

Title Effect of storage temperature, packages, 1-MCP and other preservatives on post harvest shelf life of tuberose (*Polianthes tuberosa* cv. single) loose flowers

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Keyword 1-MCP; shelf-life; flower

Abstract

Investigation was carried out in five different experiments conducted separately in CRD with 5 replications for tuberose loose flowers to elucidate the mechanism of senescence and to study the effect of storage temperature, packages, sucrose, 1-MCP and other preservative chemicals on post harvest behaviour and shelf life. Studies on post harvest changes of tuberose evinced that all the flowers exhibited significant reduction in the cumulative physiological loss in weight and moisture content as duration of shelf life advanced. The angular flux was reached 41.33° within 12 h of storage, while the freshness and colour index exhibited the negative linear trend. The electrolytic leakage was rapidly appeared and the useful shelf life was 32 h. In the experiment conducted to standardize the thickness of polyethylene bag packaging and storage temperature, the cumulative physiological loss in weight and flower opening index were reduced in low temperature storage of the flowers with increased thickness in polyethylene bag. Moisture content, freshness index and colour index were increased with increase in thickness of polyethylene bag and reduction in storage temperature. The vase life of tuberose was extended to 82.20 h in 300 gauge polyethylene bags storage at 5°C . However, the unpacked flowers stored at ambient temperature were remained useful upto 35.52. There was more than 200 per cent enhancement in shelf life. The experiment on optimizing the sucrose concentration revealed that the flowers treated with 4% sucrose at 5°C in 300 gauge polyethylene bags showed the increased moisture content, freshness index and colour index and reduction in flower opening index. Total phenol content, protease activity and electrolytic leakage were also significantly reduced in the 4% sucrose treated flowers with an extended shelf life of 95.46 h which was significantly higher than the distilled water treated flowers (81.25h) stored in 300 gauge polyethylene bags in 5°C . The results of the experiment conducted to find out the effect of sucrose in combination with 1-MCP revealed that the sucrose (4%) + 1-MCP (200 ul^{-1} for 4 h) treatment exhibited the highest shelf life of 118.64 h. The experiment on the combinations of sucrose, 1-MCP and other preservative chemicals revealed that the sucrose 4% + 1-MCP (200 ul^{-1} for 4 h) + 8-HQC (750 ppm) exhibited the maximum shelf life of 145.15 h with very good moisture content, freshness index, colour index and flower opening index. Total phenol content, protease activity and electrolytic leakage were also

significantly reduced. The overall organoleptic rating was also found to be superior. This was followed by the treatment combination of sucrose (4%) + 1-MCP (200 μl^{-1} for 4h) + Al₂(SO₄)₃ (400 ppm). Hence, it could be concluded that tuberose loose flowers can be stored at 5°C in 300 gauge polyethylene packages after treating them with sucrose (4%) + 1-MCP (200 μl^{-1} for 4h) + 8-HQC (750 ppm) or sucrose (4%) + 1-MCP (200 μl^{-1} for 4 h) + Al₂(SO₄)₃ (400 ppm) to extend the useful shelf life and freshness of flowers for more than 6 days.