

I. SUMMARY

Within this study antiadhesive effects of glycoconjugates from *Ribes nigrum* L. (Grossulariaceae) and *Abelmoschus esculentus* (L.) MOENCH (Malvaceae) towards *Helicobacter pylori* adhesion were investigated.

From the water soluble raw polysaccharides of *Ribes nigri semen* a high molecular weight polysaccharide fraction (F2) was isolated by ion-exchange chromatography (IEC). Structural elucidation, including molecular weight, monosaccharide composition, linkage analysis, and determination of D-/L-configuration were carried out and revealed the presence of type II arabinogalactans. By reaction with β -D-glucosyl Yariv reagent the presence of arabinogalactan proteins (AGPs) was confirmed. Gel permeation chromatography (GPC) led to the isolation of three subfractions with different molecular weight, whereby one fraction (F2.1) revealed a molecular weight of approximately 3000 kDa. According to the analytical investigations, a putative structural proposal of the carbohydrate part of F2.1 was developed, confirmed in parts by enzymatic degradation experiments.

In situ and *in vitro* experiments on human gastric tissue sections and on AGS-cell lines revealed significant antiadhesive activity of the isolated F2 fraction against *H. pylori*. Further elucidation of the inhibition mechanisms by dot blot overlay assay and hemagglutination experiments showed specificity of F2 towards the BabA adhesin of *H. pylori* whereby the SabA adhesin was not influenced. During activity testing of the subfractions of F2 only F2.1 showed inhibitory effects towards *H. pylori* adhesion to AGS cells; especially the high molecular weight and the glucuronic acid content of F2.1 were supposed to contribute to the activity.

The general impact of glucuronic acid in antiadhesive polymers was investigated in two different model systems, which strongly indicates that this uronic acid, but also the overall charge of the antiadhesives, contributes significantly to the interaction with *H. pylori* adhesion in comparison to neutral carbohydrates.

F2 and water soluble high molecular weight compounds from immature okra fruits (*Abelmoschus esculentus* (L.) MOENCH) were investigated on potential interaction with bacterial outer membrane proteins BabA and SabA in radioimmunoassay (RIA) experiments. F2 was shown to only influence the BabA-mediated adhesion while the glycoconjugates from okra fruits influenced the BabA- and SabA-mediated adhesion.

Additionally, strain-specific activity was found for both plant products. RIA with radiolabeled plant extracts and different *H. pylori* strains indicated that binding is not directly located at the adhesin protein, as no differences between BabA mutants and their parent strains were observed.