

丁香活性物质提取工艺优化与抗氧化活性研究 Extracting Technology and Antioxidant Activity of Bioactive Components from Clove

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摘要: 对丁香抗氧化活性物质提取工艺及其抗氧化活性进行了研究。结果表明,最佳提取工艺条件为:60%乙醇、提取温度60℃、料液比1:20和提取时间40min;在此工艺条件下抗氧化活性物质提取率为 $(10480.4 \pm 40.3) \mu\text{mol/g}$ ,获得的相应丁香粗提物具有较强的抗氧化活性,总还原力弱于相同质量浓度的阳性对照BHT和VC ( $P < 0.01$ 或 $P < 0.001$ ),FRAP法抗氧化能力和DPPH自由基清除能力弱于相同质量浓度的VC,强于相同质量浓度的BHT ( $P < 0.05$ 、 $P < 0.01$ 或 $P < 0.001$ );通过生物活性追踪发现丁香抗氧化活性物质主要存在于其弱极性的乙酸乙酯部分,该部分 $100 \mu\text{g/mL}$ 质量浓度样液的总还原力达 $0.634 \pm 0.040$ ,FRAP法抗氧化能力达 $0.433 \pm 0.005$ ,DPPH自由基清除率达 $(85.294 \pm 0.499)\%$ ;相关关系表明丁香抗氧化活性的主要物质基础为总多酚和总黄酮。The extracting technology and antioxidant activity of bioactive components from clove were studied. The results showed that the optimal parameters of the extracting technology were as follows, the concentration of ethanol was 60%, the extracting temperature was 60℃, the ratio of sample to extracting solution was 1:20, and the extracting time was 40min. The recovery ratio of bioactive compounds from clove was  $(10480.4 \pm 40.3) \mu\text{mol/g}$  in this extracting technology. The crude extracts obtained from this extracting technology were proved to have strong antioxidant activity. The reducibility of the crude extracts was weaker than those of two positive controls (BHT and VC) ( $P < 0.01$  or  $P < 0.001$ ). The FRAP values and the activity of scavenging DPPH radicals of the crude extracts were weaker than those of VC and stronger than those of BHT ( $P < 0.05$ ,  $P < 0.01$  or  $P < 0.001$ ). It was found by using the bioassay guided method that the bioactive antioxidants of clove were mainly attributed to the ethyl acetate fraction. The reducibility (OD 700nm) and FRAP values (OD 593nm) of the sample of the ethyl acetate fraction with the concentration of  $100 \mu\text{g/mL}$  were  $0.634 \pm 0.040$  and  $0.433 \pm 0.005$ , respectively. The percentage of scavenging DPPH radicals of the same sample was  $(85.294 \pm 0.499)\%$ . The result of correlation analysis showed that the strong antioxidant activity mainly resulted from the high contents of the total phenols and total flavonoids.

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