

Title Quality and oxidative enzymes activities of superior 'seedless grapes' during maturation at São Francisco river valley, Brazil

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Abstract

The São Francisco River Valley is the main Brazilian region producing table grapes. A significant part of its production is destined to exportation, contributing with 98% of the volume exported by Brazil. Aiming at characterizing the changes on compounds associated to quality and on oxidases activity of 'Superior Seedless' grapes during fruit maturation, clusters were harvested periodically from plants growing at Experimental Station of Embrapa Tropical Semi-Arid, in Petrolina, Pernambuco State, Brazil. Plants of 'Superior Seedless' grapes were grafted on 'IAC-766', grown in a 3 m x 3 m spacing and drip irrigated. Plants of the experimental area were pruned in May 05th 2006 and evaluated after the beginning of the maturation until harvest time. The treatments corresponded to the age of the berries: 73, 80, 87, 90, 94, 97 and 101 days after pruning (dap). At each date, one cluster was collected per each one of the three plants which constituted the plot. It was used a randomized complete-block design, with seven treatments and three replicates. The first fifteen days after the beginning of maturation represented a critical period for soluble solids and total soluble sugars accumulation and for organic acids degradation. From the 87th dap, the increase on soluble solids and total soluble sugars was slower. The same response was observed on titrable acidity, which was reduced in a slow way from that date. The ripe berries were characterized by 16.4°Brix, 15.3 g. 100 g⁻¹ of total soluble sugars and 0.58 % tartaric acid. On the other hand, the phenolic compounds showed a regular behavior, decreasing linearly during maturation. For the oligomeric phenols, the predominant phenolic fraction, the reduction was more intense from 99 mg. 100 g⁻¹ to 40 mg.100 g⁻¹. The enzymatic activity of polyphenol oxidase (PPO) and peroxidase (POD) also had the 87th dap as the critical date. While the PPO activity increased until the 87 dap followed by a stabilization trend, POD activity rose after that date, suggesting an effective contribution for the enzymatic browning of the berries which can occur during harvest and postharvest handling. After great changes in chemical and biochemical berry composition, the approximation of the harvest date is characterized by a reduced metabolism even the POD activity signaling some precautions with handling procedures.