

The detection of antioxidant activity of fruits using flow injection analysis with electrochemical detection



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INTRODUCTION

This work focuses on the use of flow injection analysis (FIA) coupled with a multi-channel electrochemical detector (ECD) to evaluate antioxidant activity of red, black and white currants, gooseberries, cherries and apples. The antioxidant activity was observed with a focus on two different cultivation methods, such as organic (ECO; BIO) and chemical protection mode (IPM = Integrated Protection Mode).

FIA-ECD

Instrumentation for FIA-ECD:

Model 582 Solvent Delivery Module + Model 542 HPLC

Autosampler + Coularray electrochemical detector

ESA Detector, Model 5600A (ESA Inc, USA)

FIA-ECD conditions:

Mobile phase: 90% KH₂PO₄, 0.05M + 10% ACN (pH 4.8)

Flow rate: 1 ml/min

Injection: 10 ul

Potentials: 200, 400, 600 and 800 mV

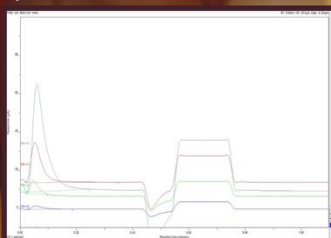
Time of analysis: 1.1 min

Fruit extract diluted with mobile phase 1:100

FIA-ECD apparatus



Record of FIA-ECD analysis at potentials 200, 400, 600, 800



Fruit samples



RESULTS

Black currant samples were found to have the highest antioxidant activity with an average 0.82 C/g for samples grown in ECO mode and 0.95 C/g for those grown in IPM mode. This average is almost 4 times higher than the average values of both red and white currants with 0.22 C/g for both IPM and ECO, 5 times higher than the average value of cherries with 0.14 C/g IPM and 0.18 C/g ECO, 8 times higher than red gooseberries with 0.12 C/g IPM and 0.10 C/g ECO and up to 15 times higher than green gooseberries with 0.06 C/g IPM and 0.09 C/g ECO and apples with averages of 0.079 C/g ECO and 0.054 C/g for IPM mode.

Antioxidant activity of all measured samples of fruit

