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研究报告

光质对萝卜芽苗菜总酚类物质含量及抗氧化能力的影响

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Effects of Light Quality on Total Phenolic Contents and Antioxidant Activity in Radish Sprouts

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摘要 采用发光二极管（LED）精确调制光质和光量，以黑暗为对照，研究光质对‘杨花萝卜’和‘青头萝卜’芽苗菜生长、总酚类物质含量、抗氧化能力及苯丙氨酸解氨酶（PAL）活性的影响。结果表明，芽苗菜的生长、总酚类物质含量、抗氧化能力和PAL 活性因光质和处理时间不同而异。总体来看，下胚轴长和地上部鲜质量在培养3 ~ 7 d 增加迅速，其后增加缓慢，且总酚类物质含量也是在培养初期高于培养后期。与黑暗处理相比，紫外光（UV-B）处理显著增加了芽苗菜中酚类物质的含量。相应地，芽苗菜的抗氧化能力和PAL 活性都在UV-B 处理下最高。另外，蓝光处理也显著增加了‘杨花萝卜’芽苗菜中酚类物质的含量及PAL 活性。因此认为UV-B 和蓝光，能增加芽苗菜中的总酚类物质含量，提高萝卜芽苗菜的营养品质。

关键词： 萝卜 芽苗菜 光质 总酚类物质 PAL 活性 抗氧化能力

Abstract： The effects of different light quality on growth, total phenolic contents, antioxidant and phenylalanine ammonia-lyase（PAL）activity of radish sprouts have been investigated. The results showed that the growth, total phenolic contents, antioxidant and PAL activity of radish sprouts that treated with different light spectrum qualities varied with light quality and treatment time. The hypocotyl length and growth of radish sprouts rapidly increased from 3 to 7 d, and then they increased slowly. Accumulated phenolic in sprouts also showed the general trend distribution of early stage of culture > late stage of culture. Compared to dark treatment, radish sprouts grown in UV-B treatment were found to have much higher concentrations of phenolic. Accordingly, the antioxidant and PAL activity were highest in the UV-B treatment. In addition, the blue light treatment also induced the PAL activity and increased the phenolic content in ‘Yanghua’ radish sprouts. These results suggest that light treatments of radish sprouts, especially UV-B and blue light, are effective in promoting dietary phenolic antioxidants and radish sprouts have the potential to be an effective source of bioactive compounds for the consumers.

Keywords： radish, sprouts, light quality, total phenolic contents, PAL activity, antioxidant activity

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