106-E, Kamla Nagar, New Delhi-110007, India.
Tel: 91-11-23843955, 23845654, 23845886, +918800733955
Mobile: +91-9811043595

Email: npcs.ei@gmail.com, info@entrepreneurindia.co
Website: www.entrepreneurIndia.co

# **Aromatic Plants Cultivation, Processing and Uses**

Code: NI120	Format: paperback	
Indian Price: ₹975	US Price: \$100	
Pages: 504	ISBN: 8178330571	
Publisher: Asia Pacific Business Press Inc.		

# **Description**

Aromatic plants have essential or aromatic oils naturally occurring in them. They help heal mental ailments and other diseases. India is endowed with a rich wealth of medicinal plants. Aromatic (Aroma Producing) plants are those plants which produce a certain type of aroma. Their aroma is due to the presence of some kind of essential oil with chemical constituents that contain at least one benzene ring in the their chemical configuration. The chemical nature of these aromatic substances may be due to a variety of complex chemical compounds. These plants have made a good contribution to the development of ancient Indian material medica. In recent years, there has been a tremendous growth of interest in plant based drugs, pharmaceuticals, perfumery products, cosmetics and aroma compounds used in food flavors and fragrances and natural colors in the world. There is a definite trend to adopt plant based products due to the cumulative derogatory effects resulting from the use of antibiotic and synthetics and except for a few cultivated crops, the availability of plant based material is mainly from the natural sources like forests and wastelands. There is a need to introduce these crops into the cropping system of the county, which, besides meeting the demands of the industry, will also help to maintain the standards on quality, potency and chemical composition. During the past decade, demand for aromatic plants and its products has attracted the worldwide interest, India being the treasure house of biodiversity, accounts for thousands of species which are used in herbal drugs. 90% of herbal industry requirement of raw material is taken out from the forests.

Some fundamentals of this book are botanical description of the plant, genetic improvement, harvesting, intercropping, transplantation, irrigation and weeding, vanilla cultivation in india, commercial cultivation of vanilla, distillation of herbage for essential oil, effect of growth hormones, jasmine crop improvement & agrotechniques,

efforts for new vatiety of jasminum auriculatum, essential oils of agarwood, cinnamomum tamala leaves, eucalyptus citriodora and caultheria pragrantissima, past and future of sandal wood oil industry, by product development from turmeric and ginger rhizomes, isolation of essential oils and its flavour profile etc.

This book contains most of the important aspects related to aromatic plants. It is being published for those who are interested in growing, processing and trading of aromatic plants.

# Tags

Aromatic plants cultivation India, Cultivation of aromatic plants, Aromatic plants farming, Cultivation of aromatic crops, List of aromatic plants in India, Names of aromatic plants, Aromatic plants, Processing of Aromatic Plants, Extraction of essential oils from aromatic plants, Extraction of essential oils by steam distillation, Essential oil extraction methods, How Are Essential Oils Extracted?, Essential oils, Extraction of Volatile Oil from Aromatic Plants, Steam distillation procedure, How to extract plant oils by distillation?, How to extract oil from plants?, List of aromatic plants and their uses, List of Important Aromatic Plants, Multiple Uses of Aromatic Plants, Commercial cultivation of aromatic plants

# **Content**

1. Cultivation of Tagetes Minuta Botanical description of the plant Genetic improvement Agrotechnology Soil and climate Propagation

Fertilizers and manures

Irrigation

Harvesting

Intercropping

Weed control

Crop rotations

Diseases

Distillation

Chemistry

Distillation unit design availability

# 2. Cultivation of Eucalyptus Citriodora

Description of the plant

Cultivation

Soil and Climate

Preparation of Land

Propagation

Nursery

Transplanting

Weeding

Manures and Fertilizers

Harvesting

Pests and Diseases

Distillation

Yield

Chemical Constituents

Uses

#### 3. Cultivation of Rosmarinus Officinalis

Introduction

Description of the plant

Cultivation

Soil and Climate

Propagation

Transplanting, interculture and fertilizer application

**Irrigation** 

Harvesting

Pests and diseases and their control

Distillation

Oil content and yield

Chemical constituents

#### 4. Cultivation of Coriander Sativum

Description of the Plant

Cultivation

Soil and Climate

Propagation

Irrigation

Harvesting

Pests and Diseases

Distillation

Yield

Chemical Constituents

Uses

**Economics of Cultivation** 

#### 5. Cultivation of Lavender Species

**Botany** 

Soil and Climate

Cultivation

Propagation

Propagation By Seeds

Transplantation

Fertilizer Application

Weeding

Regeneration

Harvesting

Distillation

Oil Content and Oil Yield

Chemical Constituents

Uses

**Economics of Cultivation** 

#### 6. Cultivation of Matricaria Chamomilla

Description of the Plant

Genetics

Cultivation

Soil and climate

Propagation/nursery

Transplantation, irrigation and weeding

Cropping sequence

Pests and diseases

Manures and fertilizers

Harvesting

Collection of seeds

Yield

Drying and storage

Distilation

Yield and characteristics of the oil

Uses

Specification of the drug

#### Economics of cultivation

# 7. Vanilla World's second most expensive spice

Vanilla Flower

Vanilla Beans

Vanilla cultivation in India

Commercial Cultivation of Vanilla

Vanilla Extract and Flavourings

Commercial uses of Vanilla

Market for Vanilla

Exports grades and standards

#### 8. Cultivation of Artemisia Annua

Description of the plant

Soil and climate

Propagation

Weed control

Fertilizers and manures

Irrigation

Harvesting

Chemistry and uses

Distillation

Economics of cultivation

#### 9. Cultivation of Mentha Arvensis

Plant descriptors

Available cultivars of menthol mint

Choice of place for cultivation

Land preparation

Preparation of planting material

Production of suckers

Production of seedlings

Planting of suckers in the field

Fertilizer application

Irrigation and drainage

Interculture and weed control

Crop rotation

Intercropping

Harvesting

Yield

Storage of herbage

Pests and diseases

Insect pests

**Diseases** 

Distillation of herbage for essential oil

Directly fired distillation tank

Design availability

Use of mint oil and its derivatives

**Economics of cultivation** 

# 10. Cultivation of French Basil (Ocimum Bacilicum L.)

- 1. European Type
- 2. Reunion Type
- 3. Methyl Cinnamate Type
- 4. Eugenol Type

**Botany** 

Soil and Climate

Field preparation

Propagation

- (a) Raising of Nursery
- (b) Planting

Irrigation

Fertiliser Application

Interculture

Harvesting and Yield

Agronomical Studies

Physiological Studies

Heavy metal tolerance

Effect of growth hormones

Mineral contents

Seed mucilage studies

Effect of photoperiodism

Biosynthesis of Eugenol

Tissue Culture Studies

**Genetical Studies** 

**Chemical Composition** 

Uses

Cosmetic

Food

# Folk medicine Ayurvedic Properties

# 11. Jasmine Crop improvement & agrotechniques

New varieties of jasmine

Arka Surabhi

Arka Arpan

Efforts for new vatiety of Jasminum auriculatum

for extraction of essential oil

Constituent of Jasmine essential oil

Agronomy

Plant protection

Water saving, labour saving low cost device for

propagation of plant cuttings

Details of the device

Required materials for the device

Detailed method

Economic viability of growing jasmine for essential oil

#### 12. Semecarpus Anacardium L.f.

Introduction

Chemistry of Nuts

#### 13. Himalayan Cedarwood Oil

Essential oil of Deodar (Cedrus Deodara)

Essential oil of Juniperus Recurva var. Squamata and other oils of Juniperus spp.

Agarwood and Oil Agarwood

Uses

#### 14. Essential oils of Agarwood, Cinnamomum Tamala Leaves,

Eucalyptus Citriodora and Caultheria Pragrantissima

Distillation

Gaultheria

Eucalyptus

#### 15. Past and Future of Sandal wood Oil Industry

Plantation and Harvesting

Disease Control

Distillation of Oil

_					
L	$\sim$		1/1	n	
г	a	<b>L</b> .	ĸι		u
•	•	_			

Problems and their Solutions

Adulteration

**Future Prospects** 

Kewda Industry in Orissa

# 16. Production Technology and Package of Practices in Chilli

**Cultivated Species of Capsicum** 

Constraints in Chilli Production

Technologies Developed

Disease and Disease Management

Marketing in Chilli

Value Addition in Chilli

# 17. By Product Development from Turmeric and Ginger Rhizomes

Introduction

By Product Development in Turmeric

Curcumin

Turmeric Essential Oils

Isolation of Essential Oils and its Flavour Profile

By product Development in Ginger

Survey of Raw Material

Essential oils

Oleoresin

Gingerol in Ginger Oleoresin

Starch

**Protein** 

Crude Fibre

Commercial Extraction of Ginger Oleoresin

**Process Description for Oleoresins** 

Oleoresin Quality

Flavour Quality of Ginger Oleoresins

Essential Oils of Ginger

Profile of Flavour in Ginger Cultivars

## 18. Synthesis of 4 Acye 3, 7,7 Trimethylbicyclo [4, 1, 0]

Hept 3 ene and Related Compounds by Friedel Crafts

Reaction on  $(+) \sim Car 3$  ene

Results and Discussions

1. Synthesis of 4 acetyl 3, 7, 7 trimethylbicyclo [4, 1, 0]

- hept 3 ene and its position isomers (II).
- 2. Synthesis of 4 propionyl 3, 7, 7 trimethylbicyclo [4, 1, 7] hept 3 ene and its position isomers (III).
- 3. Synthesis of 4 Butyryl 3, 7, 7 trimethylbicyclo [4, 1, 0] hept 3 ene and its position isomers (IV).

Experimental

Fractionation of Turpentine Oil for Isolation of 3, 7, 7 Trimethylbicyclo [4, 1, 0] hept 3 ene ((+) Car 3 ene (I)).

4 Acetyl 3, 7, 7 trimethylbicyclo [4, 1, 0] hept 3 ene and its position isomers (II).

Separation of IIa, and IIc by Column Chromatography.

4 Acetyl 3, 7, 7 trimethylbicyclo [4, 1, 0] hept 2 ene (IIb) 3 Methylene 4 acetyl 7, 7 dimethylbicyclo

[4, 1, 0] heptane (IIc)

4 Propionyl 3, 7, 7 trimethylbicyclo [4,1,0] hept 3 ene and position isomers (III).

Separation of IIIa, IIIb and IIIc by column Chromatography.

- 4 Propionyl 3, 7, 7 trimethylbicyclo [4, 1, 0] hept 3 ene (Illa).
- 4 Propionyl 3, 7, 7 trimethylbicyclo [4, 1, 0] hept 2 ene (IIIb).
- 3 Methylene 4 propionyl 7, 7 dimethylbicyclo [4, 1, 0] heptane (IIIc).
- 4 Butyryl 3, 7, 7 trimethylbicyclo [4, 1, 0] hept 3 ene and its position isomers (IV).

Sederation of IVa, IVb and IVc by column chromatography.

- 4 Butyryl 3, 7, 7 trimethylbicyclo [4, 1, 0] hept 3 ene (IVa).
- 4 Butyryl 3, 7, 7 trimethylbicyclo [4, 1, 0] hept 2 ene (IVb).
- 3 Methylene 4 Butyryl 7, 7 dimethylbicyclo [4, 1, 0] heptane (IVc).
- 19. Free and Glycosidically bound volatiles of Clove (Eugenia caryophyllata) Experimental Procedures Capillary Gas Chromatographic Analysis Results
- 20. Cultivation of Spices

Black Pepper
Climate
Soil
Varieties
Production of Rooted Cuttings
Cultural Practices
Standards
Planting
Under Planting
Soil Fertility and Nutrient Management
Irrigation
Bush Pepper
Diseases
Pests
Harvesting
Cardamom
Mainfield Planting
Varieties
Propagation
Diseases
Pests
Cloves
Climate and Soil
Varieties
Planting Material
Planting
Manuring
Diseases
Pests
Nutmeg
Cultural Practices
Manuring
Pests
Cinnamon
Cultural Practices
Diseases
Manuring and Processing
Diseases
Pests

Ginger Varieties **Cultural Practices** Diseases **Pests** Turmeric **Varieties Cultural Practices** Diseases **Pests** 21. Bunium persicum (Boiss.) Fedtsch Botany, Conservation Strategies and Cultivation **Botanical Description of Plant** Climate and Distribution Reasons and Remedies for Dwindling Population of B. persicum in Nature Phenotypic Variability Climate Soil Type Preparation of Land Plantation` (i) Plantation Through Seeds (ii) Plantation Through Tuberous Roots Spacing Method of Plantation Manuring Weeding Irrigation Harvesting Intercropping Pests and Diseases of Kala Zira Crop Experimental Studies for the Propagation of Planting Material Under Laboratory Conditions Regeneration Through Tissue Culture Economics of the Crop Conclusion 22. Essential Oils of Artemisia species in Kashmir Himalaya

Artemisia moorcroftiana Wall Artemisia laciniata Wild

Artemisia salsoloides Will Artemisia persica Boiss Artemisia vestita Wall Conclusion

#### 23. Cultivation and Utilization of Kaempferia galanga L.

**Botany** 

Crop Improvement

Crop Management

Extraction of Essential Oil

Physico chemical Properties of Oil

Utilisation

# 24. Cultivation and Improvement of Sweet Marjoram

Floristics and Crop Improvement

- (i) Floristics
- (ii) Studies on Floral Biology
- (iii) Crop Improvement

Crop Production and Management.

- (a) Soil and Climate
- (b) Propagation
- (c) Studies on Nutrient and Spacing
- (d) Use of Growth Regulators
- (e) Crop Rotation/Sequencing and Inter crops
- (f) Irrigation and Inter culture
- (g) Insect Pests and Diseases
- (h) Harvesting, Production of Essential Oil and Yield
- (i) Chemistry of Oil

#### 25. Cultivation of Davana for Essential Oil

Introduction

**Botany** 

Floral biology

Climate

Soil

Nursery raising

**Transplanting** 

Manures and fertilizers

Irrigation

Interculture

Growth regulator application

Plant protection

Insect pests

Diseases

Harvesting

Distillation

Yield and Oil content

**Chemical Constituents** 

Physico chemical characteristics of davana

## 26. Essential Oil of Hyptis Suaveolens Poit

Antimicrobial Efficacy of the Essential Oil of H. suaveolens

- (ii) Phytotoxic Behaviour of the Oil
- (iii) Chemical Constituents of the Oil

Conclusions

# 27. Tagetes minuta (Wild Marigold)

An Economic Crop for Hilly Regions

Introduction

Crop Management

Harvesting and Distillation

**Quality Evaluation** 

Uses of Tagetes Oil

Research Needs

# 28. Present Status of Jamrosa A Review

Cultivation

Areas Under Cultivation and Marketing Prospects

#### 29. Cultural Practices of CKP 25

(Lemongrass) under Irrigated conditions

Introduction

Effect of Date of Plantings

Effect of Different Spacing Combinations

Effect of Nitrogen Levels

Recommendations

# 30. Development of New Cultivars of Cymbopogons as

Source of Terpene Chemicals

31. Indian Cymbopogons Botany, Agrotechnology, Utilization, Constraints and Future Scope

**Botany** 

Morphology

Taxonomic Position

Distribution

Cytological Studies

\*Chromosome Number

\*Cytogenetics

\*Reproduction

Agrotechnology

Age of Plantation

Manures and Fertilizers

Irrigation

Weed Control

Harvesting

Genetic Improvement

Utilization

**Essential Oils** 

Major Research and Development Constraints

Conclusion and Scope for Future Work

32. Growth and Performance of Cymbopogon citratus

Stapf., the West Indian Lemongrass and Cymbopogon pendulus (Nees ex Steud.) Wats., the Jammu

Lemongrass in West Bengal)

Result and Discussion

Intraspecific Variation:

Interspecific Variation:

33. Indian Turpentine Oil as a Raw Material for Terpene Chemicals

Production of Oil of Turpentine

Utilization of Oil of Turpentine

Constituents of Oil of Turpentine and their Derivatives

34. Cultivation of Musk Mallow in Jammu

Introduction

35. Morpho Economic Features of Burma Citronella (Cymbopogon

winterianus Jowitt)

Introduction

36. Oxidation of Y Terpinene and Isolongifolene with t Butyl chromate Oxidation of terpinene (I)
Oxidation of isolongifolene (VI)

37. Scope for Commercial Cultivation of Aromatic Plants in Upper Pulney Hills

# **About NIIR Project Consultancy Services (NPCS)**

NIIR Project Consultancy Services (NPCS) is a reliable name in the industrial world for offering integrated technical consultancy services. Its various services are: Prefeasibility study, New Project Identification, Project Feasibility and Market Study, Identification of Profitable Industrial Project Opportunities, Preparation of Project Profiles and Pre-Investment and Pre-Feasibility Studies, Market Surveys and Studies, Preparation of Techno-Economic Feasibility Reports, Identification and Selection of Plant and Machinery, Manufacturing Process and/or Equipment required, General Guidance, Technical and Commercial Counseling for setting up new industrial projects and industry. NPCS also publishes various technology books, directories, databases, detailed project reports, market survey reports on various industries and profit making business. Besides being used by manufacturers, industrialists, and entrepreneurs, our publications are also used by Indian and overseas professionals including project engineers, information services bureaus, consultants and consultancy firms as one of the inputs in their research.

NIIR PROJECT CONSULTANCY SERVICES
106-E, Kamla Nagar, New Delhi-110007, India.
Tel: 91-11-23843955, 23845654, 23845886, +918800733955
Mobile: +91-9811043595
Email: npcs.ei@gmail.com, info@entrepreneurindia.co

Website: www.entrepreneurIndia.co