

**EVALUATION OF CARDIAC DEPRESSANT ACTIVITY OF THE DIFFRENT EXTRACTS OF *TECOMARIA CAPENSIS* (THUNB) SPACH. LEAVES**

Elamaran Tamil Jothi<sup>1</sup>, K.V.Gopichand<sup>2</sup>, A.Sriram<sup>2</sup>, V.Suba Kumaravalan<sup>3</sup>

1. Department of Pharmacology, School of Pharmacy, Vels University, Pallavaram, Chennai, T.N
- 2 .Department of Pharmacology, Vignan Pharmacy college, Vadlamudi, Guntur Dt, A.P
3. Department of Pharmacology, National Institute of Siddha, Tambaram, Chennai, T.N

**Summary**

The study aimed to evaluate the cardiovascular activity of various extracts of *Tecomaria Capensis* leaves on isolated frog-heart. The results of this study reveals that the different extracts of *Tecomaria capensis* leaves exhibit negative inotropic and chronotropic effects on isolated frog heart. Hence this study concluded that various extracts of leaves of *Tecomaria capensis* produce cardiac depressant activity.

**Key word:** *Tecomaria capensis*, Cardiac depressant, negative inotropic and chronotropic.

**Corresponding author**

Elamaran Tamil Jothi\*

Department of Pharmacology,

School of Pharmacy,

Vels University,

Pallavaram,

Chennai.

Tamil nadu.

Mobile: 08985430720

[Email-tamiljothi.e@gmail.com](mailto:Email-tamiljothi.e@gmail.com)

### Introduction

Cardio vascular disease incurs a greater economical constraint than any other illness especially in the developing countries. It would be most common cause of death by the year 2020. The risk factors for heart disease are family history, sex, increased lipid levels, diabetes mellitus, hypertension, obesity, and cigarette smoking. There is adequate evidence indicating hypercholesterolemia and other lipid abnormalities as major risk factors in the development of atherosclerosis and coronary heart disease. Therefore, cardiovascular disease is a very common problem in the affluent societies related to their life style <sup>(1)</sup>. So this study planned to evaluate the cardiovascular influence of the various extracts of *Tecomaria capensis* leaves. *Tecomaria capensis* lin., has an important place in cardiovascular medicinal herbs and its synonym is *Tecomaria capensis* lin., commonly known as Cape- honeysuckle (family:bignoniaceae) <sup>(2)</sup>, it is fast growing scrambling shrub which grows up to 2-3 meter height and spreads more than 2.5m. *Tecoma capensis* is a ever green plant in warm climate areas but loses its leaves in cold climate. Flowers are orange in color and the plant is used as a traditional medicine to relieve pain and insomnia <sup>(3)</sup>. Dried bark powdered infusions are taken for sleeplessness <sup>(4)</sup> also reported to induce sleep <sup>(5)</sup>. It included in a list of African plants evaluated for in-vitro plasmodial activity against plasmodium flsiperum <sup>(6)</sup>.

### Materials and Methods

#### Plant Materials

The leaves of *Tecomaria Capensis* were collected from Guntur, Andhra Pradesh, India. Plant was authenticated by Dr.S.M. Kasim Dept of Botany and Microbiology, Acharya Nagarjuna University, Guntur. The leaves part was selected, dried in shade were powdered and subjected to sox halation with different solvents ( Ethanol, Ethyl acetate, Aqueous) for 48 hours. Extracts were collected and calculated the extractive value.

#### Animals

The animal green frog (*Rana hexadactyla*) was used for this study.

#### Drugs and chemicals

The chemicals acetylcholine (10µg/ml), adrenaline 10µg/ml, potassium chloride (1%-4%), calcium chloride (1%-4%), propranolol (100µg/ml), atropine sulphate (100µg/ml), frog's ringer solution.

### Physiological salt solution

Composition of physiological salt solution were: Frog ringer NaCl (18g), KCl (0.42g), CaCl<sub>2</sub>(0.36g), NaHCO<sub>3</sub> (0.6g) and Glucose (6g) ( for 3 litres of distilled water.)

### Determination of Cardiovascular activity

Pith the frog and pin it to the frog board .Give a middle line incision on the abdomen. Remove the pectoral girdle and expose the heart. Remove the pericardium carefully and put a few drops of frog ringer over the heart. Trace the inferior Venacava, put the thread around it and give a small cut in order to insert the venous cannula which is in turn connected to a perfusion bottle containing frog ringer .Insert the cannula in the vein and tie the thread to assure the cannula in place. Give a small cut in one of the aorta for the perfusate to come out. Adjust a proper venous pressure of 2-4cm by altering the height of perfusion bottle. The effective venous pressure is the height in cms from level of the venous cannula and the ringer level in the perfusion bottle. Start the perfusion by opening screw clamp attached to the tube. Pass a thin pin hook through the tip of the ventricle and with the help of a fine thread attach to the hook tie it to the free limb of the universal lever which is fixed to the stand. Adjust the proper tension and magnification by altering the height of the lever. Record the normal contractions of the heart on the smoked drum <sup>(7)</sup>.

### Results and Discussion

In this study, different extracts of leaves of *Tecomaria capensis* were evaluated for cardiovascular activity in isolated frog heart .Observed readings were tabulated in Table no: 1. Different concentrations of extracts reveal that the activity of *Tecomaria capensis* leaves on cardiovascular system via heart rate, force of contraction and tone level. Primarily normal cardiogram was recorded followed by Adrenaline (1µg/ml), Calcium chloride (5µg/ml), Acetyl choline (1µg/ml) and Potassium chloride (5µg/ml) were treated as standard drugs respectively .Then the cardiovascular activity of *Tecomaria Capensis* was confirmed with treatment of different extracts in different concentration (0.1µg/ml, 1µg/ml).All these extracts showed depression on the heart rate, force of contraction and tone level. Further, the study was extended to confirm the mechanism of action of *Tecomaria Capensis*. In presence of atropine different leaves extracts of *Tecomaria capensis* have failed to produce cardiac depressant action. Hence, it is conformed that different extracts of *Tecomaria Capensis* leaves produce cardiac depressant action by acting on muscranic receptor (M<sub>2</sub>). Hence the study confirmed that *Teccomaria Capensis* as like Acetylcholine has negative inotropic and chronotropic effect on cardiac muscle.

### Conclusion

This study concluded that different extracts of *Tecomaria Capensis* leaves shows negative inotropic and chronotropic effect on cardiovascular system. Hence, it is proved its cardiac depressant action. Further, this study suggested that there was no preliminary work reported on this species. So, this work paves the way to isolate different constituents and proved various activities experimentally

**Table -1 Cardiac depressant activity of *Tecomaria capensis* leaves extracts**

Sno	Drug concentration	Heart rate	Force of concentration	Tone level
1	<b>Normal</b>	<b>63/min</b>	<b>normal</b>	<b>Normal</b>
2	<b>Adrenaline (1µg)</b>	<b>79/min</b>	<b>Increased</b>	<b>Increased</b>
3	<b>Calcium chloride(5µg)</b>	<b>87/min</b>	<b>Increased</b>	<b>Increased</b>
4	<b>Acetylcholine (1 µg)</b>	<b>12/min</b>	<b>Decreased</b>	<b>Decreased</b>
5	<b>Potassium chloride (5 µg)</b>	<b>18/min</b>	<b>Decreased</b>	<b>Decreased</b>
6	<b>Ethanolic extract ( 1:100)</b>	<b>6/min</b>	<b>Decreased</b>	<b>Decreased</b>
7	<b>Ethanolic extract ( 1:10)</b>	<b>10/min</b>	<b>Decreased</b>	<b>Decreased</b>
8	<b>Ethanol + atropine</b>	<b>54/min</b>	<b>Normal</b>	<b>Normal</b>
9	<b>Ethyl acetate (1:100)</b>	<b>5/min</b>	<b>Decreased</b>	<b>Decreased</b>
10	<b>Ethyl acetate ( 1:10)</b>	<b>10/min</b>	<b>Decreased</b>	<b>Decreased</b>
11	<b>Ethyl acetate + atropine</b>	<b>47/min</b>	<b>Normal</b>	<b>Normal</b>
12	<b>Aqueous (1:100)</b>	<b>4/min</b>	<b>Decreased</b>	<b>Decreased</b>
13	<b>Aqueous ( 1:10)</b>	<b>9/min</b>	<b>Decreased</b>	<b>Decreased</b>
14	<b>Aqueous + atropine</b>	<b>51/min</b>	<b>Normal</b>	<b>Normal</b>
15	<b>Atropine (10 µg)</b>	<b>58/min</b>	<b>Normal</b>	<b>Normal</b>

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#### References

- 1) Trivedi PC, Nehra S. Herbal drugs and Biotechnology, plants which cures heart disease, Jaipur: pointer publication: 20043.
- 2) UDSA,ARS, Natinal gentic resources program, Grem plasm resources information network-(GRIN) [ONLINE Datebase], National germplasm resources laboratory Beltsille, Maryland.
- 3) South African national biodiversities institutes integrated biodiversity system, information [URL:http://www.plantzafrica.com/planttuv/tecomaria\\_cap.htm](http://www.plantzafrica.com/planttuv/tecomaria_cap.htm).
- 4) Roberts M, Indeganious healing plants. Halfway house. Southern book publications :1990.
- 5) Hutchings A, Scott A.H. Lewis G. Cunnigham A.B. Zulu medical plants: An inventory. University of Natal Press, Pietermaritzburg, 1996.
- 6) P.Pillaya V.J. Maharaj P.J. Smith, Investigating south African Plants as a sources of new amti malarial drugs. journal of Ethano-pharmacology 2008: 119438-454.
- 7) Kulkarni S.K. Handbook of experimental Pharmacology IIIrd edition, 1999; Vallabh Prakashan, New Delhi.