

ABSTRACT

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Title of diploma thesis: Vasodilatory effects of catechol derivatives *ex vivo*

Polyphenols, including flavonoids, are a broad group of natural substances with significant effects on human health, including the prevention of cardiovascular diseases. Their metabolites can also be active, with clinical effects which may even exceed those of the parent compounds. The aim of this diploma thesis was to verify vasodilatory effects of one flavonoid metabolite type, a series of catechol derivatives and elucidate the mechanism of action of the most potent substance. The established *ex vivo* method of isolated aortic rings of Wistar rats with isotonic registration of tissue contraction and dilation (software S.P.E.L. Advanced Kymograph Software) was used. In the experiments with the rat aorta precontracted by norepinephrin, 3-methoxycatechol was the most effective vasodilator ($EC_{50} = 7,6 \mu\text{mol.l}^{-1}$). In the mechanistic study, we found out that its effect is endothelium-independent, and that 3-methoxycatechol enhances the vasodilatory effect of sodium nitropruside. However, the specific mechanism responsible for vasodilation was not identified and further experiments should be carried out in future. An effect on the NO/sGC/cGMP/PKG pathway seems possible.