

论文

UV-B诱导的大豆愈伤组织异黄酮和超弱发光的变化\*

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摘要:

利用基于单光子技术的超弱发光测量系统研究了UV-B辐射对大豆愈伤组织异黄酮和超弱发光的影响,UV-B辐射的强度范围为20~80 μW/cm<sup>2</sup>.结果表明,UV-B辐射使大豆愈伤组织延迟发光初始强度和自发发光强度明显增强,随着诱导处理后时间的延长,延迟发光初始强度和自发发光强度逐渐减小,大豆异黄酮含量逐渐增加,大豆异黄酮含量的变化与延迟发光初始发光强度的变化之间呈现负相关.结果表明,UV-B辐射使大豆愈伤组织总体代谢和活性氧代谢强度提高,大豆异黄酮含量提高是自发发光和延迟发光强度降低的原因,大豆异黄酮含量的增加可以用延迟发光初始发光强度的降低来量度.

关键词: UV-B辐射 超弱发光 异黄酮 大豆愈伤组织

Changes of Isoflavones and Ultraweak Photoemission of Soybean Callus Induced by UV-B Radiation

Abstract:

The effect of UV-B radiation on isoflavones and ultraweak photoemission of soybean callus were studied by the measurement system of ultraweak illumination based on single photon technology. The scope of radiation intensity was 20~80 μW/cm<sup>2</sup>. The results showed that UV-B radiation made the intensity of initial light(I<sub>0</sub>) of delayed luminescence(DL) and spontaneous biophoton emission(BPE) of soybean callus increased obviously. Then both of them decreased and the contents of isoflavones increased gradually with the time after stopping radiation. The changes of isoflavones content were negative related to the changes of intensity of initial light I<sub>0</sub> of delayed luminescence. The results indicated that UV-B radiation made the levels of total metabolism and active oxygen metabolism of soybean callus increased and the increase of isoflavones contents could be the cause of BPE and DL reduction. The increase of isoflavones contents of soybean could be measured of intensity of initial light I<sub>0</sub> of delayed luminescence.

Keywords: UV-B radiation ultra-weak photoemission isoflavones soybean callus

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