Maintaining the quality of sugarcane juice with blanching and ascorbic acid

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Abstract

The physicochemical changes in fresh sugarcane juice stored at 10 °C were studied by determining juice yield, color, reducing sugar, titratable acidity, viscosity, pH, polyphenol oxidase (PPO), sucrose neutral invertase (SNI) and total microbial count. Results showed that blanching of stems before squeezing effectively prevented degreening and/or browning, and reduced activities of PPO and SNI in fresh sugarcane juice. Added ascorbic acid delayed the increase of reducing sugar, titratable acidity,
viscosity and total microbial count, and also prevented degreening and/or browning with reduced PPO and SNI activities in fresh sugarcane juice during storage. Addition of 0.1% ascorbic acid seemed to be more effective than blanching of sugarcane stems, and was able to maintain the quality of fresh sugarcane juice for up to 5 days at 10 °C. Deterioration of fresh sugarcane juice was demonstrated as a rapid increase of titratable acidity and viscosity with a obvious browning.

**Keywords**

- Sugarcane;
- Juice;
- Blanching;
- Ascorbic acid

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Figures and tables from this article:

**Fig. 1.** Color $a$ (a) and $L$ (b) values in sugarcane juice during storage at 10 °C. Juice extracted from blanched sugarcane stems and added with 0.1% ascorbic acid (•) or without the addition of ascorbic acid (◦). Juice extracted from unblanched sugarcane stems and added with 0.1% ascorbic acid (•) or without the addition of ascorbic acid (◦).

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**Fig. 2.** Titratable acidity of fresh sugarcane juice during storage at 10 °C. Juice extracted from blanched sugarcane stems and added with 0.1% ascorbic acid (•) or without the addition of ascorbic acid (◦). Juice extracted from unblanched sugarcane stems and added with 0.1% ascorbic acid (•) or without the addition of ascorbic acid (◦).

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Fig. 3. pH values of fresh sugarcane juice during storage at 10 °C. Juice extracted from blanched sugarcane stems and added with 0.1% ascorbic acid (●) or without the addition of ascorbic acid (○). Juice extracted from unblanched sugarcane stems and added with 0.1% ascorbic acid (●) or without the addition of ascorbic acid (○).

Fig. 4. Reducing sugar content of fresh sugarcane juice during storage at 10 °C. Juice extracted from blanched sugarcane stems and added with 0.1% ascorbic acid (●) or without the addition of ascorbic acid (○). Juice extracted from unblanched sugarcane stems and added with 0.1% ascorbic acid (●) or without the addition of ascorbic acid (○).

Fig. 5. Viscosity of fresh sugarcane juice during storage at 10 °C. Juice extracted from blanched sugarcane stems and added with 0.1% ascorbic acid (●) or without the addition of ascorbic acid (○). Juice extracted from unblanched sugarcane stems and added with 0.1% ascorbic acid (●) or without the addition of ascorbic acid (○).

Fig. 6. PPO activity of fresh sugarcane juice during storage at 10 °C. Juice extracted from blanched sugarcane stems and added with 0.1% ascorbic acid (●)
or without the addition of ascorbic acid (•). Juice extracted from unblanched sugarcane stems and added with 0.1% ascorbic acid (•) or without the addition of ascorbic acid (◦).

Fig. 7. Activities of sucrose neutral invertase in fresh sugarcane juice stored for 0 day and 4 days at 10 °C, respectively. Juice extracted from unblanched sugarcane stems and added with 0.1% ascorbic acid (unblanching + AA) or without the addition of ascorbic acid (unblanching). Juice extracted from blanched sugarcane stems and added with 0.1% ascorbic acid (blanching + AA) or without the addition of ascorbic acid (blanching).

Fig. 8. Total microbial count in fresh sugarcane juice during storage at 10 °C. Juice extracted from blanched sugarcane stems and added with 0.1% ascorbic acid (•) or without the addition of ascorbic acid (◦). Juice extracted from unblanched sugarcane stems and added with 0.1% ascorbic acid (•) or without the addition of ascorbic acid (◦).

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