

THE INTERFERENCE OF THE ETHYLENE PERCEPTION SYSTEM LEADS TO A TRANSCRIPTIONAL RE-PROGRAMMING INVOLVED IN HORMONAL CROSS-TALK

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Ethylene is a gaseous plant hormone playing master regulatory roles in triggering and coordinating the ripening syndrome in climacteric fruits. The control of this hormone represents a key point in the modern horticulture and postharvest management, since the reduction of ethylene can extend the postharvest life of fruits limiting quality decay and general fruit loss. One of the most efficient strategies to limit the effect of ethylene during the postharvest ripening of apple is the exogenous application of 1-methylcyclopropene (1-MCP), a molecule competing with ethylene at the receptor-binding site. The transcriptional signature coded by the application of 1-MCP was further investigated with microarray platforms. Together with an expected gene transcriptional repression, an equal dose of genes was also de-repressed or de-novo activated, underlying elements especially involved in regulatory processes and hormonal cross-talk, in particular with auxin. The re-programming of the auxin perception pathway, correlated with the amount of ethylene produced during normal ripening, was validated by the specific expression pattern of genes involved in conjugation/de-conjugation processes. In this physiological scenario the activation of auxin following the interference with ethylene is thought as an alternative mechanism induced by the fruit in the attempt to re-establish a normal physiological progression towards the completion of ripening.