عنوان مقاله:

In vitro evaluation of drought tolerance in two grape (Vitis vinifera L.) cultivars

محل انتشار:

مجله فیزیولوژی و پرورش گیاهان, دوره 10, شماره 2 (سال: 1399)

تعداد صفحات اصل مقاله: 13

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خلاصه مقاله:

Abiotic stresses pose a major threat to agriculture. Therefore, developing plants that are more tolerant of these stresses is very important for improving crop productivity. Grapevines (Vitis vinifera L.) is an important fruit crop cultivated in the world. An in vitro experiment was designed to study the response of 'White Seedless' and 'Flame Seedless' cultivars of Vitis to drought stress. Treatments included four concentrations of PEG ۶۰۰۰, i.e., ۰, ۰.۵, ۱, and ۲% (w/v), which were equivalent to ۰, -۰.۰۳۵, -۰.۰۷, and -۰.۱۴ times the water potential, respectively. The single-node explants of Vitis grown on MS medium, supplemented with growth regulators BA (۲ mg/l), NAA (۰.۲ mg/l), sucrose (۳۰ g/l), agar (۷ gr), and activated charcoal)۲۰۰ mg/l), were transferred to the same medium but with different concentrations of PEG for ۳۰ days. The results showed that the Flame Seedless cultivar had better growth characters than the White Seedless cultivar on the average of PEG concentrations. Flame Seedless also managed drought stress in terms of shoot length, the number of leaves per shoot, dry weight, chlorophyll a, chlorophyll b, and soluble carbohydrates more efficiently than White Seedless, and produced a high percentage of callus (۸۷.۵%) at the ۱% PEG stress level. Although the White Seedless cultivar was not more vigorous than Flame Seedless but showed significantly higher proline content, non-significant reduction in relative water content, and a slightly lower reduction in shoot length, and fresh weight at ۲% PEG as compared to the control. It seems that both grapevine varieties succeeded in dealing with the PEG drought stress with their special mechanisms.

کلمات کلیدی:

Drought Stress, In vitro culture, Polyethylene glycol, Vitis vinifera L