ABSTRACT
In the present investigation the potential activity of ethanolic extract of Caralluma fimbriata for its antimutagenicity using Salmonella typhimurium was determined. This is mainly based on the reversion of mutant cells by mutagenic agents. It was found that the extract inhibit the revertant formation produced by direct acting mutagens such as sodium azide, Ethidium bromide and Hydroxyl amine. The extracts showed more than 95% inhibition of mutagenicity at a concentration of 1mg/plate and the activity decreased with decreased concentration. It could also produce significant inhibition of mutagenicity and the results are highly significant.

KEYWORDS: Caralluma fimbriata, Salmonella typhimurium, antimutagenicity, Sodium azide, Ethidium bromide and Hydroxyl amine.

INTRODUCTION
Plants have been an important source of medicines for thousands of years. Even today, the WHO estimates that up to 80% of people still rely mainly on traditional remedies such as herbs for their medicines.[1] Antimutagenic and anticarcinogenic properties of a wide variety of dietary constituents and plant secondary metabolites have been reported. Natural antimutagens from edible and medicinal plants are of great importance because they may be

ANTIMUTAGENIC ACTIVITY OF ETHANOLIC EXTRACT OF CARALLUMA FIMBRIATA

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useful for human cancer prevention and have no undesirable xenobiotic effects on living organisms.[2]

*Caralluma fimbriata* is a succulent plant, in the cactus family, that has been used as a natural appetite suppressant in India for centuries. It's a new arrival in the family of cacti and succulent plants that are becoming increasingly popular for their appetite suppressant, and weight loss properties, as well as their ability to lower blood sugar. *caralluma fimbriata* has been used as a portable food for hunting. It is used to enhance endurance throughout India.[3] The Phytochemistry of genus Caralluma is characterized by many pregnane glycosides, while recently megastigmane glycosides also have been isolated from *Caralluma negevensis*.[4] with few flavones.[5] The objective of the study given was designed as to test the antimutagenic activity of the ethanolic extract of *Caralluma fimbriata* by using Ames test.

**MATERIALS AND METHODS**

**Collection of Plant Materials**

The plant *Caralluma fimbriata* was collected from Coimbatore district of Tamilnadu, India. Authentication of plant material was carried out at the herbarium center of Botanical Survey of India; Coimbatore, Tamil Nadu, India and specimens were preserved.

**Preparation of Extract**

The whole plant was collected, washed and shade dried and then ground to a fine powder and extracted with 90% ethanol at room temperature under stirring for 48 hours and the extraction process was repeated until the solvent become colourless. The solvent fractions from processes were pooled and then filtered through whatmann no. 1 filter paper and concentrated in vacuum at 50°C in a rotavapour to obtain the extract.

**Antimutagenicity of Plant Extract Using Ames Assay**[6]

Many common food articles contain components that possess anti mutagenic and anti carcinogenic properties. [7] Naturally occurring substances in plants and other natural sources provide potential protection against environmental mutagens and carcinogens

**TOXICITY**

The toxicity of the extract was tested by the addition of extract did not inhibit the growth of the organism indicating the extract did not show any toxicity to these organism.
RESULTS AND DISCUSSION

Plate No – 1: Plant extract showing No Toxicity on TA 1535 Strain

Antimutagenic Activity of the Extract Using Direct Acting Mutagens
Sodium Azide
Table 1, shows the antimutagenicity effect induced by the ethanolic extract of Caralluma fimbriata using sodium azide as positive control (plate incorporation assay).

Table – 1: Number of S.Typhimurium Revertants Induced By the Ethanolic Extract of Caralluma Fimbriata Using Sodium Azide as Positive Control

<table>
<thead>
<tr>
<th>Group</th>
<th>Average number of colonies present</th>
<th>% inhibition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Sodium azide (2.5µg /plate)</td>
<td>340</td>
<td>-</td>
</tr>
<tr>
<td>100 µg</td>
<td>272</td>
<td>20</td>
</tr>
<tr>
<td>250 µg</td>
<td>223</td>
<td>25</td>
</tr>
<tr>
<td>500 µg</td>
<td>156</td>
<td>54</td>
</tr>
<tr>
<td>1mg</td>
<td>17</td>
<td>95</td>
</tr>
</tbody>
</table>

Plate No – 2: Number of S.Typhimurium Revertants Induced by the Ethanolic Extract of Caralluma fimbriata Using Sodium Azide as Positive Control
The extract was found to inhibit the mutagenicity produced by sodium azide (2.5µg /plate) to salmonella strain TA 1535. At a concentration of 1mg of extract / plate, there was 95% inhibition in the colony formation .For 500 µg, 250 µg and 100µg the percentage of inhibition produced by extracts were 54, 25, 20 percentages respectively.

**ETHIDIUM BROMIDE**

Table 2, shows the antimutagenicity effect induced by the ethanolic extract of *Caralluma Fimbriata* using Ethidium Bromide as positive control (Plate Incorporation Assay).

**Table – 2: Number of S.Typhimurium Revertants Induced By the Ethanolic Extract of Caralluma Fimbriata Using Ethidium Bromide as Positive Control**

<table>
<thead>
<tr>
<th>Group</th>
<th>Average number of colonies present</th>
<th>% inhibition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Ethidium Bromide (5 µg /plate)</td>
<td>257</td>
<td>-</td>
</tr>
<tr>
<td>100 µg</td>
<td>142</td>
<td>46.30</td>
</tr>
<tr>
<td>250 µg</td>
<td>138</td>
<td>53.69</td>
</tr>
<tr>
<td>500 µg</td>
<td>119</td>
<td>44.74</td>
</tr>
<tr>
<td>1mg</td>
<td>79</td>
<td>69.26</td>
</tr>
</tbody>
</table>

The extract was found to inhibit the mutagenicity produced by Ethidium Bromide (5 µg /plate) to salmonella strain TA 1535. At a concentration of 1mg of extract / plate there was 69.26% inhibition in the colony formation. For 500µg, 250 µg and 100 µg, the percentage of inhibition produced by extracts were found to be 54, 46, 44 percentages respectively.

**Plate No – 3: Number of S.Typhimurium Revertants Induced By the Ethanolic Extract of Caralluma Fimbriata Using Ethidium Bromide as Positive Control.**

**HYDROXYL AMINE**

Table 3, shows the antimutagenicity effect induced by the ethanolic extract of *Caralluma Fimbriata* using Hydroxyl amine as positive control (Plate Incorporation Asssy)
Table – 3: Number of S. Typhimurium Revertants Induced by the Ethanolic Extract of Caralluma Fimbriata Using Hydroxyl Amine as Positive Control

<table>
<thead>
<tr>
<th>Group</th>
<th>Average number of colonies present</th>
<th>% inhibition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>85</td>
<td>-</td>
</tr>
<tr>
<td>100 µg</td>
<td>69</td>
<td>18</td>
</tr>
<tr>
<td>250 µg</td>
<td>43</td>
<td>49</td>
</tr>
<tr>
<td>500 µg</td>
<td>37</td>
<td>56.47</td>
</tr>
<tr>
<td>1mg</td>
<td>16</td>
<td>81.17</td>
</tr>
</tbody>
</table>

The extract was found to inhibit the mutagenicity produced by hydroxyl amine (1 µg /plate) to salmonella strain TA 1535. At a concentration of 1mg of extract / plate, there was 81.17% inhibition in the colony formation. For 500µg, 250 µg and 100 µg the percentage of inhibition produced by extracts were 56.47, 49, 18 percentages respectively.

Plate No – 4: Number of S. Typhimurium Revertants Induced by the Ethanolic Extract of Caralluma Fimbriata Using Hydroxyl Amine as Positive Control

CONCLUSION

The studied extract exhibited a strong effect against the damage induced by the direct mutagens namely sodium azide, ethidium bromide and hydroxyl amine.

This may be due to two reasons, that the plant may absorbs mutagens in a way similar to carcinogen adsorption or the extract could induce DNA glycosylase enzymes which are capable of repairing alkylated DNA bases.

The observed antimutagenic activity of the extract in the TA 1535 strain is congruent with the strong antioxidant capacity of the plant. This result suggests that consumption of the Caralluma fimbriata could be an alternative for reducing genotoxic damage induced by the free radicals.
REFERENCES


