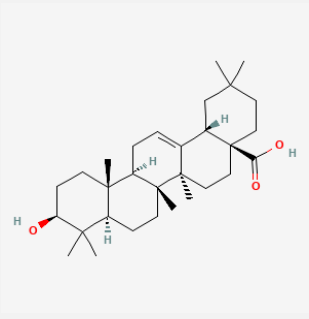
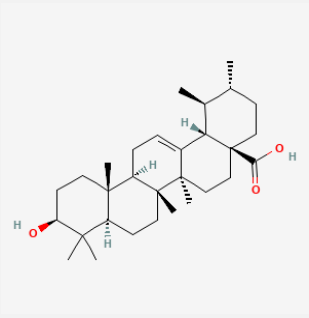
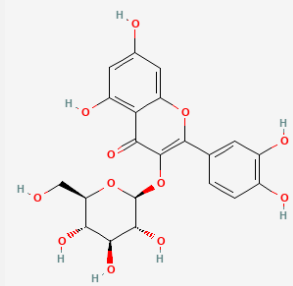


Phytochemical/ Compound	Molecular Structure	Class of Compound	Molecular Weight (g/mol)	Notable Pathways & Interactions (Reported in Previous Literature)	Pharmacologic and Biologic Activities (Reported in Previous Literature)	KEGG and/or PubChem CID
Persimmon						
Oleanolic acid		Terpene (triterpenoid)	456.360	NF-κB, COX-2, Nrf2 (Baer-Dubowska et al., 2021), PI3K, Akt, mTOR, p53, MMPs, EGFR (Lisiak et al., 2023)	antioxidative, anti-inflammatory, anti-cancer (Baer-Dubowska et al., 2021), antifungal, antibacterial, anti-carcinogenic, hepatoprotective, gastroprotective, antiviral (Castellano et al., 2022)	C17148/10494
Ursolic acid		Terpene (triterpenoid)	456.360	TNF-α, IL-6, caspase-7, LC3A, LC3B, beclin-1, proapoptotic Bax/Bcl-2, glycolytic pathway, caspase-3, JNK, caspase-9, MMP-2, MMP-9 (Michalak et al., 2023), Wnt, β-catenin, TGF-β1, STAT3, caspase-3, TCF4 (Zhao et al., 2023) ROCK, PTEN, p53, NF-κB, p60, p65, COX-2	antitumor, anti-cancer, anti-proliferative, antiviral, anti-inflammatory, antibacterial, antiallergic, cytotoxic against various cancer cell lines, antiestrogen, (Michalak et al., 2023)	C08988/64945

Isoquercitrin



Phenolic (Flavonoid)
Glycosidic form of
quercetin

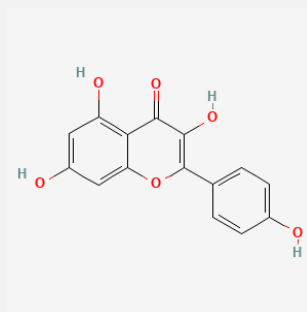
464.095

Wnt/ β -catenin, caspase-3/8/9, p53, Bax/Bcl-2, MAPK (Wei et al., 2023), Nrf2, NOX4, ROS, **NF- κ B**, p65, p-I κ B α , p38, ERK (Dai et al., 2018)

antitumor, antioxidant, anti-inflammatory, anti-proliferative (Wei et al., 2023), neuroprotective, decrease ROS, anti-apoptosis, (Dai et al., 2018)

C05623/5280804

Kaempferol



Phenolic (Flavonoid)

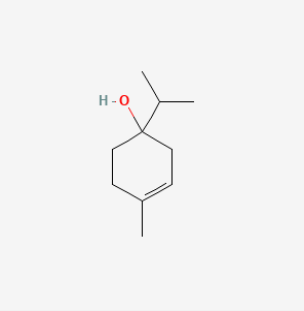
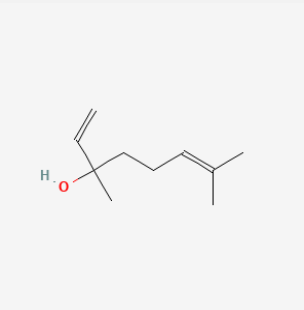
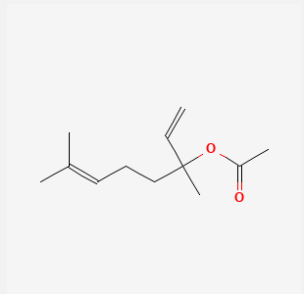
286.048

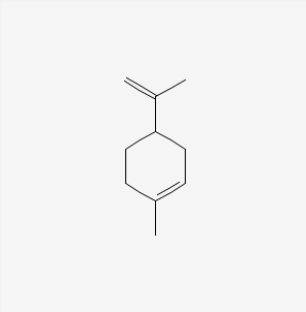
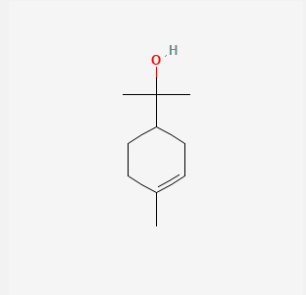
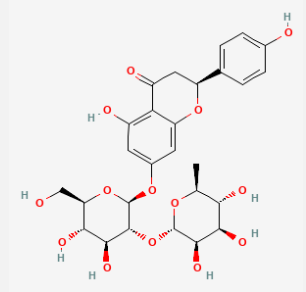
ERK1/2, P13K, Akt, mTOR, VEGF, STAT3, p53, **NF- κ B**, TNF- α , IRAK-1/-4, p38, MAPK, ESRRA, HIF-1 α , RSK2, COX-2, caspase-3/-7/-9, TYK-2, SOCS-3, MAPILC3, IRE1-CHOP, Bax/Bcl-2, PARP, MMP-9/-2, cathepsin-D/-B, AP1 (Qattan et al., 2022)

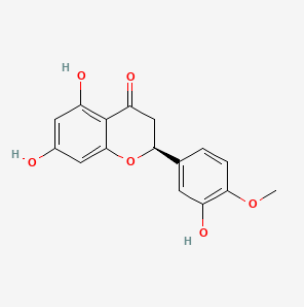
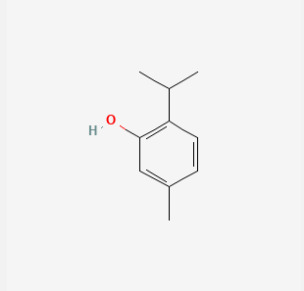
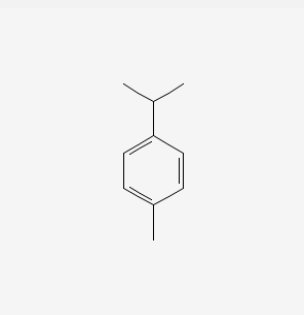
anti-inflammatory, anti-cancer, antioxidant, toxic activities against only cancer cells & have restricted toxicity on healthy cells, cardioprotective, neuroprotective, antimicrobial, antidiabetic, enhances apoptosis, inhibits ROS, antiproliferation, cell cycle arrest (Qattan et al., 2022)

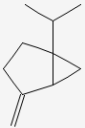
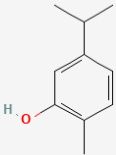
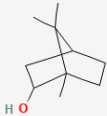
na/5280863

Marjoram

Terpinene-4-ol		Terpene (monoterpenoid)	154.250	KLF4, NF-κB , (He et. al, 2023), ROCK2 (Cao et. al., 2022), IL-1β, TNF-α, IRAK, IL-17, IL-10 (Aslam et. al., 2022)	anti-carcinogenic, selective toxicity to cancer cells, when combined with sabinene hydrate, exhibited anti-cancer effect <i>in vitro</i> and <i>in vivo</i> , enhancing survivin downregulation (Arafat, 2023) anti-inflammatory, anti-arthritic, antioxidant (Aslam et. al., 2022)	C17013/11230
Linalool		Terpene (monoterpenoid)	154.250	VEGF, p-VEGFR1, p-Flk-1, HIF-1α (Pal et. al., 2022) Bax/Bcl-2, caspase-3, caspase-9 (Hosseini et. al., 2023)	antioxidant, pro-oxidant, anti-angiogenesis, anti-metastasis, anti-carcinogenic (Pal et. al., 2022) neuroprotective, alleviation of oxidative stress and apoptosis (Hosseini et. al., 2023)	C03985/6549
Linalyl acetate		Terpene (monoterpenoid) Acetate ester of linalool	196.290	Thymic stromal lymphopoietin and IL-33 (Lu et. al., 2022) Nrf2, NF-κB , p65 (Cui et. al., 2021)	anti-inflammatory, pain modulating (Lu. et. al., 2022) antioxidant, anti-apoptotic, protective mechanisms to induction of cancer (Cui et. al., 2021)	na/8294

Limonene		Terpene (monoterpenoid)	136.23	TNF- α , IL-1 β , COX-2, TLR4, NF-κB , AP-1 (Kathem et. al.,. 2024)	role as a human metabolite, anti-inflammatory, reduced levels of serum urea and creatinine to stop renal decline, reduction of pro-inflammatory cytokines, modulating oxidative stress (Kathem et. al., 2024) anti-cancer, breast cancer targeting (Kaur et. al., 2022)	D00194/22311
alpha-terpineol		Terpene (monoterpenoid)	154.25	KDEL2, Notch, PI3K, mTOR, MAPK (Jin et. al., 2024)	anti-tumorigenic, anti-proliferative, anti-angiogenic, blood-brain-barrier penetrable, anti-migration anti-invasion of glioblastoma (Jin et. al., 2024)	C16772/17100
Marjoram, Notable Phytochemicals Beyond the Major Components						
Naringin		Phenolic (Flavonoid)	580.50	PARP-1, ATM, ATR, CHK1, WEE1) (Pravin et. al.,., 2024) GSK3B, NF-κB , COX-2, JAK2, STAT3, Notch1, p38, MAPK, caspase-3 (Rauf et. al., 2022)	antioxidant, anticancer, cytotoxic selectivity against cancer cells and not normal cells, free radical scavenging (Pravin et. al, 2024) (Rauf et. al, 2022)	C09789/442428

Hesperetin		Phenolic (Flavonoid)	302.28	IL-1 β , TNF- α , NF-κB , caspase-3 (Zhang et. al., 2024) PI3K/Akt, tight junction proteins (Gao et. al., 2024)	antioxidant, antineoplastic, anti-cancer, decreased estrogen receptor (ER α) in breast cancer cells (Vosooghi et. al., 2024) anti-inflammatory, anti-apoptotic, neuroprotective (Zhang et. al., 2024)	C01709/72281
Thyme						
Thymol		Terpene (monoterpenoid) phenol, Isomeric compound to Carvacrol	150.22	TNF- α , IL-1 β , IL-6, NF-κB , TGF-B, PI3K, Akt (Hussein et. al., 2024)	antibacterial, antiviral, anti-cancer, antioxidant, anti-hypertensive, antifungal, anti-inflammatory, antimalarial (Peter et. al., 2024)	C09908/6989
p-cymene		Terpene (monoterpenoid)	134.22	TNF- α , IL-1 β , IL-6, IL-10, NF-κB , MAPK, ERK1/2, JNK (Zhong et. al., 2013)	antioxidant, anti-inflammatory, antiparasitic, antidiabetic, antiviral, antitumor, antibacterial, antifungal, neuroprotective, immunomodulatory, vasorelaxant, analgesic, antinociceptive (Balahbib et. al., 2021)	C06575/7463

Sabinene		Terpene (monoterpenoid)	136.23	TNF- α , IL-1 β , OL-6, iNOs, LPS+IFN- γ (Valente et. al., 2013)	anti-inflammatory, antifungal, antioxidant (Cao et. al., 2017)	C16777/18818
Carvacrol		Terpene (monoterpenoid) phenol	150.22	IL-1 β , IL-6, TNF- α , NF-κB (El Sayed et. al., 2016)	antibacterial, antiviral, anti-cancer, antioxidant, anti-hypertensive, antifungal, anti-inflammatory, antimalarial (Peter et. al., 2024)	C09840/10364
Borneol		Terpene derivative	154.25	p38, MAPK (Xie et. al., 2023) HIF-1 α , NF-κB , VEGF, BCL-2 (Chen et. al., 2024)	anti-inflammatory, neuroprotective, anti-apoptotic, anti-cerebral infarction (Xie et. al., 2023)	C01411/64685
Linalool	See Marjoram Components for Detail	-	-	-	-	-
Thyme, Notable Phytochemicals Beyond the Major Components						
Limonene	See Marjoram Components for Detail	-	-	-	-	-