

KIKUYA

Dune

Terpene Profile



info@nubupharma.com

0800 46 33 22

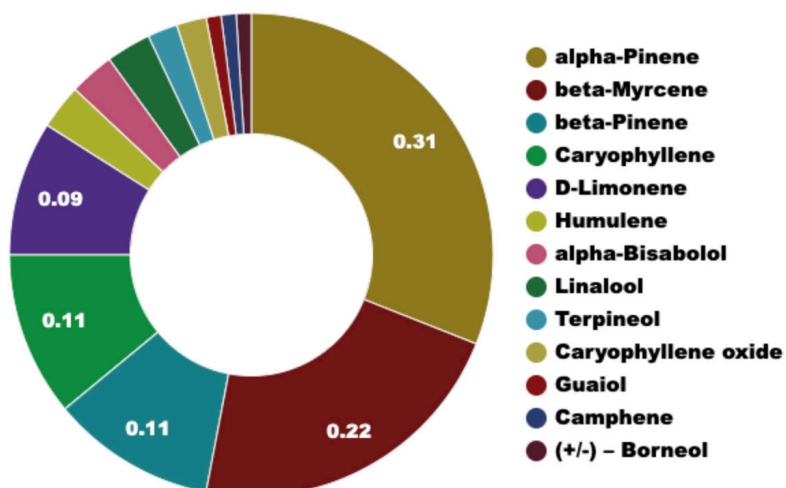
NUBU039bV1.1

KIKUYA Dune Dominant Terpenes

Terpene	Aroma	Effects*
Pinene	Pine, slightly woody	<ul style="list-style-type: none"> Antibiotic resistance modulation¹⁵ Antimicrobial¹⁶ Antioxidant¹⁷ Anti-inflammatory¹⁸ Acetylcholinesterase inhibitor, aiding memory¹⁴
Myrcene	Earthy fruity, clove like	<ul style="list-style-type: none"> Analgesic^{1,2} Antioxidant³ Antibacterial³ Anti-inflammatory^{2,4}
Caryophyllene	Spicy	<ul style="list-style-type: none"> Analgesic⁵ Antidepressant⁶ Anti-inflammatory^{5,7} Anti-proliferative⁸ Antioxidant⁸ Anxiolytic⁹ Neuroprotective⁷ Gastro/cytoprotective¹⁰
Limonene	Citrus	<ul style="list-style-type: none"> Antidepressant^{11,12} Antifungal¹³ Anti-inflammatory⁴ Anti-proliferative, apoptosis breast cancer cells¹⁴ Anxiolytic¹¹ Immunostimulant (inhaled)¹²
Humulene	"Hoppy"	<ul style="list-style-type: none"> Analgesic²⁴ Antibacterial²⁵ Anti-inflammatory²⁴ Anti-proliferative²⁶

*Evidence from animal models or cultured human cells

KIKUYA Dune Terpene Profile %W/W



References:

1. Rao V, Menezes A, Viana G. Effect of myrcene on nociception in mice. *J Pharm Pharmacol*. 1990;42(12):877-878.
2. Lorenzetti B, Souza G, Sarti S, Santos Filho D, Ferreira S. Myrcene mimics the peripheral analgesic activity of lemongrass tea. *J Ethnopharmacol*. 1991;34(1):43-48.
3. Wang C, Chen Y, Hou C. Antioxidant and antibacterial activity of seven predominant terpenoids. *International Journal of Food Properties*. 2019;22(1):230-238.
4. Rufino A, Ribeiro M, Sousa C, et al. Evaluation of the anti-inflammatory, anti-catabolic and pro-anabolic effects of E-caryophyllene, myrcene and limonene in a cell model of osteoarthritis. *Eur J Pharmacol*. 2015;750:141-150.
5. Klauke A, Racz I, Pradier B, et al. The cannabinoid CB₂ receptor-selective phytocannabinoid beta-caryophyllene exerts analgesic effects in mouse models of inflammatory and neuropathic pain. *Eur Neuropsychopharmacol*. 2014;24(4):608-620.
6. Hwang E, Kim H, Lee S, et al. Antidepressant-like effects of β -caryophyllene on restraint plus stress-induced depression. *Behav Brain Res*. 2020;380:112439.
7. Yang M, Lv Y, Lou J, et al. Neuroprotective Effect of β -Caryophyllene on Cerebral Ischemia-Reperfusion Injury via Regulation of Necroptotic Neuronal Death and Inflammation: In Vivo and in Vitro. *Front Neurosci*. Oct 2017;11:583.
8. Dahham S, Tabana Y, Iqbal M, et al. The Anticancer, Antioxidant and Antimicrobial Properties of the Sesquiterpene β -Caryophyllene from the Essential Oil of *Aquilaria crassna*. *Molecules*. 2015;20(7):11808-11829.
9. Bahi A, Al Mansouri S, Al Memari E, Al Ameri M, Nurulain S, Ojha S. β -Caryophyllene, a CB₂ receptor agonist produces multiple behavioral changes relevant to anxiety and depression in mice. *Physiol Behav*. 2014;135:119-124.
10. Tambe Y, Tsujiuchi H, Honda G, Ikeshiro Y, Tanaka S. Gastric cytoprotection of the non-steroidal anti-inflammatory sesquiterpene, beta-caryophyllene. *Planta Med*. 1996;62(5):469-470.
11. Komiya M, Takeuchi T, Harada E. Lemon oil vapor causes an anti-stress effect via modulating the 5-HT and DA activities in mice. *Behav Brain Res*. 2006;172(2):240-249.
12. Komori T, Fujiwara R, Tanida M, Nomura J, Yokoyama M. Effects of citrus fragrance on immune function and depressive states. *Neuroimmunomodulation*. 1995;2(3):174-180.
13. Chee H, Kim H, Lee M. In vitro Antifungal Activity of Limonene against *Trichophyton rubrum*. *Mycobiology*. 2009;37(3):243-246.
14. Russo EB. Taming THC: Potential cannabis synergy and phytocannabinoid-terpenoid entourage effects. *Br J Pharmacol*. 2011;163(1476-5381; 0007-1188; 7):1344-64.
15. Kovač J, Šimunović K, Wu Z, et al. Antibiotic resistance modulation and modes of action of (-)- β -pinene in *Campylobacter jejuni*. *PLoS One*. Apr 2015;10(4):e0122871.
16. Lee J, Yang H, Hong S. Chemical composition and antimicrobial activity of essential oil from cones of *Pinus koraiensis*. *J Microbiol Biotechnol*. 2008;18(3):497-502.
17. Türkeş H, Aydın E. In vitro assessment of cytogenetic and oxidative effects of β -pinene. *Toxicol Ind Health*. 2016;32(1):168-176.
18. Li X, Yang Y, Li Y, Zhang W, Tang H. β -Pinene, linalool, and 1-octanol contribute to the topical anti-inflammatory and analgesic activities of frankincense by inhibiting COX-2. *J Ethnopharmacol*. 2016;179:22-26.
19. Lee C, Chen L, Chen L, Chang T, Huang C, Huang M. Correlations of the components of tea tree oil with its antibacterial effects and skin irritation. *Journal of Food and Drug Analysis*. 2013;21(2):169-176.
20. Macedo E, Santos W, Sousa BN, et al. Association of terpinolene and diclofenac presents antinociceptive and anti-inflammatory synergistic effects in a model of chronic inflammation. *Braz J Med Biol Res*. 2016;49(7):e5103.
21. Yu D, Wang J, Shao X, Xu F F, Wang H. Antifungal modes of action of tea tree oil and its two characteristic components against *Botrytis cinerea*. *J Appl Microbiol*. 2015;119(5):1253-1262.
22. Ito K, Ito M. The sedative effect of inhaled terpinolene in mice and its structure-activity relationships. *J Nat Med*. 2013;67(4):833-837.
23. Aydın E, Türkeş H, Taşdemir Ş. Anticancer and Antioxidant Properties of Terpinolene in Rat Brain Cells. *Archives of Industrial Hygiene and Toxicology*. 2013;64(3):415-424.
24. Chaves JS LPPLCJ. Pharmacokinetics and tissue distribution of the sesquiterpene alpha-humulene in mice. *Planta Med*. 2008;74(14):1678-1683.
25. Jang H, Rhee K, Eom Y. Antibacterial and antibiofilm effects of β -humulene against *Bacteroides fragilis*. *Can J Microbiol*. 2020;66(6):389-399.
26. Legault J, Pichette A. Potentiating effect of beta-caryophyllene on anticancer activity of alpha-humulene, isocaryophyllene and paclitaxel. *J Pharm Pharmacol*. 2007;59(12):1643-1647.