

Optimization of microwave-enhanced extraction parameters to recover phenolic compounds and antioxidants from *Corchorus olitorius* leaves

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ABSTRACT

Vegetables are industrial crops endowed with both nutritional and medicinal values. The overwhelming contributions of vegetables to human living in the form of nutrients and medicine cannot be under emphasised. Thus, this study examined the recoveries of phenolic compounds and antioxidants from *Corchorus olitorius* leaves using a microwave-enhanced extraction technique. Furthermore, the phenolic compounds in the leaf extract of *C. olitorius* were comprehensively identified using liquid chromatography-mass spectrometry quadrupole of flight (LC-QToF-MS). At the optimized conditions of microwave-enhanced extraction (extraction time of 131 s, microwave power 305 W, solvent/sample ratio of 12 mL/g, and ethanol concentration of 50%), total phenolic content (TPC) of 343.098 ± 3.05 mg GAE/10 g d.b., IC_{50} values of 68.89 ± 1.08 and 29.76 ± 1.00 μ g/mL for 2,2-diphenyl-1-picrylhydrazyl (DPPH) and 2,2'-azino-bis(3-ethylbenzothiazoline-6'-sulfonic acid) (ABTS) assays, respectively, were achieved. Furthermore, an aggregate of fourteen phenolic compounds that include 1-galloyl-glucose, 1,3,5-O-tricaffeoylquinic acid, procyanidin C-1, 4,4',5,6-tetrahydroxystilbene, 3,4,5-O-tricaffeoylquinic acid, 5-desgalloylstachyurin, sanguin H-4, corilagin_1, 1-O-galloylpedunculagin, laevigatin A, pedunculagin, 2,4,6-tri-O-galloyl- β -D-glucose, 1,3,6-trigalloyl- β -D-glucose, and 1,2,3,6-tetra-O-galloyl- β -D-glucose was tentatively identified in the leaf extract of *C. olitorius*. In general, this study has established *C. olitorius* leaves as sources of phenolic compounds and natural antioxidants. Thus, the intake can continue to be promoted as a way forward in solving the problem of food insecurity.

KEYWORDS

Antioxidant; *Corchorus olitorius*; Liquid chromatography quadrupole time-of-flight mass spectrometry; Microwave-enhanced extraction; Response surface methodology; Total phenols

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