

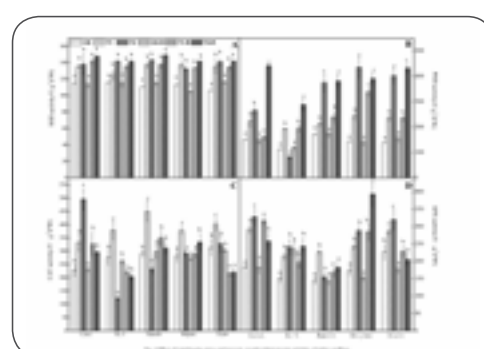
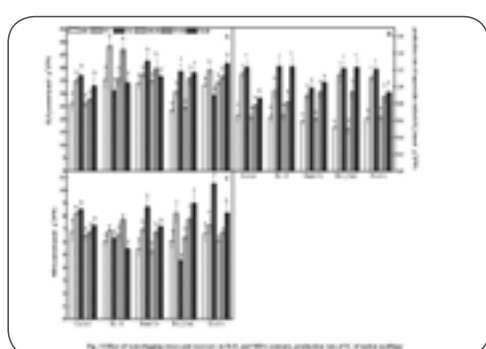
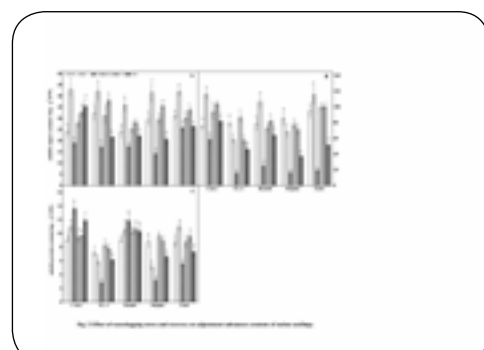
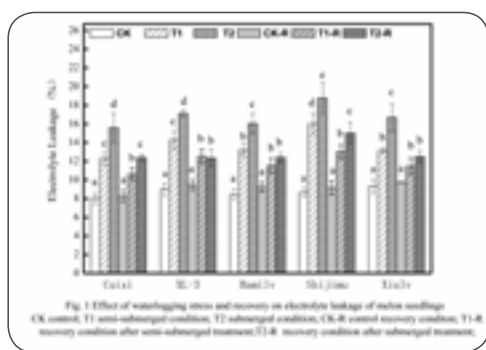
Agriculture & Horticulture

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Effects of waterlogging stress on growth and physiological indexes on different melon seedlings

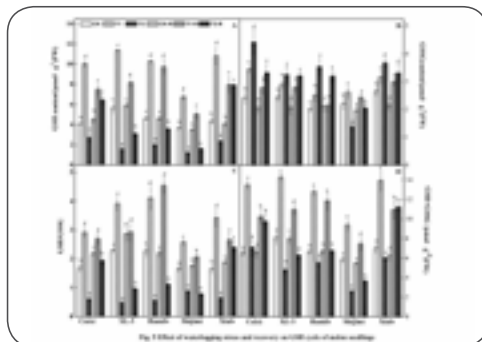
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In order to investigate the effects of semi-submerged, submerged and recovery condition on growth and physiological biochemical changes of different melon varieties (including ‘Cuixi’, ‘XL-3’, ‘Hamilv’, ‘Shijimi’, ‘Xiulv’), the seedlings were flooded submerged or semi-submerged 3d and then recovered 3d in laboratory condition. The results showed that two waterlogging conditions inhibited the growth of melon seedlings, generally, the leaf area, plant height, and fresh weight melon seedlings were lower than the control, especially, morphology parameters reduced significantly after submerge waterlogging and recovery condition, Compare with the control, the electrolyte leakage significantly increased under different waterlogging conditions, the electrolyte leakage of five melon varieties were almost 70%-85% and 61%-78% of the control under semi-submerged and submerged condition. The semi-submerged and recovery conditions induced the content of soluble sugars significantly increased, the proline and soluble protein contents of ‘cuixi’, ‘hamilv’, and ‘xiulv’ were remarkably increased, while, the contents of proline and soluble sugars decreased under submerged condition. Moreover, under semi-submerged, submerged and recovery conditions, Malondialdehyde (MDA), Hydrogen Peroxide (H₂O₂) contents, and production rate of superoxide radical (O₂⁻) improved to varying degrees, among them, the O₂⁻ changed was most obvious. Semi-submerged condition made Superoxide Dismutase (SOD), Peroxidase (POD), Catalase (CAT) and Ascorbate Peroxidase (APX) Activities, Glutathione (GSH), Oxidized Glutathione (GSSG), GSH+GSSG contents, and GSH/GSSG enhanced in various degrees. Under submerged condition, activities of SOD, POD, CAT and APX, as well as GSSG contents were higher than control, however, GSH, GSH+GSSG contents and GSH/GSSG were lower than control. After the waterlogging stress was relieved, different varieties have different change. Overall, semi-submerged and submerged condition can inhibit the growth of five melon varieties, the effect of submerged condition was clear, and this effect was reversible, the growth and growth and physiological parameters of melon were recovered to different degrees.



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Recent Publications:

1. Damanik R, Maziah M, Ismail M, et al (2010). Responses of the antioxidative enzymes in Malaysian rice (*Oryza sativa* L) cultivars under submergence condition. *Acta Physiologiae Plantarum*, 32: 739-747
2. Sairam R, Kumutha D, Ezhilmathi K, et al (2008). Physiology and biochemistry of waterlogging tolerance in plants. *Biologia plantarum*, 52(3): 401
3. Foyer C, Noctor G (2005). Redox homeostasis and antioxidant signaling: a metabolic interface between stress perception and physiological responses. *Plant Cell*, 17: 1866-1875
4. Barnawal D, Bharti N, Maji D, et al (2012). 1-Aminocyclopropane-1-carboxylic acid (ACC) deaminase-containing rhizobacteria protect *Ocimum sanctum* plants during waterlogging stress via reduced ethylene generation[J]. *Plant physiology and biochemistry*, 58: 227-235.
5. Wang X, Huang M, Zhou Q, et al (2016). Physiological and proteomic mechanisms of waterlogging priming improves tolerance to waterlogging stress in wheat (*Triticum aestivum* L.). *Environmental and Experimental Botany*, 132: 175-182.

Biography

Chen Youyuan has working on Shanghai Academy of Agricultural Sciences since 1982. Now he has his expertise in melon cultivation and breeding. He has chosen 12 melon varieties that have large area.

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Notes: