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Ana Paula Craig, Christine Fields, Ningjian Liang, David Kitts, Aron Erickson

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Performance review of a fast HPLC-UV method for the quantification of chlorogenic acids in green coffee bean extracts

Ana Paula Craig[1*], Christine Fields[1], Ningjian Liang[2], David Kitts[2], Aron Erickson[3]

[1]Applied Food Sciences, Inc. 8707 South Congress Ave, Austin, TX 78745, USA

[2]Food, Nutrition, and Health Program, Faculty of Land and Food Systems, The University of British Columbia, 2205 East Mall, Vancouver, British Columbia, V6T 1Z4, Canada.

[3]ChromaDex Analytics Inc., 2830 Wilderness Place, Boulder, CO 80301, USA

[*]Corresponding author. Applied Food Sciences, Inc. 8707 South Congress Ave, Austin, 78745, USA. Tel.: (512) 732 8300. Fax: 512-732-8301. E-mail: ap.craig@appliedfoods.com

Abstract

The aim of this study was to test the performance of a HPLC method, designated for rapid quantification of chlorogenic acids (CGA) in green coffee extract (GCE). The precision statistics associated with the method were assessed using three independent laboratories with five samples analyzed in triplicate. Seven main CGA isomers (3-CQA, 5-CQA, 4-CQA, 5-FQA, 3,4-diCQA, 3,5-diCQA and 4,5-diCQA) were quantified. The concentration of total CGA in the samples varied from 32.24 to 52.65 % w/w. The repeatability and reproducibility standard deviations for the determination of individual isomers varied, respectively, from 0.01 to 0.28 and 0.05 to 1.59. The repeatability and reproducibility standard deviations of the calculated total CGA, corresponding to the sum of the seven main CGA isomers, varied respectively, from 0.17 to 0.58 and 0.55 to 2.01. The fast HPLC method evaluated in this study was considered precise and appropriate for the determination of CGA in GCE.

Abbreviations

3-CQA, 3-Caffeoyquinic Acid; 3,4-diCQA, 3,4-Dicaffeoylquinic Acid; 3,5-diCQA, 3,5-Dicaffeoylquinic Acid; 4-CQA, 4-Caffeoyquinic Acid; 4,5-diCQA, 4,5-Dicaffeoylquinic Acid; 5-CQA, 5-Caffeoyquinic Acid; 5-FQA, 5-Feruloylquinic Acid; CGA, Chlorogenic Acids; CQA, Caffeoylquinic Acid; diCQA, Dicaffeoylquinic Acid; FQA, Feruloyilquinic Acid; GCE, Green Coffee Extract; HPLC, High-Performance Liquid Chromatography.