Research article

ANTILIPASE ACTIVITY: CRATAEVA NURVALA AND ACACIA CATECHU (L.)

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INTRODUCTION:

Dietary lipids represent the major source of unwanted calories; therefore, lipid metabolism is a vital and subtle balance that maintains energy homeostasis. Inhibition of pancreatic lipase is an attractive targeted approach for the treatment of obesity. (C.D. Zheng, et al., 2010). The lipases catalyze wide range of reactions, including hydrolysis, inter-esterification, alcholysis, acidolysis, esterification and aminolysis. They catalyse the hydrolysis of fatty acid ester bond in the triacylglycerol (TAG) and release free fatty acids (ffa). The reaction is reversible. (Vakhlu, J. and Kour, A. 2006).

Crataeva nurvala bark contains a variety of the bioactive phytochemical constituents in medicinal plants which include flavonoids, phenolic compounds, tannins, anthracene derivatives, and essential oils. (Dugganaboyana Guru Kumar et al., 2012). Crataeva nurvala belong to family Capparidaceae commonly known as Varuna, is an evergreen tree indigenous to India. It is reported that C. nurvala traditionally being used in treating blood flow, waste elimination and breathing problems, fever and metabolic disorders, joint lubrication, skin moisture, wound healing, memory loss, heart and lung weakness and weak immune system. (Atanu Bhattacharjee et al.,2012)

Acacia catechu (L.) willd, commonly known as Khadira, is widely used in Ayurveda for the treatment of diseases. Preliminary analysis of various functional groups revealed the presence of alkaloids, tannin, saponins, carbohydrate, starch, steroid and proteins. (Dhruve K et al., 2011). It is reported that bark of Acacia catechu contain alkaloids and many other very potent active components which shows anti-microbial activity so for management of wounds and burns it also acts as a disinfectant which reduces the chances of infections at the site of wound. Due to presence of alkaloids and other active constituents it is used in many dermatological disorders. A combination of cinnamon and extract of Acacia catechu is given to treat diarrhea. (Muhammad Anis Hashmat, Rabia Hussain, 2013)

ABSTRACT: antilipase activity is defined as inhibition of lipase enzyme inturn inhibiting the accumulation of cholesterol in the body. The degradation of FFA may result in increased Cholesterol & Obesity. The idea of inhibition of lipase enzyme may help in the controlled release of free fatty acids in the body thereby decreasing the cholesterol & fat content in the body. Some of the aqueous extract of the plants like Crataeva nurvala bark and Acacia catechu (L.) showed a significant in antilipase activity as 40.09% and 52.74% of inhibition.
MATERIALS AND METHOD: (Oben J., et al., 2010)

Lipase inhibitory activity:
Inhibition of lipase by the aqueous extract of selected herbs was determined using a modified assay described by Oben J., et al., 2010

1. Briefly, a suspension containing 1% (v/v) of triolein, and 1% (v/v) Tween 40 in 0.1M phosphate buffer (pH 8) from IP was prepared and emulsified. [1% triolein=1mL in 100mL and 1% tween 40=1mL in 100mL]

2. Assays were then initiated by adding 800 μL of the triolein emulsion to 200 μL of porcine pancreatic lipase 0.1 gm (modified from the protocol) pancreatic in 15 mL 0.1M phosphate buffer at pH 8.0) and 200 μL of extract (or 0.1M Phosphate buffer, pH 8).

3. The contents were mixed and the absorbance measured immediately at 450 nm and designated as T0.

4. The test tubes were incubated at 37°C for 30 min and at the end of the incubation; the absorbance at 450 nm was recorded and designated as T30.

5. The variation in absorbance = [A450 (T0) - A450 (T30)] was calculated for both control and the treatment and the % inhibition was calculated using the formula:

\[
\% \text{ Inhibition} = \left( \frac{\text{A450Control} - \text{A450Extract}}{\text{A450Control}} \right) \times 100
\]

Where, A = absorbance of the sample, B = absorbance of blank (no extract), and C = absorbance of control.

RESULTS AND DISCUSSION:
Table 1 shows the percentage inhibition of antilipase activity of the aqueous extract of the kadira and varuna.

Studies have shown that the pharmacological activities of these plants are attributable to the presence of secondary metabolites such as polyphenols, saponins, tannins, terpenes, flavonoids and alkaloids that are active inhibitors of pancreatic lipase. One reason why some of the plant extracts used in the study demonstrated high anti-lipase activity could be due to higher contents of bioactive compounds in their tissues (Muhammad Abubakar Ado et al., 2013). Therefore we can conclude that the herbal extract in this study contains these secondary metabolites which is responsible for anti lipase activity.

Table no. 1: The percentage of inhibition is described in the table given below.

<table>
<thead>
<tr>
<th>Sl.no</th>
<th>Aqueous extract of herbs</th>
<th>Percentage of inhibition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Kadira (Acacia catechu heart wood)</td>
<td>52.74%</td>
</tr>
<tr>
<td>2</td>
<td>Varuna (Crataeva nurvala bark)</td>
<td>40.07%</td>
</tr>
</tbody>
</table>

CONCLUSION:
Aqueous extracts of the kadira and varuna shows a significant antilipase activity. This herb could be useful in the management of some chronic diseases like hyperlipidemia & increased levels of cholesterol. This study of inhibition of lipase enzyme is one aspect of treating cholesterol. The herbal aqueous extract of kadira and varuna showed significant effect. Much more work has to be done considering many more aspects.
REFERENCES:


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