided into 3 groups. Each group comprised of 5 animals.

STANDARD:

Treated with standard substance (400mg/kg i.p) for 15days. The dementia inducing agent scopolamine (0.4mg/kg i.p), alternatively for 10 days. TRC (learning scores) was tested by using HEBB-WILLIAM maze.

CONTROL:

Served as the control. TRC (learning scores) was tested by using HEBB-WILLIAM maze.

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TEST: Treated with Methanolic extract (100mg/kg), orally for 15days. The dementia inducing agent scopolamine (0.4mg/kg), alternatively for 10 days. TRC (Learning score) was tested by using HEBB-WILLIAM maze.
The results were shown in the table no 14,table 15,table 16,table 17.

Table14: Spatial working memory by using hebb-williams maze of Methanolic extract of Digitalis purpurea(MEDP) in Rats:

S.No	DAYS	STANDARD	CONTROL	TEST
1	1ST DAY	70.83 ± 1.302	55.83 ± 1.376	65.33 ± 1.333
2	2ND DAY	66.50 ± 1.057	49.33 ± 1.308	60.66 ± 0.666
3	3RD DAY	61.83 ± 0.833	45.33 ± 1.116	56.33 ± 1.282
4	LAST DAY	78.50 ± 2.643	60.3 ± 1.430	76.16 ± 2.400

All values shown are mean ± SEM and n=5 Statistical significant test for comparison was done by ANOVA, followed by Dunnett‟s test, ***P<0.001, **p<0.01, *P<0.05 Compared to Control Group.

Table15: Spatial working memory by using hebb-williams maze of Methanolic extract of Digitalis purpurea(MEDP) in Mice:

S.No	DAYS	STANDARD	CONTROL	TEST
1	1ST DAY	70.83 ± 1.302	53.83 ± 1.206	62.33 ± 1.333
2	2ND DAY	66.50 ± 1.057	47.13 ± 1.118	61.66 ± 0.666
3	3RD DAY	61.83 ± 0.833	45.33 ± 1.096	54.33 ± 1.282
4	LAST DAY	78.50 ± 2.643	55.3 ± 1.340	74.16 ± 2.400

All values shown are mean ± SEM and n=5 Statistical significant test for comparison was done by ANOVA, followed by Dunnett‟s test, ***P<0.001, **p<0.01, *P<0.05 Compared to Control Group.

Table16: Spatial working memory by using hebb-williams maze of Methanolic extract of Filipenducularia (MEFC) in Rats:

S.No	DAYS	STANDARD	CONTROL	TEST
1	1ST DAY	70.83 ± 1.302	59.53 ± 1.106	61.33 ± 1.053
2	2ND DAY	66.50 ± 1.057	49.13 ± 1.018	59.06 ± 0.124
3	3RD DAY	61.83 ± 0.833	51.33 ± 1.006	51.33 ± 1.182
4	LAST DAY	78.50 ± 2.643	53.3 ± 1.340	72.16 ± 2.400

All values shown are mean ± SEM and n=5 Statistical significant test for comparison was done by ANOVA, followed by Dunnett‟s test, ***P<0.001, **p<0.01, *P<0.05 Compared to Control Group.

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Table17: Spatial working memory by using hebb-williams maze of Methanolic extract of Filipenducularia (MEFC) in Mice:

S.No	DAYS	STANDARD	CONTROL	TEST
1	1ST DAY	70.83 ± 1.302	55.83 ± 1.206	60.33 ± 1.323
2	2ND DAY	66.50 ± 1.057	48.13 ± 1.118	62.66 ± 0.506
3	3RD DAY	61.83 ± 0.833	48.33 ± 1.096	53.33 ± 1.112
4	LAST DAY	78.50 ± 2.643	53.3 ± 1.340	70.16 ± 2.400

All values shown are mean ± SEM and n=5 Statistical significant test for comparison was done by ANOVA, followed by Dunnett‟s test, ***P<0.001, **p<0.01, *P<0.05 Compared to Control Group.

4. Conclusion

Based on literature survey collection of plant materials has done. The processes of plant identification and authentication have done by Botanist. The collected plants have shade dried completely, and coarsely powdered by using mixer. Extraction of plant material was carried out by using Soxlet apparatus then the product was obtained by hot percolation methodand they are subjected to different phytochemical screening methods identify the presence of basic chemical constituents. Separation of plant extract was done by using Column and TLC chromatography. Screening model for the study has been selected. This study, I hoped that these extracts may produce more effective, efficient and potent application for anti-dementia effect.

5. Acknowledgement

The author Mr. K. Hari Kumar thanks the University Grants Commission, Minor Research Project Scheme, Government of India, New Delhi (F.No. 4-4/2015-16 /MRP/UGC-SERO/P.No.2067, Link No.6801 dated 04.12.2017) for its financial support. The authors also thank the Management and Principal of Sri Venkateswara College of Pharmacy for providing facilities towards successful completion of this project.

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