Anti-hyperglycemic effect of D-psicose

(Keywords: D-Psicose, Food, Blood sugar level, Diabetes prevention)

Research theme

Outline of technology

This technology provides uses of D-psicose for the control of abnormal diurnal increases in the blood sugar level. When rats were regularly given foods containing D-psicose or a mixture of D-fructose and D-psicose (psico-rare sugar; fructoescpsicose = 3:1) at 5%, the plasma glucose level remained low throughout the day (Figure). This suggests that increases in the blood sugar level may be controlled by the addition of D-psicose or psico-rare sugar to regular meals. Also, as there was no difference in the diurnal changes in the plasma glucose level between the D-psicose group and psico-rare sugar group, in which the D-psicose intake was 1/4 that of the D-psicose group, this effect was shown not to have been due simply to a decrease in the sugar intake.

The mechanism of this effect has also been analyzed, and D-psicose has been found to exert the effect by actions both in the intestine and after absorption.

Sales points

- Abnormal increases in the plasma glucose level can be controlled simply by mixing D-psicose in ordinary regular meals.
- In addition to the promotion of insulin secretion, multiple mechanisms including inhibition of the saccharolytic enzymes, inhibition of intestinal sugar absorption, and activation of glucokinase activity in the liver have been clarified.

Expected application fields and products

(1) Control and prevention of diabetes
(2) Foods for specified health uses
(3) Food materials, foods and beverages, and healthy foods and beverages
(4) Sweeteners, seasonings, food additives
(5) Pharmaceuticals
(6) Feeds

Comparison with existing products

<table>
<thead>
<tr>
<th></th>
<th>Anti-hyperglycemic effect</th>
<th>Effects in the intestine</th>
<th>Effects in the liver or pancreas</th>
</tr>
</thead>
<tbody>
<tr>
<td>D-Psicose</td>
<td>Observed</td>
<td>Observed</td>
<td>Observed</td>
</tr>
<tr>
<td>L-Arabinose</td>
<td>Observed</td>
<td>Observed</td>
<td>Unclear</td>
</tr>
<tr>
<td>Poorly digestible dextrin</td>
<td>Observed</td>
<td>Observed</td>
<td>Not observed</td>
</tr>
</tbody>
</table>

References, patents, etc.


Other matters to note

(Developer’s comment)
D-Psicose is a monosaccharide with not only an anti-hyperglycemic but also anti-atherosclerotic effect and is effective for the prevention of both diabetes (hyperglycemia) and atherosclerosis (hypercholesterolemia, hypertriglycerideremia), both of which often complicate metabolic syndrome. The action mechanism has been clarified by research at our university.

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