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[home](#) [page](#) [about us](#) [contact](#)



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Table of Contents

IN PRESS

CJFS 2014

CJFS 2013

CJFS 2012

CJFS 2011

CJFS 2010

CJFS 2009

CJFS 2008

CJFS 2007

CJFS 2006

CJFS 2005

CJFS 2004

CJFS 2003

CJFS 2002

CJFS 2001

CJFS Home

Editorial Board

For Authors

- **Authors
Declaration**
- **Instruction
to Authors**
- **Guide for
Authors**
- **Copyright
Statement**
- **Submission**

For Reviewers

- **Guide for
Reviewers**
- **Reviewers
Login**

Subscription

Czech J. Food Sci.

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Antioxidant activities of two novel synthetic methylbenzenediol derivatives

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2-(*tert*-Butyl)-5-methylbenzene-1,4-diol and 3-(*tert*-butyl)-5-methylbenzene-1,2-diol were synthesised by Friedel-Craft reaction of 2-methylbenzene-1,4-diol and 4-methylbenzene-1,2-diol, respectively, with tertiary butanol providing reasonable yields. The antioxidant activities of these two products, mother compounds and 2-(*tert*-butyl)benzene-1,4-diol were investigated and compared by means of 2,2-diphenyl-1-picrylhydrazyl radical and Rancim at test; 3-(*tert*-butyl)-5-methylbenzene-1,2-diol is the most potent antioxidant tested by using Rancimat test experiment. The 2,2-diphenyl-1-picrylhydrazyl radical scavenging abilities of 2-methylbenzene-1,4-diol, 4-methylbenzene-1,2-diol and 2-(*tert*-butyl)benzene-1,4-diol are almost equal and more than twice as strong as 2-(*tert*-

butyl)-5-methylbenzene-1,4-diol and 3-(*tert*-butyl)-5-methylbenzene-1,2-diol. The antioxidant activities of the five compounds evaluated by Rancimat test mainly depend on their steric synergist effects between the two phenolic hydroxyl groups in their molecules. The antioxidant activities of the five compounds mainly depend on how many 2,2-diphenyl-1-picrylhydrazyl radicals can be scavenged by one mole of them in 2,2-diphenyl-1-picrylhydrazyl test. One mole of 2-methylbenzene-1,4-diol, 4-methylbenzene-1,2-diol and 2-(*tert*-butyl)benzene-1,4-diol can scavenge four moles of 2,2-diphenyl-1-picrylhydrazyl radicals, but one mole of 2-(*tert*-butyl)-5-methylbenzene-1,4-diol or 3-(*tert*-butyl)-5-methylbenzene-1,2-diol can only scavenge two mole 2,2-diphenyl-1-picrylhydrazyl radicals because 2,2-diphenyl-1-picrylhydrazyl radicals are very bulky.

Keywords:

2-(*tert*-butyl)-5-methylbenzene-1,4-diol;
3-(*tert*-butyl)-5-methylbenzene-1,2-diol;
steric synergist effect; DPPH; Rancimat
test

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