

Title 1-MCP application for optimizing papaya fruit (*Carica Papaya* L.) quality during postharvest- possibilities and constrains

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Abstract

Papaya (*Carica papaya* L.) is considered one of the most important crops throughout the tropical and subtropical countries with a high consumer demand worldwide. Papaya fruit - consumed fresh, cooked, dried or fresh-cut as convenient product - is known as a rich source of health-promoting phytochemicals, e.g. glucosinolates, carotenoids, and dietary fibres. However, papaya fruit has a climacteric ripening behaviour deteriorating rapidly during transport, storage and marketing. Postharvest losses of up to 75% occur during shipping and distribution showing a range of disorders associated with mechanical injury, chilling injury, undesired ripening by acceleration of ethylene evolution and diseases. Reaching the 40% skin yellow stage, papaya fruit become more susceptible to these disorders. Physiological ageing and softening is influenced by the maturity stage of fruit at harvest, postharvest treatment and storage conditions. The ethylene inhibitor 1-methylcyclopropene (1-MCP) is known to control ethylene-dependent processes and prolong storability and shelf life of various fruits and vegetables. However currently, there is almost no information available on the effect of 1-MCP treatment on the ripening behaviour of papaya fruit. In the present study, two different 1-MCP concentrations (312 and 624 nL/L) were applied to harvested fruit at two different ripening stages, i.e. colour break and ripe. Thereafter, fruit were analyzed for ethylene production and respiration rates as well as for TSS, acidity, dietary fiber, glucosinolates, carotenoids and phenol pattern subsequently during 6 days of storage under simulated commercial conditions. Results presented here revealed an inhibiting effect of 1-MCP at both concentrations on undesired changes of TSS, acidity and carotenoids in colour break fruit only. Ripening pattern of ripe fruit was negatively affected by 1-MCP. Results will be discussed in detail with special emphasis on optimizing postharvest operations for papayas in food supply chain.