Supplementary Materials

Table S1. Essential oils constituents with anti-ulcer activity.

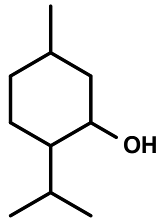
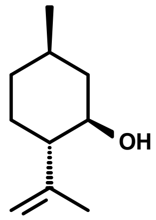
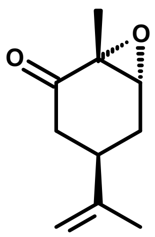
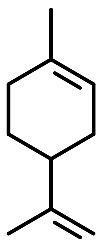
Compound	Experimental protocol	Antiulcer activity and/or mechanism	Animal tested	Reference
Menthol 	Indomethacin-induced gastric ulcer	Increase PGE2 production Activation of the K^{+}ATP channels	Wistar rat	[1]
	Ethanol-induced gastric lesions	Increased production of gastric GSH Increase gastric mucus		
	Gastric secretion in 4-h pylorus-ligature	Diminish the H^{+} concentration in the gastric juice		
	Ibuprofen- induced gastric ulcer	Cytoprotection		[2]
Isopulegol 	Ethanol-induced gastric lesions in indomethacin-pretreated animals	Increase endogenous prostaglandins K^{+}ATP channel opening Increase endogenous NO	Swiss mouse	[3]
Epoxy-carvone 	Ethanol and indomethacin-induced gastric ulcer	Gastroprotective activity	Rats	[4]
	Ethanol and indomethacin-induced ulcers	Gastroprotective effects	Rats	[5]
Limonene 	Ethanol- induced gastric lesions	Increased expression of the HSP-70 protein	Wistar rat	[6]
		Increase gastric mucus Increase of VIP		[7]
		Activity against *H. pylori*		[8]
	Indomethacin-induced gastric ulcers	Increase gastric mucus		[9]

Table S1. *Cont.*

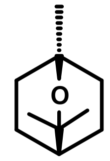
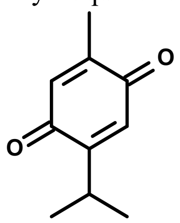
Compound	Experimental protocol	Antiulcer activity and/or mechanism	Animal tested	Reference
1,8-Cineole 	*Ethanol-induced gastric lesions*	Inhibition of lipoxigenase		[10]
		Increased production of gastric GSH	Swiss mouse	[11]
	Gastric secretion in 4-h pylorus-ligature	Reduced the gastric secretory volume and total acid output		[12]
	Induced gastric mucosal injury by ischemia and reperfusion	Increase levels of SOD and GSH		[13]
	Ethanol-induced gastric lesions	Increase GSH content Decreased the MDA level in gastric tissue		
Thymoquinone 	Ethanol-induced gastric lesions	Decreased the gastric MDA content Increase GSH content Increased the enzymatic activity of SOD Increase the enzyme activity of gastric GST		[14]
		Reduction in the number of mast cells in the gastric mucosa	Wistar rat	[15]
		Decrease gastric tissue histamine levels		[16]
		Decrease MPO activity		[17]
	Induced gastric mucosal injury by ischemia and reperfusion	Decrease acid concentration and acid output Reduction pepsin content Increased gastric mucin content		[18]
	Induced gastric mucosal injury by ischemia and reperfusion	Low proton pump activity Decrease MPO activity Increase endogenous NO Increase GSH and SOD levels		[19]

Table S1. *Cont.*

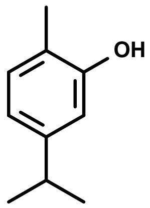
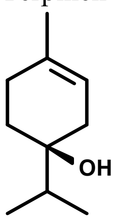
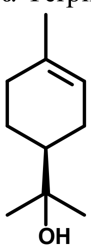
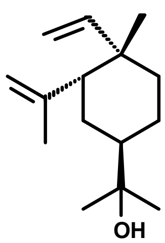
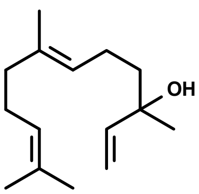
Compound	Experimental protocol	Antiulcer activity and/or mechanism	Animal tested	Reference
Carvacrol 	Ethanol -induced gastric lesions	Participation of sulfhydryl groups (SH) non-protein Increase catalase activity K^+ATP channels Opening Increase endogenous NO	Swiss mouse and Wistar rat	[20]
	Pylorus ligation induced ulceration	Increase in gastric mucus content		
	Pretreatment with ibuprofen on absolute ethanol-induced gastric lesions model	Involvement of endogenous prostaglandin		[21]
Terpinen-4-ol 	Pylorus ligation induced ulceration	Reduction the volume of gastric juice, acidity and pepsin content	Wistar or Sprague–Dawley rat	[22]
α-Terpineol 	Ethanol and indomethacin-induced gastric ulcer	Gastroprotective activity	Rats	[23]
Elemol 	Pylorus ligation induced ulceration	Reduction the volume of gastric juice, acidity and pepsin content	Wistar or Sprague–Dawley rat	[22]
Nerolidol 	Gastric secretion in 4-h pylorus-ligature	Reduction the volume of gastric juice and the total acidity Increased gastric pH	Wistar rat	[24]

Table S1. *Cont.*

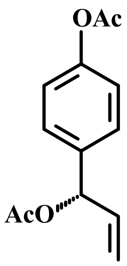
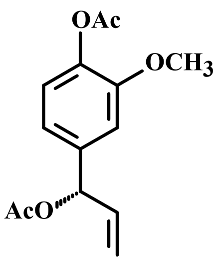
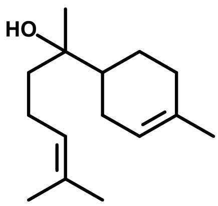
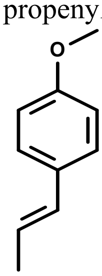
Compound	Experimental protocol	Antiulcer activity and/or mechanism	Animal tested	Reference
1'S-1'-Acetoxychavicol acetate 	Pretreatment with indomethacin on absolute ethanol-induced gastric lesions model	Involvement of endogenous prostaglandin	Sprague–Dawley rat	[25]
	Gastric lesions induced by ethanol in NEM-pretreated rats	Increase in endogenous SH		
1'S-1'-Acetoxyeugenol acetate 	Pretreatment with indomethacin on absolute ethanol-induced gastric lesions model	Involvement of endogenous prostaglandin	Sprague–Dawley rat	[25]
α-Bisabolol 	Gastric lesions induced by ethanol in NEM-pretreated rats	Increase in endogenous SH	Wistar rat	[26]
		Increase SOD activity Decrease the MDA amount in gastric mucosa Reduction the MPO activity in gastric mucosa		[27]
Anethole [1-methoxy-4-(1-propenyl)benzene] 	Indomethacin-induced gastric ulcers	Increased production of gastric GSH	Swiss mouse	[28]
		Increased the level of gastric mucus		[29]
	Ethanol- induced gastric lesions	Increase gastric mucus		[30]

Table S1. *Cont.*

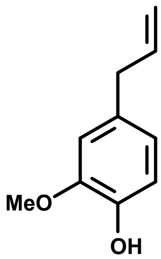
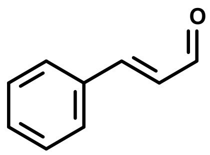
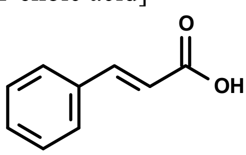
Compound	Experimental protocol	Antiulcer activity and/or mechanism	Animal tested	Reference
	Pylorus ligation induced ulceration	Enhanced gastric mucus	Wistar rat	[31]
	PAF-induced damage	PAF antagonist		[32]
		Reduction gastric acid secretion Decrease pepsin activity Reduction mucin content		[33]
Eugenol (4-allyl-2-methoxyphenol) 	Indomethacin-induced gastric ulcers	Opening of K^+ATP channel	Sprague-Dawley rat	[34]
		Reduction MDA level Increase endogenous NO Increased production of gastric GSH		[35]
	In vitro assay *Helicobacter pylori*	Supression of *Helicobacter pylori* growth	*Helicobacter pylori* strains	[36]
	Ethanol-induced gastric lesion	Increase gastric mucus	Sprague-Dawley rat	
	Ibuprofen- induced gastric ulcer	Cytoprotection	Wistar rat	[2]
Cinnamaldehyde [(2*E*)-3-phenylprop-2-enal] 	*In vitro* assay *Helicobacter pylori*	Supression of *Helicobacter pylori* growth	*Helicobacter pylori* strains	[37]
Cinnamic acid [(*E*)-3-phenylprop-2-enoic acid] 	Ethanol -induced gastric lesions	Increase gastric mucus	Sprague–Dawley rat	[36]

Table S1. *Cont.*

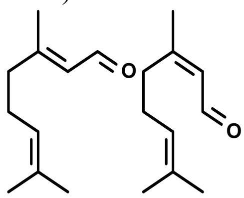
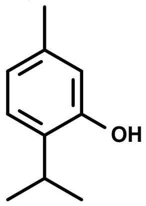
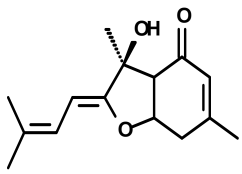
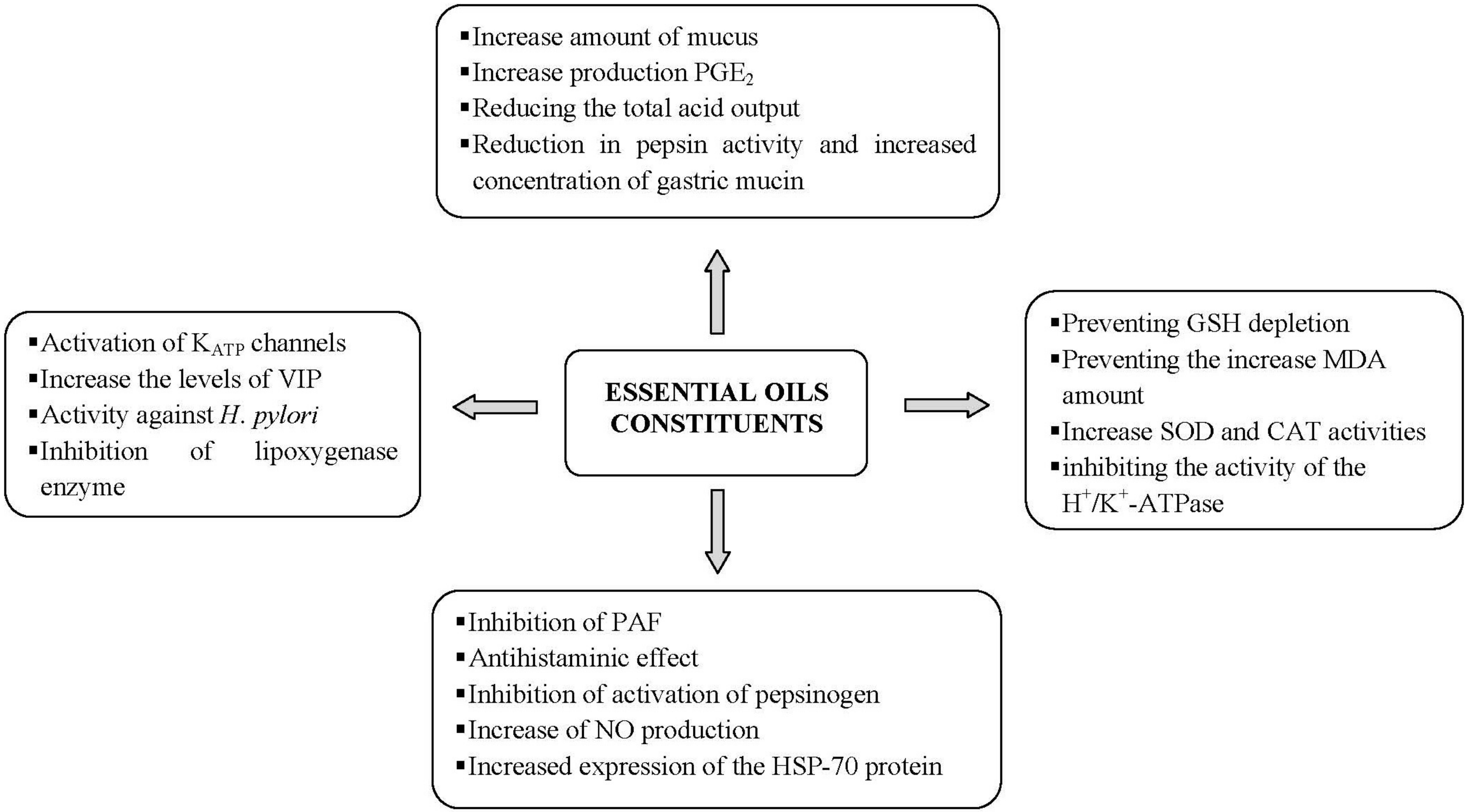
Compound	**Experimental protocol**	**Antiulcer activity and/or mechanism**	**Animal tested**	**Reference**
Citral (= geranial + neral)  (geranial) (neral)	Naproxen –induced gastric injury	Cytoprotection	Wistar rat	[38]
Thymol 	Ibuprofen- induced gastric ulcer	Cytoprotection	Wistar rat	[2]
Bisabolangelone 	Ethanol -induced gastric lesions Pylorus ligation model	Inhibiting the activity of the H^+/K^+-ATPase; Reducing the H^+ output	Kunming mice Sprague–Dawley rats and Kunming mouse	[39]

Figure S1. Possible mechanisms of action from essential oils constituents with anti-ulcer activity.



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