

论著

## 天然黄酮类抗氧化剂对脂氧合酶介导四种具有苯环结构化合物氧化的影响

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**摘要** 目的 研究天然黄酮类抗氧化剂茶多酚(GTP)、表没食子儿茶素没食子酸酯(EGCG)、槲皮素、芦丁对脂氧合酶介导愈创木酚、联苯胺、对苯二胺和二甲氧联苯胺协同氧化的影响, 初步探讨此类抗氧化剂通过抑制脂氧合酶协同氧化作用的机制发挥其抗氧化作用的可能性。方法 用分光光度法和电子自旋共振技术(ESR)检测加入或未加抗氧化剂等调节物的反应体系中反应产物及自由基中间产物的生成情况。结果 GTP, EGCG, 槲皮素、芦丁均可降低大豆脂氧合酶(SLO)介导的受试化合物协同氧化反应的速度, 以及氧化产物和自由基中间产物的生成量。其对SLO介导愈创木酚氧化的半数抑制浓度(IC<sub>50</sub>)分别为8.2 mg·L<sup>-1</sup>, 17.4, 41.4和46.1 μ

mol·L<sup>-1</sup>, 均有显著意义地低于还原型谷胱甘肽、二硫苏糖醇、丁基羟基茴香醚、棉子酚。结论 GTP, EGCG, 槲皮素、芦丁均可明显抑制SLO介导愈创木酚、联苯胺等的氧化活化。

**关键词** [脂氧合酶](#) [异生物质](#) [抗氧化药](#)

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## Effect of natural flavonoid antioxidants on the oxidation of four compounds with benzene ring structure mediated by lipoxygenase

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### Abstract

**AIM** To study the effect of the natural flavonoid antioxidants (green tea polyphenol(GTP), (-)epigallocatechin-3-gallate(EGCG), quercetin and rutin) on the co-oxidation of four compounds (guaiacol, benzidine, *p*-phenylenediamine and *o*-dianisidine) mediated by lipoxygenase for investigating the possibility that the mechanism of their anti-oxidation is based on the inhibition of lipoxygenase co-oxidation. **METHODS** The reaction product and free radical intermediate in the reaction medium with or without antioxidants and other moderators was detected by spectrophotometry and electron spin resonance(ESR). **RESULTS** GTP, EGCG, quercetin and rutin all reduced the co-oxidation reaction rate and the amount of oxidative product and free radical intermediate of the tested four compounds mediated by soybean lipoxygenase(SLO). The 50% inhibition concentration(IC<sub>50</sub>) of these natural antioxidants for the co-oxidation of guaiacol mediated by SLO was 8.2 mg·L<sup>-1</sup>, 17.4 μmol·L<sup>-1</sup>, 41.4 μmol·L<sup>-1</sup> and 46.1 μmol·L<sup>-1</sup>, respectively, which was significant lower than reduced glutathion, *dl*-dithiothreitol, butylated hydroxyanisole and gossypol. **CONCLUSION** GTP, EGCG, quercetin and rutin all can obviously inhibit the co-oxidation of four compounds including guaiacol and benzidine catalyzed by SLO.

**Key words** [lipoxygenase](#) [xenobiotics](#) [antioxidants](#) [flavones](#) [free radicals](#)

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