Chemical composition, radical scavenging and anti-oxidant capacity of Ocimum Basilicum essential oil

Abstract

Ocimum basilicum has several functional characteristics including carminative, stimulant, diuretic, antiseptic, anesthetic, anti-spasmodic, analgesic and anti-tussive properties. O. basilicum essential oil (basil oil) was tested for chemical composition and in vitro and ex vivo anti-oxidant activities. The in vitro anti-oxidant capacity of basil oil was examined using 1, 1-diphenyl-2-picryl-hydrazyl radical (DPPH•), 2, 2-azino-bis (3-ethylbenzthiazoline-6-sulfonic acid) radical (ABTS•), hydrogen peroxide (H2O2), hydroxyl radical (HO•), nitric oxide (NO) and nitrite (NO2) scavenging effects. The ex vivo anti-oxidant activity of basil oil was determined through measuring NADH oxidase (NOX) and inducible nitric oxide synthase (iNOS) mRNA expression in lipopolysaccharide-stimulated murine macrophages using real-time polymerase chain reaction (RT-PCR). GC-MS analysis indicated that the main components in the basil oil were methylchavicol (47%), geranial (19%) and neral (15%). Basil oil had effective DPPH•, ABTS•, H2O2, HO•, NO and NO2 scavenging effects. Basil oil significantly reduced NOX and iNOS mRNA expression in lipopolysaccharide-stimulated murine macrophages at concentrations of 1-10 μg/mL. Basil oil had radical scavenging and anti-oxidant activities and could potentially be used as a safe and effective source of natural anti-oxidants in therapy against oxidative damage and stress associated with some inflammatory conditions. © 2016 Informa UK Limited, trading as Taylor & Francis Group.