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(54) **COMPOSITIONS COMPRISING
COMBINATIONS OF PURIFIED
CANNABINOIDS, WITH AT LEAST ONE
FLAVONOID, TERPENE, OR MINERAL**

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Related U.S. Application Data

(60) Provisional application No. 62/126,365, filed on Feb.
27, 2015.

(57) **ABSTRACT**
 Disclosed herein are new compositions having combinations
 of purified cannabinoids. One embodiment of this disclosure
 provides compositions having one or more purified cannab-
 inoids in combination with a purified terpene. One embodi-
 ment of this disclosure provides compositions having one or
 more purified cannabinoids in combination with a purified
 flavonoid. One embodiment of this disclosure provides com-
 positions having one or more purified cannabinoids in com-
 bination with a purified mineral.

**COMPOSITIONS COMPRISING
COMBINATIONS OF PURIFIED
CANNABINOIDS, WITH AT LEAST ONE
FLAVONOID, TERPENE, OR MINERAL**

**CROSS-REFERENCE TO RELATED
APPLICATIONS**

[0001] The present application claims priority on the basis of U.S. provisional application Ser. No. 62/126,365, filed Feb. 27, 2015, which is hereby incorporated by reference.

TECHNICAL FIELD

[0002] This disclosure relates to the *cannabis* industry. In particular, the disclosure relates to compositions and formulations comprising purified cannabinoids, flavonoids, and/or terpenes.

BACKGROUND

[0003] *Cannabis* is a genus of flowering plants that have three different species: *Cannabis sativa*, *Cannabis indica*, and *Cannabis ruderalis*. *Cannabis* has long been used for hemp fiber, for seed and seed oils, for medicinal purposes, and as a recreational drug.

[0004] *Cannabis* is composed of at least 483 known chemical compounds, which include cannabinoids, terpenoids, flavonoids, nitrogenous compounds, amino acids, proteins, glycoproteins, enzymes, sugars and related compounds, hydrocarbons, simple alcohols, aldehydes, ketones, simple acids, fatty acids, simple esters, lactones, steroids, terpenes, non-cannabinoid phenols, vitamins, pigments, and elements. These compounds are secreted on the glandular trichomes. Cannabinoids are unique to the *cannabis* plant and there have been 100 cannabinoids that have been isolated as purified (single) molecules.

[0005] Most extraction processes aim to extract cannabinoids, particularly tetrahydrocannabinol (THC). THC has many effects including pain relief, treating glaucoma, relieving nausea and vomiting during cancer treatments. The latter is sold as the drug dronabinol. The brand name in the US is Marinol. It is the pure isomer of THC, (-)-trans- Δ^9 -tetrahydrocannabinol which is man-made.

[0006] Preparative gas chromatography has proven to be a suitable method for providing adequate pure samples of THC, Cannabidiol (CBD), and Cannabinol (CBN). There has been difficulty in isolating pure cannabinoids in order to conduct research. Cannabinoids can have synergistic or antagonistic effects on each other. Other methods of extraction include butane hash oil (BHO) and supercritical carbon dioxide extraction. Cannabinoids are drawn out of the plant through solvent (e.g., butane or carbon dioxide) extraction, which produces a purified composition.

[0007] The resin glands, more commonly referred to as kief, contain a high concentration of cannabinoids and terpenes. The extraction process for kief involves placing the whole plant in a fine mesh screen shifter and gently shaking so that the kief falls through the screen away from the plant. The kief is sometimes compressed into rounds known as hash or hashish.

[0008] Despite developments in isolating single molecules, no work has been done in formulating compositions having particular combinations of the purified compounds. There has been no work developing compounds having repeatable, dependable ratios of purified molecules. In particular, there

have been no developments in combining purified cannabinoids with purified terpenes, flavonoids, and/or minerals.

[0009] There exists a need for compositions comprising new combinations of purified cannabinoids. There also exists a particular need for compositions providing one or more purified cannabinoids in combination with a purified terpene. Furthermore, there exists a need for compositions providing one or more purified cannabinoids in combination with a purified flavonoid. Additionally, there exists a need for compositions providing one or more purified cannabinoids in combination with a purified mineral.

DETAILED DESCRIPTION

[0010] Disclosed herein are new compositions having combinations of purified cannabinoids. One embodiment of this disclosure provides compositions having one or more purified cannabinoids in combination with a purified terpene. One embodiment of this disclosure provides compositions having one or more purified cannabinoids in combination with a purified flavonoid. One embodiment of this disclosure provides compositions having one or more purified cannabinoids in combination with a purified mineral.

[0011] Disclosed herein are compositions comprising:

[0012] a first purified cannabinoid; and

[0013] a compound chosen from a second purified cannabinoid, a purified terpene, a purified flavonoid, and a purified mineral,

[0014] wherein the said composition is substantially free from cellulose.

[0015] As used herein, the term “purified” means isolated from the plant using chromatography, distillation, extractions, or similar technique resulting in a greater than 60% purity. In some embodiments the “purified” compositions disclosed herein are greater than 70% purity. In some embodiments the “purified” compositions disclosed herein are greater than 80% purity. In some embodiments the “purified” compositions disclosed herein are greater than 90% purity.

[0016] Within the context of this disclosure, where a compound comprises stereogenic centers, the term “purified” includes enantiomerically pure compositions and also mixtures of enantiomers or isomers.

[0017] Cannabinoids and other plant molecules may be extracted using various solvents and technologies including, but not limited to ethanol, butane, methane, carbon dioxide, ice, water, steam. Cannabinoids and other plant molecules may be extracted from plants bred to express desired cannabinoid and/or terpene and/or flavonoid profiles for purity. Cannabinoids and other molecules may be purified using supercritical fluid (“SFC”) extraction and similar technologies. In one example, the process of crystallization involves placing the compound of interest in a liquid and then cooling or adding participants to the solution which would lower the solubility of the compound of interest so that it forms crystals. In this example, crystals are then separated from the liquid through filtration or centrifuge.

[0018] As used herein, the term “cannabinoid” means any substance that acts upon a cannabinoid receptor. For example the term cannabinoid includes cannabinoid ligands such as agonists, partial agonists, inverse agonists, or antagonists, as demonstrated by binding studies and functional assays. In many examples, a cannabinoid can be identified because its chemical name will include the text string “*cannabi*” in the name. Within the context of this application, where reference is made to a particular cannabinoid, each of the acid and/or

decarboxylated forms are contemplated as both single molecules and mixtures. Examples of cannabinoids within the context of this disclosure include compounds belonging to any of the following classes of molecules, their derivatives, salts, or analogs: Tetrahydrocannabinol (THC), Tetrahydrocannabinarin (THCV), Cannabichromene (CBC), Cannabichromanon (CBCN), Cannabidiol (CBD), Cannabielsoin (CBE), Cannabidivarin (CBDV), Cannbifuran (CBF), Cannabigerol (CBG), Cannabicyclol (CBL), Cannabinol (CBN), Cannabinodiol (CBND), Cannabitriol (CBT), Cannabivarin (CBV), and Isocannabinoids.

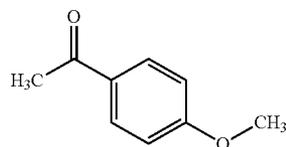
[0019] As used herein, the term “terpene” means an organic compound built on an isoprenoid structural scaffold or produced by combining isoprene units. Often, terpene molecules found in plants may produce smell.

[0020] The structure of terpenes are built with isoprenes, which are 5 carbon structures. Flavonoids are generally considered to be 15 carbon structures with two phenyl rings and a heterocyclic ring. So, there could be an overlap in which a flavonoid could be considered a terpene. However, not all terpenes could be considered flavonoids.

[0021] Within the context of this disclosure, the term terpene includes Hemiterpenes, Monoterpenols, Terpene esters, Diterpenes, Monoterpenes, Polyterpenes, Tetraterpenes, Terpenoid oxides, Sesterterpenes, Sesquiterpenes, Norisoprenoids, or their derivatives.

[0022] Derivatives of terpenes include Terpenoids in their forms of hemiterpenoids, monoterpenoids, sesquiterpenoids, sesterterpenoid, sesquarterpenoids, tetraterpenoids, Triterpenoids, tetraterpenoids, Polyterpenoids, isoprenoids, and steroids. They may be forms: α -, β -, γ -, oxo-, isomers, or combinations thereof. Examples of terpenes within the context of this disclosure include: 7,8-dihydroionone, Acetanisoole, Acetic Acid, Acetyl Cedrene, Anethole, Anisole, Benzaldehyde, Bergamotene (α -cis-Bergamotene) (α -trans-Bergamotene), Bisabolol (β -Bisabolol), Borneol, Bornyl Acetate, Butanoic/Butyric Acid, Cadinene (α -Cadinene) (γ -Cadinene), Caffeol, Caffeic acid, Camphene, Camphor, Capsaicin, Carene (Δ -3-Carene), Carotene, Carvacrol, Carvone, Dextro-Carvone, Laevo-Carvone, Caryophyllene (β -Caryophyllene), Caryophyllene oxide, Castoreum Absolute, Cedrene (α -Cedrene) (β -Cedrene), Cedrene Epoxide (α -Cedrene Epoxide), Cedrol, Cembrene, Chlorogenic Acid, Cinnamaldehyde (α -amyl-Cinnamaldehyde) (α -hexyl-Cinnamaldehyde), Cinnamic Acid, Cinnamyl Alcohol, Citronellal, Citronellol, Cryptone, Curcumene (α -Curcumene) (γ -Curcumene), Decanal, Dehydrovomifoliol, Diallyl Disulfide, Dihydroactinidiolide, Dimethyl Disulfide, Eicosane/Icosane, Elemene (β -Elemene), Estragole, Ethyl acetate, Ethyl Cinnamate, Ethyl maltol, Eucalyptol/1,8-Cineole, Eudesmol (α -Eudesmol) (β -Eudesmol) (γ -Eudesmol), Eugenol, Euphol, Farnesene, Farnesol, Fenchol (β -Fenchol), Fenchone, Geraniol, Geranyl acetate, Germacrenes, Germacrene B, Guaia-1(10), 11-diene, Guaiacol, Guaiene (α -Guaiene), Gurjunene (α -Gurjunene), Herniarin, Hexanaldehyde, Hexanoic Acid, Humulene (α -Humulene) (β -Humulene), Ionol (3-oxo- α -ionol) (β -Ionol), Ionone (α -Ionone) (β -Ionone), Ipsdienol, Isoamyl acetate, Isoamyl Alcohol, Isoamyl Formate, Isoborneol, Isomyrcenol, Isopulegol, Isovaleric Acid, Isoprene, Kahweol, Lavandulol, Limonene, γ -Linolenic Acid, Linalool, Longifolene, α -Longipinene, Lycopene, Menthol, Methyl butyrate, 3-Mercapto-2-Methylpentanal, Mercaptan/Thiols, β -Mercaptoethanol, Mercaptoacetic Acid, Allyl Mercaptan, Benzyl Mercaptan, Butyl Mercaptan, Ethyl Mercap-

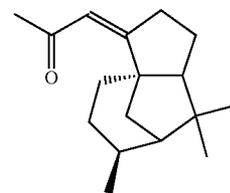
tan, Methyl Mercaptan, Furfuryl Mercaptan, Ethylene Mercaptan, Propyl Mercaptan, Thenyl Mercaptan, Methyl Salicylate, Methylbutenol, Methyl-2-Methylvalerate, Methyl Thiobutyrate, Myrcene (β -Myrcene), γ -Muurolene, Nepetalactone, Nerol, Nerolidol, Neryl acetate, Nonanaldehyde, Nonanoic Acid, Ocimene, Octanal, Octanoic Acid, P-cymene, Pentyl butyrate, Phellandrene, Phenylacetaldehyde, Phenylethanethiol, Phenylacetic Acid, Phytol, Pinene, β -Pinene, Propanethiol, Pristimerin, Pulegone, Quercetin, Retinol, Rutin, Sabinene, Sabinene Hydrate, cis-Sabinene Hydrate, trans-Sabinene Hydrate, Safranal, α -Selinene, α -Sinensal, β -Sinensal, β -Sitosterol, Squalene, Taxadiene, Terpin hydrate, Terpeneol, Terpene-4-ol, α -Terpinene, γ -Terpinene, Terpinolene, Thiophenol, Thujone, Thymol, α -Tocopherol, Tonka Undecanone, Undecanal, Valeraldehyde/Pentanal, Verdoxan, α -Ylangene, Umbelliferone, or Vanillin. As used herein, the term acetanisoole refers to a compound that has an anisole with an acetic group para to the methoxy group having the structural formula: Often acetanisoole is characterized as having a medium strength, sweet, anisic, vanilla-like aroma with powdery, balsamic and benzaldehyde nuances. It is used



as a flavoring, it has been described as a sweet, anisic, fruity and cherry with powdery vanilla nuances.

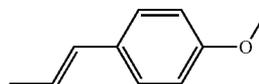
[0023] As used herein, the term acetic acid refers to a carboxylic acid with a methyl group. Often acetic acid is characterized as having a medium strength, sweet, anisic, vanilla-like aroma with powdery, balsamic and benzaldehyde nuances. Used in flavoring, it has been described as a sweet, anisic, fruity and cherry with powdery vanilla nuances.

[0024] As used herein, the term acetyl cedrene refers to a compound having a cedrene with an acetyl group and with the following structural formula:



[0025] Acetyl Cedrene is often characterized as having a medium strength, warm, woody, amber musky aroma. It can constitute up to 20% of some fragrance concentrates.

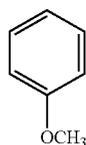
[0026] As used herein, the term anethole refers to an aromatic compound having the following structural formula:



[0027] Anethole is often characterized as having a very strong, sweet, anise, licorice aroma. It is used in a wide variety of fragrances and flavors. It has a sweet, anise, and

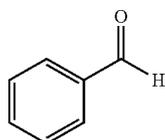
spicy licorice flavor with a lingering, sweet aftertaste. Anethole has also shown some antioxidant and antimicrobial activities.

[0028] As used herein, the term anisole refers to a compound having a benzene ring with a methoxy group with the following structural formula:



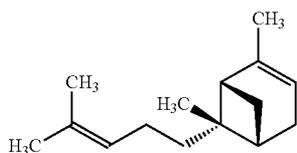
[0029] Anisole is often characterized as smelling like anise seeds.

[0030] As used herein, the term benzaldehyde refers to a compound having a benzene ring connected to an aldehyde with the following structural formula:

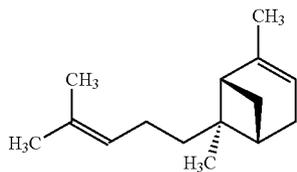


[0031] Benzaldehyde is often characterized as having an almond-like odor.

[0032] As used herein, the term bergamotene refers to a compound that includes either or both of α -cis-Bergamotene and/or α -trans-Bergamotene in a pure and/or mixture of any ratio. α -cis-Bergamotene refers to the following structural formula:

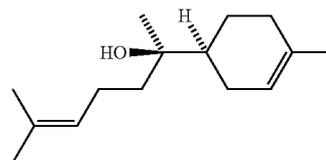


[0033] The α -cis-Bergamotene is often characterized as having a strong odor of ground black pepper. It is an aroma component of many species of the family orchidaceae. It has also shown some antioxidant activity. α -trans-Bergamotene refers to the following structural formula:

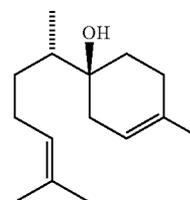


[0034] The α -trans-Bergamotene is often characterized as having a medium strength, warm, tea-leaf-like odor. It is used in the chemical communication system of some species of aphids.

[0035] As used herein, bisabolol refers to either or both of the β and/or α forms of a monocyclic sesquiterpene alcohol in a pure and/or mixture of any ratio. The β form differs from the α form based on the position of the tertiary alcohol group. The α form refers to the following structural formula:

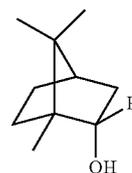


[0036] The β form refers to the following structural formula:



[0037] It is often characterized as having a medium strength, citrus, floral, tangy, lemon, fresh, sweet, herbaceous aroma. It is used in the chemical communication system of the Cotton boll weevil. It has shown anti-inflammatory, antimicrobial, antifungal and antimutagenic activities.

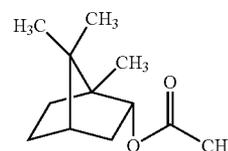
[0038] As used herein, the term borneol refers to a compound having the following structural formula:



[0039] It is often characterized as having a smell much like the menthol aroma of camphor and is easily converted into it. In Chinese medicine, herbs containing borneol are recommended for fatigue and over stress. Borneol is considered a "calming sedative" in Chinese medicine. It is directed for fatigue, recovery from illness and stress. It is found in small quantities in many essential oils.

[0040] Commercially it is derived from *Artemisia* plants such as wormwood and some species of cinnamon.

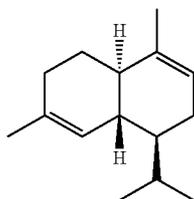
[0041] As used herein, the term bornyl acetate refers to an acetate that has a borneol group with the following structural formula:



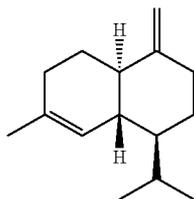
[0042] It is often characterized as having a pine, camphoraceous, herbal, and balsamic odor.

[0043] As used herein, butanoic/butyric acid refers to a carboxylic acid with the following structural formula: $\text{CH}_3\text{CH}_2\text{CH}_2\text{COOH}$. It is often characterized as having an unpleasant, acrid odor normally found in perspiration, flatulence and rancid butter. It is the primary cause of the foul smell associated with human vomit as it is one of many stomach acids that helps break down food for energy, and it is a common addition to stink bombs for this reason.

[0044] As used herein, the term Cadinene refers to either or both of α -Cadinene and/or γ -Cadinene as pure forms or mixtures in any ratio. α -Cadinene refers to an isomeric hydrocarbon sesquiterpene with the following structural formula:

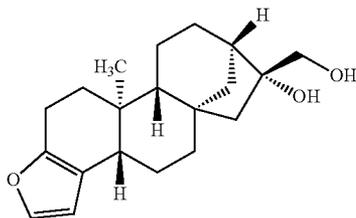


[0045] α -Cadinene is often characterized as having a pungent, smoky, woody, guaiac wood-like odor. It is listed by the FDA as a food additive permitted for direct addition to food for human consumption. It has shown some antimicrobial, anticancer, anti-inflammatory, antioxidant and antimalarial activities. γ -Cadinene refers to a compound having the following structural formula:



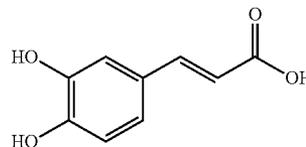
[0046] γ -Cadinene is often characterized as having a herbaceous, herbal, woody aroma. It has shown some antimicrobial and antibacterial properties. Many species of termites and a few beetles utilize γ -Cadinene in their chemical communication systems.

[0047] As used herein, the term cafestol refers to a diterpene molecule having the following structural formula:



[0048] It is often characterized as being present in high quantities in unfiltered coffee. It has also been shown to have anticarcinogenic properties in rats.

[0049] As used herein, the term caffeic acid refers to a compound having both a phenolic and acrylic functional groups with the following structural formula:



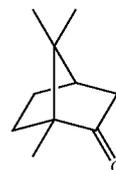
[0050] As used herein, the term camphene refers to a bicyclic monoterpene having the following structural formula:



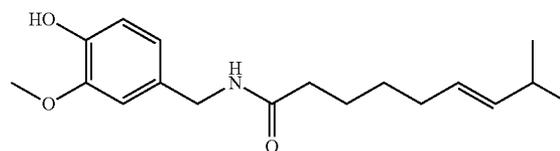
[0051] Camphene is often characterized as having a pungent, herbal, fir needle smell. Its odor has often been described as a camphoraceous, cooling, piney and woody with terpy nuances. It has citrus and green minty and green spicy notes.

[0052] Camphene is used in fragrances and food additives. It is a minor constituent of many essential oils such as turpentine, cypress oil, camphor oil, citronella oil, neroli, ginger oil, and valerian.

[0053] As used herein, the term camphor refers to a terpenoid that is similar in structure to camphene but instead possess a ketone instead of a double bond with the following structural formula:



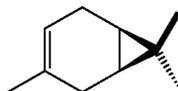
[0054] Camphor has a very characteristic odor for which the tree is named. The most recognizable product that contains the extracts of camphor is medicated chest rubs, which have the same distinct scent. It is a strong, penetrating, persistent odor. It is used as a flavor and fragrance agent in chewing gum and hard candy. The therapeutic properties of camphor oil are analgesic, antidepressant, anti-inflammatory, antiseptic, cardiac, carminative, diuretic, febrifuge, hypertensive, insecticide, laxative, rubefacient, stimulant, sudorific, vermifuge and vulnerary. As used herein, the term capsaicin refers to a chemical compound with following structural formula:



[0055] In its pure form, capsaicin is often odorless. It is often characterized as an irritant for mammals, known for the sensation it provokes when inhaled, eaten, or applied to the

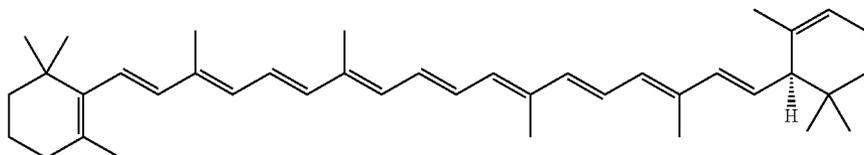
skin. In this sense, it is similar to menthol (which stimulates the body's sensors without causing an actual change in temperature). Capsaicin is often used as an analgesic in topical ointments and dermal patches to relieve pain and as an anti-inflammatory.

[0056] As used herein, the term Carene (Δ -3-Carene) refers to a bicyclic monoterpene that has the following structural formula:



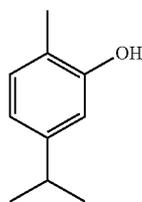
[0057] It differs from camphor and camphene by having the double bond within the ring structure. Δ -3-Carene is often characterized as having a medium strength, sweet, pungent citrus odor. It is a constituent of pine and cedar resin but is found in many other plants including rosemary. In aromatherapy, cypress oil, high in Δ -3-Carene, is used to dry excess fluids, tears, running noses, excess menstrual flow and perspiration. It is thought to be at least partially responsible for the dry mouth and eye problems that are common side effects experienced by some *cannabis* users.

[0058] As used herein, the term carotene refers to any one of a series of related unsaturated hydrocarbon substances having the formula $C_{40}H_x$. The α -carotene has the following structural formula:



[0059] Within the context of this disclosure, the term carotene refers to any of the isomeric forms of carotene in a pure and/or mixture in any ratio. Carotene is often characterized as appearing colored to the human eye.

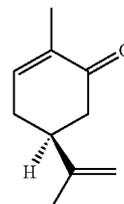
[0060] As used herein, term carvacrol refers to a monoterpene phenol that has the following structural formula:



[0061] Carvacrol is often characterized as having a pungent, warm odor of oregano. It is used as a flavor and fragrance agent and its flavor has been described as spicy, herbal, phenolic, medicinal and woody. Carvacrol is often responsible for the biological activities of oregano. Carvacrol exhibits many diverse activities such as: antimicrobial, antitumor, antimutagenic, antigenotoxic, analgesic, antispasmodic, anti-inflammatory, angiogenic, antiparasitic, antiplatelet, AChE inhibitory, antielastase, insecticidal, antihepatotoxic and hepatoprotective activities.

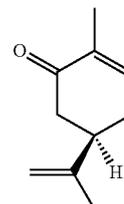
[0062] As used herein, the term carvone refers to a monoterpene that it is similar in structure to a carvacrol but has a carbonyl group instead of an alcohol group. For the context of this disclosure, the term "carvone" includes the enantiomer forms S-(+) and R-(-) as pure and/or mixtures in any ratio.

[0063] As used herein, the term dextro-carvone refers to the S-(+) enantiomer of carvone that has the following structural formula:



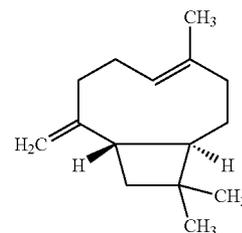
[0064] Dextro-Carvone is often characterized as having a spicy, bready, caraway aroma. It is found in mandarin peel oil and gingergrass oil. It is the principal constituent (60-70%) of the oil from caraway seeds.

[0065] As used herein, the term laevo-carvone refers to the R-(-) enantiomer of carvone with the following structural formula:



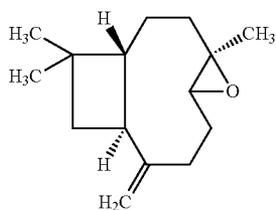
[0066] Laevo-Carvone is often characterized as having a sweet, minty, herbaceous, spearmint odor. It is found in spearmint and kuromoji oils. It is used extensively in chewing gums and flavor oils such as spearmint, but is also used in spice and floral fragrances for air fresheners, perfumes, shampoos, deodorants, body wash, laundry detergents, cosmetics and toothpaste.

[0067] As used herein, the term Caryophyllene (β -Caryophyllene) refers to a bicyclic sesquiterpene with the following structural formula:

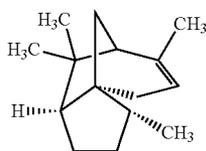


[0068] β -Caryophyllene is often characterized as having a sweet, woody and dry clove odor and has a peppery, spicy with camphor and astringent citrus backgrounds. It is a major terpene found in black pepper, clove and cotton. It is often found in smaller percentages in many other green, leafy vegetables, herbs, and spices. Caryophyllene contributes to black pepper's spiciness. Caryophyllene oil is also used industrially to enhance tobacco flavor.

[0069] As used herein, the term caryophyllene oxide refers to a compound with the following structural formula:

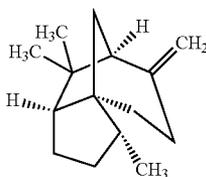


[0070] Caryophyllene oxide is often characterized as having a lemon balm odor. It has shown some effectiveness as an insecticidal/anti-feedant and as broad-spectrum antifungal in plant defense. Caryophyllene oxide has the distinction of being the main component responsible for *cannabis* identification by drug-sniffing dogs. As used herein, the term Cedrene refers to either or both of α -Cedrene and/or β -Cedrene as pure forms or mixtures in any ratio. The (-) α and (+) β form differ in the position of the double bond. α -Cedrene refers to a compound having the following structural formula:



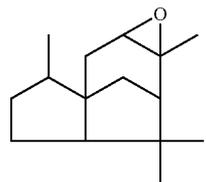
[0071] The α form is often characterized as having a medium strength, woody, sweet, fresh aroma of cedar. It is used in bakery items, sherbet and sorbet. It is a major component in the essential oil of cedar.

[0072] The β form refers to a compound having the following structural formula:



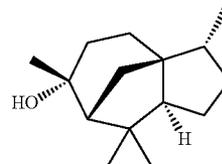
[0073] The β form is often characterized as having a medium strength, woody, fresh aroma of cedar. It is a major component in the essential oil of cedar.

[0074] As used herein, the term Cedrene Epoxide (α -Cedrene Epoxide) refers to cedrene with an epoxide group and having the following structural formula:



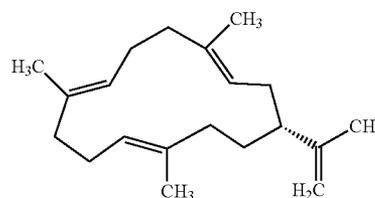
[0075] α -Cedrene Epoxide is often characterized as having a medium strength, woody, amber, tobacco, sandalwood, and fresh patchouli aroma. It is commonly used as a fragrance agent and a perfuming agent for cosmetics.

[0076] As used herein, the term cedrol refers to a sesquiterpene alcohol having the following structural formula:



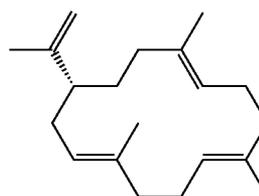
[0077] Cedrol is often characterized as having a very faint aroma that is sweet, soft, dry and cedar woody. Studies have shown cedrol to show deeply sedative effects when inhaled. Cedrol is a major component of cedar wood oil. It is found in the essential oil of conifers, especially in cypress and juniper. It has also been identified in *Origanum onites*, a plant related to oregano.

[0078] As used herein, the term Cembrene A refers to a monocyclic diterpene with the following structural formula:



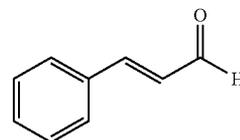
[0079] It is often characterized as having a faint wax like odor.

[0080] As used herein, the term chlorogenic acid refers to an ester of the caffeic acid and a (-)-quinic acid that has the following structural formula:



[0081] It can often be found in peaches, prunes, and green coffee bean extract.

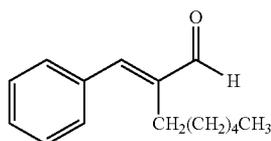
[0082] As used herein, the term Cinnamaldehyde refers to a phenyl group attached to an unsaturated aldehyde with the following structural formula:



[0083] Cinnamaldehyde is often characterized as having a very strong, spicy, sweet cinnamon odor, and gives cinnamon its flavor. It occurs naturally in the bark of cinnamon trees and

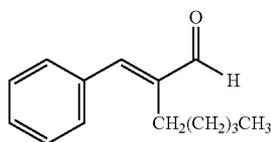
other species of the genus *Cinnamomum*. Cinnamaldehyde constitutes 90% of the essential oil of cinnamon.

[0084] As used herein, the term α -hexyl-Cinnamaldehyde refers to a compound having the structural formula:



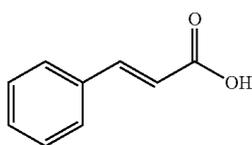
[0085] α -hexyl-Cinnamaldehyde is often characterized as having a medium strength, sweet, floral, green, jasmine, citrus and fruity aroma with powdery, tropical or spicy notes. As a flavoring it is sweet, waxy, floral and green with citrus and fruity nuances.

[0086] As used herein, the term α -amyl-Cinnamaldehyde refers to a compound having the structural formula:



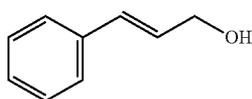
[0087] α -amyl-Cinnamaldehyde is often characterized as having a medium, sweet floral, oily, fruity, herbal, jasmine, and tropical aroma. Used in flavorings it is tropical, waxy, floral, rosy and honey-like with a fruity nuance and body.

[0088] As used herein, the term cinnamic acid refers to a phenyl group double bonded to a propionic acid with the following structural formula:



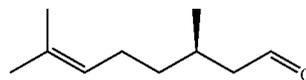
[0089] Cinnamic acid is often characterized as having a weak balsamic, sweet, storax, honey-like odor. It can be obtained from the oil of cinnamon, or from balsams such as storax.

[0090] As used herein, the term cinnamyl alcohol refers to a phenyl group that is double bonded to a propanol group that has the following structural formula:



[0091] Cinnamyl alcohol is often characterized as having a medium strength, cinnamon spice, floral green and fermented odor with powdery balsamic nuances. As a flavor component it has a green, floral, spicy and honey flavor with a fermented yeasty nuance.

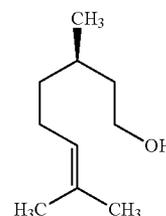
[0092] As used herein, the term citronellal refers to a monoterpenoid that has the following structural formula:



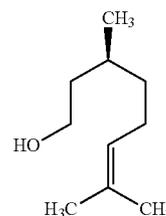
[0093] Citronellal is often characterized as making up to 80% of the leaf oil from Kaffir lime leaves and is the compound responsible for its characteristic aroma.

[0094] Citronellal has a high repellent effectiveness against mosquitoes and other insects. It is also shown to have strong antifungal qualities. Citronellal is the main component that gives citronella oil its distinctive lemon-lime scent.

[0095] As used herein, the term citronellol refers to an acyclic monoterpenoid that includes either or both of the (+) and (-) enantiomers as pure forms or mixtures in any ratio. The (+) enantiomer has the following structural formula:

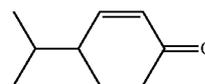


[0096] The (-) form has the following structural formula:



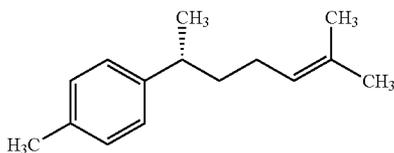
[0097] Citronellol is often characterized as having a floral, rosy, sweet, citrus with green, fatty, terpene-nuanced odor. Used in flavorings it has a floral, rose, sweet, green with fruity citrus nuanced flavor. In studies it was shown to have a deeply sedating effect upon inhalation.

[0098] As used herein, the term cryptone refers to 4-Isopropyl-2-cyclohexen-1-one and has the following structural formula:

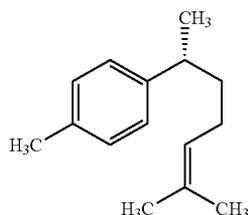


[0099] It is often characterized as having a woody minty herbaceous smell.

[0100] As used herein, the term Curcumene refers a compound with $C_{15}H_{22}$ with either both α -Curcumene and/or γ -Curcumene as pure forms or mixtures in any ratio. α -Curcumene has the following structural formula:

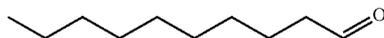


[0101] α -Curcumenol is often characterized as having an odor of Turmeric. It is found prominently in the *Zingiber* genus of Ginger. It is one of the main active ingredients of both Turmeric and Ginger oils. γ -Curcumenol has the following structural formula:



[0102] γ -Curcumenol is often characterized as having an earthy aroma. It is found prominently in the *Libocedrus bidwillii* tree of New Zealand. It is one of the main active ingredients of both Turmeric and Ginger oils.

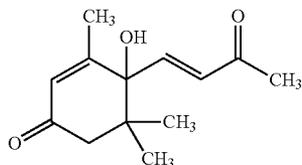
[0103] As used herein, the term decanal refers to a ten-carbon aldehyde having the following structural formula:



[0104] Decanal is often characterized as having a very powerful, waxy, orange-peel, citrus like, sweet, aldehydic odor. It is used in fragrances and flavoring. Its flavor is a waxy, fatty, citrus and orange peel with a slight green melon nuance.

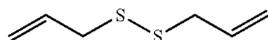
[0105] Decanal occurs in nature and is an important component in citrus along with octanal, citral, and sinensal.

[0106] As used herein, the term dehydrovomifoliol refers to a cyclic terpenoid oxide having the following structural formula:



[0107] Dehydrovomifoliol is often characterized as having a fruity and flowery odor. It has shown some cytostatic and antiviral activity.

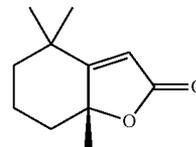
[0108] As used herein, the term diallyl disulfide refers to a disulfide with an allyl group on each sulfide and having the following structural formula:



[0109] Diallyl Disulfide is often characterized as having a strong, alliaceous, onion and garlic-like odor with metallic

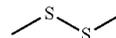
nuances. When highly diluted, it is used as a flavoring in food. It has a green onion and garlic-like flavor with meaty nuances. It is an organosulfur (organic compounds that contain sulfur) derived from garlic. It is also one of the main components of the distilled oil of garlic. Diallyl disulfide has many of the health benefits of garlic, but it is also an allergen causing garlic allergy.

[0110] As used herein, the term dihydroactinidiolide refers to a terpenoid oxide that has the following structural formula:



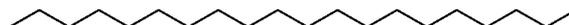
[0111] Dihydroactinidiolide is often characterized as having a fruity, musky, coumarin tea-like, peach aroma. It is a flavoring agent for food and tobacco and used in tea flavors, berry flavors, other fruit flavors, brown flavors, seaweed, tomato and beer. It has shown antiproliferative effects.

[0112] As used herein, the term dimethyl disulfide refers to a disulfide with a methyl group attached to each sulfide that has the following structural formula:



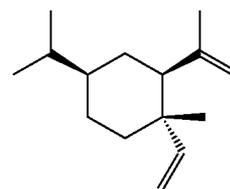
[0113] Dimethyl Disulfide is often characterized as having a high strength, sulfurous, rotten garlic, cabbage or onion type of aroma. Dimethyl disulfide along with dimethyl sulfide and dimethyl trisulfide are compounds given off by the plant known as dead-horse arum. Flies are attracted to the odor of fetid meat the combination of the three make, and they help pollinate this plant.

[0114] As used herein, the term eicosane/icosane refers to an alkane with the formula $C_{20}H_{42}$ having 366,619 constitutional isomers with the following skeletal structure:



[0115] Eicosane is often characterized as having a waxy odor. It is used in fragrance concentrates. It is the shortest compound found in paraffin waxes used to form candles. It is also used in insect repellent.

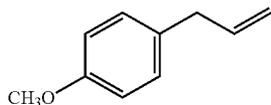
[0116] As used herein, the term Elemene (β -Elemene) refers to a cyclic sesquiterpene that has the following structural formula:



[0117] β -Elemene is often characterized as having a medium strength, sweet aroma. The parenteral form of β -elemene is isolated from *Rhizoma zedoariae*, a type of ginger, although it is a volatile terpene found in botanicals such as

celery, mint, and it is prevalent in a variety of medicinal plants. It has a strong antiproliferative and anti-cancer effects against a broad spectrum of tumors.

[0118] As used herein, the term estragole refers to a phenylpropene that has the following structural formula:

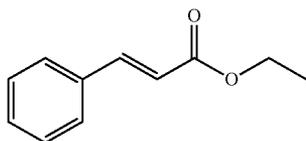


[0119] It is an isomer of anethole with the difference being the location of the double bond. It is often characterized as having an anise seed smell and occurs in tarragon oil, turpentine, and other essential oils, and is used in perfumes and flavoring materials.

[0120] As used herein, the term ethyl acetate refers to an ester of ethanol and acetic acid. Ethyl acetate is often characterized as having a medium strength, acidic fruity, dirty, cheesy, fermented odor with the strong nuance of Roquefort cheese.

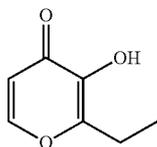
[0121] It is used as a flavoring with a fruity, dirty, acidic flavor with a dairy, buttery and cheesy nuance.

[0122] As used herein, the term ethyl cinnamate refers to an ester of cinnamic acid and ethanol that has the following structural formula:



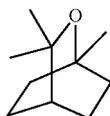
[0123] Ethyl Cinnamate is often characterized as having a medium strength, sweet, balsamic, spicy, powdery, fruity, berry, and plum odor. It is used as a flavoring agent, where it has a balsamic, powdery, fruity, berry, punch, spice, sweet and green flavor with an amber note.

[0124] As used herein, the term ethyl maltol refers to a cyclic organic compound with the formula $C_6H_6O_3$ that has the following structural formula:



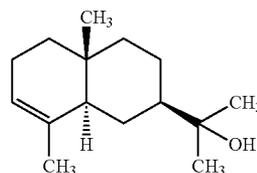
[0125] It is often characterized as having a sweet smell that is similar to caramelized sugar and cooked fruit.

[0126] As used herein, the term Eucalyptol/1,8-Cineole refers to a cyclic ether and monoterpene that has the following structural formula:

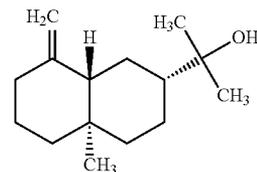


[0127] Eucalyptol/1,8-Cineole is often characterized as having a camphor-minty odor of eucalyptus. In fact, it is the main ingredient in oil of *eucalyptus*. It is also found in other fragrant plants. It is used to increase circulation, and reduce pain and swelling when applied topically. Cineole readily crosses the blood/brain barrier, possibly helping other can-

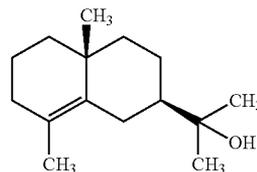
nabinoids to cross more readily as well. The inhalation of cineole often increases cerebral blood flow and enhances cortical activity. The effects of cineole, when combined with oral or smoked *Cannabis*, are reported as being very uplifting, noticeably increasing mental and physical energy. This terpene, and others like it, may be responsible for the reported difference in effect between indica and *sativa* strains with a similar cannabinoid profile. As used herein, the term Eudesmol refers to α -Eudesmol, β -Eudesmol, or γ -Eudesmol as pure forms or mixtures in any ratio. α -Eudesmol has the following structural formula:



[0128] α -Eudesmol is often characterized as having a sweet, woody odor. It's been shown to protect against brain injury after focal ischemia in rats. α -Eudesmol may be useful for the treatment of migraines. β -Eudesmol refers to the following structural formula:



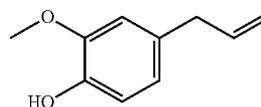
[0129] β -Eudesmol is often characterized as having a sweet, green, woody, yuzu-like aroma. It has shown some antioxidant, antimicrobial and anti-wood-decay fungal activities. γ -Eudesmol refers to the following structural formula:



[0130] γ -Eudesmol is often characterized as having a waxy, sweet, woody, floral odor.

[0131] γ -Eudesmol presents cytotoxic effect to cancer cells. All Eudesmol isomers displayed cytotoxicity to different tumor cell lines.

[0132] As used herein the term eugenol refers to a phenylpropene that has the following structural formula:

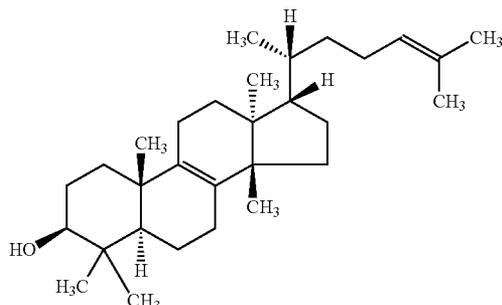


[0133] Eugenol is often characterized as causing the aromatic smell typical of cloves. It is sometimes called clove oil because it is the active element in cloves. Eugenol is found in

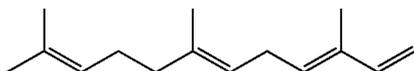
insect attractants as well as UV absorbers. It is an antioxidant, and when mixed with zinc oxide, eugenol is a common base for temporary fillings.

[0134] This is the reason dental offices smell the same.

[0135] As used herein, the term euphol refers to a tetracyclic triterpene that has the following structural formula:

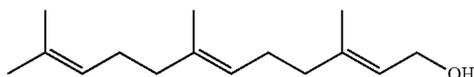


[0136] As used herein, the term farnesene refers to six closely related compounds that are sesquiterpenes. (E,E)- α -Farnesene is one of these six molecules and has the following structural formula:



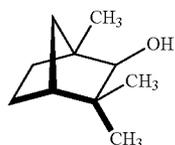
[0137] Within the context of this disclosure, the term "farnesene" refers to any one of the six closely related compounds, either alone or in combination of any other of those six closely related compounds. A species of aphids emit farnesene as a defense mechanism. It is often characterized as having a fragrance of *magnolia* flowers and has citrus notes with green, woody, vegetative odor with hints of lavender.

[0138] As used herein, the term farnesol refers to a cyclic sesquiterpene alcohol that has the following structural formula:



[0139] Farnesol is often characterized as having a weak, mild, fresh, sweet, floral, linden tree odor. It is used as an agent in cosmetics, flavors and fragrances. It has anti-inflammatory, antioxidant and antiproliferative effects and it has been suggested to function as a chemopreventive and antitumor agent with some analgesic potential. Farnesol is present in many essential oils such as citronella, neroli, cyclamen, lemon grass, tuberose, rose, musk, balsam and tolu. It is used in perfumery to emphasize the odors of sweet floral perfumes. It is also a natural pesticide for mites and is a pheromone for several other insects.

[0140] As used herein, the term Fenchol (β -Fenchol) refers to the isomer of borneol with the following structural formula:



[0141] β -Fenchol is often characterized as having a camphorous, borneol, piney, woody, dry, sweet, lemon scent. It is

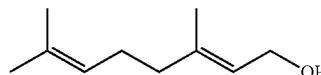
used as a flavor and fragrance agent. It is an antioxidant and antimicrobial with limited antifungal properties.

[0142] As used herein, the term fenchone refers to a monoterpene and a ketone with the following structural formula:



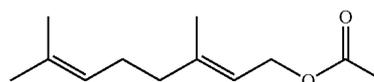
[0143] Fenchone is often characterized as having a camphorous, thuja, cedar leaf, herbal, earthy, woody aroma. As an additive, its flavor has been described as cooling, camphorous, sweet and minty with a musty, earthy nuance.

[0144] As used herein, the term geraniol refers to a monoterpene alcohol that has the following structural formula:



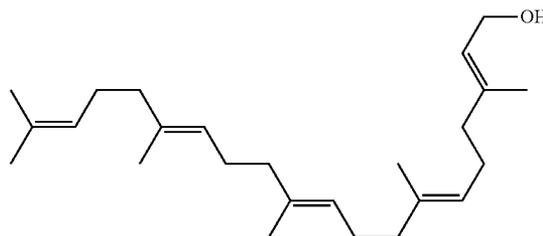
[0145] Geraniol is often characterized as having a medium strength, floral, sweet, rosy, fruity odor with citrus to citronella-like odor nuances. Its flavor is floral, rosy, waxy and perfume-like with a fruity peach-like nuance. It is used as a flavor and fragrance agent. It is used in flavors such as peach, raspberry, grapefruit, red apple, plum, lime, orange, lemon, watermelon, pineapple, and blueberry. It is also used for cosmetic as a perfuming agent. Geraniol is a natural antioxidant. It inhibits DNA synthesis. In one study, Geraniol was shown to suppress pancreatic tumor growth.

[0146] As used herein, the term geranyl acetate refers to a monoterpene with a carboxylic acid with the following structural formula:



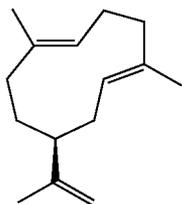
[0147] Geranyl Acetate is often characterized as having a very strong, floral aroma with a fruity twist. It is found in a variety of natural oils from plants such as citronella, lemon grass, saffras, rose, and many others. It exhibits strong antimicrobial properties.

[0148] As used herein, the term geranyl farnesol refers to an acyclic 25-carbon isoprenoid that has the following structural formula:

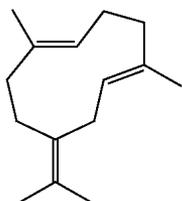


[0149] As used herein, the term germacrene refers to a class of volatile organic hydrocarbons that are specifically sesquiterpenes. For the purposes of this disclosure, the term

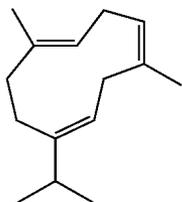
“germacrene” refers to any of the five isomers as either pure forms or in any combination of the five isomers. Germacrene A refers to the following structural formula:



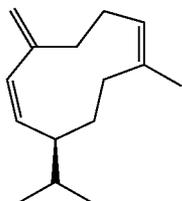
[0150] Germacrene B refers to the following structural formula:



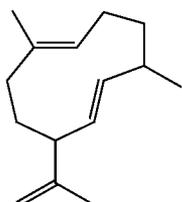
[0151] Germacrene C refers to the following structural formula:



[0152] Germacrene D refers to the following structural formula:



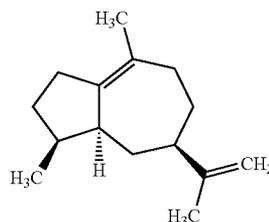
[0153] Germacrene E refers to the following structural formula:



[0154] They are often produced in a number of plant species for their antimicrobial and insecticidal properties, though

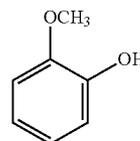
they also play a role as insect pheromones. The essential oil of the red deadnettle (*Lamium purpureum*) is characterized by its high contents of germacrene. Germacrene B is often characterized as having a potent odor ranging from spicy, warm and earthy to the sweet aroma of expressed lime oil. It is not used in food or fragrances.

[0155] As used herein, the term guaia-1(10), 11-diene refers to a bicyclic sesquiterpene that has the following structural formula:



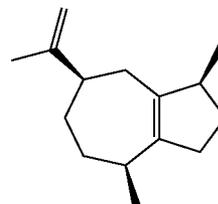
[0156] Guaia-1(10), 11-diene is often characterized as having an elegant and sweet woody aroma. It is used as a fragrance for a wide range of products from food additives, tobacco flavorings and general cosmetics, to odorizing rooms.

[0157] As used herein, the term guaiacol refers to an organic compound with a phenol group with a methoxy group in the ortho-position with the following structural formula:



[0158] Guaiacol is often characterized as having a powerful, smoke-like, phenolic, spicy, woody somewhat medicinal odor. It has a sweet, powdery, musty, vanilla, floral, almond flavor. It is used chiefly as an expectorant, but is also used as a local anesthetic, an antiseptic and an intestinal disinfectant. Guaiacol is a precursor to various flavorants, such as eugenol and vanillin.

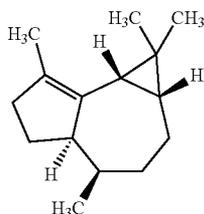
[0159] As used herein, the term Guaiene (α -Guaiene) refers to a bicyclic sesquiterpene that has the following structural formula:



[0160] α -Guaiene is often characterized as having a medium strength, sweet, earthy, woody, balsamic, peppery aroma. It is used as a flavor and fragrance agent in bakery items, cereals and cereal products, including flours & starches from roots & tubers, pulses & legumes, and edible ices,

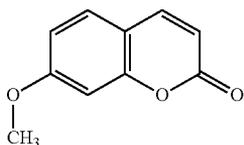
including sherbet and sorbet. α -Guaiene imparts earthy, spicy aromas and tastes. α -Guaiene also shows anti-inflammatory properties.

[0161] As used herein, the term Gurjunene (α -Gurjunene) refers to a tricyclic sesquiterpene that has the following structural formula:



α -Gurjunene is often characterized as having a slight, woody, balsamic odor. It can be used in cosmetics and fragrances. It has shown to be an antimicrobial as well as an antibacterial agent.

[0162] As used herein, the term herniarin refers to a methoxy derivative of coumarin that has the following structural formula:



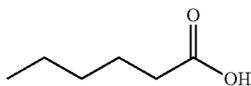
[0163] Herniarin is often found in *Herniaria glabra*, *Ayanpana triplinervis*, and in species of the genus *Prunus* (*P. mahaleb*, *P. pensylvanica*, and *P. maximowiczii*).

[0164] As used herein, the term hexanaldehyde refers to an aldehyde with the following structural formula:



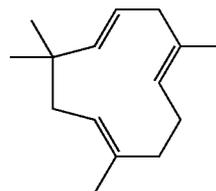
[0165] Hexanaldehyde is often characterized as having a very powerful, penetrating, fatty green, freshly cut grassy odor. It is also used in the flavor industry to produce fruity flavors that are green woody, vegetative, apple, grassy, citrus and orange with fresh lingering aftertastes.

[0166] As used herein, the term hexanoic acid refers to a carboxylic derivative of hexane that has the following structural formula:



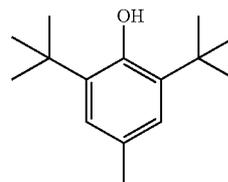
[0167] Hexanoic acid is often characterized as having a pungent, oily, acrid, sour, fatty, sweaty, rancid cheese odor. It is used as a flavoring agent as well as in cosmetics. It is a fatty acid found naturally in various animal fats and oils. It is one of the chemicals that give the decomposing fleshy seed coat of ginkgo its characteristic unpleasant odor.

[0168] As used herein, the term Humulene refers to either or both the α -Humulene and/or the β -Humulene isomers as pure forms or mixtures in any form. They are monocyclic sesquiterpene with an 11-membered ring. α -Humulene refers to the following structural formula:



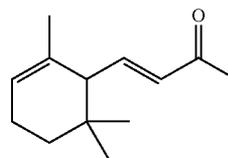
[0169] α -Humulene (obsolete name: α -Caryophyllene) is often characterized as having an aroma that has been described as bitter, medium woody, and hoppy. α -Humulene has shown anti-inflammatory properties. Humulene is one of the essential oils made in the flowering cone of the hops plant *Humulus lupulus*. The concentration of humulene varies among different varieties of the plant, but can be up to 40% of the essential oil of noble hops.

[0170] As used herein, the term Ionol refers to an antioxidant that is in a group of straining, sterically hindered phenols that has the following structural formula:

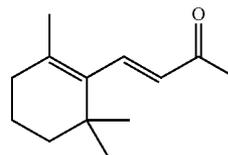


[0171] It is also known as Butylated Hydroxy Toluene (BHT). For the purpose of this disclosure "ionol" also refers to 3-oxo- α -ionol and/or β -ionol in a pure and/or mixture of any ratio. β -ionol is often characterized as having a sweet, woody, herbal, fruity, floral, violet, tropical and berry aroma. As a flavoring it is a floral, violet-like, fruity, woody, berry flavor with powdery nuances.

[0172] As used herein, the term Ionone refers to either or both α -ionone and/or β -ionone as pure forms or mixtures in any ratio as a group of compounds known as the rose ketones. α -ionone refers to the following structural formula:



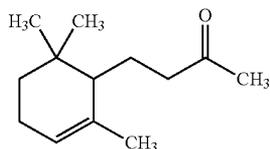
[0173] β -ionone refers to the following structural formula:



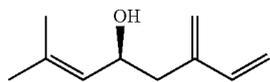
[0174] β -ionone is often characterized as having a flowery, violet, raspberry odor. It is a significant contributor to the aroma of roses, despite its relatively low concentration, and is an important fragrance chemical used in perfumes. β -ionone, derived from grape carotenoids, plays an important role in the

flavor of some red wines. The flavor imparted to wine by β -ionone is a component of fruity/floral character of some of the most sought-after red wines of Bordeaux, Burgundy and the Rhone Valley. β -Ionone demonstrates potent anticancer activity as well as antifungal properties.

[0175] As used herein, the term 7,8-dihydro- α -ionone refers to the following structural formula:

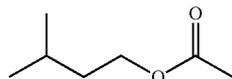


[0176] As used herein, the term ipsdienol refers to a terpene alcohol having the following structural formula:

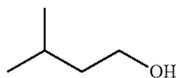


[0177] It is often characterized as having a balsamic, piney aroma. It is a major component of the floral fragrance of several species of orchids. Ipsdienol is also one of the major aggregation pheromones of the bark beetle in which it is believed to be a mating attractant.

[0178] As used herein, the term isoamyl acetate refers to an ester formed from isoamyl alcohol and acetic acid that has the following structural formula:

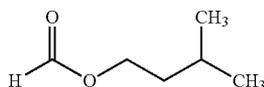


[0179] It is often characterized as having a strong odor similar to banana and pears. As used herein, the term isoamyl alcohol refers to 3-methyl-1-butanol that has the following structural formula:



[0180] It is often characterized as having a pungent, fermented type, fusel, alcohol-like, ethereal cognac aroma with fruity, banana and molasses notes. It is used as a flavor and fragrance agent. Its flavor is similar to fusel, fermented, fruity, banana, ethereal and cognac.

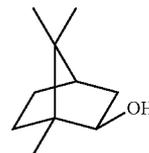
[0181] As used herein, the term isoamyl formate refers to 3-methylbutyl formate that has the following structural formula:



[0182] It is often characterized as having a medium strength, ethereal, vinous, dry, earthy, fruity, green, plum,

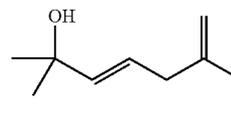
black currant aroma. As a flavoring it has a sharp, green, apple and fruity flavor with winery, fatty notes.

[0183] As used herein, the term isoborneol refers to an isomer of borneol with the alcohol group in a different position with the following structural formula:



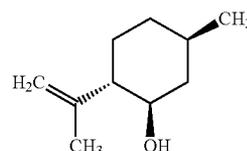
[0184] Isoborneol is often characterized as having a camphoraceous, sweet & musty, India ink-like aroma. It has shown antioxidant, anti-inflammatory and some limited antimicrobial properties. It is used as a flavor and fragrance agent for beverages, ice cream, candy, baked goods, and chewing gum.

[0185] As used herein, the term isomyrcenol refers to a monoterpenoid with the following structural formula:



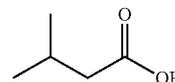
[0186] It is often characterized as having a fresh, floral, lime-like odor. Isomyrcenol is used in the chemical communication systems of the Spruce bark beetle, the Pinyon pine beetle and the Double-spined bark beetle.

[0187] As used herein, the term isopulegol refers to $C_{10}H_{18}O$ with the following structural formula:



[0188] It is often characterized as having a medium strength odor that is minty, cooling and bittersweet. It is used as a flavor and fragrance agent in candies and chewing gum. It is found in the *hesperozygis rhododon* shrub, as well as in *eucalyptus citriodora*. It is also commonly used in cosmetics.

[0189] As used herein, the term isovaleric acid refers to 3-methylbutanoic acid with the following structural formula:

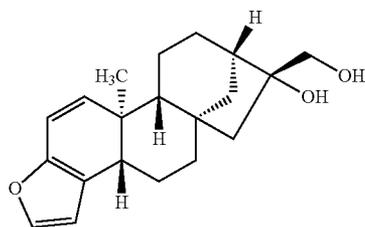


[0190] It is often characterized as having a strong, pungent, sour, stinky feet, and sweaty cheese smell. It is a major component of the cause of unpleasant foot odor. However, its volatile esters have pleasing scents and are used widely in perfumery. Used as a flavoring it is cheesy, dairy, sweet

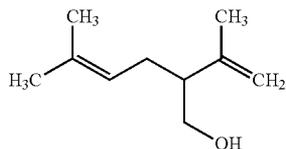
creamy, fermented, waxy and berry. It has shown effectiveness as an anticonvulsant and antidepressant.

[0191] As used herein, the term isoprene refers to 2-methyl-1,3-butadiene. Isoprene is considered to be the monomer that is connected together to provide the structural skeleton for most terpenes.

[0192] As used herein, the term kahweol refers to a diterpene that is structurally related to cafestol with the following structural formula:

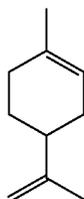


[0193] As used herein, the term lavandulol refers to a monoterpene alcohol as either of its R and S enantiomer as pure forms or mixture in any ratio with the following structural formula:



[0194] The (R) enantiomer is often characterized as having a weak floral, herbal odor with a slightly lemon-like, citrus fruity nuance. The (S) enantiomer is often characterized as having a weak odor.

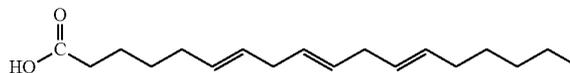
[0195] As used herein, the term limonene refers to a liquid hydrocarbon that is a cyclic monoterpene with the following structural formula:



[0196] Limonene is often found in high amounts in *cannabis* resin as well as tropical fruit rinds and many other fruits and flowers. The exact odor is determined by the structure of the terpene. Plants use limonene to repulse predators. For instance, flies have a group of receptors similar in function to the taste buds on our tongues. One of them detects noxious chemicals, and responds to Limonene as if it were toxic. This is hard wired into the fly's brain. Limonene is a potent antibacterial, antifungal and anticancer agent. Limonene has been used clinically to dissolve gallstones, improve mood and relieve heartburn and gastrointestinal reflux. Limonene has been shown to destroy breast-cancer cells in lab experiments,

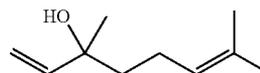
and its powerful antimicrobial action can kill pathogenic bacteria. Limonene sprays are also used to treat depression. Limonene is the second, third or fourth most prevalent terpene in almost all *cannabis* resins and it is a precursor to the synthesis of other cannabinoids. Limonene is highly absorbed by inhalation and quickly appears in the bloodstream. Since Limonene is known to affect the permeability of the cell membranes, it allows more THC to reach brain cells and increases the absorption of other terpenes. Limonene's design facilitates a direct response by quickly permeating the blood-brain barrier. The result is increased systolic blood pressure. One test, reported subjective alertness and restlessness.

[0197] As used herein, the term γ -linolenic acid refers to a fatty acid with the following structural formula:



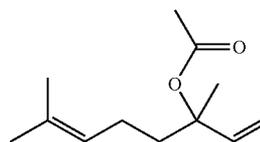
[0198] It is often characterized as having the slight, light aroma of vegetable oil. This is because it is an unsaturated fatty acid found primarily in vegetable oils. It is sold as a dietary and health supplement, although there is very limited evidence of any effectiveness, and only as a slight anti-inflammatory and blood-thinning agent.

[0199] As used herein, the term linalool refers to a terpene alcohol that has the following structural formula:



[0200] Linalool is being tested now for treatment of several types of cancer. It is also a component of several sedating essential oils including lavender oil, which is believed to possess antianxiety and sedative properties. In tests on humans who inhaled it, it caused severe sedation. In tests on lab rats it reduced their activity by almost 75%. In addition to being a compound that counters anxiety and mediates stress, linalool is a strong anticonvulsant, and it also amplifies serotonin-receptor transmission, conferring an antidepressant effect. Applied topically, linalool can heal acne and skin burns without scarring. Strains that are high in linalool may be particularly beneficial for patients who experience insomnia due to their sedating effects.

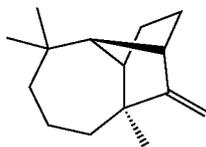
[0201] As used herein, the term linalyl acetate refers to an acetate ester of linalool that has the following structural formula:



[0202] Linalool is often characterized as having a floral scent reminiscent of spring flowers such as lily of the valley, but with spicy overtones. It is a terpenoid prominent in lav-

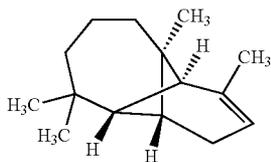
ender. It is refined from lavender, neroli, and other essential oils. Humans can detect its odor at rates as low as one part per million in the air.

[0203] As used herein, the term longifolene refers to a liquid hydrocarbon that is a tricyclic sesquiterpene with (+) and (-) enantiomers. The (+) enantiomer refers to the following structural formula:



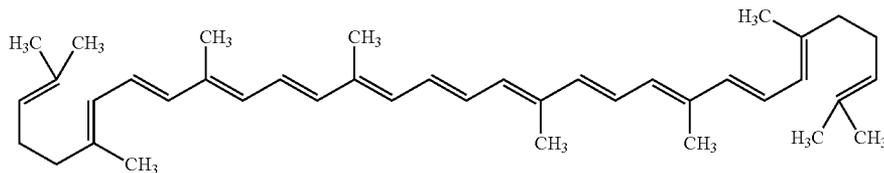
[0204] For the purposes of this disclosure, the term "linalool" refers to either of its (+) and/or (-) enantiomers in a pure form or mixture in any ratio. It is often characterized as having a medium strength, sweet, woody, rosy, medical, fir needle odor. Longifolene is also one of two most abundant aroma constituents of lapsang souchong tea, because the tea is smoked over pine fires. The Norway spruce produces longifolene as its main product.

[0205] As used herein, the term α -Longipinene refers to a bicyclic sesquiterpene with the following structural formula:



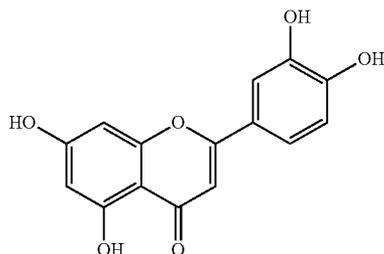
[0206] It is often characterized as having a pine aromatic odor. The Norway spruce produces high levels of α -Longipinene secondary to longifolene as its main product.

[0207] As used herein, the term lycopene refers to a symmetrical tetraterpene made from 8 isoprene units with the following structural formula:



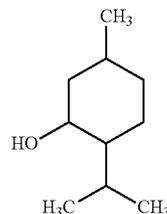
[0208] It also is considered a carotene. It is a pigment that gives a red color.

[0209] As used herein, the term luteolin refers to a flavonoid having the structural formula:



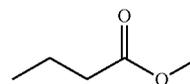
[0210] It is often found in leaves, rinds, barks, clover blossoms, and ragweed pollen.

[0211] As used herein, the term menthol refers to a cyclohexane with the following structural formula:



[0212] Menthol is often characterized as having a very strong, cooling, mentholic, minty, peppermint aroma and flavor. It is obtained from cornmint, peppermint or other mint oils. Menthol has local anesthetic and counter-irritant qualities, and it is widely used to relieve minor throat irritation. Menthol also acts as a weak kappa opioid receptor agonist. Menthol is responsible for the well-known cooling sensation it provokes when inhaled, eaten, or applied to the skin. In this sense, it is similar to capsaicin, the chemical responsible for the spiciness of hot chilies (which stimulates heat sensors, also without causing an actual change in temperature).

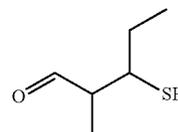
[0213] As used herein, the term methyl butyrate refers to a methyl ester of butyric acid that has the following structural formula:



[0214] It is often characterized as having an odor that is sulfurous with egg and cheese notes, and tomato, tropical-fruit top notes. Used in flavorings, its taste is a musty, sulfu-

rous, Limburger-type cheese top note, with a metallic cheese body. Some have described the odor as sulfuric, cheese-like, putrid, cabbage or garlic.

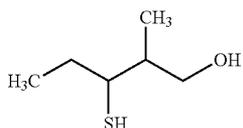
[0215] As used herein, the term 3-Mercapto-2-Methylpentanal refers to an aldehyde with a thiol and methyl group with the following structural formula:



[0216] It is often characterized as having a very heavy, sulfurous, savory, alliaceous, garlic odor with tropical fruit

and cultured dairy nuances. As a flavoring, it has a sulfurous, alliaceous, savory flavor with cooked onion and sautéed garlic notes and tropical fruit nuances of mango and passion fruit.

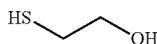
[0217] As used herein, the term 3-Mercapto-2-Methylpentanol refers to a pentanol with a thiol and methyl group with the following structural formula:



[0218] It is often characterized as having a very strong, sulfurous, onion type aroma. It is used in seasonings as a food additive, but not used as a fragrance. It is recommended to be smelled in a 0.10% solution or less due to its strength.

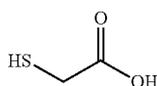
[0219] As used herein, the term mercaptan/thiols refers to an organosulfur compound that contains a carbon-bonded sulfhydryl. It is often characterized as the main odor constituent added to assist in the detection of natural gas (which in pure form is odorless), and the “smell of natural gas” is due to the smell of the mercaptan thiol used as the odorant.

[0220] As used herein, the term β -Mercaptoethanol refers to an ethanol with a thiol (mercaptan) group with the following structural formula:



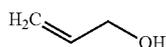
[0221] It is often characterized as having an extremely strong and persistent aroma that has all the basic rotten-egg sulfur-stink notes. It is an extremely intestinal and skunk-like odor.

[0222] As used herein, the term mercaptoacetic acid refers to a carboxylic acid with a thiol group with the following structural formula:



[0223] It is often characterized as having an ugly, sharp, acrid, skunk smell with plenty of endurance.

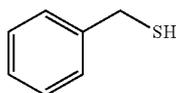
[0224] As used herein, the term allyl mercaptan refers to an allyl and thiol chemical compound with the following structural formula:



[0225] It is often characterized as having a high strength, sulfurous and alliaceous, sautéed onion and garlic aroma with roasted, grilled and charred meaty nuances.

[0226] It is used as a flavor additive and is described as alliaceous onion, garlic and leek with meaty bouillon savory nuances.

[0227] As used herein, the term benzyl mercaptan refers to a benzene and thiol chemical compound with the following structural formula:



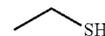
[0228] It is often characterized as having a high strength, sharp, alliaceous, sulfurous, onion, garlic, and horseradish aroma with mint and coffee notes. It is a flavoring and is described as a green, leek, horseradish, cabbage, tomato and coffee flavor.

[0229] As used herein, the term butyl mercaptan refers to a butyl and thiol chemical compound with the following structural formula:



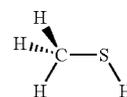
[0230] It is often characterized as having an extremely strong, fetid, extremely foul-smelling odor, commonly described as “skunk” odor. It is structurally similar to several major components of a skunk’s defensive spray but is not present in the spray itself. The scent of butyl mercaptan is so strong that the human nose can easily detect it in the air at concentrations as low as 10 parts per billion. Used as a flavor additive, it has a sulphureous, vegetative, savory meaty, garlic and onion taste.

[0231] As used herein, the term ethyl mercaptan refers to a thiol and ethyl chemical compound with the following structural formula:



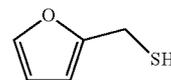
[0232] It is often characterized as having a high strength, sulfurous, skunky odor with a slight fruity note.

[0233] As used herein, the term methyl mercaptan refers to a thiol with a methyl group with the following structural formula:



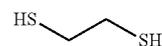
[0234] It is often characterized as having an extremely strong, sulfurous, decomposing cabbage, skunky aroma. It is used in flavorings and is described as sulfurous, alliaceous and creamy with a surface-ripened cheese topnote and a clean savory meaty depth.

[0235] As used herein, the term furfuryl mercaptan refers to C_5H_6OS with the following structural formula:



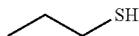
[0236] It is often characterized as having a very strong, oily, fatty, roasted coffee, sulfurous skunky odor with a burnt match note. Used in flavorings, it is described as a sulfurous, roasted coffee, burnt match-like, rubbery, and slightly nutty flavor with eggy and savory meaty nuances.

[0237] As used herein, the term ethylene mercaptan refers to $C_2H_6S_2$ with the following structural formula:



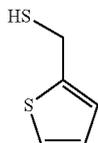
[0238] It is often characterized as having a very high strength, sulfurous, skunky odor with a slight meaty note. It is so strong, it is recommended smelling it in a 0.01% solution or less.

[0239] As used herein, the term propyl mercaptan refers to a thiol with a propyl group with the following structural formula:



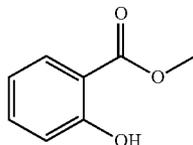
[0240] It is often characterized as having a high strength, alliaceous, natural gas, sweet onion, cabbage odor.

[0241] As used herein, the term Thienyl Mercaptan refers to a cyclic thiol with the following structural formula:



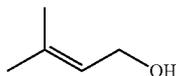
[0242] It is often characterized as having a high strength, roast coffee, fishy aroma. It is used as a flavoring agent where it has the flavor of coffee.

[0243] As used herein, the term Methyl Salicylate refers to an organic ester with the following structural formula:



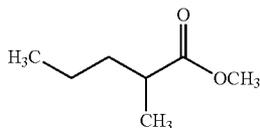
[0244] It is often characterized as having a strong, distinct wintergreen aroma. Its flavor is sweet, salicylate and root beer like with aromatic and balsamic nuances. It is used as a fragrance, in foods and beverages, and in liniments where it is commonly used as a topical medicine for muscle, joint or soft tissue pain and inflammation.

[0245] As used herein, the term methylbutenol refers to a hemiterpenoid with the following structural formula:



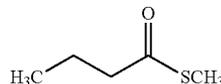
[0246] It is often characterized as having a very strong, suffocating, malty herb aroma. It is released in high concentrations from lodge pole pine trees.

[0247] As used herein, the term Methyl-2-Methylvalerate refers to a carboxylic acid with the following structural formula:

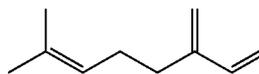


[0248] It is often characterized as having a medium strength, fruity, sweet, berry, pineapple, apple, banana, green melon and tropical aromas. Used as a flavor additive in food, its taste is described as fruity, green apple, grape, bubble gum and pineapple-like.

[0249] As used herein, the term methyl thiobutyrate refers to methyl butyrate that has a sulfur atom instead of an oxygen atom with the following structural formula:

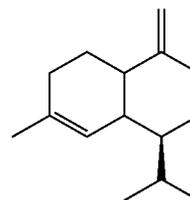


[0250] As used herein, the term Myrcene (β -Myrcene) refers to a monoterpene with the following structural formula:



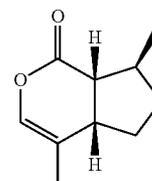
[0251] β -Myrcene is often characterized as having an odor that is variously described as an aroma of hops, clove like, earthy, green-vegetative, citrus, fruity with tropical, mango and minty nuances. The various odors are the result of slight differences in the overall makeup. These flavors and odors are commonly used to describe *Cannabis*.

[0252] As used herein, the term γ -Muurolene refers to a sesquiterpene with the following structural formula:



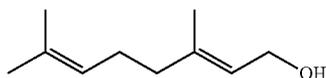
[0253] It is often characterized as having a medium strength, oily, woody type, and a herbal spice aroma. It is used in the chemical communication system of the Lucerne seed wasp and the European grapevine moth.

[0254] As used herein, the term Nepetalactone refers to a bicyclic monoterpene that has the following structural formula:



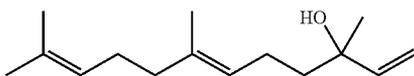
[0255] It is often characterized as having a valerian odor that is generally considered unpleasant by humans. It has a compound that resembles a component of a female cat urine odorant thought to mimic sex communication pheromones. It is one of the main attractants and stimulants in catnip, which,

when inhaled, insights wild play behavior in many cats (i.e., gets them 'stoned'). It has also been shown to be an active repellent for cockroaches, and recent tests on yellow fever mosquitoes showed that it was 10 times more of an effective repellent than DEET (N,N diethyl-m-toluamide), the most popular synthetic insect repellent. As used herein, the term nerol refers to a monoterpene with the following structural formula:

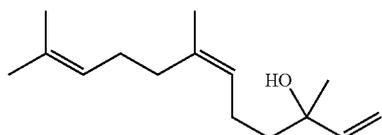


[0256] Nerol is often characterized as having a strong, fresh, wet seashore to sweet rose odor. It is a constituent of attar of roses, oil of orange blossoms and oil of lavender. It is used as a fragrance in cosmetics and as a flavor agent. Its flavor has been described as lemon, bitter, green and fruity with a terpy nuance.

[0257] As used herein, the term nerolidol refers to a sesquiterpene with $C_{15}H_{26}O$ with cis and trans isomers. The trans isomer has the following structural formula:



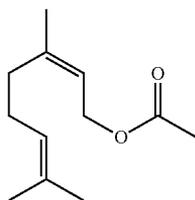
[0258] The cis isomer has the following structural formula:



[0259] Nerolidol is often characterized as having a mild, delicate odor that is floral, apple, rose, green and citrus-like with woody, waxy nuances. It can be found in ginger, niaouli and citronella. It is present as a low-level component in orange and other citrus peels. It is used as a flavor and fragrance agent. Its flavor has been described as green, floral and woody with fruity-citrus and melon nuances.

[0260] It has antifungal, antileishmaniasis and antimalarial properties. It is also known to produce a sedative effect.

[0261] As used herein, the term neryl acetate refers to an acetate ester of nerol with the structural formula:



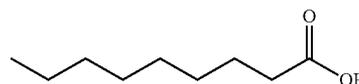
[0262] It is often characterized as having a floral and fruity aroma.

[0263] As used herein, the term Nonanaldehyde refers to an aldehyde with the following structural formula:



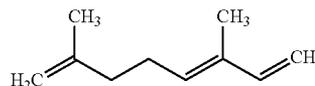
[0264] It is often characterized as having a high strength, soapy, axy, aldehydic, citrus odor with a fresh, slightly green, lemon peel like nuance, and a cucumber fattiness. It is a component of perfumes, although it also occurs in several natural oils. Used in flavorings, its taste is an effervescent, aldehydic, citrus, cucumber and melon rind with raw potato and oily nutty and coconut-like nuances. It has been identified as a compound that attracts mosquitoes.

[0265] As used herein, the term nonanoic acid refers to a carboxylic acid with the following structural formula:



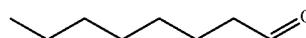
[0266] It is often characterized as having a high strength, unpleasant, rancid, waxy, dirty and cheesy aroma with a cultured dairy nuance. Used as a cosmetic, a fragrance and a flavor agent, its flavor is fatty, waxy and cheesy with a mild, sweet creamy background.

[0267] As used herein, the term ocimene refers to a group of isomeric hydrocarbons that are monoterpenes. α -Ocimene has the following structural formula:



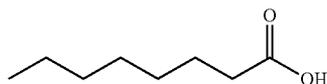
[0268] For this disclosure ocimene can mean any of the isomers in a single pure form and/or combination. α -Ocimene is often characterized as having a medium strength, fruity, floral aroma with a wet cloth note. It is contributor to green odor of unripe mango and of mango ginger (*Curcuma amada*). It is used in oriental pickles. β -Ocimene is often characterized as having a medium strength, tropical, green, terpy and woody odor with vegetable nuances. It is used as a flavoring agent where it has a green, tropical, woody flavor with floral and vegetable nuances. It is a flavor and fragrance additive as well as a common component in many essential oils. β -cis-Ocimene is often characterized as having a medium strength, warm, floral, herbal, sweet, citrus-like aroma. It is a component of the chemical communication system of the tea weevil and cotton bollworm. It has shown some antioxidative properties. β -trans-Ocimene is often characterized as having a mild, herbaceous, citrusy sweet, orange to lemon aroma. It is used in the chemical communication system of boxelders, a few beetles, and the *Phytoseiulus Persimilis* predatory mite.

[0269] As used herein, the term octanal refers to an aldehyde with the following structural formula:



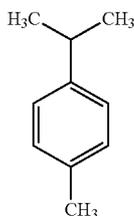
[0270] It is often characterized as having a very strong aldehydic waxy citrus green orange peel nuance. As a flavoring it is aldehyde and green with a peely, citrus, orange note.

[0271] As used herein, the term Octanoic Acid refers to a saturated fatty acid with the following structural formula:



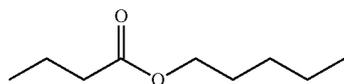
[0272] It is often characterized with a very strong, musty, rancid, penetrating, fatty, waxy, oily, cheesy, sweat-like odor that is repulsive to most people. It is used as a cosmetic surfactant and as a flavoring agent for processed cheeses.

[0273] As used herein, the term p-cymene refers to an aromatic compound related to a monoterpene with the following structural formula:



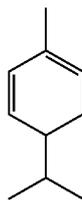
[0274] p-Cymene is often characterized as having a musty tang of terpenes with an orange to carrot odor, although synthetic p-Cymene can have a turpentine-like odor. It has shown Antibiotic, Anticandidal and AChE inhibiting properties. p-Cymene is a constituent of a number of essential oils, most commonly the oils of cumin and thyme.

[0275] As used herein, the term pentyl butyrate refers to an ester of a pentanol and butyric acid with the following structural formula:



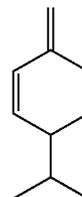
[0276] It is often characterized as having a smell reminiscent of pear or apricot.

[0277] As used herein, the term Phellandrene refers to a cyclic monoterpene with two isomers. α -Phellandrene has two double bonds within the ring with the structural formula:



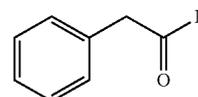
[0278] It is often characterized as having a medium strength, terpenic, citrus, herbal, slightly green, black pepper-like odor. It is a flavor additive where it is described as a

terpenic, citrus lime with a fresh green note. β -Phellandrene has one double bond in ring with the structural formula:



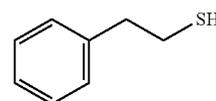
[0279] It is often characterized as having a medium strength, peppery-minty and slightly citrusy odor with a slight minty-turpentine note.

[0280] As used herein, the term Phenylacetaldehyde refers to an aldehyde with a phenyl group with the following structural formula:



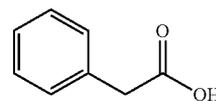
[0281] It is often characterized as having a very powerful and penetrating pungent honey-like sweet and green floral odor of passion fruit. It is found in buckwheat, chocolate and many other foods and flowers. As an additive its flavor is a honey, sweet, floral, chocolate and cocoa, with a spicy nuance. It has shown some antibiotic and anti-asthmatic activity.

[0282] As used herein, the term Phenylethanethiol refers to $C_8H_{10}S$ that has multiple isomers. 2-Phenylethanethiol has the following structural formula:



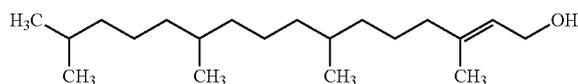
[0283] Within the context of this disclosure, phenylethanethiol refers to any of the isomers as a pure compound and/or in any mixture. It is often characterized as having the high strength odor of rubber.

[0284] As used herein, the term phenylacetic acid refers to a phenyl and carboxylic acid compound with the following structural formula:



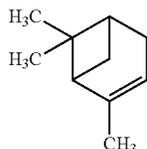
[0285] It is often characterized as having a sour yet sweet, waxy, civet, honey, rosey, floral odor similar to honeysuckle with notes of chocolate and tobacco. It is also used in cosmetics for perfuming. Used as a flavoring, it has been described as sweet, floral, chocolate and honey with tobacco notes.

[0286] As used herein, the term phytol refers to diterpene alcohol with the following structural formula:



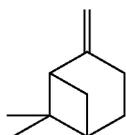
[0287] Phytol is often characterized having a mild, light floral, balsamic, green jasmine, green tea type of aroma. It's been shown to prevent Vitamin A teratogenesis.

[0288] As used herein, the term α -Pinene refers to a bicyclic monoterpene with the following structural formula:



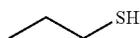
[0289] α -Pinene is often associated with the familiar odor associated with pine trees and their resins. It is a major component in turpentine and is found in many other plant essential oils in noticeable amounts including rosemary, sage, eucalyptus and many others. Pinene can be used medically as an expectorant, and topical antiseptic. It easily crosses the blood-brain barrier where it acts as an acetylcholinesterase inhibitor; that is, it inhibits activity of a chemical that destroys an information transfer molecule. This results in better memory. Pinene also promotes alertness and memory retention. Largely due to the presence of pinene, rosemary and sage are both considered "memory plants." Concoctions made from their leaves have been used for thousands of years in traditional medicine to retain and restore memory. It is also a bronchodilator. A pharmacokinetics study of inhaled α -pinene in humans demonstrated 60% uptake, and a relative bronchodilation effect. The smoke seems to expand in your lungs and the high comes on very quickly since a high percentage of the substance will pass into the bloodstream and brain. It also increases focus, self-satisfaction and energy, which generally counteracts with the presence of Terpeneol. α -Pinene has inhibited acetylcholinesterase, suggesting utility in the clinical treatment of Alzheimer's disease.

[0290] As used herein, the term β -Pinene refers to a monoterpene with the following structural formula:



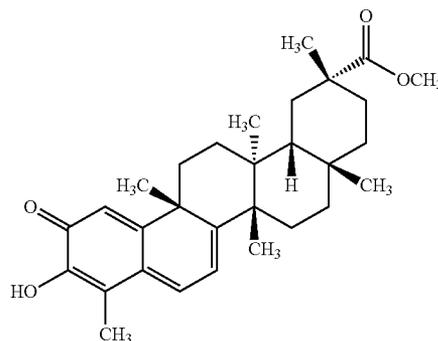
[0291] It is often characterized as having a woody-green pine-like smell. β -Pinene is one of the most abundant compounds released by forest trees. It is one of the two isomers of pinene (The other being α -Pinene) and it shares similar properties.

[0292] As used herein, the term propanethiol refers to a thiol with a propane group with the following structural formula:

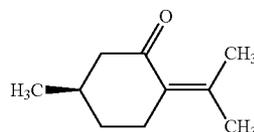


[0293] It is often characterized as having a high strength, alliaceous odor of cabbage, sweet onion and natural gas. It belongs to the group of thiols. It is colorless with a strong, offensive odor.

[0294] As used herein the term pristimerin refers to a five-cyclic triterpene with the following structural formula:

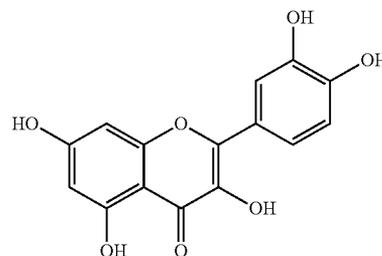


[0295] As used herein, the term pulegone refers to a cyclic monoterpene with the following structural formula:



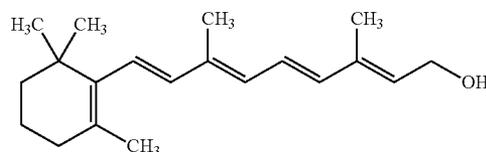
[0296] Pulegone is often characterized as having a minty-camphor odor and flavor that is used in the candy industry. It is implicated in liver damage in very high dosages. Pulegone is an acetylcholinesterase inhibitor. Thus, it stops the action of the protein that destroys acetylcholine, which is used by the brain to store memories. It may counteract THC's activity, which leads to low acetylcholine levels. The result is that you would forget more on THC alone than you would on THC accompanied by Pulegone.

[0297] As used herein, the term quercetin refers to a flavonoid with the following structural formula:



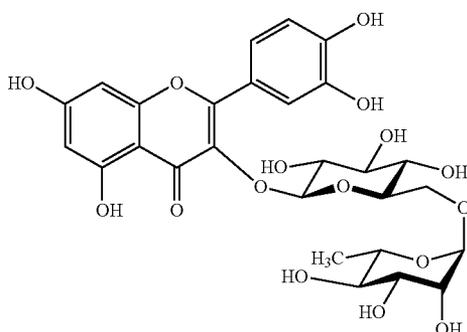
[0298] It is often characterized as a polar auxin transport inhibitor.

[0299] As used herein, the term retinol refers to a cyclic diterpenoid alcohol with the following structural formula:



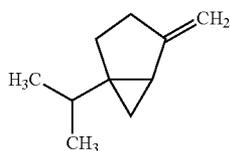
[0300] It is a type of vitamin A that can be converted to other types of vitamin A.

[0301] As used herein, the term rutin refers to glycoside that has the following structural formula:



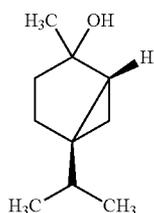
[0302] It is often characterized as citrus flavonoid found in many plants.

[0303] As used herein, the term sabinene refers to a bicyclic monoterpene that has the following structural formula enantiomers:



[0304] Sabinene is often characterized as having a medium strength, warm, oily-peppery, woody, herbaceous and spicy pine odor with citrus notes. As a flavoring it is oily, citrus and tropical fruity. It is found in oak trees, tea tree oil, black pepper and is a major constituent of carrot seed oil.

[0305] As used herein, the term sabinene hydrate refers to a cyclic monoterpene alcohol with the following structural formula:



[0306] It is often characterized as having a medium strength, herbal, cooling, minty, eucalyptol, green and terpy odor with a spicy nuance. It is used as a flavor additive and has a cool, minty, camphoreous, woody green, and oily flavor. It is also used in fragrances and cosmetics.

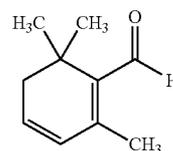
[0307] As used herein, the term cis-Sabinene Hydrate refers to the sabinene hydrate structure in which alcohol group is oriented behind the methyl group.

[0308] It is often characterized as having a medium strength balsamic odor.

[0309] As used herein, the term trans-Sabinene Hydrate refers to the sabinene hydrate structure in which the alcohol group is oriented in front of the methyl group.

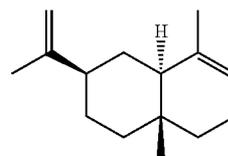
[0310] It is often characterized as having a medium strength, more woody, balsamic odor.

[0311] As used herein, the term Safranal refers to a monoterpene with an aldehyde that has the following structural formula:



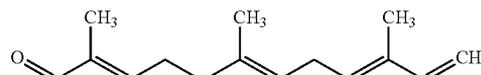
[0312] It is often characterized as being the component primarily responsible for the aroma of saffron. Its flavor is a woody, medicinal, phenolic, spicy and camphoreous with a fruity herbal nuance. Safranal is an effective anticonvulsant, an agonist and it exhibits high antioxidant and free radical scavenging activity as well as cytotoxicity towards cancer cells. It has also been shown to have antidepressant properties.

[0313] As used herein, the term α -Selinene refers to a bicyclic sesquiterpene that has the following structural formula:



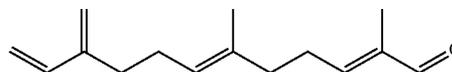
[0314] It is often characterized as having a distinct odor of amber. It is one of the principal components of the oil from celery seeds. It has shown analgesic antioxidant and antifungal activity with antimicrobial potential.

[0315] As used herein, the term α -Sinensal refers to a sesquiterpenoid that has the following structural formula:



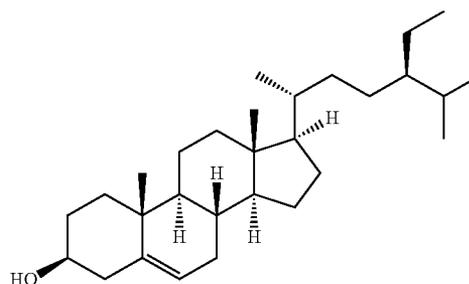
[0316] It is often characterized as having a medium strength, citrus orange, mandarin aroma. Its flavor is an orange, waxy and juicy citrus with a bitter peel nuance.

[0317] As used herein, the term β -Sinensal refers to a sesquiterpenoid that has the following structural formula:



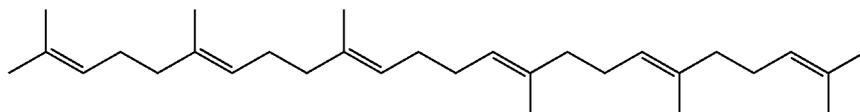
[0318] It is often characterized as having a medium strength, sweet, fresh, waxy, citrus, orange juicy odor. It is mainly used in fragrances.

[0319] As used herein, the term β -Sitosterol refers to plant sterols with a similar structure to cholesterol that has the following structural formula:



[0320] It is often characterized as having a characteristic waxy aroma. It is found in pecans, avocados, pumpkin seeds, cashews, corn oils, and soybeans. It has shown anti-inflammatory properties.

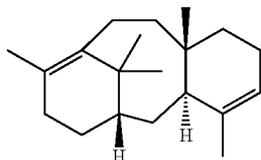
[0321] As used herein, the term squalene refers to a hydrocarbon triterpene that has the following structural formula:



plant essential oils. It is also used in soaps for fragrance. It reduces the capability for movement by 45% in lab rat tests. It was also shown to be deeply sedating upon inhalation. This may partially account for the couch lock effects of some cannabis although it is not usually associated with body highs.

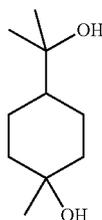
[0322] It plays an important part in the synthesis of plant and animal sterols.

[0323] As used herein, the term taxadiene refers to a tricyclic diterpene that has the following structural formula:

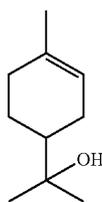


[0324] It is an intermediate in the synthesis of taxol.

[0325] As used herein, the term terpin hydrate refers to a drug commonly used to loosen mucus in patients with respiratory issues. It has the following structural formula:

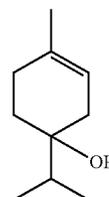


[0326] As used herein the term terpineol refers to a cyclic monoterpene alcohol with the following structural formula:



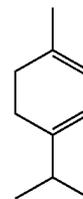
[0327] The α isomer has an isopropyl alcohol group. α -Terpineol is often characterized as having a lilac, citrus or apple blossom to lime odor. It is used extensively in the perfume industry. Terpineol however, is often found in cannabis with high pinene levels. Therefore, the pungent aromas of pinene very often mask its odor. It is a minor constituent of many

[0328] As used herein, the term terpinen-4-ol refers to the isomer of terpineol that has the following structural formula:



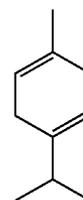
[0329] Terpinen-4-ol is often characterized as having a pleasantly herbaceous, peppery, woody odor and is used in commercial fragrances. Terpinen-4-ol is used in fragrances for spice types. It is considered the primary active ingredient of tea tree oil. It is the compound of highest concentration in the essential oil of nutmeg. It also occurs in oil of cypress, juniper berry, Ceylon cardamom, marjoram, thyme, and a few others. It has been shown to act as an AChE inhibitor and as an antibiotic.

[0330] As used herein, the term α -Terpinene refers to a cyclic monoterpene that has the following structural formula:



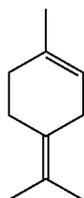
[0331] It is often characterized as having a refreshing, lemony-citrus aroma. It has been isolated from cardamom and marjoram oils.

[0332] As used herein, the term γ -Terpinene refers to a cyclic monoterpene that has the following structural formula:



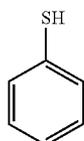
[0333] It is often characterized as having a herbaceous, citrusy sweet aroma. It is commercially extracted from tea tree oil. γ -Terpinene shows antimicrobial properties against various human pathogens. It has also been studied for its antioxidant, anti-inflammatory and antiproliferative activities.

[0334] As used herein, the term terpinolene/ δ -Terpinene refers to a cyclic monoterpene with an isoprene group that has the following structural formula:



[0335] Terpinolene is often characterized as having a medium strength, herbal aroma that has been described as fresh, woody, sweet and piney with a hint of citrus. Its flavor is a sweet, woody, terpy, lemon and lime-like with a slight herbal and floral nuance. It is used as a flavor and fragrance agent. Its use in fragrances in the USA alone exceeds 50,000 lb/yr. Terpinolene is used in soap, detergent, creams, lotions, and perfume.

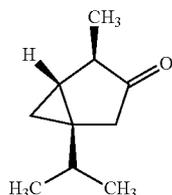
[0336] As used herein, the term thiophenol refers to a benzene ring with a sulfur atom that has the following structural formula:



[0337] It is often characterized as having an extremely potent, extremely persistent, foul-smelling, pure essence of burning rubber. It has a high strength, meaty, repulsive, penetrating, garlic, sulfurous odor with a rubbery, allicious backnote.

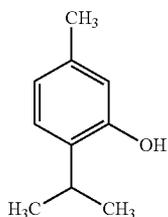
[0338] Used in flavorings it is described as a meaty, phenolic taste with a burnt rubber sulphurous nuance.

[0339] As used herein, the term thujone refers to a bicyclic monoterpene with a ketone that has two diastereomeric forms that each has two possible enantiomers. (-)- α -thujone has the following structural formula:



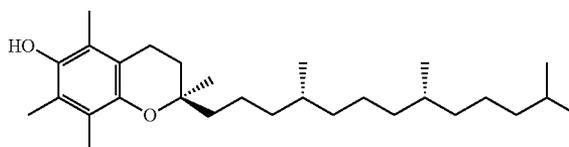
[0340] For the purposes of this closure "thujone" refers to any of the isomeric forms in a pure form or mixture of any ratio. It is often characterized as having a menthol like odor.

[0341] As used herein, the term thymol refers to a monoterpene phenol with the following structural formula:



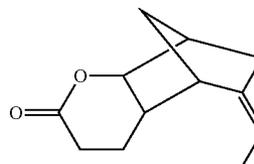
[0342] Thymol is often characterized as having a distinctive, strong flavor of the herb thyme. It is often found in oil of thyme, and extracted from *Thymus vulgaris* (common thyme) and various other kinds of plants as a white crystalline substance of a pleasant, aromatic odor and strong antiseptic properties. Thymol is a natural monoterpene phenol derivative of Cymene.

[0343] As used herein, the term α -Tocopherol refers to a form of vitamin E that has the following structural formula:



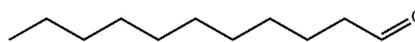
[0344] It is often characterized as having a very bland, slight, vegetable oil-like odor. α -Tocopherol is one of the most active component of the vitamin E complex, and this organic substance is the most powerful antioxidant in the lipid phase of the human body. α -Tocopherol can be to effectively deactivate free radicals and stop chain reactions before they can run away.

[0345] As used herein, the term Tonka undecanone refers to bicyclic structure with a carbonyl and ester that has the following structural formula:



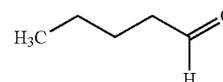
[0346] It is often characterized as having a medium strength, sweet, spicy, balsamic, Tonka woody tobacco green aroma.

[0347] As used herein, the term undecanal refers to an aldehyde that has the following structural formula:



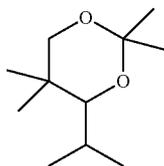
[0348] It is often characterized as having an intensely soapy, aldehydic, waxy and slightly effervescent orangey citrus-like odor with a watermelon, pineapple and cilantro background. As an additive, its flavor is Waxy, aldehydic and soapy with a citrus note and slight laundry detergent nuance. Undecanal is a common component of perfumes.

[0349] As used herein, the term Valeraldehyde/Pentanal refers to an alkyl aldehyde with the following structural formula:



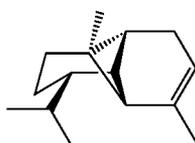
[0350] It is often characterized as having a fermented type, diffusive, bready, fruity odor with berry nuances. Used as a flavoring agent, it has a wine-like, fermented, bready, cocoa flavor with chocolate notes.

[0351] As used herein, the term verdoxan refers to a cyclic ether with the following structural formula:



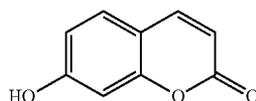
[0352] It is often characterized as having a medium strength odor of earthy, fruity, green, herbal, sawn old wood. It is used in fragrances and cosmetics.

[0353] As used herein, the term α -Ylangene refers to a cyclic sesquiterpene with the following structural formula:



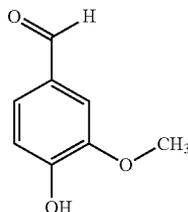
[0354] It is often characterized as having a spicy, fruity aroma. It is a natural substance often found in wine and is emitted by some plants. It has shown both antibacterial and antioxidant properties.

[0355] As used herein, the term Umbelliferone refers to a phenylpropanoid that has the following structural formula:



[0356] It has been reported to have antioxidant properties and can strongly absorb ultraviolet light at several wavelengths.

[0357] As used herein, the term vanillin refers to a phenolic aldehyde with the following structural formula:



[0358] It is often characterized as having a pleasant, sweet aroma, and characteristic vanilla-like flavor.

[0359] As used herein, the term "flavonoid" means a class of secondary plant metabolites that have a general 15-carbon skeleton structure which consists of two phenyl rings and a

heterocyclic ring. Examples of flavonoids within the context of this disclosure include broadly phenolic acids, stilbenoids, dihydroflavonols, anthocyanins, anthocyanidins, polyphenols, tannins, flavones, flavan-3-ols, Flavan-4-ol, Flavan-3,4-diol flavonols, phytochemicals, antioxidants, homoisoflavonoids, and any ketone containing compound including: flavonoids or bioflavonoids, isoflavonoids, neoflavonoids or their derivatives.

[0360] As used herein, the term "cellulose" means an organic compound with the formula $(C_6H_{10}O_5)_n$. Within the context of this disclosure, the phrase "substantially free from cellulose" is intended to distinguish purified components of naturally occurring plants (for example the cannabis plant) from the isolated chemical compounds that are free from plant material, such as cellulose.

[0361] As used herein, the term "mineral" means a naturally occurring substance that is solid, inorganic, and has an ordered atomic structure. Examples of minerals within the context of this disclosure include lithium.

[0362] Disclosed herein are compositions comprising a purified cannabinoid and a purified mineral. In one embodiment, the purified mineral is lithium. In one embodiment, the composition consists essentially of a first purified cannabinoid and a purified mineral.

[0363] Disclosed herein are compositions comprising a purified cannabinoid and a purified terpene.

[0364] In one embodiment, the composition disclosed herein comprises a terpene chosen from 7,8-dihydroionone, Acetanilole, Acetic Acid, Acetyl Cedrene, Anethole, Anisole, Benzaldehyde, Bergamotene (α -cis-Bergamotene), α -trans-Bergamotene), Bisabolol (β -Bisabolol), Borneol, Butanoic/Butyric Acid, Cadinene (α -Cadinene) (γ -Cadinene), Cafestol, Caffeic acid, Camphene, Camphor, Capsaicin, Carene (Δ -3-Carene), Carotene, Carvacrol, Carvone, Dextro-Carvone, Laevo-Carvone, Caryophyllene (β -Caryophyllene), Caryophyllene oxide, Castoreum Absolute, Cedrene (α -Cedrene) (β -Cedrene), Cedrene Epoxide (α -Cedrene Epoxide), Cedrol, Cembrene, Chlorogenic Acid, Cinnamaldehyde (α -amyl-Cinnamaldehyde) (α -hexyl-Cinnamaldehyde), Cinnamic Add, Cinnamyl Alcohol, Citronellal, Citronellol, Cryptone, Curcumene (α -Curcumene) (γ -Curcumene), Decanal, Dehydrovomifoliol, Diallyl Disulfide, Dihydroacetylacetonide, Dimethyl Disulfide, Eicosane/Icosane, Elemene (β -Elemene), Estragole, Ethyl acetate, Ethyl Cinnamate, Ethyl maltol, Eucalyptol/1,8-Cineole, Eudesmol (α -Eudesmol) (β -Eudesmol) (γ -Eudesmol), Eugenol, Euphol, Farnesene, Farnesol, Fenchol (β -Fenchol), Fenchone, Geraniol, Geranyl acetate, Germacrenes, Germacrene B, Guaia-1(10), 11-diene, Guaiacol, Guaiene (α -Guaiene), Gurjunene (α -Gurjunene), Herniarin, Hexanaldehyde, Hexanoic Acid, Humulene (α -Humulene) (β -Humulene), Ionol (3-oxo- α -Ionol) (β -Ionol), Ionone (α -Ionone) (β -Ionone), Ipsdienol, Isoamyl acetate, Isoamyl Alcohol, Isoamyl Formate, Isoborneol, Isomyrcenol, Isopulegol, Isovaleric Acid, Isoprene, Kahweol, Lavandulol, Limonene, γ -Linolenic Add, Linalool, Longifolene, α -Longipinene, Lycopene, Menthol, Methyl butyrate, 3-Mercapto-2-Methylpentanal, Mercaptan/Thiols, β -Mercaptoethanol, Mercaptoacetic Add, Allyl Mercaptan, Benzyl Mercaptan, Butyl Mercaptan, Ethyl Mercaptan, Methyl Mercaptan, Furfuryl Mercaptan, Ethylene Mercaptan, Propyl Mercaptan, Thenyl Mercaptan, Methyl Salicylate, Methylbutenol, Methyl-2-Methylvalerate, Methyl Thiobutyrate, Myrcene (β -Myrcene), γ -Muurolene, Nepetalactone, Nerol, Nerolidol, Neryl acetate, Nonanaldehyde,

Nonanoic Add, Ocimene, Octanal, Octanoic Add, P-cymene, Pentyl butyrate, Phellandrene, Phenylacetaldehyde, Phenylethanethiol, Phenylacetic Add, Phytol, Pinene, β -Pinene, Propanethiol, Pristimerin, Pulegone, Retinol, Sabinene, Sabinene Hydrate, cis-Sabinene Hydrate; trans-Sabinene Hydrate, Safranal, α -Selinene, Sinensal, β -Sinensal, β -Sito-sterol, Squalene, Taxadiene, Terpin hydrate, Terpineol, Terpene-4-ol, α -Terpinene, γ -Terpinene, Terpinolene, Thiophenol, Thujone, Thymol, α -Tocopherol; Tonka Undecanone, Undecanal, Valeraldehyde/Pentanal, Verdoxan, α -Ylangene, Umbelliferone, or Vanillin. In one embodiment the composition disclosed herein comprises a terpene chosen from α -terpineol, Bergamotene (α -cis-Bergamotene) (α -trans-Bergamotene), Bisabolol (β -Bisabolol), Borneol, Camphor, Capsaicin, Carvacrol, Caryophyllene (β -Caryophyllene), Caryophyllene oxide, Cineole, Cinnamaldehyde (α -amyl-Cinnamaldehyde) (α -hexyl-Cinnamaldehyde), Cinnamyl Alcohol, Citronellal, Citronellol, Ethyl, Cinnamate, Eucalyptol/1,8-Cineole, Farnesol, Fenchol (β -Fenchol), Geranyl acetate, Germacrene B, Guaiene (α -Guaiene), Humulene (α -Humulene) (β -Humulene), Ionol (3-oxo- α -ionol) (β -Ionol), Ionone (α -Ionone) (β -Ionone), Isoamyl acetate, Isoprene, Kahweol, Laevo-Carvone, Lavandulol, Limonene, Linalool, Linalyl acetate, Luteolin, Lycopene, Menthol, Myrcene (β -Myrcene), Nerol, Nerolidol, Neryl acetate, P-cymene, Phytol, Pinene, Pristimerin, Pulegonecarotene, Retinol, Terpin hydrate, Terpineol, Terpinol-4-ol, Terpinolene, Thujone, Thymol, or Vanillin.

[0365] In one embodiment, the composition herein disclosed comprises of Cannabigerolic Acid (CBGA), Cannabigerolic Acid monomethylether (CBGAM), Cannabigerol (CBG), Cannabigerol monomethylether (CBGM), Cannabigerovarinic Acid (CBGVA), Cannabigerovarin (CBGV), Cannabichromenic Acid (CBCA), Cannabichromene (CBC), Cannabichromevarinic Acid (CBCVA), Cannabichromevarin (CBCV), Cannabidiolic Acid (CBDA), Cannabidiol (CBD), Cannabidiol monomethylether (CBDM), Cannabidiol-C₄ (CBD-C₄), Cannabidivarinic Acid (CBDVA), Cannabidivarin (CBDV), Cannabidiorcol (CBD-C₁), Tetrahydrocannabinolic acid A (THCA-A), Tetrahydrocannabinolic acid B (THCA-B), Tetrahydrocannabinol (THC), Tetrahydrocannabinolic acid C₄ (THCA-C₄), Tetrahydrocannabinol C₄ (THC-C₄), Tetrahydrocannabivarinic acid (THCVA), Tetrahydrocannabivarin (THCV), Tetrahydrocannabiorcolic acid (THCA-C₁), Tetrahydrocannabiorcol (THC-C₁), Δ^7 -cis-iso-tetrahydrocannabivarin, Δ^8 -tetrahydrocannabinolic acid (Δ^8 -THCA), Δ^8 -tetrahydrocannabinol (Δ^8 -THC), Cannabicyclic acid (CBLA), Cannabicyclol (CBL), Cannabicyclovarin (CBLV), Cannabielsoic acid A (CBEA-A), Cannabielsoic acid B (CBEA-B), Cannabielsoin (CBE), Cannabinolic acid (CBNA), Cannabinol (CBN), Cannabinol methylether (CBNM), Cannabinol-C₄ (CBN-C₄), Cannabivarin (CBV), Cannabino-C₂ (CBN-C₂), Cannabiorcol (CBN-C₁), Cannabinodiol (CBND), Cannabinodivarin (CBDV), Cannabitriol (CBT), 10-Ethoxy-9-hydroxy- Δ^{6a} -tetrahydrocannabinol, 8,9-Dihydroxy- $\Delta^{6a(10a)}$ -tetrahydrocannabinol (8,9-Di-OH-CBT-C₅), Cannabitriolvarin (CBTV), Ethoxy-cannabitriolvarin (CBTVE), Dehydrocannabifuran (DCBF), Cannabifuran (CBF), Cannabichromanon (CBCN), Cannabicitran (CBT), 10-Oxo- $\Delta^{6a(10a)}$ -tetrahydrocannabinol (OTHC), Δ^9 -cis-tetrahydrocannabinol (cis-THC), Cannabiripsol (CBR), 3,4,5,6-tetrahydro-7-hydroxy-alpha-alpha-2-trimethyl-9-n-propyl-2,6-methano-2H-1-benzoxocin-5-methanol (OH-iso-HHCV), Trihydroxy-delta-9-tetrahydrocannabinol (triOH-THC), Yangonin, Epigallocatechin gallate, Dodeca-2E,4E,8Z,10Z-tetraenoic acid isobutylamide or Dodeca-2E,4E-dienoic acid isobutylamide

9-tetrahydrocannabinol (triOH-THC), Yangonin, Epigallocatechin gallate, Dodeca-2E,4E,8Z,10Z-tetraenoic acid isobutylamide or Dodeca-2E,4E-dienoic acid isobutylamide.

[0366] In one embodiment, the composition herein disclosed comprises a first purified cannabinoid chosen from Tetrahydrocannabinol (THC), Tetrahydrocannabivarin (THCV), Cannabichromene (CBC), Cannabichromanon (CBCN), Cannabidiol (CBD), Cannabielsoin (CBE), Cannabidivarin (CBDV), Cannabifuran (CBF), Cannabicyclol (CBL), Cannabinol (CBN), Cannabiniol (CBND), Cannabitriol (CBT), Cannabivarin (CBV), and Isocannabinoids.

[0367] In one embodiment the first purified cannabinoid is chosen from Cannabigerolic Acid (CBGA), Cannabigerolic Acid monomethylether (CBGAM), Cannabigerol (CBG), Cannabigerol monomethylether (CBGM), Cannabigerovarinic Acid (CBGVA), Cannabigerovarin (CBGV), Cannabichromenic Acid (CBCA), Cannabichromene (CBC), Cannabichromevarinic Acid (CBCVA), Cannabichromevarin (CBCV), Cannabidiolic Acid (CBDA), Cannabidiol (CBD), Cannabidiol monomethylether (CBDM), Cannabidiol-C₄ (CBD-C₄), Cannabidivarinic Acid (CBDVA), Cannabidivarin (CBDV), Cannabidiorcol (CBD-C₁), Tetrahydrocannabinolic acid A (THCA-A), Tetrahydrocannabinolic acid B (THCA-B), Tetrahydrocannabinol (THC), Tetrahydrocannabinolic acid C₄ (THCA-C₄), Tetrahydrocannabinol C₄ (THC-C₄), Tetrahydrocannabivarinic acid (THCVA), Tetrahydrocannabivarin (THCV), Tetrahydrocannabiorcolic acid (THCA-C₁), Tetrahydrocannabiorcol (THC-C₁), Δ^7 -cis-iso-tetrahydrocannabivarin, Δ^8 -tetrahydrocannabinolic acid (Δ^8 -THCA), Δ^8 -tetrahydrocannabinol (Δ^8 -THC), Cannabicyclic acid (CBLA), Cannabicyclol (CBL), Cannabicyclovarin (CBLV), Cannabielsoic acid A (CBEA-A), Cannabielsoic acid B (CBEA-B), Cannabielsoin (CBE), Cannabinolic acid (CBNA), Cannabinol (CBN), Cannabinol methylether (CBNM), Cannabinol-C₄ (CBN-C₄), Cannabivarin (CBV), Cannabino-C₂ (CBN-C₂), Cannabiorcol (CBN-C₁), Cannabinodiol (CBND), Cannabinodivarin (CBDV), Cannabitriol (CBT), 10-Ethoxy-9-hydroxy- Δ^{6a} -tetrahydrocannabinol, 8,9-Dihydroxy- $\Delta^{6a(10a)}$ -tetrahydrocannabinol (8,9-Di-OH-CBT-C₅), Cannabitriolvarin (CBTV), Ethoxy-cannabitriolvarin (CBTVE), Dehydrocannabifuran (DCBF), Cannabifuran (CBF), Cannabichromanon (CBCN), Cannabicitran (CBT), 10-Oxo- $\Delta^{6a(10a)}$ -tetrahydrocannabinol (OTHC), Δ^9 -cis-tetrahydrocannabinol (cis-THC), Cannabiripsol (CBR), 3,4,5,6-tetrahydro-7-hydroxy-alpha-alpha-2-trimethyl-9-n-propyl-2,6-methano-2H-1-benzoxocin-5-methanol (OH-iso-HHCV), Trihydroxy-delta-9-tetrahydrocannabinol (triOH-THC), Yangonin, Epigallocatechin gallate, Dodeca-2E,4E,8Z,10Z-tetraenoic acid isobutylamide or Dodeca-2E,4E-dienoic acid isobutylamide

[0368] and a second purified cannabinoid chosen from Cannabigerolic Acid (CBGA), Cannabigerolic Acid monomethylether (CBGAM), Cannabigerol (CBG), Cannabigerol monomethylether (CBGM), Cannabigerovarinic Acid (CBGVA), Cannabigerovarin (CBGV), Cannabichromenic Acid (CBCA), Cannabichromene (CBC), Cannabichromevarinic Acid (CBCVA), Cannabichromevarin (CBCV), Cannabidiolic Acid (CBDA), Cannabidiol (CBD), Cannabidiol monomethylether (CBDM), Cannabidiol-C₄ (CBD-C₄), Cannabidivarinic Acid (CBDVA), Cannabidivarin (CBDV), Cannabidiorcol (CBD-C₁), Tetrahydrocannabinolic acid A (THCA-A), Tetrahydrocannabinolic acid B (THCA-B), Tetrahydrocannabinol (THC), Tetrahydrocannabinolic acid C₄

(THCA-C₄), Tetrahydrocannabinol C₄ (THC-C₄), Tetrahydrocannabivarinic acid (THCVA), Tetrahydrocannabivarin (THCV), Tetrahydrocannabiorcolic acid (THCA-C₁), Tetrahydrocannabiorcol (THC-C₁), Δ⁷-cis-iso-tetrahydrocannabivarin, Δ⁸-tetrahydrocannabinolic acid (Δ⁸-MCA), Δ⁸-tetrahydrocannabinol (Δ⁸-THC), Cannabicyclic acid (CBLA), Cannabicyclol (CBL), Cannabicyclovarin (CBLV), Cannabielsoic acid A (CBEA-A), Cannabielsoic acid B (CBEA-B), Cannabielsoin (CBE), Cannabinolic acid (CBNA), Cannabinol (CBN), Cannabinol methylether (CBNM), Cannabinol-C₄ (CBN-C₄), Cannabivarin (CBV), Cannabino-C₂ (CBN-C₂), Cannabiorcol (CBN-C₁), Cannabidiol (CBND), Cannabinodivarin (CBDV), Cannabitril (CBT), 10-Ethoxy-9-hydroxy-Δ^{6a}-tetrahydrocannabinol, 8,9-Dihydroxy-Δ^{6a(10a)}-tetrahydrocannabinol (8,9-Di-OH-CBT-C₅), Cannabitrilvarin (CBTV), Ethoxy-cannabitrilvarin (CBTVE), Dehydrocannabifuran (DCBF), Cannabifuran (CBF), Cannabichromanon (CBCN), Cannabicitran (CBT), 10-Oxo-Δ^{6(10a)}-tetrahydrocannabinol (OTHC), Δ⁹-cis-tetrahydrocannabinol (cis-THC), Cannabiripsol (CBR), 3,4,5,6-tetrahydro-7-hydroxy-alpha-alpha-2-trimethyl-9-n-propyl-2,6-methano-2H-1-benzoxocin-5-methanol (OH-iso-HHCV), Trihydroxy-delta-9-tetrahydrocannabinol (triOH-THC), Yangonin, Epigallocatechin gallate, Dodeca-2E,4E,8Z,10Z-tetraenoic acid isobutylamide or Dodeca-2E,4E-dienoic acid isobutylamide.

[0369] Disclosed herein, is a composition comprising a purified cannabinoid and a purified flavonoid.

[0370] In one embodiment, the composition herein disclosed comprises a flavonoid chosen from phenolic acids, stilbenoids, dihydroflavonols, anthocyanins, anthocyanidins, polyphenols, tannins, flavones, flavan-3-ols, Flavan-4-ol, Flavan-3,4-diol flavonols, phytochemicals, antioxidants, homoisoflavonoids, phenylpropanoids, Phloroglucinols coumarins, Naphthodianthrones, Steroid glycosides, bioflavonoids, isoflavonoids, and neoflavonoids. In one embodiment, the composition herein disclosed comprises a flavonoid chosen from Adenosine, Adhyperforin, amentoflavone, Anandamide, Apigenin, Cannafavin B, Catechin (C), Catechin 3-gallate (Cg), Chlorogenic acid, cichoric acid, caftaric acid, Daidzein, Delphinidin, Eleutherosides, Epicatechin 3-gallate (ECg), Epicatechins, Epicatechin, epigallocatechin, myricetin, Oxalic acid, Pelargonidin, Tannin, Theaflavin-3-gallate, Theanine, Theobromine, Theophylline, Tryptophan, Tyramine, Xanthine, Caffeine, Cannafavin A, Cannafavin B, Catechin (C), Catechin 3-gallate (Cg), Epicatechin 3-gallate (ECg), Epicatechins (Epicatechin (EC)), epigallocatechin, Epigallocatechin (EGC), Epigallocatechin 3-gallate (EGCg), Galocatechin (GC), Galocatechin 3-gallate (GCg), Gamma amino butyric acid, Genistein, *Ginkgo biloba*, Ginsenosides, Quercetin, Quercitrin, or Rutin. In one embodiment, the composition herein disclosed comprises a flavonoid chosen from Caffeine, Cannafavin A, Cannafavin B, Catechin (C), Catechin 3-gallate (Cg), Epicatechin 3-gallate (ECg), Epicatechins (Epicatechin (EC)), epigallocatechin, Epigallocatechin (EGC), Epigallocatechin 3-gallate (EGCg), Galocatechin (GC), Galocatechin 3-gallate (GCg), Gamma amino butyric acid, Genistein, *Ginkgo biloba*, Ginsenosides, Quercetin, Quercitrin, or Rutin.

[0371] Disclosed herein is a composition comprising a purified cannabinoid and a purified terpene. In one embodiment the compound comprises Cannabichromene and at least

one purified terpene chosen from Linalool, Borneol, Elemene, Myrcene, Nerolidol, Phytol, Terpinolene, Bornyl Acetate, or Terpeneol.

[0372] Disclosed herein is a composition comprising a purified cannabinoid and a purified terpene. In one embodiment the compound comprises Cannabigerol and at least one purified terpene chosen from Linalool, Borneol, Elemene, Myrcene, Nerolidol, Phytol, Terpinolene, Bornyl Acetate, or Terpeneol.

[0373] Disclosed herein is a composition comprising a purified cannabinoid and a purified terpene. In one embodiment the compound comprises Cannabinol and at least one purified terpene chosen from Linalool, Borneol, Elemene, Myrcene, Nerolidol, Phytol, Terpinolene, Bornyl Acetate, or Terpeneol.

[0374] Disclosed herein is a composition comprising a purified cannabinoid and a purified terpene. In one embodiment the compound comprises Tetrahydrocannabivarin and at least one compound chosen from Pinene, Bornyl Acetate, Limonene, Caryophyllene, and Sabinene.

[0375] Disclosed herein is a composition comprising a purified cannabinoid and a purified terpene. In one embodiment the compound comprises a cannabinoid chosen from Tetrahydrocannabinol and Cannabichromene and at least one compound chosen from Caryophyllene, Pinene, Bornyl Acetate, Cineole, and Limonene.

[0376] Disclosed herein is a composition comprising a purified cannabinoid and a purified terpene. In one embodiment the compound comprises of a cannabinoid chosen from Tetrahydrocannabinol or Tetrahydrocannabivarin and at least one compound chosen from Limonene and Caryophyllene.

[0377] Disclosed herein is a composition comprising a purified cannabinoid and a purified terpene. In one embodiment the compound comprises of a cannabinoid chosen from Tetrahydrocannabinol or Tetrahydrocannabivarin and at least one compound chosen from Limonene, Terpinolene, and Pulegone.

[0378] Disclosed herein is a composition comprising a purified cannabinoid and a purified terpene. In one embodiment the compound comprises of Cannabichromene and at least one compound chosen from Linalool, Myrcene, and Terpeneol.

[0379] Disclosed herein is a compound comprising a purified cannabinoid and a purified terpene. In one embodiment the compound comprises of Cannabigerol and Myrcene.

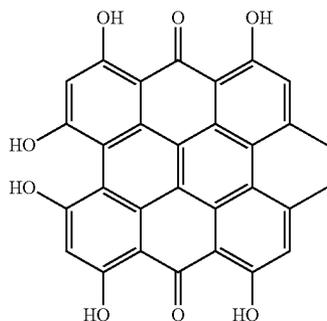
[0380] Disclosed herein is a compound comprising a purified cannabinoid and a purified terpene. In one embodiment the compound comprises of Cannabidiol and Myrcene.

[0381] Disclosed herein is a compound comprising a purified cannabinoid and a purified terpene. In one embodiment the compound comprises of Cannabinol and at least one compound chosen from Linalool and Terpeneol.

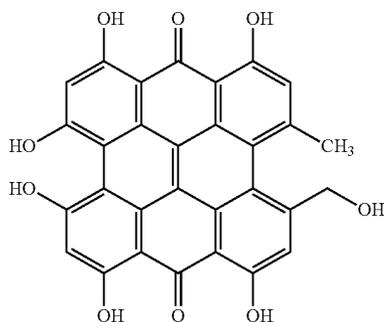
[0382] Disclosed herein is a compound comprising a purified cannabinoid and a purified terpene. In one embodiment the compound comprises of Tetrahydrocannabivarin and at least one compound chosen from Cineole, Pinene, Bornyl Acetate, Limonene, Caryophyllene, and Sabinene.

[0383] Disclosed herein is a compound comprising a purified cannabinoid and a purified terpene. In one embodiment the compound comprises at least one cannabinoid chosen from Tetrahydrocannabinol and Cannabidiol and at least one terpene chosen from Caryophyllene, Pinene, Bornyl Acetate, Cineole, Limonene, Pulegone, Linalool, Hypericin, Pseudo-hypericin, Hyperforin, or Anthole.

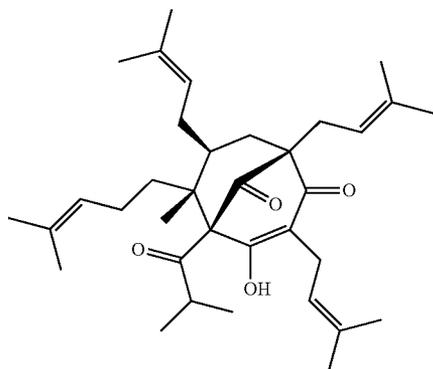
[0384] As used herein, the term hypericin refers to a red-colored anthraquinone-derivative that has the following structural formula:



[0385] As used herein, the term pseudohypericin refers to a hypericin with one more alcohol group with the following structural formula:



[0386] As used herein, the term hyperforin refers to a prenylated phloroglucinol derivative with the following structural formula:



[0387] Disclosed herein is a compound comprising a purified cannabinoid and a purified terpene. In one embodiment the compound comprises of Tetrahydrocannabinol or Tetrahydrocannabivarin and at least one compound chosen from Pulegone, Cineole, and Anethole.

[0388] Disclosed herein is a compound comprising a purified cannabinoid and a purified terpene. In one embodiment the compound comprises of Tetrahydrocannabinol and Myrcene.

[0389] Disclosed herein is a compound comprising a purified cannabinoid and a purified terpene. In one embodiment the compound comprises of Tetrahydrocannabivarin and Myrcene.

[0390] Although the present disclosure herein has been described with reference to various exemplary embodiments, it is to be understood that these embodiments are merely illustrative of the principles and applications of the present disclosure. Those having skill in the art would recognize that various modifications to the exemplary embodiments may be made, without departing from the scope of the invention.

[0391] Moreover, it should be understood that various features and/or characteristics of differing embodiments herein may be combined with one another. It is therefore to be understood that numerous modifications may be made to the illustrative embodiments and that other arrangements may be devised without departing from the scope of the invention.

[0392] It will be appreciated that there is an implied "about" prior to all numerical values recited herein, whether or not so stated. It should also be understood that the precise numerical values used in the specification and claims form additional embodiments. Efforts have been made to ensure the accuracy of the numerical values disclosed herein. Any measured numerical value, however, can inherently contain certain errors resulting from the standard deviation found in its associated measuring technique.

[0393] Furthermore, other embodiments of the disclosure will be apparent to those skilled in the art from consideration of the specification and practice of the invention disclosed herein. It is intended that the specification and examples be considered as exemplary only, with a scope and spirit being indicated by the claims.

[0394] Furthermore, throughout this application, where particular molecules may exist in multiple isomeric (e.g., stereoisomers) forms, it should be understood that this disclosure contemplates each of the individual isomers and mixtures comprising any combination of those isomers.

[0395] Finally, it is noted that, as used in this specification and the appended claims, the singular forms "a," "an," and "the," include plural referents unless expressly and unequivocally limited to one referent, and vice versa. As used herein, the terms "comprise," "comprises," "comprising," "contain," "contains," "containing," "have," "having," "include," "includes," and "including" are intended to be non-limiting, such that recitation of an item or items is not to the exclusion of other like items that can be substituted or added to the recited item(s).

EXAMPLES

[0396] The following examples illustrate certain aspects of the above described invention. They should not be read as limiting the full scope of the invention.

Example 1

[0397] *Cannabis* plant material was cooled to -20 C for 24 hours by placing the cannabis plant material in a freezer. The cold plant material was then triturated twice with cold ethanol (2 mL of ethanol at -20 C per gram of cannabis plant material) by agitating the mixture plant material and ethanol for 3 minutes, then decanting the liquid from the mixture. Portions of decanted ethanol were combined and cooled at -20 C for 24 hours. The precipitate was then removed by gravity filtration. The ethanol was removed from the filtrate by evapora-

tion, leaving an amber oil. The oil was dissolved in ethanol (10-100 mg/mL). This solution was injected into a Supercritical Fluid Chromatograph equipped with an Ethyl Pyridine column. Pure fractions were collected and analyzed by LC-MS, Multiple Reaction Monitoring transitions, full scan detection, photodiode array detection, and Evaporative Light Scattering Detection to assess purity.

Example 2

[0398] *Cannabis* plant material was cooled to -20 C for 24 hours by placing the cannabis plant material in a freezer. The cooled plant material was ground into particles having a diameter of approximately 2 mm. The particles were transferred into a cylinder and connected to a supercritical fluid extraction device for extracting cannabinoids and flavonoids. The extracted material was collected as an amber oil. The oil was dissolved in ethanol (10-100 mg/mL). This solution was injected into a Supercritical Fluid Chromatograph equipped with an Ethyl Pyridine column.

[0399] Pure fractions were collected and analyzed by LC-MS, Multiple Reaction Monitoring transitions, full scan detection, photodiode array detection, and Evaporative Light Scattering Detection to assess purity.

Example 3

[0400] A composition was formulated by combining the following components: THCV (1 g); CBG (1 g); CBC (1 g); THC (2 g); and CBD (4 g); b-Caryophyllene (0.2); Linalool (0.005 g); Limonene (0.0019); Pilegone (0.005 g); and Humulene (0.005 g).

Example 4

[0401] A composition was formulated by combining the following components: THCV (1 g); CBG (1 g); CBC (2 g); THC (1 g); and CBD (2 g); 1,8-Cineol (0.005 g); α -Pinene (0.005 g); and Limonene (0.001 g).

Example 5

[0402] A composition was formulated by combining the following components: CBG (1 g); CBC (2 g); THC (4 g); and CBD (1 g); 1,8-Cineol (0.0025 g); α -Pinene (0.0025 g); b-Myrcene (0.001 g); and Limonene (0.001 g).

Example 6

[0403] A composition was formulated by combining the following components: THCV (2 g); CBG (1 g); CBC (1 g); THC (3 g); and CBD (1 g); b-Caryophyllene (0.0025 g); Linalool (0.001 g); 1,8-Cineol (0.0025 g); b-Myrcene (0.0025 g); Limonene (0.001 g); and Pilegone (0.001 g).

Example 7

[0404] A composition was formulated by combining the following components: CBG (1 g), THC (5 g); and CBD (1 g); b-Caryophyllene (0.05 g); Linalool (0.01 g); b-Myrcene (0.001 g); Limonene (0.001 g); Pilegone (0.01 g); and Humulene (0.01 g).

We claim:

1. A composition comprising:
 - a first purified cannabinoid; and
 - a compound chosen from a second purified cannabinoid, a purified terpene, a purified flavonoid, and a purified mineral,

wherein the said composition is substantially free from cellulose.

2. The composition of claim 1, comprising a purified mineral.
3. The composition of claim 2, wherein the purified mineral is lithium.
4. The composition of claim 2, consisting essentially of a first purified cannabinoid and a purified mineral.
5. The composition of claim 1, comprising a purified terpene.

6. The composition of claim 5, wherein the terpene is chosen from 7,8-dihydroionone, Acetanisoole, Acetic Acid, Acetyl Cedrene, Anethole, Anisole, Benzaldehyde, Bergamotene (α -cis-Bergamotene) (α -trans-Bergamotene), Bisabolol (β -Bisabolol), Borneol, Butanoic/Butyric Acid, Cadinene (α -Cadinene) (γ -Cadinene), Cafestol, Caffeic acid, Camphene, Camphor, Capsaicin, Carene (Δ -3-Carene), Carotene, Carvacrol, Carvone, Dextro-Carvone, Laevo-Carvone, Caryophyllene (β -Caryophyllene), Caryophyllene oxide, Castoreum Absolute, Cedrene (α -Cedrene) (β -Cedrene), Cedrene Epoxide (α -Cedrene Epoxide), Cedrol, Cembrene, Chlorogenic Acid, Cinnamaldehyde (α -amyl-Cinnamaldehyde) (α -hexyl-Cinnamaldehyde), Cinnamic Acid, Cinnamyl Alcohol, Citronellal, Citronellol, Cryptone, Curcumene (α -Curcumene) (γ -Curcumene), Decanal, Dehydrovomifoliol, Diallyl Disulfide, Dihydroactinidiolide, Dimethyl Disulfide, Eicosane/Icosane, Elemene (β -Elemene), Estragole, Ethyl acetate, Ethyl Cinnamate, Ethyl maltol, Eucalyptol/1,8-Cineole, Eudesmol (α -Eudesmol) (μ -Eudesmol) (γ -Eudesmol), Eugenol, Euphol, Farnesene, Farnesol, Fenchol (β -Fenchol), Fenchone, Geraniol, Geranyl acetate, Germacrene, Germacrene B, Guaia-1(10), 11-diene, Guaiacol, Guaiene (α -Guaiene), Gurjunene (α -Gurjunene), Herniarin, Hexanaldehyde, Hexanoic Acid, Humulene (α -Humulene) (β -Humulene), Ionol (3-oxo- α -ionol) (β -Ionol), Ionone (α -Ionone) (β -Ionone), Ipsdienol, Isoamyl acetate, Isoamyl Alcohol, Isoamyl Formate, Isoborneol, Isomyrcenol, Isopulegol, Isovaleric Acid, Isoprene, Kahweol, Lavandulol, Limonene, γ -Linolenic Acid, Linalool, Longifolene, α -Longipinene, Lycopene, Menthol, Methyl butyrate, 3-Mercapto-2-Methylpentanal, Mercaptan/Thiols, β -Mercaptoethanol, Mercaptoacetic Acid, Allyl Mercaptan, Benzyl Mercaptan, Butyl Mercaptan, Ethyl Mercaptan, Methyl Mercaptan, Furfuryl Mercaptan, Ethylene Mercaptan, Propyl Mercaptan, Thenyl Mercaptan, Methyl Salicylate, Methylbutenol, Methyl-2-Methylvalerate, Methyl Thiobutyrate, Myrcene (β -Myrcene), γ -Muuroleone, Nepetalactone, Nerol, Nerolidol, Neryl acetate, Nonanaldehyde, Nonanoic Acid, Ocimene, Octanal, Octanoic Acid, P-cymene, Pentyl butyrate, Phellandrene, Phenylacetaldehyde, Phenylethanethiol, Phenylacetic Acid, Phytol, Pinene, β -Pinene, Propanethiol, Pristimerin, Pulegone, Retinol, Rutin, Sabinene, Sabinene Hydrate, cis-Sabinene Hydrate, trans-Sabinene Hydrate, Safranal, α -Selinene, α -Sinensal, β -Sinensal, β -Sitosterol, Squalene, Taxadiene, Terpin hydrate, Terpeneol, Terpene-4-ol, α -Terpinene, γ -Terpinene, Terpinolene, Thiophenol, Thujone, Thymol, α -Tocopherol, Tonka Undecanone, Undecanal, Valeraldehyde/Pentanal, Verdoxan, α -Ylangene, Umbelliferone, or Vanillin.

7. The composition of claim 5, wherein the terpene is chosen from Alpha-terpineol, Bergamotene (α -cis-Bergamotene) (α -trans-Bergamotene), Bisabolol (β -Bisabolol), Borneol, Camphor, Capsaicin, Carvacrol, Caryophyllene (β -Caryophyllene), Caryophyllene oxide, Cineole, Cinnama-

ldehyde (α -amyl-Cinnamaldehyde) (α -hexyl-Cinnamaldehyde), Cinnamyl Alcohol, Citronellal, Citronellol, Ethyl, Cinnamate, Eucalyptol/1,8-Cineole, Farnesol, Fenchol (β -Fenchol), Geranyl acetate, Germacrene B, Guaiene (α -Guaiene), Humulene (α -Humulene) (β -Humulene), Ionol (3-oxo- α -ionol) (β -Ionol), Ionone (α -Ionone) (β -Ionone), Isoamyl acetate, Isoprene, Kahweol, Laevo-Carvone, Lavandulol, Limonene, Linalool, Linalyl acetate, Luteolin, Lycopene, Menthol, Myrcene (β -Myrcene), Nerol, Nerolidol, Neryl acetate, P-cymene, Phytol, Pinene, Pristimerin, Retinol, Terpin hydrate, Terpineol, Terpinol-4-ol, Terpinolene, Thujone, Thymol, or Vanillin.

8. The composition of claim 5, comprising of Cannabigerolic Acid (CBGA), Cannabigerolic Acid monomethylether (CBGAM), Cannabigerol (CBG), Cannabigerol monomethylether (CBGM), Cannabigerovarinic Acid (CBGVA), Cannabigerovarin (CBGV), Cannabichromenic Acid (CBCA), Cannabichromene (CBC), Cannabichromevarinic Acid (CBCVA), Cannabichromevarin (CBCV), Cannabidiolic Acid (CBDA), Cannabidiol (CBD), Cannabidiol monomethylether (CBDM), Cannabidiol- C_4 (CBD- C_4), Cannabidivarinic Acid (CBDVA), Cannabidivarin (CBDV), Cannabidiolcol (CBD- C_1), Tetrahydrocannabinolic acid A (THCA-A), Tetrahydrocannabinolic acid B (THCA-B), Tetrahydrocannabinol (THC), Tetrahydrocannabinolic acid C_4 (THCA- C_4), Tetrahydrocannabinol C_4 (THC- C_4), Tetrahydrocannabivarinic acid (THCVA), Tetrahydrocannabivarin (THCV), Tetrahydrocannabiorcolic acid (THCA- C_1), Tetrahydrocannabiorcol (THC- C_1), Delta-7-cis-iso-tetrahydrocannabivarin, Δ^8 -tetrahydrocannabinolic acid (Δ^8 -THCA), Δ^8 -tetrahydrocannabinol (Δ^8 -THC), Cannabicyclic acid (CBLA), Cannabicyclol (CBL), Cannabicyclovarin (CBLV), Cannabielsoic acid A (CBEA-A), Cannabielsoic acid B (CBEA-B), Cannabielsoin (CBE), Cannabinolic acid (CBNA), Cannabinol (CBN), Cannabinol methylether (CBNM), Cannabinol- C_4 (CBN- C_4), Cannabivarin (CBV), Cannabino- C_2 (CBN- C_2), Cannabiorcol (CBN- C_1), Cannabinodiol (CBND), Cannabinodivarin (CBDV), Cannabitriol (CBT), 10-Ethoxy-9-hydroxy- Δ^{6a} -tetrahydrocannabinol, 8,9-Dihydroxy- $\Delta^{6a(10a)}$ -tetrahydrocannabinol (8,9-Di-OH-CBT- C_2), Cannabitriolvarin (CBTV), Ethoxy-cannabitriolvarin (CBTVE), Dehydrocannabifuran (DCBF), Cannbifuran (CBF), Cannabichromanon (CBCN), Cannabicitran (CBT), 10-Oxo- $\Delta^{6a(10a)}$ -tetrahydrocannabinol (OTHC), Δ^9 -cis-tetrahydrocannabinol (cis-THC), Cannabiripsol (CBR), 3,4,5,6-tetrahydro-7-hydroxy-alpha-alpha-2-trimethyl-9-n-propyl-2,6-methano-2H-1-benzoxocin-5-methanol (OH-iso-HHCV), Trihydroxy-delta-9-tetrahydrocannabinol (triOH-THC), Isocannabinoids, and Epigallocatechin gallate.

9. The composition of claim 8, wherein the first purified cannabinoid is chosen from Tetrahydrocannabinol (THC), Tetrahydrocannabivarin (THCV), Cannabichromene (CBC), Cannabichromanon (CBCN), Cannabidiol (CBD), Cannabielsoin (CBE), Cannabidivarin (CBDV), Cannbifuran (CBF), Cannabicyclol (CBL), Cannabinol (CBN), Cannabinodiol (CBND), Cannabitriol (CBT), Cannabivarin (CBV), and Isocannabinoids.

10. The composition of claim 9, comprising a first purified cannabinoid chosen from Cannabigerolic Acid (CBGA), Cannabigerolic Acid monomethylether (CBGAM), Cannabigerol (CBG), Cannabigerol monomethylether (CBGM), Cannabigerovarinic Acid (CBGVA), Cannabigerovarin (CBGV), Cannabichromenic Acid (CBCA), Cannabichromene (CBC),

ichromene (CBC), Cannabichromevarinic Acid (CBCVA), Cannabichromevarin (CBCV), Cannabidiolic Acid (CBDA), Cannabidiol (CBD), Cannabidiol monomethylether (CBDM), Cannabidiol- C_4 (CBD- C_4), Cannabidivarinic Acid (CBDVA), Cannabidivarin (CBDV), Cannabidiolcol (CBD- C_1), Tetrahydrocannabinolic acid A (THCA-A), Tetrahydrocannabinolic acid B (THCA-B), Tetrahydrocannabinol (THC), Tetrahydrocannabinolic acid C_4 (THCA- C_4), Tetrahydrocannabinol C_4 (THC- C_4), Tetrahydrocannabivarinic acid (THCVA), Tetrahydrocannabivarin (THCV), Tetrahydrocannabiorcolic acid (THCA- C_1), Tetrahydrocannabiorcol (THC- C_1), Delta-7-cis-iso-tetrahydrocannabivarin, Δ^8 -tetrahydrocannabinolic acid (Δ^8 -THCA), Δ^8 -tetrahydrocannabinol (Δ^8 -THC), Cannabicyclic acid (CBLA), Cannabicyclol (CBL), Cannabicyclovarin (CBLV), Cannabielsoic acid A (CBEA-A), Cannabielsoic acid B (CBEA-B), Cannabielsoin (CBE), Cannabinolic acid (CBNA), Cannabinol (CBN), Cannabinol methylether (CBNM), Cannabinol- C_4 (CBN- C_4), Cannabivarin (CBV), Cannabino- C_2 (CBN- C_2), Cannabiorcol (CBN- C_1), Cannabinodiol (CBND), Cannabinodivarin (CBDV), Cannabitriol (CBT), 10-Ethoxy-9-hydroxy- Δ^{6a} -tetrahydrocannabinol, 8,9-Dihydroxy- $\Delta^{6a(10a)}$ -tetrahydrocannabinol (8,9-Di-OH-CBT- C_2), Cannabitriolvarin (CBTV), Ethoxy-cannabitriolvarin (CBTVE), Dehydrocannabifuran (DCBF), Cannbifuran (CBF), Cannabichromanon (CBCN), Cannabicitran (CBT), 10-Oxo- $\Delta^{6a(10a)}$ -tetrahydrocannabinol (OTHC), Δ^9 -cis-tetrahydrocannabinol (cis-THC), Cannabiripsol (CBR), 3,4,5,6-tetrahydro-7-hydroxy-alpha-alpha-2-trimethyl-9-n-propyl-2,6-methano-2H-1-benzoxocin-5-methanol (OH-iso-HHCV), Trihydroxy-delta-9-tetrahydrocannabinol (triOH-THC), Yangonin, Isocannabinoids, Epigallocatechin gallate, Dodeca-2E,4E,8Z,10Z-tetraenoic acid isobutylamide, or Dodeca-2E,4E-dienoic acid isobutylamide; and

a second purified cannabinoid chosen from Cannabigerolic Acid (CBGA), Cannabigerolic Acid monomethylether (CBGAM), Cannabigerol (CBG), Cannabigerol monomethylether (CBGM), Cannabigerovarinic Acid (CBGVA), Cannabigerovarin (CBGV), Cannabichromenic Acid (CBCA), Cannabichromene (CBC), Cannabichromevarinic Acid (CBCVA), Cannabichromevarin (CBCV), Cannabidiolic Acid (CBDA), Cannabidiol (CBD), Cannabidiol monomethylether (CBDM), Cannabidiol- C_4 (CBD- C_4), Cannabidivarinic Acid (CBDVA), Cannabidivarin (CBDV), Cannabidiolcol (CBD- C_1), Tetrahydrocannabinolic acid A (THCA-A), Tetrahydrocannabinolic acid B (THCA-B), Tetrahydrocannabinol (THC), Tetrahydrocannabinolic acid C_4 (THCA- C_4), Tetrahydrocannabinol C_4 (THC- C_4), Tetrahydrocannabivarinic acid (THCVA), Tetrahydrocannabivarin (THCV), Tetrahydrocannabiorcolic acid (THCA- C_1), Tetrahydrocannabiorcol (THC- C_1), Delta-7-cis-iso-tetrahydrocannabivarin, Δ^8 -tetrahydrocannabinolic acid (Δ^8 -THCA), Δ^8 -tetrahydrocannabinol (Δ^8 -THC), Cannabicyclic acid (CBLA), Cannabicyclol (CBL), Cannabicyclovarin (CBLV), Cannabielsoic acid A (CBEA-A), Cannabielsoic acid B (CBEA-B), Cannabielsoin (CBE), Cannabinolic acid (CBNA), Cannabinol (CBN), Cannabinol methylether (CBNM), Cannabinol- C_4 (CBN- C_4), Cannabivarin (CBV), Cannabino- C_2 (CBN- C_2), Cannabiorcol (CBN- C_1), Cannabinodiol (CBND), Cannabinodivarin (CBDV), Cannabitriol (CBT), 10-Ethoxy-9-hydroxy- Δ^{6a} -tetrahydrocannabinol, 8,9-Dihydroxy- $\Delta^{6a(10a)}$ -tet-

rahydrocannabinol (8,9-Di-OH-CBT-C₂), Cannabitrivarin (CBTV), Ethoxy-cannabitrivarin (CBTVE), Dehydrocannabifuran (DCBF), Cannabifuran (CBF), Cannabichromanon (CBCN), Cannabicitran (CBT), 10-Oxo- $\Delta^{6a(10a)}$ -tetrahydrocannabinol (OTHC), Δ^9 -cis-tetrahydrocannabinol (cis-THC), Cannabiripsol (CBR), 3,4,5,6-tetrahydro-7-hydroxy-alpha-alpha-2-trimethyl-9-n-propyl-2,6-methano-2H-1-benzoxocin-5-methanol (OH-iso-HHCV), Trihydroxy-delta-9-tetrahydrocannabinol (triOH-THC), Yangonin, Isocannabinoids, Epigallocatechin gallate, Dodeca-2E,4E,8Z,10Z-tetraenoic acid isobutylamide, or Dodeca-2E,4E-dienoic acid isobutylamide.

11. The composition of claim **1**, comprising a purified flavonoid.

12. The composition of claim **11**, wherein the flavonoid is chosen from phenolic acids, stilbenoids, dihydroflavonols, anthocyanins, anthocyanidins, polyphenols, tannins, flavones, flavan-3-ols, Flavan-4-ol, Flavan-3,4-diol flavonols, stilbenoids, phytochemicals, antioxidants, homoisoflavonoids, phenylpropanoids, Phloroglucinols coumarins, Phenolic acids, Naphthodianthrones, Steroid glycosides, bioflavonoids, isoflavonoids, and neoflavonoids.

13. The composition of claim **11**, wherein the flavonoid is chosen from Adenosine, Adhyperforin, amentoflavone, Anandamide, Apigenin, Cannafavin B, Catechin (C), Catechin 3-gallate (Cg), Chlorogenic acid, cichoric acid, cataric acid, Daidzein, Delphinidin, Eleutherosides, Epicatechin 3-gallate (ECg), Epicatechins, Epicatechin, epigallocatechin, myricetin, Oxalic acid, Pelargonidin, Tannin, Theaflavin-3-gallate, Theanine, Theobromine, Theophylline, Tryptophan, Tyramine, Xanthine, Caffeine, Cannafavin A, Cannafavin B, Catechin (C), Catechin 3-gallate (Cg), Epicatechin 3-gallate (ECg), Epicatechins (Epicatechin (EC)), epigallocatechin, Epigallocatechin (EGC), Epigallocatechin 3-gallate (EGCg), Galocatechin (GC), Galocatechin 3-gallate (GCg), Gamma amino butyric acid, Genistein, *Ginkgo biloba*, Ginsenosides, Quercetin, Quercitrin, or Rutin.

14. The composition of claim **11**, wherein the purified flavonoid is chosen from Caffeine, Cannafavin A, Cannafavin B, Catechin (C), Catechin 3-gallate (Cg), Epicatechin 3-gallate (ECg), Epicatechins (Epicatechin (EC)), epigallocatechin, Epigallocatechin (EGC), Epigallocatechin 3-gallate (EGCg), Galocatechin (GC), Galocatechin 3-gallate (GCg), Gamma amino butyric acid, Genistein, *Ginkgo biloba*, Ginsenosides, Quercetin, Quercitrin, or Rutin.

15. The composition of claim **1**, comprising Cannabichromene and at least one purified terpene chosen from Linalool, Borneol, Elemene, Mycerne, Nerolidol, Phytol, Terpinolene, Bornyl acetate, Terpeneol.

16. The composition of claim **1**, comprising Cannabigerol and at least one purified terpene chosen from Linalool, Borneol, elemene, Mycerne, Nerolidol, Phytol, Terpinolene, Bornyl acetate, Terpeneol.

17. The composition of claim **1**, comprising Cannabinol and at least one compound chosen from Linalool, Borneol, elemene, Mycerne, Nerolidol, Phytol, Terpinolene, Bornyl acetate, Terpeneol.

18. The composition of claim **1**, comprising Tetrahydrocannabivarin and at least one compound chosen from Pinene, Bornyl acetate, Limonene, Caryophyllene, and Sabinene.

19. The composition of claim **1**, comprising a cannabinoid chosen from Tetrahydrocannabinol and Cannabichromene and at least one compound chosen from Caryophyllene, Pinene, Bornyl acetate, Cineole, Limonene, Caryophyllene, Pinene, Bornyl acetate.

20. The composition of claim **1**, comprising a cannabinoid chosen from Tetrahydrocannabinol or Tetrahydrocannabivarin and at least one compound chosen from Limonene and Caryophyllene.

21. The composition of claim **1**, comprising a cannabinoid chosen from Tetrahydrocannabinol or Tetrahydrocannabivarin and at least one compound chosen from Limonene, Terpinolene, Pulegone.

22. The compound of claim **1**, comprising Cannabichromene and at least one compound chosen from Linalool, Myrcene, Terpeneol.

23. The compound of claim **1**, comprising Cannabigerol and Myrcene.

24. The compound of claim **1**, comprising Cannabidiol and Myrcene.

25. The compound of claim **1**, comprising Cannabinol and at least one compound chosen from Linalool, Terpeneol.

26. The compound of claim **1**, comprising Tetrahydrocannabivarin and at least one compound chosen from Cineole, Pinene, Bornyl acetate, Limonene, Caryophyllene, and Sabinene.

27. The compound of claim **1**, comprising at least one cannabinoid chosen from Tetrahydrocannabinol or Cannabidiol and at least one terpene chosen from Caryophyllene, Pinene, Bornyl acetate, Cineole, Limonene, Pulegone, Linalool, Hypericin, Pseudohypericin, Hyperforin, Anethole.

28. The compound of claim **1**, comprising Tetrahydrocannabinol or Tetrahydrocannabivarin and at least one compound chosen from Pulegone, Cineole, Anethole.

29. The compound of claim **1**, comprising Tetrahydrocannabinol and Myrcene.

30. The compound of claim **1**, comprising Tetrahydrocannabivarin and Myrcene.

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