Possibilities of modified atmosphere packaging to prevent the occurrence of internal fruit rot in bell pepper fruit (*Capsicum annuum*) caused by *Fusarium* spp

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Abstract

Bell pepper (*Capsicum annuum* L.), with its wide array of colors and flavors, plays an important role in many different cuisines around the world. Yet once harvested, it is a highly perishable fruit and needs appropriate post-harvest handling. Recently, post-harvest internal rotting (IFR) by *Fusarium lactis* species complex isolates (FLASC), became an additional challenge to maintain shelf-life and quality of bell pepper fruit. Therefore, modified atmosphere packaging (MAP) was explored as a possible technique to postpone symptom development of infected bell peppers. Four artificially infected bell pepper cultivars with different susceptibility towards IFR were stored under MAP conditions for a maximum of 14 d at challenging conditions of 20 °C resembling unrefrigerated shelf life conditions. Each week, 5 fruit of each object were analyzed for IFR symptom development and additional physicochemical and quality parameters. For all cultivars, MAP packaged fruit showed less severe fungal proliferation compared to controls after 14 d. As total titratable acid (TA), total soluble solids (TSS) and vitamin C concentrations in fruit remained rather stable throughout the experiment, fungal development was likely to be postponed directly due to reduced oxygen levels in the pouches rather than a decreased host susceptibility by influencing fruit metabolism. Since no significant differences of disease development were observed between sensitive and less sensitive cultivars for both colors, sensitivity for IFR seems not likely to be caused by different post-harvest disease development patterns but rather by differences in the initial susceptibility for flower infection under normal growth conditions. Based on our results, MAP can indeed be considered a useful tool to ameliorate IFR development during post-harvest storage of bell pepper under conventional temperatures of 7–16 °C.