

Shelf life extension studies under different temperature regimes on ripening mechanism and quality preservation in Plums fruits (*Prunus domestica* and *P. salicina*) treated with 1-methylcyclopropene

Neeraj¹, Joon M. S² and Noga G³

¹National Institute of Food Technology Entrepreneurship and Management, India

²Department of Horticulture, CCSHAU, India

³INRES, Universität Bonn, Germany

The prime objectives of study was to assess the impact of 1-MCP on ripening changes (physical, physiological and biochemical) in plum fruits during storage at different storage temperatures (2°C, 15 °C and 20°C). European plum (cv. Hauszwetschge) fruits were treated with 0.5 µl⁻¹ 1-MCP and 100 ppm ethylene, alone or in combination (i.e. 1-MCP+ethylene) at 2°C for 24 h. After every 15 days interval (i.e. 15, 30, 45, 60 days at 2°C) fruits were transferred to 20°C for 6 days. At both the storage temperatures, 1-MCP treated European plum fruits exhibited lower physiological loss in weight, retained better firmness and higher L values (brightness), b* values (blue-yellow axis), showed minimum change in total soluble solids, sucrose, glucose and fructose as compared to other treatments and untreated fruits. Fruits lost nearly 16% of their physiological weight during 56 days of storage at 2°C and more than 30% of their weight by end of storage period of 60 days at 2°C plus 6 days at 20°C. At molecular level, PPO activity was lowest (3.01 units g⁻¹ min⁻¹) in 1-MCP treated fruits and also lower activities of PG and PME enzymes. Fruits treated with 1-MCP have lowest carbon dioxide (3.14±0.98 ml kg⁻¹ h⁻¹) and ethylene (17.59 µl kg⁻¹ h⁻¹) production rates as compared to other treatments. Japanese plum (cv. Santa Rosa) treated with 1-MCP (0.5µl⁻¹) and stored at 15°C for 9 days showed lower weight loss, decay loss and higher specific gravity, higher total soluble solids, acidity, ascorbic acid content as compared to control fruits. 1-MCP treated fruits had longer shelf life as compared to untreated control fruits. The study has shown that 1-MCP has the potential to control the ripening of plum fruit and extending the storage period by more than 15 days at 2°C and by approximately 5 days at 15°C.

Biography

Neeraj has completed his Ph.D. from CCS Haryana Agricultural University in Horticulture Science with specialization in postharvest management and worked as DAAD Research Fellow in Institute fuer Gartenbauwissenschaft, Bonn University, Germany. He is working as Assistant Professor in National Institute of Food Technology Entrepreneurship and Management.

Neeraj@niftem.ac.in