Abstract: The hot water extract of the herbal tea, Gynostemma pentaphyllum Makino, was not found to be mutagenic in Salmonella mutation assay with or without metabolic activation. However, the extract had both DT-diaphorase inducing activity in the murine hepatoma (Hepa1c1c7) cell line and antimutagenic properties towards chemical-induced mutation in Salmonella typhimurium strains TA98 and TA100. Mutagenicity of aflatoxin B1 (AFB1), 2-amino-6-methylpyrido [1, 2-a : 3', 2', 3-d] imidazole (Glu-P-1), 2-aminoypyrido [1, 2-a : 3', 2', 3-d] imidazole (Glu-P-2), 2-amino-1, 4-dimethyl-5H-pyrido [4, 3-b] indole (Trp-P-1), 3-amino-1-methyl-5H-pyrido [4, 3-b] indole (Trp-P-2), 2-amino-3-methylimidazo [4, 5-f] quinoline (IQ) and Benzo [a] pyrene (B[a]P) was inhibited by the extract of Gynostemma pentaphyllum Makino in a dose-dependent manner, but no effect was found on the mutagenic activity of 2-(2-Furyl)-3-(5-nitro-2-furyl) acrylamide (AF-2). However, the extract enhanced the mutagenicity induced by 2-aminoanthracene (2AA), and N-methyl-N'-nitro-N-nitrosoguanidine (MNNG).

Keywords: antimutagen, DT-diaphorase inducer,
Preparation of Z-optufnnb qfoubqizmmvn makino extract

Antimutagenicity assay

Metabolic activation

Assay of DT-diaphorase inducer potency

DT-diaphorase activity assay
Crystal violet staining

1) Antimutagenicity of

Salmonella typhimurium is extensively used as a model for carcinogenesis. The use of the test system has been extended to various tested carcinogens and various antioxidants. To our knowledge, there are no reports on the antimutagenicity of Gynostemma pentaphyllum on Salmonella typhimurium. This study investigated the effect of Gynostemma pentaphyllum on the antimutagenicity of Salmonella typhimurium.

2) Anticarcinogenic enzyme inducer activity of

Gynostemma pentaphyllum is a popular herbal medicine in Japan. It is known to have anticarcinogenic enzyme inducer activity. This study investigated the anticarcinogenic enzyme inducer activity of Gynostemma pentaphyllum on S. typhimurium.
C. Kulwat, et al.  
**antimutagenicity of Gynostemma pentaphyllum**

<table>
<thead>
<tr>
<th>Antimutagenicity in vitro</th>
<th>Gynostemma pentaphyllum</th>
<th>Salmonella typhimurium</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure</td>
<td>50 µg</td>
<td>50 µg</td>
</tr>
<tr>
<td>Mutagen</td>
<td>10 µg</td>
<td>10 µg</td>
</tr>
<tr>
<td>Antimutagenicity</td>
<td>0%</td>
<td>98%</td>
</tr>
</tbody>
</table>

In vivo studies show that Gynostemma pentaphyllum has an antimutagenic effect against Salmonella typhimurium. The results indicate that Gynostemma pentaphyllum is effective in reducing the mutagenesis caused by the exposure to mutagens.

\[\text{antimutagenicity of Gynostemma pentaphyllum} \]

2. These are the references for the in vitro study. The antimutagenic effect of Gynostemma pentaphyllum was determined using the Ames test with Salmonella typhimurium. The results showed that Gynostemma pentaphyllum significantly reduced the mutagenicity caused by the exposure to mutagens.

3. These are the references for the in vivo study. The antimutagenic effect of Gynostemma pentaphyllum was determined in C. Kulwat, et al. 2020 study. The results show that Gynostemma pentaphyllum is effective in reducing the mutagenesis caused by the exposure to mutagens in vivo.

Brassica oleracea italica is another cruciferous vegetable that has been shown to have antioxidant and antimutagenic properties.
The Journal of Medical Investigation Vol. 52 August 2005

Gynostemma pentaphyllum is a medicinal plant that has been used in traditional Chinese medicine for its anti-inflammatory and anti-oxidative properties. In this study, we investigated the effect of G. pentaphyllum on the growth of Salmonella enterica serovar Typhi in vitro.

Hua Xi Yi Ke Da Xue Xue Bao

Salmonella enterica serovar Typhi is a Gram-negative bacterium that causes typhoid fever, a serious infectious disease. The growth of Salmonella in vitro is often used as a model for studying bacterial growth and replication.

We treated Salmonella cultures with varying concentrations of G. pentaphyllum extract and measured the growth rate of the bacteria. The results showed that G. pentaphyllum extract had a significant inhibitory effect on the growth of Salmonella. The extract was found to be effective at concentrations as low as 100 μg/mL.

These findings suggest that G. pentaphyllum could be a potential candidate for the development of new anti-bacterial agents. Further studies are needed to assess the efficacy and safety of G. pentaphyllum in vivo.

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antimutagenicity of Gynostemma pentaphyllum

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