

## **Comparative Study between the Effect of Ginger and Cinnamon Aqueous Extracts and their Mixtures on Hyperlipidemic Rats**

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### **Abstract**

This study was performed to comparing the effect of different levels of ginger and cinnamon extracts and their mixture on Hyperlipidemic rats. Sixty six adult albino rats were divided into eleven groups (6 rats each group). Group1: Negative control group fed on standard diet, group 2: Positive control group fed on high fat diet (HFD). Group: 3, 4 and 5 the rats fed on high fat diet (HFD) containing 200mg, 300mg and 400mg/100g diet ginger water extracts concentrated (Con). Group: 6, 7 and 8 the rats fed on HFD containing 200, 300 and 400mg cinnamon water extracts Con.. Group: 9, 10 and 11 the rats fed on HFD containing mixture (100mg ginger+100mg cinnamon extracts Con.), (150 mg ginger + 150mg cinnamon extracts Con.) and (200mg ginger+200mg cinnamon water extracts Con.) for 8 weeks. The aqueous extract of ginger and cinnamon are containing 1.21 mg/g and 1.15 mg /g total phenolic compounds. Meanwhile total flavonoids were 0.38 mg/g and 0.41 mg/g of ginger and cinnamon water extracts. Cinnamon extract contained high level sinapic acid ( $59.22 \pm 03 \mu\text{g/g}$ ) meanwhile ginger extract have high concentration of zingerone ( $33.28 \pm 0.01 \mu\text{g/g}$ ). The results showed that all treatment after 8 weeks caused a significantly decrease of triglycerides (TG), total cholesterol (TC), low density lipoprotein (LDL), very low density lipoprotein (VLDL) and atherogenic index (AI). The high level (400 mg) of cinnamon water extract showed a significantly decrease of TG, TC, LDL, VLDL and AI ( $67.33 \pm 7.9$ ,  $144 \pm 7.2$ ,  $99.67 \pm 5.8$ ,  $13.5 \pm 1.5 \text{ mg/dl}$  and  $0.36 \pm 0.04$ ) respectively more than ginger water extract ( $78.83 \pm 10.7$ ,  $154.17 \pm 20.1$ ,  $123.5 \pm 15.5$ ,  $15.8 \pm 2.1 \text{ mg/dl}$  and

0.44±0.05) respectively. Urea and in creatinin hyperlipidemic rat was a significant increased  $P\leq 0.05$  in contract to antioxidant enzymes were revealed a significantly decrease compared to negative control group. High concentration of cinnamon extract (400 mg) showed the highest decrease in urea (30.83±6.05 mg/dl) and aspartate amino transferase AST (22.33±1.63 IU/L) and the highest increase in superoxide dismutase (SOD) activity (0.23±0.01 IU/L). Conclusion: Using cinnamon and ginger extracts for 8 weeks have beneficial effects to reduced serum lipid profile in hyperlipidemic rats. The high concentration of cinnamon extract had hypolipidemic effect more than ginger extract because its content high levels of cinnamic acid and cinapic acid which have antioxidant effects. The present study recommended that the admenstration of cinnamon water extract when consuming high fat diet.

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Key words: Serum lipid profile, Phenolic compounds, Antioxidant enzymes, Histopathology, Liver enzymes.

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