EFFECT OF SENEGIN-Ⅱ ON BLOOD GLUCOSE IN NORMAL AND NIDDM MICE

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The hypoglycemic effect of senegi-Ⅱ, the main component of Polygala senega (Polygalaceae), was examined in normal and KK-Ay mice, one of the model animals of non-insulin-dependent diabetes mellitus (NIDDM). Senegi-Ⅱ (2.5 mg/kg) reduced the level of blood glucose in normal mice from 220 ± 8 to 131 ± 5 mg/dl 4 hours after intraperitoneal administration (P<0.001), and also significantly lowered the blood glucose of KK-Ay mice from 434 ± 9 to 142 ± 6 mg/dl under similar conditions (P<0.001).

KEY WORDS Polygala senega; senegi-Ⅱ; triterpenoid glycoside; hypoglycemic effect; normal mice; KK-Ay mice

We reported the hypoglycemic effect of glycosomes.1) The constituents of Polygala senega have been chemically investigated with some glycosomes.2,3,4,5) However, there is no experimental evidence of the hypoglycemic action of these materials. The purpose of this study was to examine the hypoglycemic effect of senegi-Ⅱ, one of the components of Polygala senega.

MATERIALS AND METHODS

Triterpenoid glycosides (Senegi-Ⅱ) (Fig. 1) were isolated by a conventional method4,6). Male mice (ddY, 5 weeks old) were kept in the experimental animal room for 7 days with free access to food and water. KK-Ay mice 12 weeks old were used, the blood glucose level being determined. Mice with blood glucose level above 300 mg/dl, considered to be diabetic, were used in this study. For the determination of blood glucose levels, blood samples were withdrawn from the cavernous sinus with a capillary. Blood glucose levels in both normal and diabetic animals were determined by glucose oxidase method.7) All the data were expressed as mean ± S. E., and Student’s t test was used for the statistical analysis. The values were considered to be significantly different when the P value was less than 0.05.
RESULTS AND DISCUSSION

The present study clearly showed that seneglin-II from extract of the root of Polypogon senega produces consistent hypoglycemic effects. The effect of seneglin-II on blood glucose in normal mice after intraperitoneal administration is shown in Fig. 2.

![Graph showing effect of seneglin-II on blood glucose in normal mice](image)

**Fig. 2. Effect of Seneglin-II on Blood Glucose in Normal Mice**

Each value represents the mean ± S. E. from 4-5 mice. Significantly different from baseline value (0 h), *P<0.05, **P<0.01, ***P<0.001.

Seneglin-II-treated groups showed a significant decrease of blood glucose in normal mice. The effect of seneglin-II was stronger than that of tolbutamide, one of the synthetic hypoglycemic drugs. In addition, we examined the therapeutic effect of seneglin-II on hyperglycemia in KK-Ay mice as shown in Fig. 3.
Fig. 3. Effect of Senegin-II on Blood Glucose in KK-Ay Mice

Each value represents the mean ± S. E. from 4-5 mice.
Significantly different from baseline value (0 h), **P<0.01, ***P<0.001.

Senegin-II (0.5~5 mg/kg)-treated mice showed a significant decrease in blood glucose 4h after the administration (0.5: P<0.01, 2.5: P<0.001, 5: P<0.01). The group given low doses of 2.5 mg showed a striking action, and the glucose level was similar to the baseline value (0 h) of normal mice. In streptozotocin-induced diabetic mice, however, the glucose levels were unchanged in comparison with the baseline value during the experiment period. These findings indicate that the presence of insulin is necessary to produce a hypoglycemic effect of senegin-II. Further study will indicate how senegin-II could become a useful drug in the treatment of diabetes.

REFERENCES

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