

Title Increased biosynthesis of free polyamines in response to higher ethylene production during fruit ripening of mango

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Abstract

Preliminary investigations were conducted to test whether or not endogenous free polyamines and ethylene have a competitive biosynthesis relationship during mango (*Mangifera indica*) fruit ripening. Aqueous solutions of 2 mM MGBG (methylglyoxal (bis (guanyldrazone))), putrescine and 500 ppm ethephon (ETH) along with 0.02% Tween-20 surfactant were applied for 6 minutes to uniformly mature, hard, green 'Kensington Pride' mangoes as a postharvest fruit dip treatment. Following treatments, fruits were allowed to ripen at ambient temperature (22 plus or minus 1 deg C). Ethylene production of fruits was recorded on days 2 and 5, while endogenous free polyamines (putrescine (PUT), spermidine (SPD) and spermine (SPM)) from fruit pulp were estimated on two critical days (2 and 4) during ripening. The effects of various treatments on fruit quality of ripe fruits were also assessed. ETH increased ethylene production by 23.0- and 4.9-folds higher than the control on days 2 and 5, respectively, while endogenous total free polyamines also increased simultaneously by 32 and 20%, respectively. On days 2 and 4, respectively, endogenous free PUT (43, 11%), SPD (10, 35%) and SPM (16, 20%) increased in ETH-treated fruits compared to the control. Other treatments did not have any appreciable effect on endogenous free polyamines and ethylene; however, generally, MGBG tended to increase, while PUT decreased polyamine biosynthesis compared to the control. PUT retarded fruit ripening and significantly reduced colour development, total and nonreducing sugars and total carotenoids compared to the control. These preliminary results show that higher ethylene production did not inhibit, but rather increased the endogenous free polyamines, indicating that polyamines and ethylene may not have a "competitive" biosynthesis although they showed opposite effects during mango fruit ripening.