

Melissa officinalis

[Contents](#) - [Previous](#) - [Next](#)

I. GENERAL

COMMON NAME

Melissa officinalis

BOTANICAL NAME

Melissa officinalis L.

FAMILY

Labiata

OTHER NAMES

Balm, Lemon Balm, Melissa Balm (USA), Balm Mint

CULTIVATION CONDITIONS

Melissa is a native of the countries bordering the northern shores of the Mediterranean, with further reports of it as far north as Finland and growing from the Alps to the Pyrenees. It was introduced into the USA where it was cultivated for the dried herb.

The herb is commercially produced in Hungary and the oil in Ireland.

Melissa grows best in alluvial soil, excess water is harmful, while yields diminish in light and dry soils (Guenther).

MAJOR PRODUCING COUNTRIES

Hungary, Egypt, Italy, for herb Ireland for essential oil

YIELD AND DESCRIPTION

Genuine Melissa oil is a pale yellow sweet smelling oil with an odour of aromatic lemon. Yields are as low as 0.014% for distillation of the fresh herb to 0.112% for dried herb, increasing to 0.13% using cohobation. True oil is extremely expensive. The oil is held in high esteem for its use in aromatherapy, it is reported to have a sedative effect. There is little use for the oil in perfumery, where the odour is readily suggested by blends of the very cheap oils of Lemon, Lemongrass and fortified by Citronella oil. According to Arctander the plant is known in Europe as "Hearts Delight" since infusions of the herb were supposed to cure heart disease and melancholia and this led to the late 1930's perfume "Cosur-Joie", which had a melissa like top note.

MAIN USES

Infusions are made from the herb; the oil has several names (Oil of Balm, Oil of Lemon Balm, Oil of Melissa Balam, Oil of Balm Mint, Oil of Melissa Officinalis) and is used as a sedative in alternative medicine.

II. AGRICULTURAL ASPECTS

CULTIVATION

Planting is usually 40,000 plants/Ha. with propagation from seed or cuttings. The plants have a life of 10 years but are usually replaced every five years with crop rotation to rejuvenate the soil. Propagation in the northern hemisphere is from April to July.

HARVESTING PERIOD

In the first year the crop is in August, thereafter two crops are experienced. The first in June and the second in August.

HARVESTING METHODS

Usually by hand on a clear warm day as the leaves will turn black if harvested wet. For good appearance leaves should not be left in the sun.

III. POST HARVEST TREATMENT, PRESERVATION, STORAGE

PRE-TREATMENT

Weed control is recommended (Pank). It has been reported that, in Egypt, irradiating seeds has an effect on growth, essential oil content and composition. The quantity of herb was reduced but the oil content was increased, with the irradiation dosage varying the proportion of the constituents.

PRESERVATION AND STORAGE

The oil should be stored in filled sealed containers, out of light and kept cool. The oil is subject to oxidation.

IV. PROCESSING

PROCESSING METHOD

Stainless Steel steam distillation retorts equipped for cohobation should be used to increase the yield.

COMPOSITION OF OIL

Many reports exist regarding the composition. An analysis, from New Zealand, given for *Melissa officinalis* L. subsp *altissima* (Dawson) not only gives a yield 0.33% but constituents totally different from those of *Melissa officinalis* L. subsp *officinalis*.

A summary of the composition is given by Lawrence as follows:

Compounds Percentage range

Methyl Heptenone 2.2 - 8.6

Citronellal 1.0 - 8.4

Linalool 0.5 - 2.7

Neral 19.6 - 36.1

Geranial 25.3 - 47.5

Geranyl Acetate 1.2 - 6.2

1.9 - 9.7

Carophyllene oxide 0.5 - 9.0

EQUIPMENT

Forage Harvester

Stainless steel distillation equipment

BIBLIOGRAPHY

ARCTANDER, S. "Perfume and Flavor Materials of Natural Origin" (Private publication)

DAWSON, B.S.W; FRANICH, R.A AND MEDLER, R; "Essential Oil of *Melissa officinalis* L. subsp *altissima*. (Sibthr. et Smith) Flavour and fragrance journal (1988) pp 167 - 170

"Effect of gamma radiation on growth, essential oil content and composition of *Melissa officinalis* L. grown in Egypt". *Ann-Agric-Sci-Moshtohor*. Moshtohor : Zagazig University (1984) v. 20 (2) pp 17 - 27

"Flavour composition of Lemon balm (*Melissa officinalis* L.) cultivated in Finland".

Lebensm-Wiss-Technol-Food-Sci-Technol. London : Academic Press (1986) vol 19 pp 482 485

GUENTHER, E. "The Essential Oils" vol 3 "Oil of Balm" ISBN No 0-88275-163-8

LAWRENCE, B.M. "Progress in Essential Oils" Perfumer and Flavorist (1983)
April/May vol 8 No. 2 p 61

PANK, F; EICHHOLZ, E; ENNET, D AND ZYGMUNT, B. "Chemical Weed
Control in medicinal plant crops" Part 8 Balm (Melissa officinalis L.) Pharmazie
42: 3, 1987 pp 191 195, 9 ref

Milfoil

I. GENERAL

COMMON NAME

Milfoil

BOTANICAL NAME

Achillea millefolium L.

FAMILY

Compositae

OTHER NAMES

Yarrow, *Achillea millefolium*

CULTIVATION CONDITIONS

Yarrow is a weed and is found with many associated species in the temperate zones of the northern and southern hemispheres.

MAJOR PRODUCING COUNTRIES

Yarrow is grown commercially in Albania (700 kg) and Hungary (100 kg) and in small quantities in Northern USA and Canada.

Quantities of the oil produced are small, less than 1000 kilos worldwide.

YIELD AND DESCRIPTION

The oil is found in the flowers.

Fresh flowers have been reported to contain 0.1 - 0.25% oil and semi dried flowers 0.24 -0.5% (Guenther). The oil is very dark blue in colour.

MAIN USES

The oil (which is called Oil of *Achillea millefolium* and Oil of Yarrow) has been produced as a diluent and replacement for Chamomile oil (*Matricaria chamomilla* L.) and as a source of chamazulene, an anti-inflammatory and antipyretic material (Merck).

II. AGRICULTURAL ASPECTS

CULTIVATION

The plant is an annual. Where it is cultivated the seed is planted in the early spring for a late summer flowering crop.

HARVESTING PERIOD

During full bloom

HARVESTING METHODS

Manual or mechanical. The whole plant is distilled.

III. POST HARVEST TREATMENT, PRESERVATION, STORAGE

PRE-TREATMENT

The plant should be wilted for 24 - 48 hours but kept dry to prevent fermentation.

PRESERVATION

None required

STORAGE

The oil should be stored in dark full containers in a cool condition. Platelets may deposit on the sides of the container, which should be well agitated before use.

IV. PROCESSING

PROCESSING METHOD

The plant is distilled by steam distillation. Cohobation is recommended. The distillation will take 6 - 10 hours.

COMPOSITION OF OIL

The main constituent of the oil is chamazulene. This is formed during the steam distillation (Sandra).

According to the review by Lawrence it can vary from 5 - 33%.

Detailed analytical methods have been given by Hacey and co-workers (Hacey).

EQUIPMENT

No special farm equipment is necessary. Distillation equipment should permit cohobation.

BIBLIOGRAPHY

GUENTHER, E; "The Essential Oils" Vol 5. p 472 ISBN No 0-88275073-9

HACEY, J.M., et al. "Extraction and GC/MS Analysis of the Essential Oil of *Achillea millefolium* L complex". 'Journal of Essential Oil Research 1990', Vol 2 No 6 pp 317-326

LAWRENCE, B.M; "Progress in Essential Oils" 'Perfumer and Flavorist' August/September 1984 vol 9, No 4 p 37

Merck Index Tenth edition ISBN No 9 11910-27-1

SANDRA, P; BICCHI, C; EDITORS "Capillary Gas Analysis in Essential Oil Analysis". ISBN 3-7785-0850-1

Ninde

I. GENERAL

COMMON NAME

Ninde

BOTANICAL NAME

Aeolanthus gamwellia Taylor (Erroneously reported as *Aeolanthus graveolens*) (Arctander).

FAMILY

Labiatae

OTHER NAMES

Local African names

CULTIVATION CONDITIONS

Grows wild as a weed in Central Africa. This flowering herbaceous shrub only received attention when a shortage of Indian Palmarosa occurred.

MAJOR PRODUCING COUNTRIES

Malawi

No commercial production reported.

YIELD AND DESCRIPTION

The oil has a fresh rose - lemon rose odour and is pale yellow in colour. Reported

yields have varied from 0.3 to 0.8% depending on the dryness and drying method.

MAIN USES

Ninde oil is used as a perfumery oil and as a source of cheap Geraniol. This oil performs extremely well as a perfume for soap. It was used in Malawi and surrounding areas as a replacement for Citronella and Palmarosa oils.

Interest was lost in this oil with the advent of cheap synthetic Geraniol. It has been used successfully as an adulterant for Rose Oil.

II. AGRICULTURAL ASPECTS

CULTIVATION

The plant can be grown from seed or stem cuttings. It is easily propagated and growth responds well to a good rainfall. On establishment it requires hand weeding and good plantation management as it is susceptible to nematode attack

(UNCTAD report).

Ninde should be grown on a six year rotation, three years ninde and three years rest.

HARVESTING PERIOD

Best quality oil is obtained from the flowers during the period which corresponds to a dry season.

HARVESTING METHODS

Flowers have been harvested by hand but would adapt readily to mechanical harvesting.

III. POST HARVEST TREATMENT, PRESERVATION, STORAGE

PRE-TREATMENT

Nematode treatment is required during farm growth. Flowers should be processed immediately.

PRESERVATION

Oil may be preserved initially with an anti-oxidant such as butylated hydroxy toluene (BHT).

STORAGE

In the dark in full containers.

The quality of previously marketed oil suffered from being stored in second-hand petroleum drums.

IV. PROCESSING

PROCESSING METHOD

Production to date has been in field stills resulting in some burning, and rejection of the oil resulted. The spent herb can be used as a fuel. The quality of the oil would be improved by using modern distillation equipment.

COMPOSITION OF OIL

Terpenes as minor constituents

Geraniol (80%)

Geranyl acetate (5%)

Linalol (2%)

EQUIPMENT

Normal steam distillation stills required.

BIBLIOGRAPHY

AMES, G.R; MATTHEWS, W.S.A; "The Development of Nindi Oil : Parts 1 - 111" Trop. Sci 1969 - 70 Vols X1 No 3, X11 No 1, and XII No 2

ARCTANDER, S "Perfume and Flavour Materials of Natural Origin" Private publication "Essential Oils and Oleoresins" A Study of selected producers and major markets. ITC International Trade Centre UNCTAD/GATT Geneva 1986 SITC 551.3 ESS

Patchouli

I. GENERAL

COMMON NAME

Patchouli

BOTANICAL NAME

Pogostemon cablin benth. syn *P. Patchouli* pellet var. *suavis* Hook (Guenther)

FAMILY

Labiatae

OTHER NAMES

CULTIVATION CONDITIONS

Patchouli is a tropical plant that originated in the Philippines and Indonesia, but is now found growing wild in several other locations, after spreading from cultivated areas. It is cultivated and harvested for its essential oil in Indonesia, Malaysia, China, Brazil, the Seychelles and the West Indies.

Several related plants have the typical Patchouli odour.

MAJOR PRODUCING COUNTRIES

Indonesia (500 tonnes), China (60 tonnes), Brazil (1.5 tonnes), Malaysia (1

tonne).

YIELD AND DESCRIPTION

Yields on an average are reported at 3%, however, as the plant exhausts the soil markedly, this figure can range from 5% down to 1%. The odour of the oil has been described as balsamic, spicy, sweet, aromatic, woody, and minty; it is best summarised as 'Characteristic Orient'.

The oil is usually dark brown in colour, but good quality distilled material, from modern distilleries or redistilled oil, can be pale yellow.

MAIN USES

Patchouli Oil is a perfumery raw material; it blends well in all types of perfumes contributing a rich spicy aroma and has been used in its own right as the perfume of the 'hippies' of the 1960's and by aromatherapists. As a perfume component it contributes odour but the constituents also give the oil good fixative properties, particularly in soap perfumes. Some 'Patchouli' synthetics exist, but they are expensive and do not give the odour profile of the oil.

II. AGRICULTURAL ASPECTS

CULTIVATION

The plants thrive best in a damp and moist climate with an equally distributed rainfall of 1500 - 3000 mm/year, a dry season no longer than 12 - 14 weeks and a temperature range of 22 - 32 degrees C. Well drained land is necessary for the plants which will not tolerate being waterlogged. They are susceptible to nematodes and well drained, newly-cleared land is therefore ideal. After three years crop rotation is desirable.

Patchouli is non-flowering and is, therefore, propagated from nursery stem cuttings. After four weeks, when sufficiently strong, the plants are planted out at approximately 20,000 - 25,000/Ha.

Fertiliser in the cheapest form, i.e. manure, is used especially on poorer soils. Weeding is very important to protect the young plants.

HARVESTING PERIOD

The first harvest is usually taken when the plants are six months old, having attained a height of 0.5 - 1 metre. Best quality oil is obtained by harvesting in the wet season. Subsequent harvests, again in wet seasons, are taken every 4 - 5 months, until the plants are about three years old, after which the quantity of oil decreases.

Crop rotation, if feasible, proceeds patchouli replanting.

HARVESTING METHODS

This is very labour intensive and is carried out in the early morning or early evening by hand.

While oil is present in all parts of the plant, the best oil is found only in the leaf, and so it is only the top leaves that are cut and handled. The leaf is cured for up to three days by laying it on concrete in the sun or, preferably, on racks in the shade. This latter method reduces the loss of oil by evaporation, but with both methods the leaf is turned frequently to promote even drying.

III. POST HARVEST TREATMENT, PRESERVATION, STORAGE

PRE-TREATMENT

When leaves are exported (see processing) they have to be well dried before baling to prevent mould formation in transport.

PRESERVATION

None required for the oil.

STORAGE

Second hand reconditioned drums are usually used. These should be thoroughly inspected before use, but new drums are preferable if available. When high quality oil is produced, it should be stored in epoxy-lined containers.

IV. PROCESSING

PROCESSING METHOD

The leaves are steam distilled using direct steam. Because of the nature of the oil the distillation technique requires considerable experimentation first using low pressure steam followed by high pressure. Distilling times of 6 - 24 hours have been reported and again only trials will determine a satisfactory time. In Europe and America high quality light coloured oil is produced from the combination of using matured leaves (as a result of maturing while shipping) and modern stainless steel stills.

Water/steam distillation methods are used in some areas but this results in poor control and inferior oil. The freshly distilled oil requires airing and long standing to remove entrained water.

COMPOSITION OF OIL

A comprehensive review of the analysis of Patchouli Oil is given by Lawrence. True Patchouli Oil will consist of: 1% Terpenes 50% Sesquiterpenes 30 - 40% of

Patchouli alcohols and related alcohols.

Patchouli Oil was traditionally adulterated with Gurjun Balsam Oil, Copaiba Oil and Cedarwood fractions. These are readily detected by gas chromatography (Sandra). There are many specifications such as EOA, ISO, AFNOR and BSI Standards for Patchouli Oil: most perfume blending companies have their own requirements for colour, odour and solubility for extract formulae.

EQUIPMENT

Steam boiler

Distillation vessels, preferably stainless steel.

BIBLIOGRAPHY

GUENTHER, E. "The Essential Oils" Vol 3 'Oil of Patchouli p 552 ISBN No. 0-88275-1638

LAWRENCE, B.M. "Progress in Essential Oils" 'Perfumer and Flavorist' 1981 vol 6 No 4 p 73

SANDRA, P; BICCHI, C; EDITORS "Capillary Gas Chromatography in Essential Oil Analysis". ISBN 3-7785-0860-1

Tarragon

I. GENERAL

COMMOM NAME

Tarragon

BOTANICAL NAME

Artemisia dracunculus L.

FAMILY

Compositae

OTHER NAMES

Estragon (While the Europeans use the name 'Estragon', the English speaking races interchange both names.)

Sweet Artemisia (Guenther).

CULTIVATION CONDITIONS

The herb is a perennial originating in Eurasia. It is cultivated extensively in France, Italy, Iran, Central Europe, USA and South America. The primary product is the culinary herb with the oil as a by-product. The best quality oil is considered to be of French origin.

MAJOR PRODUCING COUNTRIES

Italy (5 tonnes), France (1.5 tonnes), Hungary (1.5 tonnes), Iran (700 kg), Argentina (500 kg) Yugoslavia (500 kg) and Israel (200 kg).

YIELD AND DESCRIPTION

The oil is pale yellow with a sweet spicy anisic odour and taste. The dried herb gives a yield of 0.25 - 0.8%, while the fresh herb yields 0.1 - 0.45%. Of all the *Artemisia* this is the only one described as sweet.

MAIN USES

Both the herb and the oil (which is called Oil of Estragon or Oil of Tarragon) are used as condiment flavours e.g. tarragon vinegar and in French culinary sauces and salad dressings. The oil has some use in exotic-type heavy perfumes. Between 1000 - 2000 kilos of the oil is sold by the French per year.

II. AGRICULTURAL ASPECTS

CULTIVATION

Tarragon can only be propagated by root division. In Europe the division takes

place in February/March, with the first harvest taken in July. A minor harvest is collected in September. The herb grows to a height of 50 - 70 cms and the plants have a good oil-yielding life of three years. They are reported to do best in a sandy soil of pH 6.2 (Arctander).

HARVESTING PERIOD

This is just before inflorescence.

HARVESTING METHODS

For both harvests the plants are cut close to the ground, therefore a forage harvester is suitable.

III. POST HARVEST TREATMENT, PRESERVATION, STORAGE

PRE-TREATMENT

Where the herb is grown solely for oil production, a wilting time of twenty four hours is usual. The oil is quite often distilled from the dust and fragment residues from the herb cleaning and packing sheds.

PRESERVATION

Antioxidant can be added, although it is not usual to do so.

STORAGE

The oil is very prone to oxidise and, therefore, must be stored under good conditions, i.e. in the dark, with no air contact and in full sealed containers.

IV. PROCESSING

PROCESSING METHOD

It is preferable to steam distil the herb in stainless steel equipment or, at least, with

a stainless steel heat exchanger.

Inferior quality oil is obtained from water/steam field distillation units. In this type of distillation there is a danger of burning the oil.

In direct steam distillation the distillation time is only 1 - 1.5 hours.

COMPOSITION OF OIL

The French type is reported to contain approximately 65% Methyl chavicol (Estragole). The oil has been adulterated with synthetic estragole, but this is readily identified on a smelling blotter as the synthetic material does not have the intensity of the genuine oil; a good example of the function of natural fixatives.

Other origins, possibly from poor selection of the root stock from the many subspecies available, contain large proportions of Sabinene and Elemine (Sandra). A detailed study of the constituents has been reported using a combination of GC/MS analysis.

EQUIPMENT

Modern stainless equipment is recommended.

Forage harvester

BIBLIOGRAPHY

ARCTANDER, S. "Perfume and Flavour Materials of Natural Origin". Private publication

GUENTHER, E. "The Essential Oils" Vol 5 p 459 ISBN 0-88275073-9

SANDRA, P; & BICCHI, C; EDITORS "Capillary Gas Chromatography in Essential Oil Analysis - Chromatographic Methods".

 [Go To Next Page](#)

[Contents](#) - [◀ Previous](#) - [Next ▶](#)

Wormwood

[Contents](#) - [◀ Previous](#) - [Next ▶](#)

I. GENERAL

COMMON NAME

Wormwood

BOTANICAL NAME

Artemisia absinthium L.

FAMILY

Compositae

OTHER NAMES

Absinthe, Mugwort (USA), Common Wormwood

CULTIVATION CONDITIONS

The plant is indigenous to North America, Southern Europe, North America and North-West Asia. It is usually found with associated species *Artemisia alba*, *Artemisia annua* and *Artemisia vulgaris*. It has also been cultivated in France, Yugoslavia, Holland, Belgium and Hungary in the peppermint and spearmint growing areas. The herbaceous plant is a perennial growing from 60 - 120 cms tall. The oil is distilled from the dried leaves and flowering tops of the herb (Guenther).

MAJOR PRODUCING COUNTRIES

United States, Morocco and the USSR, USA (5 tonnes), Brazil (1 tonne), Hungary (150 kg), Bulgaria (700 kg), Morocco and USSR (no identifiable figures)

YIELD AND DESCRIPTION

It is dark green to brownish in colour with a herbaceous distilled odour and a bitter taste but in high dilution is reminiscent of hops and chamomile. The colour is attributed to azulene (Arctander).

Various reported yields indicate the average yield is 0.35% of semi-dried herb. While the life of the plant is 7 - 10 years, the best yields are in the second and third years and the plants are rarely kept after 4 - 5 years.

MAIN USES

The oil has several names (Wormwood oil, Essence d'Absinthe, Oil of Mugwort (USA), Common Wormwood Oil) and is used as the flavouring of "Absinth", and its subsequent ban by the French government, is widely reported (Arctander). The whole oil and distilled fractions are used as the flavouring principle of Vermouth. According to Merck it has therapeutic properties as an anthelmintic and antimalarial, but Guenther warns it is an active narcotic poison (Guenther). Wormwood Oil should not be confused with American Wormseed Oil (*Chenopodium ambrosiodes* var. *anthelminthicum* L.) or Chenopodium Oil (*Chenopodium ambrosiodes*)

II. AGRICULTURAL ASPECTS

CULTIVATION

A typical planting density is 25,000 plants / Ha. Seeds can either be planted direct in late autumn or in greenhouses in early spring, from slips or from root division. The plants are very hardy and resistant to disease or insects, however, weed control in the first season, is important.

Weedkillers used for mint are satisfactory for Wormwood. This herb responds well to fertilizers (Slepetys) and it can be used for the reclamation of sandy soils (Glavan). It has been shown that a 50% increase in oil content was achieved at an altitude increase from 0 to 1000 metres (Alekseev).

HARVESTING PERIOD

In the northern hemisphere the plant is harvested when in full bloom, usually in July, for best oil quality and quantity.

HARVESTING METHODS

By the use of a forage harvester.

III. POST HARVEST, TREATMENT, PRESERVATION, STORAGE

PRE-TREATMENT

The herb should be wilted for 24 hours before distillation.

PRESERVATION

Antioxidant can be added to the oil.

STORAGE

The oil should be stored in full, well-sealed containers.

IV. PROCESSING

PROCESSING METHOD

While field stills can be used, modern distillation equipment, such as that used for mint processing, is preferable. The best oil is obtained from direct steam applications, rather than water distillations. Distillation appears complete after 2 hours, but is continued for an extra half hour to collect some heavy fractions.

COMPOSITION OF OIL

The main constituent of the oil is reported to be Thujone. The E.O.A. specification (EOA) gives a ketone content of 34 - 71% calculated as Thujone. A recent study reports on the chemical analysis of the oil from Patagonia (Sacco).

EQUIPMENT

Forage harvester

Steam distillation equipment

Steam boiler

There is no identifiable information for the following areas: PROCESSING oil extraction, and nomenclature of products.

BIBLIOGRAPHY

ARCTANDER, S. "Perfume and Flavour Materials of Natural Origin". (Private publication)

GUENTHER, E. "The Essential Oils" Vol 5 'Oil of Wormwood' ISBN no 0-88275-163-8

LAWRENCE, B.M. "Progress in Essential Oils" 'Perfumer and Flavorist' April/May 1981 Vol 6 No. 2 p 59

"The Merck Index" Tenth Edition ISBN No 911910-27-1

SLEPETYS, J. "The Biology and Biochemistry of Wormwood". 2 "The Effects of Fertiliser on the Concentration and Yield of Essential Oil. (*Artemisia absinthism*)" Akad Nauk Litov Ssr Darbai Tr Ser C 1970, 3: pp 33 - 40 (In Russian with English summary).

SLEPETYS, J. "The Biology and Biochemistry of Wormwood". 5. "Effect of different Norms of Mineral Fertilisers on the Yield and Amount of Essential Oil (*Artemisia absinthism*)" Darb, C Ser Biol Mokslaij Liet TSR Mokslu Akad 1973, 3: pp 29 - 35 (In Russian) *Artemisia absinthism* L.

ALEKSEEV, B.D; SHLEIFER, G.A; "Essential Oil content of some *Artemisia*. Species of the Dagestan Flora". *Rastitelnye Resursy* 1983, 19: 3, pp 360 - 364

E.O.A No 114 "Oil Wormwood" Scientific Section Essential Oil Association of U.S.A.

GLAVAN, P; BURNEA, I; PLENICEANU, M; RUSU, O.; CHICHEA, I; Reclamation of Sandy soils for cultivation of Medicinal Plants". *Analele*

universitatis Craiova Biol Agron Hortic 1985 16 pp 101 - 112 (In Romanian, French Summary).

SACCO, T; CHIALVA, F; "Chemical Characteristics of the Oil from Artemisia absinthium collected in Patogonia, Argentina. " Planta Medica 1988, 54: 1, p 93

Appendix I - Summary of various applications of minor essential oil crops

The following Table shows the distribution of various known applications of extracted fatty materials from those minor essential oil crops, reviewed in this section. Such applications are listed below:

A. MAJOR APPLICATIONS

- Perfumery, as fragrance or diluent
- Food flavour or food condiment

- Medicine, both modern and traditional
- Insect or animal repellent
- Fungicides or bactericidal agent
- Pesticide

B. MINOR APPLICATIONS

- Fixative agent (particularly in soap perfumes).
-

[Contents](#) - [◀ Previous](#) - [Next ▶](#)

[Home](#) > [ar.cn.de.en.es.fr.id.it.ph.po.ru.sw](#)

Part IV - Minor oil crops general appendix

[Contents](#) - [◀ Previous](#)

I. LIST OF EQUIPMENT SUPPLIERS

THRESHING EQUIPMENT

Amar Agricultural Implements Works

Amar Street, Janta Nagar

Gill Road

LUDHIANA 141 003

INDIA

Amar Engineering Works

Tulsiwadi

Mazagaon

BOMBAY

400 010

INDIA

Dandekar Brothers (Engineers & Co)

Shivaji Nagar, Factory Area

SANGLI

416 416

INDIA

Standard Agricultural Eng. Co.

824/5 Industrial Area B

LUDHIAN

141 003

INDIA

Sree Bhuvaneshwari Industries M/S

168/C Avanashi Road

Peelamedu

COIMBATORE

641 004

INDIA

Institute for Agricultural Research

Samaru, Ahmadu Bello Uni

PmB 1044

ZARIA

NIGERIA

Noor Wheat Thresher

Manawala

Lahore-Sheikhpura Road

FAISALABAD

PAKISTAN

United Steel Mills Ltd

32/A S.I.E.

GUJARANWALA

PAKISTAN

P.I. Farm Products Inc

Km 16 Malanday

Valenzuela

METRO MANILA

PHILIPPINES

WINNOWING EQUIPMENT

Union for Appropriate Technical Assistance

G. Van den Heuvelstraat 131

3140 RAMSEL

BELGIUM

Cossul & Co. Pvt Ltd

123/367 Industrial Area

Fazalgunji

KANPUR U.P.

INDIA

Kisan Krishi Yantra Udyog

64 Moti Bhawan

Collector Ganji

KANPUR

208 001

INDIA

Department of Agricultural Engineering
Faculty of Engineering
University of Nigeria
NSUKKA
NIGERIA

SIEVING EQUIPMENT

Kemutec Group Ltd
Hulley Road
Hurdafield Industrial Estate
MACCLESFIELD
SK10 2ND
UK

Agricultural Engineers Limited

Ring Road West Industrial Area

P.O.Box 12127

ACCRANORTH

GHANA

Industrias Technicas "Dolorier"

Alfredo Mendiola 690

Urbanizacion Ingenieria

LIMA

PERU

DRYING EQUIPMENT

P.T.Rutan Machinery Trading Co.

P.O.Box 319

Surabaya

INDONESIA

CECOCO
PO Box 8
Ibaraki City
Osaka 567
JAPAN

Agricultural Mechanisation Development Programme
AMDP, CEAT, UP Los Banos
College
Laguna 4031
PHILIPPINES

JCCE Industries
242 Mayondon
Los Banos
Laguna
PHILIPPINES

MARINAS Machinery Man. Co. Inc.
Rizal St.

Pila

Laguna

PHILIPPINES

DECORTICATING EQUIPMENT

Union for Appropriate Technical Assistance

G. Van den Heuvelstraat 131

3140

RAMSEL

BELGIUM

Agricultural Engineers Limited

P.O. Box 12127

ACCRA NORTH

GHANA

Rajan Universal Exports (MFRS) P Ltd

Raj Buildings 162, Linghi
Chetty Street, P Bag No 250
MADRAS 600 001

INDIA

EBM Industries, Inc.
115 North Blvd.

Navotas

Metro Manila

PHILIPPINES

Technology Development Unit
Home Industry Division
Vipavadee-Rangsit Road

Payathai

BANGKOK

10400

THAILAND

Lewis C Grant Ltd

East Quality Street
Dysart
KIRKCALDY
KY1 2UA
UK

MILLING EQUIPMENT

Union for Appropriate Technical Assistance
G. Van den Heuvelstreat 131
3140
RAMSEL
BELGIUM

Kisan Krishi Yantra Udyog
64 Moti Bhawan
Collector Ganj
Kanpur

208 001

INDIA

Mekins Agro Products (Pvt) Ltd.

6-3-866/A Begumpet

Greenlands

Hyderabad

500 016

INDIA

Rajan Universal Exports (Mfrs) P Ltd

Raj Buildings 162, Linghi

Chetty Street, P Bag No 250

MADRAS

600 001

INDIA

Sanjay Steel Builders

Matru Chhaya N Subbash Road

Near Syndicate Bank, Mulund

BOMBAY

400 080

INDIA

Maquinaria pare Moliendas y Mezclas

Calle Playa Langosta 25

Col Refora Iztaccihuatl

MEXICO DF

CP 08840

MEXICO

AB Svegma Svenska Gardmaskiner

Box 400

535 00

KVANUM

SWEDEN

OIL EXPELLERS

IBG Monforts & Reiners Gmbh & Co

Postfach 20 08 53

D 4050

MONCHENGLADBACH 2

GERMANY

Agricultural Engineers Limited

Ring Road West Industrial Area

P.O.Box 12127

ACCRA-NORTH

GHANA

CECOCO

PO Box 8

Ibaraki City

Osaka 567

JAPAN

SEV Corporation
44 Rizal Ave Ext
Grace Park
CALOOCAN CITY
PHILIPPINES

Tanzania Eng.& Manufact.Design Org.
P.O.Box 6111
Arusha
TANZANIA

OIL PRESSES

Union for Appropriate Technical Assistance
G. Van den Heuvelstraat 131
3140
RAMSEL
BELGIUM

Outils pour les Communautés

BP 5946

DOUALA

Akwa

CAMEROON

Agricultural Engineers Limited

Ring Road West Industrial Area

P.O.Box 12127

ACCRA-NORTH

GHANA

Technology Consultancy Centre

University of Science & Technology

KUMASI

GHANA

Behere's & Union Industrial Works

Jeevan Prakash

Masoli

DAHANU ROAD 401 602

Dist Thane

INDIA

Karnataka Iron Works

Balmatta Road

Near Bendoor Well

MANGALORE 575 002

INDIA

Kisan Krishi Yantra Udyog

64 Moti Bhawan

Collector Ganj

Kanpur

208 001

INDIA

Rajan Universal Exports (Mfrs) P Ltd

Raj Buildings 162, Linghi

Chetty Street, P Bag No 250
MADRAS 600 001
INDIA

AGRO Machinery Ltd.
P.O.Box 3281
Bush Rod Island
Monrovia
LIBERIA

Department Of Agricultural Eng.
Faculty of Engineering
University of Nigeria
Nsukka
NIGERIA

Nigerian Institute for Oil Palm Research
Private Mail Bag 1030
BENIN CITY

NIGERIA

Royal Tropical Institute
Mauritskade 63
1092 AD
AMSTERDAM
NETHERLANDS

Ramzan Engineering Works
Maqbool Rd
FAISALABAD
PAKISTAN

Almeda Cottage Industry
2326 S. Del Rosario St
Tondo
MANILA
PHILIPPINES

Appropriate Technology Centre

College of Ag Complex
Manresa Heights
CAGAYAN DE ORO CITY
9000
PHILIPPINES

ELCT-DAR
Village Sunflower Project
PO Box 1409
ARUSHA
TANZANIA

[Contents](#) - [◀ Previous](#)