Cognitive Enhancement Activity of Herbo mineral Formulation *Thanga Uram (*Stannic Sulphidum*).*

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Abstract

Background: Siddha is medicine of ancient Tamils/Dravidians of peninsular South India. This system has enormous pharmacopoeia containing herbal, animal and mineral products. **Objective**: To evaluate the memory enhancement activity of *THANGA URAM (Stannic sulphidum) in Wister* albino rats by Diazepam induced method. **Material and methods**: The animals were randomly selected and divided into five groups (I, II, III, IV and V) of six rats(n=6) each. Individual identification of the animal was made by marking. Group I animals served as control and received only honey, p.o. for 7 days. *Group II* served as standard drug was treated with Piracitam (200mg/kg/day) i.p once a day, for 7days. Experimental group's splits into group III and IV served as the treated groups and received TU which was grounded in mortar-pestle with honey. *Group III* was treated with 23mg/kg of TU orally once for 7days. *Group* IV was treated with 46mg/kg of TU orally once for7days. **Results**: Time taken to reach the reward chamber (TRC) on the eighth day (24h after last dose) reflected the memory of animals. Significant reduction in TRC value indicated enhancement in memory. TU with honey (23mg/kg, p.o.) did not show any significant effect on TRC compared with the control group of young rats.

Keywords: *Thangauram (Stannic sulphidum)*, Cognitive, Siddha, Piracetam, Memory

Introduction

Siddha System of Medicine is a complete reputed medical system that has been practiced in India. Its origin dates back to BC 10,000 to BC 4,000[1] the name Siddha medicine owes its origin to medicinal ideas and practices of a class of Tamil sages called the Siddha's- "Perfected" or "Holy immortals who are still believed to have superhuman powers. Siddha medicine is the only medicine which bestows longevity. The word Siddha comes from the word 'Siddhi' which means an object to attain perfection or heavenly bliss.Dementia is a syndrome of onset and continuing decrease of higher cognitive functioning. It is a common disorder in older persons which becomes more prevalent in each decade of life. Generally, 10% of adults 65 years and older and 50% of adults older than 90 years have dementia. The most common cause of dementia is Alzheimer disease, which is a progressive neurodegenerative disorder associated with loss of neurons in definite brain areas. The central cholinergic pathways play aim portentrole in memory processes. Structurally acting ant muscarinic drugs (e.g., scopolamine) impair memory in animals and human beings. At present the allopathic system of medicine mainly relies on nootropic agents such as piracetam, aniracetam, fosracetam, nefiracetam and so forth, and anticholinesterases such as donepezil, metrifonate and so forth (Ringman&Cummings*Thangauram (Stannic sulphidum)* is one of the Herbo mineral formulation mentioned in classical siddha text *GunapadamThathu Jeeva Vaguppu* indicated particularly for all male and female urogenital (jananaurupugal) diseases. It also used to treat

naatpattavellai (chronic leucorrhoea) and megam (venereal diseases) [2]. It also improves appetite, memory power and strengthens the body. It also improves permatogenesis [6] [7].

Materials and Methods

Table 1. Ingredients of the test drug:

S.No	Vernacular name	Scientific name	Quantity Required
1.	Purified *Navacharam*	Ammonium chloridum	35 gms
2.	Purified *Velvangam*	Stannum	35 gms
3.	Purified *Kandhagam*	Sulphur	35 gms
4.	Purified *Rasam*	Hydragyrum	35 gms
5.	*Vediuppu thiraavagam*	-	Quantity sufficient

Method of preparation [3].

Purified *Navacharam* (Chloride of aluminum), Purified *Velvangam* (stannum), Purified *Kandhagam* (Sulphur), and Purified *Rasam* (mercury) are taken in equal quantities and titurated with vediuppu thiravagam upto mezhugu (wax) consistency. They are then placed in glass container and sealed with mud packed cloth and burnt in valuga appliance for 25 hours and the appliance is left undisturbed to get cooled. Now the prepared medicine shines like gold particles and abragam [8][9]

Procurement and rearing of experimental animal:

Male adult wistar rats weighing 180-210 gms were used for this study. The inbred animals were procured from the animal house of TANUVAS, Madhavaram, Chennai and the study was conducted at National Institute of Siddha, Chennai, India. They were housed six per cage under standard laboratory conditions at a room temperature at 22 ± 2^0 C. The animals were subjected under standard photoperiodic condition of 12:12 hrslight: dark cycle. The animals were fed with standard rodent pellet procured from Sai meera foods Pvt Ltd, Bangalore and water ad libitum. Animals were acclimatized to laboratory conditions one week prior to initiation of experiments. The protocol for experimentation was approved by Institutional Animal Ethics Committee (IAEC Approval No: NIS/IAEC- VII/28/08/2018/03) of National Institute of siddha, Chennai, India [10][11][12]

Table 2. Animal grouping and interventions:

Groups	Intervention	No of Rats
Group I- Vehicle control	Honey	6
Group II – Standard drug	*Piracetam 200mg/kg*	6
Group III– Treatment	TU (23mg / kg / day) with honey	6
Group IV – Treatment	TU (46mg / kg / day) with honey	6

Animal grouping and interventions:

The animals were randomly selected and divided into five groups (I, II, III, IV and V) of six rats(n=6) each. Authentication of each the animal. Group I animals served as control and received only honey, p.o. for 7 days. *Group*

II served as standard drug was treated with Piracitam (200mg/kg/day) i.p once a day, for 7days. Experimental group's splits into group III and IV served as the treated groups and received TU which was grounded in mortar-pestle with honey. *Group III* was treated with 23mg/kg of TU orally once for 7days.*Group* IV was treated with 46mg/kg of TU orally once for 7days [13][14][15]

Drug treatment:

In the current investigation, the rats were divided into 5 different groups for employing various interceptive and exteroceptive memory models. Each group included a minimum of 6 animals. TU with honey (23, 46mg/kg) was administered orally for 7 successive days to young rats. 90 minutes after the administration of the last dose (on the 7th day), rats were exposed to the training session using HebbWilliams maze. Maintenance (memory) was recorded after 24h (on the 8thday).

The retention (memory) was measured after 24h (on the eighth day). Piracetam (200mg/kg, i.p.) was used as determinate nootropic agent and was injected for 7 days to positive control groups. All control group animals received vehicle (honey) for 7 consecutive days [16]

Hebb-Wizlliams maze:

Hebb-Williams maze is a motivation-based exteroceptive behavioral model useful for measuring spatial working memory of rats [4]. It mainly contains of three components: animal chamber (or start box), which is attached to the middle chamber (or exploratory area), and a reward chamber at the other end of the maze in which the honour (food) is kept. All three components are supplied with guillotine detachable doors. On the first day (i.e., seventh day of drug treatment), the rat was placed in the animal chamber or start box and the door was opened to affluencethe entry of the animal into the next chamber. The door of the start box was closed instantly after the animal moved into the next chamber to prevent back-entry. Time taken by the animal to reach the reward chamber from the start box was documented on the first day (training session) for each animal. Each animal was allowed to explore the maze for 3min with all the doors opened before reinstate to its home cage. Maintenance of this learned task (memory) was examined 24h after the first day trial (i.e., eighth day, 24h after last dose)[5].

Result and Discussion:

The pharmacological study explains about the methodology of cognitive enhancement Activity of trail medicine in animal model viz., Wistar albino rats. These results and discussion give the necessary justifications to prove the potency of the drug.

Table 3. Effect of *Thanga uram* on cognitive enhancement activity:

Groups	Intervention	TRC
Group I (Vehicle Control)	Honey	50.83± 27.46
Group II (Treatment Group-1)	TU (23mg / kg / day) with honey	35.16 ±17.66
Group III (Treatment Group-2)	TU (46mg / kg b.w / day) with Honey	25.83 ±12.20
Group IV (Standard drug)	Piracetam 200mg/kg	19.16± 8.56

Values are expressed as mean ± SEM; n=6; *followed by Dunnett test.*

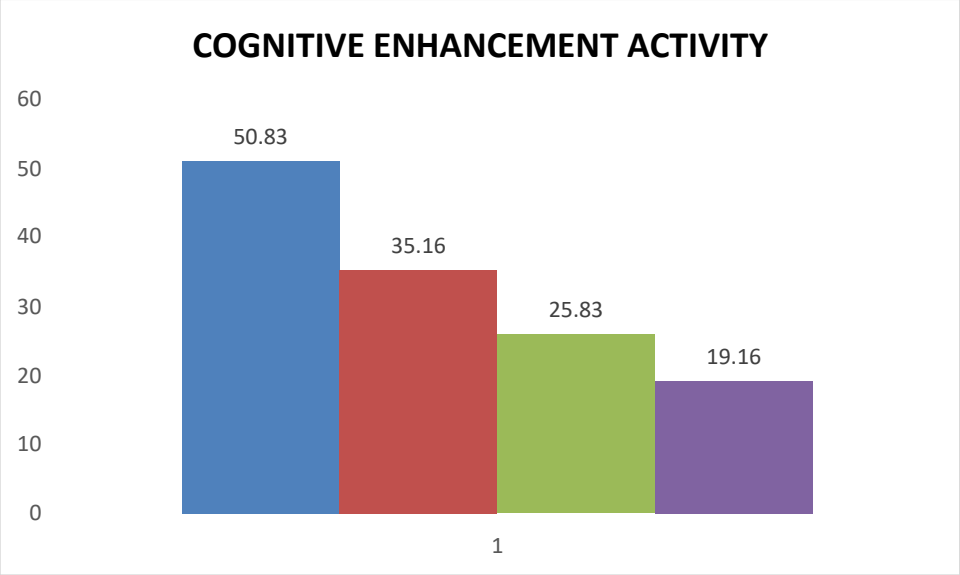

Fig. 1: Effect of Thanga uram (Stannic sulphidum) on cognitive enhancement

Effect on time taken to reach reward chamber (using Hebb-Williams maze): Time taken to reach the reward chamber (TRC) on the eighth day (24h after last dose) reflected the memory of animals. Significant decreased in TRC value indicated development in memory. Thang uram *(Stannic sulphidum)* with honey (23mg/kg, p.o.) did not show any significant effect on TRC compared with the control group of young rats. On the other hand, the higher doses of 46mg/kg TU with honey administered orally in young rats for 7 days markedly reduced TRC compared with the respective control groups. The groups of rats that were treated with piracetam (200mg/kg, i.p.) for 7 successive days showed improvement in memory of youngrats.

Memory refers to the storage, retention, and recall of details including past experiences, knowledge, and thoughts. Drugs that increased acquisition and recall of associative memory represent important goals in the therapy of cognitive disorders. In the current study, Thanga*uram* ***(****Stannic sulphidum****)***. Administered orally for 7 days developed the memory of rats as reflected by diminished TL and TRC values compared with those of control animals. Furthermore, pretreatment with TPE for 7 days protected the animals from memory deficits influence by intraperitoneal injection of scopolamine or diazepam, in addition to ageing-induced amnesia (a natural process). Piracetam, the established nootropic agent, was used as a quality drug.

Conclusion:

Present study the author concludes that the drug *Thanga uram (Stannic sulphidum)* is significant effect in cognitive enhancement activity. This conclusion gives a complied form of the study and explains the synergistic effect of all the key ingredients and activities that supports the study. It is concluded that the *Thanga uram (Stannic sulphidum)* can be used in the treatment of enhance cognition.

Acknowledgments:

Authors wish to express their gratitude to Director, National Institute of Siddha for the support.

Conflicts of Interest:

Authors declare that they have no conflicts of interest.

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