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Research Article

PHARMACOLOGICAL EVALUATION OF TWO SPECIES OF *CORCHORUS,C.OLITORIUS* AND *C.FASCICULARIES*

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ABSTRACT

The chloroform and methanolic extracts of the roots of *C. olitorius*and *C.fascicularis* produced cardiac stimulant activity. Various concentrations of Digoxin, chloroform extracts**(SGOC),(CFR-1)** and methanolic extracts, (**SGOC-M**), **(CFR-2)** of *C.olitorius*and *C.fascicularis* were tested for cardiac stimulant activity. All their extracts studied , showed potent activity in a dose dependent manner.The extracts were administerd to the isolated heart model, and the Heart rate (HR), Cardiac output (CO), and contraction amplitude (CA) were measured.The chloroform and methanolic extracts at different dose levels 10mg/ml, 20mg/ml and 40mg/ml of *C.olitorius* and *C.fascicularis*exhibited positive ionotropic andchronotropic effects.The cardiac stimulant activity of dose levels were compared with standard (Digoxin 50ng/ml, 100ng/ml and 150ng/ml).The CFR-1 and CFR-2 extracts at10mg/ml 20mg/ml and 40mg/ml dose level showed slightly positive ionotropic andchronotropic effect. But the root extracts (SGOC) and (SGOC-M) exhibited potent cardiac stimulant activity.

INDTRODUCTION

The author has extended the work on a pharmacological evaluation of two species of *Corchorus ,C.olitorius and C.fascicularis.* The *Corchorus*species are mainly used as apurgative, febrifuge, diuretic, useful in chronic cystitis, gonorrhoea and dysuria, antihistaminic, antimalarial, anticonvulsant, antioesterogenic, anticancer and cardiotonic. [1-30]Various animal models exist for the evaluation of cardiotonic activity of plant extracts.

Cardiac stimulant activity on isolated Mammalian Heart preparation

The root extracts of *Corchorusolitorius*(SGOC), (SGOC-M)and*Corchorusfascicularis*(CFR-1),(CFR-2) were tested for cardiac stimulant activity. and hence the method was expressed below.

MATERIALS AND METHODS

Plant Extracts

SGOC (Chloroform extract of *Corchorusolitorius* roots)

SGOC-M (Methanolic extract of *Corchorusolitorius* roots)

CFR-1(Chloroform extract of *Corchorusfascicularis* roots)

CFR-2 *(*Methanolicextract of *Corchorusfascicularis* roots)

MaterialsSodium Chloride (NaCl)

Sodium Bicarbonate ($NaHCO_3$)

Potassium Chloride (KCl)

Magnesium Sulphate ($MgSO_4$)

Potassium Di-hydrogen Phosphate (KH_2PO_4)

Calcium Chloride ($CaCl_2$)

The Composition of perfusion fluids used in isolated perfused heart experiments vary, but those used in most studies are based on the Krebs-Hanseleit perfusion fluid model [31]. This fluid which is supposed to mimic both the key ionic composition and the pH of blood has the following composition: Sodium chloride (NaCl) 118.5mM, Sodium bicarbonate ($NaHCO_3$) 25.0mM, Potassium Chloride (KCl) 4.7mM, Magnesium Sulphate ($MgSO_4$) 1.2mM, Potassium Di-hydrogen Phosphate (KH_2PO_4) 1.2mM, and Calcium Chloride ($CaCl_2$) 2.5mM. The pH of the buffer solution at optimal temperature of 37.0 ^oC is 7.4, and the energy requirement of the working heart is supplied by adding glucose. The problems of precipitating calcium and phosphate ions is reduced by lowering the pH by gassing the solution with 95%O_2 + 5%CO_2 before adding calcium chloride.

Animals

Healthy Dunkin Hartly guinea pigs, weighing 300-400g were used in this study as they provided the best compromise between size and heart rate, as against rabbits which have heart rates that are quite high.

METHODS

For the present work the isolated perfused heart Langendorff and working heart model was used for evaluating the extracts. Healthy Dunkin Hartly guinea pigs, weighing 300-400g were used in this study.The animals were anaesthetized using sodium thiopental (50mg/kg) administered by intra-peritoneal injection, heparin was administered (5000U/kg) intra-peritonially while maintaining artificial ventilation, the chest was opened at the median line and the pericardium was opened widely A perfusion canula was immidatly inserted in to the ascending aorta to perfuse the coronary arties with Krebs-Hanseleit buffer solution equilibrated with 95% O_2 and 5% CO_2 (Ph 7.4) at constant temperature (37°C). the heart was removed from the chest and connected to the Lanendorrff apparatus under a constant pressure (60mmHg). The heart contractly and heart rate (HR) were measured by an isotonic transducer and data was recorded by physiograph.

Protocol of the experiment

Animals were divided into 5 groups, each group receiving different test and standard drug substances.

a) GroupI. digoxin standard

(Concentrations (ng/ml) 50,100 and 150)

b) Group II. Chloroform extract of *C.olitorius*(SGOC)

(Concentrations (mg/ml) 10,20 and 40)

c) Group III methanolic extract of *C.olitorius*(SGOC-M)

(Concentrations (mg/ml) 10,20 and 40)

d) Group1V chloroform extract of *C.fascicularis*(CFR-1)

(Concentrations (mg/ml)10,20 and 40)

e) Group V methanolic extract of *C.fascicularis*(CFR-2)

(Concentrations (mg/ml) 10,20 and 40)

Parameters assessed

The results obtained show the cardiac effects of both standard and test substances on anaesthetized guinea pig perfused hearts. Tables and graphs listed below would be used to explain the observed effects of both standard and test substances on the various parameters monitored during the study.

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RESULTS AND DISCUSSION

Table 1: Effect of Digoxin on normal isolated increase heart rate (beats/min)

S.No	Concentrations (ng/ml)	Heart rate (beats/min)
1	Normal	37
2	50	130
3	100	132
4	150	131

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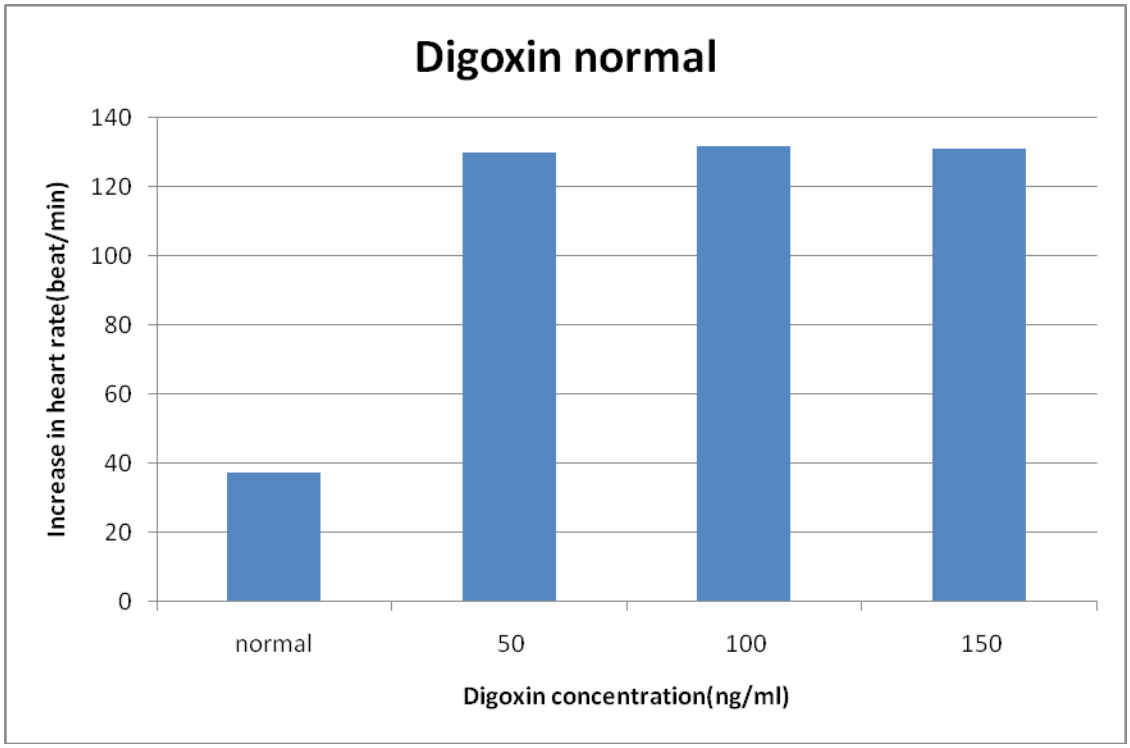

Table 2: Effect of Digoxin on normal isolated Cardiac output (ml/min)

S.No	Concentrations (ng/ml)	Cardiac output (ml /min)
1	Normal	3
2	50	2.8
3	100	2.8
4	150	2.6

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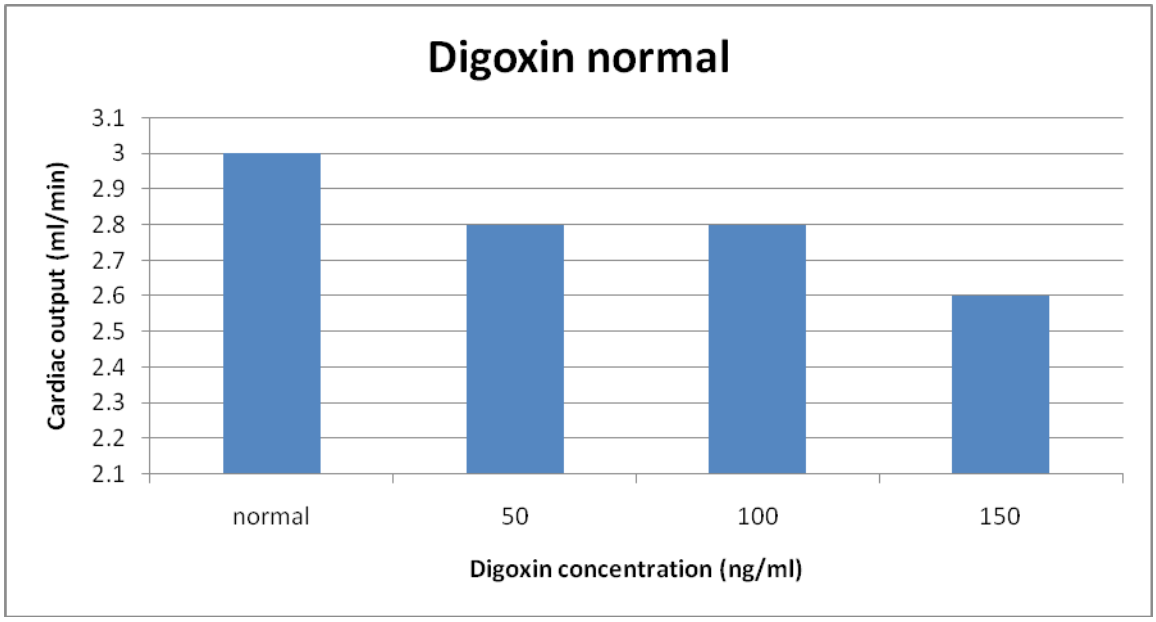

Table 3: Effect of Digoxin on normal isolated increase in contraction amplitude (mm)

S.No	Concentrations (ng/ml)	Concentration amplitude(mm)
1	Normal	10
2	50	15
3	100	14

4	150	12

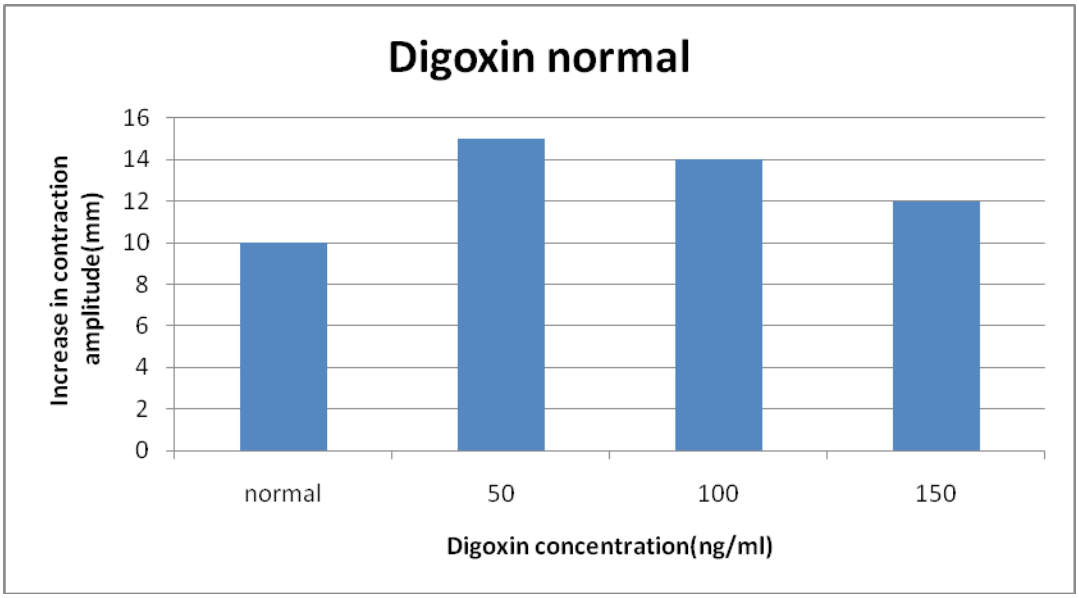

Table 4: Effect of *C. olitorius* root chloroform extract (SGOC) on normal Isolated increase in heart rate (beats/min)

S. NO.	Concentrations (mg/ml)	Heart rate (beats/min)
1	Normal	62
2	10	78
3	20	76
4	40	56

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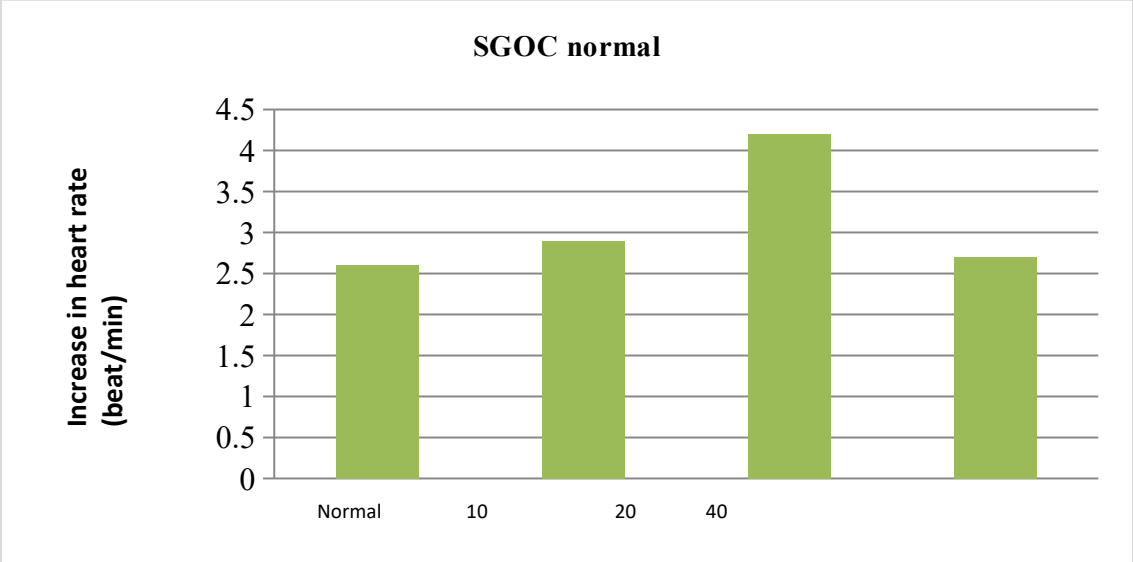

Table 5: Effect of *C. olitorius* root chloroform extract (SGOC) on normal isolated increase in contraction amplitude (mm)

S. NO.	Concentrations (mg/ml)	Heart rate (beats/min)
1	Normal	9
2	10	16
3	20	12
4	40	19

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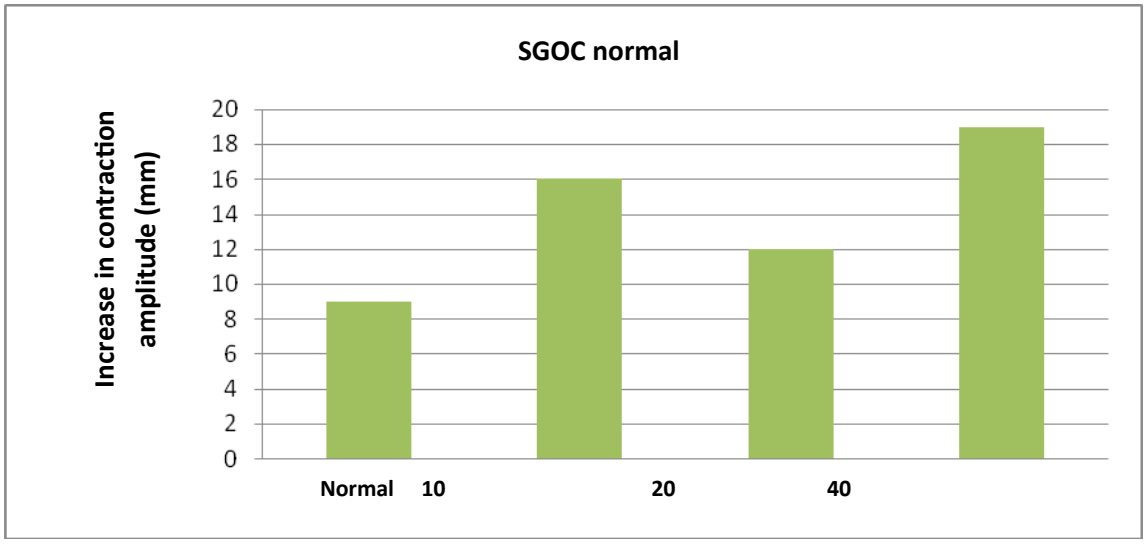

Table 6: Effect of *C. olitorius*root chloroform extract (SGOC) on normal isolated cardiac output (ml/mm)

S NO.	Concentrations (mg/ml)	Cardiac output (ml/min)
1	Normal	2.6
2	10	2.9
3	20	4.2
4	40	2.7

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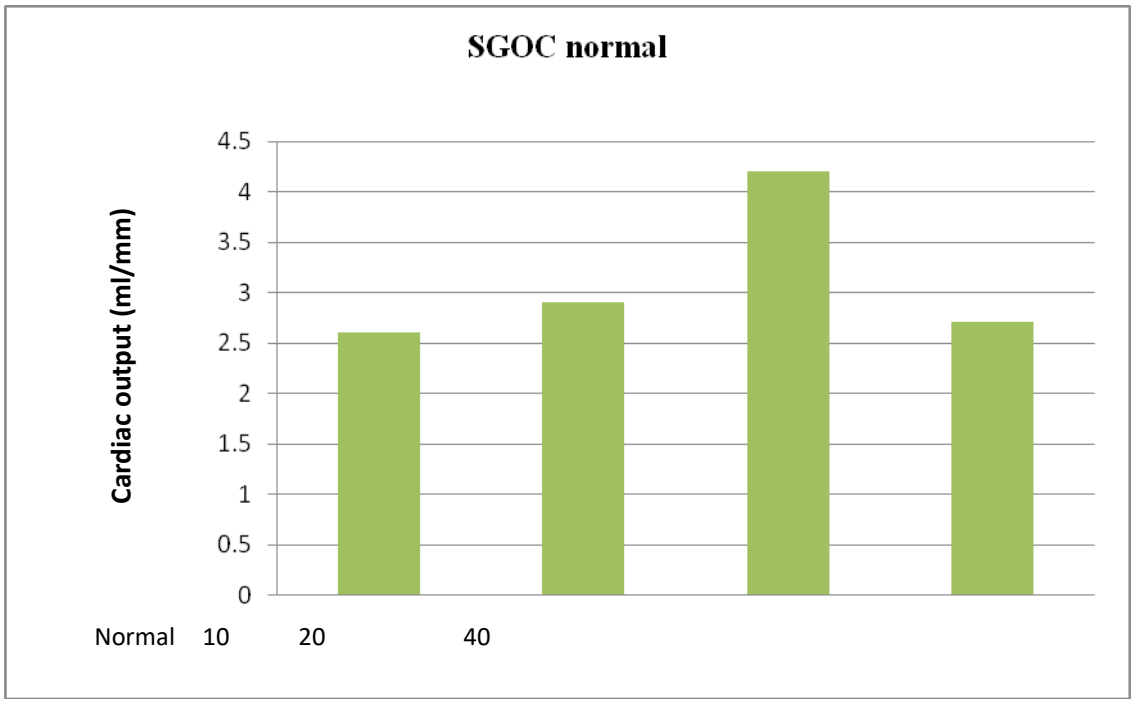

Table 7: Effect of *C. olitorius* root methanol extract (SGOC- M) on normal isolated increase in contraction amplitude (mm)

S. NO.	Concentrations(mg/ml)	Contraction amplitude (mm)
1	Normal	16
2	10	21
3	20	18
4	40	16

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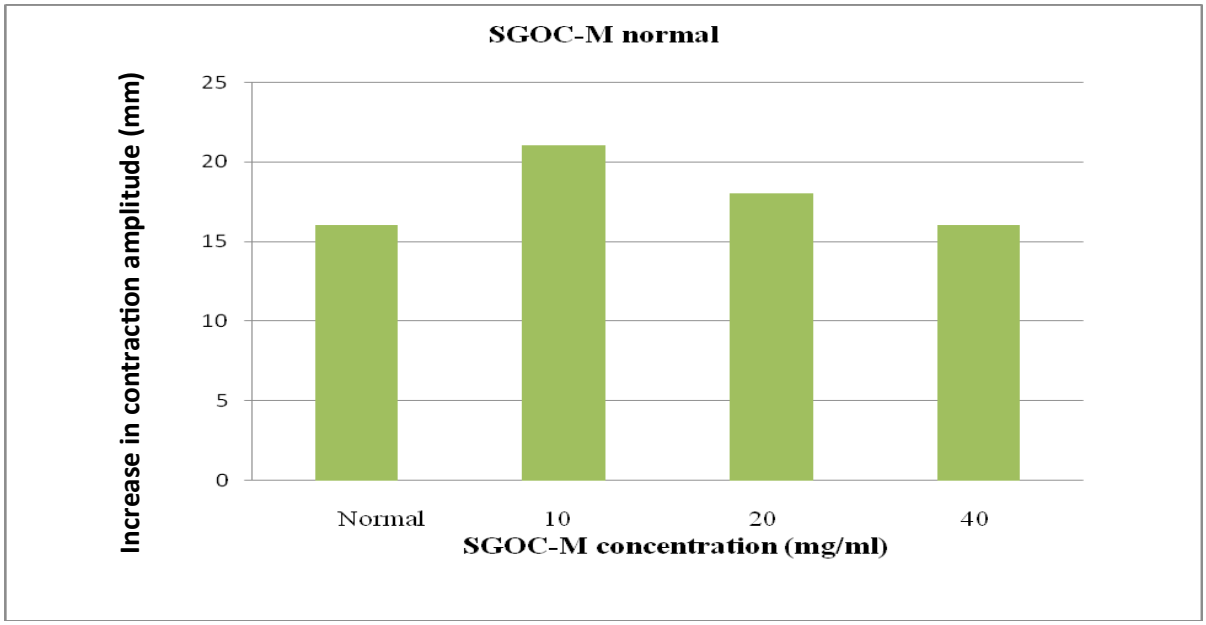

Table 8: Effect of *C. olitorius* root methanol extract (SGOC-M) on normal isolated increase in heart rate (beat/min)

S. NO.	Concentrations (mg/ml)	Heart rate (beats / min)
1	Normal	57
2	10	95
3	20	60
4	40	52

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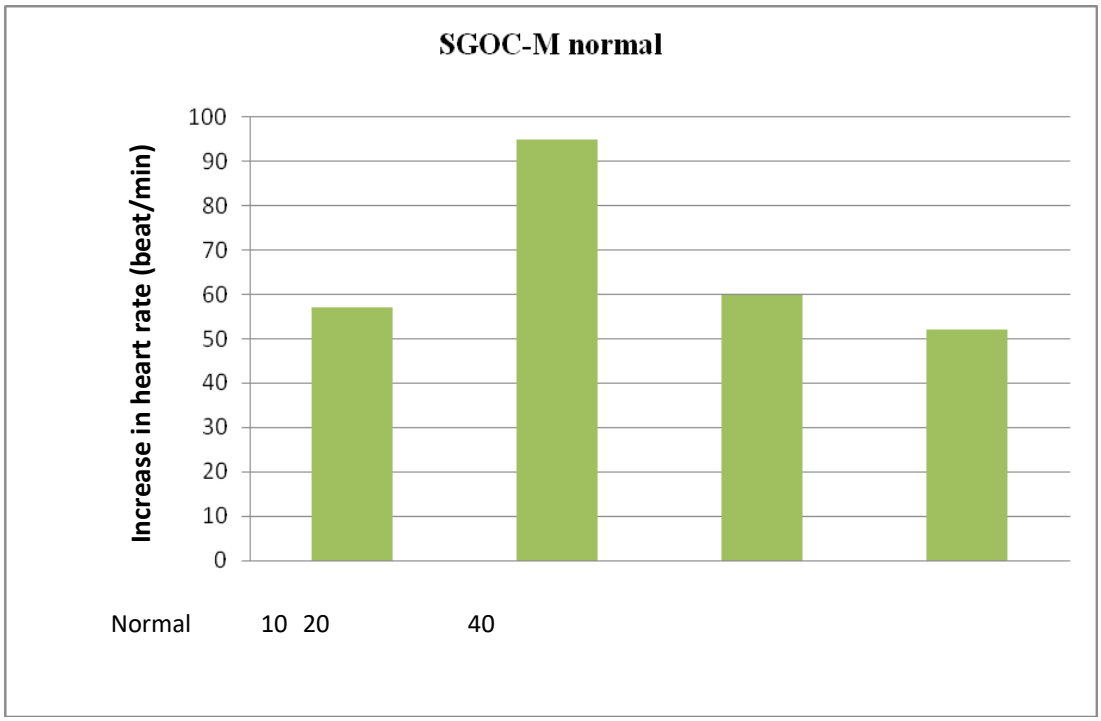


Table 9: Effect of C. *olitorius*root methanol extract (SGOC-M) on normal isolated cardiac output (ml/min)

S. NO.	Concentrations (mg/ml)	Cardiac output (ml /min)
1	Normal	2.5
2	10	1.8
3	20	1.7
4	40	1.5

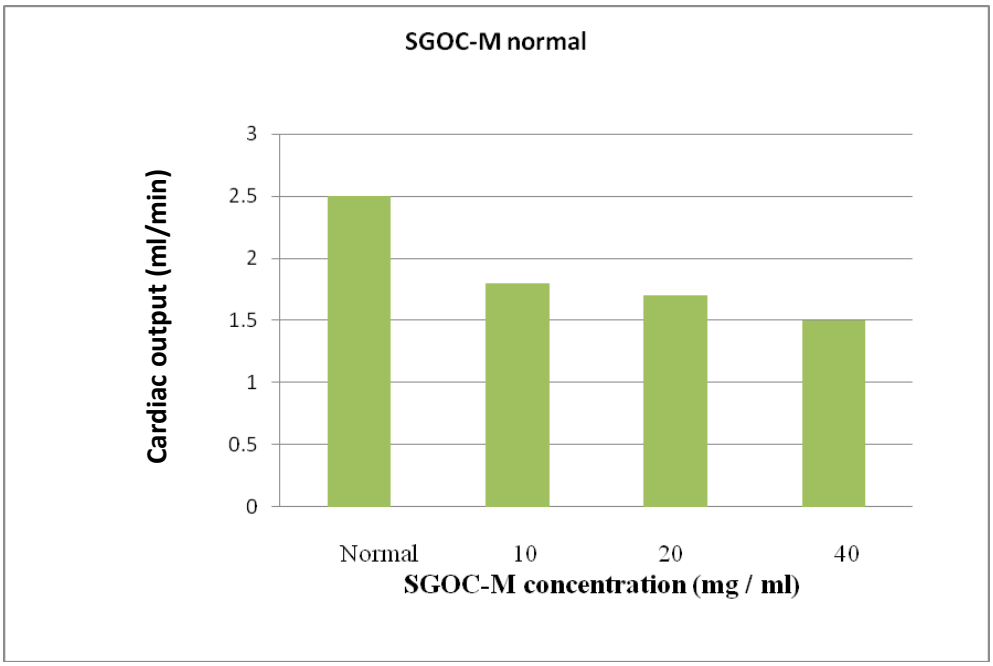


Table 10: Effect of *C.fascicularis* root chloroform extract(CFR-1) on normal isolatedincrease in heart rate (beat/min)

S.NO	Concentrations (mg/ml)	Heart rate(beats/min)
1	Normal	134
2	10	136
3	20	122

4	40	127

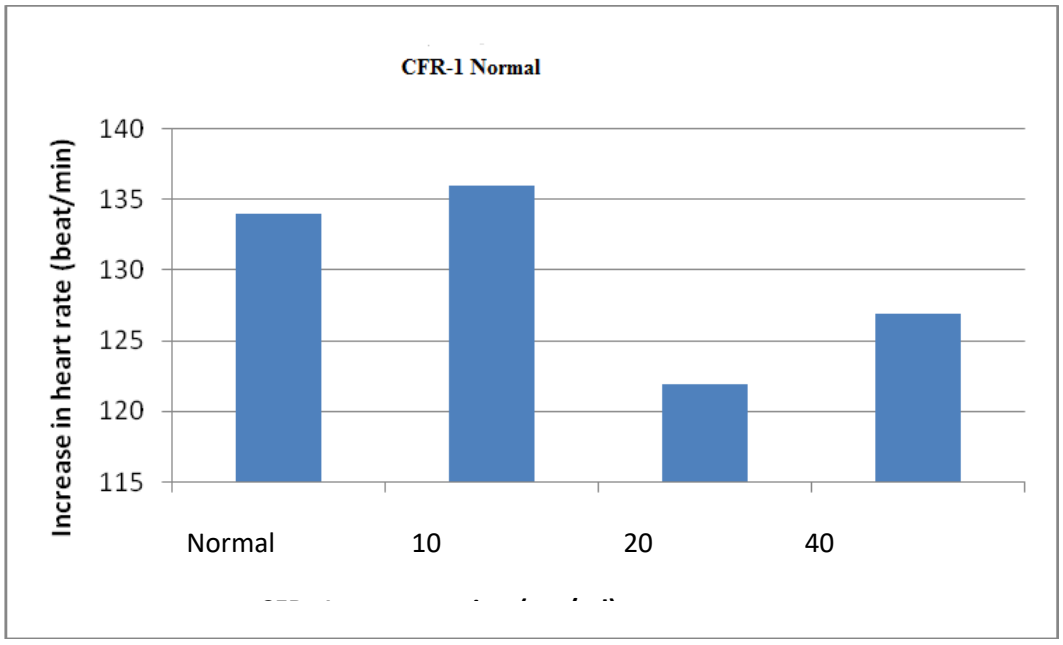


Table 11: Effect of *C.fascicularis* root chloroform extract(CFR-1) on normal isolatedcardiac out put(ml/min)

S.No	Concentrations (mg/ml)	Cardiac output(ml/min)
1	Normal	3.2
2	10	2.8
3	20	1.2

4	40	2.2

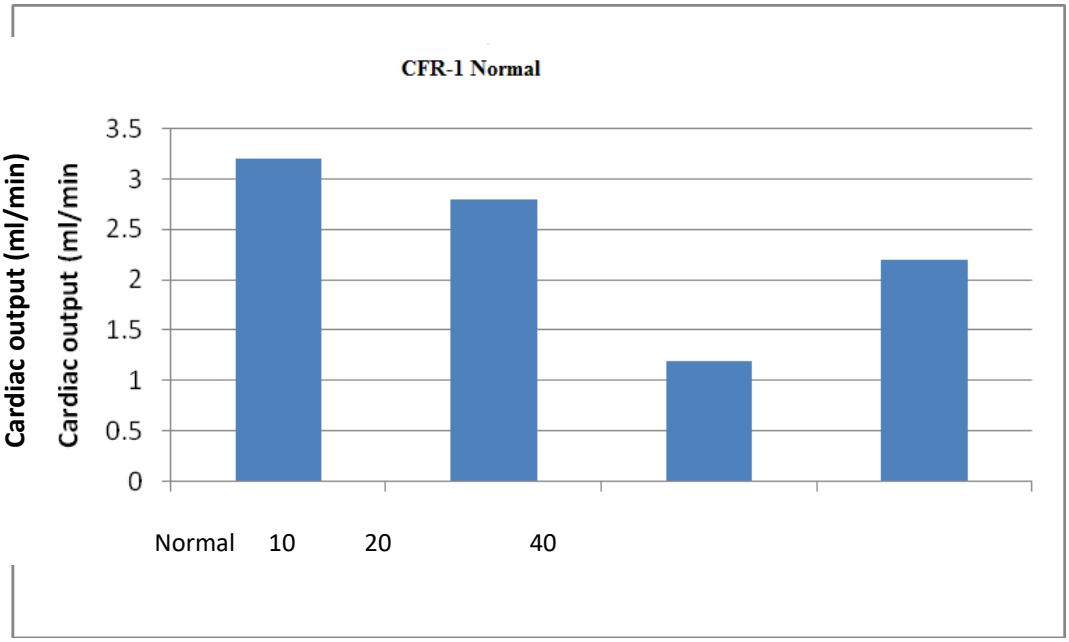


Table 12: Effect of *C.fascicularis* root chloroform extract(CFR-1) on normal isolatedincrease in concentraction amplitude (mm)

S.No	Concentrations (mg/ml)	Concentration amplitude (mm)
1	Normal	15
2	10	17

3	20	18
4	40	15

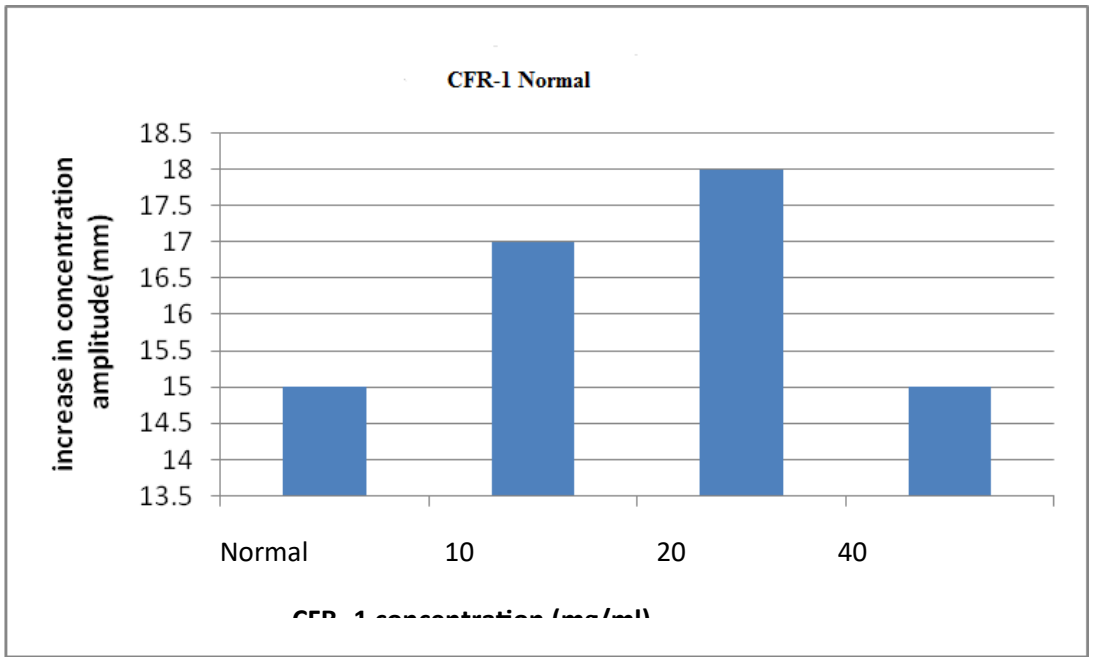


Table 13: Effect of *C.fascicularis* root methanolic extract (CFR-2) on normal isolatedincrease in heart rate (beat/min)

S.No	Concentrations (mg/ml)	Heart rate

		(beats/min)
1	Normal	57
2	10	81
3	20	81
4	40	78

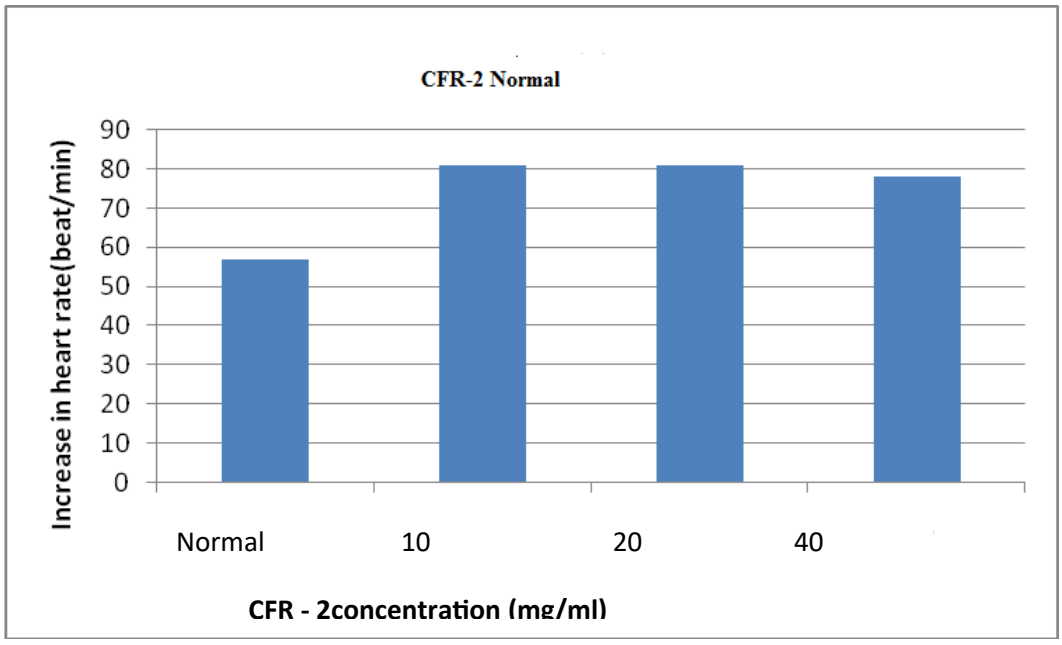


Table 14: Effect of *C.fascicularis* root methanolic extract(CFR-2) on normal isolatedcardiac output (ml/min)

S.No	Concentrations	Cardiac output

	(mg/ml)	(ml/min)
1	Normal	2.5
2	10	3
3	20	4.1
4	40	2.7

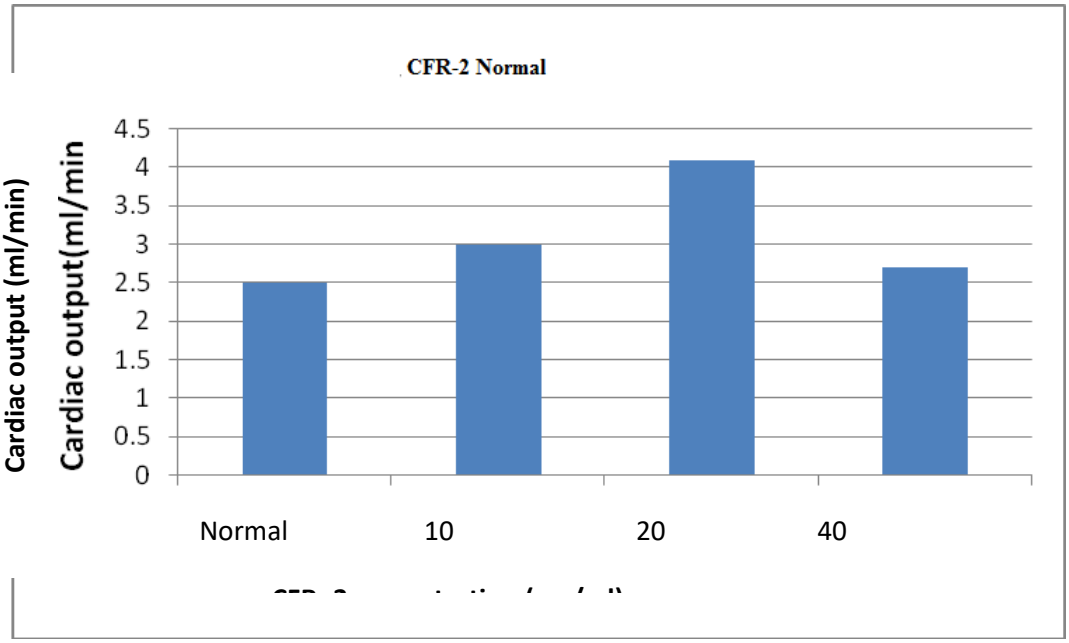
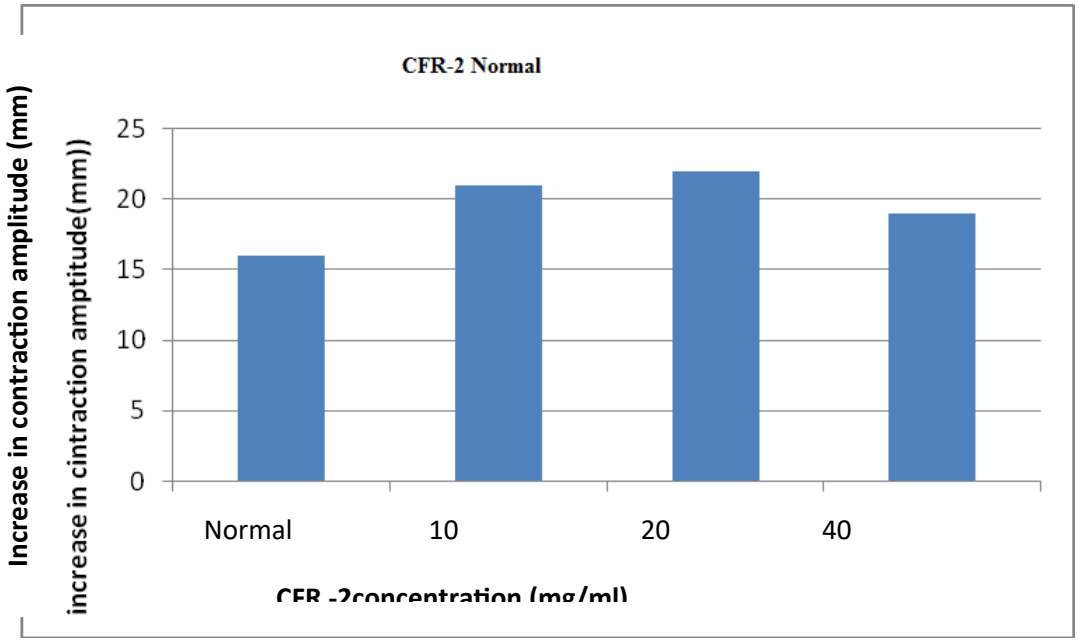


Table 15: Effect of *C.fascicularis* root methanolic extract (CFR-2) on normal isolatedincrease contraction amplitude (mm)

S.No	Concentrations	Concentration

	(mg/ml)	amplitude(mm)
1	Normal	16
2	10	21
3	20	22
4	40	19



RESULTS AND DISCUSSION

The chloroform and methanolic extracts of the roots of *C. olitorius*and *C.fascicularis* produced cardiac stimulant activity. Various concentrations of Digoxin, chloroform extracts**(SGOC),(CFR-1)** and methanolic extracts, (**SGOC-M**), **(CFR-2)** of *C.olitorius*and *C.fascicularis* were tested for cardiac stimulant activity. All their extracts studied , showed potent activity in a dose dependent manner.The extracts were administerd to the isolated heart model, and

the Heart rate (HR), Cardiac output (CO), and contraction amplitude (CA) were measured. This suggests that the extract either had a dose dependent effect on heart rate or that different constituent compounds exerted the net effect on heart rate at low and high doses.The chloroform and methanolic extracts at different dose levels 10mg/ml,20mg/ml and 40mg/ml of *C.olitorius* and *C.fascicularis*exhibited positive ionotropic andchronotropic effects.The *C.olitorous* (SGOC-M) root extract at 10mg/ml dose level the positive ionotropic effect and increased force of systolic portion and at 20mg/ml dose level negative chronotropic effect , (ie) number of heart beats was decreased . At 40mg/ml dose level positive chronotropic effect to increase heart rate beats to decreased diastolic portion. The cardiac stimulant activity activity of dose levels were compared with standard (Digoxin 50ng/ml, 100ng/ml and 150ng/ml).

The *C.olitorius*(SGOC) root extract at 10mg/ml dose level showed positive chronotropic effect and the number of heart beats was increased. At 20mg/ml dose level positive ionotropoic effect and increased heart beats were oberved. At 40mg/ml dose level a positive inotropic effect only was recorded.

The CFR-1 and CFR-2 extracts at10mg/ml 20mg/ml and 40mg/ml dose level showed slightly positive ionotropic andchronotropic effect. But the root extracts (SGOC) and (SGOC-M) exhibited potent cardiac stimulant activity.

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