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Subject: U.S. Trademark Application Serial No. 90975326 - A.F.C - 3004-1004
Sent: February 13, 2024 06:24:48 PM EST
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Attachments

[screenshot-ww-niehs-nih-gov-health-topics-agents-essential-oils-17078648122901](#)
[screenshot-ww-webmd-com-vitamins-ai-ingredientmono-915-medium-chain-triglycerides-mcts-17078648689521](#)
[screenshot-ww-ncbi-nlm-nih-gov-pmc-articles-PMC5456241-17078649537561](#)
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[screenshot-greatist-com-live-what-is-cbd-oil-and-cbd-tincture-17078658903991](#)

United States Patent and Trademark Office (USPTO)
Office Action (Official Letter) About Applicant's Trademark Application

U.S. Application Serial No. 90975326

Mark: A.F.C

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Reference/Docket No. 3004-1004

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REQUEST FOR RECONSIDERATION AFTER FINAL ACTION DENIED

Issue date: February 13, 2024

Applicant's request for reconsideration is denied. *See* 37 C.F.R. §2.63(b)(3). The trademark examining attorney has carefully reviewed applicant's request and determined the request did not: (1) raise a new issue, (2) resolve all the outstanding issue(s), (3) provide any new or compelling evidence with regard to the outstanding issue(s), or (4) present analysis and arguments that were persuasive or shed new light on the outstanding issue(s). TMEP §§715.03(a)(ii)(B), 715.04(a).

The applicant's amendment to the Identification of Goods made in the Request for Remand on November 30, 2023 fails to clarify the goods. Accordingly, the requirement to clarify the Identification of Goods made final in the Office action dated February 14, 2022 is **maintained and continued**. *See* TMEP §§715.03(a)(ii)(B), 715.04(a).

I. The classification of the goods is not clear (TMEP §§1401 *et seq.*)

As worded, the classification of the goods is not justified in Cl. 5 without further specification as they may encompass Cl. 3 goods. Specifically, it is not clear whether these goods are predominately comprised of essential oils or non-essential oils.

“As of September 1, 1973, the international classification of goods and services is the controlling classification used by the United States, and it applies to all applications filed on or after September 1, 1973, and their resulting registrations, for all statutory purposes. *See* 37 C.F.R. §2.85(a).” TMEP §1401.02. “International trademark classification, and the headings of the international trademark classes, are established by the Committee of Experts of the Nice Union and set forth in the International Classification of Goods and Services for the Purposes of the Registration of Marks (Nice Classification) published annually by the World Intellectual Property Organization (WIPO) on its website.” TMEP §1401.02(a).

Applicant identifies its goods as oils “derived from seed-producing plants” that are “accompanied by medium-chain triglyceride oil;” as “herb oil accompanied by medium-chain triglyceride oil;” and as “herb oil extracts accompanied by medium-chain triglyceride oil.” While medium-chain triglyceride

oils are not essential oils, oils derived from seed producing plants, “herb oils” and “herb oil extracts” all encompass essential oils. “Essential oils, which are obtained through mechanical pressing or distillation, are concentrated plant extracts that retain the natural smell and flavor of their source.” See, NIH National Institute of Environmental Health Science, <https://www.niehs.nih.gov/health/topics/agents/essential-oils>; <https://www.webmd.com/vitamins/ai/ingredientmono-915/medium-chain-triglycerides-mcts>. They are extracted from “ Flowers, of course, including: orange, pink, lavender, and the (clove) flower bud or (ylang-ylang) bracts, Leaves, most often, including: eucalyptus, mint, thyme, bay leaf, savory, sage, pine needles, and tree underground organs, e.g., roots (vetiver), Rhizomes (ginger, sweet flag), Seeds (carvi, coriander), Fruits, including: fennel, anise, Citrus epicarps, Wood and bark, including: cinnamon, sandalwood, rosewood.” *Essential Oils’ Chemical Characterization and Investigation of Some Biological Activities: A Critical Review - PMC (nih.gov)*, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5456241/>; <https://onlinelibrary.wiley.com/doi/abs/10.1002/9781119829614.ch3#:~:text=Antimicrobial%20property%2C%20fo>
Under the Nice Classification, essential oils are Cl. 3 goods: “ Some products, however, are always in Class 3 regardless of purpose, such as essential oils....” The Nice Classification, Class 3 Info File, https://nclpub.wipo.int/enfr/?version=20240101¬ion=information_files&class_number=3&lang=en. Thus, even though essential oils are used for Cl. 5 purposes they would remain in Cl. 3.

If applicant’s goods are comprised predominantly of essential oils, the goods remain properly classified in Cl. 3. While the applicant indicates that its goods are accompanied by “medium-chain triglyceride oil,” “accompanied” is insufficient to indicate the proper classification of the goods. Under the Nice Classification, “When a product, whether finished or not, is classified according to the material of which it is made, and it is made of different materials, the product is in principle classified according to the material which predominates.” The Nice Classification, General Remarks, Goods, https://nclpub.wipo.int/enfr/?gors=&lang=en&menulang=en¬ion=general_remarks&version=20200101. If these goods are predominantly comprised of essential oils, these goods are properly classified in Cl. 3.

If applicant’s oil goods are not comprised predominantly of essential oils, they are classified by their function or purpose, per The Nice Classification, General Remarks, Goods (a), “A finished product is in principle classified according to its function or purpose.” https://nclpub.wipo.int/enfr/?gors=&lang=en&menulang=en¬ion=general_remarks&version=20200101. The “function or purpose” of applicant’s goods has been identified as “intended for reducing risk of disease;” “for the purpose of promoting functions of the body;” “intended to affect the structure or function of the body;” “for the purpose of affecting the structure or function of the body;” “for the purpose of promoting the structure or function of the body;” and “for the purpose of having a salutary effect on the structure or function of the body.” The identified functions/purposes generally fall within the definitions/common understanding of that of a “drug” or as being “medicinal” –

DRUG

MW/FDA

<https://www.fda.gov/drugs/drug-approvals-and-databases/drugsfda-glossary-terms#:~:text=A%20drug%20is%20defined%20as,any%20function%20of%20the%20body>;
<https://www.merriam-webster.com/dictionary/drug>

A substance recognized by an official pharmacopoeia or formulary.

A substance intended for use in the diagnosis, cure, mitigation, treatment, or prevention of disease.

A substance (other than food) ***intended to affect the structure or any function of the body.***

OL: https://www.oxfordlearnersdictionaries.com/us/definition/english/drug_1

a substance used as a medicine or used in a medicine

AHD: <https://www.ahdictionary.com/word/search.html?q=drug>

A substance used in the diagnosis, treatment, or prevention of a disease or as a component of a medication.

MEDICINAL

MW: *Salutary*

<https://www.merriam-webster.com/dictionary/medicinal>

SALUTARY

AHD: <https://www.ahdictionary.com/word/search.html?q=salutary>

1. Effecting or designed to effect an improvement; remedial: salutary advice.
2. Favorable to health; wholesome: a salutary climate.

MW: <https://www.merriam-webster.com/dictionary/salutary>

1: producing a beneficial effect : REMEDIAL

salutary influences

2: promoting health : CURATIVE

NIH: “What are medicines?”

Medicines, often referred to as drugs, are used to prevent or treat diseases and other health conditions. Medicines can be obtained by a prescription or over the counter (OTC).”

[https://www.nia.nih.gov/health/medicines-and-medication-management/taking-medicines-safely-you-age#:~:text=all%20your%20medicines.-,What%20are%20medicines%3F,over%20the%20counter%20\(OTC\).](https://www.nia.nih.gov/health/medicines-and-medication-management/taking-medicines-safely-you-age#:~:text=all%20your%20medicines.-,What%20are%20medicines%3F,over%20the%20counter%20(OTC).)

Thus, if applicant’s goods are *not* comprised in substantial part of essential oils, the goods are properly classified in Cl. 5 because their function/purpose aligns with those in Cl. 5 of the Nice Classification.

To that end, please note that if these goods are comprised of essential oils, prefacing the goods with the term “tinctures” does not change their classification as noted in TMEP §1401.05(c): “If a product is normally classified in a particular class, an applicant cannot obtain registration in another class merely by identifying an ultimate use of the product in goods that fall in the other class. Example - Essential oils are classified in Class 3. This item cannot be classified in Class 1 with an indication that it is used in the manufacture of other finished products. Raw or unfinished materials that are used in the manufacture of other finished products may be classified in Class 1. However, an item like essential oils, which is always classified in Class 3 regardless of its ultimate use, cannot be transferred to Class 1 by adding Class 1 qualifying language.” TMEP §1401.05(c).

II. Section 1402.01 states that an identification “must be specific, definite, clear, *accurate*, and concise,” identify the goods “in an *explicit* manner,” and “*the language used to describe goods and/or services should be understandable to the average person and should not require an in-depth knowledge of the relevant field.*” TMEP §1402.01.

Please note the following definitions:

“Accurate” – Conforming exactly to fact; correct and true in every detail; conforming exactly to truth or to a standard

<https://www.ahdictionary.com/word/search.html?q=accurate>;

<https://www.oxfordlearnersdictionaries.com/us/definition/english/accurate>

“Explicit” - clear and easy to understand, so that you have no doubt what is meant; Fully and clearly expressed; fully revealed or expressed without vagueness, implication, or ambiguity : leaving no question as to meaning or intent

<https://www.oxfordlearnersdictionaries.com/us/definition/english/explicit>,

<https://www.ahdictionary.com/word/search.html?q=explicit>

Also, the “ordinary meaning” or “common understanding” of the term at issue, “tincture,” is also important to establish before moving on to the analysis. By the definitions of well known, reputable dictionaries, “tinctures” are defined as –

MW: <https://www.merriam-webster.com/dictionary/tincture>

1: a solution of a medicinal substance in an alcoholic solvent

AHD: <https://www.ahdictionary.com/word/search.html?q=tincture>

1. A coloring or dyeing substance; a pigment.

2. An imparted color; a tint.

3. A quality that colors, pervades, or distinguishes.

4. A trace or vestige: "a faint tincture of condescension" (Robert Craft).

5. An alcohol solution of a nonvolatile medicine: tincture of iodine.

6. Heraldry A metal, color, or fur.

OL: <https://www.oxfordlearnersdictionaries.com/us/definition/english/tincture>

a substance dissolved in alcohol for use as a medicine

Thus, we can see that tinctures are alcohol-based medicinal solutions. They are not comprised of oils. Each of the 216 tincture IDs indicates that the goods are comprised of oils. By the definitions of well known, reputable dictionaries, tinctures are not comprised of oils, but of alcohol. Therefore, the 216 tincture IDs are *inaccurate* because they do not conform to the standard of tinctures being alcohol-based as established by these dictionaries, and their categorization as oil-based goods is incorrect. Thus, the IDs are unacceptable per TMEP §1402.01.

Additionally, the tincture goods have not been identified in an *explicit* manner. For this additional reason, the IDs do not satisfy TMEP requirements. As indicated, above, to be *explicit* the goods must be identified in a manner that is clear, easy to understand, and so there is no doubt as to the meaning of the goods. Well-known, reputable dictionaries define and establish “tinctures” as alcohol-based solutions. Thus, identifying “tinctures” as oils raises doubt as to the nature of the goods. The ID is no longer clear or easy to understand, but rather is confusing in light of the established meaning of these goods. As such, the goods have not been identified in the requisite *explicit* manner.

Section 1402.03(f) does allow for “widely used industry terminology” to be deemed sufficient to identify goods when the following conditions are met: (1) that terminology at issue is definite; (2) the

terminology at issue is limited to a single class; (3) that terminology is supported by dictionary definitions or other authoritative references. See, TMEP §1402.03(f), “Widely used industry terminology that is *definite* and *limited to a single class* should be recognized as sufficient to identify the goods or services *when supported by dictionary definitions or other authoritative references.*” TMEP §1402.03(f). Given the above dictionary definitions, the term “tinctures” when further defined as oils, is not definite terminology because it is not accurate or explicit, as explained, above. Second, as discussed previously, it is not clear whether these goods are limited to a single class. If the goods are comprised predominantly of essential oils, these goods are properly classified in Cl. 3. Third, dictionary definitions do not support the use of the term “tincture” to identify goods comprised of oils. Therefore, these IDs do not meet the requirements of TMEP 1402.03(f) to allow these goods to register under the “widely used industry terminology” standard.

[Applicant’s website](#) indicates that it is a provider of cannabidiol goods. The use of the term “tinctures” to describe oil-based products is not uniformly adopted within the cannabidiol industry and the use of “tincture” to describe oil-based goods has been noted as “confusing.”

1. Healthline: CBD Oil vs. Tincture: What’s the Difference?

<https://www.healthline.com/health/cbd-oil-vs-tincture>

What is CBD oil?

CBD oil is most often a blend of CBD extract and an inert [carrier oil](#), like [medium-chain triglyceride \(MCT\)](#) coconut oil.

What is a CBD tincture?

A CBD tincture is an alcohol-based extract. High proof alcohol is used as a solvent to extract the natural compounds of the cannabis plant, and its also used in the finished product.

2. Medical News Today What to know about CBD oils and CBD tinctures

<https://www.medicalnewstoday.com/articles/cbd-oil-vs-tincture>

CBD oil and tinctures are similar products that both contain CBD derived from [hemp](#) or other plants in the *Cannabis sativa* family. While people may interchange the terms “CBD oil” and “CBD tincture,” they are different products.

The main difference between the two is the method of extracting CBD. For oil, manufacturers use carbon dioxide, but for tinctures, they utilize alcohol.

Using heat and pressure, manufacturers use the carbon dioxide method to separate CBD from the plant. Manufacturers generally regard this as the quickest and most efficient way to extract the substance. It is also environmentally safe, while the [Food and Drug Administration \(FDA\)](#) also note that the method is safe.

The process of creating a CBD tincture typically involves soaking cannabis in alcohol and slowly heating the mixture. This infuses the alcohol with CBD, which the manufacturer then boils or dilutes.

Through these different extraction methods, manufacturers end up with slightly different products: CBD oil contains CBD suspended in a carrier oil, while tinctures are typically glycerin- or alcohol-based solutions.

Generally, CBD oils will also contain a higher potency of CBD, but tinctures will have a longer shelf life. Additionally, people can use CBD oil orally or topically, but it is not advisable to use tinctures on the skin.

3. Greatist: CBD Tincture vs Oil: What Do They Really Do?

<https://greatist.com/live/what-is-cbd-oil-and-cbd-tincture>

“CBD tinctures and oils are used to help ease many conditions. People use CBD for things like sleep and anxiety relief to things like help with pain and inflammation.

Tinctures have a reputation for fast-acting results, which makes them a strong choice for those looking to relieve pain. A tincture also tends to live longer on your nightstand since its base is preserving alcohol and not oil.

Unlike CBD oils, tinctures are more challenging to find. Most CBD brands have a good selection of CBD oils to choose from, but for those looking for a tincture, you may have to search across a good handful of brands before finding one that suits you.

Plus, many brands use the term tincture to describe an oil and vice versa, so it can be annoyingly confusing.”

As these articles indicate, oils containing CBD are recognized as non-tincture goods. Outside of the CBD industry and CBD consumers, the identification of a “tincture” as an oil product would likely cause even greater confusion to the average consumer because, as indicated by the dictionary definitions, they are widely known as alcohol-based goods. *For this reason, this language used to describe applicant’s goods oil-based goods would not be understandable to the average person without an in-depth knowledge of the cannabidiol products field*, and even then it appears that it may cause confusion amongst such consumers.

III. Section 1402.05 indicates that an identification is unacceptable if the ordinary meaning of the identification language is at variance with the goods evidenced by any part of the record.

TMEP Section 1402.05 states that “[a]n identification is unacceptable if it is inconsistent with the goods or services indicated by the specimens *or if the ordinary meaning of the identification language is at variance with the goods or services evidenced by the specimens or any other part of the record.*” TMEP §1402.05.

IV. TMEP §1402.07

When an ID is ambiguous, the ID must be amended to a definite ID within the scope of the applied-for wording. TMEP §1402.07(b). The originally applied-for wording that is the basis of these amendments is “Tinctures; Herbal tinctures.” As has been addressed previously, the originally applied-for IDs are

unacceptable. Applicant has indicated the function/purpose of its goods and applicant has indicated their composition, which under the Nice Classification is problematic, as discussed above. As noted in the dictionary definitions, above, “tinctures” are alcohol-based medicinal goods, not oil-based goods. Therefore, because the amendments do not fall within the ordinary meaning of the term “tinctures,” these amendments are outside the scope of the initially applied-for wording.

If applicant has already filed an appeal with the Trademark Trial and Appeal Board, the Board will be notified to resume the appeal. *See* TMEP §715.04(a).

If applicant has not filed an appeal and time remains in the response period for the final Office action, applicant has the remainder of that time to (1) [file another request for reconsideration](#) that complies with and/or overcomes any outstanding final requirement(s) and/or refusal(s), and/or (2) [file a notice of appeal](#) to the Board. TMEP §715.03(a)(ii)(B).

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Indoor Air Quality

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Nanomaterials

Essential Oils

> Table of Contents

Introduction

What are essential oils?

Essential oils, which are obtained through mechanical pressing or distillation, are concentrated plant extracts that retain the natural smell and flavor of their source.

Each essential oil has a unique composition of chemicals, and this variation affects the smell, absorption, and effects on the body. The chemical composition of an essential oil may vary within the same plant species, or from plant to plant.

Synthetic oils are not considered true essential oils.



Have researchers studied essential oils?

Previous [studies](#) have shown that lavender and tea tree oil may act as [endocrine disrupting chemicals \(EDCs\)](#), which have been associated with several health issues. EDCs are substances in the environment (air, soil, or water), food sources, personal care products, and manufactured products that interfere with the normal function of your body's endocrine system. Also, [clinical research](#) found a possible link between the topical use of essential oils and the onset of male gynecomastia, or the development of breast tissue, in prepubescent boys. Since lavender and tea tree oil are composed of hundreds of chemicals, NIEHS scientists wanted to find out which of these chemicals displayed hormonal activity that could potentially lead to prepubertal gynecomastia.

What is NIEHS Doing?

The scientists applied pure essential lavender oil, tea tree oil, or eight of their chemical components to human cell lines in test tubes, known as in vitro

Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS)

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experiments. They found that the compounds displayed a range of hormonal activities, which may stimulate prepubertal gynecomastia in boys.

Which essential oils and components were tested in the NIEHS study?

The researchers tested pure essential lavender and tea tree oils, as well as four chemicals commonly found in both: eucalyptol, 4-terpinenol, dipentene/limonene, and alpha-terpineol. These compounds were selected because the International Standard Organization mandated that they be included in both lavender and tea tree oils. The NIEHS research team also studied linalyl acetate and linalool, which are specific to lavender oil, and alpha-terpinene and gamma-terpinene, which are specific to tea tree oil.

Do other essential oils contain these chemicals?

According to an [analysis](#) of the chemical components of 93 essential oils, the eight chemicals selected in the NIEHS study appeared in most, as indicated in the list below. Each of the eight chemicals is followed by the number of oils in which it appeared.

- dipentene/limonene - 90
- alpha-terpineol - 87
- linalool - 82
- 4-terpinenol - 80
- eucalyptol - 79
- gamma-terpinene - 79
- alpha-terpinene - 77
- linalyl acetate - 62

What age range are boys at risk for gynecomastia?

Male gynecomastia is a common clinical symptom observed during infancy, adolescence, and older age. Some physicians theorize that periods of major hormonal change may lead to the condition. However, prepubertal gynecomastia is relatively rare due to lower circulating hormone levels. Some scientists suspect that boys in this range may be more susceptible to hormonal changes and disrupting chemicals, which may lead to gynecomastia.

Is direct skin exposure the main link to male gynecomastia or can smelling or inhaling essential oils, as in aromatherapy, be linked, too?

The clinical cases have only described using essential oils on skin or topical exposure and not aromatherapy. In the NIEHS study, the team described whether topical exposure to the chemicals led to hormonal activity. Further studies are needed to determine if the same can be said about aromatherapy.

Are girls affected by lavender and tea tree oils?

Because breast growth is a natural process for pubescent girls, it is more difficult to determine whether pure essential lavender oil or tea tree oil have the same effect in females as males. A [clinical case was reported in 2019](#) that described abnormal breast growth in prepubescent girls who had continuous exposure to lavender-fragranced products. The premature breast growth resolved when exposure to the lavender-containing products stopped.

What were the results of tests using pure essential oils?

NIEHS researchers created different dilutions of the two types of pure essential oils and the eight selected chemical components and tested their activity. They found as the dilution increased, the EDC activity of the oils and chemicals decreased.

Should the public discontinue the use of essential oils? Why or why not?

Using essential oils is up to the individual. The researchers want the public to be aware of the findings, since some essential oils and their components display hormonal activity and could be potential EDCs.

Further Reading

Stories from the *Environmental Factor* (NIEHS Newsletter)

- [Botanical Safety Taken on by New Consortium](#) (April 2020)

Last Reviewed: February 17, 2022

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MENU Vitamins & Supplements > Medium Chain Triglycerides (Mcts)

Medium Chain Triglycerides (Mcts) - Uses, Side Effects, and More

OTHER NAME(S): 1,2,3-Propanetriol Trioctanoate, AC-1202, Acide Ca ... Show More

- Overview
- Uses
- Side Effects
- Precautions
- Interactions
- Dosing
- Reviews (19)

Overview

Medium chain **triglycerides** (MCTs) are fats that are made in a lab from coconut and palm kernel oils. Typical dietary fats are called long-chain triglycerides.

MCTs are a **fat** source for people who cannot tolerate other types of fats. These fats might also improve **weight loss** because the body can more easily break them down into molecules called ketone bodies. These ketone bodies can be used for energy.

People use MCTs for involuntary weight loss called cachexia or wasting syndrome. MCTs are also used for **obesity**, **seizures**, athletic performance, **Alzheimer disease**, and many other conditions, but there is no good scientific evidence to support these other uses.

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Essential Oils' Chemical Characterization and Investigation of Some Biological Activities: A Critical Review

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Abstract

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This review covers literature data summarizing, on one hand, the chemistry of essential oils and, on the other hand, their most important activities. Essential oils, which are complex mixtures of volatile compounds particularly abundant in aromatic plants, are mainly composed of terpenes biogenerated by the mevalonate pathway. These volatile molecules include monoterpenes (hydrocarbon and oxygenated monoterpenes), and also sesquiterpenes (hydrocarbon and oxygenated sesquiterpenes). Furthermore, they contain phenolic compounds, which are derived via the shikimate pathway. Thanks to their chemical composition, essential oils possess numerous biological activities (antioxidant, anti-inflammatory, antimicrobial, etc...) of great interest in food

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Keywords: essential oils, chemical composition, biological activities

1. Introduction

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The attraction of medicinal and aromatic plants is continuously growing due to increasing consumers demand and interest in these plants for culinary, medicinal, and other anthropogenic applications.

As consumers are becoming more and more informed about issues of food, health, and nutrition, they are also becoming aware of the benefits and potential applications of medicinal and aromatic plants and their metabolites. These plants produce a large variety of secondary metabolites; among them, essential oils.

Despite their rich and complex composition, the use of essential oils remains wide and limited to the cosmetics and perfumery domains. It is worthy to develop a better understanding of their chemistry and the biological properties of these extracts and their individual components for new and valuable applications in human health, agriculture, and the environment. Essential oils could be exploited as effective alternatives or complements to synthetic compounds of the chemical industry, without inducing the same secondary effects.

2. Definition of Essential Oils

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The term essential oil dates back to the sixteenth century and derives from the drug *Quinta essentia*, named by Paracelsus von Hohenheim of Switzerland [1]. Essential oils or "essences" owe their name to their flammability. Numerous authors have attempted to provide a definition of essential oils. The French Agency for Normalization: Agence Française de Normalisation (AFNOR) gives the following definition (NF T 75-006): "The essential oil is the product obtained from a vegetable raw material, either by steam distillation or by mechanical processes from the epicarp of Citrus, or "dry" distillation. The essential oil is then separated from the aqueous phase by physical means [2]. This definition encompasses products obtained always from vegetable raw material, but using other extraction methods, such as using non-aqueous solvents or cold absorption. Thus, we can define four types of products [2].

Essential oils are soluble in alcohol, ether, and fixed oils, but insoluble in water. These volatile oils are generally liquid and colorless at room temperature. They have a characteristic odor, are usually liquid at room temperature and have a density less than unity, with the exception of a few cases (cinnamon, sassafras, and vetiver). They have a refractive index and a very high optical activity. These volatile oils contained in herbs are responsible for different scents that plants emit. They are widely used in the cosmetics industry, perfumery, and also aromatherapy. The latter is intended as a therapeutic technique including massage, inhalations, or baths using these volatile oils. The last key will serve as chemical signals allowing the plant to control or regulate its environment (ecological role): attraction of pollinating insects, repellent to predators, inhibition of seed germination, or communication between plants (emission signals chemically signaling the presence of herbivores).

for example). Moreover, EOs also possess antifungal or insecticide and deterrent activities. All parts of aromatic plants may contain essential oils as follows:

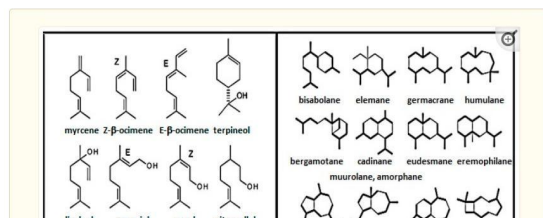
- Flowers, of course, including: orange, pink, lavender, and the (clove) flower bud or (ylang-ylang) bracts,
- Leaves, most often, including: eucalyptus, mint, thyme, bay leaf, savory, sage, pine needles, and tree underground organs, e.g., roots (vetiver),
- Rhizomes (ginger, sweet flag),
- Seeds (carvi, coriander),
- Fruits, including: fennel, anise, Citrus epicarps,
- Wood and bark, including: cinnamon, sandalwood, rosewood.

3. Chemistry of Essential Oils

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Essential oils are produced by various differentiated structures, especially the number and characteristics of which are highly variable. Essential oils are localized in the cytoplasm of certain plant cell secretions, which lies in one or more organs of the plant; namely, the secretory hairs or trichomes, epidermal cells, internal secretory cells, and the secretory pockets. These oils are complex mixtures that may contain over 300 different compounds [4]. They consist of organic volatile compounds, generally of low molecular weight below 300. Their vapor pressure at atmospheric pressure and at room temperature is sufficiently high so that they are found partly in the vapor state [5,6]. These volatile compounds belong to various chemical classes: alcohols, ethers or oxides, aldehydes, ketones, esters, amines, amides, phenols, heterocycles, and mainly the terpenes. Alcohols, aldehydes, and ketones offer a wide variety of aromatic notes, such as fruity ((E)-nerolidol), floral (Linalool), citrus (Limonene), herbal (γ -selinene), etc.

Furthermore, essential oil components belong mainly to the vast majority of the terpene family (Figure 1). Many thousands of compounds belonging to the family of terpenes have so far been identified in essential oils [7], such as functionalized derivatives of alcohols (geraniol, α -bisabolol), ketones (menthone, *p*-vetivone) of aldehydes (citronellal, sinensal), esters (γ -terpinyl acetate, cedryl acetate), and phenols (thymol).



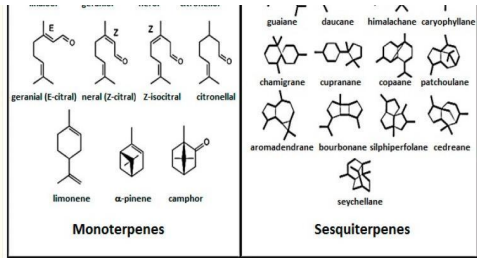
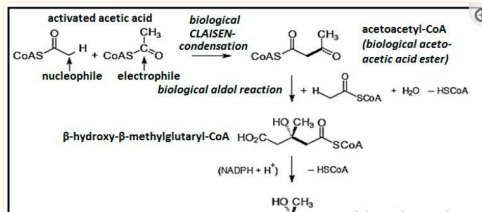


Figure 1

Structures of some terpenes.

essential oils also contain non-terpene compounds biogenerated by the phenylpropanoids pathway, such as eugenol, cinnamaldehyde, and safrole.

Genetically, terpenoids and phenylpropanoids have different primary metabolic precursors and are generated through different biosynthetic routes (Figure 2). The pathways involved in terpenoids are the mevalonate and mevalonate-independent (deoxyxylulose phosphate) pathways, whereas phenylpropanoids originate through the shikimate pathway [8,9]. Some authors have reviewed the biosynthetic pathways of terpenoids and phenylpropanoids, respectively, the enzymes and enzymatic mechanisms involved, and information about genes encoding for these enzymes [8,9].



Essential oils have a very high variability of their composition, both in qualitative and quantitative

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anisms. Various factors are responsible for this variability and can be grouped into two categories: **ca** and **ins**. **ca** (intrinsic factors related to the plant, and interaction with the environment (soil type and climate, etc.) and the maturity of the plant concerned, even at harvest time during the day, EO) **ins** (Extrinsic factors related to the extraction method and the environment). **ins** (intrinsic factors that determine essential oil yield and composition are numerous. In some cases, it is difficult to isolate these factors from each other as they are interrelated and influence each other. These parameters include the seasonal variations, plant organ, and degree of maturity of the plant, geographic origin, and genetics [10,11,12]. It is important to mention that several techniques are used for the trapping of volatiles from aromatic plants. The most often used device is the circulatory distillation apparatus described by Cocking and Middleton [13] introduced in the European Pharmacopoeia and several other pharmacopoeias. This device consists of a heated round-bottom flask into which the chopped plant material and water are placed and which is connected to a vertical condenser and a graduated tube, for the volumetric determination of the oil. At the end of the distillation process, the essential oil is separated from the water phase for further investigations. The length of distillation depends on the plant material to be investigated. It is usually fixed to 3–4 h. This device was further improved by the development of a simultaneous distillation–solvent extraction process by Likens and Nickerson in 1964 [14]. The device permits continuous concentration of essential oils during hydrodistillation in one step using a closed-circuit distillation system.

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hly **ca** [Antibacterial Activity](#)

Th **ca** (antimicrobial properties of essential oils and of their constituents have been considered [15,16]) **ca** (the mechanism of action has been studied in detail [17]. An important feature of essential oils is their hydrophobicity, which allows them to partition into lipids of the cell membrane of bacteria, disrupting the structure, and making it more permeable [18]. This can then cause leakage of ions from *Staphylococcus aureus*, and *Helicobacter pylori* [31,32]. Other families of compounds also have valuable antibacterial properties: certain alcohols, aldehydes, and ketones, monoterpene (geraniol, linalol, menthol, terpineol, thujanol, myrcenol, citronellal, neral, thujone, camphor, carvone, etc.), phenylpropanes (cinnamaldehyde), and monoterpenes (γ -terpinene, *p*-cymene). Among these compounds, carvacrol is the most active. Known to be non-toxic, it is used as a preservative and food flavoring in drinks, sweets, and other preparations.

It is important to mention that essential oils are more active against Gram-positive than Gram-negative bacteria [33,34,35,36,37]. The latter are less susceptible to the action of essential oils with the outer membrane surrounding the cell wall that restricts the diffusion of hydrophobic compounds through its lipopolysaccharide film [36]. Furthermore, the antibacterial activity of essential oils related to their chemical composition, the proportions of volatile molecules, and their interactions [28,33,37].

An additive effect is observed when the combination is equal to the sum of the individual effects. Antagonism is observed when the effect of one or both compounds is less important when they are tested together than when used individually [38].

A synergistic effect is observed when the combination of substances is greater than the sum of the individual effects [39]. Some studies have shown that the use of the whole essential oil provides an effect which is greater than that of the major components used together [40]. This suggests that minor components are essential for activity and may have a synergistic effect.

It has been reported additive and synergistic effects of the combinations of 1,8-cineole and aromadendrene against methicillin-resistant *Staphylococcus aureus* (MRSA) and vancomycin-resistant enterococci (VRE) and *Enterococcus faecalis* by using checkerboard and time-kill assays, respectively [41]. The combined effects of plant volatile oils and benzoic acid derivatives against *L. monocytogenes* and *S. enteritidis* are considered as synergistic since the combined components allowed ≥ 10 higher inhibition than the sum of the inhibitory effects of the components used separately [42]. Increased antifungal effects were caused by combinations (1:5, 1:7, and 1:9) of essential oils of *S. aromaticum* (clove) and *Rosmarinus officinalis* against *C. albicans* [43]. Moreover, Lambert et al. (2001) [12] reported that, combined, carvacrol and thymol showed additive effects against *S. aureus* and *P. aeruginosa* by using half-fold dilutions within the Bioscreen plat.

Two hypotheses have been proposed to explain synergistic effects of cinnamaldehyde/thymol or cinnamaldehyde/carvacrol against *S. typhimurium*: proving, on one hand, that thymol or carvacrol could increase the permeability of the cytoplasmic membrane, and probably enable cinnamaldehyde to be more easily transported into the cell, and, on the other hand, that thymol or carvacrol could increase the number, size, or duration of the existence of the pores created by the binding of cinnamaldehyde to proteins in the cell membrane [44]. These facts justify a synergistic effect achieved when these two components are used in combination. Mechanisms of interaction that produced antagonistic effects were less studied [45].

In addition, essential oils have also revealed to be effective on the inhibition of growth and reduction in numbers of the more serious foodborne pathogens, such as *Salmonella* spp., *E. coli* O157:H7, and *Listeria monocytogenes* [42].

4.2. Antioxidant Activity

Numerous studies have demonstrated the antioxidant properties of essential oils. The antioxidant potential of an essential oil depends on its composition. It is well established that phenolics and secondary metabolites with conjugated double bonds usually show substantial antioxidative properties [46]. Most of the essential oils are dominated by oxygenated monoterpenes such as alcohols (*Achillea filipendulina*), aldehydes (*Galagania fragrantissima*), ketones (*Anethum graveolens*, *Artemisia ratifolia*, *Hyssopus seravschanicus*, *Mentha longifolia*, and *Ziziphora clinopodioides*), and esters (*Salvia sclarea*), *Artemisia absinthium* and *Artemisia scoparia* predominantly contain monoterpene hydrocarbons, whereas phenolic terpenoids, such as thymol or carvacrol, characterize *Oriaanum tyttanthum* and *Mentha lonaifolia* EOs, which would explain why

both plants exhibited generally the strongest antioxidant activity. Thymol and carvacrol, which are predominant in *Origanum tyranthum*, are also responsible for the antioxidant activity of several other essential oils, such as *Mentha longifolia* and *Thymus serpyllus* [47].

The essential oils of cinnamon, nutmeg, clove, basil, parsley, oregano, and thyme are characterized by the most important antioxidant properties [42]. Thymol and carvacrol are the most active compounds. Their activity is related to their phenolic structure. These phenolic compounds have redox properties and, thus, play an important role in neutralizing free radicals and also in peroxide decomposition [40]. The antioxidant activity of essential oils is also due to certain alcohols, ethers, ketones, aldehydes, and monoterpenes: linalool, 1,8-Cineole, geranial/neral, citronellal, isomenthone, menthone, and some monoterpenes: α -Terpinene, β -Terpinene and α -Terpinolene [43].

Essential oils with important scavenging capacity of free radicals may play an important role in some disease prevention, such as brain dysfunction, cancer, heart disease, and immune system decline. In fact, these diseases may result from cellular damage caused by free radicals [43,44].

EOs have shown their action as hepatoprotective agents in ageing polyunsaturated fatty acids mammals and it has been proved that they possess a beneficial impact upon the PUFAs, in particular the long chain C20 and C22 acids [48]. Moreover, essential oils being able to scavenge free radicals may also play an important role in some disease prevention, such as brain dysfunction, cancer, heart disease, and immune system decline [49].

Shariffar et al. (2011) [50] evaluated the antioxidant activity of *Zataria multiflora* Boiss. (Lamiaceae) essential oil in rats. Antioxidant activity was measured by the test of 1,1-diphenyl-2-picrylhydrazyl (DPPH) radical inhibition and inhibition of lipid peroxidation by measuring the index of thiobarbituric acid reactive substances (TBARs). Three doses of 100, 200, and 400 μ L/kg were administered to animals by intra gastric intubation (ig) routh for 10 days. The blood was collected in eleventh day through direct puncture and the liver was rapidly excised. The histopathology studies of the animals were compared to animals in butylated hydroxyl toluene (BHT) group. The authors reported that all *Zataria multiflora* oils ZMO tested doses were able to scavenge DPPH radical ($p < 0.05$). Moreover, ZMO decreased TBARs in a dose-dependent manner. No alteration in liver function test LFT enzymes or changes in histopathology of the liver was considered in ZMO treated groups. The results indicated that ZMO might be used in human healthy and food industry.

According to Manjanalai and Grace [51], essential oil of *Wedelia chinensis* (Osbeck) increases both the level of catalase and glutathione peroxidase in the lung and liver tissues, whereas in the serum the level of catalase decreased on the 22nd day (2.32 ± 0.016 Lung tissue 6.47 ± 0.060 liver tissue, 0.94 ± 0.007 serum). Furthermore, the level of Glutathione Peroxidase GPx in the liver (the range) was found to be decreased in the EO-treated group compared to the cancer-induced group and control group, whereas the level of GPx in the lung tissue was found to be low (76.2 ± 1.66).

4.3. Anti-Inflammatory Activity

Inflammation is a normal protective response induced by tissue injury or infection and functions to

combat invaders in the body (microorganisms and non-self cells) and to remove dead or damaged host cells. The inflammatory response induces an increase of permeability of endothelial lining cells and influxes of blood leukocytes into the interstitium, oxidative burst, and release of cytokines, such as interleukins and tumor necrosis factor- α (TNF- α). It also stimulates the activity of several enzymes (oxygenases, nitric oxide synthases, peroxidases, etc.), as well as the arachidonic acid metabolism. Recently, essential oils have been used in clinical settings to treat inflammatory diseases, such as rheumatism, allergies, or arthritis [45]. *Melaleuca alternifolia* EO was reported to have a considerable anti-inflammatory activity [46,47,48]. This activity is correlated with its major compound: α -terpineol [49]. The active compounds act by inhibiting the release of histamine or reducing the production of inflammation mediators. Geranium essential oil is another example [45]. Linalool and linalyl acetate showed anti-inflammatory activity on oedema of paw-induced mouse carrageenan [50]. Yoon et al. [52] reported that the oils of *Torreya nucifera* Siebold et Zucc. oil, mainly constituted by limonene, δ -3-carene, and α -pinene, have an inhibitory effect on COX-2, thus inducing a significant inhibitory effect on prostaglandin (PGE2) production. Furthermore, 1,8-cineole, present in many essential oils, was reported as an inhibitor of leukotrienes (LTB4) and PGE2, biogenerated both from pathways of arachidonic acid metabolism [52].

The anti-inflammatory activity of essential oils may be attributed not only to their antioxidant activities but also to their interactions with signaling cascades involving cytokines and regulatory transcription factors, and on the expression of pro-inflammatory genes. Essential oils, therefore, represent a new option in the treatment of inflammatory diseases.

4.4. Cancer Chemoprotective Activity

The varied therapeutic potential of essential oils attracted, in recent years, the attention of researchers for their potential activity against cancer: They and their volatile constituents of the studies target the discovery of new anticancer natural products [41]. Essential oils would act in the prevention of cancer, as well as at its removal. It is well known that certain foods, such as garlic and turmeric, are good sources of anticancer agents [53]. Garlic essential oil is a source of sulfur compounds recognized for their preventive effect against cancer [54,55]. Diallylsulfide, diallyldisulfide, and diallyltrisulfide are examples. According to Wu et al. [56], these compounds activate, in rats, the enzymes involved in the detoxification process of hepatic phase 1 (disintegration of chemical bonds that link carcinogenic toxins to each other) and phase 2 (bonds to toxins released detoxifying enzymes, such as glutathione S-transferase).

Metabolism happens mainly in the liver, the body's largest internal organ. The portal vein carries blood from the small intestine directly to the liver. Sixty percent of liver tissue is made up of hepatic cells. More chemical processes happen in these than in any other group of cells in the body. Phase 1 metabolism involves chemical reactions, such as oxidation (most common), reduction, and hydrolysis. There are three possible results of phase 1 metabolism. The drug becomes completely inactive. In other words, the metabolites are pharmacologically inactive. One or more of the metabolites are pharmacologically active, but less so than the original drug. The original substance is not pharmacologically active, but one of its metabolites is. The original substance is called a prodrug.

Phase 2 metabolism involves reactions that chemically change the drug or phase 1 metabolites into compounds that are soluble enough to be excreted in urine. In these reactions, the molecule (drug or metabolite) is attached to an ionisable grouping. This is called conjugation and the product is called a conjugate. Metabolites formed in phase 2 are unlikely to be pharmacologically active. Some drugs undergo either phase 1 or phase 2 metabolism, but most undergo phase 1 metabolism followed by phase 2 metabolism.

Another example is myristicin, an allylbenzene present on a certain essential oil, especially that of nutmeg (*Myristica fragrans*). This molecule is known to activate glutathione S-transferase in mice [57] and inhibit carcinogenesis induced by benzo(a)pyrene in the lungs of mice [58]. Recently, it has been discovered that myristicin induces apoptosis in neuroblastoma (SK-N-SH) in humans [58]. There are other volatile compounds that showed a cytotoxic activity against various cancer cell lines [43]. Geraniol decreases the resistance of colon cancer cells (TC118) to 5-fluorouracil, an anticancer agent. Therefore, geraniol enhances this inhibitory effect of tumour growth 5-fluorouracil [59,60]. The essential oil of balsam fir and α -Humulene, showed significant anticancer activity in several cell lines and low toxicity to healthy cells [61].

In addition, anticancer activity of D-limonene, the main component of Citrus essential oil has been proven, especially at the level of stomach cancer and liver [62]. The α -Bisabolol, an abundant sesquiterpene alcohol in chamomile essential oil (*Matricaria*), has an antitumour activity [63]. Many essential oils have a cytotoxic activity namely *Melissa officinalis* [64], *Melaleuca alternifolia* [65], *Artemisia annua* [66], and *Comptonia peregrina* [67].

4.5. Cytotoxicity

Due to their complex chemical composition, essential oils have no specific cellular ligands [24]. As lipophilic mixtures, they are able to cross the cell membrane and degrade the layers of polysaccharides, phospholipids and fatty acids, and permeabilize. This cytotoxicity appears to include such membrane damage. In bacteria, the membrane permeabilization is associated with the loss of ions and the reduction of the membrane potential, the collapse of the proton pump and the depletion of the ATP pool [22,68,69,70]. Essential oils may coagulate the cytoplasm [17] and damage lipids and proteins [22,40]. Damage to the wall and the cell membrane can lead to the leakage of macromolecules and lysis [17,20,71].

In addition, essential oils change membrane fluidity, which becomes abnormally permeable, resulting in a leakage of radicals, cytochrome C, the Ca^{2+} ions, and proteins, like in the case of oxidative stress. This permeabilization of the outer and inner membranes causes cell death by apoptosis and necrosis [72-74]. Ultrastructural alteration of the cell can be observed at a plurality of compartments [54,74,75]. The interruption of the viral envelope herpes simplex virus HSV by essential oils can also be observed by electron microscopy [76]. The induction of membrane damage was also confirmed by an analysis showing that microtubule *Saccharomyces cerevisiae* genes involved in the biosynthesis of ergosterol, the absorption of sterols, lipid metabolism, the structure and function of cell wall cellular detoxification, and transport are affected by treatment with α -terpinene [77].

Recent work on the yeast *Saccharomyces cerevisiae*, has shown that the cytotoxicity of some essential oils based on the ability to form colonies differs significantly in relation to their chemical composition. Generally, essential oil cytotoxicity mainly correlates to the presence of phenols, alcohols, and monoterpene aldehydes [78,79]. The cytotoxic properties of essential oils are of great importance because they assume their use not only against certain human pathogens and animal parasites, but also in the preservation of agricultural and marine products against microbial attack. Indeed, some components of essential oils are effective against a variety of microorganisms as bacteria [80], viruses [81], fungi [77,82,83,84], protozoa [85], parasites [86,87,88], mites, and others.

In addition, α -humulene shows cytotoxicity against breast cancer cells in vitro. α -humulene was reported to be responsible for cytotoxicity (IC_{50} 55 nM) [89]. It induced a dose- and time-dependent decrease in cellular glutathione (GSH) content and an increase in reactive oxygen species (ROS) production.

Furthermore, Zeytinoglu et al. [90], focusing on the effects of carvacrol, one of the main compounds in the EO of oregano, on the DNA synthesis of *N*-ras transformed mouse myoblast CO25 cells, finding that this monoterpene phenol was able to inhibit the DNA synthesis in the growth medium and ras-activating medium, which contained dexamethasone. They proposed that it may be valuable in cancer therapy because of its growth inhibition of myoblast cells, even after activation of mutated *N*-ras-oncogene.

The EO of the Anonaceae *Xylopiya aethiopica* (Ethiopian pepper), a plant grown in Nigeria, showed, at a concentration of 5 mg/mL, a cytotoxic effect in the carcinoma cell line (Hep-2) [91].

Moreover, Yu et al. [92] tested the essential oil of the rhizome of the *Aristolochiaceae* *Aristolochia mollissima* for its cytotoxicity on four human cancer cell lines (ACHN, Bel-7402, Hep G2, HeLa). The rhizome oil possessed a significantly greater cytotoxic effect on these cell lines than the oil extracted from the aerial plant.

Linalool inhibited only moderate cell proliferation; however, in subtoxic concentrations potentiates doxorubicin-induced cytotoxicity and proapoptotic effects in both cell lines, MCF7 WT and MCF7 AdR. This monoterpene improves the therapeutic index in the management of breast cancer, especially multidrug resistance (MDR) tumors [93].

An in vitro cytotoxicity assay indicated that the EO of *Cyperus rotundus* (Cyperaceae) characterized by the predominance of cyperene, α -Cyperone, isolongifolen-5-one, rotundene, and cyperorotundene, was very effective against L1210 leukemia cells, which correlates with significantly increased apoptotic DNA fragmentation [94].

4.6. Allelopathic Activity

According to the International Allelopathy Society (IAS), allelopathy was defined in 1996 as "The science that studies any process involving secondary metabolites produced by plants, algae, bacteria

and fungi that influences the growth and development of agricultural and biological systems. Allelopathic interactions derive from the production of secondary metabolites. The secondary metabolites are synthesized for a wide range of defense by plant and microorganisms. The secondary metabolites involved are called allelochemicals [95].

Volatile oils and their constituents are being explored for weed and pest management, and are viewed as an important source of lead molecules in agriculture [96]. Bioactive terpenoids constitute an important part of the defensive mechanisms of a large number of organisms and represent a fairly untapped source of active compounds of potential use both in the agricultural field [97]. In fact, a large number of highly phytotoxic allelochemicals are derived from the terpenoid pathway [98] and the phytotoxicity of essential oils has been investigated [98,99,100,101]. The allelopathic activity of *Melaleuca alternifolia* (Maiden and Betche) Cheel (tea tree) essential oil was investigated by Angelini et al., [101] against *Trichoderma harzianum*, which is a fungal contaminant that causes extensive losses in the cultivation of *Pleurotus* species. This essential oil has, in vitro, an allelopathic ability to control *Trichoderma harzianum*. The antifungal activity of *M. alternifolia* essential oil and antagonist activities between *Pleurotus* species against three *T. Harzianum* strains were studied in dual-culture experiments done with different concentrations.

Santos et al. [102] reported that leaves' and rhizomes' EOs caused a decrease in dry matter. They also reported a reduction of shoot length in lettuce seedlings. Evaluating the effect of these EOs on the germination and vigor of the lettuce seedlings, they noticed a reduction of these parameters and concluded that rhizomes' oil caused a greater reduction in all of the variables than the oil from the leaves.

Portulaca oleracea seeds' germination and growth were significantly decreased by the treatment with rosemary EO [103]. These authors reported that a concentration of 1000 ppm of this oil, rosemary decreased *Portulaca oleracea* seed germination to 76 percent. They also noted that Artemisia and lavender essential oils have strong allelopathic effects and prevents weed germination and growth of *Portulaca oleracea*, which would be a promising result in the organic cultivation of crops to be followed, and it can be used in the production of herbicides with natural origin.

Furthermore, de Oliveira et al. [104] reported that *Callistemon viminalis* EO affected the growth of lettuce seedlings and caused a reduction in the length of shoots and the root system. This reduction was proportional to the EO concentration.

The results of the research of Saad and Abdelgaleil [105] revealed a correlation between EOs chemical composition and their effects on germination and seedling growth. It was reported that the most active compounds belonged to the groups of ketones and alcohols and were followed by the group of aldehydes and phenols [106]. Moreover, Kotan et al. [107] suggested that, in general, a potent phytotoxic activity of plant EOs is correlated to a high amount of oxygenated monoterpenes.

Almost all the effective oils had high percentages of oxygenated monoterpenes and this was in agreement with previous work of de Almeida et al. and Vokou et al. [108,109].

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Dudaí et al. [102] reported that monoterpenes act on seeds at very low levels. In particular, among the Lamiaceae family, many species release phytotoxic monoterpenes that hinder the development of herbaceous species, including pinene, limonene, *p*-Cymene, and 1,8-cineole [101]. Moreover, it is well known that monoterpenes in the essential oils have phytotoxic effects that may cause anatomical and physiological changes in plant seedlings leading to accumulation of lipid globules in the cytoplasm, reduction in some organelles such as mitochondria, possibly due to inhibition of DNA synthesis or disruption of membranes surrounding mitochondria and nuclei [110,111]. Since the continued use of synthetic herbicides may threaten sustainable agricultural production and result in serious ecological and environmental problems, essential oils with allelopathic properties could be exploited as in alternative strategies leading to the development of biodegradable and non-toxic compounds [112].

4.7. Repellent and Insecticidal Activity

Essential oils constitute a rich bank of structurally-diverse compounds with a variety of insecticidal and repellent mechanisms. Numerous studies have demonstrated that these compounds, as well as their parent blends, possess biological activity capable of eliciting adverse effects in arthropod pests. Several factors affecting the commercialization of plant essential oil extracts as repellents include regulatory requirements, intellectual property value, biological activity, product performance, and product quality [113].

The toxic effect of essential oils was not only suitable for granary insects but also for flying insects: *Gaultheria* (Ericaceae) and *Eucalyptus* (Myrtaceae) oils exhibited very high killing power on insects, such as the rice weevil *Sitophilus oryzae*, the beetles *Callosobruchus chinensis* (Coleoptera: Bruchidae) and *S. paniceum*, and also on *M. domestica* [114]. Actually, the activities of essential oils on species are manifold. *Mentha*, *Lavandula* (Lamiaceae), or *Pinus* (Pinaceae) essential oils were noted for their toxicity against *Myzus persicae* (Homoptera: Aphididae) and the greenhouse white fly *Trialeurodes vaporariorum* (Homoptera: Aleyrodidae), as well as the Colorado beetle *Leptinotarsa decemlineata* (Coleoptera: Chrysomelidae) and the pear bug *Stephanitis pyri* (Hymenoptera: Stephanidae) [115].

Commonly, essential oils can be inhaled, ingested, or skin-absorbed by insects. The fumigant toxicity of essential oils and their main components, the volatile monoterpenes, has been described [116]. Insects were also very sensitive to topical applications *Sitophilus zeamais* (Coleoptera: Curculionidae), *Tribolium castaneum* and *Prostephanus truncatus* (Coleoptera: Bostrychidae) reacted to citrus (Rutaceae) essential oils. *Pediculus capitis* (Anoplura: Pediculidae), *Anopheles funestus* (Diptera: Culicidae), *Cimex lectularius* (Hemiptera: Cimicidae), and *Periplaneta orientalis* (Dictyoptera: Blattellidae) were killed by contact with *Eucalyptus saligna* (Myrtaceae) oil within 2 to 30 min.

Essential oils belonging to plants in the citronella genus (*Poaceae*) are commonly used as ingredients of plant-based mosquito repellents, mainly *Cymbopogon nardus*, which is sold in Europe and North America in commercial preparations [117].

5. Conclusions

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Thanks to their numerous biological activities, essential oils have to be valorized via several domains, mainly human health, green chemistry, and sustainable agriculture. However; numerous investigations should be carried out on their mode of action and their probable toxicological effects in order to optimize their potential uses.

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Mohamed Soufiene Mnif

Author Contributions Go to: ▶

Wissal Dhifi and Wissem Mnif conceived and designed the paper. Wissal Dhifi, Sama Bellili, Sabine Jazi and Nada Bahloul wrote the paper. Wissem Mnif re-viewed the manuscript.

Conflicts of Interest Go to: ▶

The authors declare no conflict of interest.

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Chapter 36
Industrial Application of Essential Oils

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Book Editor(s) Muhammad

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Essential Oils: Extraction Methods and Applications

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Summary

Consumers have become increasingly interested in natural commodities as solutions to artificial ingredients or pharmacologically relevant chemicals in recent years. Essential oils have gained prominence in the food, cosmetics, and pharmaceutical industries, among others. Food safety and sustainability during preparation, transportation, and storage are now required for modern food management. The bioactivities of essential oils (EOs), which are significant fragrant components of spices and herbs, have been known and used in medication, food preservation, seasoning, and perfume since ancient times. This chapter introduces the origin, composition, extraction techniques, and commercial applications of essential oils. Antimicrobial property, food security, extension of shelf life, pharmacological, aromatherapy, and pest control management are among the applications. Essential oils are mentioned for their therapeutic benefits in massage treatments as well as their application as natural skin permeation enhancers for drug administration systems. Recent breakthroughs in the application and alternative fruit and food degradation methods were highlighted, particularly secondary metabolites of plants as fruit preservatives, pharmaceutical use of essential oils, and their antimicrobial scavenger properties. Essential oil components and derivatives are thought to be a viable alternative for controlling a variety of dangerous insects. Their quick disintegration in the environment has improved selectivity, favoring helpful insects.

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Class 3

Toiletry and sanitary preparations, as well as general cleaning preparations, are usually in Class 3, the main exception being when they are used for medical purposes, in which case they are in Cl_5.

There are in fact a number of preparations which could possibly be included in other classes that are classified in Class 3 when they are used for cosmetic, cleaning or laundry purposes. For example, ammonia is in Cl_1 when used for industrial purposes but in Class 3 when used as a detergent, and lotions can be in Cl_5 when used for pharmaceutical purposes but in Class 3 when used for cosmetic purposes. Some products, however, are always in Class 3 regardless of purpose, such as essential oils and perfumes.

Goods used for personal hygiene or sanitary purposes can be classified in either Class 3 or Cl_5 depending on their nature or function. Thus, whilst soaps and shampoos in general belong to Class 3, medicated soaps and shampoos are in Cl_5. Similarly, products intended for use with animals can be divided in the same way so shampoos for animals are in Class 3 but medicated and insecticidal shampoos for animals are in Cl_5.

Class 3 largely consists of *preparations*. However, there are some consumer articles included in this class when they are used for one of the Class 3 purposes or impregnated with a Class 3 preparation, for example, abrasive paper, alum stones, pumice stones, or cloths impregnated with cosmetic lotions or a detergent for cleaning. Articles such as cotton sticks are classified according to their purpose, hence in Class 3 when for cosmetic purposes but in Cl_5 when for medical purposes.

It should also be noted that, generally, Class 3 does not include apparatus. Cosmetic utensils and cleaning articles for household purposes, such as toothbrushes, combs and dishcloths, are more commonly classified in Cl_21.

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General Remarks

The indications of goods or services appearing in the class headings are general indications relating to the fields to which, in principle, the goods or services belong. The Alphabetical List should therefore be consulted in order to ascertain the exact classification of each individual product or service.

GOODS

If a product cannot be classified with the aid of the List of Classes, the Explanatory Notes and the Alphabetical List, the following remarks set forth the criteria to be applied:

- a. A finished product is in principle classified according to its function or purpose. If the function or purpose of a finished product is not mentioned in any class heading, the finished product is classified by analogy with other comparable finished products, indicated in the Alphabetical List. If none is found, other subsidiary criteria, such as that of the material of which the product is made or its mode of operation, are applied.
- b. A finished product which is a multipurpose composite object (e.g., clocks incorporating radios) may be classified in all classes that correspond to any of its functions or intended purposes. If those functions or purposes are not mentioned in any class heading, other criteria, indicated under (a), above, are to be applied.
- c. Raw materials, unworked or semi-worked, are in principle classified according to the material of which they consist.
- d. Goods intended to form part of another product are in principle classified in the same class as that product only in cases where the same type of goods cannot normally be used for another purpose. In all other cases, the criterion indicated under (a), above, applies.
- e. When a product, whether finished or not, is classified according to the material of which it is made, and it is made of different materials, the product is in principle classified according to the material which predominates.
- f. Cases adapted to the product they are intended to contain are in principle classified in the same class as the product.

SERVICES

If a service cannot be classified with the aid of the List of Classes, the Explanatory Notes and the Alphabetical List, the following remarks set forth the criteria to be applied:

- a. Services are in principle classified according to the branches of activities specified in the headings of the service classes and in their Explanatory Notes or, if not specified, by analogy with other comparable services indicated in the Alphabetical List.
- b. Rental services are in principle classified in the same classes as the services provided by means of the rented objects (e.g., Rental of telephones, covered by Cl. 38). Leasing services are analogous to rental services and therefore should be classified in the same way. However, hire- or lease-purchase financing is classified in Cl. 36 as a financial service.
- c. Services that provide advice, information or consultation are in principle classified in the same classes as the services that correspond to the subject matter of the advice, information or consultation, e.g., transportation consultancy (Cl. 39), business management consultancy (Cl. 35), financial consultancy (Cl. 36), beauty consultancy (Cl. 44). The rendering of the advice, information or consultancy by electronic means (e.g., telephone, computer) does not affect the classification of these services.
- d. Services rendered in the framework of franchising are in principle classified in the same class as the particular services provided by the franchisor (e.g., business advice relating to franchising (Cl. 35), financing services relating to franchising (Cl. 36), legal services relating to franchising (Cl. 45)).

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General Remarks

The indications of goods or services appearing in the class headings are general indications relating to the fields to which, in principle, the goods or services belong. The Alphabetical List should therefore be consulted in order to ascertain the exact classification of each individual product or service.

GOODS

If a product cannot be classified with the aid of the List of Classes, the Explanatory Notes and the Alphabetical List, the following remarks set forth the criteria to be applied:

- a. A finished product is in principle classified according to its function or purpose. If the function or purpose of a finished product is not mentioned in any class heading, the finished product is classified by analogy with other comparable finished products, indicated in the Alphabetical List. If none is found, other subsidiary criteria, such as that of the material of which the product is made or its mode of operation, are applied.
- b. A finished product which is a multipurpose composite object (e.g., clocks incorporating radios) may be classified in all classes that correspond to any of its functions or intended purposes. If those functions or purposes are not mentioned in any class heading, other criteria, indicated under (a), above, are to be applied.
- c. Raw materials, unworked or semi-worked, are in principle classified according to the material of which they consist.
- d. Goods intended to form part of another product are in principle classified in the same class as that product only in cases where the same type of goods cannot normally be used for another purpose. In all other cases, the criterion indicated under (a), above, applies.
- e. When a product, whether finished or not, is classified according to the material of which it is made, and it is made of different materials, the product is in principle classified according to the material which predominates.
- f. Cases adapted to the product they are intended to contain are in principle classified in the same class as the product.

SERVICES

If a service cannot be classified with the aid of the List of Classes, the Explanatory Notes and the Alphabetical List, the following remarks set forth the criteria to be applied:

- a. Services are in principle classified according to the branches of activities specified in the headings of the service classes and in their Explanatory Notes or, if not specified, by analogy with other comparable services indicated in the Alphabetical List.
- b. Rental services are in principle classified in the same classes as the services provided by means of the rented objects (e.g., Rental of telephones, covered by Cl. 38). Leasing services are analogous to rental services and therefore should be classified in the same way. However, hire- or lease-purchase financing is classified in Cl. 36 as a financial service.
- c. Services that provide advice, information or consultation are in principle classified in the same classes as the services that correspond to the subject matter of the advice, information or consultation, e.g., transportation consultancy (Cl. 39), business management consultancy (Cl. 35), financial consultancy (Cl. 36), beauty consultancy (Cl. 44). The rendering of the advice, information or consultancy by electronic means (e.g., telephone, computer) does not affect the classification of these services.
- d. Services rendered in the framework of franchising are in principle classified in the same class as the particular services provided by the franchisor (e.g., business advice relating to franchising (Cl. 35), financing services relating to franchising (Cl. 36), legal services relating to franchising (Cl. 45)).

Drugs@FDA Glossary of Terms

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A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

Content current as of: 11/14/2017

Abbreviated New Drug Application (ANDA)

An Abbreviated New Drug Application (ANDA) contains data that, when submitted to FDA's Center for Drug Evaluation and Research, Office of Generic Drugs, provides for the review and ultimate approval of a generic drug product. Generic drug applications are called "abbreviated" because they are generally not required to include preclinical (animal) and clinical (human) data to establish safety and effectiveness. Instead, a generic applicant must scientifically demonstrate that its product is bioequivalent (i.e., performs in the same manner as the innovator drug). Once approved, an applicant may manufacture and market the generic drug product to provide a safe, effective, low cost alternative to the American public.

Abbreviated New Drug Application (ANDA) Number

This six-digit number is assigned by FDA staff to each application for approval to market a generic drug in the United States.

Active Ingredient

An active ingredient is any component that provides pharmacological activity or other direct effect in the diagnosis, cure, mitigation, treatment, or prevention of disease, or to affect the structure or any function of the body of man or animals.

Approval History

The approval history is a chronological list of all FDA actions involving one drug product having a particular FDA Application number (NDA). There are over 50 kinds of approval actions including changes in the labeling, a new route of administration, and a new patient population for a drug product.

Application

See [New Drug Application \(NDA\)](#), [Abbreviated New Drug Application \(ANDA\)](#), or [Biologic License Application \(BLA\)](#)

Approval Letter

An official communication from FDA to a new drug application (NDA) sponsor that allows the commercial marketing of the product.

Application Number

See [FDA Application Number](#)

Biologic License Application (BLA)

Biological products are approved for marketing under the provisions of the Public Health Service (PHS) Act. The Act requires a firm who manufactures a biologic for sale in interstate commerce to hold a license for the product. A biologics license application is a submission that contains specific information on the manufacturing processes, chemistry, pharmacology, clinical pharmacology and the medical affects of the biologic product. If the information provided meets FDA requirements, the application is approved and a license is issued allowing the firm to market the product.

Biological Product

Biological products include a wide range of products such as vaccines, blood and blood components, allergenics, somatic cells, gene therapy, tissues, and recombinant therapeutic proteins. Biologics can be composed of sugars, proteins, or nucleic acids or complex combinations of these substances, or may be living entities such as cells and tissues. Biologics are isolated from a variety of natural sources – human, animal, or microorganism – and may be produced by biotechnology methods and other cutting-edge technologies. Gene-based and cellular biologics, for example, often are at the forefront of biomedical research, and may be used to treat a variety of medical conditions for which no other treatments are available.

In general, the term "drugs" includes [therapeutic biological products](#).

Brand Name Drug

A brand name drug is a drug marketed under a proprietary, trademark-protected name.

Chemical Type

The Chemical Type represents the newness of a drug formulation or a new indication for an existing drug formulation. For example, Chemical Type 1 is assigned to an active ingredient that has never before been marketed in the United States in any form.

Company

The company (also called applicant or sponsor) submits an application to FDA for approval to market a drug product in the United States.

Discontinued Drug Product

Products listed in Drugs@FDA as "discontinued" are approved products that have never been marketed, have been discontinued from marketing, are for military use, are for export only, or have had their approvals withdrawn for reasons other than safety or

efficacy after being discontinued from marketing.

Dosage Form

A dosage form is the physical form in which a drug is produced and dispensed, such as a tablet, a capsule, or an injectable.

Drug

A drug is defined as:

- A substance recognized by an official pharmacopoeia or formulary.
- A substance intended for use in the diagnosis, cure, mitigation, treatment, or prevention of disease.
- A substance (other than food) intended to affect the structure or any function of the body.
- A substance intended for use as a component of a medicine but not a device or a component, part or accessory of a device.
- Biological products are included within this definition and are generally covered by the same laws and regulations, but differences exist regarding their manufacturing processes (chemical process versus biological process.)

Drug Product

The finished dosage form that contains a drug substance, generally, but not necessarily in association with other active or inactive ingredients.

FDA Action Date

The action date tells when an FDA regulatory action, such as an original or supplemental approval, took place.

FDA Application Number

This number, also known as the NDA (New Drug Application) number, is assigned by FDA staff to each application for approval to market a new drug in the United States. One drug can have more than one application number if it has different dosage forms or routes of administration

Generic Drug

A generic drug is the same as a brand name drug in dosage, safety, strength, how it is taken, quality, performance, and intended use. Before approving a generic drug product, FDA requires many rigorous tests and procedures to assure that the generic drug can be substituted for the brand name drug. The FDA bases evaluations of substitutability, or "therapeutic equivalence," of generic drugs on scientific evaluations. By law, a generic drug product must contain the identical amounts of the same active ingredient(s) as the brand name product. Drug products evaluated as "therapeutically equivalent" can be expected to have equal effect and no difference when substituted for the brand name product.

Label

The FDA approved label is the official description of a drug product which includes indication (what the drug is used for); who should take it; adverse events (side effects);

instructions for uses in pregnancy, children, and other populations; and safety information for the patient. Labels are often found inside drug product packaging.

Marketing Status

Marketing status indicates how a drug product is sold in the United States. Drug products in Drugs@FDA are identified as:

- [Prescription](#)
- [Over-the-counter](#)
- [Discontinued](#)
- None - drug products that have been [tentatively approved](#)

Medication Guide

A medication guide contains information for patients on how to safely use a drug product.

NDA (see [New Drug Application](#))

New Drug Application (NDA)

When the sponsor of a new drug believes that enough evidence on the drug's safety and effectiveness has been obtained to meet FDA's requirements for marketing approval, the sponsor submits to FDA a new drug application (NDA). The application must contain data from specific technical viewpoints for review, including chemistry, pharmacology, medical, biopharmaceutics, and statistics. If the NDA is approved, the product may be marketed in the United States. For internal tracking purposes, all NDA's are assigned an NDA number.

New Drug Application (NDA) Number

This six digit number is assigned by FDA staff to each application for approval to market a new drug in the United States. A drug can have more than one application number if it has different dosage forms or routes of administration. In Drugs@FDA, you can find the NDA number under the column named "FDA Application."

NME (see [New Molecular Entity](#))

New Molecular Entity (NME)

An NME is an active ingredient that contains no active moiety that has been previously approved by the Agency in an application submitted under section 505 of the Federal Food, Drug, and Cosmetic Act, or has been previously marketed as a drug in the United States.

Over-the-Counter Drugs (OTC)

FDA defines OTC drugs as safe and effective for use by the general public without a doctor's prescription.

Patient Package Insert (PPI)

A patient package insert contains information for patients' understanding of how to safely use a drug product.

Pharmaceutical Equivalents

FDA considers drug products to be pharmaceutical equivalents if they meet these three criteria:

- they contain the same [active ingredient\(s\)](#)
- they are of the same [dosage form](#) and [route of administration](#)
- they are identical in [strength](#) or concentration

Pharmaceutically equivalent drug products may differ in characteristics such as

- shape
- release mechanism
- labeling (to some extent)
- scoring
- excipients (including colors, flavors, preservatives)

Prescription Drug Product

A prescription drug product requires a doctor's authorization to purchase.

Product Number

A product number is assigned to each drug product associated with an NDA (New Drug Application). If a drug product is available in multiple strengths, there are multiple product numbers.

Reference Listed Drug (see [RLD](#))

Review

A review is the basis of FDA's decision to approve an application. It is a comprehensive analysis of clinical trial data and other information prepared by FDA drug application reviewers. A review is divided into sections on medical analysis, chemistry, clinical pharmacology, biopharmaceutics, pharmacology, statistics, and microbiology.

Review Classification

The NDA and BLA classification system provides a way of describing drug applications upon initial receipt and throughout the review process and prioritizing their review. ([List of Review Classifications and their meanings](#))

RLD (Reference Listed Drug)

A Reference Listed Drug (RLD) is an approved drug product to which new generic versions are compared to show that they are bioequivalent. A drug company seeking approval to market a generic equivalent must refer to the Reference Listed Drug in its [Abbreviated New Drug Application](#) (ANDA). By designating a single reference listed drug as the standard to which all generic versions must be shown to be bioequivalent, FDA hopes to avoid possible significant variations among generic drugs and their brand name counterpart.

Strength

The strength of a drug product tells how much of the active ingredient is present in each

the strength of a drug product that is not listed in the active ingredient is present in each dosage.

Supplement

A supplement is an application to allow a company to make changes in a product that already has an approved new drug application (NDA). CDER must approve all important NDA changes (in packaging or ingredients, for instance) to ensure the conditions originally set for the product are still met.

Supplement Number

A supplement number is associated with an existing FDA New Drug Application (NDA) number. Companies are allowed to make changes to drugs or their labels after they have been approved. To change a label, market a new dosage or strength of a drug, or change the way it manufactures a drug, a company must submit a supplemental new drug application (sNDA). Each sNDA is assigned a number which is usually, but not always, sequential, starting with 001.

Supplement Type

Companies are allowed to make changes to drugs or their labels after they have been approved. To change a label, market a new dosage or strength of a drug, or change the way it manufactures a drug, a company must submit a supplemental new drug application (sNDA). The supplement type refers to the kind of change that was approved by FDA. This includes changes in manufacturing, patient population, and formulation.

Tentative Approval

If a generic drug product is ready for approval before the expiration of any patents or exclusivities accorded to the [reference listed drug](#) product, FDA issues a tentative approval letter to the applicant. The tentative approval letter details the circumstances associated with the tentative approval. FDA delays final approval of the generic drug product until all patent or exclusivity issues have been resolved. A tentative approval does not allow the applicant to market the generic drug product.

Therapeutic Biological Product

A therapeutic biological product is a protein derived from living material (such as cells or tissues) used to treat or cure disease.

Therapeutic Equivalence (TE)

Drug products classified as therapeutically equivalent can be substituted with the full expectation that the substituted product will produce the same clinical effect and safety profile as the prescribed product. Drug products are considered to be therapeutically equivalent **only** if they meet these criteria:

- they are [pharmaceutical equivalents](#) (contain the same [active ingredient\(s\)](#); [dosage form](#) and [route of administration](#); and [strength](#).)
- they are assigned by FDA the same [therapeutic equivalence codes](#) starting with the letter "A." To receive a letter "A", FDA
- designates a brand name drug or a generic drug to be the [Reference Listed Drug](#)

(RLD).

- assigns therapeutic equivalence codes based on data that a drug sponsor submits in an [ANDA](#) to scientifically demonstrate that its product is bioequivalent (i.e., performs in the same manner as the Reference Listed Drug).

Therapeutic Equivalence (TE) Codes

The coding system for [therapeutic equivalence](#) evaluations allows users to determine whether FDA has evaluated a particular approved product as therapeutically equivalent to other [pharmaceutically equivalent](#) products (first letter) and to provide additional information on the basis of FDA's evaluations (second letter). Sample TE codes: AA, AB, BC ([More on TE Codes](#))

- FDA assigns therapeutic equivalence codes to [pharmaceutically equivalent](#) drug products. A drug product is deemed to be [therapeutically equivalent](#) ("A" rated) only if:
- a drug company's approved application contains adequate scientific evidence establishing through *in vivo* and/or *in vitro* studies the bioequivalence of the product to a selected [reference listed drug](#).
- those active ingredients or dosage forms for which no *in vivo* bioequivalence issue is known or suspected.
- Some drug products have more than one TE Code.
- Those products which the FDA does not deem to be therapeutically equivalent are "B" rated.

Over-the-counter drugs are not assigned TE codes.

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Definition

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drug

1 of 3

noun

'dreg

plural drugs



verb

Synonyms

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Synonyms of drug >

- 1 **a** : a substance used as a medication or in the preparation of medication
- b** according to the Food, Drug, and Cosmetic Act
 - (1) : a substance recognized in an official **pharmacopoeia** or formulary (see **FORMULARY** sense 3)
 - (2) : a substance intended for use in the diagnosis, cure, mitigation, treatment, or prevention of disease
 - | prescription *drugs*
 - | *drugs* for treating high blood pressure
 - (3) : a substance other than food intended to affect the structure or function of the body
 - (4) : a substance intended for use as a component of a medicine but not a device or a component, part, or accessory of a device
- 2 : something and often an illegal substance that causes addiction, habituation (see **HABITUATION** sense 2b), or a marked change in consciousness
 - | keeping teens off *drugs*
 - | heroin and other hard *drugs*
- 3 : a commodity that is not **salable** or for which there is no demand (see **DEMAND** entry 1 sense 3a) → used in the phrase *drug on the market*
- 4 **obsolete** : a substance used in dyeing or chemical operations

drug 2 of 3 **verb**
drug 2 of 3 **verb**

drugged; drugging; drugs

transitive verb

- 1 : to affect (a person or animal) with a drug (see **DRUG** entry 1)
 - | especially : to **stupefy** (someone) by an intoxicating drug
 - | looks like he's been *drugged*
- 2 : to administer a drug to (a person or animal)
 - | *drugged* against pain
- 3 : to lull or stupefy (someone) as if with a drug
 - | ... the kind of overly familiar music that delights most audiences and *drugs* most *critics*

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W	O	R	D	Y
L	O	V	E	R
P	L	A	Y	S
D	A	I	L	V

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Time

4 : to add an illicit or intoxicating drug to (food or drink) usually surreptitiously
There's also very little violence in the movie. ... The kidnapping is done by *drugging* the victim's drink.
- Drew Zahn

intransitive verb

: to take drugs especially for the intoxicating effect

drug

3 of 3

dialectal past tense of DRAG



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Synonyms

Noun

cure

medicament

medication

medicinal

medicine

pharmaceutical

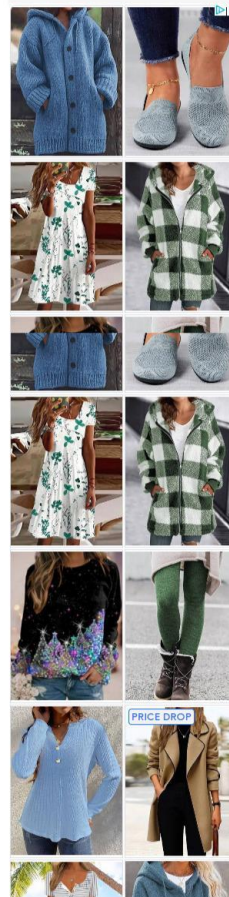
physic

remedy

specific

[See all Synonyms & Antonyms in Thesaurus >](#)

Examples of *drug* in a Sentence



Noun

- | a new *drug* used to treat people with high blood pressure
- | an experimental *drug* for the treatment of AIDS
- | Have you ever taken any illegal *drugs*?

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Recent Examples on the Web

Noun

- | Starting in the nineteen-nineties, however, farmers began to medicate their livestock with *drugs* that were toxic to vultures.
— Meera Subramanian, *The New Yorker*, 31 Jan. 2024
- | Nearly 70,000 people in the US died of *drug* overdoses that involved fentanyl in 2021, almost a four-fold increase over five years, according to a US Centers for Disease Control and Prevention report released last spring.
— Amy Simonson and Lauren Mascarenhas, *CNN*, 31 Jan. 2024

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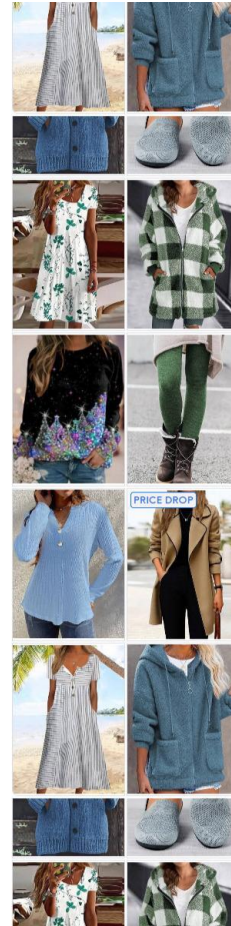


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Word History

Etymology

Noun and Verb

Middle English *drogge*

First Known Use

Noun

1611, in the meaning defined at [sense 4](#)

Verb

1667, in the meaning defined at [transitive sense 2](#)

Time Traveler

The first known use of *drug* was in 1611

[See more words from the same year](#)

Phrases Containing *drug*

date rape drug	drug test	drug dealer
sulfa drug	prescription drug	wonder drug
smart drug	recreational drug	performance-enhancing drug

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Articles Related to *drug*



8 Ball

An eighth of an ounce of cocaine or some other drug

MODERA
MOSAIC



drudging
drug
drug dealer

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Style

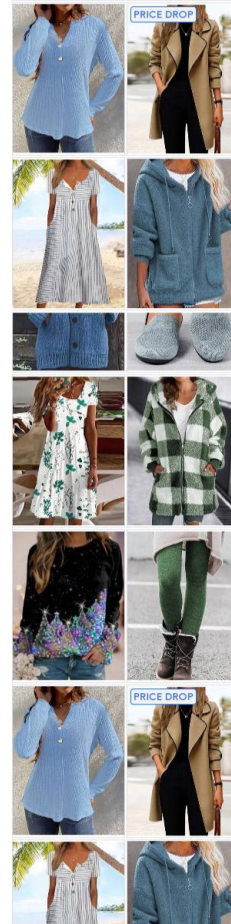
"Drug." *Merriam-Webster.com Dictionary*, Merriam-Webster, <https://www.merriam-webster.com/dictionary/drug>. Accessed 13 Feb. 2024.

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Kids Definition



drug ^{1 of 2} noun

'drʌg

- 1 : a substance used as a medicine or in making medicines
- 2 : something for which there is no demand → used in the phrase *drug on the market*
- 3 : a usually illegal substance (as heroin, LSD, or cocaine) that affects bodily activities often in a harmful way and is taken for other than medical reasons

drug ^{2 of 2} verb

drugged; drugging

- 1 : to affect or treat with a drug
especially: to make dull or numb by a narcotic drug
- 2 : to lull or make dull or numb as if with a drug

Medical Definition

drug ^{1 of 2} noun

'drʌg

- 1 **a** : a substance used as a medication or in the preparation of medication
- b** **according to the Food, Drug, and Cosmetic Act**
 - (1) : a substance recognized in an official pharmacopoeia or formulary
 - (2) : a substance intended for use in the diagnosis, cure, mitigation, treatment, or prevention of disease



- (3) : a substance other than food intended to affect the structure or function of the body
 - (4) : a substance intended for use as a component of a medicine but not a device or a component, part, or accessory of a device
- 2 : something and often an illicit substance that causes addiction, habituation, or a marked change in consciousness

drug ^{2 of 2} verb

drugged; drugging

transitive verb

- 1 : to affect (a person or animal) with a drug (see DRUG entry 1)
especially : to stupefy (someone) by an intoxicating drug
- 2 : to administer a drug to (a person or animal)

intransitive verb

: to take drugs especially for the intoxicating effect

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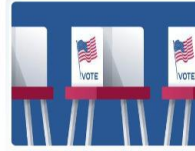
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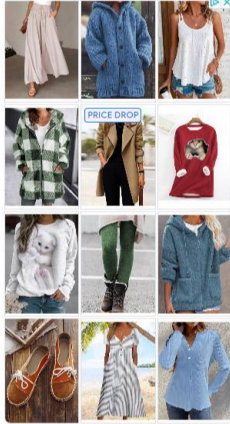
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Definition of drug noun from the Oxford Advanced Learner's Dictionary

drug noun

A2

/ drʌɡ /

/ drʌɡ /

1 an illegal substance that some people smoke, inject, etc. for the physical and mental effects it has

- He does not smoke or take drugs.
- to use/abuse drugs
- (informal) I don't do drugs (= use them).
- to smuggle/supply/sell drugs
- He was charged with possessing drugs.
- illegal/illicit drugs
- on drugs She looked like she was on drugs (= had taken drugs).
- I found out he was on drugs (= took them regularly).
- a drug dealer/trafficker/smuggler
- drug use/abuse
- She was a drug addict.
- The actor struggled with drug addiction.

SEE ALSO class A drug, recreational drug, truth drug

Other results

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drug verb

drug lord noun

hard drug noun

soft drug noun

drug baron noun

drug dealer noun

truth drug noun

designer drug noun

See more

Nearby words

drudge noun

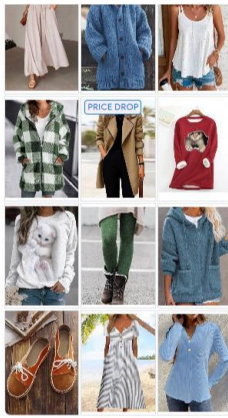
drudgery noun

drug noun

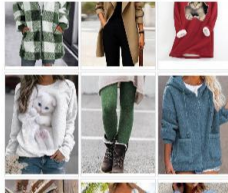
drug verb

drug baron noun

13 February 2024



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+ Wordfinder

drug *noun*

A2

/ drʌɡ /

/ drʌɡ /

1 ★ **A2** an illegal substance that some people smoke, inject, etc. for the physical and mental effects it has

- He does not smoke or **take drugs**.
- to **use/abuse drugs**
- (informal) I don't **do drugs** (= use them).
- to **smuggle/supply/sell drugs**
- He was charged with **possessing drugs**.
- **illegal/illicit drugs**
- **on drugs** She looked like she was **on drugs** (= had taken drugs).
- I found out he was **on drugs** (= took them regularly).
- a **drug dealer/trafficker/smuggler**
- **drug use/abuse**
- She was a **drug addict**.
- The actor struggled with **drug addiction**.

SEE ALSO **class A drug, recreational drug, truth drug**

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+ Culture **drugs**

+ Extra Examples

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marvel

verb

Other results

All matches

drug *verb*

drug lord *noun*

hard drug *noun*

soft drug *noun*

drug baron *noun*

drug dealer *noun*

truth drug *noun*

designer drug *noun*

See more

Nearby words

drudge *noun*

drudgery *noun*

drug *noun*

drug *verb*

drug baron *noun*

13 February 2024

marvel

verb



From the topic

FEELINGS

C1

Oxford Learner's Dictionaries Word of the Day



ROSLINKUN

2 ★ **A2** a substance used as a medicine or used in a medicine

- to *prescribe/administer a drug*
- a *prescription drug* (= one that must be prescribed by a doctor)
- *anti-inflammatory/antiviral/painkilling drugs*
- a *new cancer drug*
- a *major drug company*
- *He's taking drugs for depression.*

+ Wordfinder

+ Collocations **Illnesses**

SEE ALSO **designer drug**

+ Extra Examples

TOPICS **Healthcare A2**

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+ Word Origin



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Some compound words (like *bus rapid transit*, *dog whistle*, or *identity theft*) don't appear on the drop-down list when you type them in the search bar. For best results with compound words, place a quotation mark before the compound word in the search window.

[GUIDE TO THE DICTIONARY](#)

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[THE PANELISTS](#)

drug (drʌg)

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n.

- A substance used in the diagnosis, treatment, or prevention of a disease or as a component of a medication.
 - Such a substance as recognized or defined by the US Food, Drug, and Cosmetic Act.
- A chemical substance, such as a narcotic or hallucinogen, that affects the central nervous system, causing changes in behavior and often addiction.
- Obsolete A chemical or dye.

tr.v. **drugged, drug-ging, drugs**

- To administer a drug to, especially to treat pain or induce anesthesia.
 - To give a drug to, especially surreptitiously, in order to induce stupor.
- To poison or mix (food or drink) with a drug.

[Middle English *drogge*, from Old French *drogue*, drug, perhaps from Middle Dutch *droge* (*vate*), dry (cases), pl. of *droeg*, dry.]

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sal·u·tar·y (săl'ŭ-tĕr'ē)

adj.

1. Effecting or designed to effect an improvement; remedial: *salutary advice.*
2. Favorable to health; wholesome: *a salutary climate.*

[Middle English *saluter*, from Old French *salutaire*, from Latin *salūtāris*, from *salūs*, *salūtē*, health; see **sol-** in the Appendix of Indo-European roots.]

sal'u-tar'i-ly (-tăr'ŭ-lē) *adv.*

sal'u-tar'i-ness *n.*

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salutary adjective

sal-u-tary (ˈsal-yə-ter-ē)

Synonyms of *salutary*

1 : producing a beneficial effect : **REMEDIAL**

salutary influences

2 : promoting health : **CURATIVE**

salutarily (ˈsal-yə-ter-ē-lee) *adverb*

salutariness (ˈsal-yə-ter-ē-nəs) *noun*



Can you solve 4 words at once?

Save Word

More from M-W

Show Less

Save Word

Synonyms

advantageous	benefic	beneficent
beneficial	benignant	favorable
friendly	good	helpful
kindly	profitable	



Synonyms

advantageous	benefic	beneficent
beneficial	benignant	favorable
friendly	good	helpful
kindly	profitable	

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Choose the Right Synonym for *salutary*

HEALTHFUL, **WHOLESOME**, **SALUBRIOUS**, **SALUTARY** mean favorable to the health of mind or body.

HEALTHFUL implies a positive contribution to a healthy condition.

| a *healthful* diet

WHOLESOME applies to what benefits, builds up, or sustains physically, mentally,

once?

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WHOLESOME applies to what benefits, builds up, or sustains physically, mentally, or spiritually.

- | *wholesome* foods
- | the movie is *wholesome* family entertainment

SALUBRIOUS applies chiefly to the helpful effects of climate or air.

- | cool and *salubrious* weather

SALUTARY describes something corrective or beneficially effective, even though it may in itself be unpleasant.

- | a *salutary* warning that resulted in increased production

Examples of *salutary* in a Sentence

- | The accident should be a *salutary* lesson to be more careful.
- | the low interest rates should have a *salutary* effect on business

Recent Examples on the Web

Spotify has seen a *salutary* flywheel effect when popular podcasters feature music or artists on their shows.
— Todd Spangler, *Variety*, 3 Feb. 2024

Yet for some of us, the Palestinian revolt has had the *salutary* effect of making Israel more visible through the mists of wish and dream.
— Jordan Castro, *Harper's Magazine*, 9 Jan. 2024

When the company's inaugural train made its way to Orlando in late September, Stuart officials organized a trackside welcoming committee complete with banners and a *salutary* hosing of the passenger cars by a fire truck as the train passed through town.
— David Lyons, *Sun Sentinel*, 2 Jan. 2024

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Word History

Etymology

Middle French *salutaire*, from Latin *salutaris*, from *salut-*, *salus* health

First Known Use

15th century, in the meaning defined at sense 1

Time Traveler

The first known use of *salutary* was in the 15th century

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Dictionary Entries Near *salutary*

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Kids Definition

salutary adjective

sal-u-tary ('sal-yə-ter-ē)

1 : producing a good result

2 : furthering good health

salutariness noun



Medical Definition

salutary adjective

sal-u-tary ('sal-yə-ter-ē)

: promoting health : CURATIVE

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- [What are medicines?](#)
- [Starting a new medicine](#)
- [Filling your prescription](#)
- [Medication side effects](#)
- [Keeping track of your medicines](#)
- [Taking medicines safely](#)
- [Frequently asked questions \(FAQs\)](#)

Medicines are intended to help us live longer and healthier, but taking medicines the wrong way or mixing certain drugs and supplements can be dangerous. Older adults often have multiple medical conditions and may take many medicines, which puts them at additional risk for negative side effects. Read on to learn how to safely take and keep track of all your medicines.

What are medicines?

Medicines, often referred to as drugs, are used to prevent or treat diseases and other health conditions. Medicines can be obtained by a prescription or over the counter

(OTC). Prescription drugs are medicines that you can get only with a doctor's order; for example, pills to lower your cholesterol or an asthma inhaler. OTC medications can be purchased without a prescription; for example, aspirin or lubricating eye drops.

Dietary supplements are not considered drugs because they are not intended to prevent or treat diseases. Rather, these products are intended to maintain or improve health, and they may help you meet your daily requirements for essential [vitamins and minerals](#). For example, calcium and vitamin D can help build strong bones. Learn more about taking supplements safely in the NIA article, [Dietary Supplements for Older Adults](#).



It can be dangerous to combine certain prescription drugs, OTC medicines, dietary supplements, or other remedies. For example, you should not take aspirin if you take warfarin for [heart problems](#). To avoid potentially serious health issues, talk to your doctor about all medicines you take, including those prescribed by other doctors, and any OTC drugs, vitamins, supplements, and herbal remedies. Mention everything, even ones you use infrequently.

Starting a new medicine

Talk with your health care provider before starting any new prescription, OTC medicine, or supplement, and ensure that your provider knows everything else you are taking. Discuss any allergies or problems you have experienced with other medicines. These might include rashes, trouble breathing, indigestion, dizziness, or mood changes. Make sure your doctor and pharmacist have an up-to-date list of your allergies so they don't give you a medicine that contains something that could cause an allergic reaction.

You will also want to find out whether you'll need to change or stop taking any of your other prescriptions, OTC medicines, or supplements while using this new medicine. Mixing a new drug with medicines or supplements you are already taking might cause unpleasant and sometimes serious problems. For example, mixing a drug you take to help you sleep (a sedative) and a drug you take for allergies (an antihistamine) can slow your reactions and make driving a car or operating machinery dangerous.

slow your reactions and make driving a car or operating machinery dangerous.

When starting a new medication, be sure to write down the name of the drug, the dose, and why it's being prescribed for you. Also, make note of any special instructions for how to take the medicine. For many drugs, this information is included on the bottle or prescription label.

Questions to ask your health care provider about a new medicine

Before you start a new medicine, your doctor or pharmacist can provide important information and answer any questions.

Ask your doctor:

- What is the name of the medicine and why am I taking it?
- Is there a less expensive alternative?
- What medical condition does this medicine treat?
- When should I expect the medicine to start working? How will I know if it's working?
- What type of side effects might I expect, if any? What should I do if I experience serious side effects?
- Will this drug cause problems if I am taking other prescriptions, OTC medicines, or supplements?
- What should I do if I want to stop taking this medicine? Is it safe to stop abruptly?
- Will I need a refill? If so, will I need a follow-up appointment or other testing before I can refill the medication?

Ask your pharmacist:

- Is it safe for me to drive while taking this medication?
- Should I take the medicine with food or not? Is there anything I should not eat or drink when taking this medicine?
- How much medicine should I take?
- How many times a day should I take it? At what time(s)? If the bottle says take "four times a day," does that mean four times in 24 hours or four times when I am awake?

- What does “as needed” mean?
- If I forget to take my medicine, what should I do?

Each time you visit one of your health care providers, tell them about any new prescription drugs, OTC medicines, and supplements you're taking and be sure to ask if you still need to be on all your medications.

Find more resources for [communicating with your health care team](#) about medications.

Filling your prescription

When you get your prescriptions filled, the pharmacist can answer many of your questions about prescription drugs, OTC medicines, and supplements. Try to have all your prescriptions filled at the same pharmacy so your records are in one place. This will help alert the pharmacist if a new drug might cause a problem with something else you're taking. If you're unable to use just one pharmacy, share your list of medicines and supplements with the pharmacist at each location when you drop off your prescription.

When you have a prescription filled:

- Ask your pharmacist if there is a patient profile you can fill out, so the pharmacy is aware of all drugs and OTC medications, vitamins, and supplements you take.
- Tell the pharmacist if you have trouble swallowing pills. There may be liquid medicine available. Do not chew, break, or crush tablets without first asking if this will change the way the drug works.
- Make sure you can read and understand the name of the medicine as well as the directions on the container and on the color-coded warning stickers on the bottle. If the label is hard to read, ask your pharmacist to use larger type.
- Read all the information about your medication carefully. Many prescription medicines come with paper handouts, called medication guides, that contain information to help patients avoid serious side effects.
- Check that you can open the container. If not, ask the pharmacist to put your medicines in bottles that are easier to open.
- Ask about special instructions on where to store a medicine. For example, should it

be kept in the refrigerator or in another climate-controlled place?

- Check the label on your medicine before leaving the pharmacy. It should have your name on it and the directions provided by your doctor. If it doesn't, don't take it, and talk with the pharmacist.

The image below points out information typically present on a prescription label. Please note that your prescription label may have a different format than the one shown. The prescription number is usually printed in the upper left corner of the label.



Talk with your doctor or pharmacist if you have questions about the written information that comes with your prescription.

Medications and traveling

When you travel, your health care provider may recommend that you adjust your medicine schedule to account for changes in time zones, routine, and diet. Ask your doctor or pharmacist about these changes before you depart. Carry a list of all the prescription drugs, OTC medicines, and supplements you take and the phone numbers of your doctors and pharmacists. When flying, carry your

medicines with you; do not pack them in your checked luggage. Take enough medication with you in case you need to stay longer. Always keep medicines out of heat and direct sunlight both at home and when traveling.

Generic or brand name? What's the difference?

A generic drug is a medication created to work the same way and have the same effects as an already marketed brand-name drug. Generic drugs and their brand-name equivalents contain the same [active ingredients](#), which are the parts of the medicine that make it work. A generic drug is just as safe, and is of equal strength and quality, as a brand-name drug. You take a generic drug the same way as a brand-name drug. Generic drugs are usually less expensive than their brand-name counterparts, and they are more likely to be covered by health insurance.

Keeping track of your medicines

Many older people take multiple medications, and it can be challenging to keep track of everything. Here are some tips that can help:

- **Make a list.** [Write down all medicines you take](#), including OTC drugs. Also include any vitamins or dietary supplements. The list should include the name of each medicine or supplement, the amount you take, and time(s) you take it. If it's a prescription drug, also note the doctor who prescribed it and the reason it was prescribed. Show the list to all your health care providers, including physical therapists and dentists. Keep one copy in a safe place at home and one in your wallet or purse.
- **Get familiar with your medicines.** If you take more than one medicine, make sure you can tell them apart by size, shape, color, or the number imprinted on the pill.
- **Create a file.** Save all the written information that comes with your medicines and keep it somewhere you can easily refer to it. Keep these guides for as long as you're taking the medication.
- **Check expiration dates on bottles.** Don't take medicines that are past their expiration date. Your doctor can tell you if you need a refill.

- **Secure your medicines.** Keep your medicines out of the reach of children and pets. If you take any prescription pain medicines (for example, morphine, other opioids, or codeine), keep them in a locked cabinet or drawer. If your medicines are kept in bottles without safety caps because those are hard for you to open, be extra careful about where you store them.
- **Dispose of your medicines safely.** Check the expiration dates on your medication bottles and discard any unused or expired medicines as soon as possible. Timely disposal of medicines can reduce the risk of others taking them accidentally or misusing the medications on purpose. Check with your doctor or pharmacist about how to safely discard expired or unneeded medications, or review the FDA's guidance on [Where and How To Dispose of Unused Medicines](#).

Get more tips for [managing your medications](#).

Do I need to take so many medications?

The use of multiple drugs to treat diseases and other health conditions — called polypharmacy — is a growing concern for older adults. People age 65 and older tend to take more medicines than those in any other age group, often because they have several diseases or other health problems at the same time. Managing multiple medications can be expensive and difficult to track, especially for those who are homebound or who live in rural areas. Check out these [tips for taking multiple medications safely](#).

Taking many medications can also increase the risk for side effects and other unintended problems. Researchers are studying deprescribing, an approach to safely reduce or stop medications that are potentially inappropriate or unnecessary. Read how NIA supports research on [polypharmacy and deprescribing](#) to help ensure older adults take only those medicines they need to help them live full, healthy lives.

If you are concerned that you might be taking too many medications, [have a conversation with your health care provider](#) about whether there are any you could safely reduce or stop.

Taking medicines safely

Here are some tips to help you take your medicines safely:

- **Follow instructions.** Read all medicine labels and be sure to follow instructions. Don't take a larger dose of a medicine, thinking it will help you more. This could be very dangerous and even deadly. And don't skip or take half doses of a prescription drug to save money.
- **Take medicine on time.** Some people use meals or bedtime as reminders to take their medicine. Other people use charts, calendars, or weekly pill boxes. You can also set timers and write reminders to take your medication. Medication reminder apps for smartphones are becoming more popular; these apps can help you remember when and how to take your medications each day.
- **Turn on a light.** Don't take medicine in the dark; you might make a mistake.
- **Report problems.** Call your doctor right away if you have any trouble with your prescriptions, OTC medicines, or supplements. There may be something else you can take.
- **Tell your doctor about alcohol, tobacco, and drug use.** [Alcohol](#), tobacco, and other drugs can affect how well your medicines work. Be honest with your doctor about how much you use.
- **Ask your loved ones for help.** Take a friend or relative with you to your doctor's appointments if you think you may need help understanding or remembering what the doctor tells you.
- **Check before stopping.** Take prescription medicine until it's finished, or your doctor says it's all right to stop. Note that some medicines are supposed to be taken only "as needed."
- **Don't share.** Do not take medicines prescribed for another person or give yours to someone else.

Can I get addicted to pain medicine?

Anyone can become addicted to prescription pain medicines. Never take more medicine than the doctor prescribes. Read more about opioids and prescription pain medicines in the [Pain and Older Adults](#) booklet.

Frequently asked questions (FAQs)

Why is a medicine I've taken for years no longer working? +

Why do I need to pay attention to the active ingredients in my medications? +

What do the abbreviations in my prescription mean? +

What does it mean to take medicines on an empty stomach? +

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ASHLEY Perfect Space
Ashley

3 ★ **B2** an **accurate** throw, shot, weapon, etc. hits or reaches the thing that it was aimed at

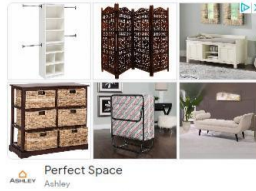
• *There were only two accurate shots on goal.*

OPPOSITE **inaccurate**

+ Word Origin

- See **accurate** in the Oxford Advanced American Dictionary
- See **accurate** in the Oxford Learner's Dictionary of Academic English

Check pronunciation: accurate



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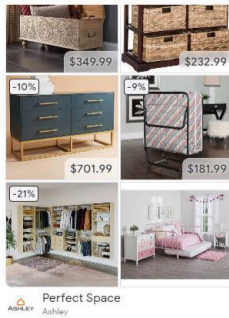
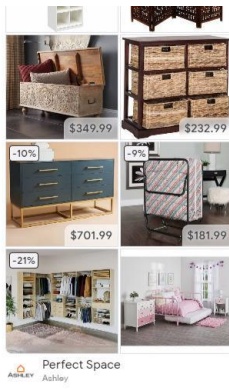


Definition of **accurate** adjective from the Oxford Advanced Learner's Dictionary

accurate *adjective*

Nearby words

accumulator *noun*



B2 OPAL W
/ˈækjərət/
/ˈækjərət/

- 1 ★ B2 correct and true in every detail
- an **accurate description/picture** of something
 - *Accurate measurements are essential.*
 - *I'm not convinced the reports are accurate.*
 - *The film is not **historically accurate**.*
 - an **accurate prediction/estimate/assessment**
 - an **accurate representation/portrayal**
 - *scientifically accurate information/data*
 - *reasonably/entirely/fairly accurate*
 - *The cost is an accurate reflection of the quality of our products.*

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- 2 ★ B2 able to give completely correct information or to do something in an exact way
- a **highly accurate electronic compass**
 - *My watch is not very accurate.*
 - *Scientists have found a more accurate way of dating cave paintings.*
 - **accurate (to) within something** *Huygens was able to build a clock accurate to within ten seconds in a day.*

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accuracy noun

accurate adjective

accurately adverb

accursed adjective

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- 3 ★ [B2](#) an **accurate** throw, shot, weapon, etc. hits or reaches the thing that it was aimed at

There was only **one accurate shot** on goal.



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explicit·it (ik-splɪt)

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adj.

- Fully and clearly expressed; leaving nothing implied: *explicit approval*.
 - Fully developed or formulated: *has an explicit idea of what to say in the paper*.
- Forthright and unreserved in expression: *They were explicit in their criticism*.
- Readily observable: *an explicit sign of trouble*.
 - Describing or portraying nudity or sexual activity in graphic detail.

[Latin *explicitus*, past participle of *explicāre*, to unfold; see *EXPLICATE*.]

ex·plicit·ly adv.

ex·plicit·ness *n.*

Synonyms: **explicit, definite, express, specific**

These adjectives mean entirely clear and unambiguous: *explicit statements; a definite answer; my express wishes; a specific purpose*.

Antonym: **ambiguous**

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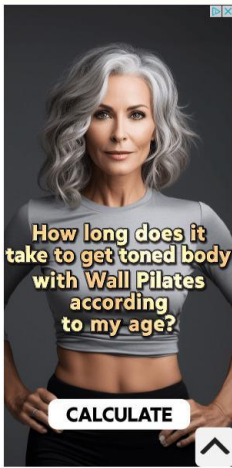
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- 3 ★ (usually disapproving) describing or showing something, especially sexual activity, with a lot of detail
 - a sexually explicit film
 - a highly explicit description of torture

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+ Word Origin

- See explicit in the Oxford Advanced American Dictionary
 - See explicit in the Oxford Learner's Dictionary of Academic English
- Check pronunciation: explicit

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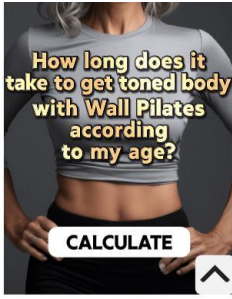
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Nearby words

- explicate verb
- explication noun
- explicit adjective
- explicitly adverb
- explicitness noun



1 ★ **explicit** (of a statement or piece of writing) clear and easy to understand, so that you have no doubt what is meant

- He gave me very explicit directions on how to get there.
- The reasons for the decision should be made explicit.
- She made some very explicit references to my personal life.

COMPARE **implicit** (1)

+ Extra Examples

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2 ★ **explicit** (of a person) saying something clearly, exactly and openly

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2 ★ **explicit** (of a person) saying something clearly, exactly and openly

SYNONYM **frank**

- She was quite explicit about why she had left.

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- 3 ★ *(usually disapproving)* describing or showing something, especially sexual activity, with a lot of detail
- *a sexually explicit film*
 - *a highly explicit description of torture*



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tincture ^{1 of 2} noun

tincture ^{ˈtɪŋ(k)-chər}

Synonyms of tincture >

- 1 : a solution of a medicinal substance in an alcoholic solvent
- 2 a : a characteristic quality : **CAST**
b : a slight admixture : **TRACE**
| a *tincture* of doubt
- 3 a : **COLOR, TINT**
b *archaic* : a substance that colors, dyes, or stains
- 4 : a heraldic metal, color, or fur

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obsolete : an active principle or extract

tincture 2 of 2 verb

tinctured; tincturing 'tɪŋ(k)-chə-rɪŋ -shriŋ
transitive verb

- to tint or stain with a color : **TINGE**
- to infuse or instill with a property or entity : **IMPREGNATE**
 - to imbue with a quality : **AFFECT**
writing *tinctured* with wit and wisdom



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A droplet of this, a *skosh* of that. Now you take that home, throw it in a beaker, and add a touch of *ethyl alcohol* to hold it all together—baby, you've got a tincture going. *Tincture* is a word with a colorful past most often encountered today in reference to a solution consisting of a medicinal substance mixed with alcohol, as in "Carl weathers his cold with a tincture of *echinacea*." When the word first appeared in English in the 14th century, *tincture* referred to a substance used to color, dye, or stain, but by the 17th century the word had acquired several additional meanings, including "a slight infusion or trace of something." This sense is still in use today, especially figuratively, as when an aspiring actor is said to feel a "tincture of doubt that the acting lessons are worth what he paid."

Synonyms

Noun

cast	color	hue
shade	tinge	tint
tone		

Verb

bepaint [<i>archaic</i>]	color	dye
paint	pigment	stain
tinge	tint	

[See all Synonyms & Antonyms in Thesaurus >](#)

Examples of *tincture* in a Sentence

Noun

a ragged shirt that seemed to be stained with the *tincture* of blood

Verb

clouds *tintured* by the rays of the setting sun

Recent Examples on the Web



XIFAXAN is the #1 prescribed treatment for adults with IBS-D.*

*Based on aggregated total of all prescribers as of June 2022.

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- If you take antibiotics, like XIFAXAN, there is a chance you could experience diarrhea caused by an overgrowth of

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XIFAXAN is the #1 prescribed

Noun

Swallow and let this *tincture* — made with organically grown hemp — do its job.
— Erin Michelle Newberg, *Miami Herald*, 30 Jan. 2024

It can be used to make tea, capsules, or *tinctures*.
— Sponsored Content, *The Mercury News*, 11 Jan. 2024

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These examples are programmatically compiled from various online sources to illustrate current usage of the word 'tincture.' Any opinions expressed in the examples do not represent those of Merriam-Webster or its editors. Send us feedback about these examples.

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Luxury Studio - 2BR Apts



Word History

Etymology

Noun

Middle English, from Latin *tinctura* act of dyeing, from *tinctus*, past participle of *tingere* to tinge

First Known Use

Noun

14th century, in the meaning defined at sense 3b

Verb

1616, in the meaning defined at [sense 1](#)

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Time Traveler

The first known use of *tincture* was in the 14th century

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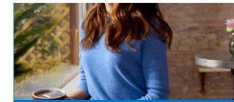
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Kids Definition

tincture noun

tinc-ture 'tin(k)-cher

- 1 : a substance that colors, dyes, or stains
 - 2 : a solution that contains a medical substance (as a drug) mixed with alcohol
- tincture of iodine*



Medical Definition

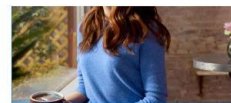
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: a solution of a medicinal substance in an alcoholic or hydroalcoholic menstruum
→ compare LIQUOR sense b

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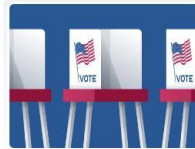
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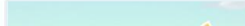
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tinc-ture (tingk'chər)

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- n.
- 1. A coloring or dyeing substance; a pigment.
- 2. An imparted color; a tint.
- 3. A quality that colors, pervades, or distinguishes.
- 4. A trace or vestige: "a faint tincture of *condescension*" (*Robert Craft*).
- 5. An alcohol solution of a nonvolatile medicine: *tincture of iodine*.
- 6. *Heraldry*: A metal, color, or fur.

tr.v. tinc-tured, tinc-turing, tinc-tures

- 1. To stain or tint with a color.
- 2. To infuse, as with a quality; impregnate.

[Middle English, from Latin *tinctura*, a dyeing, from *tinctus*, past participle of *tingere*, to dye.]

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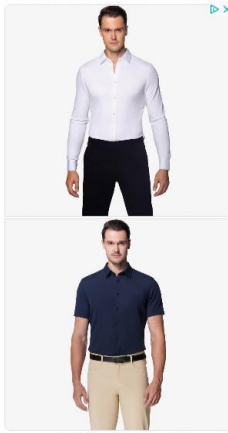
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*This website is best viewed in Chrome, Firefox, Microsoft Edge, or Safari. Some characters in pronunciations and etymologies cannot be displayed properly in Internet Explorer.



- medicine given in powder or tincture form
- Herbal remedies are usually dispensed as tinctures.
- Use 30ml tincture of myrrh.

+ Word Origin

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Lifestyle block	90%	Stress	Overeating	Exercise	High protein
Hormonal block	60%	Irregular periods	Overeating	Exercise	Low fat
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tincture noun

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/'tɪŋktʃər/

[countable, uncountable] (specialist)

★ a substance dissolved in alcohol for use as a medicine

- Nearby words**
- Tina
 - tin can noun
 - tincture noun**
 - tinder noun
 - tinderbox noun



- a *tincture* or *morphine*
- *medicine given in powder or tincture form*
- *Herbal remedies are usually dispensed as tinctures.*
- *Use 30ml tincture of myrrh.*

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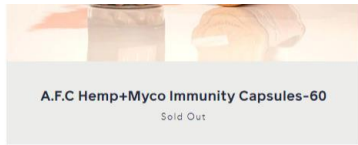
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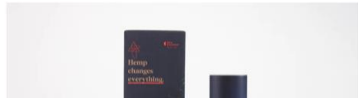
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CBD Oil vs. Tincture: What's the Difference?



Medically reviewed by
 Eloise Theisen, RN, MSN,
 AGPCNP-BC — By Jessica
 Timmons — Updated on
 June 14, 2022

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If you're researching **cannabidiol (CBD) oil**, you'll likely come across information about CBD tinctures, too. You may wonder whether both terms describe the same product. Technically, they don't, but it's an easy mistake to make.

"A true 'tincture' is an herbal extract suspended in alcohol, as opposed to an oil," says Jim Higdon, co-founder of **Cornbread Hemp**. "Nearly all CBD products are properly classified as CBD oils, even though many are called tinctures."

He explains that the products are similar in that they both come in small glass bottles with dropper tops for sublingual administration.

While CBD oils and tinctures may be packaged in the same way, there are some important distinctions. Here's what to understand about the differences between a CBD oil vs. tincture so you can decide what's best for your needs.

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What is CBD?

CBD is one of the many active compounds found in the cannabis plant. But unlike **tetrahydrocannabinol (THC)**, CBD has no intoxicating effects — meaning it won't get you "high."

Research is limited, but CBD may offer some **therapeutic benefits**. These include relief from:

- **pain**
- **anxiety**
- **depression**
- **some types of seizures**
- **acne**

Different CBD products, including oils and tinctures, offer various ways to access these potential benefits.

What does CBD do?



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CBD may help these conditions because of the effects it has on the [endocannabinoid system \(ECS\)](#) in the human body. This complex system regulates many functions and processes, including sleep, mood, memory, appetite, and more.

Researchers aren't exactly sure how CBD interacts with the ECS. Some believe CBD prevents the breakdown of molecules known as endocannabinoids, which are similar to cannabinoids but produced in the body. Even if you don't use cannabis, naturally occurring endocannabinoids are active in your body.

Other researchers suspect CBD binds to receptors known as 5HT and TRPV in the ECS.

What is CBD oil?

CBD oil is most often a blend of CBD extract and an inert [carrier oil](#), like [medium-chain triglyceride \(MCT\)](#) coconut oil.

To make a CBD oil, CBD and sometimes other compounds like [terpenes](#) and [flavonoids](#) are extracted from the plant material and then mixed with a carrier oil. That's the case with [full-spectrum CBD oils](#).

Unlike CBD isolate, these products retain all the compounds of the hemp plant, including up to 0.3 percent THC, so consumers may benefit from the [entourage effect](#).

The entourage effect is a [theory](#) that all the compounds in the plant work synergistically for the greatest effect.

After the desired compounds are extracted, they're mixed with the carrier oil. After the desired compounds are extracted, they're mixed with the carrier oil. Sometimes, natural and/or artificial flavors are added for taste.

CBD oils are easy to find, and they're more common than CBD tinctures. Most products labeled "CBD oil tincture" and even some labeled "CBD tincture" are actually CBD oils.

Higdon says that's because the current lingo of the CBD marketplace has been referring to CBD oils as "tinctures" for years.

"For all practical purposes, consumers should understand that 'CBD tinctures' and 'CBD oils' are considered to be synonyms, despite the fact that it's inaccurate," Higdon says.



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✓ Pros of CBD oils

- easy to dose
- can be used topically

- can be mixed with food and beverages
- many options for potencies and flavors
- usually contains minimal ingredients

Cons of CBD oils

- price point may be higher than other forms of CBD
- some CBD oils have a strong flavor

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What's the right CBD product for you?

Take a short quiz about what type of CBD you are interested in and we'll share our top product picks, vetted by experts.

Choose a reason for your interest in CBD (select one).

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Stress and anxiety

Sleep

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What is a CBD tincture?


A CBD tincture is an alcohol-based extract. High proof alcohol is used as a solvent to extract the natural compounds of the cannabis plant, and it's also used in the finished product.

This method of processing preserves the cannabinoids and protects against oxidation, but it does require a lot of refinement and filtration. It can also leave a bitter flavor.

To mask the bitterness, tinctures are often mixed with additives like sweeteners, flavoring, or vegetable glycerin. Some companies might also add vitamins, herbal extracts, or supplements like melatonin, depending on the goal of the product.

However, keep in mind that not much is known about how CBD interacts with supplements or

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vitamins. Additionally, the FDA has stated that CBD cannot be sold as a dietary supplement, so combining CBD with these ingredients may go against the FDA's ruling.

CBD tinctures are not very common, partly because of the bitter taste. Many products labeled as tinctures are actually oils.

"Any consumer looking for a proper CBD tincture should ask for an 'alcohol-based tincture' for clarity," says Higdon.

✓Pros of CBD tinctures

- easy to dose
- can be mixed with food and beverages
- rapid onset effects when taken sublingually

✗Cons of CBD tinctures

- bitter flavor
- not as readily available
- not effective as a topical

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Is one better than the other?

Both CBD oils and CBD tinctures can be effective. The biggest difference is the production process and the base ingredient.

In deciding which one is best for your needs, it's important to consider your preferences and goals.

"A CBD consumer may choose an alcohol-based tincture if they are allergic to the source of the oil in a CBD oil product, like coconut," says Higdon. "Someone looking to avoid alcohol would choose an oil."

A CBD oil will often contain fewer ingredients than a tincture. If you're sensitive to alcohol, an oil may be a better choice.

Higdon also makes a good point about the accessibility of CBD oils over tinctures. "The vast majority of sublingual CBD products on the market are oils, not tinctures," he says. Even if it's labeled as a tincture, it's best to ask the retailer or look at the ingredient list for clarity.

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How do you take CBD oils and tinctures?

CBD oils can be dropped into the mouth and swallowed. Note that it can take 1 to 2 hours for an oil to take effect when you ingest it this way because it has to work its way through the digestive system.

You can also add CBD oils and tinctures to foods and drinks for oral ingestion.

CBD oils and tinctures are taken **sublingually**, or under the tongue. It absorbs through mucous membranes straight into the bloodstream and bypasses the digestive process. an oil to take effect when you ingest it this way because it has to work its way through the digestive system.

You can also add CBD oils and tinctures to foods and drinks for oral ingestion.

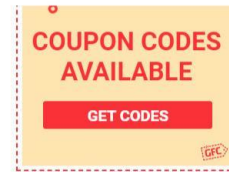
CBD oils and tinctures are taken **sublingually**, or under the tongue. It absorbs through mucous membranes straight into the bloodstream and bypasses the digestive process.

For tinctures, this may provide **faster and more efficient absorption**, but more research is needed to substantiate claims that oil-based CBD can also absorb quickly under the tongue.

Depending on the carrier oil, some CBD oils can even be used topically, or applied directly to the skin. However, CBD products designed specifically for topical use tend to be better used for on-the-spot relief rather than full-body effects.

Applying a CBD tincture topically won't have any benefit, so don't waste your product by rubbing it on your skin.

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Finding a quality CBD oil or tincture

Just because you can buy CBD oils and tinctures at mall kiosks and drugstores doesn't mean every product is safe.

The Food and Drug Administration (FDA) doesn't regulate CBD in the same way as it does drugs and supplements, which makes it crucial to shop wisely.

No matter what kind of CBD product you're considering, it's important to find a reputable CBD manufacturer that provides current and comprehensive certificates of analysis (COA) for all of

manipulation that provides certain and comprehensive estimates of drug use (28) for an...
Look into the brand's reputation, including whether they've received any [FDA warning letters](#).

Other ways to take CBD

If a CBD oil or tincture doesn't appeal to you, there are [other ways](#) you can try CBD:

- **Edibles.** Edibles are a discreet way to consume CBD. They come in a variety of options, including gummies, mints, and truffles. However, eating CBD means it must pass through the digestive system, slowing down the onset of effects. It can take 2 to 3 hours to feel effects. Absorption rates are between [20 and 30 percent](#).
- **Topicals.** These products are designed to be applied directly to your skin. CBD-infused [lotions](#), [salves](#), [creams](#), [balms](#), and [transdermal patches](#) can be a good choice if you're targeting specific skin conditions or localized pain.

Safety and side effects

At this time, CBD is generally considered [safe](#). However, some people experience some side effects, such as:

- fatigue
- diarrhea
- changes in weight or appetite

Before trying CBD, it's a good idea to speak with a doctor, especially if you're already taking any medications or supplements. CBD can [interact](#) with some of these.

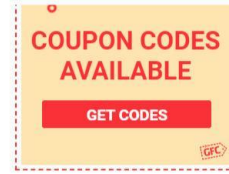
Also, a [2020 study](#) found that taking CBD by mouth alongside high fat meals can dramatically increase CBD blood concentrations, which means a greater chance of side effects.

Finally, if you're pregnant or breastfeeding, avoid taking CBD.

Legal considerations of CBD

While hemp-derived CBD products with less than 0.3 percent THC are federally legal in the United States, they're still illegal under some state laws. It's important to check the law in your state and anywhere you may be traveling.

Frequently asked questions about CBD oils and tinctures



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and tinctures

Is CBD tincture the same as CBD oil?

No. Though the two terms are often used interchangeably, they're actually two different products. As the name suggests, CBD oils have an oil base. CBD tinctures, on the other hand, have an alcohol base.

"The terms are used interchangeably because we associate small bottles with droppers as 'tinctures' due to associations with old-fashioned preparations," says Higdon.

Do CBD tinctures and CBD oils have the same benefits?

Yes. Both CBD tinctures and oils are equally effective because the only difference is the suspension liquid.

"The difference between tinctures and oils is what medium is used to dilute the extract," says Higdon.

How long does it take CBD oil or tincture to kick in?

If you take CBD orally, it can take an hour or two to feel the effects. That's because it has to be processed via the digestive system.

For faster absorption, tinctures can be taken sublingually, or beneath the tongue. With this method, CBD is absorbed through mucous membranes in the mouth. That means a higher [bioavailability](#), or how much your body is able to absorb.

However, CBD oils may still take longer to kick in when taken sublingually. There's currently no research that substantiates its rapid onset when taken this way.

Takeaway

While the terms are often used interchangeably, CBD oils and CBD tinctures are two different products.

CBD oils are generally made with just two ingredients: CBD and carrier oil.

CBD tinctures are alcohol-based extracts that use high proof alcohol to steep the plant material. This is strained, and the entire solution is bottled, along with additional ingredients for flavor or specific benefits.

The right product for you will depend on your preferences, but make a point of shopping wisely. Be sure to talk with a doctor or other healthcare professional before trying CBD,



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especially if you are taking supplements or medications to manage a health condition.

Is CBD legal? The 2018 Farm Bill removed hemp from the legal definition of marijuana in the Controlled Substances Act. This made some hemp-derived CBD products with less than 0.3% THC legal at the federal level. However, CBD products containing more than 0.3% THC still fall under the legal definition of marijuana, making them illegal at the federal level. Some states have legalized CBD, so be sure to check state laws, especially when traveling. Also, keep in mind that the FDA has not approved nonprescription CBD products, and some products may be inaccurately labeled.

Last medically reviewed on June 14, 2022.

How we reviewed this article:

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Does CBD Increase Your Appetite?

[CBD and appetite](#) | [Munchies](#) | [CBD and metabolism](#) | [Summary](#)

CBD typically suppresses appetite, though it may stimulate it for people who are not hungry because of anxiety or pain.

Cannabidiol (CBD) is a nonpsychoactive compound in cannabis known for its pain relief, anti-inflammation, anti-seizure, and anxiety-reducing properties. Unlike tetrahydrocannabinol (THC), CBD doesn't produce the "high" often associated with cannabis use.

While THC is recognized for stimulating appetite, CBD's effect on appetite remains a subject of ongoing debate. Individual responses to CBD vary due to differences in the endocannabinoid system and the reasons behind a person's lack of hunger.

We explore what the research says.

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Medically reviewed by
Dominique Fontaine, BSN,
RN, HNB-BC, HWNC-BC —
By Traci Pedersen on
February 9, 2024

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Medically reviewed by Dominique Fontaine, BSN, RN, HNB-BC, HWNC-BC

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Brown Girl Jane CBD: A 2024 Review

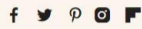
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What to know about CBD oils and CBD tinctures

Differences | Benefits | Risks | Legality | How to use | How to choose |

Summary

As interest in cannabidiol (CBD) continues to grow, so does the variety of CBD products available. Many people may confuse or use the terms “CBD oils” and “tinctures” interchangeably. However, they are different products with varying production methods.



Medically reviewed by Debra Rose Wilson, Ph.D., MSN, R.N., IBCLC, AHN-BC, CHT —
By Jenna Fletcher on January 26, 2021

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CBD is one of [many phytochemicals](#) found in the *Cannabis sativa* plant. Although the [World Health Organization \(WHO\)](#) and leading research recognize the many potential health benefits and limited short-term side effects of CBD use, more research is still necessary to better understand the long-term implications.

CBD has grown in popularity in recent years, with manufacturers selling a variety of [CBD products](#) such as oils and tinctures. Although both products are similar and share many benefits, their compositions and the methods that manufacturers use to produce them vary.

This article explores the differences between CBD oil and tinctures, their benefits, and how to use and choose CBD products.

Is CBD legal? *The 2018 Farm Bill removed hemp from the legal definition of marijuana in the Controlled Substances Act. This made some hemp-derived CBD products with less than 0.3% THC federally legal. However, CBD products containing more than 0.3% THC still fall under the legal definition of marijuana, making them federally illegal but legal under some state laws. Be sure to check state laws, especially when traveling. Also, keep in mind that the FDA has not approved nonprescription CBD products, and some products may be inaccurately labeled.*

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Differences

CBD oil and tinctures are similar products that both contain CBD derived from [hemp](#) or other plants in the *Cannabis sativa* family. While people may interchange the terms "CBD oil" and "CBD tincture," they are different products.


The main difference between the two is the method of extracting CBD. For oil, manufacturers use carbon dioxide, but for tinctures, they utilize alcohol.

Using heat and pressure, manufacturers use the carbon dioxide method to separate CBD from the plant. Manufacturers generally regard this as the quickest and most efficient way to extract the substance. It is also environmentally safe, while the [Food and Drug Administration \(FDA\)](#) also note that the method is safe.

[Click here to learn more about some of the best tasting CBD oils.](#)

The process of creating a CBD tincture typically involves soaking cannabis in alcohol and slowly heating the mixture. This infuses the alcohol with CBD, which the manufacturer then boils or dilutes.


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Through these different extraction methods, manufacturers end up with slightly different products: CBD oil contains CBD suspended in a carrier oil, while tinctures are typically glycerin- or alcohol-based solutions.

Generally, CBD oils will also contain a higher potency of CBD, but tinctures will have a longer shelf life. Additionally, people can use CBD oil orally or topically, but it is not advisable to use tinctures on the skin.

Benefits

CBD displays many potential [health benefits](#) and has become a popular aid for many health conditions.

- **Anti-inflammatory properties:** In a [review](#), researchers found that CBD may have anti-inflammatory effects. A 2018 [study](#) also found similar results with oral forms of the substance.
- **Reducing chronic pain:** A 2019 study suggests a link between CBD use and reduced chronic pain. In the research, 94% of participants reported improvements in their quality of life. A small 2020 [trial](#) also indicates that CBD may be beneficial in reducing intense pain, sharp pain, and cold itchy sensations.
- **Helping with anxiety:** A 2015 [review](#) notes that CBD could help reduce anxiety-related behaviors. A 2019 [study](#) further indicates this, suggesting that it could lower anxiety and help people living with anxiety disorders.

Risks

According to a [2020 study](#), there are few adverse effects noted with acute use of CBD, while chronic use has links with mild adverse effects.

However, this does not mean long-term effects are not possible. A [2018 study](#) notes that more research investigating potential long-term side effects is necessary.

The [FDA](#) warn that CBD products may result in:

- liver injury
- damage to male fertility
- changes in appetite
- drowsiness or sleepiness
- Irritability or agitation
- diarrhea

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It is advisable for people to speak with their doctor before taking any products containing CBD, as some evidence suggests that the substance [may interact](#) with certain medications.

Legality

The legal status of CBD in the United States is complex. Currently, hemp and hemp-derived products are permitted under the [Farm Bill](#), as long as their [tetrahydrocannabinol \(THC\)](#) content is less than 0.3%. This is the cannabinoid that people associate with the sensation of feeling "high."

However, there is still some confusion over the specifics. If in doubt, people may wish to check the [laws within each state](#).

The [Transportation Security Administration \(TSA\)](#) note that people can travel with medical CBD products with a THC content under 0.3%.

The [CBD Awareness Project](#) also acknowledge the challenges of navigating state, local, and federal laws regarding CBD. They provide an up-to-date list of the legal status of medical and recreational uses of CBD and other related products by state.

How to use

It is vital for a person to follow all instructions on the packaging and not exceed the [correct dose](#) on the label. People who are new to CBD should start with the lowest possible dosage. Once they know how their body reacts to the substance, they can gradually increase the dose.

People can mostly use CBD oils and tinctures in a similar way. A popular method is orally ingesting the product, and with this in mind, CBD products are typically available in a variety of flavors.

People can also consume CBD by placing one full dropper of the product under their tongue and holding the liquid for 30–90 seconds before swallowing.

In addition, a person can add CBD oils and tinctures to food and beverages. However, it is not advisable to do this with CBD oils, as it will likely not mix well, while some CBD oils may leave an unpleasant oily taste. However, water-soluble tinctures typically mix well in food and drink.

People can also apply CBD oil [directly to their skin](#), but they should not try this with tinctures, as it will not be as effective and may irritate the skin. Individuals may also wish to attempt a [patch test](#) before applying CBD oil to check for any allergic reactions to the substance.

[Learn more about CBD oil and skin here.](#)



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The advertisement features a central image of a Medterra tincture bottle with a label that reads "medterra Relax Sound Asleep". To the right of the bottle, there is a promotional offer: "FREE \$40 CBD + THC Gift Card" with a "RELIEF" logo. Below this, it says "CBD + THC Gift Card" and a "CLAIM OFFER" button. At the top, it says "ADVERTISEMENT" and "OVER 40,000 REVIEWS" with five stars. At the bottom, it repeats the tagline "TRUSTED PRODUCTS FOR SLEEP, PAIN AND RELIEF".

It is also important for people to speak with a healthcare professional before using a CBD oil or tincture. A doctor can help ensure a person is safe to use the product, and that these products will not interact with any current medications.

How to choose

At present, the [FDA](#) do not regulate CBD products. A [2017 study](#) also suggests that several CBD goods available online may include inaccurate labels. Therefore, when purchasing CBD oils or tinctures, it is advisable for people to look for products that:

- contain no more than 0.3% THC, as per the Agriculture Improvement Act
- have proof of third-party testing by an ISO/IEC 17025-accredited laboratory
- pass tests for pesticides, heavy metals, mold, and microbes
- pass product potency evaluations and safety testing
- are not from a company subject to an FDA warning letter
- are from a company that provide certificates of analysis for all their products

Additionally, people may also consider:

- price
- CBD potency
- customer reviews
- retailer and manufacturer reputations

[Read our complete buyer's guide to CBD here.](#)

Summary

There is growing interest in CBD products, while some of the most popular items include oils and tinctures. Research suggests that the substance may have several potential health benefits.

While they are similar, manufacturers produce these products in different ways. Typically, CBD oil uses a carbon dioxide extraction method, while tinctures use alcohol to extract the substance.

Always consult with a doctor before trying CBD products for the first time.

CBD resources

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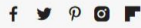


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CBD Tincture vs. Oil: What Do They Really Do?

[CBD tincture](#) | [CBD oil](#) | [Tincture vs. oil](#) | [Which is better?](#) | [How to use](#) |

Side effects

Ready to “add to cart” but don’t know what the heck a CBD tincture is compared to oil? We have all you need to know about the differences here.

If you’ve done any CBD shopping, you know the number of choices is borderline unreal.

CBD oils and tinctures may look like the same damn thing, but there is actually a difference.

We get into the nuts and bolts of it below, but to quickly answer your burning question: One is oil-based, and the other is alcohol-based.

CBD oil uses a carrier oil — commonly medium-chain triglyceride (MCT) oil — as its base, while CBD tincture uses an alcohol base.



Medically reviewed by **Dominique Fontaine, BSN, RN, HNB-BC, HWNC-BC**
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What is CBD tincture?

CBD tinctures and oils are used to help ease many conditions. People use CBD for things like sleep and anxiety relief to things like help with pain and inflammation.

Tinctures have a reputation for fast-acting results, which makes them a strong choice for those looking to relieve pain.

A tincture also tends to live longer on your nightstand since its base is preserving alcohol and not oil.

Unlike CBD oils, tinctures are more challenging to find. Most CBD brands have a good selection of CBD oils to choose from, but for those looking for a tincture, you may have to search across a good handful of brands before finding one that suits you.

Plus, many brands use the term tincture to describe an oil and vice versa, so it can be annoyingly confusing. Scanning the ingredient list can help. If you see a carrier oil listed, you'll know it's an oil.

P.S. Tinctures may be extra bitter-tasting, though some brands try to help with flavoring. Don't say we didn't tell you.

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What is CBD oil?

CBD oil has the same potential benefits as CBD tinctures and is used similarly to CBD tinctures. It can be added to food and bevys, but it can also be applied to the body. (CBD massage oil is a thing, by the way).

CBD oil may not last as long as CBD tinctures, but it may not taste as earthy. It's pretty easy to find CBD oil; most brands have a variety of CBD oils ranging across broad-spectrum, full-spectrum, and isolate options.

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PROGRESS

What's the right CBD product for you?

Take a short quiz about what type of CBD you are interested in and we'll share our top product picks, vetted by experts.

Choose a reason for your interest in CBD (select one).

Pain

Inflammation

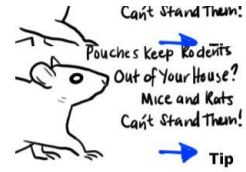
Stress and anxiety

Sleep

Skin health

Overall wellness

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CBD tincture vs. CBD oil

CBD oils and tinctures need a base ingredient to make CBD products. The point here is to dilute your product so it's safe for consumption. CBD tinctures and oils go about this in two different ways, and the extraction method varies too.

CBD tinctures

CBD tinctures use an alcohol base for dilution.

Manufacturers use high-proof alcohol to extract what they need from the cannabis plant. Plus, alcohol is also added to the item when it's all done.

The point of this extraction method is to protect the precious cannabinoids at all costs and keep everything safe from oxidation.

OFC, there are a couple of downsides to this approach:

1. It needs a sh*t ton of filtration and refinement.
2. A bitter flavor may be left behind (ew).

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Since not too many folks love a bitter dose of anything, some brands try to offset the earthy taste by tossing in vegetable glycerin, flavors, or sweeteners. At this point, some may question why they don't just eat a CBD gummy instead, and that's a very valid question, TBH.

Like a good deal of CBD products, CBD tinctures may also feature extras like sleep supplements (often melatonin) or some good ole vitamins to sweeten the deal.

CBD oil

For CBD oils, the extraction method is either CO2 or ethanol.

Instead of using any alcohol, a carrier oil is used to dilute the product.

As we mentioned, many brands' go-to choice is MCT oil, an ingredient usually made from coconut oil. Some other, less common carrier oil options include straight-up coconut oil, avocado oil, olive oil, etc.

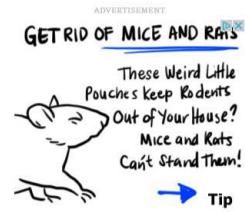
The carrier oil of choice is mixed with CBD extract, and sometimes, brands also include other extracted compounds from the cannabis plant, like flavonoids and terpenes, for potentially extra benefits (a theory known as the entourage effect).

For those who want CBD and nothing but CBD, CBD isolate products don't include extra compounds from the cannabis plant, meaning there's likely zero THC in these products and zero or little earthy taste.

CBD oils are popular for those who don't feel like eating a CBD gummy, which can often include added sugars and can become costly. Of course, an alternative to CBD oils is CBD capsules, which can be taken more easily on the go.



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Which is better?

This ultimately comes down to personal preference and possible [allergy restrictions](#).

If you know you're allergic to MCT oil, one of the more commonly used carrier oils in CBD oil (coconut [allergy peeps](#), this means you), opting for a CBD tincture makes sense — these products use an alcohol base instead.

Of course, if you're trying to skip alcohol, opting for CBD oil might be the right choice for you.

The [potency](#) of your CBD will make the biggest difference in your experience, not so much whether you choose an oil or a tincture.

But [CBD beginners](#), be sure you don't overdo things initially and crank up to an intermediate or high dose (more on that in a sec).

How to use CBD tincture and oil

Though they are not identical items, these liquid products are generally used in the same way — by mouth via a little dropper the product usually comes with.

If you like to get straight to the point, you can place your tincture dosage directly under your tongue, holding it there for about one minute.

This method is the more streamlined approach. The CBD flops directly into your bloodstream via your mucous membranes (cool and also gross). This way, your CBD can skip the tedious and time-consuming [digestive process](#).

If time isn't of the essence and you don't love the earthy taste tinctures are lowkey famous for, you can sprinkle yours into your food or [beverages](#).

It's best to start with a low dose of either product (something like 10 mg per day) so you can see how CBD jives with your body first. Then, you can slowly work your way to a higher dose if you find it necessary.

Pro tip: Some CBD oils and tinctures are unflavored. Still, they may have a noticeable

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earthy hemp taste. Tossing them into a flavored beverage you already like *may* help dilute that bitter taste. Or, if you're brave, you can test out flavored CBD oils and tinctures and see if they're your cup of tea or not.

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What are the side effects?

"We still don't fully understand all of the mechanisms involved in CBD's actions," says [Marcel Bonn-Miller](#), Ph.D, who studies CBD and its effects, primarily on PTSD.

The good news is that most of the official [research](#) done on CBD oil has shown that there are very few negative side effects from using it. However, CBD is not without some side effects. Most notably, in [the clinical studies](#) for epilepsy, sedation was one of the more common side effects. Decreased appetite and diarrhea were also seen in some patients. Depending on what other medicines they are taking, certain patients may need to have periodic blood tests to check on liver function.

In addition, CBD *may* cause some drug interactions. However, Bonn-Miller also adds that there is evidence that it does not have any dependence potential.

It's always best practice to chat with your health care provider first if you can. This way, you can learn about any potential drug interactions and see if the potential side effects are worth it for the ailment you'd like to improve.

Takeaway

CBD oil and tinctures may seem like identical twins (and many brands seem to advertise them this way), but there are a few differences.

CBD tinctures are alcohol-based, while CBD oils use carrier oils to dilute products.

Tinctures may taste extra earthy and shouldn't be applied to the body like CBD oils can. People with tree nut allergies may opt for tinctures since these do not use MCT carrier oil like most CBD oils.

Both types of CBD products may help with a slew of health ish, like [better sleep](#), help with anxiety, pain, and more. More doctors will know if CBD may interact with any



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with anxiety, pain, and more. Your doctor will know if CBD may interact with any medications you're taking, so it's always great to get their opinion before trying anything new.

Remember to start your doses off small to avoid any unsavory reactions (though CBD is generally well-tolerated and considered safe to use).

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Last medically reviewed on June 13, 2023

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