

Protective Effects of Qingke β -glucan on Gastric Damage in Rats and Mice

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Outline

1. Introduction

2. Protective Effects of β -glucan Isolated from Highland Barley on Ethanol-induced gastric Damage in Rats and Its Benefits to Mice Gut Conditions

3. Qingke β -glucan Synergizes with a β -glucan-utilizing *Lactobacillus* Strain to Relieve Capsaicin-induced Gastrointestinal Injury in Mice

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Abstract

Millions of people around the world suffer from gastrointestinal diseases. Common causes are dietary and bacterial infections, which leads to gastric ulcers, gastric perforation and gastroenteritis. β -glucan is a natural plant ingredient with anti-inflammation, anti-tumor and immunomodulatory functions. In this study, β -glucan extract from barley was used to investigate its therapeutic effect on ethanol and Capsaicin (CAP)-induced gastrointestinal injury in mice and rats. Also, it combined with *Lactobacillus plantarum* S58 (LP.S58) to confirm the effect of alleviating gastrointestinal damage. β -glucan alleviated ethanol-induced gastric ulcer in mice, and significantly decreased the expression of oxidative stress indexes, pro-inflammatory factors, increased Prostaglandin E2 and nitric oxide. In addition, the total short-chain fatty acids in the intestinal tract of mice were significantly increased, the decrease of colon length shortened together with the pH value decreased. In CAP-induced mice, β -glucan co-cultured with LP.S58 significantly reduced gastrointestinal inflammatory cytokines and inhibited inflammatory responses by Nuclear factor kappa B pathway. In addition, Motilin, Substance P decreased significantly and Somatostatin increased significantly. In addition, gastric mucosa repaired as well as intestinal compact protein expression increased. Intestinal microbial richness analysis showed that *Lachnospiraceae* NK4A136 and unclassified *Ruminococcaceae* in the CAP group was higher than that in the control group. Spearman correlation analysis indicated that CAP would possibly lead to inflammatory bacteria. In conclusion, Qingke extract β -glucan has effect on curing ethanol and CAP-induced gastrointestinal damage in mice and rats. Furthermore, synergizing with probiotics that utilized β -glucan improves antioxidant and anti-inflammatory ability, which may contribute to the potential of improving functional food for gastrointestinal damage in the future.

Reference

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