Evaluation of antidepressant activity of TURNERA DIFFUSA in albino mice

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OVERVIEW:

- Introduction
- Need for study
- Objective
- Materials and Methods
- Results
- Discussion
- Conclusion

INTRODUCTION

- Common name of Turnera diffusa is DAMIANA
- Damiana is a small shrub that grows 1-2 metre high and bears aromatic, serrate leaves that are 10-25 cm long.
- Small yellow flowers bloom in early to late summer which are followed by small fruits with a sweet smell and fig-like flavour.
- The medicinal part of the plant is its leaves, which are harvested during the flowering season.

Cont…

- Damiana has a long history of use in traditional herbal medicine throughout the world.

- It is thought to act as:

✓ aphrodisiac,
✓ antidepressant,
✓ diuretic,
✓ cough-suppressant,
✓ mild laxative.

- In Mexico, the plant also is used for asthma, bronchitis, neurosis, diabetes, dysentery, dyspepsia, headaches, paralysis, nephrosis, stomach ache, and syphilis.

- Damiana first was recorded with aphrodisiac effects in scientific literature over 100 years ago

NEED FOR THE STUDY

- Depression is a mood disorder consisting of a set of symptoms, which include
- a predominance of the affective type (pathological sadness, hopelessness, apathy, anhedonia, irritability, subjective feeling of distress),
- And there can also be cognitive, volitional, and physical symptoms.

Cont...

Depression & anxiety are "modernization borne diseases". pharmacotherapeutic approaches for management of these include TCAs, norepinephrine & SSRI, MAOIs, Atypical antidepressants.

Among these, TCAs are most widely used, regular use of which may cause physical dependence, tolerance, deterioration of cognitive function.

In the view of adverse effects of synthetic drugs, investigating plants, based on their use in traditional systems of medicine, is a sound, and cost-effective strategy to develop new drugs.

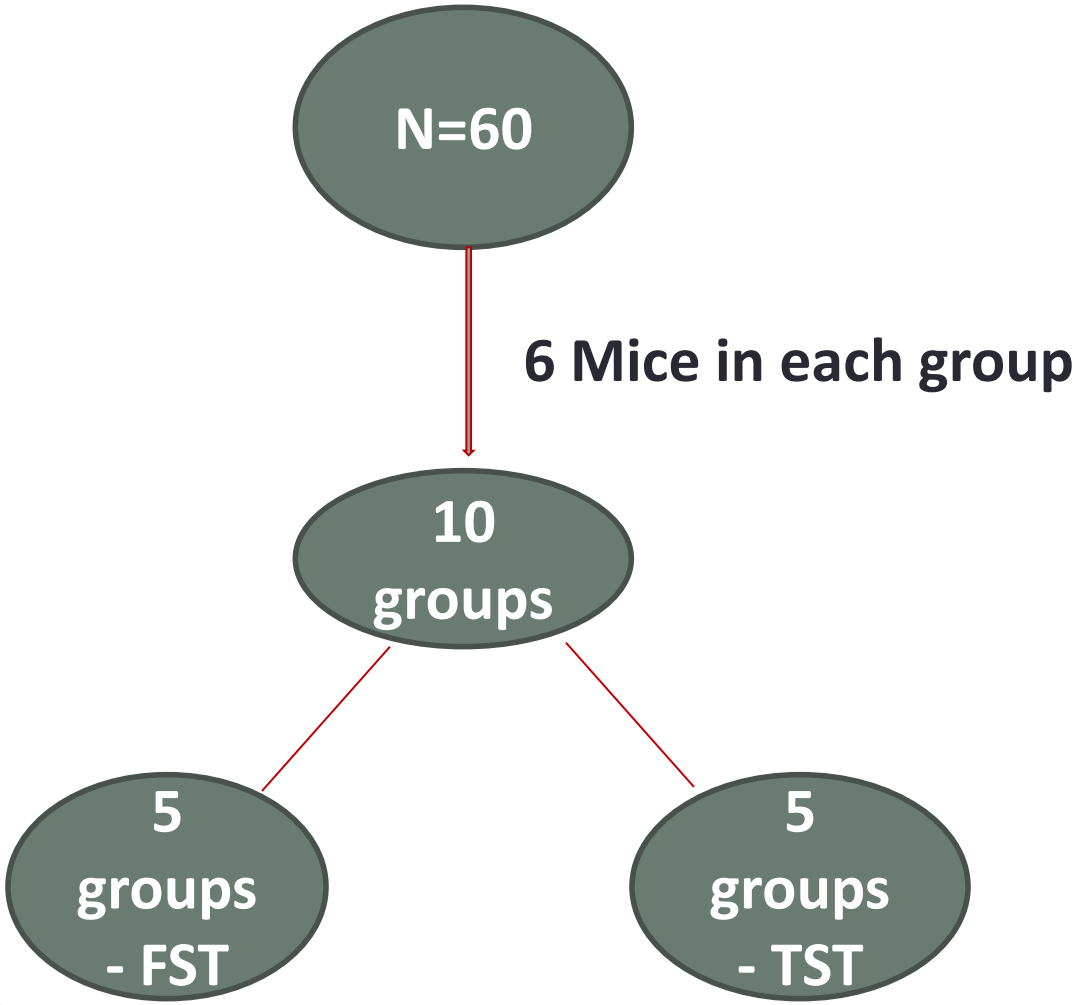
OBJECTIVE:

- To evaluate antidepressant activity of Turnera diffusa in albino mice.

MATERIALS AND METHODS

- Albino mice of either sex of average weight 20-30gm.
- Animals inbred in Central Animal House, SSIMS&RC, Davangere, were randomly housed as 6 mice per cage at an ambient temperature & humidity with a 12 hour light/dark cycle and had free access to food & water, *ab libitum*.
- The Institutional Animal Ethics Committee approval was taken prior to the study.
- The data were analysed separately using one way analysis of variance (ANOVA), using statistical software Graph Pad In Stat version 3.06.
- P values of < 0.05 were considered as statistically significant

MATERIALS AND METHODS



MATERIALS USED

- Albino mice of either sex weighing 20-30gms
- Turnera diffusa aqueous extract (50mg, 75mg, 125mg/kg p.o)
- Standard drug amitriptyline(20mg/kg p.o)

MATERIALS AND METHODS

Inclusion Criteria:

1) Albino mice of either sex weighing between 20-30 gm.
2) Healthy animals with normal activity.

Exclusion Criteria:

1) Pregnant mice and those just delivered.
2) Animals previously used in other experiments.

METHOD:

- A total of 60(n=60) animals will be divided into 10 groups of 6 each. Among which, 5 groups were subjected to forced swimming test and 5 groups to tail suspension test.

Forced swimming test :

- Group 1(Control) : Normal saline 1ml
- Group 2(Standard) : Amitriptyline20mg/Kg body weight
- Group 3 : Turnera diffusa 50mg /Kg body weight
- Group 4 : Turnera diffusa 75 mg /Kg body weight
- Group 5 : Turnera diffusa 125 mg/Kg body weight

Cont…

Tail suspension test:

- The animals will be grouped in similar manner and all above mentioned drugs administered p.o.

FORCED SWIMMING TEST

- The Forced Swimming Test (FST), developed by Roger Porsolt (Porsolt et al, 1977) is used.

- One day prior to test, mice will be dropped into glass cylinder (height 25cm, diameter 10cm, containing water level of 10cm, maintained at 23- 25 degree Celsius) for about 15 minutes and then taken out for towel drying.

- This is done for adaptation of animals.

Cont….

- On the next day, the mice will be dropped individually in the glass cylinder for about 6 minutes.

- The last 4 minutes of the testing period is considered for taking the parameters, as the first 2 minutes are for habituation. The animals receive the test drug/standard drug/control per orally 30 min before the test.

- The floating or immobility time is noted down i.e., floating in upright position except for the small movements to keep their heads above water.

FORCED SWIMMING TEST

- SWIMMING IN GLASS CYLINDER



TOWEL DRYING



WARMING



TAIL SUSPENSION TEST

- The Tail Suspension Test (TST) developed by Steru (Steru et al 1980) is used.

- After 30 minutes of per oral administration of test drug/standard drug/control, mice are suspended from a metal rod mounted 50cm above the surface by fastening the tail to the rod with the adhesive tape for 6 minutes.

- The measuring principle is based on the energy developed by a mouse trying to escape from its suspension. The immobility time is noted down in the last 4 minutes.

- Immobility here refers to the absence of any body or limb movements except for those caused by respiration

Parameters noted:

a) Forced Swimming Test: The duration of active behavior (climbing and swimming) and the period of immobility are noted.

b) Tail Suspension Test: The duration of immobility is noted.

- Decrease in the period of immobility after the drug administration is taken as the evidence of its antidepressant activity.

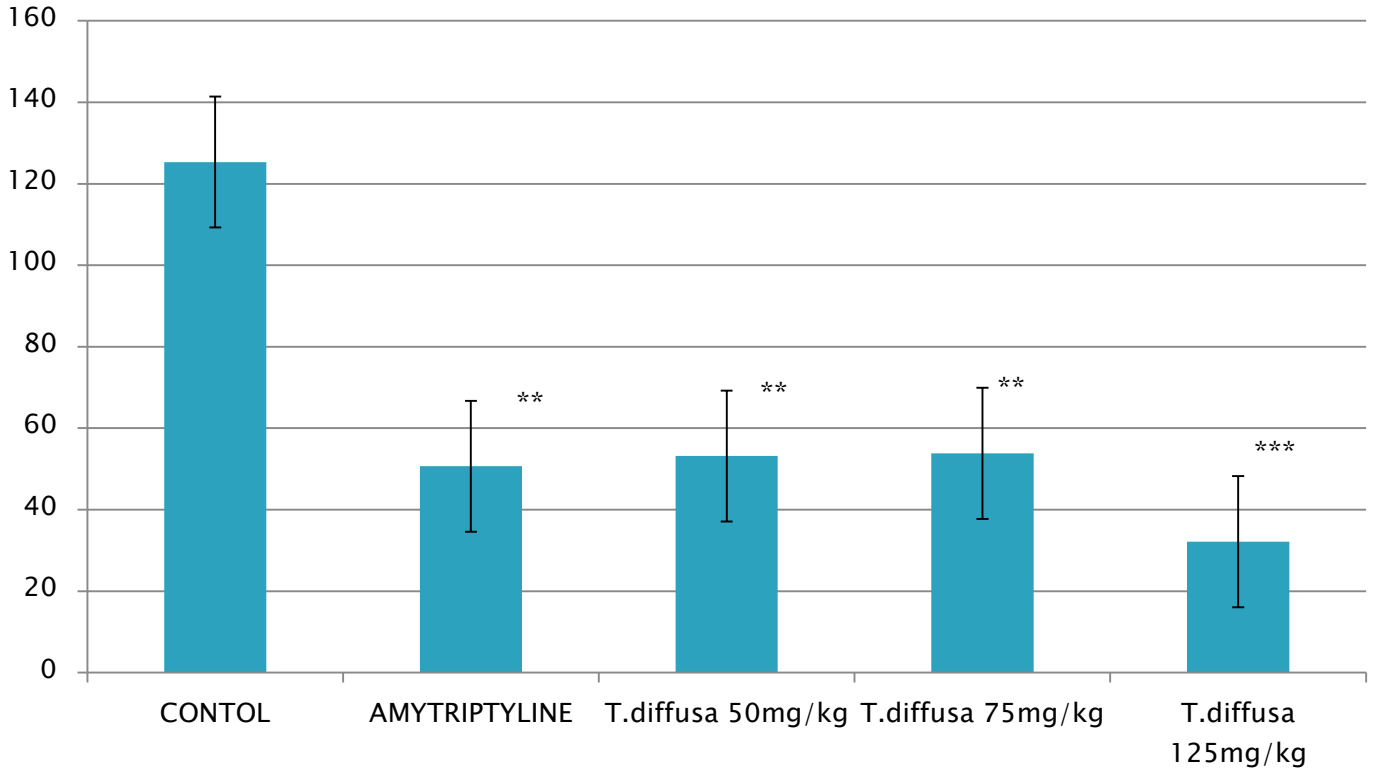


TAIL SUSPENSION TEST

RESULTS

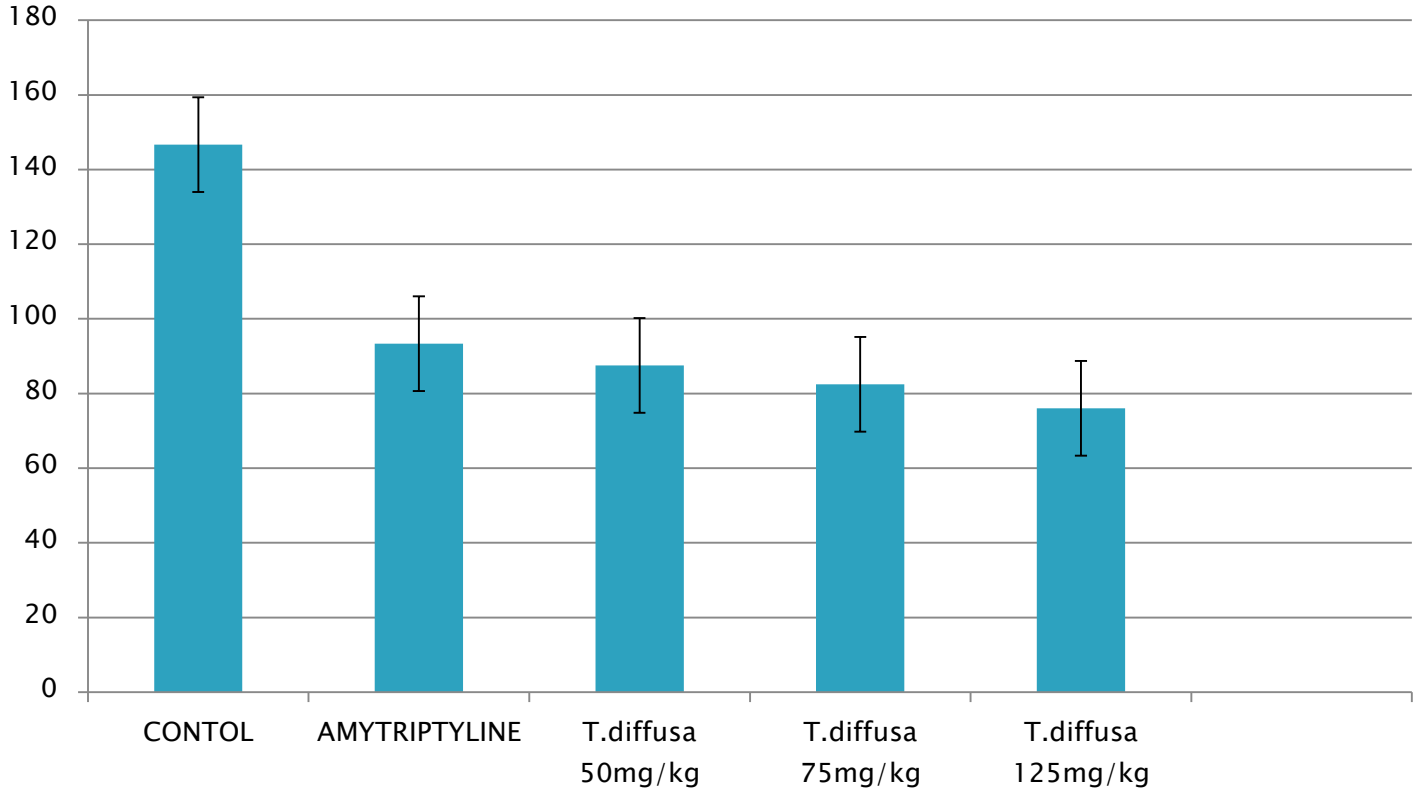
FST	CONTROL	AMYTRIPT-YLINE	T. diffusa (50mg/kg)	T. diffusa (75mg/kg)	T. diffusa (125mg/kg)
MEAN	125.3	50.6	53.16	53.8	32.16
SD	33.1	41.0	33.0	36.6	19.96
SEM	13.5	16.7	13.5	14.9	8.1
pVALUE		<0.01(**)	<0.01(**)	<0.01(**)	<0.001(***)

FORCED SWIMMING TEST



TST	CONTROL	AMYTRIPTYLINE	T. diffusa (50mg/kg)	T. diffusa (75mg/kg)	T. diffusa (125mg/kg)
MEAN	146.6667	93.33333	87.5	82.5	76
SD	16.66933	24.25421	21.10579	25.24876	9.703951
SEM	6.8	9.9	7.3	10.3	3.96
pVALUE		<0.001(***)	<0.001(***)	<0.001(***)	<0.001(***)

TAIL SUSPENSION TEST



DISCUSSION

- Turnera diffusa exhibited significant antidepressant activity .
- At a dose of 50mg/kg, 75mg/kg antidepressant activity was significant and comparable with the the standard Amitriptyline 20mg/kg.($p<0.01$)
- At a dose of 125mg/kg antidepressant activtiy was highly significant when compared to standard.($p<0.001$)

CONCLUSION

- The present study showed that Turnera diffusa has significant antidepressant activity.
- It may be used as an alternative or add on therapy for depression.
- Further detailed studies with larger sample size and clinical trials are required to establish the therapeutic potential.


Thank
You