



Fruit Extract of *Thaumatococcus daniellii* Reduces Oxidative Stress in Rats

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Introduction

Thaumatococin, a naturally occurring protein sweetener and taste modifier, is extracted from the arils of *Thaumatococcus daniellii* (Katemfe) fruits.¹ Katemfe fruit consists of the arils (4.8%), seeds (28.8%) and fruit pulp (72.4%).² The seeds and fruit pulp are wastes from the extraction process. Oxidative stress plays important role in the pathogenesis of many liver diseases.³ In this study, we examined the effect of ethanolic extract of the fruit pulp on some oxidative stress parameters in male Wistar rats.



Thaumatococcus daniellii (Benn.) Benth: (a) plant, (b) fruits, (c) seed with arils

Materials and Methods

Fruit pulp of *T. daniellii* was pulverised and extracted with 80% ethanol. Graded concentrations (500, 1000, 15000 mg/kgBWt) of the extract was administered orally to different groups of male Wistar rats at 24-hr intervals for 14 days after which they were sacrificed. Groups given distilled water and Vitamin C (10mg/KgBWt) served as control and standard respectively. The liver was harvested. Liver histology was studied and hepatic tissue superoxide dismutase (SOD) activity, Malondialdehyde (MDA) and Glutathione (GSH) levels were determined. Results were statistically analysed using one way analysis of variance (ANOVA) and Duncan multiple range test (DMRT).

Results and Discussions

There was no significant ($p < 0.05$) difference in weight gain and liver weight in the animals (Fig 1). There was significant ($p < 0.05$) decrease in MDA levels and significant ($p < 0.05$) increase in both SOD activity and GSH level (Fig. 2) compared to Vitamin C signifying a marked reduction of oxidative stress. Histological analyses of the liver showed no significant abnormality indicating little or no toxicity to the hepatocytes. The antioxidant properties of the fruit extract may be attributable to phytochemicals such as flavonoids^{2,4} and polyphenols⁵.

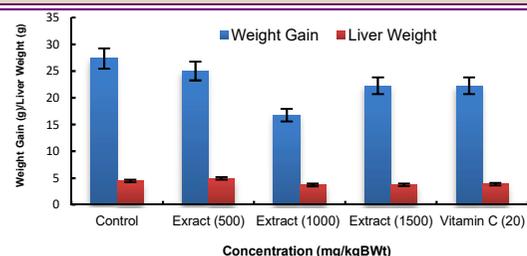


Fig. 1. Effect of ethanolic extract of *T. daniellii* fruit on weight gain and liver weight.

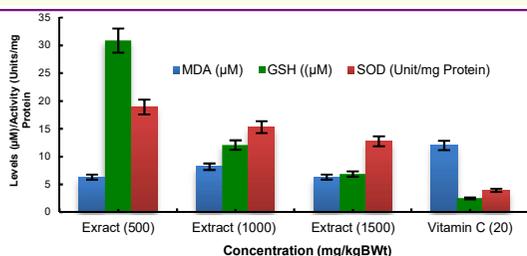


Fig. 2. Effect of ethanolic extract of *T. daniellii* fruit on MDA and GSH levels, and SOD activity in liver.

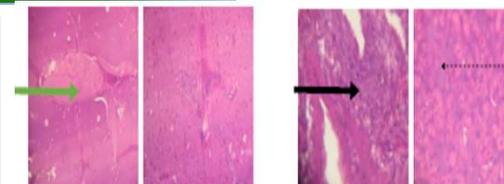


Plate 1: Liver sections of rats given 1500mg/kgbw of extracts showing mild infiltration by inflammatory cells (black arrow), lysed blood vessels (green arrow); and distended sinusoid with fluid highlighting oedema (dotted arrow).

Conclusion

Ethanolic extract of *Thaumatococcus daniellii* fruit pulp showed antioxidant properties, comparable to commercial vitamin C supplement. Further work is needed to characterize the bioactive compounds and mechanisms of action. The medicinal potential of the fruit pulp, which constitutes the major waste from thaumatocin extraction, can be exploited for the purpose of reducing oxidative stress and many liver diseases.

References

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