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EVALUATION OF CARDIOTONIC ACTIVITY OF *TECOMA STANS* ON ISOLATED FROG'S HEART

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Abstract:

Tecoma Stans, the yellow bells Plants belonging to the family Bignoniaceae. It height ranges from 2 to 4 meters. It is an important medicinal herb throughout India. Among all parts from Plant-seeds, roots and bark are the most important parts which are used medicinally.

Present study was carried out to determine the cardiotonic activity by using infusion of Tecoma stanswith different dilutions & compared with cardiotonic activity of digoxin-the life saving cardiotonic. The activity was tested by using isolated frog heart assembly. The present preliminary studies confirm the better cardiotonic act ivity of Tecoma Stan, than digoxin. Further studies can confirm the reduced toxicity & this will be the advantage of Tecoma stans, over digitalis. Thus, in future it will be interesting to isolate the active chemical constituents are responsible for the cardiotonic activity.

Keywords: *Cardiotonic activity, Digoxin, Tecoma Stans, Isolated frog heart.*

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INTRODUCTION:

Plants are Cultured everywhere not in specific place. It useful to human health and well being. The plant is fast growing plant with 30 feet in height contents yellow flowers and leaves with green. The t.stan is useful to treat diabetes in mostly countries like Mexico, India and America and the roots are used to treat diuretic and Anti-fungal. The first prefer for this plant is herbal medicines. [1-5]

Vernacular (or) other names in other languages:
Hindi-Pillakaner
English-Yellow bells
Telugu-Paccha Pulu
Classification:
Common Name-Yellow trumpet bells
Kingdom-Planate-Plants
Subkingdom-Tracheobionta-Vasscular plants
Superdivision-Spermatophyta-Seed Plants
Division-Mangoliophyta-Flowering Plants
Class-Magnoliopsida-Dicotyledons
Subclass-Asteridae
Order-Scrophulariales
Family-Bignoniaceae-Trumpet-creeper family
Genus-Tecoma Juss,-trumpetbush P
Species-Tecoma Stans (L.) Juss. ex kunth-Yellow trumpetbush

Fig.1: *TECOMA STANS* plant

T.stan has various pharmacological Activities anti-oxidant, anti diabetic, anti-fungal, anti-cancer, anti-hyperlipidemic, anti-micribial activities.

1. Anti-oxidant: The presents of Tannins in the extracts of bio-activities to posses' potent anti-oxidant activity.
2. Anti-spasmodic effect: This effect can be evaluated by using segment of ileum from rat with trade solution. The TLE dose dependently which indicate calcium channels are involved in this spasmolytic effect.
3. Anti-microbial activity: The extract of leaf was tested on Bacteria. The extract of phenolic content was showed its anti-microbial activity.
4. Anti fungal acitivity: The extract of t.stan was tested against two species of fungi (sporothrix schenckii and fonsecaea pedrosoi) Shows best effective anti-yeast and anti-fungal activity.
5. Anti-diabetic activity: TAE sub-chronic admin reduces triglycerides and cholesterol without modifying fasting glucose. The chemical composition of extract was analyzing their content of phenols, flavonoids and alkaloids reputed as to be responsible for hypo-glycemic properties of many anti diabetic.
6. Wound healing property: The methanol extract of t.stans leaf was possess significant wound healing property.[6-11].

The *Tecomastans*
was claimed to have general cardiotonic activity and we decided to determine the same with the help of isolated frog heart assembly.

MATERIALSAND METHODS: [12]

Drug: Infusion of Tecoma *stans* leaf extract
Chemicals: Digoxin, Ringer Solution
Animal: Frog of Rana
Tigrigna species were used for the study and those w ere maintained as per CPCSEA guidelines.
Instruments:
Sherington Rotating Drum, Sterling's heart lever.
Preparation of infusion
Ethanolic *Tecoma stans* leaf extract was mixed with 100ml distilled water With the help of magnetic stirrer for half an hour. The material was filtered through Whatman Filter paper no.40 and filtrate was collected.
The prepared infusion was diluted with the Help of di stilled water in varying proportion and labeled as follows,
TL1-Undiluted filtrate
TL2-1:1 (filtrate: distilled water)
TL3-1:2 (filtrate: distilled water)
TL4-1:4 (filtrate: distilled water)
All the preparations were evaluated for their cardioto nic activity by using isolated frog heart

Assembly. The rate and force of heart contraction was determined.

Preparation of digoxin solution

The marketed digoxin ampoules (Samarth life sciences Pvt Ltd.).

Were obtained from local market. Various different dilutions were made with distilled water and labeled as follows, D1- 25 µg/ml, D2- 50 µg/ml. Above prepared samples were evaluated for their Cardio tonic activity and treated as standard.

Preparation of hypo dynamic ringer solution [13]

Hypo dynamic ringer solution was prepared by using Standard Method. (Table-1)

Table1: Composition of hypo dynamic ringer solution

Sr.No	Ingredients	Quantity
1	. Sodium chloride (NaCl)	6.5 gm
2	Potassium chloride (KCl)	0.14 gm
3	Calcium Chloride (CaCl2)	0.03 gm
4	Sodium bicarbonate (NaHCO3	0.2 gm
5	Glucose	2 gm
6	Distilled Water	1000 ml

Evaluation of cardio tonic activity [14]

The frog of species Rana tigrina was pithed and pinned it to the frog board. A midline incision was given on the abdomen, the pectoral girdle was removed and the heart was exposed. The pericardium was carefully removed and put a few drops of hypo dynamic frog ringer over the heart. The inferior venacava was traced, put a thread around it and given a small cut in order to insert the venous cannula. The cannula was inserted in the vein and the thread was tied to assure the cannula in place which is in turnconnected to a saline bottle containing hypo dynamic frog ringersolution. A small cut in one of the aorta was given for the ringer to come out.

Heart was isolated and attached to the stand with moderate flow of ringer. A thin pin hook was passed through the tip of the ventricle and with the help of a fine thread to the hook; it was tied to the free limb of the Sterling 's heart attached lever which wasfixed to a stand. A proper tension was adjusted by altering the height of the lever.

The normal heart rate was noted. All test samples that is TL1, TL2, TL3, TL4, D1, & D2 were administered in different doses viz. 0.1ml, 0.2ml, 0.3ml respectively. The rate and force of heart contraction[15] were noted as given in (Table 2-7). (Fig-1).

RESULTS AND DISCUSSION:

All the dilutions of Tecoma *stans* leaf extract restore cardiac activity of Hypodynamic frog heart i.e. it increases rapidity and force of contraction. It was found that undiluted sample showed better response as compared to other samples. It is interesting to know that *Tecoma stans* leaf extract has rapid onset of action compared to Digoxin. These preliminary studies confirm the better cardiotonic activity of *Tecoma stans* leaf extract. And it can stand as better option for digitalis. Further studies can confirm the reduced toxicity & this will be the advantage of *Tecoma stans* over digitalis.

Table-2

Sr.No.	Drug	Dose(in ml)	Beats/min	Change in Force
1	-----	Normal	37	Normal
2	TL1	0.1	34	Rapid Increase
3	TL1	0.2	29	Increase
4	TL1	0.3	28	Increase

Table-3

Sr.No.	Drug	Dose(in ml)	Beats/min	Change in Force
1	-----	Normal	37	Normal
2	TL2	0.1	31	Slight Increase
3	TL2	0.2	27	Slight Increase
4	TL2	0.3	28	Increase

Table-4

Sr.No.	Drug	Dose(in ml)	Beats/min	Change in Force
1	-----	Normal	37	Normal
2	TL3	0.1	30	Rapid Increase
3	TL3	0.2	28	Increase
4	TL3	0.3	27	Slight Increase

Table-5

Sr.No.	Drug	Dose(in ml)	Beats/min	Change in Force
1	-----	Normal	37	Normal
2	TL4	0.1	30	Slight Increase
3	TL4	0.2	29	Slight Increase
4	TL4	0.3	28	No change

Table-6

Sr.No.	Drug	Dose(in ml)	Beats/min	Change in Force
1	-----	Normal	38	Normal
2	1	0.1	25	Increase
3	D1	0.2	24	Slight Increase
4	D1	0.3	26	Slight Increase

Table-7

Sr.No.	Drug	Dose(in ml)	Beats/min	Change in Force
1	-----	Normal	38	Normal
2	D2	0.1	28	Increase
3	D2	0.2	25	Slight Increase
4	D2	0.3	22	Sudden Cardiac Block

TL(*Tecoma stans* leaf extract) & D(digoxin).

CONCLUSION:

Tecoma stans has been used medicinally throughout history by many different cultures. Many compounds have been found in the exudates of the *Tecoma stans* plant that have been used medically by humans. The *Tecoma stans* was claimed to have general cardio tonic activity and we decided to determine the same with the help of isolated frog heart assembly. In conclusion, the leaves of neem acts as for alternative or complementary medicine as a cardio tonic agent.

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