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IN VITRO AND IN VIVO ANTIOXIDANT POTENTIAL OF SWEET BASIL (*Ocimum basilicum* L.) EXTRACT

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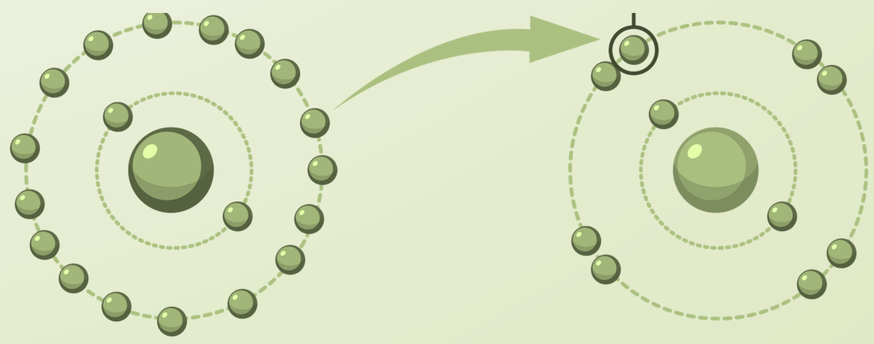
Sweet basil (*Ocimum basilicum* L., *Lamiaceae*) exhibits strong antioxidant activity due to high content of phenolic and flavonoid compounds. It is a widely cultivated annual herb with numerous pharmacological activities, including antioxidant activity, chemopreventive, anti-inflammatory, anti-microbial activity, anti-inflammatory and immunomodulatory activity. The aim of this research was to examine the effects of pre-treatment with basil extract on acetaminophen-induced acute liver injury in rats.

Total phenolic and flavonoid contents were tested by spectrophotometric methods. For the chemical characterization of basil extracts, an appropriate high performance liquid chromatography (HPLC) method was applied. For determination of antioxidant activity of extracts several tests were used (the DPPH method, testing of the neutralization of peroxide and hydroxide radical and lipid peroxidation intensity). Determination of oxidative stress parameters in tissue homogenate was carried out using spectrophotometric methods. The intensity of lipid peroxidasis (LPx), catalase (CAT), glutathione S-transferase (GST), glutathione reductase (GR) and glutathione peroxidase (GPx) were determined in an *in vivo* model of acetaminophen-induced liver injury in Wistar rats.

The total extraction yield was 26.77 ± 0.36 g/100g of dry extract, the total phenol content was 52.61 ± 1.35 mg of gallic acid per gram of a dry extract and the flavonoid content was 0.5 ± 0.2 mg of quercetin per gram of a dry extract. The concentration of extract required to neutralize 50% analyzed radicals was 0.22 ± 0.01 μg/mL for DPPH radical, 14.19 ± 1.03 μg/mL for hydroxyl radical, 2.74 ± 0.16 μg/mL for peroxide radical. IC_{50} value for lipid peroxidation was 45.76 ± 1.54 μg/ml.. Chlorogenic, *p*-hydroxybenzoic, caffeic, vanillic, rosmarinic and cinnamic acid, quercetin and naringenin were identified and quantified in the basil extract. The extract lowered the intensity of lipid peroxidation and potentiated the activity of antioxidant enzymes, with statistically significant increase in catalase ($p<0.01$), glutathione reductase ($p<0.05$), glutathione transferase activities ($p<0.05$), except for glutathione peroxidase activity.

Assay	IC_{50} (μg/ml)	
	Basil extract	Ascobic acid
DPPH radical scavenging	0.22±0.01	0.01±0.001
lipid peroxidation inhibition	45.76±1.54	10.58±0.61
hydroxyl radical scavenging	14.19±1.03	2.10±0.08
peroxide radical scavenging	2.74±0.16	0.21±0.05

The obtained results indicate that basil extract, produced by a simple, convenient and widely accessible mode of extraction, easily done without any sophisticated equipment, exhibits several beneficial properties. In addition to high antioxidant *in vitro* activity, the present study demonstrated significant hepatoprotective potential of aqueous basil extract in a model of acetaminophen induced liver injury.



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