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Effect of an aqueous extract of *Ajuga iva* on glycaemia, reverse cholesterol transport and atherogenic ratios in rats with streptozotocin-induced diabetes

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Experimental evidence suggests that hyperglycaemia is commonly associated with hyperlipidaemia[1,2]. The present study was undertaken to investigate the effect of an aqueous extract of *Ajuga iva* L. Schreiber (Lamiaceae; *Ai*) on blood glucose, serum and lipoprotein lipid profiles and lecithin:cholesterol acyltransferase (LCAT) activity in rats with streptozotocin-induced diabetes.

Twelve rats with diabetes were divided into two groups that were fed a casein diet either with or without an *Ai* supplement (5 g/kg diet) for 4 weeks. Experimental diabetes was induced by intraperitoneal injection of streptozotocin as a single dose of 60 mg/kg body weight. HDL subfractions were separated by differential dextran sulphate–$MgCl_2$ precipitation and LCAT activity was determined by conversion of [^{3}H]cholesterol (unesterified; UC) to [^{3}H]cholesteryl esters (CE).

Ai treatment significantly decreased glycaemia (−41 %) and liver total cholesterol (TC; −33 %), TAG (−30 %) and phospholipids (PL; −47 %). In the *Ai*-treated rats compared with the untreated rats hypocholesterolaemia (−33 %) and hypotriacylglycerolaemia (−72 %) were observed with a concomitant reduction in LDL-HDL_1-cholesterol (−50 %), VLDL-cholesterol (−56 %) and VLDL-TAG, whereas HDL-cholesterol remained unchanged for both groups. Moreover, plasma apoB concentration was 2-fold lower, while that of apoA was 2.4-fold higher.

Group.....	Untreated		*Ai*-treated	
	Mean	SE	Mean	SE
LCAT (nmol/ml per h)	10.0	1.93	14.86*	1.29
ApoA (g/l)	0.98	0.12	2.31***	0.24
HDL_3-PL (mmol/l)	0.90	0.12	0.27**	0.08
HDL_3-UC (mmol/l)	0.21	0.02	0.09**	0.03
HDL_2-CE (mmol/l)	0.39	0.03	0.56	0.19

Mean values were significantly different from those for the untreated group: *$P<0.05$, **$P<0.01$, ***$P<0.001$.

LCAT activity was 1.5-fold higher in the *Ai*-treated rats than in the untreated rats. Moreover, HDL_3-PL and HDL_3-UC were decreased by 57 % and 70 % respectively, whereas HDL_2-CE was similar for both groups. Also, the atherogenic ratios TC : HDL-cholesterol, VLDL-LDL-cholesterol : HDL-cholesterol and apoB:apoA were decreased by 31 %, 46 % and 79 % respectively in *Ai* treated rats *v*. untreated rats.

These results suggest that *Ai* treatment is effective in decreasing the level of glycaemia and attenuating dyslipidaemia in rats with streptozotocin-induced diabetes by reducing plasma lipids and inversely increasing reverse cholesterol transport.

1. Annida B & Stanely Mainzen Prince P (2004) *J Med Food* **7**, 153–156.
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