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An efficient one-step scheme for the purification of major xanthophyll carotenoids from lettuce, and assessment of their comparative anticancer potential

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ABSTRACT

The foremost problem in carotenoid research is the excessive cost and difficulty of maintaining pure carotenoid compounds. This work presents an economical, efficient, and simplified one-step scheme for the purification of four major xanthophyll carotenoids from lettuce by utilizing preparative thin layer chromatography on Hyflo-Super-Cel: MgO (Heavy): calcium sulfate hemihydrate (9:9:2 w/w) based adsorbent. The mobile phase of acetone: hexane (1:1) provided the perfect separation of major xanthophylls, resulting in 95–96 % purity after just single-step separation, with no interference from chlorophylls or other minor carotenoids. The identity of carotenoids was confirmed by absorption spectroscopy, chemical tests and APCI⁺–MS/MS. The proposed scheme can be used to isolate the carotenoids at the analytical and preparative scale. In anticancer studies, among four xanthophylls, 9-Z-

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