

# The impact of commercial polyphenolic extracts on meat spoilage bacteria

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## INTRODUCTION

According to Regulation 178/2002 (EU) spoiled food is considered unsafe. One of the most susceptible to microbial spoilage products are raw and processed meat. Because of its rich chemical composition, high water activity and pH, meat is an excellent habitat for numerous microorganisms [1]. The combination of VP, MAP and natural antimicrobial agents could be very promising. Polyphenols can be potentially used as natural preservatives. They have been reported to have a variety of biological effects including antimicrobial activities. The aim of the study was the investigation of influence of black carrot and red cabbage extracts on meat spoilage bacteria.

## EXPERIMENTAL METHODS

The composition of polyphenolic extracts was provided by HPLC and LC-MS methods. The antimicrobial activity of polyphenol extract against bacterial strains was evaluated with an agar diffusion well method. Six strains of bacteria were used in the bioassays: *Proteus mirabilis*, *Escherichia coli*, *Pseudomonas* sp. and three strains of *Brochothrix thermosphacta*. The inoculum was prepared from overnight cultures in TSB at 30°C. The test was performed using TSA medium. The bacteria were aseptically swabbed onto an agar plates. Two wells, 4 mm in diameter each, were punched into the inoculated medium and were filled up with 0.1 mL of extract of black carrot or red cabbage. The plates were incubated at 30°C. After incubation the inhibition zones were measured and the effect was calculated as a mean of the triplicate experiments for each strain [2].

## RESULTS AND DISCUSSION

Major compounds found in black carrot extract were derivatives of caffeoylquinic acid (6.21 mg/ml) and five cyanidin 3-xylosyl(glucosyl)galactoside derivatives (6.06 mg/ml). Black carrots have been previously reported as good sources of anthocyanins including acylated forms [4, 5]. Red cabbage extract was the source only of cyanidin derivatives. The main compound was Cy-3(sin)(sin)diglu-5-glu (16.15 mg/ml). The occurrence of this anthocyanin has been established by McDougall et al. [3]. Black carrot extract exhibited antibacterial activity against all investigated strains. The inhibitory activity of red cabbage was lower. The activity of this extract against *Enterobacteriaceae* was not observed. The antimicrobial effect of red cabbage was previously investigated [6,7]. To the best of our knowledge, the effect of black carrot extracts on the microbiological growth had not been studied previously. Our investigation indicate that this extract can be use not only as color enhancer but also as natural preservative of meat products.

## CONCLUSIONS

Red cabbage and black carrot extracts can be use not only as color enhancers but also as natural preservatives of meat products.

## REFERENCES

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