Effects of thermal treatment and sonication on quality attributes of Chokanan mango (Mangifera indica L.) juice

Vicknesha Santhirasegaram *, Zuliana Razali, Chandran Somasundram

Institute of Biological Sciences & Centre for Research in Biotechnology for Agriculture (CIARRA), Faculty of Science, University of Malaya, 50603 Kuala Lumpur, Malaysia

ARTICLE INFO

Article history:
Received 4 November 2012
Received in revised form 3 January 2013
Accepted 25 February 2013
Available online 7 March 2013

Keywords:
Sonication
Chokanan mango
Juice
Thermal treatment
Antioxidant activity

ABSTRACT

Ultrasound treatment is an emerging food processing technology that has growing interest among health-conscious consumers. Freshly squeezed Chokanan mango juice was thermally treated (at 90 °C for 30 and 60 s) and sonicated (for 15, 30 and 60 min at 25 °C, 40 kHz frequency, 130 W) to compare the effect on microbial inactivation, physicochemical properties, antioxidant activities and other quality parameters. After sonication and thermal treatment, no significant changes occurred in pH, total soluble solids and titratable acidity. Sonication for 15 and 30 min showed significant improvement in selected quality parameters except color and ascorbic acid content, when compared to freshly squeezed juice (control). A significant increase in extractability of carotenoids (4-9%) and polyphenols (30-35%) was observed for juice subjected to ultrasonic treatment for 15 and 30 min, when compared to the control. In addition, enhancement of radical scavenging activity and reducing power was observed in all sonicated juice samples regardless of treatment time. Thermal and ultrasonic treatment exhibited significant reduction in microbial count of the juice. The results obtained support the use of sonication to improve the quality of Chokanan mango juice along with safety standard as an alternative to thermal treatment.

© 2013 Elsevier B.V. All rights reserved.