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Effect of Aqueous Extract of Ginger (Zingiber Officinale) on some Antioxidant Enzymes in Male Rabbits

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Abstract:
This study aimed to investigate the effect of an aqueous extract of Ginger (Zingiber officinale) on some anti-oxidant enzymes in male Rabbits that were allocated into three groups, Rabbits that were randomly distributed into three groups (five Rabbits/group) control group and given distilled water orally daily, Rabbits were given 100 mg/kg aqueous extract Zingiber Officinale in 2ml distilled water orally daily and Rabbits given 200mg/kg aqueous extract of Zingiber Officinale in 2ml of distilled water orally daily. Administration of an aqueous extract of Zingiber Officinale at doses of 100mg/kg and 200mg/kg to the animals resulted in a significant increase in CAT, GPx and SOD when compare with the control group

Keywords: CAT Catalase 1, GPx Glutathione Peroxidase 2, SOD Superoxide Dismutase

Introduction

Herbal medicines had become an integral part of life in many communities and considered as a promising avenue for the discovery of new drugs due to its easy access and relatively low-cost care (Sandhya *et al*., 2006). Zingiber officinale is common is name for plant belongs to family Zingiberaceae, which contains about 1300 species in 50 genera, along with four other families is placed in the order Zingiberales (Garner-Wizard M *et al*., 2006). Nowadays ginger rhizome (Zingiber officinale R., family: Zingiberaceae), is used worldwide as a spice. Many studies were carried out on ginger and its pungent constituents, fresh and dried rhizome. The plant is completely sterile (produce no seed) and only propagated by rhizomes (Fnimh, 2001). The major part of traditional therapy involves the use of plant extract and their active constituents, herbal medicine is still the mainstream of about 75 to 80% of the whole population. Herbal medicine is very popular and gains much attention nowadays. It has been believed that it is much safer than synthetic drugs. ginger (Zingiber officinale) has a long historical medicine use dating back 2500 years in China and India. Its pharmacological properties are varied including antioxidant, anti-inflammatory, anticancer and antimicrobial activities (Ahmad *et al*., 2015).

Material and methods

A total of 15 local domestic adult male rabbits weighing 2.00 -2.32 kg were used in the present study, the animals were grouped and housed in cages (100 x 85x 45 cm) at the laboratories of the Zoology Department, Omar AL- Mukhtar University. The photoperiod was regulated at 12 hours light / 12 hours dark cycle and temperature was adjusted at 25±1˚C. The rabbits were fed on commercial standard pellet and offered drink water and libitum. The animals were acclimatized to laboratory conditions for one week before commencement of the experiment.
The dry of Ginger (Zingiber Officinale) were obtained from a local herbal market. The plant was identified and authenticated by the Herbarium of Botany Department, Faculty of Science, Omar ALMukhtar University.

The root was powdered using a commercial blender. Known weight of their powders was used as suspension in constant distilled water volume.

Rabbits were randomly distributed into three groups (five rabbits/group).

- Group I: control (G1) normal control rabbits were given distilled water orally daily.
- Group II: rabbits were given 100 mg /kg b.wt. aqueous extract of Zingiber Officinale in 2 ml distilled water orally daily.
- Group III: rabbits were given 200 mg /kg b.wt. aqueous extract of Zingiber Officinale in 2 ml distilled water orally daily (Omar and Hammam, 2016).

Results and discussion

Table 1: represents the effect of aqueous extract of ginger on antioxidant enzymes:

	Parameters	**Control**	**100mg**	**200mg**
Antioxidant enzymes	GPx (U/L)	381.8±2.23[a]	519.17±1.58[b]	631.3±2.044[c]
	CAT(U/L)	314.0±2.23[a]	463.83±2.49[b]	625.3±3.232[c]
	SOD(U/L)	424.17±2.3[a]	565.5±1.7[b]	745.0±2.42[c]

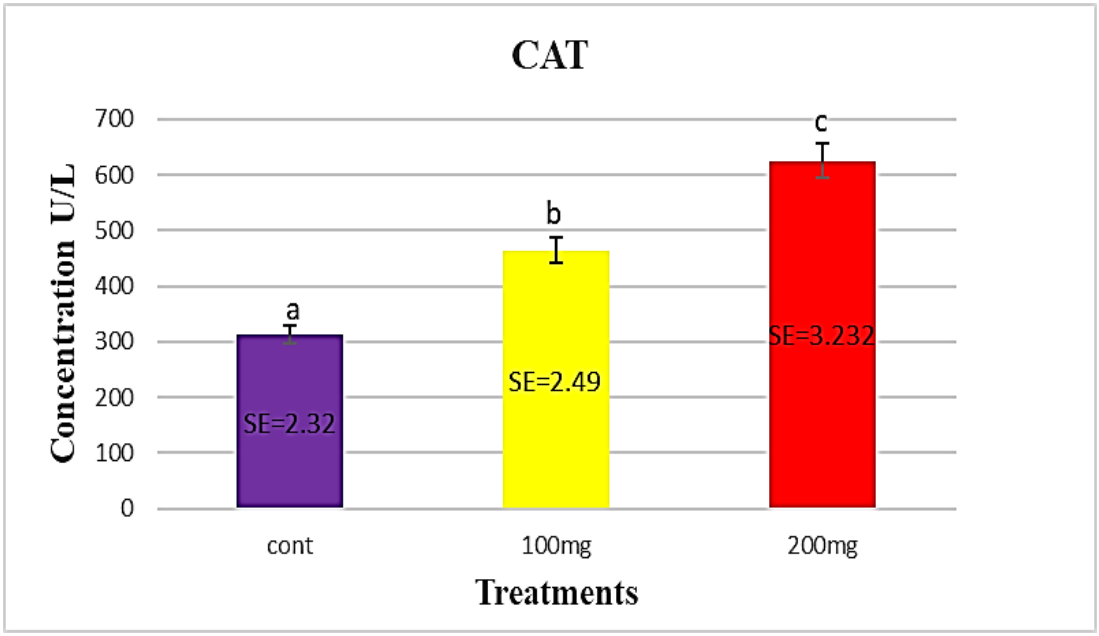

Figure 1: represents the effect of aqueous extract of ginger serum Concentration of CAT U/L

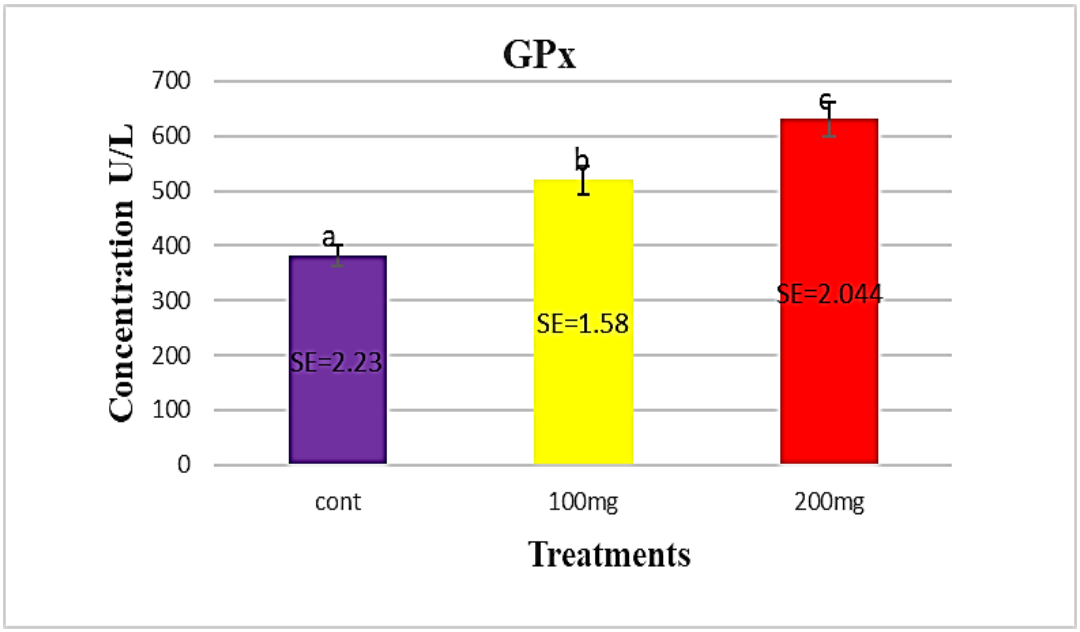

Figure2: represents the effect of aqueous extract of ginger serum Concentration of GPx U/L

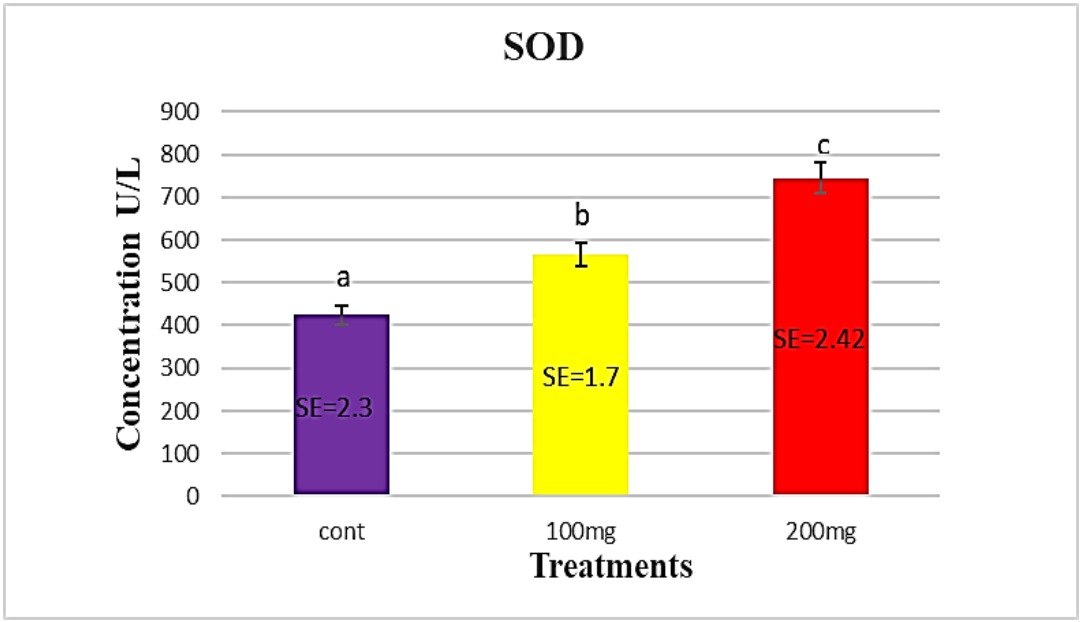

Figure3: represents the effect of aqueous extract of ginger on serum Concentration of SOD U/L

Discussion in the present study the effect of aqueous extract of Zingiber officinale on some antioxidant enzymes was assessed by the determination the levels of serum antioxidant enzymes (GPx, CAT and SOD) activity, the study revealed that the administration of aqueous extract of Zingiber officinale at doses of 100mg/kg and 200mg/kg to the rabbits caused a significant change in serum antioxidant enzymes.

Our results agreed with (Sikka, 1996). suggested that Zingiber officinale has been extensively studied for a broad range of biological activities, especially antioxidant activities, found that ginger significantly lowered lipid per oxidation by maintaining the activities of the antioxidant enzymes –super oxide dismutase, catalase and glutathione peroxides in rats.

According to these results, (Hamza *et al*., 2006) have demonstrated that, Zingiber officinale treatment increases the activities of testicular antioxidants enzyme and restores sperm motility of cisplatin-treated rats.

(Amr *et al*., 2006), reported in animal models that Zingiber officinale has protective effects against cisplatin-induced testicular damage and oxidative stress in rats. Ginger rhizome contains a wide variety of both anti oxidative and androgenic activity.

(Zahedi et al., 2010) reported that, Zingiber officinale has been shown to, decreases lipid peroxidation and increases glutathione content in the blood of rats by maintaining the activities of the antioxidant enzymes; superoxide dismutase (SOD), catalase and glutathione peroxidase (GPx) in the rat testes.

Conclusion

The use of ginger suspension at doses 100 or 200 mg/kg body weight was beneficial in increasing antioxidant enzymes

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