

## Effect of fermented-bean product on anti-aging and health

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### Introduction

Fermented foods are made by taking advantage of the workings of microorganisms and enzymes in food ingredients. The Japanese have a long history of making fermented foods and this become Japan's unique food culture.

Not only delicious flavor that came out but also the rich in health benefits nutrition. The functional effects of Japanese style fermented-bean product have been studied. It possesses antimicrobial activity against bacteria such as *Staphylococcus aureus*, *Shigella flexneri*, *Vibrio cholerae*. It also contains an angiotensin I-converting enzyme inhibitor having antihypertensive effects. The active compound is identified as nicotianamine, which comes from soybeans.

The fermented-bean also product exhibits anti cancer effects. The flavor components of the product, such as 4-hydroxy-2-ethyl-5-methyl-3-furanone, which is a characteristic flavor component of Japanese style fermented-bean product and 4-hydroxy-2,5-dimethyl-3-furanone and 4-hydroxy-5-methyl-3-furanone exhibit antioxidant activities and anticarcinogenic effects. Fermented-bean product contains three tartaric isoflavone derivatives called shoyuflavones. These shoyuflavones inhibit histidine decarboxylase, which produces histamine, a mediator of inflammation, allergy and gastric acid secretion.

There were many studies about benefit of fermented-bean product. However, little is known about whether and how it promotes longevity and health in any organism.

### Materials and Method

#### **Stains and growth conditions**

All strains were maintained at 20 °C on nematode growth medium (NGM) seeded with *Escherichia coli* OP50 feeding strain. One hundred microliters of OP50 was dropped on the center of the 60-mm NGM plates, which were allowed to dry overnight before the culture assays were carried out. Strains used in this study were: N2.

#### **Lifespan assay**

All lifespan assays were carried out at 20 °C. The eggs were obtained by using NaClO treatment. The eggs were allowed to hatch and 30 L4/young adult worms per

plate(NGM plate containing 50 µg/mL FUDR to prevent

the growth of progeny) were used for each assay. All the assays were carried out in triplicates, and a minimum of three independent trials were performed. The dead worms were counted every 2 days and exploding, protruding, bagging or contaminated worms were censored if applicable. The day L4/young adult worms were transferred was defined as day 0 of adult age.

#### **Heat stress assay**

Adult worms were put into 37 °C for 3 hrs in incubator and using same method as life span assay to get the result.

#### **Gene expression assay**

Total RNA was extracted from adult worms. And cDNA was produced with reverse transcriptase and Real-time PCR was performed.

### Result and discussion

The result showed increasing of longevity in *C. elegans* and also increased tolerance of *C. elegans* to heat stress. In addition, hsp12.6 and SOD-3 gene expression level in fermented-bean product given *C. elegans* also higher than control group. To study involved gene and mechanism, further experiments and discussions are need to be made.

### References

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