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Effect of lactic acid fermentation of watermelon juice on its sensory acceptability and volatile compounds

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Abstract

Fermentation increases food shelf-life but is characterized by changes that affect product's perception. Watermelon juice was fermented with *Lactobacillus plantarum* (WJ-LP), *L. rhamnosus* (WJ-LR), *L. casei* (WJ-LC), *L. brevis* (WJ-LB) and *Pediococcus pentosaceus* (WJ-PP). Their sensory characteristics and volatile compounds were investigated by consumers and Headspace Solid Phase Microextraction integrated with Gas Chromatography-Mass Spectrometry, respectively. WJ-PP and WJ-LB were most liked and perceived with 'watermelon-flavor', 'natural taste', 'sweet' and 'watermelon-color' while WJ-LC, WJ-LP and WJ-LR were least liked and perceived as 'sour', 'bitter', 'off-flavor', 'aftertaste' and 'intense-flavor'. Fifty-four volatiles were identified. After fermentation, alcohols, ketones, monoterpenes, acids, and furans increased while aldehydes and alkanes decreased. Lactic acid fermentation introduced 4-decanone and 2,3-butanedione in WJ-LB, WJ-LC, WJ-LP and WJ-LR, however, heptanal, 2-heptenal, 2,6-nonadienal, 2-decenal, and 2,4-decadienal in WJ-LC, heptanal, 2-hexenal, 2-heptenal, 2,6-nonadienal, 2-decenal and octanal in WJ-LR and 2,6-dimethyl-2,6-octadiene in WJ-LP disappeared. Juice sensory profiles were associated with their volatile compounds.

Keywords

Watermelon juice; Fermentation; *Lactobacillus*; Volatile profile; Consumer sensory acceptability