

Title Technological parameters of water curing affect postharvest physiology and storage of marrons (*Castanea sativa* Mill., *Marrone fiorentino*)

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Abstract

Little is known about the biochemistry of the marron (*Castanea sativa* cv *Marrone fiorentino*) when it is soaked in water for the curing process; the immersion treatment time is still empirical and based on traditional knowledge. A study was carried out by keeping marrons in water for 7 d at 14 °C. Tap water and acid water (pH 3) were used in the following water/marron ratios 1:1, 1:2, and 3:2. After curing, the marrons were moved to air storage at room temperature (20 °C and 90% RH) for 1 week (shelf-life), and at 0 °C and 90% RH for 60 d. A large accumulation of carbon dioxide in the head space of the glass jar where the marrons were kept, was observed during water soaking, above all in samples in acid water with a water/marron ratio 1:2. In the first 5 d of water curing, a significant increase in acetaldehyde concentration and phenol content was measured in the marron pulp and subsequently, both compounds declined. Ethanol decreased slightly or remained constant. During the following week of shelf-life, the lowest respiration rate was measured in 1:1 and 1:2 samples while the highest rate was measured in acid water samples. SSC (solid soluble contents) increased in marrons soaked in acid water but remained constant under shelf-life conditions. SSC, ethanol, acetaldehyde and polyphenols did not change following storage at 0 °C for 2 months, but acid water samples showed a higher percentage of decayed marrons. Finally, it is possible to define some technological parameters. The immersion time of marrons in water must be at least 5 and no longer than 7 d, in order to avoid cell destruction. A water/marron ratio of 1:1 is advised. Using acid water, the samples with the ratios of 1:2 and 1:1 showed higher polyphenol and sugar contents. However, the metabolic response of these marrons was assumed to be a “stress response” to acid water.