

DECCAN PHARMA JOURNAL SERIES

ARMS Online Publications

www.deccanpharmajournals.com

(Research Article)

Received; accepted

COMPARATIVE CARDIOTONIC ACTIVITY OF *TRITICUM AESTIVUM* JUICE WITH DIGOXIN ON ISOLATED FROG HEART

Dama G.Y.*, Tare H.L., Gore M.S., Shende V.S., Deore S.R., Bidkar J.S., Sherikar A.

SGMSPM's Sharadchandra Pawar College of Pharmacy, Otur (Dumbarwadi), Pune, Maharashtra, India

Keywords:

Cardiotonic activity,
digoxin, *Triticum aestivum*,
isolated frog heart

For Correspondence:

Dama G.Y.

SGMSPM's Sharadchandra
Pawar College of
Pharmacy, Otur
(Dumbarwadi), Pune,
Maharashtra, India

E-mail:

tareguruji@yahoo.co.in

ABSTRACT

Triticum aestivum L. belonging to family Gramineae which is indigenous to tropical Africa. Phytochemical studies had revealed the presence of carbohydrates, proteins and dietary fibers, flavonoids. The juice was claimed to have general cardiotonic activity. Present study was carried out to determine the same by using fresh leaves juice with 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 indicated the absence of cardiotonic activity in *Triticum aestivum L.* when compared with digoxin. Further studies can confirm the lack of cardiotonic activity on mammalian heart. Thus, in future it will be interesting to check this effect by using isolated mammalian heart.

INTRODUCTION

Number of deaths in industrial world are increasing due to cardiac diseases. Cardiac diseases are emerging as single largest contributors for morbidity in India. Cardiac glycosides are used in the treatment of congestive heart failure (CHF) but in some cases its show many time intoxication. Hence, there is need for new drug research with wide therapeutic index. Nowadays 80% of the world's population uses medicines, which are directly or indirectly derived from plants. Worldwide, such medicines make up a 25% share of the pharmaceutical arsenal. Based on the strong traditional knowledge on the use of plants as therapeutic agents, a rational approach is being developed to use the medicinal plants as lead for the discovery of active molecules.¹⁻⁹

The *Triticum aestivum L.* is not frost tender. It is in flower from Jun to July, and the seeds ripen from Aug to September. Stems are 1.2m tall, erect, simple, multiple from base. Leaves are bluish-green. Leaf sheath open, glabrous or lowermost pubescent.¹⁰⁻¹¹

EXPERIMENTAL WORKDONE

Materials and methods^[15]

Drug : Juice of *Triticum aestivum* (Gramineae)

Chemical : Digoxin, Ringer Solution

Animal : Frog

Instruments: Sherington Rotating Drum, Sterling's heart lever

1. Preparation of juice

The fresh leaves of *Triticum aestivum* (Bread Wheat) of Family Gramineae were collected from Rajgurunagar Dist-Pune and identified at Department of Pharmacognosy of our Institute . One specimen was preserved for the future reference. The leaves were washed thoroughly to remove adhered material and fresh juice was prepared by using mixer. The material was filtered through Whatman filter paper no.40 and filtrate was collected .The prepared juice was diluted with the help of distilled water in varying proportion and labeled as follows,

A1-Undiluted filtrate

The preparations was evaluated for their cardiotoxic activity by using isolated frog heart assembly. The rate and force of heart contraction was determined.

2. Preparation of digoxin solution

The marketed digoxin ampoules (Sunpharma Ltd.) were obtained from local market. Various different dilutions were made with distilled water and labeled as follows, B1- 25 µg/ml, B2- 50 µg/ml. Above prepared samples were evaluated for their cardiotoxic activity and treated as standard.

3. Preparation of hypodynamic ringer solution ^[13-14]

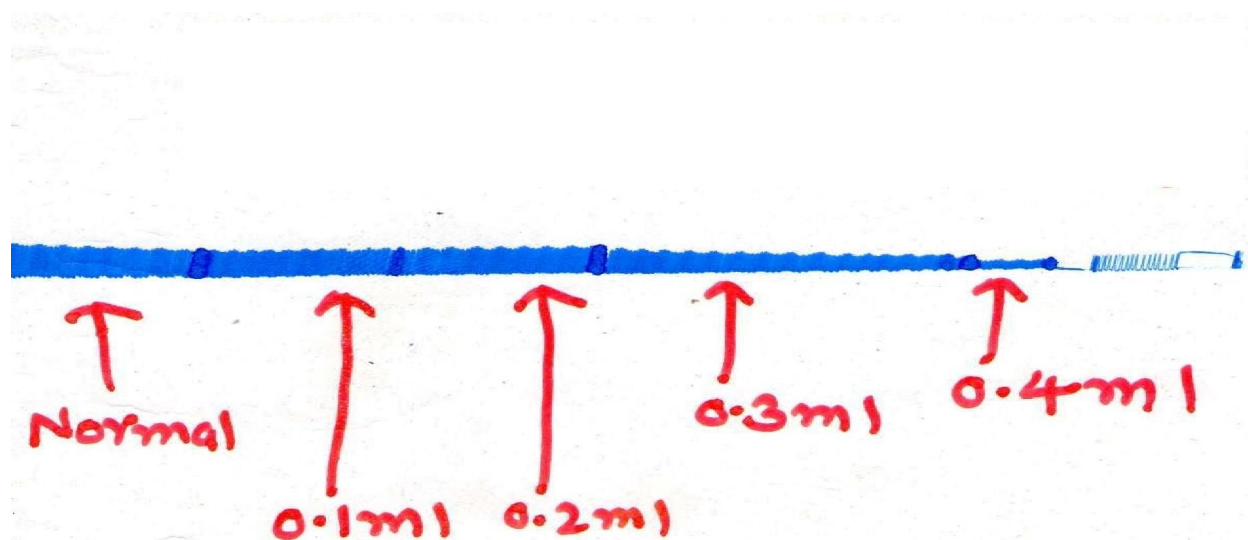
Hypodynamic ringer solution was prepared by using standard method (Table-1).

Table-1 Composition of Hypodynamic ringer solution

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

Evaluation of cardiotonic activity ^[13-14]

1. The frog of species *Rana tigrina* was pithed and pinned it to the frog board.
2. A midline incision was given on the abdomen, the pectoral girdle was removed and the heart was exposed.
3. The pericardium was carefully removed and put a few drops of hypodynamic frog ringer over the heart.
4. 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 turn connected to a saline bottle containing hypodynamic frog ringer solution. A small cut in one of the aorta was given for the ringer to come out.
5. Heart was isolated and attached to the stand with moderate flow of ringer.
6. A thin pin hook was passed through the tip of the ventricle and with the help of a fine thread attached to the hook; it was tied to the free limb of the Sterling's heart lever which was fixed 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 A1, B1 and B2 were administered in different doses viz. 0.1ml, 0.2ml, 0.3ml respectively. The rate and force of heart contraction were noted as given in (Table 2-4, Figure 1-3).

OBSERVATIONS:**Figure-1****Table-2**

Sr. No.	Drug	Dose(in ml)	Beats/min.	Change in Force
1	.....	Normal	28	Normal
2	A1	0.1	23	Decrease
3	A1	0.2	22	Slight decrease
4	A1	0.3	24	Marked decrease
5	A1	0.4	20	Cardiac block

Figure-2

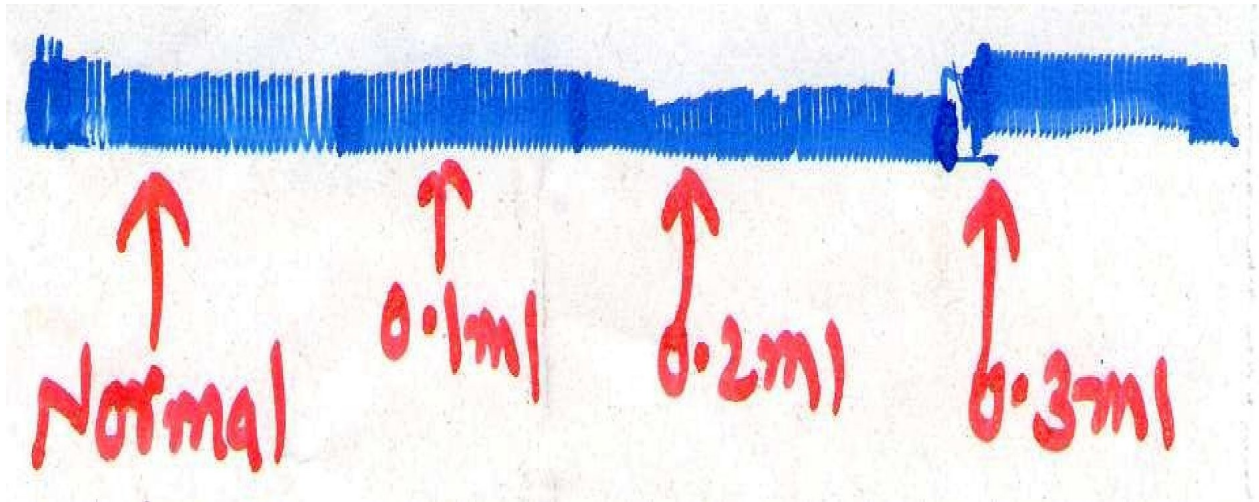
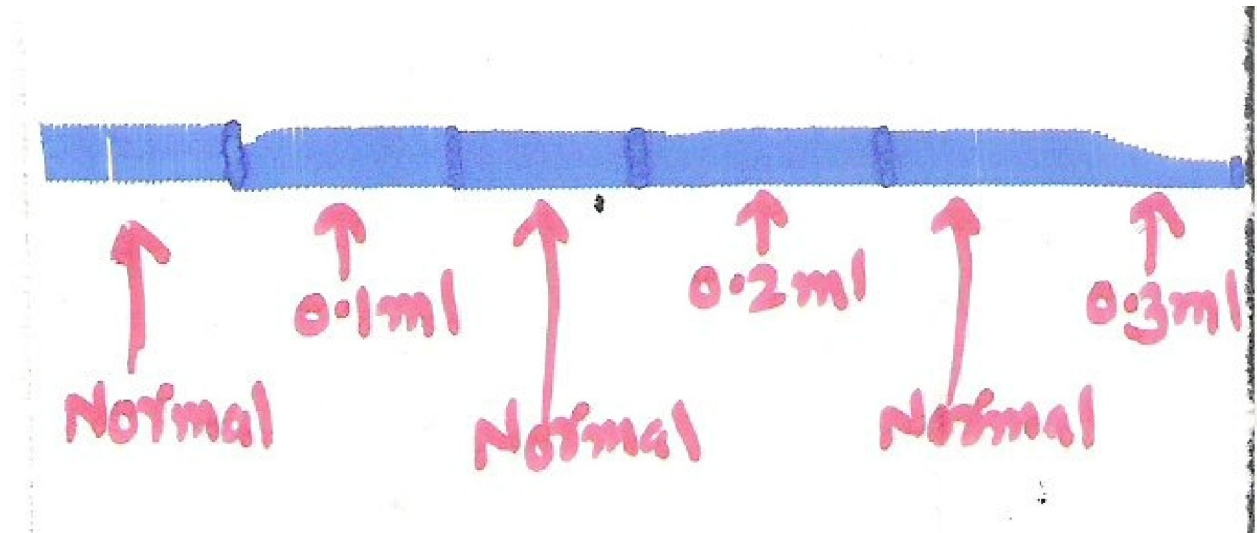


Table-3

Sr. No.	Drug	Dose(in ml)	Beats/min.	Change in Force
1	.....	Normal	28	Normal
2	B1	0.1	23	Increase
3	B1	0.2	22	Slight decrease
4	B1	0.3	24	Increase

Figure-3**Table-4**

Sr. No.	Drug	Dose(in ml)	Beats/min.	Change in Force
1	.....	Normal	30	Normal
2	B2	0.1	27	Increase
3	B2	0.2	26	Slight Increase
4	B2	0.3	20	Sudden Cardiac Block

RESULTS AND DISCUSSION:

The present preliminary studies indicated the absence of cardiotoxic activity in *Triticum aestivum L.* when compared with digoxin. Further studies can confirm the lack of cardiotoxic activity on mammalian heart. Thus, in future it will be interesting to check this effect by using isolated mammalian heart.

REFERENCES:

1. Emilio L. Ghisalberti, Survey of Secondary Plant Metabolites with Cardiovascular activity, *Pharmaceutical Biology*, October 1998, 4(36):237-279.
2. Stephen, CP., Aaron, H, Herb drug interactions and compounding in clinical trial, *J Herb Pharmacotherapy*, 2002, 2(1): 23-36.
3. Harsh Mohan -Textbook of Pathophysiology, 4th edition, Jaypee Brothers Medical Publishers 2000: 278-325.
4. Goodman & Gillman, *The Pharmacological Basis of Therapeutics*, 9th edition, McGraw Hill Publications, 1996: 810-820.
5. Remington: *The Science and Practice of Pharmacy*, 19th Edition, Mack Publishing Company: 956.
6. Tripathi KD, *Essentials of Medical Pharmacology*, 5th Edition, New Delhi, Jaypee Brothers Medical Publishers, 2003: 457-467.
7. Barar FSK, *Essentials of Pharmacotherapeutics*, 1st edition, S.Chand Publications, 1985: 253-254
8. Satoskar RS, Bhandarkar SD, Ainpure SS, *Pharmacology and Pharmacotherapeutics*, 16th Edition, Mumbai, Popular Prakashan, 1997: 352-355.
9. Terence JC, Peter SM, Digoxin in heart failure and cardiac arrhythmias, 179 (2), *MJA* 2003: 98-102.
10. Nadkarni AK, *The Indian Materia Medica*, Popular prakashan 2nd edition: 1190
11. Anonymous, *The Wealth of India, Tamarindus indica* (Leguminoseae), Raw Materials, Part-10, A Dictionary of Indian Raw Materials and Industrial Products, Council of Scientific Industrial Research (New Delhi),10: 114-122
12. Ansari KU, Gupta N, Bapat SK, Frusemide-Digitalis Interaction on Experimental model, *IJMS*, (47) , Dec1993:277-279.
13. Kulkarni SK, *Handbook of Experimental Pharmacology*, 2nd Edition, Vallabh Prakashan, 1993: 9, 74-76.
14. Kale SR, Kale RR, *Practical Pharmacology and toxicology*, 6th edition, Nirali Prakashan, 2003: 27- 28.
15. Tare HL, Thube BB., Comparative Cardiotoxic Activity Of *C.angustifolia* With Digoxin On Perfused Frog Heart,” *IJPRD*, Vol 1(1), 2009 : 1-14