

# **CARDIOPROTECTIVE EFFECTS OF VEDICINAL-9 ON ISOPROTERENOL INDUCED MYOCARDIAL INFARCTION IN RATS**

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**April 3, 2021**

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# Objectives

- **Objective:** The objective of the study is to assess the effect of pre and post treatment of Vedinical-9 in isoproterenol induced myocardial infarction in rats

# Experimental Design

<b>Group</b>	<b>Treatment</b>	<b>Route</b>	<b>Sex (No. of animals)</b>
<b>G1</b>	Isoproterenol- Single Dose	Sub cutaneous	<b>1-6</b>
<b>G2</b>	Vedicalin-9 Normal + Single Dose Isoproterenol	Oral + Sub cutaneous	<b>7-12</b>
<b>G3</b>	Vedicalin-9 Bio-enhanced + Single Dose Isoproterenol	Oral + Sub cutaneous	<b>13-18</b>
<b>G4</b>	Isoproterenol- Divided Dose	Sub cutaneous	<b>19-24</b>
<b>G5</b>	Vedicalin-9 Normal + Divided Dose Isoproterenol	Oral + Sub cutaneous	<b>24-30</b>
<b>G6</b>	Vedicalin-9 Bio-enhanced + Divided Dose Isoproterenol	Oral + Sub cutaneous	<b>31-36</b>

# Induction of Myocardial infarction

- G1- Animals received isoproterenol at dose of 60 mg/kg body weight as a single dose by subcutaneous route.
- G4 - Animals received isoproterenol at dose of 85 mg/kg body weight in to two divided doses by subcutaneous route at interval of 24 hrs.

# Observations

Following observations were recorded during experimental period;

- **Clinical Signs-** Twice a day
- **Clinical pathology evaluations-** On Day 11 blood was collected, plasma pooled and analysis of CK-MB, LDH, AST, ALT, ALT:AST, Creatinine were performed.
- **Gross Pathology Observations-** At necropsy and cross sections of formalin fixed heart.
- **Heart Weights-** Absolute heart weights recorded at the time of necropsy.
- **Histopathology-** Heart weight and histopathological observations of the heart.

# Clinical Chemistry

## Isoproterenol + Vedicinals-9 Formulation

	Group	CREAT (mg/dl)	GPT (U/L)	GOT (U/L)	CK-MB (U/L)	LDH (U/L)
Mean	G1-Single isoproterono I	0.83	135.43	113.45	137.92	410.23
SD		0.19	24.77	9.21	16.06	90.17
N		6	6	6	6	6
Mean	G2-Vedicinal- 9 normal	0.81	113.33	109.78	128.93	375.47
SD		0.19	24.76	10.39	8.18	71.86
N		6	6	6	6	6
Mean	G3-Vedicinal- 9 bioenhanced	0.71	89.53*	100.62	116.55*	342.70
SD		0.17	13.54	10.52	8.44	89.20
N		6	6	6	6	6

# Clinical Chemistry

## Isoproterenol + Medicinals-9 Bio-enhanced Formulation

	GROUP	CREAT (mg/dl)	GPT (U/L)	GOT (U/L)	CK-MB (U/L)	LDH (U/L)
Mean	G4	0.68	89.55	140.70	145.14	486.28
SD		0.32	12.83	35.13	14.18	85.19
N		6	6	6	6	6
Mean	G5	0.58	100.50	116.17	133.37	407.08
SD		0.13	19.70	17.41	9.63	62.96
N		6	6	6	6	6
Mean	G6	0.58	88.95	114.13	124.97*	374.63
SD		0.17	22.20	50.86	10.02	112.95
N		6	6	6	6	6

# Results

## Clinical Chemistry

- **Clinical pathology evaluations-**

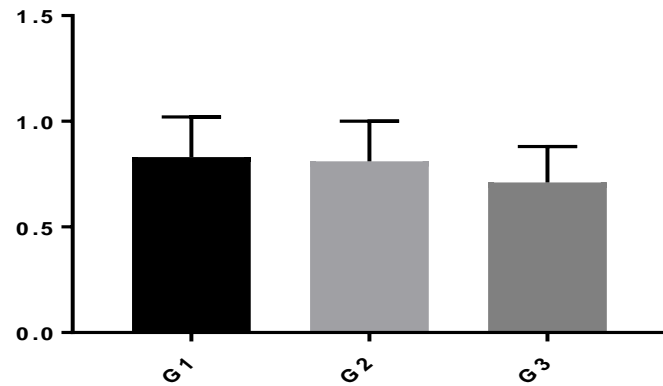
- Isoproterenol administration at single dose showed more damage than that caused by the divided doses of isoproterenol.
- In the experimental group receiving single dose of isoproterenol both treatments, normal formulation and bio-enhanced formulation of Vedicinal-9 has brought the increased GPT values of all clinical chemistry parameters to normal, however the bio-enhanced more pronounced effects on these parameters compared to normal formulation.
- Similar results observed in the experimental group receiving divided doses of isoproterenol, except for the creatinine and GPT parameters where normal formulation of vedicinal-9 has similar or no recovery effects compared to bio-enhanced formulation. For remaining parameters bio-enhanced formulation performed better than normal formulation.



# Results

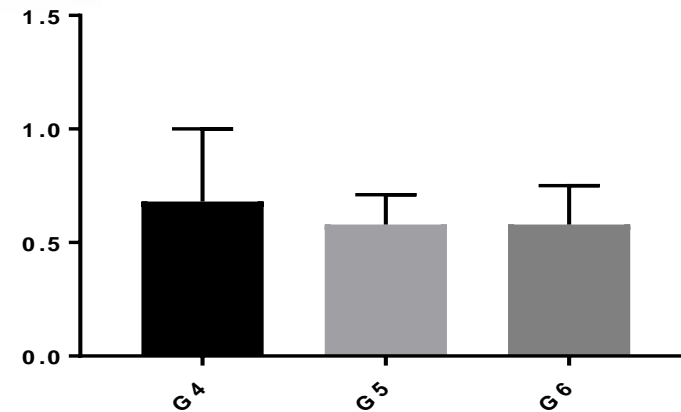
## Clinical Chemistry

CREAT



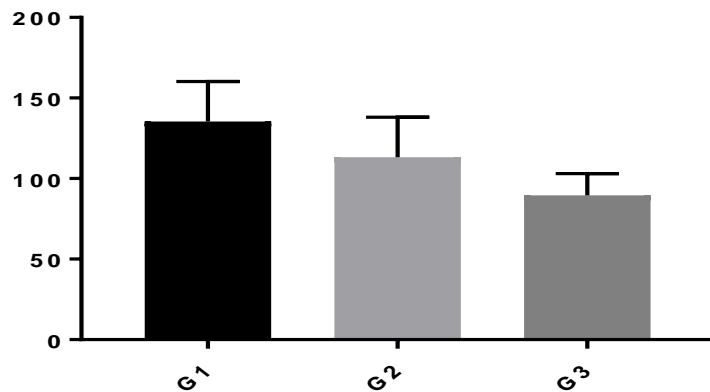
Single Dose of Isoproterenol

CREAT

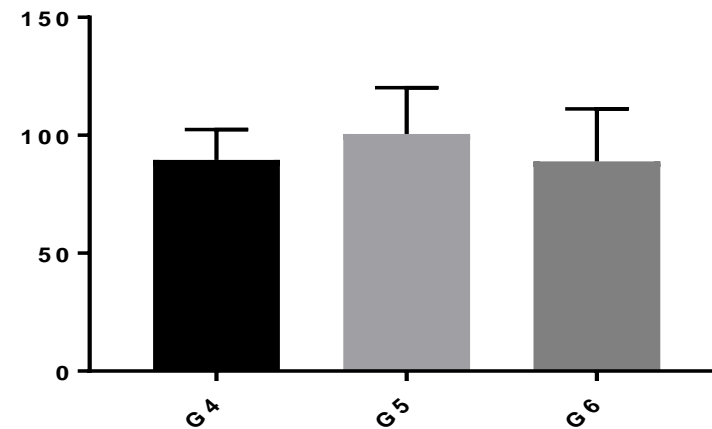


Divided Dose of Isoproterenol

GPT

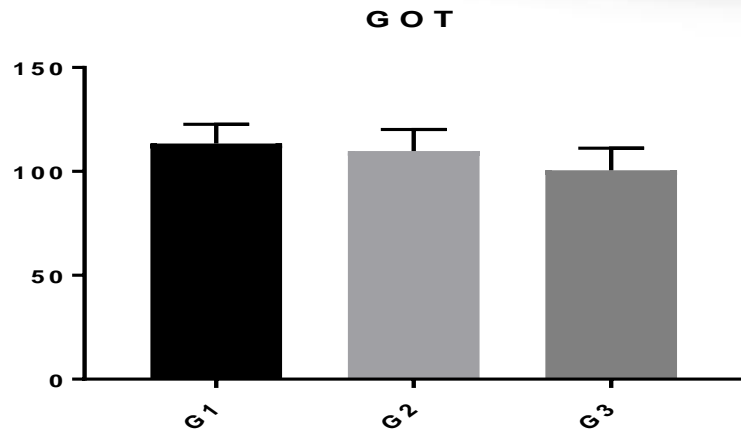


GPT

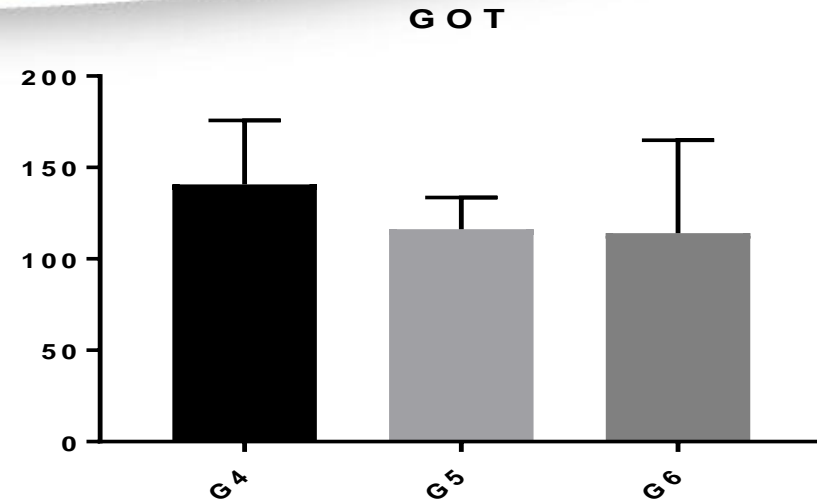


# Results

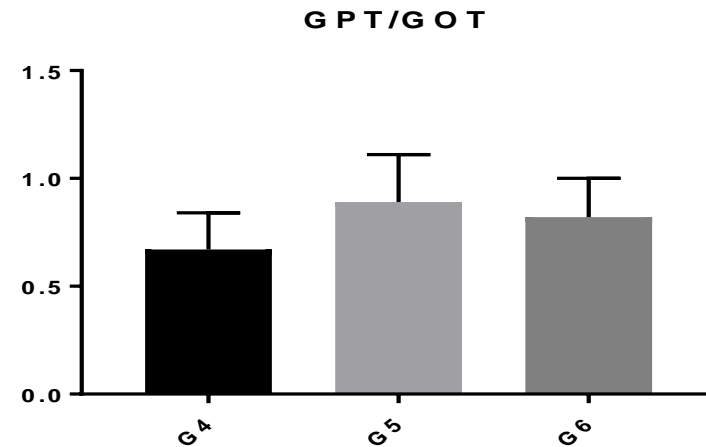
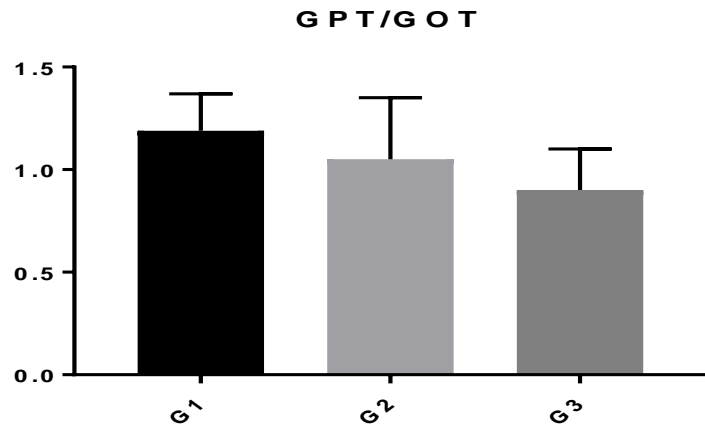
## Clinical Chemistry



Single Dose of Isoproterenol



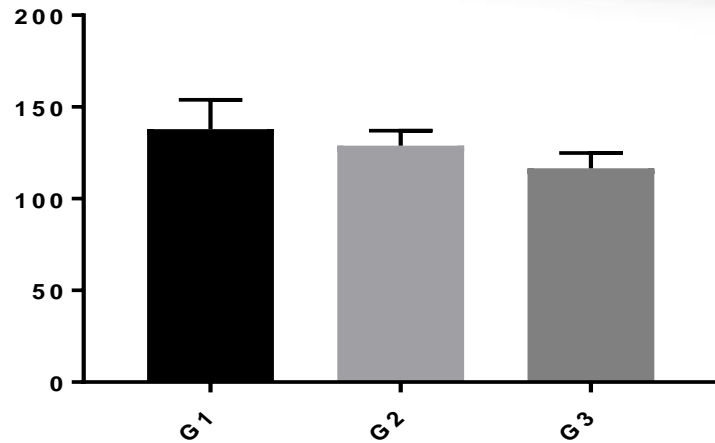
Divided Dose of Isoproterenol



# Results

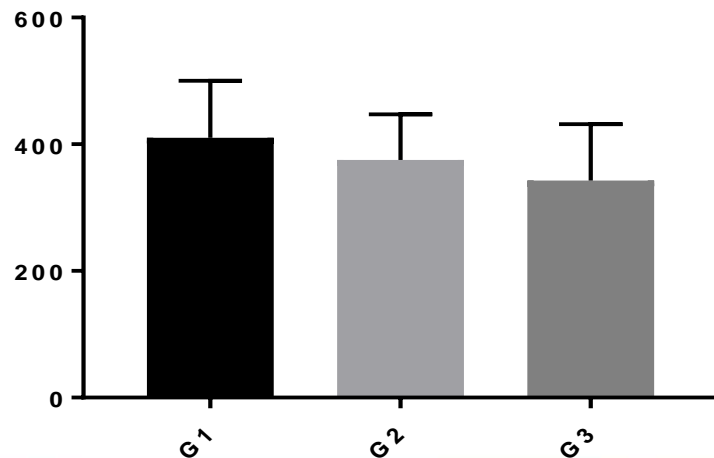
## Clinical Chemistry

CK-MB (U/L)

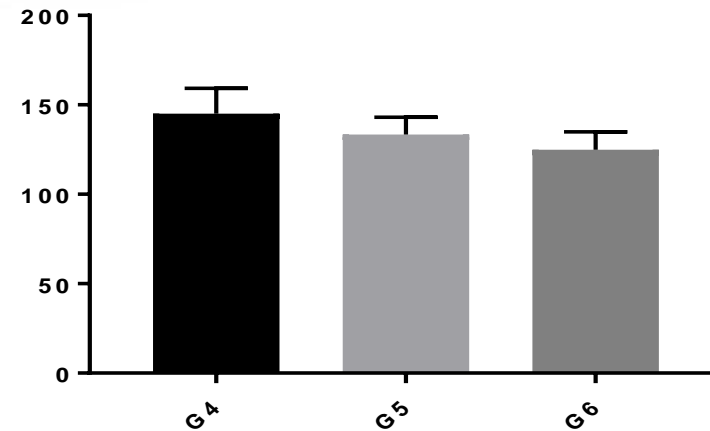


Single Dose of Isoproterenol

LDH (U/L)

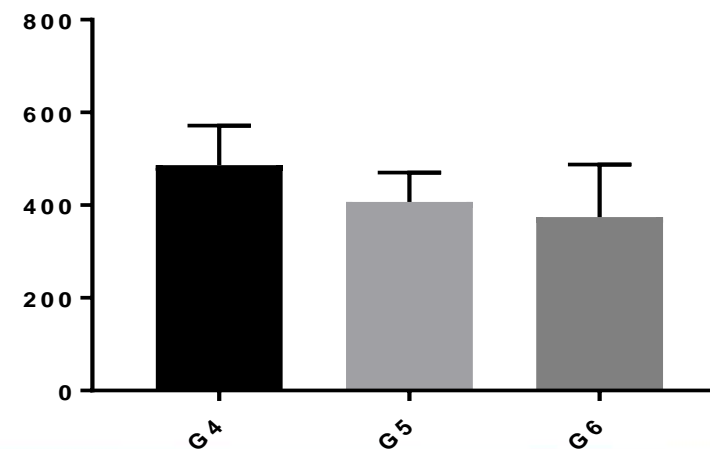


CK-MB (U/L)



Divided Dose of Isoproterenol

LDH (U/L)



# Results

## Absolute Heart Weights

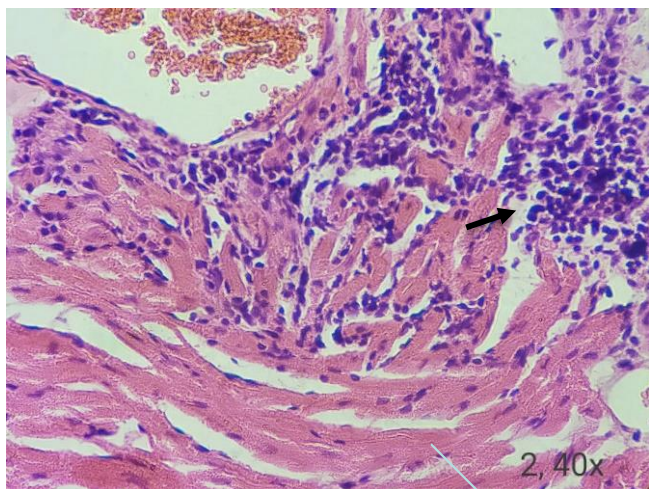
- The experimental group receiving Single dose of isoproterenol, bio-enhanced formulation of Vedicinal-9 reduced the heart weights. Divided doses of isoproterenol, bio-enhanced Vedicinals-9 formulation significantly increased heart weights above that of normal Vedicinals-9 formulation or only isoproterenol.

Tissue/ Findings/Sex				Females		
Dose Group	G1	G2	G3	G4	G5	G6
Dose (mg/kg)	Isoproterenol (Single Dose 60)	Vedicinals-9 (100)	Vedicinals-9 Bioenhanced (100)	Isoproterenol (Divided Dose 85)	Vedicinals-9 (100)	Vedicinals-9 Bioenhanced (100)
Number Examined	6	6	6	6	6	6
Heart						
Mean	0.75	0.76	0.71	0.72	0.77	0.78*

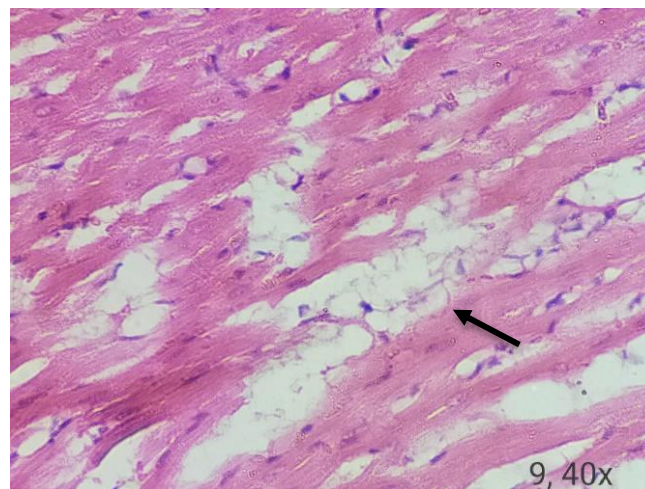
# Results

## Histopathology

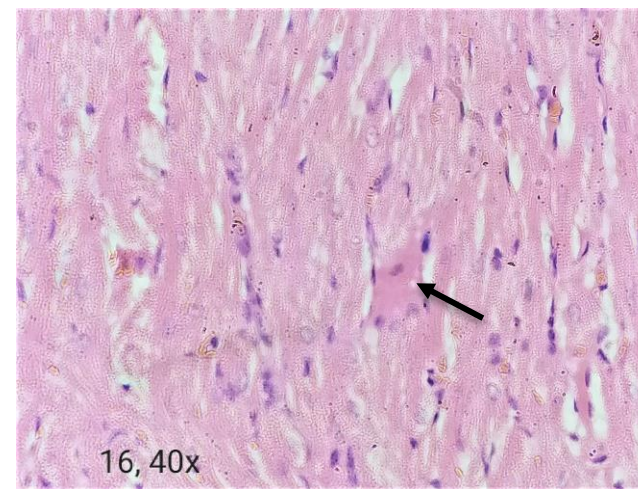
### Isoproterenol + Vedicinals-9 Formulation



**Group 1:** Isoproterenol – Mild myocardial degeneration, infiltration of inflammatory cells, and extra-vascular RBCs. H &E, 40X



**Group 2:** Isoproterenol+Vedicinal-9 – Minimal myocardial degeneration, vacuolations, No infiltration of inflammatory cells, and no hemorrhages seen. H &E, 40X

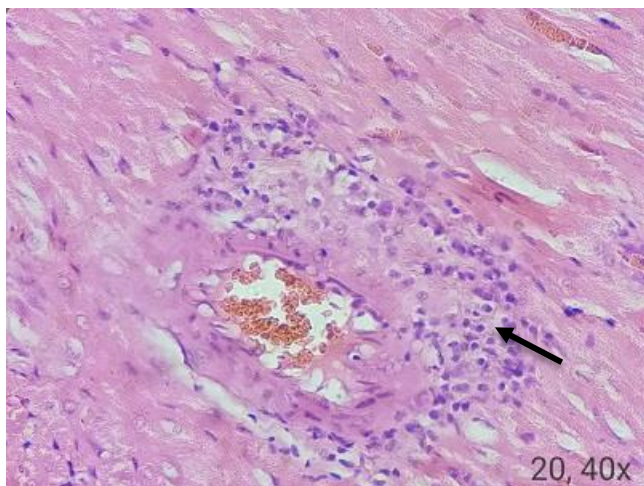


**Group 3:** Isoproterenol+Vedicinal-9 bioenhanced – Minimal myocardial degeneration, No infiltration of inflammatory cells, and No hemorrhages or vacuolations seen. H &E, 40X

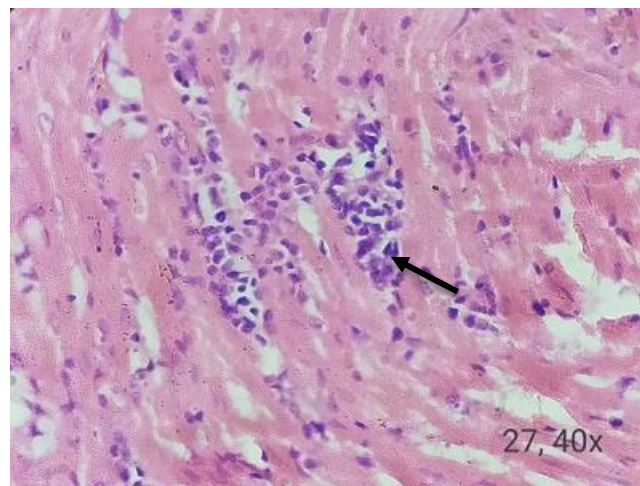
# Results

## Histopathology

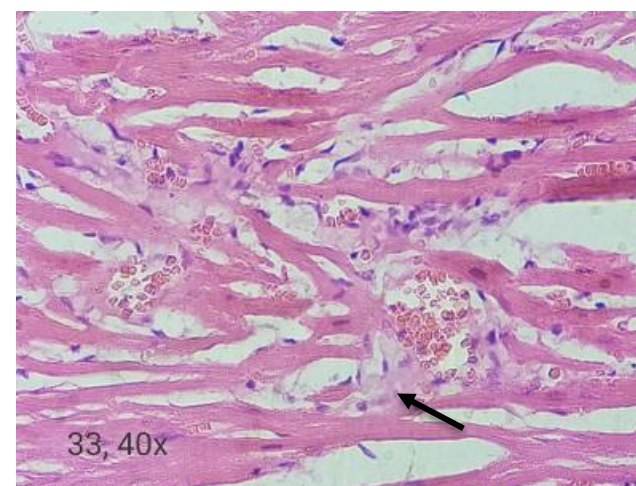
### Isoproterenol + Vedicinals-9 Bio-enhanced Formulation



**Group 4:** Isoproterenol Divided dose – Minimal myocardial degeneration, infiltration of inflammatory cells, and extra-vascular RBCs. H &E, 40X



**Group 5:** Isoproterenol+Vedicinal-9 – Minimal myocardial degeneration, and minimal focal infiltration of inflammatory cells, and no haemorrhages seen. H &E, 40X



**Group 3:** Isoproterenol+Vedicinal-9 bioenhanced – Minimal myocardial degeneration and infiltration of inflammatory cells, and minimal focal fibrous tissue proliferation seen. H &E, 40X

# Conclusions

- Based on the present study conditions, it can be concluded that the both formulations of Vedicinals-9 showed cardioprotective activity, whereas Bio-enhanced formulation performed better than that of normal Vedicinals-9 formulation.

*Thank you !*



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