



Bharath

INSTITUTE OF HIGHER EDUCATION AND RESEARCH

(Declared as Deemed-to-be University under section 3 of UGC Act, 1956)
(Vide Notification No. F.9-5/2000 - U.3, Ministry of Human Resource Development, Govt. of India, dated 4th July 2002)



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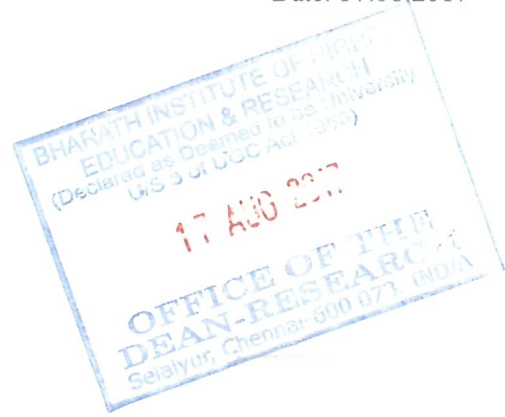
173, Agaram Road, Selaiyur, Tambaram,
Chennai - 600 073. Tamil Nadu.

Ref. No.SMS-2015-O-03

Date: 17.08.2017

TO

Mr. R. Vijaykumar
Professor/Physiology
BIHER.



Thro: Concern Head of the Department

Greetings!!!

We are happy to announce that the Research Advisory Committee has approved your proposal for Seed Money Scheme-2015 which was presented by you. You are requested to complete the proposal and send the progress report to the Dean Research in the prescribed time period.

Title of the Project: Effect of Saraswatarishta on sleep deprivation induced behavioral changes in mice

Seed Money Amount: Rs.1, 00,000/- (Rupees One Lakh Only)

Approved on: 02.08.2017

Payment details:

Voucher No.38

Dated: 30.08.2017

With Regards


Dean-Research

Bharath University

SELAIYUR, CHENNAI - 600 073, TAMIL NADU, INDIA.

CASH / PAYMENT VOUCHER

Date 20/08/2017

V.No. 58

Debit _____ Amount _____

Rs.

PAID TO Dr. R. Vijay Kumar

RUPEES One Lakh Only

TOWARDS Good Money Scheme - 2015



[Signature]

Authorised by

Finance Manager

Cashier/Accountant



Payee's Signature

PROPOSAL SUBMISSION

1. Details of Principal Investigator

Name : Dr.R.Vijayakumar
Designation : Professor
Highest Qualifications : Ph.D.
Department : Physiology
E-mail : sivanviji@gmail.com
Contact no : 9445383846
Date of Joining : 2.1.2012

2. Details of Co-Principal Investigator

Name : Dr. V. Deepika
Designation : Associate Professor
Highest Qualifications : Ph.D.
Department : Physiology
E-mail : deepy843@gmail.com
Contact No : 9962279360
Date of Joining : 27.07.2013

Technical details

1. Introduction:

Sleep is a normal human function that is detrimental to sustaining life yet; individuals are affected differently by their sleep schedule. Sleep deprivation (SD) is a significant problem in humans. It is considered to be a risk factor that contributes to various diseases. It has been proposed that reactive oxygen species and the resulting oxidative stress may be responsible for some of the effects of SD. [1] The sleep occupies approximately one-third of a person's lifetime. SD seems to disturb the vital biological processes necessary for cognitive function and physical health, yet the ways in which the body is compromised are not fully understood. SD caused various behavioral disturbances involving motor activity, anxiety level, memory and metabolic functions related to anabolic hormones, body weight, 7619 and so on. There is pressure in modern society to carry out an increasing variety of complicated activities during wakefulness. The expectation that these activities which are to be achieved tends to push sleep. This result in impaired concentration, altered behavior, reduced the quality of life, inability to enjoy, and complete the routine activities.[2] In Ayurveda, formulations containing multiple herbals and herbomineral ingredients are often used for many different conditions. One such multi-ingredient plant-based herbomineral formulation is Saraswatarishta (SA).” It consists of 18 plants. Some of which include Ashwagandha, Brahmi, and Shatavari which are Medhya rasayanas. Medhya rasayanas are used to improve memory and cognitive deficits. SA is claimed to be useful to treat acute anxiety, fatigue, insomnia, partial loss of memory, low grasping power, slurred speech, etc.[3-7] In view of the central nervous system effects of SA described in Ayurveda, the present study was planned to study the effect of SA on behavioral changes induced by SD.

2. Review of status of Research and Development in the subject

Adams SM, Miller KE, Zylstra RG. Pharmacologic Management of Adult Depression. *Am Fam Physician* 2008; 77:785-92.

Several different pharmacologic classes of medications are used to treat depression. Oldest agents are tricyclic antidepressants (TCAs), monoamine oxidase inhibitors (MAOIs) and the newer agents include selective serotonin reuptake inhibitors (SSRIs) and selective norepinephrine reuptake inhibitors (SNRIs). Although both TCAs and MAOIs are effective, their use is limited, primarily because of adverse effects. TCAs are associated with cardiac, anticholinergic, sedative and hypotensive side effects, as well as there is potential for severe toxicity with overdose. MAOIs require adherence to dietary restrictions. Newer agents, SSRIs are also associated with side effects like somnolence, sexual dysfunction, diarrhea and weight gain.[3] Only one-third of depressed patients who are treated with a single antidepressant achieve remission (i.e., complete resolution of symptoms).[4] Although the currently prescribed drugs provide some improvement in clinical condition of patients, it is at the cost of having to bear the burden of their adverse effects.

2.1. International Status:

Ashwagandha, Brahmi and Shatavari which are Medhyarasayanas. Medhyarasayanas are used to improve memory and cognitive deficits. Saraswatarishta is claimed to be useful to treat acute anxiety, fatigue, insomnia, partial loss of memory, low grasping power, slurred speech etc. In view of the central nervous system effects of Saraswatarishta described in Ayurveda, it was of interest to study whether it has antidepressant potential.

2.2. National Status:

NIL

3. Progress/ achievement so far, if any

- a). Reference papers was collected.
- b). Literature survey was studied.
- c). Materials and methods were designed.

4. Work plan

4.1 Methodology

The study was done in the Department of Physiology, Sri Lakshmi Narayana Medical College and Research Institute. Animal Ethical Clearance was obtained from CPCSEA. The mice were adapted 7 days before the experiment with access to food and water ad libitum. Thirty-six male Swiss albino mice weighing 15–30 g was used for the study. The animals were divided into three groups, Group I – control-(6), Group II – sleepdeprived group, and Group III – SA treated sleepdeprived group. SD Technique (Flower Pot Technique) The mice were deprived sleep for 96 h using a small platform (3 cm) by flower pot technique.[8] They were placed on top of an upside-down flower pot which was placed in a bucket filled with water up to 1 cm. When the mouse entered into sleep, it lost its muscle tone and fall off the flowerpot into the water, then climb back up and awake from sleep. Control group mice were kept on a large platform (6 cms) in the same environment where SD was performed. The animals were provided with food and water throughout the experiment.

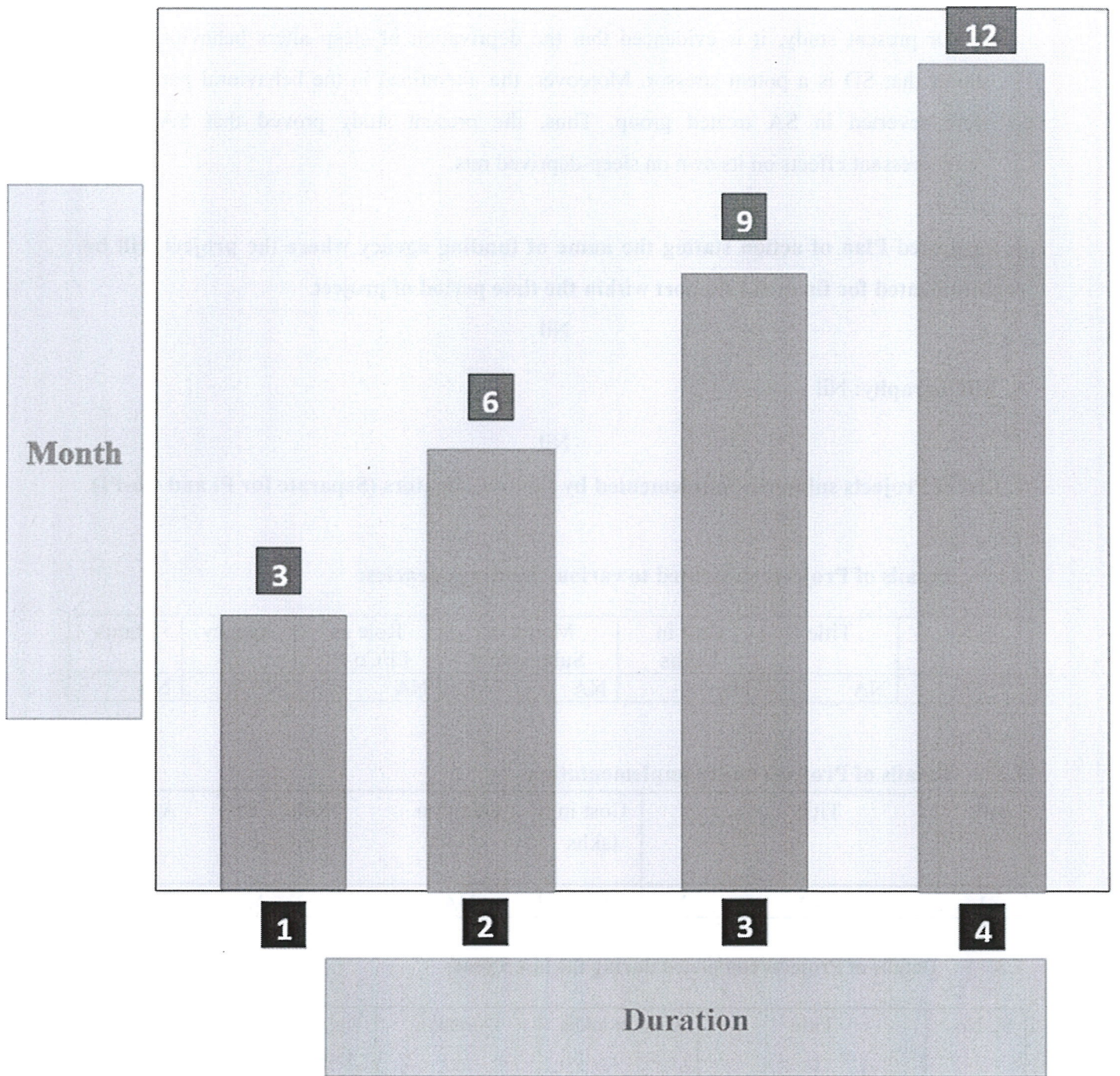
Drug SA was purchased (IMCOPS) and stored at room temperature throughout the experiment. SA was administered orally in the dose of 1.8 mL/kg/day for 15 days. Ingredients of SA are Bacopa monnieri, Asparagus racemosus, Pueraria tuberosa, Terminalia chebula, Zingiber officinale, Anethum sowa, Operculina ipomoea, Piper longum, Syzygium aromaticum, Acorus calamus, Saussurea lappa, Withania somnifera, Terminalia belerica, Tinospora cordifolia, Elettaria cardmomum, Embelia ribes,

Cinamomum zelonica, and pure gold.[9] Behavioral Analysis Behavioral analysis was performed using open field test and elevated plus maze, according to Brown et al. [10] and Espejo.[11] Open Field Test Mice were placed into the center or one of the four corners of the open field apparatus and allowed to explore the apparatus for 3 min. The behaviors

scored using an open field test are: (1) Peripheral square entries, (2) center square entries, (3) rearing, (4) grooming, and (5) immobilization time of the animal.[12] Elevated Plus Maze Test The animal was left in the open arm and the time is taken for it to enter the closed arm 1. Transfer latency was measured first. Then, the time spent in the open arm (2), time spent in the closed arm (3), and the number of crossings (4) were also measured. The test duration in elevated plus maze is 5 min. [13]

4.2 Time Schedule of activities giving milestones through BAR diagram. (Maximum of 1/2 pages)

S. No	Activity/ mile stolen	1 st Year			
1	Literature review	1-3 month			
2	Analysis of existing work	-	4-6 month		
3	Designing & work initiated	-	-	7-9 month	
4	Statistics & Discussion with results	-	-	-	10-12 month



4.3 Expected outcome within the time period of See Money Scheme

In our present study, it is evidenced that the deprivation of sleep alters behavior, which shows that SD is a potent stressor. Moreover, the alterations in the behavioral parameters were reverted in SA treated group. Thus, the present study proved that SA exerts antidepressant effects on its own on sleep-deprived rats.

5. Suggested Plan of action stating the name of funding agency where the project will be communicated for financial support within the time period of project.

Nil

6. Bibliography: Nil

Nil

7. List of Projects submitted/implemented by the Investigators (Separate for Pi and Co-PI)

7.1 Details of Projects submitted to various funding agencies:

S.No	Title	Cost in Lakhs	Month of Submission	Role as PI/Co-PI	Agency	Status
1	NA	NA	NA	NA	NA	NA

7.2 Details of Projects under implementation

Sl. No.	Title	Cost in lakhs	Duration	Role as PI/ Co-PI	Agency
1	NA	NA	NA	NA	NA

7.3 Details of Projects completed during the last 5 years

Sl. No.	Title	Cost in lakhs	Duration	Role as PI/ Co-PI	Agency
1	NA	NA	NA	NA	NA

8. List of publications published by the Investigators, if any:

a) Principal Investigator

S. No	Author names	Title of paper	Name of Journal	Vol (Issue)	Page No.	Year
1.	Velusami Deepika 1,2, Raman Vijayakumar ³	Impact of Body Mass Index on Arterial Stiffness in Young Prehypertensives: A Cross Sectional Study	Journal of Research in Health Sciences	18(1): e00402	1-6	2018
2.	Deepika.V1, R.R.Vijaya Kumar ^{2*} , S. Latha Vijaya Kumar ³ And Dr.R.Srikumar ⁴	Impact of body mass index on corrected QT Interval in prehypertensives	International Journal of Pharma and Bio Sciences	8(1): (B)	266 - 270	2017
3.	S Latha, R Vijaya Kumar, BR Senthil Kumar, G Bupesh, TSV Kumar	Acute and repeated oral toxicity of antidiabetic polyherbal formulation flax seed, Fenugreek and Jamun seeds in Wistar albino rat	Journal of Diabetes & Metabolism	7(3)	1-7	2016
4.	Vijaya kumar R, Kishor Kumar.C, Christy A, Sasikala C.	Prevalence of Prehypertension among school students in Puducherry	Research Journal of Pharmaceutical, Biological and Chemical Sciences	6(1)	631-637	2015

b). Co- Principal Investigator

S. No	Author names	Title of paper	Name of Journal	Vol (Issue)	Page No.	Year
1.	Deepika Veluswami, B Ambigai Meena, S Latha, I Gayathri Fathima, K Soundariya, K Senthamil Selvi	A study on prevalence of phenyl thiocarbamide (PTC) taste blindness among obese individuals	Journal of clinical and diagnostic research: JCDR	9(5)	CC04	2015
2.	SP Venkatesh, K Soundariya, V Deepika	A study on attitude of medical students towards learning of communication skills	J of Evolution of Med and Dent Sci	3(27)	7567-7573	2014

9. Budget

SI. No	Head	Amount (Rs.)
1	BP Apparatus, Stethoscopes, Body weight weighing machine, SPSS version 16 Chicago, IL, USA, ECG machine	45000
2	Consumables (gels bottles, cotton, sprit, testing charges, tools, etc.)	10000
3	Travel support for the purpose of research work.	10000
4	Contingency	25000
5	Others consumables	10000
	Total	1,00,000

*In case of any joint proposal for purchasing a same equipment, each of the associated PLs is also required to give separate budget (without any clubbing) to avoid any ambiguity, if all the associated projects are not awarded by committee.

10. Name of at least two subject experts from the Institute and one from the outside Institute with their contact details:

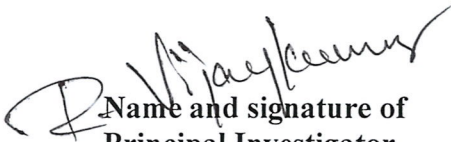
1. Dr. R. Ravindran, Professor in Physiology IBMS, Chennai Mobile No: 9444145990 E-mail id: ravindran89@gmail.com	2. Dr. Vasuki, Associate Professor in Physiology, Priyadharshini Dental College, Thiruvallur Mobile No: 9443793114 E-mail id: vasukiphysio@gmail.com
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CERTIFICATE FROM THE INVESTIGATOR

Project Title: Effect of Saraswatarishta on sleep deprivation induced behavioral changes in mice

It is certified that


1. I do hereby agree to submit a complete proposal for financial support to the external funding agency within the time period of SMS-2015.
2. I undertake that spare time on equipment procured in the project will be made available to other users.
3. I agree to submit a certificate from Institutional Biosafety Committee, if the project involves the utilization of genetically engineered organisms. I also declare that while conducting experiments, the Biosafety Guidelines of Department of Biotechnology, Department of Health Research, GOI would be followed in to.
4. I agree to submit ethical clearance certificate from the concerned ethical committee, if the project involved field trails/experiments/exchange of specimens, human & animal materials etc.
5. I agree to abide by the terms and conditions of SMS-2015, BIHER, and Chennai.


Name and signature of
Principal Investigator


Name and signature of
Co-Principal Investigator

Date: 19.07.2017

Place: Pondicherry

Forwarded by Head of the Department 

Signature of the Head


DEAN
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSUDU, AGARAM VILLAGE,
KODAPAKKAM POST,
PUDUCHERRY - 605 502

PROJECT EVALUATION FORMAT

Recommendation sheet

Name of the Principal Investigator	Dr.R.Vijayakumar
Name of the Principal Investigator	Dr. V. Deepika
Name of the Department	Physiology
Title of project	Effect of Saraswatarishta on sleep deprivation induced behavioral changes in mice
Recommendation of the evaluation committee (Recommended/Revision/Not Recommended)	Recommended
Financial allocation recommended	Rs. 1,00,000/-

SI. No.	Head	Amount
1	BP Apparatus, Stethoscopes, Body weight weighing machine, SPSS version 16 Chicago, IL, USA, ECG machine	45000
2	Consumables- Gel bottles, cotton, sprit, testing charges, tools, etc.	10000
3	Travel support for the purpose of research work.	10000
4	Contingency	25000
5	Other's consumables	10000
	Total	1,00,000

Name and Signature of the Research Advisory Committee members with date.



[Signature]
Dr. G. Jayalakshmi