

Mechanism of Quercetin Inhibits Hemoglobin-Induced Lipid Oxidation

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I. INTRODUCTION

In most instances, lipid oxidation is a free radical chain reaction. The high reactivity of free radicals can cause body injury, cell damage, aging phenomenon. Flavonoids is a kind of polyphenol compounds, many studies suggested that the antioxidant activity of flavonoids mainly depend on the ability of free radical scavenging and metal chelating. Quercetin can inhibit lipid oxidation by reducing MetHb into OxyHb. Quercetin have the potential to become a new source of antioxidants in meat products, oil and ascorbic acid. The purpose of this study is to analys the mechanism of quercetin inhibit lipid oxidation induced by hemoglobin[1,2].

II. MATERIALS AND METHODS

Taking fresh COD,removed intramuscular fat and connective tissue, using chopping machine (5mm diameter) minced meat. Mixed Cod with three times volume (v/w) phosphate buffer (50mM, 6.3pH, 4°C), using glass rod to stir for 2 minutes then standing for 15 minutes, collected muscle tissue after rinsing. Using homogenizer 10000 RPM homogenated for 1 minute, standing for 15 min. Then 15263*g (4°C) centrifuged for 25 minutes, the residue was washed cod muscle, WCM[3]. Mixed 0.5 ml samples with 0.5 ml antioxidant ferrous chloride (3 mM), adding 0.5 ml 1,10-phenanthroline (3mM) with 2ml phosphate buffer (2.5mM, pH7.4), vortex shock 1 minutes after mixing, added 0.5 mL 0.1% hydrogen peroxide solution cultivating 30 minutes in 37°C from light. Measured absorbance value at 560 nm [4].

The data was analysed by using one-way ANOVA.The means were compared using Fisher's least significant difference procedure with significance at $P < 0.05$. Analyses were performed using SAS 8.2(SAS Institute Inc., Cary, North Carolina, USA).

III. RESULTS AND DISCUSSION

Effect of quercetin (200 mol/kg muscle) on lipid peroxidation induced by OxyHb as shown in figure 1. The experimental group added quercetin increased slightly from first day, then tend to be stable from second to fourth day. The result showed that quercetin can effectively inhibit lipid oxidation induced by OxyHb.

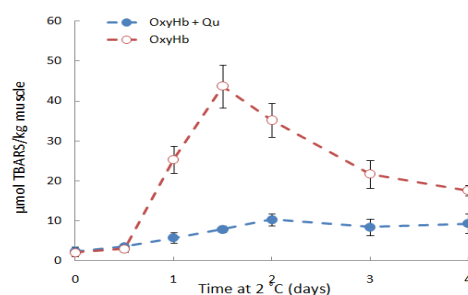


Fig. 1 Effect of quercetin on TBARS value of OxyHb in washed cod muscle

In Figure 2, TBARS almost did not increase before 0.75 days in MetHb-Qu adducts, followed by a slow growth. MetHb-Qu adducts induced lipid oxidation was significantly lower than MetHb.

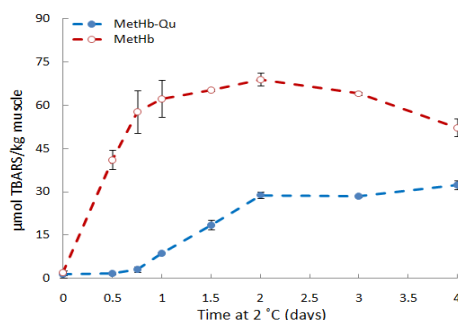


Fig. 2 Comparison of lipid oxidation of MetHb-Qu adducts and MetHb in washed cod muscle

IV. CONCLUSION

Quercetin can inhibit lipid oxidation by making reduction of MetHb to OxyHb. MetHb can combine with 1 molecules of quercetin to form adduct, reduced lipid oxidation ability of Hb. Quercetin can be used as new antioxidants in meat products, oil and ascorbic acid.

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