



KEMENTERIAN PERDAGANGAN  
REPUBLIK INDONESIA

Indonesian Essential Oil

*The Scents  
of Natural Life*

MINISTRY OF TRADE OF THE REPUBLIC OF INDONESIA

# TRECYDA

Trade Policy Analysis and Development Agency

## Handbook of Commodity Profile

### “ Indonesian Essential Oil : The Scents of Natural Life”

Is developed as part of national efforts to create mutual beneficial economic cooperation and partnership between Indonesia and world communities.

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Cetakan Pertama



## Introduction

As part of our continuous effort to support development of national trade policy, The Trade Policy Research and Development Agency is making effort to collect, assess, and present trade and industry information in an innovative and comprehensible form. And here we present you the profile of essential oils of Indonesia.

This book shows the various essential oils produced in Indonesia. Each of them is derived from different plant species and carries with it various benefits for human society. The source plants are grown and processed in farmlands and countryside, distant from the pollution-ridden megacities of the world, and therefore offer us with a natural and environmental-friendly element on which we can build a better life on Earth. And yet, the industry is also world-class, employing qualified people and advance technology as well as following international standards.

Readers of this book would appreciate its illuminating contents as well as its beautiful design, combining technical specifications and statistics with easily readable narrative and supporting pictures.

We hope that the readers will find this book informative and enjoyable.

**Herry Soetanto**  
*Head of Trade Policy Analysis and Development Agency (TRECDA)*



Minister of Trade  
Republic of Indonesia

## Message

Situated between two large continents and two vast oceans, blessed with fertile soil and gracious climate, and populated by one of the most astounding biodiversity in the planet, Indonesia is the best source of one of the most important chemical the world can offer: essential oil. Although less celebrated than petrochemical oil, essential oil has silently touched our lives in many ways. And touched us in a much cherished ways too.

Essential oil is natural. Essential oil is drawn from the environment in which we live in. Essential oil carry with it the characteristics of its original plant—the essence of the plant, including its natural properties to remedy our ailments, to satisfy our moods, or to support our livelihood.

There is no doubt that essential oil will contribute much more to our lives in the future.

*Mari Elka Pangestu*

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# The Essence of Nature

## THE OIL FOR ALL SEASON

There are numerous essential oils, each carry with it the essence of its original plant. Essential oil has been used throughout the millennia for different purposes, especially in medicine, flavoring, or fragrance.

Essential oil is concentrated liquid containing aroma compounds from plants. It is “essential” in the sense that it carries distinctive scent, or essence, of the plant. Although the use of plants for their aroma and scents have existed for millenia, the first mention of techniques and methods used to produce essential oils was by Ibn al-Baitar (1188–1248), an Andalusian physician, pharmacist and chemist.

As a country rich in plant species, Indonesia is a natural place for essential oil industry to develop. There are around 40 kinds of oil produced by Indonesia, among them 12 are commercially developed at an industrial scale. They are: patchouli (nilam), vetiver (akarwangi), cananga (kenanga), cajuput (kayu putih), lemon grass (sereh dapur), clove (cengkeh), sandalwood (cendana), nutmeg (pala), cinnamon (kayu manis), cubeb or Javanese pepper (kemukus), and pepper (lada). Essential oils are usually high-value, low-volume commodity. They are easy to plant, maintain, and harvest, easy to process, and easy to transport. All these make them preferable for small farmers and remote communities.

Indonesian export of essential oils exceeded US\$ 124 million in 2010. Essential oil is mainly used in fragrance, medicine and culinary. The perfume industry is one of the largest consumers of essential oil. As for culinary, many food manufacturers usually purchased essential oil and combine it with other substances and materials to create delicious products, such as chocolate, candy, and beverages.

Aromatherapy products are labeled by the names of the plants from which the essential oils are derived, and, indeed, the oil forms the major part of the product. However, perfumes, medicine and food products from modern industry uses variety of essential oils and extracts in a certain combination that are kept as a secret by the manufacturers.

## DEFINITION AND CHEMICAL PROPERTIES

Unlike perfume or fragrance oil and crude vegetable oil, essential oil is derived directly from real plant, while perfume is artificially-created fragrance that contains various substances, including artificial chemical substances.

An essential oil is a concentrated hydrophobic liquid containing volatile aroma compounds from plants. Essential oils are also known as volatile oils, ethereal oils or aetherolea, or simply as the "oil of" the plant from which they were extracted, such as oil of clove. An oil is "essential" in the sense that it carries a distinctive scent, or essence, of the plant. Essential oils do not form a distinctive category for any medical, pharmacological, or culinary purpose. (Definition taken from Wikipedia)



Essential oil is highly concentrated and will easily dissipate in room temperature. Essential oil is derived directly from real plant, while perfume is artificially-created fragrance that contains various substances

Essential oil is highly concentrated and will easily dissipate in room temperature. Contrary to the "oil" in its name, essential oil is not oily-feeling at all. They are usually clear, except patchouli, orange, and lemon grass oils which are amber or yellow in color.

Chemically, the essential oils are primarily composed of mono- and sesquiterpenes and aromatic polypropanoids synthesized via the mevalonic acid pathway for terpenes and the shikimic acid pathway for aromatic polypropanoids. The essential oils from aromatic plants are for the most part volatile and thus, lend themselves to several methods of ex-

traction such as hydro distillation, water and steam distillation, direct steam distillation, and solvent extraction.

Essential oils are very complex substances; all essential oils are made up of many individual chemical components which are difficult to identify. In addition, pure essential oils are affected by a number of factors on the source (the plant), making it impossible to 'duplicate' nature.

## DIFFERENT APPLICATION OF ESSENTIAL OIL

Most people would equate essential oil with aromatherapy. The truth is, only a small portion of essential oils produced is used for aromatherapy. Most modern usage is in flavor and fragrance industry, pharmacy, and chemical synthesis.

Aromatherapy is a branch of medicine—some would say alternative medicine—that uses essential oils and other aromatic compounds to improve one's health or alter one's mood. As the term aromatherapy suggests, essential oils are used mainly for their aroma. Many people believe that these natural fragrances are good for their health.

But medicine is a much larger field than just aromatherapy. Essential oils have been found to have other medical or chemical properties. Cajuput and tea tree oils are known to have antiseptic properties, while a record from the early 20th century stated that a French chemist has successfully treated gas gangrene in his hand (after he was badly wounded in a laboratory explosion) by using lavender oil. Studies have supported the use of clove oil for dental pain and it may also reduce blood sugar level.

Outside of medicinal use, a large amount of essential oil is absorbed by the flavor and fragrance industry. Essential oil is the building block in creating flavors and fragrances. The exact formula and process for creating the flavor or fragrance of any commercial products is a highly-kept secret, but each will definitely contain chemical compounds derived from essential oil as their ingredient. Nutmeg oil, for example, contains chemical components that are used for food flavoring (e.g. baked goods, syrups, sweets, beverages) and also for creating cosmetics. Patchouli oil has a scent that is favored by many, but in addition to the scent, it is also used as a fixative in perfumes. This means that patchouli oil is added to perfume to slow the evaporation of other, more volatile oils so that their aroma would be released in a longer period of time.

Some other applications could be quite surprising to many. Clove oil, for example, contains a chemical compound called eugenol (the name derived from the scientific name of clove). In the late 19th century, scientists found that they can synthesize vanillin (the primary component of vanilla bean extract) from this eugenol. Because demand for vanillin far exceeds natural vanilla beans almost 10 to 1, this kind of synthesis is crucial. Although vanillin synthesis from eugenol has been replaced by newer methods, eugenol derivatives are still used for various purposes.

Essential oil is more than aromatherapy. Essential oil is used in flavor and fragrance industry, pharmacy, and chemical synthesis.



At the village level, distillation is the preferred method. It can produce good quality oil while still being simple enough to develop and operate.

# ESSENTIAL OIL INDUSTRY IN INDONESIA

In 2010, Indonesia exported more than US\$ 124 million worth of essential oils. The industry involves thousands of people from hundreds of villages, towns and cities in dozens of islands—it touches people from every walk of life.

## DEVELOPMENT OF ESSENTIAL OIL INDUSTRY IN INDONESIA

The plants used by the essential oil industry are either native Indonesian plants or brought in centuries ago by foreign immigrants, traders, explorers, or colonialists. After hundreds of years, the plants were planted and cultivated by the population. The people become aware of their value, may it be for private and domestic use or as a highly-valuable traded commodity.

Each plant has its own story and significance. Masoi is an indigenous plant of Papua Island where, even today, remains the only place in the world where the plant grows. Nutmeg has a different story. The common nutmeg originated in Indonesia's Banda Island in the Maluku Islands (the Moluccas). It was such a very valuable commodity that European powers of the 17th century fell into war in order to control the only source of nutmeg. Today, however, nutmeg is found various coun-

tries, including Malaysia, India, and the Caribbean. Nilam or patchouli, on the other hand, has a unique story. Industry lore tells that the name nilam originated from Nederlands-Indie Landschappen Atjeh Maaschappij, referring to the role the Dutch played in large-scale development of patchouli in its colonial territory of Aceh.

It is difficult to track the first cultivation of the plants and the subsequent processing to obtain essential oils from them. What is clear is that essential oil production, albeit in a traditional way, is a skill that has existed for hundreds of year.



# EXTRACTION AND PROCESSING

Essential oils are extracted from plants in a number of ways. Each method is used for different plant materials and has different advantages. Distillation is the most economical method and is considered suitable for small producers in the villages.

The main methods of extracting essential oils are distillation and expression; newer methods of extracting essential oils are percolation (hydro-diffusion) and carbon dioxide extraction. In addition, the distillation process of some essential oils produce aromatic, or floral, waters as a by-product. Absolutes and resinoids can also be obtained from plants through solvent extraction but these are not essential oils.

Distillation is the most economical method of extracting oil from plant materials

Distillation methods today owe much to an Arab physician called Avicenna (980 A.D. - 1037 A.D.), who vastly improved the cooling system used in the distillation units of the past by the invention of a refrigerated coil. There are three different distillation methods commonly used in Indonesia: water distillation, water and steam distillation, and steam distillation. Each is used for different kind of plant materials.

Exporters and factories use more modern and advance technologies to produce top grade oils. They are on par with other international players.

Flowers are usually solvent-extracted, with the exception of rose, ylang-ylang and orange blossoms. Another way is enfleurage extraction. Here, animal fat is used to extract the oil from the flower petals.



Carbon dioxide extraction of essential oils is an expensive way of extracting essential oils and is not as common as distillation; carbon dioxide is used at both high pressure and low temperatures to extract essential oils from the plants. Essential oils produced through carbon dioxide extraction and distillation may differ in properties.

Carbon dioxide extraction of essential oils is said to be more “pure” than distillation of essential oils and closer to the original oil in the plant; there is no trace of carbon dioxide in the final essential oil produced. Although distillation of essential oils is also “pure,” the chemical components of the final essential oil are slightly different in chemical composition to the original essential oil produced by the plant, due to the distillation process.

Essential oils obtained through expression are citrus essential oils; essential oils in citrus fruits are located in

the rind of the fruit and consequently the essential oil has to be “squeezed” out. Essential oils obtained by expression may actually contain some chemical contaminants because of the chemicals used to spray fruit trees (unless they are “organically” grown). Cold expressed essential oils are said to be chemically the same as when they existed in the plant.

Percolation, or hydro-diffusion, is also a newer method of extracting essential oils; essential oils are obtained in much the same way as a coffee percolator works. This method is quicker than distilling an essential oil but not all essential oils are suitable for extraction through percolation. In addition, the quality of essential oils obtained through percolation, or hydro-diffusion, is still being studied and compared to the quality of essential oils obtained through distillation.

Water Distillation	Steam and Water Distillation	Steam Distillation
Cananga, ylang-ylang, ginger	Patchouli, citronella, lemongrass, lime, basil, clove leaf, piper, vetiver, cajuput, and other leaves	Nutmeg, patchouli, cinnamon bark, cubeb, massoi, sandalwood, black pepper, vetiver, and other seeds, twigs and barks



## GOVERNMENT POLICIES

On the national scope, the Ministries of Agriculture, Forestry, Industry, Trade, Health, and Finance each are involved in different stages of the industry chain. Each government agency will oversee, regulate and develop specific parts of the industry. The following table can show the role of each government agency.

Ministry	Role and Scope
Agriculture	Agriculture policies and farmers development (which include farm and plantation plants, e.g. patchouli, lemongrass, clove, nutmeg)
Forestry	Forestry policies (which cover forest plants, e.g. agarwood, massoia, sandalwood)
Cooperatives and SME	Developing SMEs and home industries
Industry	Industrial policies, especially in overseeing large factories
Trade	Trade policies, trade promotion
Health	Ensuring health standards and issuing health certificates for products and factories
Finance	Export and import duties and taxes
National Education	Education and scientific research

On the provincial and regency level, regional governments usually help administer national programs and extend the reach of National Government to the village level. Agriculture and forestry are managed by one department (usually called Dinas Pertanian, Kehutanan dan Perkebunan – Department of Farming, Forestry and Plantation). Similarly, industry, trade and cooperatives are managed by one department (usually called Dinas Perindustrian, Perdagangan dan Koperasi – Department of Industry, Trade and Cooperatives).

### Universities

Universities that have agriculture, farming, biology, botany, chemistry, chemical engineering, or pharmacy programs are involved in developing essential oil industry. Notable contributions have been made by Bogor Institute of Agriculture (IPB), Gajah Mada University (UGM), November 10 Institute of Technology (ITS), Brawijaya University (Unibraw), UPN Veteran Surabaya, and many others. They are irreplaceable components in Government's effort to improve the quality of farming and processing of essential oil plants. Highly mobile, unrestrained by bureaucratic red-tapes and eager to find opportunities to implement their scientific know-how, a large number of faculty members and students are known to visit remote villages, delve into practical problems, and guide poor farmers.



Clove buds are processed in modern factories to produce essential oil and extracts



## Indonesian Medicinal and Aromatics Crops Research Institute (IMACRI) or Balitro (Balai Penelitian Tanaman Obat dan Aromatik)

In addition to those universities, in which most are state-owned, the Government also has the Indonesian Medicinal and Aromatics Crops Research Institute or IMACRI (which is commonly known by its Indonesian acronym Balitro, a short for Balai Penelitian Tanaman Obat dan Aromatik), a unit of Ministry of Agriculture in Bogor. Working closely with IPB, the state preeminent university for agriculture-related sciences, IMACRI conduct research on technical aspects of cultivating medicinal and aromatic crops, developing better plant varieties and seeds, studying alternative usage of essential oil, and assist companies in quality control. One recent contribution by IMACRI is their research in the three most important patchouli varieties: Lhokseumawe, Tapaktuan, and Sidikalang.

## Dewan Atsiri Indonesia (DAI) – Essential Oil Council of Indonesia

DAI or Dewan Atsiri Indonesia (Essential Oil Council of Indonesia) is the industry group in Indonesia. Its formation was declared in September 20, 2006 during the Indonesia National Conference on Essential Oil in Solo, Central Java. The council is the medium in which all stakeholders may gather and coordinate efforts to develop the essential oil industry in Indonesia, including representing and promoting Indonesia in international stage, develop national policies, and organize trainings for stakeholders and the public. DAI main secretariat is located in IPB campus in Bogor (Institut Pertanian Bogor or Bogor Institute of Agriculture), but will move to the Ministry of Agriculture office complex in South Jakarta. Members include government agencies and officials, companies and its representatives, academia, and business people. As of August 2011, there are 12 companies and 21 individuals listed as official members.


## International Federation of Essential Oils and Aroma Trades (IFEAT)

Many Indonesian companies and professionals are actively contributes to IFEAT. IFEAT or International Federation of Essential Oils and Aroma Trades is the international organization for flavor and fragrance industries. The principle aim of IFEAT is the advancement and protection of the interests of its members in all parts of the world through international collaboration, the encouragement of good practice, the dissemination of information and provision of forums for discussion.

In supporting the industry, IFEAT have learning programs and studies on the many aspects of essential oils and aroma trades. Successful completion of the programs will lead to IFEAT Flavourist and Perfumery Diplomas. The flavourist course is developed in association with the British Society of Flavourists and held within the Department of Food and Nutritional Sciences at the University of Reading. The University of Plymouth offers the fragrance programs both for distance learning and honours student. The distance learning program is available through ICATS (International Center for Aroma Trade Studies).



Government bodies, research institutes, and industry groups cooperate to create a favorable environment for the industry to thrive.



Kaffir lime (*Citrus × hystrix*) or known in Indonesia as jeruk purut is grown in Java. It is used in many Asian cuisines. Its leaves are distilled to produce lime oil.

# From One Island to Another: THE OILS OF INDONESIA

Essential oils are derived from plants, and therefore the types of oils existed are as plentiful as there are plant species on Earth. But among them, only a handful is used widely by human society.

Every region of the world has unique environmental characteristics, which means that each will also have specific plant species. Some species originated in part of the world, cultivated by our ancestors, and then spread throughout the globe—food plants like rice, wheat, and vanilla are just a few famous example—while others, for one reason or another, are still confined to their native geographical location.

Some oil can be derived from different plant species, e.g. curcuma oil can be extracted *Curcuma domestica* (known in Indonesia as kunyit) and *Curcuma xanthorriza* (commonly called temu-lawak). In other cases, different oils can be extracted from one plant, e.g. the green twig of bitter orange plant (*Citrus aurantium var. amara*) is used to make petitgrain oil, while the blossom is used for neroli oil.

In the following pages of this chapter we can see some of the most important essential oil produced in Indonesia. The following table list around 40 of them.

## Major Essential Oils of Indonesia

No.	Commercial Name	Plant Source	Common Indonesian Name	Application/Benefit
1	Agarwood oil	<i>Aquilaria sp</i>	Gaharu	Perfumery, cosmetics, pharmaceutical
2	Bangle oil	<i>Zingiber cassumunar</i>	Bangle	Pharmaceutical
3	Basil oil	<i>Ocimum basilicum</i>	Kemangi	Pharmaceutical, food, bio pesticide
		<i>Ocimum gratissimum</i>	Selasih mekah	Pharmaceutical, food
4	Black pepper oil	<i>Piper nigrum</i>	Lada	Flavoring, antimicrobial
5	Cajuput oil	<i>Melaleuca leucadendron</i>	Kayuputih	Pharmaceutical
6	Calamus oil	<i>Acarus calamus</i>	Jeringau	Pharmaceutical
7	Cananga oil	<i>Canangium odoratum</i>	Kenanga	Aromatherapy, perfumery, cosmetics
8	Cardamon oil	<i>Amomum cardamomum</i>	Kapulaga	Pharmaceutical
9	Celery oil	<i>Apium graveolens</i>	Seledri	Flavoring, pharmaceutical
10	Cinnamon bark oil	<i>Cinnamomum casea</i>	Kayumanis	Flavoring
11	Citronella oil	<i>Cymbopogon nardus</i>	Sereh wangi	Flavoring, perfumery, soap
12	Clausena/Anis oil	<i>Clausena anisata</i>	Clausena	Pharmaceutical, beverages, perfumery, cigarette, chewing gums, tooth paste
13	Clove oil	<i>Syzygium aromaticum</i>	Cengkih	Flavoring, perfumery, cigarette
14	Coriander oil	<i>Coriandrum sativum</i>	Ketumbar	Food and pharmaceutical
15	Cornmint oil	<i>Mentha arvensis</i>	Permen	Flavoring, perfumery, tooth paste, candy
16	Cubeb oil	<i>Piper cubeba</i>	Kemukus	Food, beverages, flavoring, soap, detergent, perfumery, pharmaceutical
17	Curcuma oil	<i>Curcuma domestica</i>	Kunyit	Flavoring, pharmaceutical
		<i>Curcuma xanthorriza</i>	Temulawak	Pharmaceutical, beverages
18	Fennel oil	<i>Foeniculum vulgare</i>	Adas	Flavoring, soap, cosmetics, perfumery, pharmaceutical
19	Ginger oil	<i>Zingiber officinale</i>	Jahe	Flavoring, pharmaceutical
20	Jasmine oil	<i>Jasminum sambac</i>	Melati	Perfumery, aromatherapy, cosmetics
21	Kaempferia oil	<i>Kaempferia galanga</i>	Kencur	Pharmaceutical
22	Lajagua oil	<i>Alpinia malaccensis</i>	Lajagua	Pharmaceutical
23	Lemongrass oil	<i>Cymbopogon citratus</i>	Sereh dapur	Pharmaceutical, food
24	Lime oil	<i>Citrus hystrix</i>	Jeruk purut	Food and perfumery
25	Litsea cubeba	<i>Litsea cubeba</i>	Krangean	Pharmaceutical, aromatherapy
26	Massoia oil	<i>Criptocaria massoia</i>	Masoyi	Flavoring
27	Lawang oil	<i>Cinnamomum cullilawan</i>	Lawang	Balm
28	Native myrtle oil	<i>Backhousia citriodora</i>	Surawung	Pharmaceutical
29	Nutmeg oil	<i>Myristica fragrans</i>	Pala	Flavoring, cigarette
30	Palmarosa oil	<i>Cymbopogon martini</i>	Palmarosa	Pharmaceutical
31	Patchoulli oil	<i>Pogostemon cablin</i>	Nilam	Fixative
32	Piper oil	<i>Piper betle</i>	Sirih	Pharmaceutical, antiseptic
33	Rose oil	<i>Rosa sp</i>	Mawar	Perfumery, flavoring, candy, sweetener
34	Rosemary oil	<i>Rosmarinus officinale</i>	Rosemari	Pharmaceutical
35	Sandalwood oil	<i>Santalum album</i>	Cendana	Antibacterial, antiseptic, disinfectant, expectorant, sedative, stimulant, refrigerant
36	Turpentine oil	<i>Pinus merkusii</i>	Tusam	Cosmetics, oil and paint solvent, antiseptic, pharmaceutical
37	Vetiver oil	<i>Vetiveria zizanioides</i>	Akar wangi	Perfumery, soap, cosmetics, fixative
38	Wintergreen oil	<i>Gaultheria fragrantissima</i>	Gandapura	Perfumery, pharmaceutical, flavoring
39	Ylang-ylang oil	<i>Canangium odoratum</i>	Ylang-ylang	Perfumery

Source: Dr. Meika Syahbana Rusii (2010), Trubus (2009)

## Patchouli (Nilam)

Botanical name	<i>Pogostemon cablin</i>
Common method of extraction	Steam distilled
Color	Golden brown
Consistency	Medium - Thick
Perfumery Note	Base
Strenght of initial aroma	Medium
Aromatic Description	Rich, earthy, woody aroma with a nearly hidden fruity note
Uses	Acne, athlete's foot, chapped skin, dermatitis, eczema, fatigue, frigidity, hair care, insect repellent, mature skin, oily skin, stress
Constituents	Patchoulol, Esters, Beta-Caryophyllene



Patchouli will grow in hot weather, but preferably not under direct sunlight. Indonesia is ideal for its cultivation, and at present is also the leader in production with around 90% of global market share. Among the competitors are Malaysia, the Philippines, India and China.

In traditional medicine, patchouli is often used as insect repellent, antidote for snakebites, and incense. In modern perfumery industry, patchouli is widely used. Also, it is used by industries that produced scented products like detergents, paper towels and air fresheners.

## Nutmeg (Pala)

Botanical name	<i>Myristica fragrans</i>
Common method of extraction	Steam Distilled
Color	Clear
Consistency	Thin
Perfumery Note	Middle
Strenght of initial aroma	Medium - Strong
Aromatic Description	Rich, spicy, sweet, woody. Similar to the cooking spice, but richer and more fragrant
Uses	Arthritis, constipation, fatigue, muscle aches, nausea, neralgia, poor circulation, rheumatism, slow digestion
Constituents	Terpinen-4-ol, Pinene, Sabinene, Cineole, Camphene, Limonene, Myristicin, Alpha Terpenene



Nutmeg is an evergreen tree indigenous to the Moluccas, the famed Spice Islands of centuries ago. The common nutmeg species that are widely used are now grown in various areas of Indonesia, mainly in Sulawesi, as well as in Malaysia, Grenada, the Caribbean, and India.

Nutmeg oil is used to replace ground nutmeg, as it leaves no particles in the food. The essential oil is also used in the cosmetic and pharmaceutical industries, for instance, in toothpaste, and as a major ingredient in some cough syrups. In traditional medicine, nutmeg and nutmeg oil were used for disorders related to the nervous and digestive systems.

### Clove (Cengkeh)



Botanical name	<i>Eugenia caryophyllata</i>
Common method of extraction	Steam Distilled
Color	Golden Yellow/Brown
Consistency	Medium, Slightly Oily
Perfumery Note	Middle
Strenght of initial aroma	Strong
Aromatic Description	Spicy, warming yet slightly bitter, woody, reminiscent of true clove buds, but richer
Uses	Arthritis, asthma, bronchitis, rheumatism, sprains, strains, toothache
Constituents	Eugenol, eugenyl acetate, caryophyllene, isocaryophyllene

Until modern times, cloves grew only on a few islands in the Maluku Islands (the Moluccas). Today, Indonesia, Madagascar, Zanzibar, Pakistan and Sri Lanka are world's leader in cloves output.

Cloves are used in variety of cuisine in various countries, from Japan to Holland, from India to Mexico. Outside culinary use, cloves is key ingredient for clove cigarettes (known as kretek in Indonesia), incense, Indian ayurvedic medicine, Chinese medicine, and western herbalism.

Eugenol comprises 72-90% of the essential oil extracted from cloves, and is the compound most responsible for the cloves' aroma. Eugenol has pronounced anti-septic and anaesthetic properties.

## Vetiver (Akar Wangi)

Botanical name	<i>Vetiveria zizanoides</i>
Common method of extraction	Solvent Extraction
Color	Golden/Dark Brown
Consistency	Thick
Perfumery Note	Base
Strenght of initial aroma	Strong
Aromatic Description	Woody, earthy, herbaceous, spicy almost smoky.
Uses	Acne, arthritis, cuts, depression, exhaustion, insomnia, muscular aches, oily skin, rheumatism, sores, stress
Constituents	Benzoic acid, vetiverol, furfurool, a-vetivone, B-vetivone, vetivene, vetivenyl vetivenate



Though it originates in India, vetiver is widely cultivated in the tropical regions of the world. The world's major producers include Haiti, India, Indonesia, and Réunion. In Indonesia the Garut Regency in West Java Province holds near monopoly of vetiver production. Other Javanese regencies, like Karang Anyar in Central Java, also produces vetiver, but in much lower scale and quality.

Like patchouli and sandalwood essential oils, the odor of vetiver develops and improves with aging. The characteristics of the oil can vary significantly depending on where the grass is grown and the climate and soil conditions. The oil distilled in Haiti and Réunion has a more floral quality to it and is considered of higher quality than the oil from Java which has a smokier scent.

## Pepper (Lada)

Botanical name	<i>Piper nigrum</i>
Common method of extraction	Steam Distilled
Color	Clear
Consistency	Thin
Perfumery Note	Middle
Strenght of initial aroma	Medium
Aromatic Description	Crisp, fresh, peppercorn aroma
Uses	Aching muscles, arthritis, chilblains, constipation, muscle cramps, poor circulation, sluggish digestion
Constituents	Limonene, Pinene, Myrcene, Phellandrene, Beta-caryophyllene, Beta-bisabolene, Sabinene, Linalol, Pinocarveol, Alpha, Terpineol, Camphene, Alpha, Terpenene



Black peppers are native to India and are extensively cultivated there and elsewhere in tropical regions. Currently Vietnam is by far the world's largest producer and exporter of pepper, producing 34% of the world's *Piper nigrum* crop as of 2008. Indonesia ranked 4th with 9% after India (19%) and Brazil (13%). In Indonesia, the Island of Bangka is regarded as the leading producer of pepper.

### Cananga (Kenanga)

Botanical name	<i>Cananga odorata</i>
Common method of extraction	Steam Distilled
Color	Pale Yellow
Consistency	Thin
Perfumery Note	Middle
Strenght of initial aroma	Medium
Aromatic Description	Resembling ylang ylang in aroma, cananga is sometimes used as an economical substitute in fragancing applications. Floral, sweet, slightly woody
Uses	Oily skin/hair, insect bites, high blood pressure, anxiety, nervous tension, stress, fragancing
Constituents	Caryophyllene, benzyl acetate, benzyl alcohol, farnesol, terpineol, borneol, geranyl acetate, safrol, linalol



The essential oil of cananga is used in aromatherapy. It is believed to relieve highblood pressure, normalize sebum secretion for skin problems, and is considered to be an aphrodisiac.

### Lemongrass (Sereh Dapur)



Botanical name	<i>Cymbopogon citratus</i>
Common method of extraction	Steam Distilled
Color	Pale Yellow to Vivid Yellow
Consistency	Thin
Perfumery Note	Top
Strenght of initial aroma	Strong
Aromatic Description	Fresh, lemony, earthy
Uses	Acne, athlete's foot, excessive perspiration, flatulence, insect repellent, muscle aches, oily skin, scabies, stress
Constituents	Citral, Geranyl Acetate, Linalyl Acetate, Geranial, Neral, Limonene, Myrcene, Beta-caryophyllene

Lemongrass is mostly used as herb in Asian cuisine, as well as some African and Latin American countries. Israeli researchers in 2006 found that lemongrass may have anti-cancer properties.



## Citronella (Sereh Wangi)

Botanical name	<i>Cymbopogon nardus</i>
Common method of extraction	Steam Distilled
Color	Clear
Consistency	Thin
Perfumery Note	Top
Strenght of initial aroma	Medium
Aromatic Description	Citrusy, slightly fruity, fresh, sweet
Uses	Excessive perspiration, fatigue, headache, insect repellent, oily skin
Constituents	Geraniol, citronellal



At present, the world production of citronella oil is approximately 4,000 tonnes. The main producers are China and Indonesia - producing 40% of the world's supply. Citronella oil is obtained from the leaves and stems. The oil is used extensively as a source of perfumery chemicals such as citronellal, citronellol, and geraniol. These chemicals find extensive use in soap, perfumery, cosmetic and flavouring industries throughout the world.

## Cinnamon (KayuManis)



Botanical name	<i>Cinnamomum zeylanicum</i>
Common method of extraction	Steam Distilled
Color	Golden Yellow/Brown
Consistency	Slightly oily feeling
Perfumery Note	Middle
Strenght of initial aroma	Strong
Aromatic Description	Cinnamon Essential Oil is peppery, earthy, spicy, bright yet slightly woody. Oil distilled from the bark of the cinnamon tree is preferred over the oil distilled from the leaves. Cinnamon Bark Essential Oil, however, tends to be much more costly.
Uses	Constipation, exhaustion, flatulence, lice, low blood pressure, rheumatism, scabies, stress.
Constituents	Eugenol, eugenol acetate, cinnamic aldehyde, benzyl benzoate

Cinnamon trees are native to South East Asia. Although it was imported to Egypt as far as 2000 BCE, its origin remained a mystery to Europeans until the exploration of the sixteenth century. Along with Indonesia, Sri Lanka, India, China, and Vietnam are notable producer of cinnamon.

## Sandalwood (Cendana)



Botanical name	<i>Santalum album</i>
Common method of extraction	Steam Distilled
Color	Clear with a Yellow Tinge
Consistency	Medium - Thick
Perfumery Note	Base
Strenght of initial aroma	Medium
Aromatic Description	Rich, sweet, fragrant yet delicate, woody, floral
Uses	Bronchitis, chapped skin, depression, dry skin, laryngitis, leucorrhea, oily skin, scars, sensitive skin, stress, stretch marks
Constituents	Santalols, santyl acetate, santalenes

Sandalwood is the name of a class of fragrant woods from trees in the *genus Santalum* (which contains more than nineteen species), although *Santalum album* is considered to be the main source of true sandalwood. *S. Album* is a rare and protected species.

## Cajuput (Kayu Putih)




Botanical name	<i>Melaleuca leucadendron</i>
Common method of extraction	Steam Distilled
Color	Clear with a Yellow Tinge
Consistency	Watery
Perfumery Note	Middle
Strenght of initial aroma	Medium
Aromatic Description	Fresh, campherous aroma with a fruity note
Uses	Asthma, bronchitis, coughs, muscle aches, oily skin, rheumatism, sinusitis, sore throat, spots
Constituents	a-pinene, B-pinene, myrcene, a-terpinene, limonene, 1,8-cineole, y-terpinene, p-cymene, terpinolene, linaolool, terpinen-4-ol, a-terpineol

## Other Types

Other important plants include: massoia (masoi), basil (kemangi), rose (mawar), melati (jasmine), ginger (jahe), kapulaga (cardamon), coriander (ketumbar), and champaka (kencur).





# The Land of Thousand Island

## THE SOURCE OF VARIOUS OILS

Indonesia has thousands of islands. Each ones are unique, resulting from nuance of geology, ecology, and development.

It is easier to review Indonesia's essential oil industry by examining the islands or island groups that make up the Indonesian archipelago. These are Sumatra, Java, Kalimantan (Borneo), Sulawesi (Celebes), Nusa Tenggara (the Lesser Sunda Islands), Maluku (the Moluccas), and Papua (New Guinea). Each of these regions have different contribution to the essential oil industry, may it be plantation, source of raw materials, processing center, trading hub, or other roles.

The following table shows exported volume of essential oil from different regions of Indonesia.

**Regional Export of Essential Oil in 2010**

Island/Region	Province	Exported Volume (kg)
SUMATRA	Riau and Riau Islands	22,534
	West Sumatra	198,410
	North Sumatra	2,361,298
	Lampung	3,317
	<b>TOTAL</b>	<b>2,585,559</b>
JAVA	DKI Jakarta	1,392,906
	West Java	7,291
	Central Java	378,578
	East Java	236,834
	<b>TOTAL</b>	<b>2,015,609</b>
KALIMANTAN	East Kalimantan	1,862
	<b>TOTAL</b>	<b>1,862</b>
THE LESSER SUNDA ISLANDS	Bali	2,635
	Eastern Nusa Tenggara	616
	<b>TOTAL</b>	<b>3,251</b>
SULAWESI	Central Sulawesi	34,400
	<b>TOTAL</b>	<b>34,400</b>
<b>TOTAL VOLUME</b>		<b>4,640,681</b>

Source: Statistics Indonesia (BPS), 2011

## SUMATRA

Sumatera is Indonesia's western-most major island. The island is world famous for producing three of the most important oil in the world: petroleum, palm oil, and essential oil. About half of the essential oil exported by Indonesia goes through Sumatra, mostly from the seaport in the city of Medan, Sumatra's largest city.

The most important essential oil produced in Sumatra is patchouli oil. Although other islands of Indonesia produces patchouli oil, the most important patchouli species is Aceh Patchouli (*Pogostemoncablin Benth*), named after Aceh, the northernmost province in Sumatra. Three of the most productive varieties are Tapaktuan, Lhokseumawe, and Sidikalang. All are named after regions in Sumatra.

## JAVA

Long been the agricultural heart of Indonesia, Java is an important island in terms of essential oil volume exported. Just like in Sumatra, patchouli is planted in almost every district. But the plants of Java are more diverse. In addition to patchouli, Javanese farmers also planted clove, vetiver, cananga, lemongrass, citronella and a host of other plants and used them for essential oil.

*Patchouliis* cultivated in every provinces of Java. Clove is planted mostly in the central and eastern region of the island. Vetiver is almost entirely produced in Garut Regency of West Java, with some effort to cultivate it in the Central Java. Cananga is concentrated in Boyolali Regency in Central Java Province and Blitar Regency in East Java. Lemongrass supply mostly comes from West Java, while Tulungagung Regency in East Java is traditionally known as the supplier of citronella.

In addition to being the most developed agricultural area of Indonesia, Java is also the most rapidly industrialized. The largest cities and the largest industrial estates of Indonesia are located in Java, especially along its northern coast, including Indonesia's capital and largest city, Jakarta. Some of the largest and most advanced companies in the essential oil industry also have their headquarters or factories in Java. They are usually in the big cities like Jakarta, Semarang, Yogyakarta, and their surrounding districts.

Java is also the location of the nation's capital, Jakarta, and many of Indonesia's outstanding universities and research centers. Some of these universities have excellent programs on agriculture (e.g. IPB in Bogor), some have strong focus on technical areas (e.g. ITB in Bandung and ITS in Surabaya), while others offer more

general curricula (e.g. UI in Jakarta and Depok, UGM in Yogyakarta, Unibraw in Malang).

## KALIMANTAN

Kalimantan or Borneo, is the 3rd largest island in the world with 743,330 km<sup>2</sup>. The area is divided between three countries: Indonesia, Malaysia and Brunei, of which Indonesia control about 73%. Its rainforest is considered the oldest in the world and very rich in biodiversity. The island is the home of more than 15,000 species of flowering plants and 3,000 species of trees. One of those species might one day be discovered to be the source of new type of essential oil.

Although the island's economy is still largely focused on forestry, petroleum, and coal, more and more patchouli is cultivated and processed in Kalimantan. The most important province is East Kalimantan.



The nutmeg tree is the source of two spices: nutmeg and mace (pictured here). Both can be processed to produce nutmeg oil.

## SULAWESI

Sulawesi or Celebes is a large island in the middle of Indonesia. Its biota is unique, a large percentage of its fauna are endemic, meaning that it is not found anywhere else in the world. It is a bridge between Asiatic species in the west and Australian in the east.

Agriculture has been a major source of income for Sulawesi for the past few decades. The island is particularly known for its clove, cacao, nutmeg, and coffee. These plants make the residents one of the most prosperous communities in the country.

For the past decades, Sulawesi has been the source of raw materials for many distillers and factories. But in recent years, its entrepreneurial population has started to develop more advanced processing facilities and distillation units.

## NUSA TENGGARA

The chain of island east of Java is called the Lesser Sunda Islands or Nusa Tenggara. The world-famous tourist destinations of Bali and Lombok, as well as Komodo Island where the komodo dragons roam, are part of this chain.

In essential oil, sandalwood trees are found mainly in East Nusa Tenggara Province. The island of Sumba is referred to as Sandalwood Island and considered to be its place of origin, while the island of Timor is now the main producer of the plant.

## PAPUA

The island of Papua or New Guinea is the eastern most part of Indonesia. The western half is Indonesian territory while the eastern half is the country of Papua New Guinea. This island is the only place in the world where the massoia trees grew, but most of the processing is done in Java. Its dense and untouched rainforest still hide many secrets—unexplored territories, untapped resources, unknown species—that may yield economic value in the future.

## MALUKU

Situated between the large islands of Papua and Sulawesi, Maluku (or the Moluccas) is an archipelago of more than one thousand islands. This is the original Spice Islands known to explorers and traders of a distant past. Before the modern age, it is the only source of clove, mace and nutmeg in the world. Today, it is still an important source of spices and other raw materials for essential oil productions.



Boyolali and Blitar in Java are the best places to find cananga trees (*Cananga odorata*) like the one pictured here. The tree grows very fast and can reach 12 meters on average.





# TRADE OF ESSENTIAL OILS

## WORLD MARKET FOR ESSENTIAL OILS

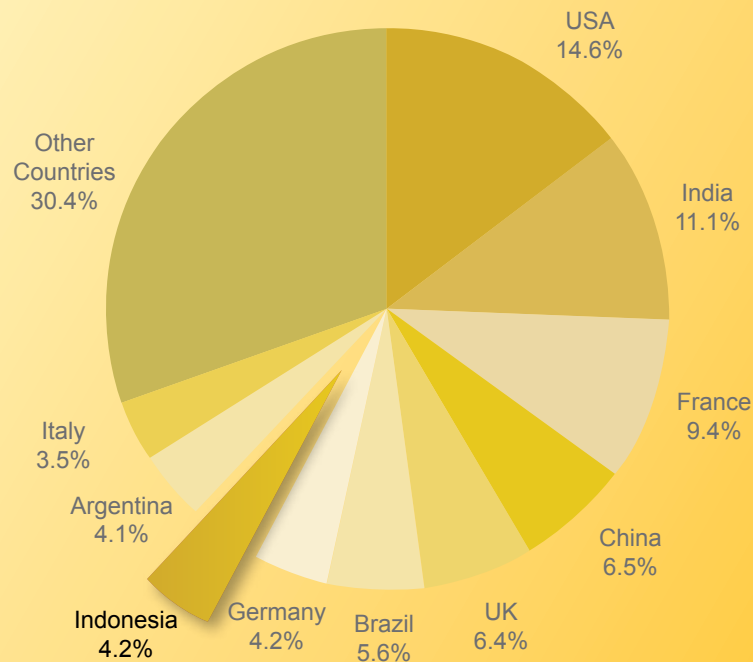
Essential oil industry supplies the global flavor and fragrance industry with basic materials for their products. The whole industry is estimated to be worth around US\$ 22 billion in 2010. The flavor and fragrance industry is dominated by a handful of corporations from Europe, US, and Japan. Together, the Top Ten companies control three-quarters of the world market.

These corporations operated in many countries, including Indonesia. Most of them have either representative office, warehouse, or factory. Others might operate from Singapore or nearby countries. The importance of Indonesia as a source of material for flavor and fragrance industry is undeniable.

As shown in the next chart, US is the leading exporter of essential oil while Indonesia sits at number 8 with 4.2% share or more US\$124 million in 2010. US leadership is partly due to its dominance in high-volume oil like orange and peppermint oils.

### Top Exporters of Essential Oil (HS 3301) in 2010

Total: US\$ 2,968 million



Source: ITC/Trademap, 2011



Global production of essential oil is difficult to obtain. First of all, many of the producers are villagers in developing countries where accurate statistics is not available and these villagers can switch between various crops and plants easily, making it more difficult to track plantation size and production. Even in developed countries, the complexity in tracking so many types of oil is too cumbersome. Countries usually grouped similar oils under one category.

In 2005, a report was released by United Nations Industrial Development Organization (UNIDO) and Food and Agriculture Organization (FAO) titled “Herb, Spices and Essential Oils: Post-harvest Operations in Developing Countries”. The report, as well as various other publications, tried to put an estimate of global essential oil production volume and value.

On top of the list is orange oil (from *Citrus sinensis*) with 26,000 tons and valued at US\$ 58.5 million, or an average of US\$ 2,300 per ton. USA and Brazil are the main producers. Next in line is cornmint oil (derived from *Mentha arvensis*). India, China and Brazil are the main producers. Production is significantly less than orange oil at 4,300 tons, but the value is US\$ 34.4 million, or an average of US\$ 8,000/ton. The third oil in the list is eucalyptus oil of *cineole-type*, produced by China and India. It is derived from *Eucalyptus globulus* and *E. polybractea*. Annual production was 3,728 tons and worth US\$ 29.8 million.

Indonesia was listed with the 4th, 8th and 20th oils: citronella (*Cymbopogon species*), clove leaf (*Syzygium aromaticum*), and patchouli (*Pogostemon cablin*). Indonesia and China were the leader in citronella production, an annual volume of 2,830 tons worth around US\$ 10.8 million (US\$ 3,800 per ton). Clove leaves oil were produced in Indonesia and Madagascar. Annual production was 1,915 tons, valued at US\$ 7.7 million or about US\$ 4,000 per ton. Patchouli oil production was dominated by Indonesia and China, from which 563 tons were produced annually and worth about US\$ 6.8 million or US\$ 12,100/ton.

The most expensive among the list of 20 biggest essential oils produced (by volume) was coriander oil (*Coriandrum sativum*). Russian and Romania was the leading producer. There was only 710 tons produced, but they are worth US\$ 49.7 million, nearly as much as the total value of orange oil. Every ton of coriander oil is worth US\$ 70 thousand.

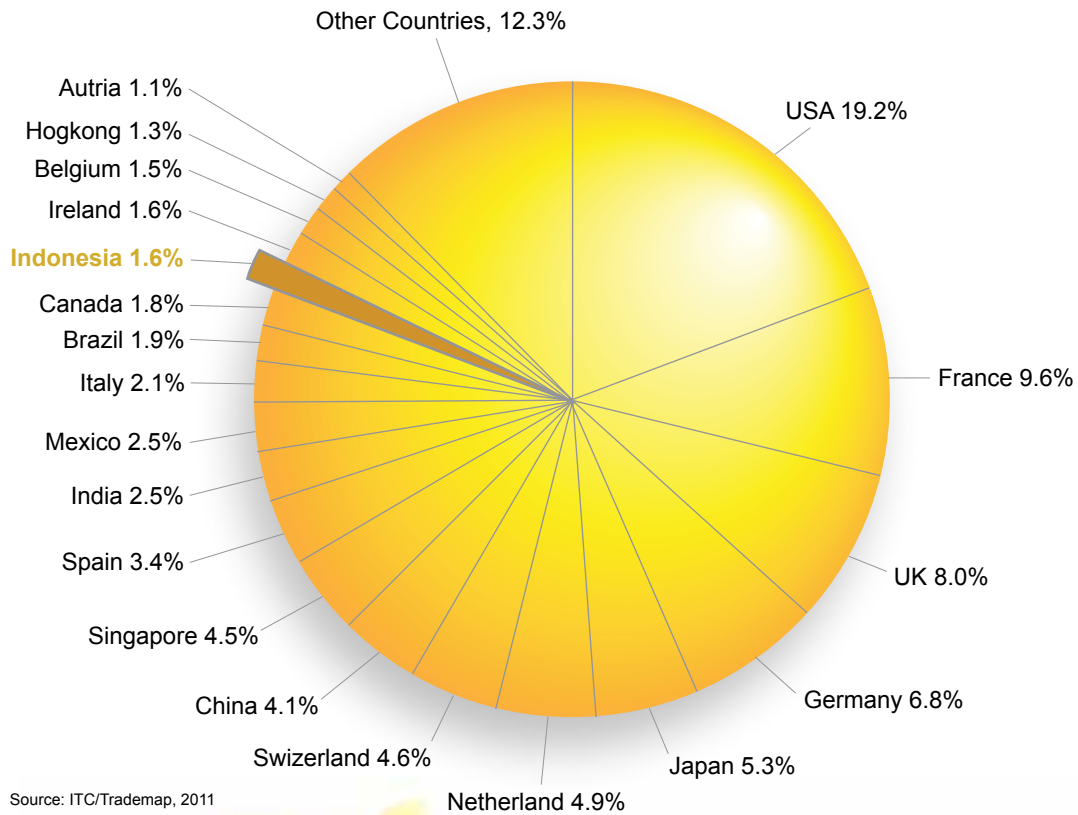
Other oils in the Top 20 includes: peppermint (*Mentha x piperita*), lemon (*Citrus limon*), cedarwood (*Juniperus virginiana*, *Chamaecyparis funebris*), litsea cubeba, sassafras (*Ocotea pretiosa*, *Cinnamomum micranthum*), lime distilled (*Citrus aurantifolia*), native spearmint (*Mentha spicata*), lavandin (*Lavandula intermedia*), camphor (*Cinnamomum camphora*), and grapefruit (*Citrus paradisi*).

# WORLD DEMAND FOR ESSENTIAL OILS

World demand for imported essential oil is dominated by the world's largest economies: US, France, UK, Germany and Japan purchase half of global export.

## World Import of Essential Oil (HS 3301) in 2010

Total: US\$ 2,968 million



Source: ITC/Trademap, 2011



## INDONESIAN EXPORT OF ESSENTIAL OILS

Indonesia exports various kinds of essential oil. This section will present export data in the period of 2004-2009 based on 6 digit HS nomenclature. To discount the effect of price changes, most of the data is presented in volume unit (kilograms).

### *Country of Destination for Indonesian Export of Essential Oils*

#### **World Imports from Indonesia for HS 3301**

Essential oils; resinoids; terpenic by-products etc

(in thousand US\$)

No.	Importers	Exported value in 2006	Exported value in 2007	Exported value in 2008	Exported value in 2009	Exported value in 2010
1	USA	15,660	19,766	30,895	16,445	27,861
2	Singapore	20,655	30,074	36,488	19,070	24,863
3	India	4,085	5,293	10,459	8,849	15,362
4	France	6,633	9,183	12,004	7,034	11,826
5	Spain	2,664	2,452	2,901	2,470	8,941
6	Germany	2,099	6,091	9,909	4,357	8,339
7	Switzerland	3,889	12,751	11,297	9,159	7,450
8	Netherlands	4,407	5,261	15,533	9,733	5,398
9	UK	2,323	2,999	5,685	2,844	4,115
10	UAE	1,042	698	3,649	3,111	2,790
11	China	1,083	2,867	2,146	1,070	2,255
12	Italy	66	407	897	638	692
13	Brazil	152	125	231	384	596
14	Belgium	225	422	31	5	582
15	Turkey	306	193	167	617	558
16	Japan	930	1,228	2,858	1,938	526
17	Mexico	88	210	703	664	452
18	Timor-Leste	4	-	9	188	313
19	Thailand	76	60	113	192	292
20	Philippines	13	88	131	164	278
	Other Countries	925	972	1,028	1,716	1,229

Source: ITC/Trademap, 2011

USA, Singapore, India and United Arab Emirates buy a large quantity of Indonesian essential oils, but half of all Indonesian export is sent to Europe.

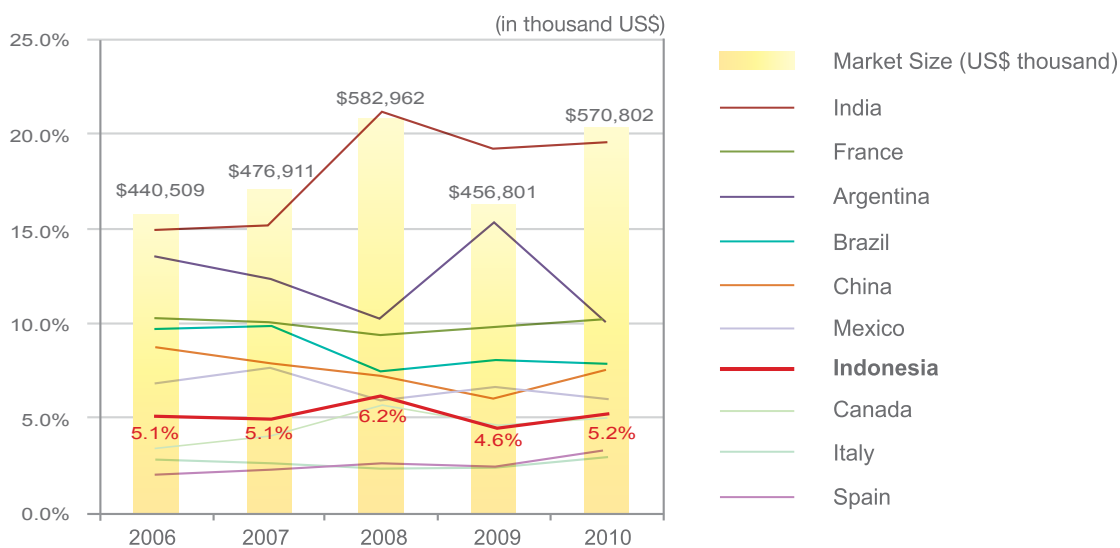
## Indonesian Market Share in World's Main Markets

In this section we will look at the position of Indonesia in the world's 5 main markets: USA, France, UK, Germany, and Japan. Together, they buy nearly half of all world exports. Two tables are presented for each country, showing the market share in both dollar value and tonnage. Please note that the data combine low-value, high-volume oils (e.g. orange oil) with high priced ones (e.g. rose oil).

### USA Market Share

#### Market Share of Imported Essential Oils in USA (HS 3301)

Essential oils; resinoids; terpenic by-products etc



Source: ITC/Trademap, 2011

#### Market Share of Imported Essential Oils in USA (HS 3301)

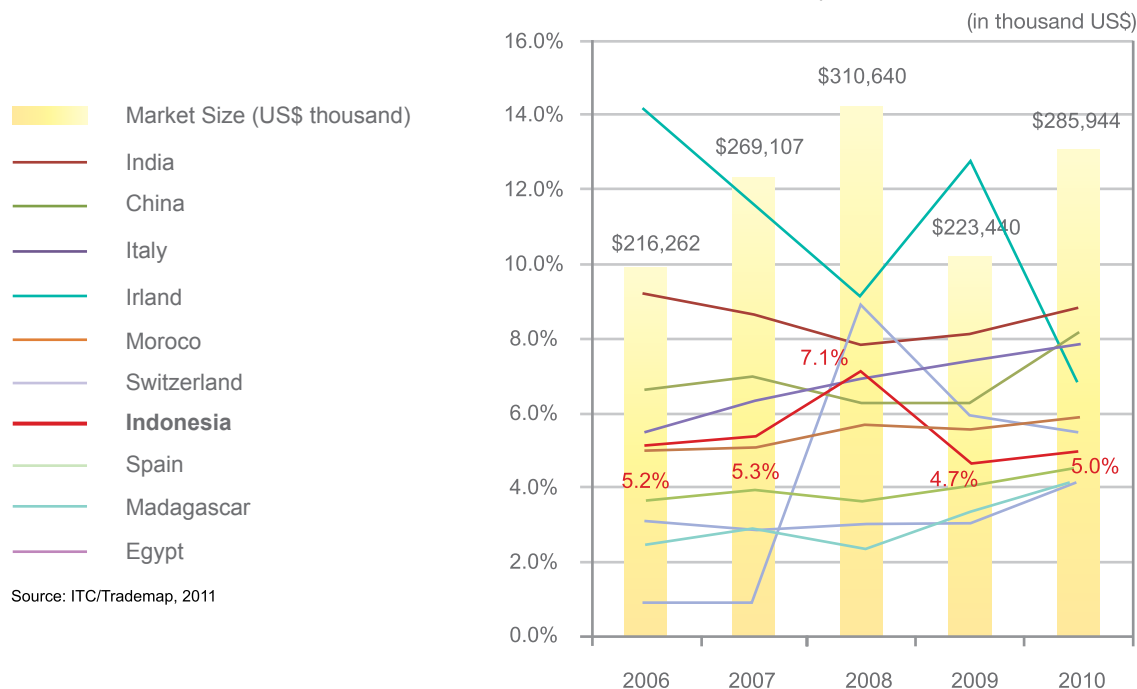
Essential oils; resinoids; terpenic by-products etc (in tons)

Exporters	2006	2007	2008	2009	2010
TOTAL IMPORT	36,156	37,778	43,376	34,287	36,759
1 Brazil	13,527	14,276	12,756	12,788	12,423
2 India	4,089	4,037	10,390	4,940	5,367
3 Mexico	2,545	3,195	3,798	2,886	3,171
4 China	3,040	3,038	2,061	2,613	2,849
5 Canada	1,375	1,240	1,897	1,293	2,028
6 Argentina	3,229	2,843	1,987	2,350	2,023
7 Costa Rica	935	1,787	1,274	1,095	1,056
8 France	1,159	1,086	2,015	725	1,016
9 Italy	623	708	718	523	960
10 Germany	378	422	751	543	823
11 Indonesia	896	885	1,001	545	729
OTHER COUNTRIES	4,360	4,261	4,728	3,986	4,314

Source: ITC/Trademap, 2011

### Market Share of Imported Essential Oils in France (HS 3301)

Essential oils; resinoids; terpenic by-products etc



### Market Share of Imported Essential Oils in France (HS 3301)

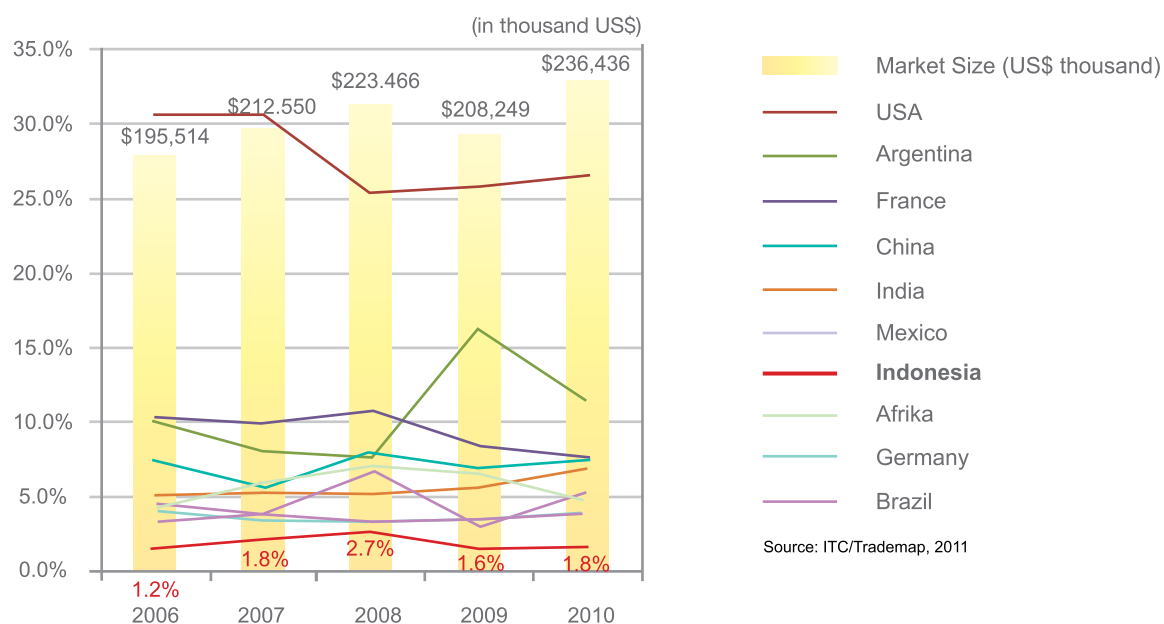
Essential oils; resinoids; terpenic by-products etc (in tons)

Exporters	2006	2007	2008	2009	2010
TOTAL IMPORT	9,140	9,719	8,096	7,890	9,455
1 China	1,333	1,194	1,119	989	1,303
2 Brazil	934	982	815	888	921
3 India	965	916	800	685	841
4 Germany	619	688	506	1,084	800
5 Madagascar	498	607	305	418	680
6 Italy	744	404	427	345	543
7 Spain	415	322	317	387	488
8 USA	691	695	510	359	475
9 Belgium	126	130	229	363	442
10 UK	257	358	376	265	417
11 Morocco	241	516	353	314	339
12 Indonesia	442	328	240	262	306
OTHER COUNTRIES	2,317	2,907	2,339	1,793	2,206

Source: ITC/Trademap, 2011

### Market Share of Imported Essential Oils in UK (HS 3301)

Essential oils; resinoids; terpenic by-products etc



### Market Share of Imported Essential Oils in UK (HS 3301)

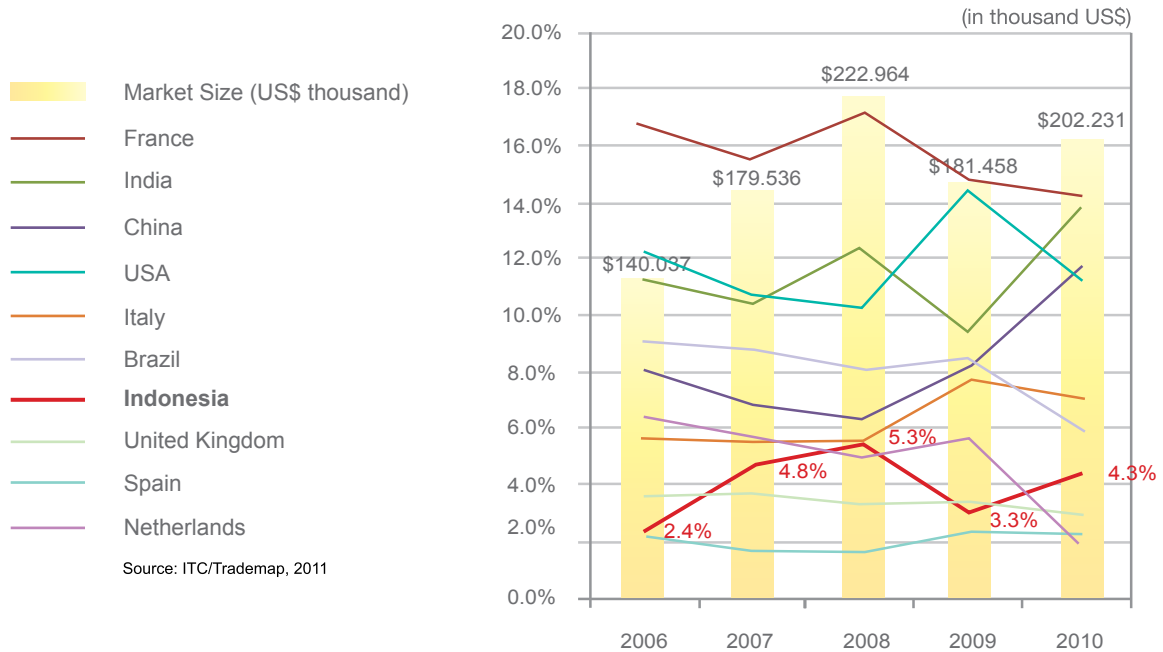
Essential oils; resinoids; terpenic by-products etc (in tons)

Exporters	2006	2007	2008	2009	2010
TOTAL IMPORT	15,640	15,124	14,892	13,938	14,628
1 USA	3,716	3,589	3,046	2,926	3,406
2 Brazil	3,328	3,265	4,347	2,928	3,122
3 China	1,470	1,164	1,401	1,193	1,220
4 Germany	928	716	812	1,237	1,084
5 Argentina	772	594	636	1,341	882
6 India	688	709	642	710	871
7 Mexico	530	522	499	564	626
8 South Africa	243	440	487	550	597
9 France	751	911	625	499	495
10 Austria	861	719	274	364	423
11 Netherlands	352	692	384	343	359
12 Italy	374	430	248	200	285
13 Indonesia	157	98	90	112	158
OTHER COUNTRIES	1,470	1,275	1,401	971	1,100

Source: ITC/Trademap, 2011

### Market Share of Imported Essential Oils in Germany (HS 3301)

Essential oils; resinoids; terpenic by-products etc



### Market Share of Imported Essential Oils in Germany (HS 3301)

Essential oils; resinoids; terpenic by-products etc (in tons)

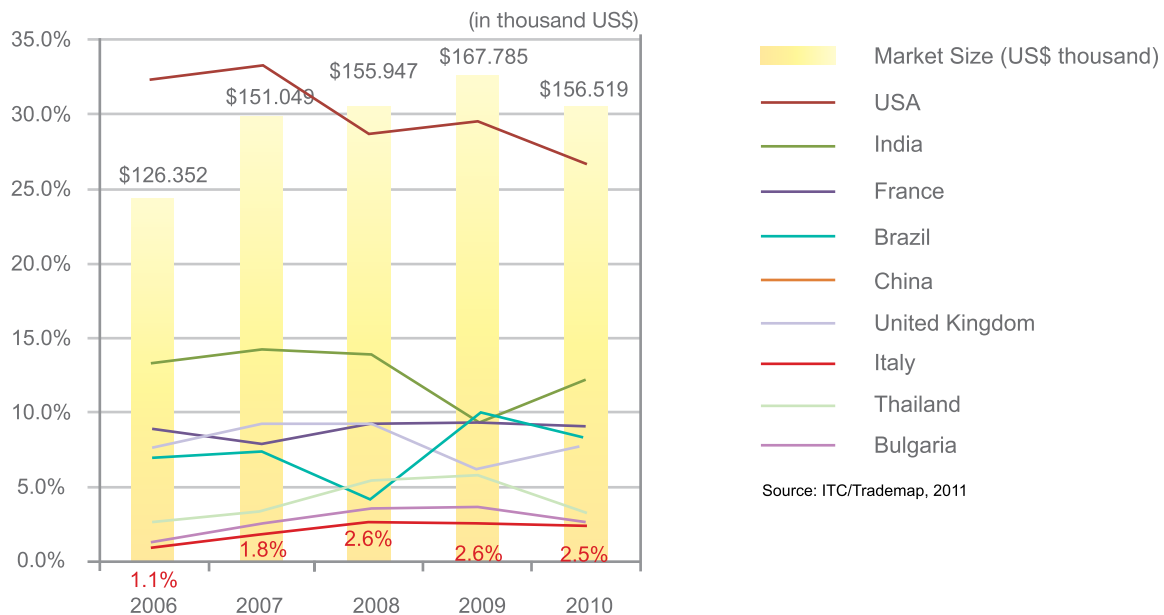
Exporters	2006	2007	2008	2009	2010
TOTAL IMPORT	15,975	22,393	18,897	18,357	15,862
1 Brazil	3,968	5,143	5,314	5,119	4,317
2 China	1,564	1,615	2,251	2,191	2,127
3 Poland	1,689	3,597	1,508	2,890	1,411
4 India	1,058	1,168	1,495	855	1,322
5 Italy	1,029	1,268	1,309	1,195	1,028
6 USA	823	899	802	802	771
7 France	663	667	858	545	622
8 Belgium	51	25	167	384	511
9 Spain	236	139	232	293	396
10 Greece	330	304	297	280	296
11 Netherlands	1,022	935	1,052	784	296
12 Madagascar	64	105	108	238	291
13 Hungary	874	1,071	186	49	283
14 Mexico	117	131	98	149	244
15 UK	423	1,234	485	473	238
16 Indonesia	163	223	183	176	201
OTHER COUNTRIES	1,901	3,869	2,552	1,934	1,508

Source: ITC/Trademap, 2011



### Market Share of Imported Essential Oils in Japan (HS 3301)

Essential oils; resinoids; terpenic by-products etc



### Market Share of Imported Essential Oils in Japan (HS 3301)

Essential oils; resinoids; terpenic by-products etc (in tons)

Exporters	2006	2007	2008	2009	2010
TOTAL IMPORT	11,912	13,613	8,516	15,457	12,280
1 Brazil	7,544	8,917	4,353	11,412	8,130
2 USA	1,837	1,976	1,586	1,527	1,570
3 India	756	939	860	591	726
4 China	356	366	337	449	476
5 Germany	199	180	235	195	308
6 UK	157	156	170	163	177
7 France	131	120	161	227	161
8 Italy	210	173	161	139	121
9 Austria	66	114	70	136	120
10 Indonesia	74	131	110	148	80
OTHER COUNTRIES	582	541	473	470	411

Source: ITC/Trademap, 2011

## Province of Origin of Indonesian Export of Essential Oils

### HS 330112

#### ESSENTIAL CITRUS FRUIT OILS OF ORANGE

(in Kg)

PROVINCE	2004	2005	2006	2007	2008	2009	2010
DKI Jakarta	17,932	35,676	7,128	4,048	18,261	2,784	8,421
North Sumatera	-	431	-	-	-	-	-
East Nusa Tenggara	-	-	-	570	-	-	-
Riau Islands	-	-	13	-	-	121	-
East Java	-	-	-	2	4	-	-
Bali	-	-	4,380	-	-	82	-
Riau	2,000	-	-	-	-	-	-
TOTAL	19,932	36,107	11,521	4,620	18,265	2,987	8,421

Source: BPS-Statistics Indonesia, 2011

### HS 330113

#### ESSENTIAL CITRUS FRUIT OILS OF LEMON

(in Kg)

PROVINCE	2004	2005	2006	2007	2008	2009	2010
DKI Jakarta	-	6,908	4,621	490	24,004	1,476	17,225
East Java	-	-	-	-	-	39	-
TOTAL	-	6,908	4,621	490	24,004	1,515	17,225

Source: BPS-Statistics Indonesia, 2011

### HS 330119

#### ESSENTIAL OILS OF CITRUS FRUIT, NESOI

(in Kg)

PROVINCE	2004	2005	2006	2007	2008	2009	2010
DKI Jakarta	72,785	7,865	22,856	9,661	12,538	5,665	4,757
North Sumatera	1,372	445	408	975	1,161	632	563
West Sumatera	7,765	6,500	2,381	641	459	853	201
Bali	248	181	-	-	-	-	-
East Java	-	5,000	-	-	-	-	-
Central Java	-	5,000	-	-	-	-	-
East Kalimantan	14,400	-	-	-	-	-	-
Riau Islands	-	-	-	-	-	21	-
Riau	11,131	-	-	-	-	-	-
East Nusa Tenggara	2,948	6,557	6	25	1,122	-	-
TOTAL	110,649	31,548	25,651	11,302	15,280	7,171	5,521

Source: BPS-Statistics Indonesia, 2011

Although location of cultivation, distillation and consumption is spread throughout the country, advance processing and export are concentrated in Jakarta and North Sumatera

**HS 330124**

ESSENTIAL OILS OF PEPPERMINT (MENTHA PIPERITA)

(in Kg)

PROVINCE	2004	2005	2006	2007	2008	2009	2010
DKI Jakarta	24,804	27,898	19,409	16,591	14,695	7,380	7,682
North Sumatera	-	7,793	-	-	-	-	60
East Java	-	-	-	-	8,603	-	-
East Nusa Tenggara	-	-	-	-	-	113	-
<b>TOTAL</b>	<b>24,804</b>	<b>35,691</b>	<b>19,409</b>	<b>16,591</b>	<b>23,298</b>	<b>7,493</b>	<b>7,742</b>

Source: BPS-Statistics Indonesia, 2011

**HS 330125**

ESSENTIAL OILS OF MINTS, NESOI

(in Kg)

PROVINCE	2004	2005	2006	2007	2008	2009	2010
DKI Jakarta	3,360	981	2,111	28,497	68,493	32,830	212,081
Central Java	-	-	-	2,355	-	1,734	1,782
East Java	400	-	-	-	177	-	-
Riau Islands	-	-	-	-	950	557	-
Bali	4	-	-	-	-	-	-
East Nusa Tenggara	-	-	-	-	-	2	-
<b>TOTAL</b>	<b>3,764</b>	<b>981</b>	<b>2,111</b>	<b>30,852</b>	<b>69,620</b>	<b>35,123</b>	<b>213,863</b>

Source: BPS-Statistics Indonesia, 2011

**HS 330130**

RESINOIDS

(in Kg)

PROVINCE	2004	2005	2006	2007	2008	2009	2010
DKI Jakarta	697	113	2	25	839	400	188
Riau Islands	-	-	-	-	-	-	423
Bali	1	-	-	255	-	-	-
Central Java	159	-	-	-	-	-	-
East Java	1	-	-	-	-	-	-
<b>TOTAL</b>	<b>858</b>	<b>113</b>	<b>2</b>	<b>280</b>	<b>839</b>	<b>400</b>	<b>611</b>

Source: BPS-Statistics Indonesia, 2011



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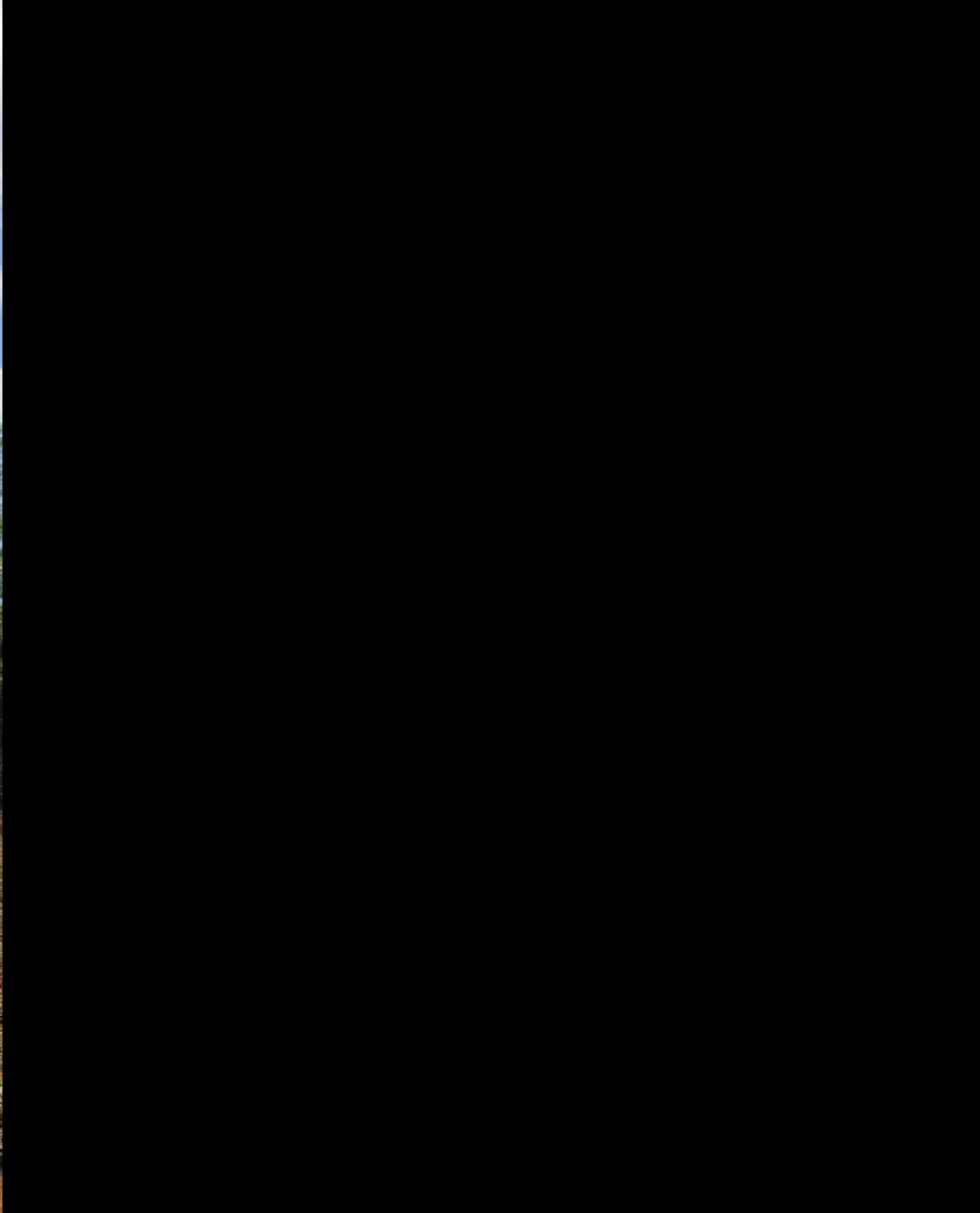
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Many plants, e.g. patchouli and nutmeg, are sun-dried before distillation. With year-long tropical sun and large areas of fertile soil, Indonesia is ideal for essential oil production





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