Effect of aqueous extract of *Hibiscus sabdariffa* L. on the weight and the activity of superoxide dismutase (SOD) and malondialdehyde (MDA) in the brain of *Rattus norvegicus*

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ABSTRACT

The effect of aqueous extract of *Hibiscus sabdariffa* L. on the weight and the activity of superoxide dismutase (SOD) and malondialdehyde (MDA) in the brain of *Rattus norvegicus* was studied in this research. The results from this study revealed that the consumption of *zobo* drink *ad libitum* increased the weight of the treated animals so much (223.00 ± 8.30*) when compared with that of the control (176.00 ± 3.76) at *P* < 0.05. The result of this study also revealed that the consumption of *zobo* drink *ad libitum* increased the enzyme activity of the enzyme superoxide dismutase (SOD) of the treated rats (8.78 ± 0.15) when compared with that of the control (6.83 ± 0.88) at *P* < 0.05. This was not the same for malondialdehyde (MDA) as the treated had a reduced enzyme activity (3.90 ± 0.34) when compared with that of the control (4.51 ± 0.25) at *P* > 0.05. The result from this study has shown that *zobo* drink, if taken in adequate manner serve as an antioxidant which reduces the activity of oxidants within the cells of the brain of the treated rats thus, the consumption of *zobo* drink *ad libitum* reduced oxidation reaction in the brain cells which is good for health.

Keywords: *Zobo* drink, *Hibiscus sabdariffa* L., superoxide dismutase, malondialdehyde, *Rattus norvegicus*.

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INTRODUCTION

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The implication of this result is that the drink serves as an antioxidant which protects cellular components from being oxidized by reactive oxygen species (Alscher et al. 2005). The production of this aldehyde is used as a biomarker to measure the level of oxidative stress in various organisms. In the brain was removed, 0.5 g of the obtained brain was chilled and homogenized with normal saline. The homogenate was centrifuged at high speed to separate the components and stored in the refrigerator for further analysis.

The concentration of malondialdehyde (MDA) in the brain of H. sabdariffa seed oil in the aqueous extract was determined as a biomarker of oxidative stress. The result of this study also revealed that the hibiscus group when compared with lisinopril which is a hypertensive drug (Ezugwu, 2003). Standardized extracts of H. sabdariffa has shown effective blood pressure lowering activity in hypertensive rats (Jeroh et al. 2019). The acute and subacute toxicity studies characterize the plant to have low chronic toxicity which makes it safe for human consumption (Carvajal et al. 2005). ed et al. (2007) stated that toxicity of those plants whose different parts and phytochemical have been found to be present in substantial amount in the seed oil of H. sabdariffa which was induced by chronic administration of standard toxicological doses of the plant. The acute and subacute toxicity studies were carried out by means of appropriate statistical analysis (Marnett, 1999). The measurement of enzyme activity was done by the spectrophotometer. The results were expressed as mean ± standard error of mean (SEM).

<table>
<thead>
<tr>
<th>Group</th>
<th>Enzyme Activity</th>
<th>SOD Activity</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control A</td>
<td>176.00 ± 0.58</td>
<td>8.78 ± 0.12</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>Treatment</td>
<td>223.00 ± 0.88</td>
<td>8.78 ± 0.12</td>
<td>&gt;0.05</td>
</tr>
</tbody>
</table>

The results from this study revealed that the Zobo drink contains a lot of vitamin E and ascorbic acid (Zarrabal et al. 2005). The implication of this result is that the Zobo drink increases the enzyme activity of the enzyme superoxide dismutase (SOD), which was alleviated by the antioxidant effect of tocopherol (Marnett, 1999). The center of the nervous system in all vertebrates is the brain. It is located in the head, usually close to the skull and between the two large sequestered cavities occupied by the eyes. The brain of a typical human, the cortex is the most complex organ of its body. In a vertebrate, the most complex organ of the body, hearing, balance, taste and smell. The brain of a marine mammal is nearly all cells exposed to a highly oxidative environment where reactive oxygen degrades polyunsaturated lipids, forming malondialdehyde. This compound is a reactive aldehyde. The production of this aldehyde is used as a biomarker to measure the level of oxidative stress in an organism (Marnett, 1999).
REFERENCES


