

Inhibition of *Helicobacter pylori* adhesion to human gastric adenocarcinoma epithelial cells by acidic polysaccharides from *Artemisia capillaris* and *Panax ginseng*

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Abstract :

Helicobacter pylori specifically adhere to host cells, based on carbohydrate-mediated cell-cell interactions. Acidic polysaccharides were isolated and purified from the leaves of *Artemisia capillaris* or the root of *Panax ginseng*, resulting in obtaining a single peak (fraction F2) using DEAE ion exchange chromatography and gel filtration FPLC, in which no protein content was detectable. We investigated that polysaccharide fractions from these plants have *H. pylori* anti-adhesive effect, using hemagglutination and enzyme-linked glycosorbent assays. We also examined the inhibitory effects of these polysaccharides on the attachment of *H. pylori* to human gastric adenocarcinoma epithelial cell line using scanning electron microscopy. The bacterial attachment to the cell line was inhibited by these polysaccharides in the range of the concentrations studied (0.2-2.8 mg/ml), showing their minimum inhibitory concentration at as low as 0.2 mg/ml. The bacterial binding was inhibited more effectively by *P. ginseng* polysaccharides, than by that from *A. capillaris*. The purified polysaccharides contain similar sugar compositions and have high amounts of uronic acids. Our results suggest that acidic carbohydrates may play an important role in the inhibitory activity on *H. pylori* adhesion to host cells and that our established purification protocol can be applied to obtain active acidic polysaccharides from plant sources.

Reference :

- Belogortseva NI, Yoon JY, Kim KH. *Planta Med* 2000; 66: 217-20
Woo JS, Ha BH, Kim TG, Lim Y, Kim KH. *Biotechnol Lett* 2001; 23: 507-11
Woo JS, Ha BH, Kim TG, Lim Y, Kim KH. *J Microbiol Biotechnol* 2003; 156: 242-49
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