

Curcuminoids Reduce Serum Levels of Atherogenic Lipids in Cardiometabolic Syndrome: A Randomized Controlled Trial

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Background: Disturbed metabolism of lipids is integral to the development of cardiometabolic syndrome. Non-high-density lipoprotein cholesterol (non-DL-C) and Lipoprotein(a) [Lp(a)] are two important indices of coronary heart disease (CHD) risk and reflect the levels of atherogenic cholesterol in plasma. Curcuminoids are naturally occurring polyphenols with numerous benefits for the cardiovascular health, including interaction with several transcription factors, receptors and enzymes involved in lipoprotein metabolism.

Objective: This study aimed to evaluate the effects of supplementation with curcuminoids on serum concentrations of non-HDL-C and Lp(a) in patients with cardiometabolic syndrome.

Methods: One-hundred subjects with the diagnosis of cardiometabolic syndrome were recruited for this trial, and were randomly assigned to curcuminoids (C3 Complex® formula; Sami Labs LTD, Bangalore, India) (n = 50) or placebo (n = 50) for eight weeks. Curcuminoids were administered at a daily dose of 1g, in combination with piperine (bioperine®; 10 mg/day; Sami Labs LTD, Bangalore, India) to enhance bioavailability. All patients received standard of care treatment including lipid-lowering agents during the course of trial. Serum non-HDL-C and Lp(a) concentrations were determined in both groups at baseline and study end.

Results: Serum concentrations of non-HDL-C and Lp(a) were significantly reduced in the curcuminoids (p < 0.001) but not in the placebo (p > 0.05) group. The magnitude of changes in non-HDL-C and Lp(a) were also greater in the curcuminoids versus placebo group (p < 0.001).

Conclusions: Supplementation with curcuminoids significantly reduces serum levels of atherogenic lipids and justifies the use of curcuminoids as adjunct to the standard treatments of cardiometabolic syndrome.

Chemical Composition of the Essential Oil of *Thymus Vulgaris L.* Grown in Iran

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Abstract: Thyme (*thymus vulgaris L.*), family Labiateae, is fairly grown wildly throughout Iran. The essential oil of the aerial parts of *T. vulgaris*, cultivated in the Khorasan province, North East of Iran, was prepared. The chemical composition of the oil was identified using GC-MS. Twenty-one compounds were identified. The major components of the oil were carvacrol (57.3%), linalool (11.8%) and thymol (10.67%). The amounts of the two main components, carvacrol and thymol, were compared with the results reported from other countries.

Key words: Thyme; Volatile oil; Gas chromatography; Mass spectrometry; Phytochemical analysis

Table: Volatile components in the aerial parts of *Thymus vulgaris L.*

Peak NO	RI ^a (Exp.)	RI ^b (Lit)	RA ^c (%)
Thujene	933	931	0.16
a-Pinene	942	939	2.26
a-Camphene	952	953	0.04
Myrcene	992	991	0.68
a-Terpinene	1020	1018	0.54
P-Cymene	1028	1026	3.23
Limonene	1032	1031	0.23
Cineole (1,8)	1035	1033	0.64
γ-Terpinene	1063	1062	0.21
Linalool oxide (cis)	1075	1074	0.35
Linalool	1097	1098	11.8
Berneol	1166	1165	0.08
Terpin-4-ol	1180	1177	0.70
α-Terpineol	1191	1189	1.12
Thymol, Methyl ether	1233	1235	3.21
Thymol	1292	1290	10.67
Carvacrol	1299	1298	57.3
Carvacrol Acetate	1373	1371	2.73
B-Caryophyllene	1420	1418	1.12
Spathulenol	1579	1576	0.36
Caryophyllene oxide	1583	1581	0.37
Total			97.8

Grouped compounds:

Monoterpene hydrocarbons	7.14
Oxygen-containing monoterpenes	88.81
Oxygen-containing sesquiterpenes	1.85

^a RI, Programmed temperature retention indices as determination on a DB-5 column using a homologous of n-hydrocarbons; ^b RI, values from literature data; ^c RA, relative area (peak area relative to total peak area).