

Table S1. Antimicrobial activities of essential oils of the main functional foods in both liquid and gas phases

PF	Name of Plants	PO	Major chemical compounds	Inhibited microorganisms				Method	Method of application of EOs	control	Reference
				Bacteria		Fungi					
				Strains	MIC	Strains	MIC				
Apiaceae	<i>Anethum graveolens</i> L.	AP, Fr	α -phellandrene, limonene, <i>p</i> -cymene, carvone, dillether	<i>Bacillus</i> spp., <i>Staphylococcus aureus</i> , <i>Escherichia coli</i> , <i>Pseudomonas aerogenosa</i>	0.5–5 μ L/mL	<i>Aspergillus nige</i> , <i>Trichoderma</i> spp., <i>Candida albicans</i>	0.5–5 μ L/mL	DD	DC		[58]
	<i>Bunium persicum</i>	Fr	γ -terpinene, cuminaldehyde, <i>p</i> -cymene, γ -terpinen-7-al	<i>S. aureus</i> , <i>E. coli</i>	1.5 mg/mL	<i>C. albicans</i>	0.375 mg/mL	DD	DC		[12]
	<i>Cuminum cyminum</i> L.	Se	cuminlaldehyde, γ -terpinene, o-cymene, β -pinene, 2-caren-10-al, 3-caren-10-al	<i>Vibrio</i> spp.	0.078–0.31 mg/mL			DD	DC		[8]
			α -pinene, limonene, 1,8-cineole, linalool, linalyl acetate, α -terpineole			<i>Aspergillus</i> spp.	750–1000 ppm	DD	DC		[59]
	<i>Echinophora Cinerea</i> Boiss	AP	α -phellandrene, α -pinene, β -phellandrene			<i>C. albicans</i>	60–250 μ L/mL	MBD	DC		[60]
	<i>Echinophora platyloba</i>	AP	ocimene, α -phellandrene, γ -terpinene	<i>L. monocytogenes</i>	5–10 mg/mL			DD	DC	Amoxicillin 25 μ g/disk), Gentamicin (10 μ g/disk), Cefexime (5 μ g/disk), Tetracycline (30 μ g/disk), Penicillin (10 μ g/disk)	[61]

			ocimene, 2,3-dimethyl-1,3-cyclohexadiene, α -pinene, γ -dodecalactone			<i>A. flavus</i> , <i>Penicilium expansum</i> , <i>Fusarium graminearum</i>	0.63–0.31 mg./mL	DD	DC	[62]
<i>Foeniculum vulgare</i> Mill.	Se	<i>trans</i> -anethole, estragole, limonene, fenchone	<i>Shigella dysenteriae</i>	0.125 mg/mL				Oc	DC	[48]
		estragole, limonene, fenchone, α -pinene				<i>C. albicans</i> , <i>Aspergillus</i> spp.	0.16–0.2 mg/mL.	DD	DC	[63]
<i>Trachyspermum ammi</i> L.	Fr	thymol, β -cymene, eugenol, β -pinene	<i>S. aureus</i> , <i>B. subtilis</i> , <i>P. aeruginosa</i> , <i>Salmonella typhimurium</i> , <i>S. enteritidis</i> , <i>E. coli</i> , <i>Enterobacter aerogenes</i>	12.5 mg/mL				D	DC	[64]
		γ -terpinene, α -cymene thymol				<i>Candida</i> spp., <i>Aspergillus</i> spp.	0.0625–1 μ g/mL	MBD	DC	[65]
<i>Lamiaceae</i>	<i>Hyssopus seravschanicus</i>	AP	<i>cis</i> -pinocamphone, β -pinene, 1,8-cineole, camphor, spathulenol	<i>Bacillus cereus</i> , <i>S. aureus</i> , <i>P. aeruginosa</i> , <i>E. coli</i>	625 μ g/mL			MBD	DC	[66]
	<i>Mentha piperita</i>		menthol, isomenthone, limonene, iso-menthanol,	<i>E. coli</i> , <i>P. aeruginosa</i> , <i>P. fluorescens</i> , <i>B. subtilis</i> , <i>S. aureus</i>	1.13–2.25 mg/mL	<i>Penicillium digitatum</i> , <i>Aspergillus</i> spp. <i>Mucor</i> spp. <i>Fusarium oxysporum</i>	1.13–2.25 mg/mL	WD, MBD DV	DC , VD	[9]
	<i>Melissa officinalis</i> L		geranial, neral, citronellal	<i>B. subtilis</i> , <i>S. aureus</i> , <i>L. monocytogenes</i> , <i>P. aeruginosa</i> , <i>E. coli</i> , <i>Klebsiella pneumoniae</i> , <i>Salmonella enterica</i>	1.00–5.00 μ L/mL.	<i>F. oxysporum albedinis</i> , <i>F. oxysporum lini</i> , <i>Mucor ramannianus</i> <i>C. albicans</i> ,	1.00–5.00 μ L/mL.	DD	DC	[67]

<i>Ocimum basilicum</i> L.	AP	<i>S. aureus</i> , <i>Bacillus</i> spp., <i>Micrococcus</i> spp., <i>Staphylococcus</i> spp., <i>P. aeruginosa</i> , <i>E. coli</i> , <i>K. pneumonia</i> , <i>Acinetobacte</i> spp.	25–75 µL/mL	<i>Saccharomyces</i> spp., <i>Aspergillus</i> spp., <i>Fusarium</i> spp., <i>Penicillium glabrum</i> , <i>Cladosporium</i> spp., <i>C. albicans</i>	70–150 µL/mL	DD	DC	Amphotericin B (15 µL/mL)	[68]
<i>Origanum dictamnus</i>	cymene, γ-terpinene, carvacrol, linalool	<i>Bacillus</i> spp., <i>Staphylococcus</i> spp., <i>E. coli</i>	25–50 µg/mL			D	DC		[69]
	carvacrol, <i>p</i> -cymene, γ- terpinene			<i>Botrytis cinerea</i>	250 µL/L	DV	VC		[33]
<i>Lavandula angustifolia</i> Mill	geranial, (–)-linalool			<i>Eurotium</i> spp.	500 µL/L	DV	VC		[70]
	linalool, 1,8-cineole, camphor, linalyl acetate, borneol	<i>E. coli</i> , <i>P. aeruginosa</i> , <i>S. aureus</i>	1–42.67 µL/mL			DD	DC		[71]
<i>Rosmarinus officinalis</i> L.	Le	<i>E. coli</i> , <i>S. aureus</i> ,	0.625–2.5%			MBD	DC		[72]
	cineole, α-pinene, camphor, linalool, camphene								
	1,8-cineole, camphor, α- pinene			<i>A. flavus</i>	250 µg/mL	MBD	DC		[73]

<i>Satureja bachtiarica</i>	AP	carvacrol, cymene	thymol, o-	<i>L. monocytogenes</i>	5 mg/mL		DD	DC	Amoxicillin 25 µg/disk), Gentamicin (10 µg/disk), Cefexime (5 µg/disk), Tetracycline (30 µg/disk), Penicillin (10 µg/disk)	[61]
<i>Satureja hortensis</i>	Se	carvacrol, γ-terpinene		<i>E. coli, P. aeruginosa, S. typhimurium, L. monocytogenes</i>	2–4 µL/mL		DD DV	DC VC		[74]
	Le	thymol, γ-terpinene, carvacrol, <i>p</i> -cymene				<i>C. albicans</i>	250–400 µg/mL	MBD	DC	[75]
	AP	carvacrol, γ-terpinene, α-terpinene, <i>p</i> -cymene, 3-myrcene, α-thujene				<i>P. digitatum</i>	500 mg/mL	DD	DC	[76]
		carvacrol, thymol, <i>p</i> -cymene		<i>Staphylococcus</i> spp., <i>Bacillus</i> spp., <i>E. coli, S. typhimurium,</i>	0.5–16 µL/mL		DD	DC		[77]
<i>Satureja khuseztanica</i>	AP	carvacrol, γ-terpinene, <i>p</i> -cymene				<i>A. niger, P. digitatum, Botrytis cinerea, R. stolinifer,</i>	3000–6000 µL/mL	MBD	DC	[11]
<i>Salvia officinalis</i> L.		1,8-cineole, camphor				<i>Candida</i> spp., <i>Aspergillus</i> spp., <i>Cryptococcus neoformans</i>	0.64–10 µL/mL	MBD	DC	Fluconazole (1-128) Amphotericin B (1-2) [78]
<i>Thymus vulgaris</i>	Le	thymol, carvacrol	o-ocimene,	<i>S. aureus, Staphylococcus enteritidis, E. coli, P.</i>	0.195–0.78 µL/mL		MBD	DC		[79]

<i>aeruginosa</i>											
			carvacrol, <i>p</i> -cymene, γ -terpinene, thymol		<i>Aspergillus</i> spp., <i>Candida</i> spp.	0.3–0.15 μ L/mL	DD DV	DC, VC			[80]
<i>Thymus capitatus</i>	AP		thymol, linalool, geraniol, <i>p</i> -cymen-3-ol, <i>p</i> -cymene		<i>Aspergillus flavus</i>	1.00 mg/mL	DD	DC			[81]
<i>Thymus pulegioides</i>	AP		carvacrol, α -terpinene, <i>p</i> -cymene	<i>E. coli</i> , <i>Salmonella</i> spp., <i>Micrococcus</i> spp., <i>Staphylococcus</i> spp., <i>Enterobacter cloacae</i> , <i>P. aeruginosa</i> , <i>Proteus mirabilis</i> , <i>B. subtilis</i> , <i>L. monocytogenes</i>	10.8–27 μ L/mL	<i>C. albicans</i>	10.8 μ L/mL	MBD	DC		[82]
<i>Zataria multiflora</i>	AP		carvacrol, thymol, <i>p</i> -cymene		<i>A. flavus</i>	100-400 ppm	DD	DC			[83]
<i>Asteraceae</i>	<i>Achillea coarctata</i> Poir.	AP	1,8-cineole, camphor, caryophyllene oxide, borneol, β -eudesmol	<i>L. monocytogenes</i> , <i>K. pneumonia</i> , <i>B. cereus</i> , <i>Streptococcus pneumonia</i>	0.25–0.5 μ g/mL	<i>C. albicans</i>	0.25-0.5 μ g/mL	DD	DC		[84]
<i>Amaryllidaceae</i>	<i>Allium sativum</i> L.		tetradecane, diallyldisulphide, diallyltetrasulfide, disulfide, bis 1,1-dimethylpropyl, oleic acid	<i>E. coli</i> , <i>P. aeruginosa</i> , <i>S. aureus</i>	0.75–1.51 mg/mL			DD	DC		[85]
<i>Fabaceae</i>	<i>Hymenaea cangaceira</i>	Le	α -copaene, β -elemene, (E)-caryophyllene, α -guaiene, germacrene D	<i>S. aureus</i> , <i>P. aeruginosa</i> , <i>K. pneumoniae</i> ,	4–512 μ g/mL	<i>Candida krusei</i> <i>Candida tropicalis</i>	512-1024 μ g/mL	MBD	DC		[86]

<i>Myristicaceae</i>	<i>Myristica fragrans</i>	Se	α -pinene, sabinene, β -pinene,	<i>B. subtilis</i> , <i>S. typhimurium</i> , <i>P. aeruginosa</i> , <i>S. aureus</i>	512 mg/ mL	WD, DD	DC	[87]
<i>Rutaceae</i>	<i>Citrus sinensis</i> var. <i>Valencia</i>	Pe	limonene, β -myrcene, β -pinene, α -pinene, citral Z and E	<i>A. flavus</i>	8000 mg /L	V	VC	[10]

PF: plant family; PO: plant organ; AP: aerial parts; Se: seed; Le: leave; Fl: flower; Fr: fruit; Pe: peel; VC: vapor contact; DC: direct contact; DD: disc diffusion; WD: well diffusion; V: vaporization; D: dilution; MBD: microbroth dilution; Oc: Oxford cup; DV: disc volatilization