

## SUMMARY

The digestive system of the rabbit is characterized by the relative importance of the caecum and colon when compared with other species. As a consequence, the microbial activity of the caecum is of great importance for the processes of digestion and nutrient utilization. The aim of this study was to extend the knowledge on pectin metabolism in bacteria from the rabbit caecum.

*Bifidobacterium pseudolongum* P6 utilized almost all glucose and *ca* 76% of pectin. Cultures grown on glucose produced significantly more formate, lactate and ethanol per gram of substrate used and less acetate and succinate than corresponding cultures grown on pectin. In cultures *B. pseudolongum* P6 pectin macromolekule was degraded by the action of extracelullar pectinase. Pectate lyase activity was not present in cells or culture supernatant fluids of this bacterium.

*Streptococcus bovis* X4 possessed both pectate lyase and pectinase activity. Activity of pectinase, however, was very low. Activity of 2-keto-3-deoxy-6-phosphogluconate-aldolase (KDPG aldolase) was found both in pectin- and glucose-grown cells of *B. pseudolongum*. The cell extract did not metabolize 6-phosphogluconate. We can assume that acidic products of pectin degradation are catabolised via a modified Entner-Doudoroff pathway. The KDPG aldolase activity was not found in cells of *Strep. bovis*. None of the enzymatic activites was found in strain N13 of *Bifidobacterium* sp.

Molecular-genetic analysis identified the KWN isolate as a strain of *B. caccae* with 98% identity of 16S rDNA sequence. *B. caccae* KWN utilized almost all glucose and 81% of pectin. Cultures grown on pectin produced significantly more acetate and less formate, lactate, fumarate and succinate than cultures grown on glucose. Pectin macromolekule was degraded by the action of pectate lyase and pectinase. Specific activities of both enzymes were higher in culture supernatants than in cell extracts. Action pattern of pectic enzymes was determined by viscosimetric and reaction product analyses. Comparison of the time course of the concentration of reducing sugars and relative viscosity indicated that the pectinase has an exo-type mode of action in *B. caccae* KWN, but an endo-type mode of action in *Strep. bovis* X4. Action pattern of lyases were similar in both bacteria. In former work was the lyase of *Strep. bovis* X4 identified as endopolygalacturonate lyase, so we propose that an enzyme the same type is produced in pectin-grown cultures of the strain KWN.

Both pectin- and glucose-grown cells of *B. caccae* KWN possessed activity of KDPG aldolase. Phosphogluconate was not metabolised by the cell extract of this strain, this indicates that the conventional Entner-Doudoroff pathway of glucose metabolism cannot operate in *B. caccae* KWN.

Strains of *Bifidobacterium pseudolongum* P13, *Bifidobacterium pseudolongum* G1, *Bifidobacterium globosum* G4 and *Bifidobacterium globosum* P11 possessed activity of pectinase but activity of pectate lyase was absent similar. The pectinase of strains *Bifidobacterium pseudolongum* P13, *Bifidobacterium pseudolongum* G1, *Bifidobacterium globosum* G4 has an exo-type mode of action, *Bifidobacterium globosum* P11 has an endo-type mode of action.