Free and Conjugated Polyamines and Phenols in Raw and Alkaline-Clarified Sugarcane Juices

Roberto de Armas ,[†] **Maritza Martinez** ,[†] **Carlos Vicente** ,[‡] **and María-Estrella Legaz** *[,‡]
Department of Plant Physiology, Faculty of Biology, Havana University, Havana, Cuba, and Department of Plant Physiology, Faculty of Biology, Complutense University, 28040 Madrid, Spain

J. Agric. Food Chem., **1999**, *47* (8), pp 3086–3092
DOI: 10.1021/jf980715+
Publication Date (Web): July 16, 1999

PDF [123 KB] | PDF w/ Links[181 KB] | Full Text HTML
Abstract | Figures | Reference QuickView | Citing Articles | Add to ACS ChemWorx

Section: Industrial Carbohydrates

Abstract

Sugarcane juice contains a lot of sucrose associated with several monosaccharides, defined as low molecular mass carbohydrates (LMMC), as well as some polysaccharides and glycoproteins, which are defined as mid and high molecular mass carbohydrates (MMMC and HMMC, respectively). These three categories of carbohydrates can be separated by size-exclusion chromatography through Sephadex G-10 and Sephadex G-50 columns, but elution profiles change drastically after juice clarification performed by adjusting the pH value of the juice to 8.0. In addition, polyamines and some phenolics are currently associated with carbohydrate preparations, and the distribution pattern of these conjugates also changes after clarification. Polyamine levels generally decrease after juice clarification. Cadaverine is completely removed from the different carbohydrate preparations, whereas spermidine is the main polyamine occurring in association with sugarcane carbohydrates, as free or acid-soluble form in LMMC preparation or as acid-soluble and -insoluble forms in both MMMC and HMMC preparations. Polyamines, presumably spermidine, conjugate to *p*-hydroxybenzoic acid in LMMC, mostly to caffeic acid in MMMC, and to syringic acid in HMMC preparations. HMMC-associated polyamines appear in both acid-soluble and -insoluble fractions. Syringic acid also occurs in the LMMC preparation, but juice clarification changes it from acid-soluble to free form, and it coelutes with sucrose.

Keywords: Carbohydrates; juice; phenols; polyamines; sugarcane

View: PDF | PDF w/ Links | Full Text HTML

Citing Articles

View all 12 citing articles

Citation data is made available by participants in CrossRef's Cited-by Linking service. For a more comprehensive list of citations to this article, users are encouraged to perform a search in SciFinder.

This article has been cited by 4 ACS Journal articles (4 most recent appear below).

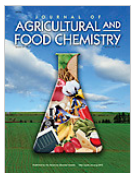
Tools
Add to Favorites
Download Citation
Permalink
Order Reprints
Rights & Permissions
Citation Alerts

SciFinder Links
SciFinder
Get Reference Detail
Get Substances
Get Cited
Get Citing
Explore by:
Author of this Article
Any Author
Research Topic (Now with patent search)
de Armas, Roberto
Search

History
Published In Issue August 16, 1999
Received for review July 2, 1998. Revised manuscript received April 29, 1999. Accepted May 10, 1999. This work as supported by a grant from the Subdirección General de Cooperación Internacional, PR61/98-7831 and a grant from the Dirección General de Investigación Científica y Técnica (Spain) PB96 0662.

Recommend & Share
ACS Network
Facebook
Tweet This
CiteULike
Newsvine
Digg This
Delicious

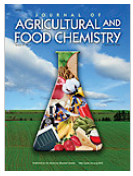
Related Content
Other ACS content by these authors:
Roberto de Armas
Maritza Martinez
Carlos Vicente
María-Estrella Legaz



Assessment of Antioxidant Activity of Cane Brown Sugars by ABTS and DPPH Radical Scavenging Assays: Determination of Their Polyphenolic and Volatile Constituents
Bertrand Payet, Alain Shum Cheong Sing, and Jacqueline Smadja
Journal of Agricultural and Food Chemistry
2005 *53* (26), 10074-10079

Photoelectrocatalytic Oxidation of *o*-Phenols on Copper-Plated Screen-Printed Electrodes
Jyh-Myng Zen, Hsieh-Hsun Chung, Hsueh-Hui Yang, Mei-Hsin Chiu, and Jun-Wei Sue
Analytical Chemistry
2003 *75* (24), 7020-7025

Selective Detection of *o*-Diphenols on Copper-Plated Screen-Printed Electrodes
Jyh-Myng Zen, Hsieh-Hsun Chung, and Annamalai Senthil Kumar
Analytical Chemistry
2002 *74* (5), 1202-1206



Preheating and Incubation of Cane Juice Prior to Liming: A Comparison of Intermediate and Cold Lime Clarification
Gillian Eggleston, Adrian Monge, and Armand Pepperman
Journal of Agricultural and Food Chemistry
2002 *50* (3), 484-490