Title Method for determining total (hydrophilic and lipophilic) radical-scavenging activity in the same sample of fresh produce

Authors Y. Vinokur and V. Rodov

Citation ISHS Acta Horticulturae 709: 53-60. 2006.

Keywords fruit; vegetables; antioxidants; stepwise extraction; ABTS; acidified ethanol; Trolox equivalent

Abstract

The work was aimed at developing a method for measuring hydrophilic and lipophilic antioxidant activities in the same sample of fresh fruits or vegetables. The assay was based on decolorization of 2,2'-azino-bis-(3-ethylbenzothiazoline-6-sulphonic acid) radical cation (ABTS+•). The radical was generated in acidified ethanol medium in order to allow the performance of both hydrophilic and lipophilic antioxidants. The radical generation conditions were optimized by choosing an appropriate acidifier, its concentration and incubation time. Hydrophilic and lipophilic fractions were isolated from fresh samples without preliminary drying by stepwise extraction with acetate buffer, acetone and hexane and repeated partition of water-soluble and water-insoluble portions. The method was applied to various fruits and vegetables. In avocado, the ratio between lipophilic and hydrophilic antioxidants varied from 1:1 to 1:3. In cherry tomatoes this ratio changed from 1:5 in green fruit to 1:1.5 in the red one. In strawberry, practically all antioxidant activity was represented by hydrophilic compounds. The total antioxidant activity in strawberries reached 14 μM TE (Trolox equivalents) per g, higher than in other objects tested.