

Table S1. Anti-inflammatory activity of essential oils or volatiles with thymol regardless the concentrations.

Species (origin)	Plant part	% of Thymol and carvacrol and main compound (>5%)	Method	Values	References
<i>Achillea millefolium</i> Ilam, Iran	Aerial parts	Thymol 26, carvacrol 10, borneol 16, limonene 15, α -pinene 10	Inhibition of NO production in <i>in vitro</i> model of LPS-stimulated RAW-264.7 macrophages	Production of nitrites 15.04 μ M; LPS (33.98 μ M)	[6]
<i>Anethum graveolens</i> Ilam, Iran	Seeds	Thymol 20, carvacrol 8, limonene 16, α -pinene 9	Inhibition of NO production in <i>in vitro</i> model of LPS-stimulated RAW-264.7 macrophages	Production of nitrites 41.04 μ M; LPS (33.98 μ M)	
<i>Carum copticum</i> (= <i>Trachyspermum ammi</i>) Ilam, Iran	Seeds	Thymol 23, carvacrol 6, sabinene 18, borneol 10	Inhibition of NO production in <i>in vitro</i> model of LPS-stimulated RAW-264.7 macrophages	Production of nitrites 26.02 μ M; LPS (33.98 μ M)	
<i>Atractylodes macrocephala</i> Qimen County in eastern China	Rhizomes	Thymol 6, atractylone 39, β -eudesmol 28, hinesol 6	Inhibition of NO and PGE ₂ in LPS-stimulated RAW264.7 cells. Real-Time Quantitative PCR (RT-qPCR) Analyses of *****COX-2 and inducible nitric oxide synthase (iNOS) mRNA Transcription in LPS-stimulated RAW264.7 cells	1, 2, 5 and 10 μ g/mL reduced the level of PGE ₂ by 32, 54, 63 and 85%, respectively. The mRNA levels of iNOS and COX-2 reduced by up to 78.45 % and 90.99 %, respectively, in comparison to model group.	[51]
<i>Carum copticum</i> (= <i>Trachyspermum ammi</i>) Unknown	Seeds	Thymol 46, carvacrol 3, γ -terpinene 20, <i>p</i> -cymene 11, β -pinene 6	Inhibition of NO production in <i>in vitro</i> model of LPS-stimulated RAW-264.7 macrophages	Essential oil: % NO inhibition (80% at 45.0 μ g/mL) <i>p</i> -cymene: % NO inhibition (48.05% at 45.0 μ g/mL) γ -terpinene: % NO inhibition (60.20% at 45.0 μ g/mL) β -pinene: % NO inhibition (45.20%)	[25]

				at 45.0 µg/mL) thymol: % NO inhibition (85.12% at 45.0 µg/mL)	
<i>Coriandrum sativum</i> from the local farm of Al- Kharj, Riyadh Province of Saudi Arabia	Leaves	Thymol 3, carvacrol 0.4, decanal 11, 1- decanol 18, <i>trans</i> -2-dodecen-1-ol 8, menthone 7, <i>trans</i> -2-decen-1-ol 5, dodecanal 5	<i>In vitro</i> inhibitory activity through the protein (egg albumin) denaturation method	Inhibitory percentage: 86.17 (1 mg/mL) 91.09 (positive control, ibuprofen) (1 mg/mL)	[52]
			<i>In vitro</i> proteinase inhibitory activity	Inhibitory percentage: 75.65 (0.2 mg/mL) 75.67 (positive control, ibuprofen) (0.2 mg/mL)	
<i>Ferulago angulata</i> Yasouj, Iran	Aerial parts	Thymol 8, carvacrol 3, spathulenol 7, <i>trans</i> -anetole 6, <i>p</i> -menth-2-en-1-ol 5, myristicin 5	<i>In vivo</i> anti-inflammatory activity through the croton oil-induced male Swiss mice (20- 30 g) ear edema	Both 200 and 100 µL/kg of essential oil produced 66% inhibition of ear edema. Indomethacin (positive control): 82% inhibition at 10 mg/kg)	[7]
<i>Isodon melissoides</i> farm of CSIR-CIMAP, Research Centre Pantnagar Uttarakhan (Supplemental data)- north India	Aerial parts	Thymol 11, carvacrol 45, <i>p</i> -cymene 12, γ-terpinene 8, carvacrol acetate 5	Production of proinflammatory mediators: ****TNF-α, *****IL-6 and IL-β <i>in vitro</i> model of LPS-stimulated HaCaT (human keratinocyte cell line) cells	Inhibition % (1% essential oil): TNF-α 56.15 ; IL-6 47.74 ; IL-β 49.3). % Inhibition (1 µg/mL positive control dexamethasone): TNF-α 60.20 ; IL-6 75.45 ; IL-β 58.23	[53]
<i>Lantana camara/ Bregbo/Côte</i> d'Ivoire	Flowers (June 2015-June 2016)	Thymol tr (March, April, May)- 34 (July), E-β-caryophyllene 19 (July) – 36 (March, April), α-humulene 9 (July) – 20 (April), γ-muurolene 2 (April) – 5 (October, December, March, May), sabinene 0.2 (July) – 5 (April) Thymol not detected (September)- 8 (December), E-β-caryophyllene 23 (August) – 37 (April), α-humulene 10 (August) – 17 (April), γ-muurolene 4	<i>In vitro</i> spectrophotometrically lipoxygenase inhibition	Best activity Flowers of July: *IC ₅₀ = 17.23 µg/mL IC ₅₀ = 13.54 µg/mL (positive control, quercetin) For detailed information, it is advisable to read the article. Data are presented under graphics	[54]

Flowers (July 2016-June 2017)	(July, August, December) – 8 (January), sabinene 0.23 (January) – 56 (December)	<i>In vitro</i> inhibitory activity through the protein (bovine serum albumin, BSA) denaturation method	IC ₅₀ = 15.45 µg/mL (leaves July 2016) IC ₅₀ = 15.82 µg/mL (leaves July 2015) IC ₅₀ = 17.75 µg/mL (flowers 15.31 µg/mL (positive control, diclofenac)
	Thymol not detected (January, February, May) - 18 (August), <i>E</i> -β-caryophyllene 24 (September) – 38 (April), α-humulene 10 (August) – 20 (March, April), γ-muurolene 2 (February) – 6 (October, November, January), sabinene 3 (July, December) – 9 (May)		For detailed information, it is advisable to read the article. Data are presented under graphics
Leaves (June 2015-June 2016)	Thymol 0.2 (January)- 2 (November, May, June), <i>E</i> -β-caryophyllene 32 (June) – 40 (October), α-humulene 13 (June) – 21 (January), γ-muurolene 4 (June, July, March, April) – 7 (October), sabinene 3 (October, January) – 11 (June)		
Leaves (June 2016-June 2017)	Thymol 0.2 (March)- 41 (August), <i>E</i> -β-caryophyllene 7 (August) – 25 (September, February), α-humulene 3 (August) – 15 (February), linalool 1 (March, April) – 9 (July, November), <i>E</i> -β-farnesene 1 (August) – 7 (November), isospathulenol 1 (August) – 6 (October, November, March, April), α-muurolene 1 (August) – 5 (November), <i>p</i> -cymene not detected (March, April) – 6 (August), γ-terpinene not detected (March, April) – 6 (August)		
	Thymol not detected (September)- 13		

Stems (June 2015-June 2016)

(November), *E*- β -caryophyllene 14 (September, October) – 25 (January, February, March), α -humulene 7 (October) – 15 (February, March), linalool 0.2 (October) – 6 (August), *E*- β -farnesene 3 (January) – 6 (December), isospathulenol 2 (November, January, February) – 5 (August), α -muurolene 3 (November, January, February) – 5 (December), γ -muurolene 2 (October) – 6 (January)

Thymol tr (March)- 28 (July), *E*- β -caryophyllene 15 (July) – 30 (January, April), α -humulene 7 (July) – 17 (April, May), linalool 1 (April) – 6 (July, May), *E*- β -farnesene 3 (June, July) – 5 (October, December, January, April, May)

Stems (July 2016-June 2017)

Thymol not detected (September)- 22 (December, June), *E*- β -caryophyllene 11 (August) – 37 (February), α -humulene 6 (August) – 18 (February), linalool 2 (February) – 6 (July), *E*- β -farnesene 2 (August) – 6 (February), neral not detected (February, May) – 15 (August), geranial (citral) not detected (July, September, December, February, April, May, June) – 23 (August)

Fruits (June
2015-June
2016)

Fruits (July
2016-June
2017)

<i>Lantana rhodesiensis</i> /Kapélé, Côte d'Ivoire	Leaves (June, July, August, September)	Thymol 3, 13, 8, 5; β -caryophyllene 25, 22, 27, 23; α -copaene 12, 10, 11, 11; α -humulene 9, 8, 10, 9; δ -cadinene 9, 8, 10, 9; limonene 7, 2, 1, 7; caryophyllene oxide 4, 5, 4, 4	<i>In vitro</i> inhibitory activity through the protein (bovine serum albumin, BSA) denaturation method	IC ₅₀ = 26.18 μ g/mL (leaves Kapélé); IC ₅₀ = 28.16 μ g/mL (leaves Nyanbélegé); IC ₅₀ = 24.76 μ g/mL (positive control, diclofenac)	[55]
		Thymol 8, 15, 8, 10; β -caryophyllene 19, 14, 19, 21; α -copaene 12, 7, 12, 13; α -humulene 7, 5, 7, 6; δ -cadinene 11, 11, 11, 13; limonene 1, tr, 0.2, tr; caryophyllene oxide 5, 8, 7, 7			
	Stems (June, July, August, September)	Thymol 17, β -caryophyllene 23; α -copaene 9; α -humulene 8; δ -cadinene 7; limonene tr; caryophyllene oxide 4			
		Thymol 3, 3, 4, 17; β -caryophyllene 25, 24, 20, 21; α -copaene 12, 12, 11, 10; α -humulene 10, 9, 8, 8; δ -cadinene 10, 10, 8, 7; limonene 6, 2, 5, 4; caryophyllene oxide 4, 6, 8, 5			
		Thymol 4, 4, 3, 9; β -caryophyllene 22, 18, 18, 21; α -copaene 15, 12, 15, 12; α -humulene 8, 7, 6, 6; δ -cadinene 12, 12, 11, 11; limonene 2, tr, 1, 1; caryophyllene oxide 4, 6, 8, 6			
	Fruits (July)	Thymol 1, β -caryophyllene 25; α -copaene 12; α -humulene 10; δ -cadinene 11; limonene 7; caryophyllene oxide 4			

For detailed information, it is advisable to read the article. Data are presented under graphics

<i>Lantana rhodesiensis</i> /Nyanbélegé, Côte d’Ivoire	Leaves (June, July, August, September)		
	Stems (June, July, August, September)		
	Fruits (July)		
<i>Lippia multiflora</i> / Gampéla, Burkina Faso	No identified plant part	Thymol 12, carvacrol 2, <i>p</i> -cymene 25, β -In <i>vitro</i> spectrophotometrically caryophyllene 13, γ -terpinene 9, thymyllipoxygenase inhibition	97% inhibition for a concentration [56] of 8 mg/mL. Quercetin (positive

	used	acetate 8,		control) 52% inhibition for a concentration of 100 µg/mL	
<i>Machilus konishii</i> / Pingtung County/ Taiwan (China)	Leaves	Thymol 12, α -pinene 34, β -pinene 14, β -caryophyllene 5	Production of NO in <i>in vitro</i> model of LPS-stimulated RAW-264.7 macrophages	Production of NO: Essential oil 12.5 µg/mL (15-20 µM) – 200 µg/mL (< 5 µM) (only based in the observation of the Figure)	[57]
				α -Pinene, β -pinene and thymol were also tested and thymol had the best activity (only based in the observation of the Figure)	
<i>Monarda didyma</i> / Urbino, Italy	Aerial parts of the plant at flowering	Thymol 8, carvacrol 17, <i>p</i> -cymene 16, γ -terpinene 8, carvacrol methyl ether 6, 1-octen-3-ol 5, thymol methyl ether 5	Regulation of microRNA-146a, IL-6, and 1-IRAK-1 (interleukin-1 receptor-associated kinase) in LPS-stimulated U937 cells	At 0.5 µL/mL, there was microRNA-146a up-regulation, and a decreased expression of IRAK-1 and IL-6	[58]
				For more information is advisable to read the article	
<i>Mosla dianthera</i> (Buch.-Ham. ex Roxb.) Maxim./ Uttarakhand, India	Aerial parts	Thymol 11, carvone 42, <i>p</i> -cymene 10, β -bisabolene 7	<i>In vitro</i> inhibitory activity through the protein (hen's egg albumin) denaturation method	IC ₅₀ = 28.85 µg/mL IC ₅₀ = 27.32 µg/mL (carvone) IC ₅₀ = 23.67 µg/mL (positive control, diclofenac)	[59]
			<i>In vitro</i> Inhibition of NO production	IC ₅₀ = 17.10 µg/mL IC ₅₀ = 18.07 µg/mL (carvone) IC ₅₀ = 10.95 µg/mL (positive control, ascorbic acid)	
<i>Nigella sativa</i> Ilam, Iran	Seeds	Thymol 10, carvacrol 1, <i>p</i> -cymene 32, thymoquinone 20, carvone 12, camphene 11, β -pinene 7, α -thujene 6, γ -terpinene 5	Inhibition of NO production in <i>in vitro</i> model of LPS-stimulated RAW-264.7 macrophages	% of NO inhibition: essential oil: 82 (25.0 µg/mL), the constituents: <i>p</i> -cymene 55 (25.0 µM), γ -terpinene 55 (25.0 µM), α -pinene 53 (25.0 µM), thymol 80 (25.0 µM), α -thujene 51 (25.0 µM), thymoquinone 90 (25.0 µM)	[60]
<i>Ocimum basilicum</i> / Kairouan,	Seeds	Solid-liquid Soxhlet extraction using <i>n</i> -	Inhibition of NO production in LPS-	At 150 µg/mL, NO production	[8]

Tunisia		hexane: Concentration (µg/g): Thymol 33, luteolin 9	induced murine macrophage RAW 264.7 cell line	decreased by 60%
		2-Methyltetrahydro-furan (MeTHF) Concentration (µg/g): Thymol 128, rosmarinic acid 21, luteolin 9, gallic acid 7, chlorogenic acid 7, ellagic acid 6, circimaritin 6		At 150 µg/mL, NO production decreased by 64%
<i>Oliveria decumbens</i> / Dil village, Iran	Aerial parts	Extraction with ethanol:H ₂ O (70:30) and then fractionation: <u>n-hexane</u> : thymol 56, carvacrol 38 <u>dichloromethane</u> : thymol 53, carvacrol 41	Oxidative burst assay using luminol- enhanced chemiluminescence technique with blood HBSS++ (Hanks Balanced Salt Solution), serum opsonized zymosan (SOZ) and intracellular reactive oxygen species	<u>Crude extract</u> : IC ₅₀ = 21.7 µg/mL [9] <u>n-Hexane</u> : IC ₅₀ = 22.6 µg/mL <u>Dichloromethane</u> : IC ₅₀ = 15.8 µg/mL Positive control (Ibuprofen): IC ₅₀ = 11.2 µg/mL Thymol: not active (>100 µg/mL) Carvacrol: not active (>100 µg/mL)
Oregano (the species is unknown)	No identified plant part used	Thymol, carvacrol, β-caryophyllene The concentrations were not provided by the authors	Expression level of CD80 in RAW.246.7 macrophages treated with the low-serum conditioned medium and analyzed by flow cytometry The assays were done with electrospun poly (L-lactide-coglycolide) /gelatin (PG)- based fibrous dressings with diverse additives	Mean fluorescence intensity (%): [61] Control: 14.0 PG: 23.7 PG@BP(amino acid sequence, DRVQRQTTTVVA: 21.3 PG@O(essential oil of oregano): 14.0 PG@BPO: 13.8
<i>Origanum compactum</i> / Boulemane,, Marocco	Aerial parts (leaves, flowers, and stems) July 2021	Thymol 19, carvacrol 46, β-pinene 13, <i>p</i> -cymene 8	<i>In vitro</i> spectrophotometrically lipoxygenase inhibition <i>In vivo</i> anti-inflammatory activity through the carrageenan-induced Wistar rats (160 to 190 g)paw edema <i>In vitro</i> spectrophotometrically lipoxygenase inhibition	**IC ₅₀ µg/mL: 0.68; quercetin [62] (positive control): 0.29 µg/mL Inhibition % of edema (1 h 30 min: the carrageenan-induced Wistar rats (160 to 56.53; 3 h: 64.95; 60.67). Indomethacin (positive control: 1 h 30 min: 70.34; 3 h: 70.40; 62.17 IC ₅₀ µg/mL: 1.33; quercetin

<i>Origanum compactum</i> / Taounate, Morocco	dried flowering tops (a mixture of leaves, flowers, and stems)	Thymol 13, 3-carene 20, <i>o</i> -cymene 11	<i>In vivo</i> anti-inflammatory activity through the carrageenan-induced Wistar rats (160 to 190 g) paw edema	(positive control): 0.29 µg/mL Inhibition % of edema (1 h 30 min: 38.86; 3 h: 39.00; 32.02). Indomethacin (positive control: 1 h 30 min: 70.34; 3 h: 70.40; 62.17)	
<i>Origanum floribundum</i> / Lakhdaria, Algeria	Aerial parts at flowering stage (July 2011)	Thymol 34, carvacrol 9, γ -terpinene 20, <i>p</i> -cymene 16,	<i>In vitro</i> spectrophotometrically lipoxygenase inhibition	IC ₅₀ : 125.7 µg/mL **NDGA (positive control): IC ₅₀ = 63.4 µg/mL	[10]
<i>Origanum heracleoticum</i> (5 samples) / Agrigento, Italy	Leaves and flowers	Thymol 47-65, carvacrol 3-5, γ - terpinene 13-22, <i>p</i> -cymene 4-5, carvacrol methyl ether 3-4	Gene expression analysis of NF-kB pathway in Caco-2 cells treated with TNF- α	An increase trend of IL-1 α , IL-6 and IL-8 gene expression was observed when compared to the treatment with TNF- α , without statistical significance It is advisable to read the article, data presented as graphics	[11]
<i>Origanum heracleoticum</i> (6 samples)/ Calabria ,Italy	No identified plant part used	Thymol 9104-54459, carvacrol 3311- 68379, <i>o</i> -cymene 3304-48176, γ - terpinene 24-19133, carvacrol-methyl ether 2658-19844, β -caryophyllene 1182-16107, γ -muurolene 1364-10824 (unknown unities, the compounds were chosen if at least one value is >10,000	Inhibition of NO production in lipopolysaccharide (LPS)-induced murine macrophage RAW 264.7 cell line	IC ₅₀ = 32.77-170.9 µg/mL. Positive controls (indomethacin and L-NAME): IC ₅₀ = 58.00 and 45.86, respectively)	[12]
<i>Origanum minutiflorum</i> (supplemental information) <i>Origanum vulgare</i> (article) Unknown collection place	No identified plant part used	Thymol 3, carvacrol 47, linalool 33	Inflammation-related parameters, such as NO, MPO, and TNF- α , were determined in the kidney tissue of adult (four months old) male Wistar rats weighing 300–350 g rats, 24 h after L- arginine application	The administration of essential oil, thymol and carvacrol prevented an increase in NO concentration and MPO activity, and did not affect an increase in TNF- α concentration.	[63]

				Treatment with allopurinol (positive control) prevented an increase in all three of the tested inflammation-related parameters.
				It is advisable to read the article. Data are under graphics
<i>Origanum vulgare</i> / Pisa, Italy	No identified plant used (The EO have been purchased)	Thymol 1, carvacrol 56, γ -terpinene 14, <i>p</i> -cymene 11	<i>In vitro</i> inhibitory activity through the protein (bovine serum albumin, BSA) denaturation method	[64] IC ₅₀ (<i>O. vulgare</i> / <i>C. ladanifer</i> or <i>O. vulgare</i> / <i>J. communis</i>) < IC ₅₀ (<i>C. ladanifer</i> or <i>C. aurantium</i> , <i>C. ladanifer</i> or <i>J. communis</i>) < IC ₅₀ (<i>O. vulgare</i> or <i>O. vulgare</i> / <i>C. aurantium</i>) < IC ₅₀ (diclofenac, positive control)
		Limonene 88	<i>In vitro</i> inhibitory activity through the protein BSA denaturation method	
<i>Citrus aurantium</i> var. <i>amara</i> /Pisa, Italy			<i>In vitro</i> inhibitory activity through the protein BSA denaturation method	It is advisable to read the article. Data are under graphics.
		Camphene 37, bornyl acetate 22, α -pinene 14, tricyclene 5	<i>In vitro</i> inhibitory activity through the protein BSA denaturation method	
		α -Pinene 42, sabinene 12, myrcene 11, limonene 6	<i>In vitro</i> inhibitory activity through the protein BSA denaturation method	
<i>Juniperus communis</i> / Pisa, Italy		Not determined	<i>In vitro</i> inhibitory activity through the protein BSA denaturation method	
			<i>In vitro</i> inhibitory activity through the protein BSA denaturation method	
<i>O. vulgare</i> / <i>Citrus aurantium</i> (1:1)		Not determined		Sum of the fractional inhibitory concentration index (Σ FIC) = 1.774 interaction indifference
				Σ FIC = 0.964 interaction additive

<i>O. vulgare</i> / <i>Cistus ladanifer</i> (1:1)		Not determined		ΣFIC = 0.862 interaction additive	
<i>Origanum vulgare</i> / <i>Juniperus comunis</i>					
<i>Origanum vulgare</i> (3 samples)/ South-East of Spain	Stems	Thymol 2-6, carvacrol 59-74, γ-terpinene 2-11, <i>p</i> -cymene 4-8	<i>In vitro</i> spectrophotometrically lipoxygenase inhibition	IC ₅₀ = 148.0 – 251.5 μL/L. IC ₅₀ of positive controls (thymol, limonene, <i>p</i> -cymene, carvacrol, linalool, NDGA) = 150, 356, 486, 2271, 3346, 339 μM, respectively	[65]
<i>Origanum vulgare</i> ssp. <i>viridulum</i> x <i>Origanum vulgare</i> ssp. <i>hirtum</i> (3 samples)/ Agrigento, Italy	Leaves and flowers	Thymol 0.1-3, carvacrol 81-85, γ-terpinene 5-7	Gene expression analysis of NF-kB pathway in Caco-2 cells treated with TNF-α	Slight decrease in IkBα, IL-6 and IL-8 gene expression was observed when compared to the treatment with TNF-α, but without statistical significance It is advisable to read the article, data presented as graphics	[12]
<i>Salacia pallescens</i> / Idi-Ayunre, Ibadan, Nigeria	Leaves	Extraction with methanol 50%: Thymol 30, 3-carene 16, p-cymene 12, caffeine 8, hexadecanoic acid 6, bicycle[3.1.1]hept-2-ene, 2,6-dimethyl-6-(4-methyl-3-pentenyl) 6, caryophyllene 5	<i>In vitro</i> inhibition of nitrite oxide (NO) production Inhibition of interleukin 6 (IL-6) production in <i>in vitro</i> model of LPS-stimulated RAW-264.7 macrophages	IC ₅₀ = 49.49 μg/mL IC ₅₀ = 48.74 μg/mL (positive control, ascorbic acid) Nine-fold reduction in LPS induced IL-6 production in RAW-264.7 macrophages pre-treated with 400 μg/mL of the extract. 1.4-fold reduction in LPS induced IL-6 production in RAW-264.7 macrophages pre-treated with 50 μg/mL of the extract	[13]
Siddhalepa Asamodagam Spirit (water distillate)	Seeds	The water distillate was then extracted with ethyl acetate:	Heat induced hemolysis principle using human red blood cell stabilization	IC ₅₀ = 0.57 mg/mL Positive control (aspirin):	[29]

derived from <i>Trachyspermum</i> (<i>roxburghianum</i> seeds/ Pakistan		Thymol 93, carvacrol 1	method	IC ₅₀ = 0.24 mg/mL	
<i>Thymbra capitata</i> (3 samples)/ South-East of Spain	Stems	Thymol 0.2-2, carvacrol 69-76, γ -terpinene 6-8, <i>p</i> -cymene 7-7	<i>In vitro</i> spectrophotometrically lipoxygenase inhibition	IC ₅₀ = 167.1 – 184.1 μ L/L. IC ₅₀ of positive controls (thymol, limonene, <i>p</i> -cymene, carvacrol, linalool, NDGA) = 150, 356, 486, 2271, 3346, 339 μ M, respectively	[65]
<i>Thymus atlanticus</i> / Errachidia region, Morocco	Aerial parts	Thymol 24, carvacrol 23, γ -terpinene 21, <i>p</i> -cymene 19	<i>In vivo</i> phenol induced ear edema in Wister albino rats of both sexes weighing 100-120 g	The application of phenol alone has developed in the control group an ear inflammation of 77.59%. The topical application of essential oil (1 mg/ear) has reduced the ear edema with a percentage of 19.39%. Indomethacin (positive control) (1 mg/ear) has reduced the ear edema with a percentage of 14.71%	[14]
<i>Thymus caespitius</i> /Azores, Portugal	Plant material was collected during the flowering phase –	Thymol 34, carvacrol 11, <i>p</i> -cymene 12, thymol acetate 8, γ -terpinene 5	NO scavenging activity <i>In vitro</i> spectrophotometrically lipoxygenase inhibition	IC ₅₀ = 0.3 mg/mL IC ₅₀ = 0.1 mg/mL	[15]
<i>Thymus linearis</i> / Harinagar and Dhanachuli, India	Aerial parts	Thymol 67. carvacrol 3, <i>p</i> -cymene 10	<i>In vivo</i> anti-inflammatory activity through the carrageenan-induced paw edema of Swiss albino mice	Inhibition % (5%) after 4 h and 24 h = 3.83 and 6.38, respectively Inhibition % (10%) after 4 h and 24 h = 5.19 and 9.52, respectively Inhibition % (20%) after 4 h and 24 h = 9.73 and 14.6, respectively Positive control (Ibuprofen): Inhibition % (0.004) after 4 h and 24 h = 26.07 and 37.18, respectively	[16]

				Volume of inflammation (mm ³) (5%): day 0, day 5, day 10 = 2.26, 2.47, 2.51
				Volume of inflammation (mm ³)
			<i>In vivo</i> sub-acute anti-inflammatory activity (10%): day 0, day 5, day 10 = 2.21, through the formaldehyde induced arthritis	2.38, 2.38
			in the right hind paw of Swiss albino mice (formaldehyde solution 1% injected on the first day of the experiment. Samples administered orally every day of the experiment. The results were recorded every day till the end (10 days). For knowing all results it is advisable to read the reference	Volume of inflammation (mm ³) (20%): day 0, day 5, day 10 = 2.19, 2.32, 2.26
				Volume of inflammation (mm ³) saline water (control): day 0, day 5, day 10 = 2.13, 2.39, 2.37
				Volume of inflammation (mm ³) positive control (Ibuprofen) (0.001%): day 0, day 5, day 10 = 2.11, 2.19, 2.15
<i>Thymus sipyleus</i> Boiss. subsp. <i>sipyleus</i> var. <i>sipyleus</i> / Sivas, Turkey	Aerial parts	Thymol 66, carvacrol 3, <i>p</i> -cymene 9, γ -terpinene 9	<i>In vitro</i> spectrophotometrically lipoxygenase inhibition	12% inhibition for a concentration of 100 μ g/mL. NDGA (positive control) 100% inhibition for a concentration of 100 μ g/mL [17]
<i>Thymus vulgaris</i> / Szigetvár city, Hungary	Plant material - No identified the part of plant used	Beginning of flowering: Thymol 56, carvacrol 2, <i>p</i> -cymene 13, γ -terpinene 15 End of flowering: Thymol 54, carvacrol 3, <i>p</i> -cymene 21, γ -terpinene 6	Inhibition of cytokine production through <i>P. aeruginosa</i> LPS-activated THP-1 macrophage cells	Inhibition of the production of IL-6, IL-8, IL-1 β , TNF- α . Thymol (positive control) had better activity [18] These results are based on the figures' observation. It is advisable to read the article There is not a decrease of the four examined proinflammatory cytokine IL-6, IL-8, IL- β , TNF- α expression both at the mRNA and protein levels

				These results are based on the figures' observation. It is advisable to read the article	
<i>Thymus vulgaris</i> (purchased)	No identified plant part used	Thymol 49, carvacrol 3, <i>p</i> -cymene 29	Male C57BL/6J mice with 8 (young)- and 53 (old)-week Male C57BL/6J mice with 53 week + <i>T. vulgaris</i> essential oil Control: without <i>T. vulgaris</i> essential oil. Gene expression of TNF- α , IL-6, IL-1 β in cerebellum, hippocampus, liver, brain's cerebral cortex Gene expression of TNF- α , IL-6, IL-1 β in the age-accelerated mouse embryonic fibroblast NIH/3T3 cell line	The essential oil group showed lower expression of IL-1 β in the liver and cerebellum and IL-6 in the hippocampus compared to the control group 24-h pretreatment with essential oil, followed by co-treatment with essential oil and mitomycin C suppressed the gene expression of pro-inflammatory cytokines	[19]
<i>Thymus vulgaris</i> (purchased)	Not reported	Thymol 49, carvacrol 3, <i>p</i> -cymene 29	Aging-related and pro-inflammatory cytokine gene expression in the liver, hippocampus, cerebellum, and cerebral cortex of mice fed with the thyme EO 250 mg/kg/day (0.2% (w/w)	It is advisable to read the article since the results are presented under graphics Lower levels of <i>p16^{INK4A}</i> in the hippocampus than control; lower expression of <i>Il-1b</i> in the liver and cerebellum, and <i>Il6</i> in the hippocampus than the control; lower expression of <i>p65</i> and <i>p50</i> (two transcription factors of ***NF- κ B) than the control	[19]
			Aging-related and pro-inflammatory	Lower levels of <i>Il6</i> and <i>Ccl2</i>	

			cytokine gene expression in age-accelerated NIH-3T3 cells. Thyme oil concentrations: 30, 60, 120 µg/mL	mRNA expression (dose-dependent)	It is advisable to read the article since the results are presented under graphics	
<i>Thymus vulgaris</i> / Póvoa de Lanhoso, Portugal	Aerial parts	Thymol 41, carvacrol 5, <i>o</i> -cymene 25, <i>p</i> -cymene 14	Inhibition of NO production in <i>in vitro</i> model of LPS-stimulated RAW-264.7 macrophages	IC ₅₀ = 8 µg/mL Dexamethasone (positive control): IC ₅₀ = 16 µM		[20]
<i>Thymus vulgaris</i> (diplod)/ Prague, Czech Republic	Aerial parts	Thymol 51, <i>p</i> -cymene 20, γ-terpinene 6	<i>In vitro</i> inhibitory activity against COX-2	Inhibition percentage: 80.96 (500 µg/mL) 70.53 (50 µg/mL) 2.02 (5 µg/mL)		[21]
<i>Thymus vulgaris</i> (tetraploid)/ Prague, Czech Republic	Aerial parts	Thymol 54, γ-terpinene 22, <i>p</i> -cymene 8, α-cadinol 8, caryophyllene 6	<i>In vitro</i> inhibitory activity against COX-2	Inhibition percentage: 85.57 (500 µg/mL) 83.74 (50 µg/mL) 6.74 (5 µg/mL)		
<i>Thymus vulgaris</i> / Tlemcen, Algeria	Aerial parts	Thymol 67, carvacrol <0.05, γ-terpinene 10, <i>p</i> -cymene 6	<i>In vivo</i> anti-inflammatory activity through the carrageenan-induced paw edema of Swiss albino mice of both sexes (weighing 25 - 30 g)	Ibuprofen (positive control): 74.52 (5 µg/mL) Paw thickness (mm): (100 mg/kg – 400 mg/kg, between 1-6 h): 2.76-2.36, respectively		[22]
<i>Thymus vulgaris</i> / Mostaganem, Algeria	Aerial parts	Thymol 60, carvacrol <0.05, γ-terpinene 9, α-pinene 6, <i>p</i> -cymene 6, linalool 5	<i>In vivo</i> anti-inflammatory activity through the carrageenan-induced paw edema of Swiss albino mice of both sexes (weighing 25 - 30 g)	Paw thickness (mm): (100 mg/kg – 400 mg/kg, between 1-6 h): 2.83-2.54, respectively		
				Paw thickness (mm): Diclofenac		

				(positive control) (10 mg/kg, between 1 h – 6 h): 2.84-2.07, respectively	
				Paw thickness (mm): Vehicle Tween 80 (Control) (10 mg/kg, between 1 h – 6 h): 2.86-3.09, respectively	
<i>Thymus zygis</i> chemotype thymol (4 samples)/ Murcia, Spain	No identified plant part used	Thymol 30-54, carvacrol 0.4-3, <i>p</i> -cymene 14-27, γ -terpinene 8-28, linalool 0.1-5	<i>In vitro</i> spectrophotometrically lipoxygenase inhibition	IC ₅₀ (μ L/L): 54-73	[23]
<i>Thymus zygis</i> chemotype linalool (2 samples)/ Murcia, Spain	No identified plant part used	Thymol 0.1-1, carvacrol 0.4-3, linalool 41-43, myrcene 7-8, terpinen- 4-ol 13-13, γ -terpinene 6-8,	<i>In vitro</i> spectrophotometrically lipoxygenase inhibition	IC ₅₀ (μ L/L): 299-402	
<i>Thymus zygis</i> subsp. <i>sylvestris</i> / Parque Natural das Serras de Aire e Candeeiros, Portugal	Aerial parts - collected in flowering stage	Thymol 20, carvacrol 16, <i>p</i> -cymene 22, γ -terpinene 7, linalool 6,	Production of NO in <i>in vitro</i> model of LPS-stimulated RAW-264.7 macrophages	Production of NO in the presence of four concentrations of the essential oil: 42.67 (0.64 μ L/mL), 62.67 (0.32 μ L/mL), 91.67 (0.16 μ L/mL) and 88.00 (0.08 μ L/mL) Thymol, carvacrol had stronger activity than <i>p</i> -cymene and the essential oil (without numeric results, only observed from te Figure), particularly in the concentrations ranging from 0.08 to 0.32 μ L/mL	[24]
				Production of NO in the presence of four concentrations of the essential oil: 22.00	

			Production of NO in <i>in vitro</i> model of LPS-stimulated in microglia	(0.64 μ L/mL), 24.34 (0.32 μ L/mL), 26.71 (0.16 μ L/mL), 38.94 (0.08 μ L/mL) The inhibitory profile triggered by the main compounds was more pronounced in microglia relative to macrophages. All the concentrations of <i>p</i> -cymene, thymol and carvacrol tested decreased NO production, quite similar to those obtained in the presence of the essential oil (only based in the observation of the Figure	
<i>Trachyspermum ammi</i> / Tiruvannamalai, Tamil Nadu, India	Seeds	Unprocessed: extraction with ethanol 90% Thymol 42, 3-methoxybutyric acid 5, 9,12-octadecadienoic acid (Z,Z) 6	<i>In vitro</i> inhibitory activity through the protein (egg albumin) denaturation method	Inhibition percentage (1000 μ g/mL): 74 Positive control (diclofenac) (1000 μ g/mL): 80	[26]
		Processed: lime treatment followed by extraction with ethanol 90% Thymol 34, 9,12-octadecadienoic acid (Z,Z) 42,		Inhibition percentage (1000 μ g/mL): 78 Positive control (diclofenac) (1000 μ g/mL): 80	
<i>Trachyspermum ammi</i> / Jorhat, Assam, India	Seeds	Thymol 50, carvacrol 0.1, γ -terpinene 25, <i>p</i> -cymene 22	<i>In vitro</i> inhibitory activity through the protein (bovine serum albumin, BSA) denaturation method	IC ₅₀ = 93.12 μ L/mL IC ₅₀ = 108.61 μ L/mL (positive control, diclofenac)	[29]
<i>Trachyspermum ammi</i> / Salem, Tamil Nadu, India	Seeds	Not reported, discussion made by the authors is based on the chemical composition of the essential oil of this species found in other articles. According to the authors, the main components of the essential oils of	<i>In vitro</i> COX-2 inhibition assay Production of nitrite oxide (NO) in <i>in vitro</i> model of LPS-stimulated RAW-264.7	IC ₅₀ = 4.49 μ g/mL, 4.15, 9.23 IC ₅₀ = 1 μ M (thymol) IC ₅₀ = 0.8 μ M (carvacrol) NO production: 82.54 μ M (0.5 μ g/mL)	[28]

<i>Trachyspermum ammi</i> are thymol and carvacrol	macrophages	73.94 μ M (1.0 μ g/mL) 99.64 μ M (without essential oil)
	Production of prostaglandin E2 (PGE2) in <i>in vitro</i> model of LPS-stimulated RAW-264.7 macrophages	(PGE2) production: 699.89 pg/mL (0.5 μ g/mL) 585.56 pg/mL (1 μ g/mL) 776.21 pg/mL (without essential oil)

*IC₅₀: Half maximal inhibitory concentration; **NDGA: Nordihydroguaiaic acid; ***NF- κ B: nuclear factor-kappa B; ****TNF- α : tumor necrosis factor-alpha; *****: IL: interleukin; *****COX: cyclooxygenase.

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