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SCIENTIFIC EVALUATION OF THE ANTIDEPRESSANT ACTIVITY OF MAANTHA KUDINEER: AN IN VIVO STUDY

Dr. R. Thirumalaikumari*[1], Dr. C. Shanmugapriya, MD(S)[2], Dr. A. Satheesh Kumar, MD(S)[3]

[1]PG Scholar, [2]Guide, Head of the Department, [3]Lecturer

Department of PG Kuzhanthai Maruthuvam, Government Siddha Medical College, Chennai-106.

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***Corresponding Author**

Dr. R. Thirumalaikumari

Department of PG Kuzhanthai Maruthuvam, Government Siddha Medical College, Chennai-106.

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ABSTRACT

The *Siddha* system of medicine, widely practiced in Southern India, encompasses several herbal formulations for the management of mental and neurological disorders. *Maanthakudineer*is a traditional *Siddha* formulation indicated for conditions associated with *Vali* (*Vatham*) imbalance, which governs neurological and psychological functions. The present study evaluates the antidepressant activity of *Maanthakudineer*using the Forced Swim Test (FST) model in mice. The formulation was administered orally at a dose of 400 mg/kg for seven consecutive days. Depression-like behavior was assessed by measuring immobility and swimming time. The results demonstrated a reduction in immobility time and an increase in active swimming behavior in the treated group, indicating significant antidepressant-like activity. From a *Siddha* perspective, the observed effects may be attributed to normalization of *Vatha* imbalance and central nervous system modulation. Although autism is a neurodevelopmental disorder, overlapping behavioral and emotional dysregulation suggests potential supportive relevance. The study scientifically validates the antidepressant activity of *Maanthakudineer*, demonstrating significant improvement in depression like behavior in vivo.These findings suggest its promising therapeutic potential in managing neurobehavioural and neurodevelopmental disorders, supporting its traditional siddha use.

KEYWORDS: Siddha medicine, *Maanthakudineer*, Antidepressant, *Vatham.*

INTRODUCTION

Siddha system of medicine is one of the oldest traditional medical systems of India, originating in the southern part of the country and attributed to the wisdom of the *Siddhars*. The system is based on the holistic concept of health, emphasizing the harmonious balance of the three fundamental humors *(UyirThathukkal)—Vali*, *Azhal*, and *Iyam*. According to Siddha philosophy, health is not merely the absence of disease but a state of physical, mental, and spiritual well-being. Siddha literature provides extensive descriptions of diseases affecting both the body and the mind. Mental disorders are collectively described as *KirigaiNoigal*, where the mind *(Manam)* plays a central role in the manifestation of disease. Imbalance of *Pitham* is considered a major causative factor for many psychological disorders, leading to conditions such as *Unmatham, Maathaazhivu, Matha Noi*, and *Kirigai*. These conditions show close resemblance to neurodevelopmental and depressive disorders described in modern medicine.

Autism Spectrum Disorder (ASD) is a neurodevelopmental condition characterized by impairments in social interaction, communication difficulties, and repetitive behavioural patterns. From a Siddha perspective, such developmental and behavioural abnormalities can be understood under *Kirigai* and related *Manasika noigal*, which arise due to derangement of humoral balance and impairment of mental health. Siddha texts emphasize early intervention, correction of humoral imbalance, and strengthening of the nervous system to improve cognitive and behavioural functions in children affected by such conditions. Herbalmedicines form the backbone of Siddha therapeutics, and among them, *Kudineer*formulations occupy a significant place due to their simplicity, quick action, and therapeutic efficacy. Siddha physicians traditionally prescribe *Kudineer* preparations for chronic and functional disorders, including mental and developmental illnesses. These formulations are believed to act by correcting humoral imbalance, enhancing mental clarity, and strengthening the nervous system.

The Siddha system emphasizes natural, safe, and effective management of diseases through herbal formulations, dietary regulation, and lifestyle practices. Scientific validation of classical Siddha formulations is essential to substantiate their therapeutic claims and to integrate traditional knowledge with modern medical research.In the Siddha system of medicine, the herbal formulation *MaanthaKudineer*is recommended for the treatment of

Maantha Saani, as referred to in *Kannusamiyam ParambaraiVaithiyam.*

MATERIALS AND METHODS

Collection and Authentication of RawDrugs

The raw materials for *Maanthakudineer* were sourced from"Ramasamy chettaiyar shop, Chennai, Tamil Nadu, India" and raw drugs authenticated by the department of *Gunapadam*,Government Siddha Medical College, Chennai, Tamil Nadu, India,"wherethesampledrugwasalsopreparedin their laboratory.

Ingredients of theTest drug: Table 1

Preparation of Maantha Kudineer

The 7drugs *Aadhatoda, Seenthilkodi, Kandankathiri, Chukku, Parpadagam,Peipudal, Nilavembu* are dried separately and make them in a coarse powder form, then put them in a used new pan,add ½ padi(1520ml) water and put it on a low flame, filter it at the kasayam form.

Dosage:

Thekarandi alavu-1-2(4-8ml)

(1 *Thekarandi*) = 4ml

STUDY SCHEDULE

Study Activity	Tentative
Date of start of experiment	November 1, 2025
Date of completion of the experiment	November 1, 2025
Date of draft report submission	November 18, 2025
Date of final report submission	November 18, 2025

EXPERIMENTAL PROCEDURE

I. Preparation of test item and administration

The formulation was given as ready to dose. The test item was administered in a single dose daily for a week by gavage using stainless steel ball tipped oral intubation needle at the desired dose level. The control does not treat with any drug or treatment.

1. Study design

An outline of the study design is presented in the following table.

Group No	Number of animals	Dosing
1	1	Control
2	1	Treatment (400mg/kg)

The animals were weighed and randomly separated into 3 groups. The animals were dosed daily for 7 days. On day 8, the animals were subjected into Forced Swim Test (FST). To induce depression, Diazepam (10 mg/kg) was injected intra-peritoneally, 30 minutes before the test. The animals were dosed with test item 1 hr before the test. After 1hr of dosing and 30 minutes of diazepam, animals were introduced into a tank having water filled upto 75%. The animals were introduced into the water and the evaluation was carried out for 6 minutes. Throughout the test, immobility time and swimming time was noted.

- Immobility time: Total absence of active movements apart from minor efforts to keep the head afloat.
- Swimming time: Active swimming of the animal, pedalling and moving around the cylinder with all four paws absorbed in water.[1]

Table1: Ingredients of *Maantha kudineer.*

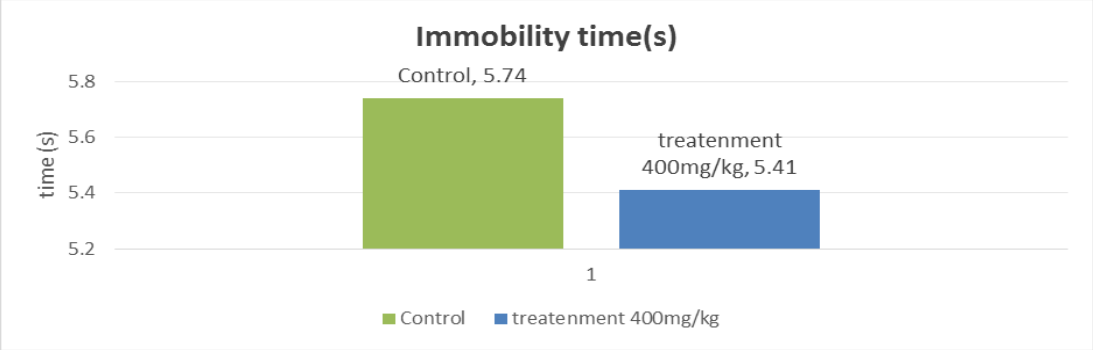
S.NO	NAME	BOTANICAL NAME	QUANTITY
1	ADATHODA	*Justicia adhatoda*	8.4 grams
2.	SEENTHILKODI	*Tinospora cordifolia*	8.4 grams
3	KANDANGKATHIRI	*Solanum xanthocarpum*	8.4 grams
4	PEIPUDAL	*Trichosanthes cucumerina*	8.4 grams
5	CHUKKU	*Zingiber officinale*	8.4 grams
6	PARPADAGAM	*Mollugo cerviana*	8.4 grams
7	NILAVEMBU	*Andrographis paniculata*	8.4 grams

APPENDIX 1

Immobility time and swimming test of mice

		Control	Treatment 400mg/kg
Start immobilized		0.36	0.31
End immobilized		5.38	5.1
Duration		5.02	4.79
Start swim		0.26	0.21
End swim		4.45	5
Duration		4.19	4.79
	Total immunization	5.74	5.41
	Total swim	4.71	5.21

COMPARISON GRAPH OF CONTROL AND TREATMENT



RESULT

The graph clearly shows that the test drug of 400 mg/kg reduced the immobility time almost equally to the control group. So, the test drug has an anti-depressive effect.

DISCUSSION

From the *Siddha* system of medicine, mental and behavioural disorders are understood as imbalances in *UyirThathukkal* (*Vali, Azhal, Iyyam*), particularly *Vali (Vatham*), which governs neurological and psychological functions. Depression-like behaviours and neurodevelopmental conditions such as autism are traditionally linked to *Vatha* derangements.*Siddha* formulations like *Maanthakudineer* are traditionally used to restore mind-body balance, improve *Manam* (mental strength), and support *Nadi* and *Naadiseyalpaadu* (neurophysiological functions).

Autism Spectrum Disorder (ASD), though primarily a neurodevelopmental condition, shares overlapping features with mood and behavioural dysregulation, including anxiety, reduced social interaction, and altered stress response. Therefore, *Maanthakudineer* possessing neuroprotective and mood –modulating properties.The observed reduction in immobility and improvement in active behaviour in mice suggest that the formulation may influence central nervous system regulation, which is a key area of interest in *Siddha*-based supportive approaches for autism.*Siddha* medicine emphasises holistic management, including internal medicines, diet regulation (*Pathiyam*), and lifestyle practices, which are often considered beneficial as adjuvant therapies in autism care.Oral administration of *MaanthaKudineer* (400 mg/kg) for seven days significantly reduced immobility time and increased swimming behaviour in the Forced Swim Test in mice, indicating a clear antidepressant effect. The observed activity may be attributed to the synergistic neuroprotectiveand antioxidant properties of its constituent herbs. These findings provide preliminary preclinical evidence

supporting the antidepressant potential of*MaanthaKudineer* and warrant further mechanistic and clinical investigations.Results from this study showed that mice treated with *Maanthakudineer* (400 mg/kg) exhibited a reduction in immobility time and an increase in swimming time that were comparable to those of the control group. This suggests that the test drug was able to counteract depression-like behaviour induced during the experiment. The observed behavioural changes indicate a potential antidepressant effect of the formulation, possibly through modulation of stress-related neurobehavioural pathways, as supported by similar findings in experimental depression models reported in the literature.

Future research may include autism-relevant animal models, behavioural cognition tests, and biochemical markers related to oxidative stress and neurotransmitter balance to scientifically validate Siddha concepts in the context of ASD.

CONCLUSION

This present study evaluated the antidepressant potential of *Maanthakudineer* using the Forced Swim Test (FST) model in mice. The formulation was administered orally at a dose of400 mg/kg for seven consecutive days, and behavioural assessment was carried out on day 8 following diazepam-induced depression. The FST is a widely accepted experimental model for screening antidepressant activity, where a reduction in immobility time and an increase in swimming behaviour indicate antidepressant-like effects.These findings suggest its promising therapeutic potential in managing neurobehavioural and neurodevelopmental disorders, supporting its traditional siddha use.

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