

Ratchanee Pattaravayo 2007: Effects of Sugars in Vase Solution on Sugar Metabolism and Invertase Activity in *Dendrobium* Flowers. Master of Science (Agriculture), Major Field: Horticulture, Department of Horticulture. Thesis Advisor: Professor Saichol Ketsa, Ph.D. 84 pages.

Effects of sugars in vase solution on sugar metabolism and invertase activity in *Dendrobium* 'Khao Sanan' flowers were studied. Inflorescences of *Dendrobium* 'Khao Sanan' were held in the distilled water as control and solutions containing 1) 30 mg/l AgNO₃ + 225 mg/l HQS, 2) 30 mg/l AgNO₃ + 225 mg/l HQS + 4% glucose and 3) 30 mg/l AgNO₃ + 225 mg/l HQS + 4% sucrose at 25°C and 75±3% RH. The results showed that the solutions containing sugar (sucrose or glucose) delayed senescence of open florets and increased bud opening and vase life compared to those held in distilled water and solution without sugar. Changes of sugar metabolism and invertase activities in flowers held in distilled water and solution with sucrose were found that glucose was the main carbohydrate of flowers and the cell wall invertase activity was higher than vacuolar invertase activity. Flower buds held in distilled water had lower sucrose, glucose and fructose contents and higher activity of cell wall invertase than those held in vase solution, while flowers held in both distilled water and solution had no different reducing sugar content but flowers held in solution contained more sucrose than those held in distilled water; while their invertase activity was less than those held in distilled water. Half-open flowers held in distilled water had invertase activity in the column higher than in the petals, sepals and labellum but reducing sugar content was less in the column. However, invertase activity was low but glucose content increased in the petals, sepals and labellum. Invertase activity decreased but sucrose content increased in the column of half-open flowers held in vase solution, while the invertase activity was low but reducing sugar increased in the petals, sepals and labellum. Open flowers held in both distilled water and the solution had low invertase activity but same levels of individual sugars. Flowers of *Dendrobium* (flower buds, half-open flowers and open flowers) showed an increase in dry weight and fresh weight as their growth and development advanced but half-open flowers had the highest invertase activity.

Ratchanee Pattaravayo

Student's signature

Saichol Ketsa

Thesis Advisor's signature

28 / 05 / 2007