Poster Presentation

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Effects of feeding mice with Ganoderma lucidum culture solution on improving gut microbe

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Abtrate

In recent research, gut microbiota has been found to be associated with many diseases, and its growth and decline are influenced by diet. Reishi mushroom is a traditional Chinese medicine and is commonly used in health supplements. Previous studies have shown that liquid culture of Reishi mushroom produces many bioactive substances, such as polysaccharides, proteins, triterpenoids, and trace elements. Supernatants were obtained after four weeks of Reishi mushroom culture. Mice were fed 10% and 20% concentrations daily, and feces were collected on days 0, 30, and 180. Microbial community analysis was performed using NGS sequencing of full-length 16S rRNA. Results showed that after sampling and analysis at different concentrations and durations, the beneficial bacteria *Lactobacillus* in the Reishi mushroom culture medium increased from 5% to 13% and 14% after 30 days, and from 17% to 21% and 13% after 180 days. *Duncaniella* increased from 17%, 11%, and 17% to 26%, 18%, and 22%, respectively. The results showed that Ganoderma lucidum culture solution could increase the beneficial bacteria Lactobacillus by 2.5 times and *Duncaniella* by 1.5 times. Therefore, Ganoderma lucidum culture solution can be used as a beverage to increase probiotics in the body.

Introduction

The large intestine is often referred to as the second brain, and its gut microbiota influences many diseases, largely due to dietary factors. Reishi mushroom (Ganoderma lucidum) has been used in Traditional Chinese Medicine (TCM) for over 4000 years to treat various ailments. Crude extracts and isolated components have been endowed with diverse biological and medicinal functions. Majar active compounds isolated from Reishi include polysaccharides and triterpenoids. These medicinal components have been reported to have anti-inflammatory effects; therefore, the effects of Reishi culture broth on beneficial and harmful bacteria in the gut microbiota were determined in mice.

Method

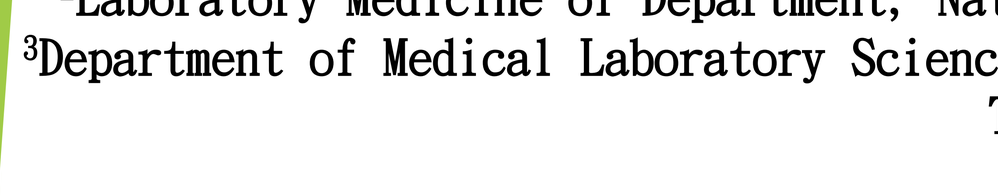

Fig.1 *Ganoderma sp. broth* culture and mice of feedding

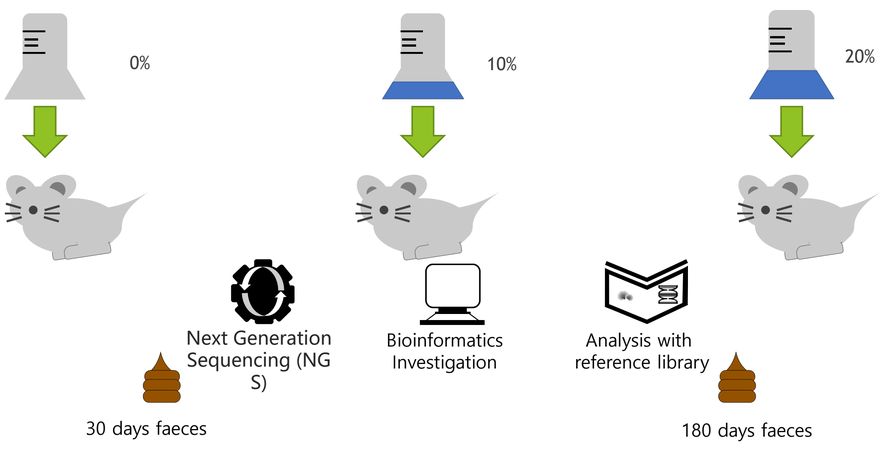

Fig.2 *Ganoderma sp*. broth feeding to mice and analysis of NGS

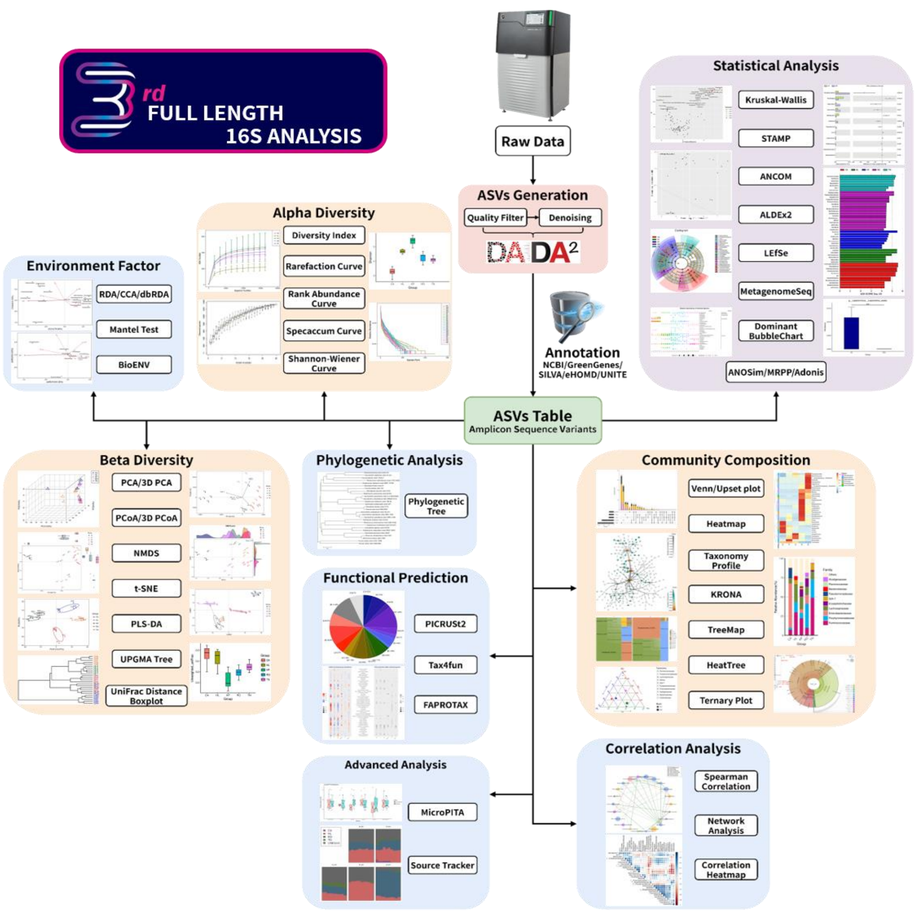

Fig.3 The procedure of NGS analysis

Result

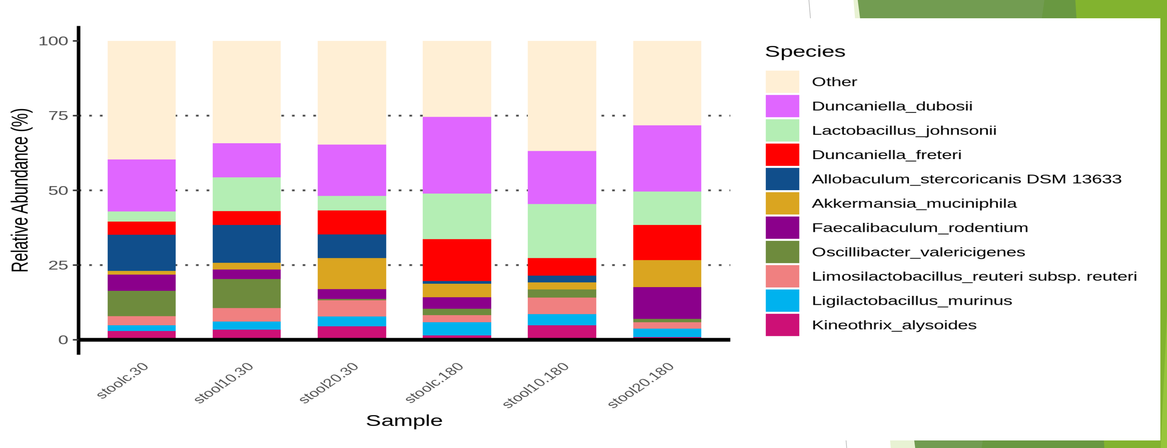

Fig.4 The species composition distribution

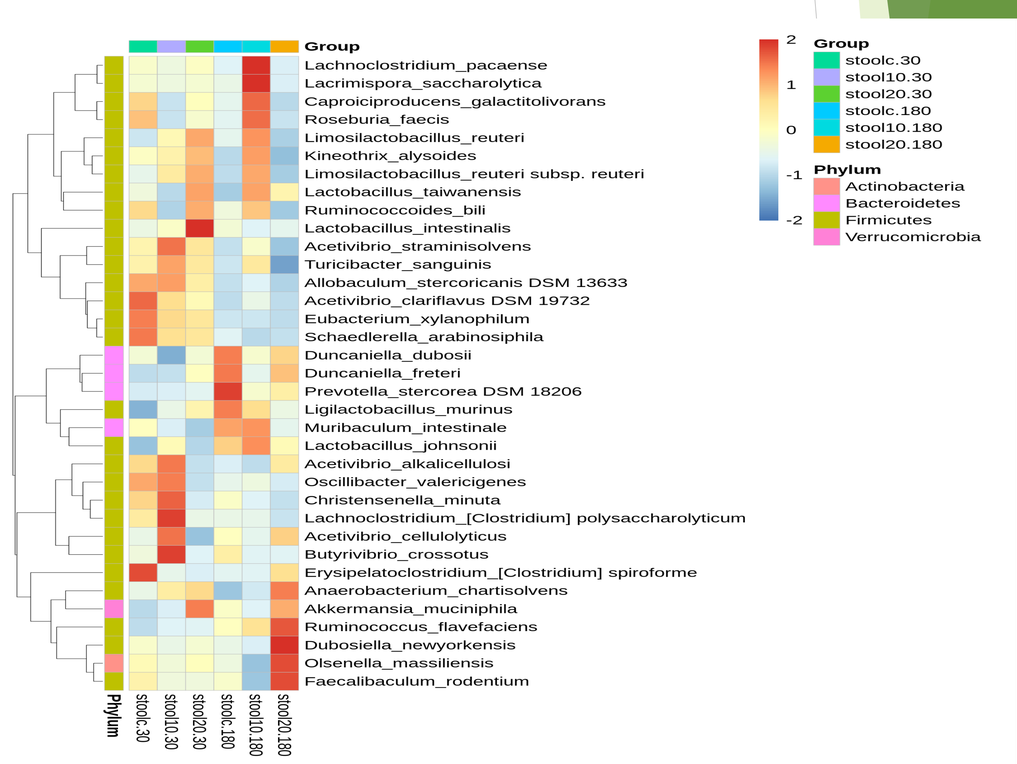

Fig5 The species abundance clustering

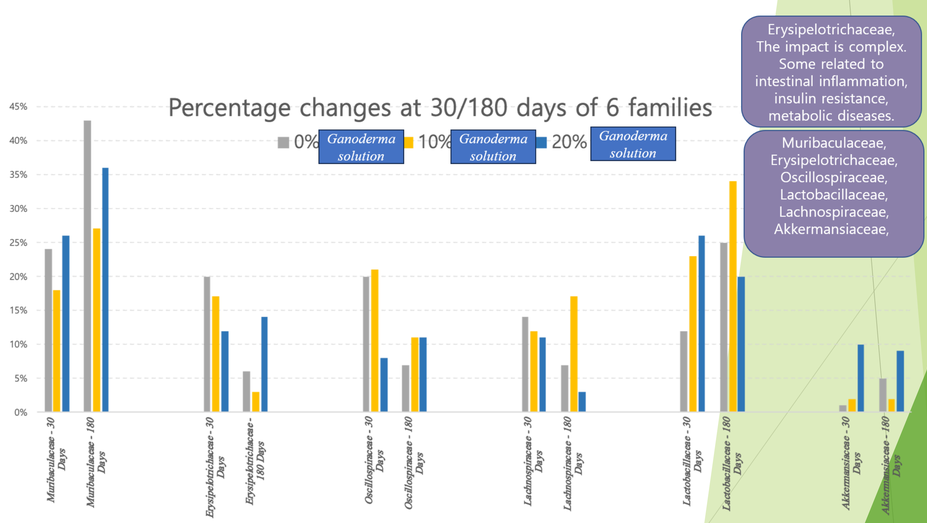

Fig6 The species of beneficial and harmful bacteria to feeding differet percentages of *Ganoderma sp*. solution

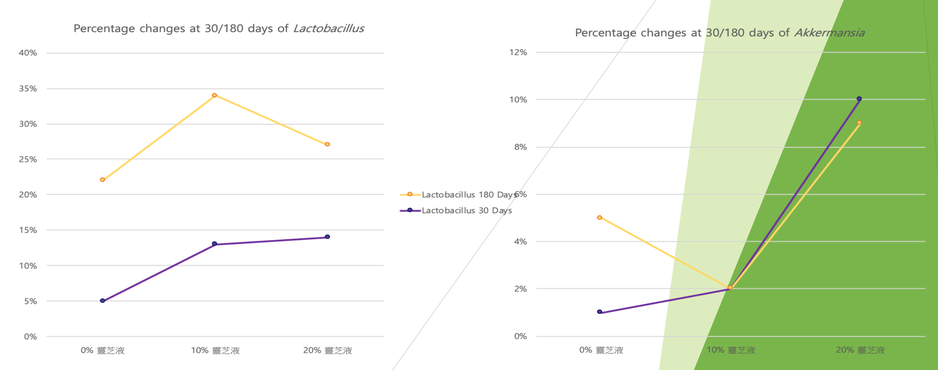

Fig7 The species of *Lactobacillus* and *Akkermansia* bacteria to feeding differet percentages of *Ganoderma sp*. solution

conclusion

In both groups sampled over 30 days, feeding with higher concentrations of Ganoderma lucidum extract resulted in a stable increase in beneficial gut bacteria (Lactobacillaceae) and a gradual decrease in Erysipelotrichaceae. Furthermore, when fed with 10% Ganoderma lucidum extract, the proportion of Lactobacillaceae was higher in the 180-day group than in the 30-day group, while Erysipelotrichaceae was lower. Beneficial bacteria (Lactobacillus) increased from 5% to 13% and 14% at 30 days, and from 17% to 21% and 13% at 180 days. In addition, Akkermansia in the digestive tract was shown to be negatively correlated with diseases such as obesity; after 30 days of feeding with Ganoderma lucidum culture, Akkermansia increased significantly from 1% to 2% and 10%, and from 5% to 2% and 9% at 180 days.