UGC Project Title: To evaluate Antiatherosclerotic activity of Indian red scorpion venom (*Mesobuthus tamulus*) in experimental animals.

Summary:

In our study SV was evaluated for its fibrinolytic properties in In-vitro blood clot dissolving method and shown to decreased stain area of blood stained cloth as compared to control. In artificial blood clot degradation method, the color intensity is higher in test tube containing SV compared to control and hence, it can be stated that SV have fibrinolytic activity.Thrombolytic effect of SV was evaluated by UV spectroscopic bioassay method. Linear relationship was observed between concentration of SV and decreased in absorbance of dispersed clot. In vitro blood clot lysis (measuring diameter) activity evaluated by using different concentrations of SV caused concentration dependent clot lysis when compared to control group. In vitro blood clot lysis (measuring weight) method the percentage (%) clot lysis by SV was statistically significant when compared to control. The SV showed moderate clot lysis activity in both the models. This indicates thrombolytic activity of SV.

Dyslipidaemia and hypertriglyceride are the two major risk factors which develop atheroma in human have been reported. To evaluate antihypertriglyceridaemic and hypolipidaemic activity of SV, protein enriched diet with 20% fructose induced hypertriglyceridaemia (H. Gerhard Vogal of pharmacology) and 25% fructose induced hyperlpidaemia model (Borate et al 2011) was used. Fructose makes overexpression of suppressor of cytokine signaling 3 (SOCS3) evoked by high protein through signal transducer and activator of transcription 3 (STAT3) blocks hepatic leptin (protein) signaling transduction targeting janus-activated kinase-signal transducer 2 (JAK2) (Vila L et.al 2008). The impairment of leptin signaling transduction is involved in fructose induced VLDL overproduction and TG hypersynthesis in fructose-fed rats (Li J.M et.al 2010). In SV treated group serum triglycerides and VLDL level was significantly reduced as compared to control group. Blood sample of SV treated animals shown increased clotting time, which may be due to the fibrinolytic activity of SV. In hyperlipidaemia model Fructose is metabolised into“glycerol-3-phosphate” and “acetyl CoA”. These two intermediate metabolites are then used as substrates for glycerides synthesis, contributing

to VLDL-TG production in liver. The exposure of liver to such large quantities of fructose leads to rapid stimulation of lipogenesis and TG accumulation and synthesizes LDL and reduces HDL to below normal level (Park OJet.al1992, Kelley GL et.al 2004). In SV treated groups lipid profile was approached to normal which found to be elevated in control group. Elevation of liver enzymes occurs due to the synthesis and accumulation of lipids takes place in liver and show toxic effect (Borate A.R et.al 2011). Presence of nontoxic lipolysis activating protein LVP1 (Bot) in SV has been reported (Soudani et al, 2005). This protein may be present in Indian red scorpion venom which responsible for hypolipidaemic activity. SV and Fenofibrate treated group was significantly reduced the elevated liver enzyme and liver weight when compared to control group.

As SV showed fibrinolytic, thrombolytic and antihypertriglyceridaemia and hypolipidemic activity which are supportive for atherosclerotic treatment hence, we have carried out high fat (lipid) diet induced atherosclerosis model in rat. The inflammatory biomarker i.e. CRP level in serum was negative in treated animals whereas control group was positive, as the anti-inflammatory property has been proved.

It was found that SV and AVT treated group showed decrease LDL, VLDL, TG, TC level and increased in HDL level when compared with control group, It was also found that oxidative stress may be relieved by increasing SOD, Catalase, and decrease MDA level in SV and AVT treated group when compared to control group. SV and AVT treated group was showed to increase SOD, catalase and decrease MDA level Therefore it able to relieve oxidative stress. SGOT, SGPT, ALP was elevated in control group whereas SV and standard treated group was found to reduce the level of SGOT, SGPT and ALP. On haematological parameters SV and standard treated group significantly reduced WBC count, platelet count, ESR when compared to control group.

In histopathology of aorta, it showed destroyed endothelial cell, infiltration and lipid deposition in control group animals which indistinct in SV treated group. Deranged and dysregular muscle cells were found in cardiac muscles histopath of control group whereas in standard and SV treated group did not show any abnormality.

Thus, we can state that SV is having fibrinolytic, thrombolytic avtivity hence; it showed antiatherosclerotic activity in experimental animal.