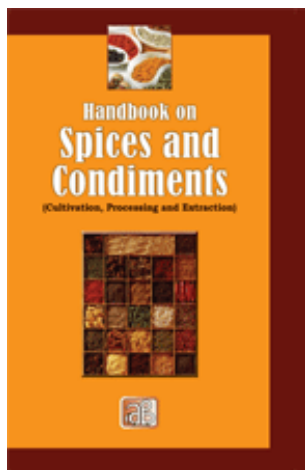


# Handbook on Spices and Condiments (Cultivation, Processing and Extraction)



**Author:** H. Panda  
**Format:** Paperback  
**ISBN:** 9788178331324  
**Code:** NI232  
**Pages:** 640  
**Price:** Rs. 1,575.00 **US\$** 150.00  
**Publisher:** Asia Pacific Business Press Inc.  
Usually ships within **5** days

The term Spice and Condiments applies to natural plant or vegetable products or mixtures in whole or ground form, which are used for imparting flavour, aroma and piquancy to the food items. Spices and condiments are a major commercial crop in India, and earn a major part of foreign exchange annually. They have been the backbone of agricultural industry. The importance of spices and condiment in dietary, medicinal and other uses, and their commercial importance are immense. India is known the world over as the home of spices. Thus spices are an important group of agricultural goods, which are virtually indispensable in the culinary art. Spice processing includes different steps: spice cleaning, spice reconditioning and spice grinding. Some spices were also used for preserving food like meat for a year or more without refrigeration. In the 16th century cloves for instance were among the spices used to preserve food without refrigeration. Cloves contain a chemical called eugenol that inhibits the growth of bacteria. It is a natural antibiotic. It is still used to preserve food like Virginia Ham. Likewise later mustard and ground mustard were also found to have preservative qualities. India alone contributes 25-30% of the total world trade in spices. It may be interesting to note that nine spices namely pepper, ginger, clove, cinnamon, cassia, mace, nutmeg, pimento (allspice) and cardamom alone contributed as much as 90% of the total world trade. Pepper is the most important spice in the world and so also of India.

This book basically deals with brief history of spices, uses of spices, world trade in spices area & production of spices in India, area and production of spices in India, major and minor spices of India, spice processing, quality issues with spices, bird chillies and Tabasco chillies, basil or sweet basil, seasoning blend duplication and tricks, sauces and gravies, snack seasonings, quality issues with spices, etc.

This book is a single compendium which deals with all aspects and facts of spices and condiments which may meet the requirements of all those handling them at various stages, from harvesting to their end use. This book contains post harvest management, the potentials of genetic engineering, high production technology in spices with plantation and processing of various spices and condiments such as vanilla, turmeric, tamarind, saffron, black pepper, onion, mint, ginger, garlic, curry leaf, coriander etc.

## Contents

## 1. INTRODUCTION

Brief History of Spices

Uses of Spices

World Trade in Spices – Area & Production of

Spices in India

Area and Production of Spices in India

Major and Minor Spices of India

Export of Value-added Spice Products:

(Spice Oleoresins & Essential Oils)

## 2. VALUE ADDED SPICE PRODUCTS

## 3. POST-HARVEST MANAGEMENT

Procedure for Post-Harvesting Handling

Drying of Spices

Ginger Products

## 4. HIGH PRODUCTION TECHNOLOGY IN SPICES

## 5. POTENTIALS OF BIOTECHNOLOGY IN

## IMPROVEMENT IN SPICE CROPS

The Potentials of Techniques Related to Tissue

Culture

Somatic Embryogenesis

Organogenesis

Micropropagation

Secondary Metabolites from Cell Cultures

A vitro Germplasm Conservation

The Potentials of Genetic Engineering: Gene and

Genome Analysis Techniques

Genetic Manipulation by Gene Technology

Agrobacterium Mediated Gene Transfer

Gene Transfer by Electroporation

Gene Transfer by Microprojectile Bombardment

Gene Marker and Genome Analysis Techniques

Non-PCR Based Marking Technique: Restriction Fragment

Length Polymorphism

Arbitrary/Semi-arbitrary Primer Based PCR Techniques

Site Target PCR Technique

Marker Assisted Selection

## 6. DISEASES OF SPICE CROPS

## 7. INSECT-PESTS OF SPICES AND THEIR CONTROL

## 8. SPICE PROCESSING

Spice Cleaning

Magnets

Sifters

Air Tables

Destoners

Air Separators

Indent Separators

Spiral Separators

Spice Reconditioning

Spice Grinding

Postprocessing Treatments

Ethylene Oxide

Propylene Oxide

Irradiation

Steam Sterilization

## 9. QUALITY ISSUES WITH SPICES

Sampling

Sample Preparation

Volatile Oil

Moisture

Total Ash and Acid Insoluble Ash

Granulation

Crude Fiber, Starch, and Nonvolatile Methylene

Chloride Extract

Spice Specific Tests

Piperine Level of White and Black Pepper

Volatile Oil of Mustard Seed

Extractable Color of Turmeric

Phenol Content of Nutmeg and Mace

Extractable Color of Paprika Products

Heat Level of Red Pepper

Microanalytical Determination of Filth

Microbiological Methods

## 10. SPICE EXTRACTIVES

Spice Volatile Oils

Spice Oleoresins

Use of Spice Extractives

Replacement of Spices with Oils and Oleoresins

## 11. SIMPLE SEASONING BLENDS

Soluble Seasonings

Celery Salt

Garlic Salt and Onion Salt

Chili Powder

Curry Powder

Pickling Spice

Poultry Seasoning

Pumpkin Pie Spice

Apple Pie Spice

Oriental Five Spice Blend

## 12. MEAT SEASONINGS

Overview of the Industry

Overview of Formulating

Meat Block

Cure

Curing Accelerator

Brine

Pickup

Formulations

Restricted Ingredients

Natural Flavoring Regulations

Seasoning Formulas

Fresh Sausage

Cooked Sausage

Rubs

Dry and Semidry Sausages

Brines

## 13. SNACK SEASONINGS

Overview of the Industry  
All Natural/No MSG  
Low Calorie-Snacks  
Unique Flavors  
Multigrain Chips  
Overview of Formulating  
Will the seasoning be Topically Applied or Applied in an Oil Slurry?  
What is the Base Product the Seasoning will be Used On?  
Is the Base Product Salted?  
What is the Target and Maximum Cost for this Seasoning?

Formulations  
Potato Chips  
Extruded Snacks  
Tortilla and Corn Chips  
Popcorn  
Nuts  
Rice Cakes  
Pork Skins

#### 14. SAUCES AND GRAVIES

Overview of the Industry  
Overview of Formulating  
Formulations  
Gravies  
Sauces

Tomato Based Sauces  
Cream Based Sauces

#### 15. ETHNIC SEASONINGS

Introduction  
Cajun and Creole  
Italian  
Mexican  
Caribbean  
Indian  
Chinese  
Others

#### 16. SEASONING BLEND DUPLICATION AND TRICKS

Duplication  
Introduction  
Duplication Steps  
Tasting  
Tricks of the Trade

Introduction  
Colors  
Anticaking Agents  
Labeling  
Synergistic Ingredients  
Flavors  
Microbiology  
Why Seasoning Blends?

#### 17. LEEK (ALLIUM PORRUM) AND CHIVES (ALLIUM SCHOENOPRASUM)

Introduction

Leek – Allium Porrum  
Area, Production in H.P./Hills in India and World  
Uses Including Medicinal Properties  
Nature of Crop  
Varieties Suitable for Mild-Winter Regions  
Varieties Suitable for Cold-Winter Regions  
Breeding  
Seed Production

#### 18. AJOWAN OR BISHOP’S WEED

Description and Distribution  
Composition  
Uses

#### 19. ALLSPICE OR PIMENTA

Description and Distribution  
Composition  
Uses

#### 20. AMCHUR

Description and Distribution  
Composition  
Uses

#### 21. ANARDANA

Description and Distribution  
Composition  
Uses

#### 22. ANGELICA

Description and Distribution  
Composition  
Root  
Fruit  
Peel Oil  
Volatile Oil  
Uses

#### 23. ANISEED

Description and Distribution  
Composition  
Adulteration  
Distillation of Oil  
Uses

#### 24. ASAFOETIDA

Description and Distribution  
Extraction of Asafoetida  
Types/Varieties of Asafoetida  
Composition  
Oil of Asafoetida  
Adulteration  
Uses

#### 25. BALM OR LEMON-BALM

Description and Distribution  
Composition  
Volatile Oil  
Uses

#### 26. BASIL OR SWEET BASIL

Description and Distribution

Varieties

Types of Basil Oil

Yield of Herb Oil

Distillation of Oil

Composition

Quality of Oil

Adulteration of Sweet Basil Oil

Uses

## 27. BAY OR LAUREL LEAVES

Description and Distribution

Composition

Volatile Oil

Uses

## 28. BLACK-CAREWAY™ KALAZIRA™

Botanical Description

Soil and Climatic Requirements

Propagation Techniques

Planting Techniques

Seed and Seed Rate

Method of Sowing

(i) Through Seeds

(ii) Through Tubers

Cultural and Irrigation Operations

Growing Possibilities

Plant Protection

Diseases

Insect-Pests

Harvesting and Storage

Yield

Economics

Market

Prospectiveness

## 29. CAPER

Description and Distribution

Composition

Uses

## 30. CAPSICUMS OR CHILLIES

(I) CHILLIES

Description and Distribution

Uses and Nutritive Value

Origin and History

Production and Distribution

Nature of Plant

Pollination

Production Technology

Soil

Climate

Sowing Time

Seed Rate

Transplanting

Interculture and Weed Control

Manures and Fertilizers

Irrigation

Harvesting  
Drying of Chillies  
Seed Production  
Genetic Improvement  
Introduction and Selection  
Hybridization  
Hybrid Breeding  
Breeding for Disease and Insect-Pest Resistance  
Mutation Breeding  
(II) PAPRIKA (*C. annum*)  
Importance  
What is a Good Paprika?  
Major Types of Paprika  
Area/Production in H.P. Hills in India and World  
Export of Oleoresin from India  
Nature of the Crop and its Uses Including Medicinal Properties  
Production Technology  
Planting Season  
Seed Production  
Other Information  
Composition  
Uses  
(III) BIRD CHILLIES AND TABASCO CHILLIES  
(*C. frutescens* Linn.)  
31. CARAWAY  
Description and Distribution  
Composition  
Adulteration  
Volatile Oil  
Uses  
32. CARDAMOM  
I. Cardamom (*Aframomum* species)  
(i & ii) Madagascar and Cameroon Cardamoms  
(iii) Korarima  
(iv) Grains of Paradise or Guinea Grains  
Composition  
Uses  
33. GREATER CARDAMOM  
(I) BENGAL CARDAMOM  
Description and Distribution  
Uses  
(II) ROUND CARDAMOM  
Description and Distribution  
Uses  
(III) CAMBODIAN CARDAMOM  
(IV) GREATER INDIAN CARDAMOM (LARGE CARDAMOM) OR NEPAL CARDAMOM  
Description and Distribution  
Production Technology  
Breeding  
Seed Production  
Post-Harvest Management  
Composition

Volatile Oil

Uses

#### 34. LESSER CARDAMOM OR TRUE CARDAMOM

Description and Distribution

Harvesting and Drying/Curing

Drying in a Heated Chamber – Kiln Drying

Bleaching of Cardamom

Varieties/types of Cardamoms

Composition

Uses

#### 35. CASSIA

(I) JANGLI-DALCHINI (Cassia)

Description and Distribution

Uses

(II) TEJPAT (INDIAN CASSIA LIGNEA)

Description and Distribution

Leaf Oil

Bark oil

Uses

(III) TEZPAT

Description and Distribution

Uses

(IV) CASSIA OR CASSIA CHINA

Description and Distribution

Preparation/Curing of Cassia Bark

Composition

Cassia Oil

Adulteration in Cassia Oil

Cassia Buds

(V) BATAVIA CASSIA

Description and Distribution

(VI) SAIGON CASSIA

Description and Distribution

Barking

Preparation and Processing of Bark

Uses

#### 36. CELERY SEED

Description and Distribution

Plant Characters

Varieties

Crop Production

Climate and Soil

Nursery Management

Manures and Fertilizers

Irrigation

Inter-Culture

Harvesting

Post-Harvest Handling

Diseases and Insect-Pests

Diseases

Insect-Pests

Seed Production

Breeding



Composition

Volatile Oil

Celery Chaff Oil

Oleoresin of Celery Seed

Celery Leaf Oil/Herb Oil

Uses

### 37. CELERIAC

Description and Distribution

Composition

Uses

### 38. CHERVIL

Description and Distribution

Composition

Uses

In Medicine

### 39. CHIVES OR CIVES

Description and Distribution

Composition

Volatile Oil

Quality Specification

Uses

### 40. CINNAMON

Description and Distribution

Preparation and Curing of Bark

Composition

Uses

### 41. CLOVE

Description and Distribution

Preparation of Cloves

Extraneous Matter

Composition

Clove Bud Oil

Clove Stem Oil

Clove Leaf Oil

Adulteration

Uses

### 42. CORIANDER

Description and Distribution

Nature of Plant

Varieties

1. According to Colour

2. According to Seed Type

3. Improved Varieties

4. Other Varieties

Climate

Production Technology

Soil

Sowing Time

Seed Rate and Method of Sowing

Manure and Fertilizers

Irrigation

Interculture

Harvesting

Yield  
Insect-Pests and Diseases  
Control Measure  
Composition  
Volatile  
Fatty Oil  
Coriander Herb Oil  
Adulteration  
Uses

#### 43. CUMIN SEED

Description and Distribution  
Composition  
Volatile Oil  
Adulteration of Volatile Oil  
Fixed Oil  
Uses

#### 44. CUMIN BLACK

Description and Distribution  
Production Technology  
Composition  
Volatile Oil  
Essential Oil  
Fixed Oil  
Uses

#### 45. CURRY LEAF

Description and Distribution  
Composition  
Volatile Oil  
Uses

#### 46. DILL AND INDIAN DILL (SOWA)

Description and Distribution  
Composition  
Essential Oil  
Uses

#### 47. FENNEL

Description and Distribution  
Production Technology of Fennel  
Recommended Fennel Varieties  
Fertilizer Recommendations for Fennel  
Varieties  
Composition  
Volatile Oil  
Fixed Oil  
Uses

#### 48. FENUGREEK

Importance  
Description and Distribution  
Uses  
Nature of Plant  
Varieties  
Non-Scented or Deshi  
Scented  
Improved Varieties

Pusa Early Bunching  
Kasuri Selection  
Other Varieties  
Production Technology  
Soil  
Climate  
Manure and Fertilizers  
Sowing  
Irrigation  
Interculture  
Crop Improvement  
Harvesting  
Yield  
Common Methi  
Kasuri Methi  
Seed Production  
Isolation  
Inspection  
Harvesting and Threshing  
Diseases  
Fixed Oil  
Volatile Oil  
Effect of Roasting and Cooking on Nutritive Value  
Uses  
In Medicine  
49. GALANGAL  
Description and Distribution  
Composition  
Volatile Oil  
Oleoresin  
Uses  
Uses of Volatile Oil  
50. GARLIC  
Two Garlic Crops a Year  
Varieties  
Breeding  
Seed Production  
Minimum seed certification standards for garlic  
(*Allium sativum* L.)  
Field Standards  
Seed Standards  
Garlic Powder  
Uses  
51. GINGER  
Description and Distribution  
Breeding  
Production Technology  
Post-Harvest Management  
Seed Production Technology  
Post-Harvest Handling of Seed Crop  
Composition  
Volatile Oil  
Ginger Oleoresin

Uses

Use of Ginger Oil

## 52. HORSE-RADISH

Description and Distribution

Composition

Adulteration

Uses

## 53. HYSSOP

Description and Distribution

Composition

Volatile Oil

Adulteration

Uses

## 54. JUNIPER

Description and Distribution

Composition

Adulteration

Volatile Oil

Composition of Volatile Oil

Uses

Other Uses/by-Products

## 55. KOKAM

Description and Distribution

Composition

Uses

## 56. STONE LEEK OR WELSH ONION

Description and Distribution

Composition

Uses

## 57. LOVAGE

Description and Distribution

Composition

Uses

## 58. MACE

Description and Distribution

Composition

Fixed Mace Oil

Adulteration

Uses

## 59. MARJORAM

Description and Distribution

Composition

Volatile Oil

Uses

## 60. MINT OR JAPANESE MINT

Description and Distribution

Uses

## 61. MUSTARD

Description and Distribution

(1) WHITE MUSTARD (SINAPIS ALBA OR BHIRTA)

Composition

Uses

(2) BLACK MUSTARD OR TRUE MUSTARD

(B.NIGRA KOCH)

Composition

Uses

(3) INDIAN MUSTARD (B. JUNCEA)

Composition

Uses

62. NUTMEG

Description and Distribution

Composition

Quality Grades

Nutmeg Butter

Leaves

Bark

Fruit Rind

Adulteration

Uses

63. ONION

Description and Distribution

Breeding

Post-Harvest Handling

Quality Traits of Onion for Dehydrated

Dehydrated Onion Products

Onion Powder

Onion Salt

Composition

Composition of Onion Powder

Uses

64. OREGANO OR ORIGANUM

Description and Distribution

Composition

Volatile Oil

Uses

65. PARSLEY

Description and Distribution

Uses Including Medicinal Properties

Nature of Crop

Production Technology

Breeding

Seed Production

66. PEPPER—BLACK, WHITE AND GREEN

Description and Distribution

Production Technology

Establishing Plantation and Management

Post-Harvest Management

Types/Varieties

Hawestine and Sun-Drjung

Yield/Revery of Dried Papper

Inclined Belt Separator/Cleaner for Pepper

Value-added Pepper products

(1) White Pepper

(2) Processed Tender Green Pepper

Composition

Pungent Principles

Oil of Pepper

Adulteration

Pepper by-Products

Pepper Hulls

Uses

67. PEPPER, LONG

Description and Distribution

Composition

Uses

68. PEPPERMINT

Description and Distribution

Volatile Oil

Adulteration of Oil

Uses

69. POPPY SEED

Description and Distribution

Composition

Poppy Seed Oil

Uses

70. ROSEMARY

Description and Distribution

Composition

Volatile Oil

Adulteration

Uses

71. SAFFRON

Botanical

Historical

Description and Distribution

Soil and Climatic Requirements

Planting Techniques

Manures and Fertilizers

Preparation of Land

Varieties

Seed Selection of Seed/Corms rate/ha

Time of Planting

Seed/Corm Treatment

Method of Planting

Inter-Cultural and Irrigation Operations

Harvesting and Processing

Yield

Diseases and Pests

Protection from Domestic Animals

Grading

Marketing

Inter-Cropping

Economics

Chemical Composition

Adulterants

Picking of Flowers for Obtaining Saffron

Drying or Toasting of the Stigmas to Obtain Saffron

Yield

Composition

Adulteration

Uses

## 72. SAGE

Description and Distribution

Composition

Volatile Oil

Uses

## 73. SAVORY

Description and Distribution

Composition

Volatile Oil

Uses

## 74. SHALLOT

Description and Distribution

Composition

Uses

## 75. SPEARMINT

Description and Distribution

Composition

Volatile Oil

Uses

## 76. STAR-ANISE

Description and Distribution

Adulteration

Volatile Oil

Fatty Oil

Uses

## 77. SWEET FLAG OR CALAMUS

Description and Distribution

Volatile Oil

Uses

## 78. TAMARIND

Description and Distribution

Composition

Tamarind Pulp

Tamarind Juice Concentrate

Uses

## 79. TARRAGON

Description and Distribution

Composition

Volatile Oil

Uses

## 80. THYME

Description and Distribution

Composition

Volatile Oil

Uses

## 81. TURMERIC

Description and Distribution

World Trade of Turmeric

Production Technology

Climate

Soil

Planting Material  
Varieties  
Land Preparation  
Time and Method of Planting  
Application of Manures and Fertilizers  
Mulching  
Interculture  
Irrigation  
Crop Rotation and Inter-Cropping  
Harvesting and Yield  
Curing  
Colouring Turmeric  
Storage of Rhizomes  
Insect-Pest and Diseases  
Insects  
Diseases  
Leaf Spot  
Leaf-Blotch  
Control Measures  
Rhizome-Rot  
Breeding  
Commercial Quality of Turmeric  
Per-Capita Consumption  
Composition  
Volatile Oil  
Oleoresin  
Use  
82. VANILLA  
Description and Distribution  
Harvesting and Curing  
Quality Attributes of Vanilla  
Composition  
Adulteration/Substitution  
Vanilla Extracts/Essences  
Vanilla Sugar  
Uses

## About NIIR

**NIIR PROJECT CONSULTANCY SERVICES (NPCS)** is a reliable name in the industrial world for offering integrated technical consultancy services. NPCS is manned by engineers, planners, specialists, financial experts, economic analysts and design specialists with extensive experience in the related industries.

Our various services are: Detailed Project Report, Business Plan for Manufacturing Plant, Start-up Ideas, Business Ideas for Entrepreneurs, Start up Business Opportunities, entrepreneurship projects, Successful Business Plan, Industry Trends, Market Research, Manufacturing Process, Machinery, Raw Materials, project report, Cost and Revenue, Pre-feasibility study for Profitable Manufacturing Business, Project Identification, Project Feasibility and Market Study, Identification of Profitable Industrial Project Opportunities, Business Opportunities, Investment Opportunities for Most Profitable Business in India, Manufacturing Business Ideas, Preparation of Project Profile, Pre-Investment and Pre-Feasibility Study, Market Research Study, Preparation of Techno-Economic Feasibility Report, Identification and Section of Plant, Process, Equipment, General Guidance, Startup Help,



Technical and Commercial Counseling for setting up new industrial project and Most Profitable Small Scale Business.

NPCS also publishes various process technology, technical, reference, self employment and startup books, directory, business and industry database, bankable detailed project report, market research report on various industries, small scale industry and profit making business. Besides being used by manufacturers, industrialists and entrepreneurs, our publications are also used by professionals including project engineers, information services bureau, consultants and project consultancy firms as one of the input in their research.

Our Detailed Project report aims at providing all the critical data required by any entrepreneur vying to venture into Project. While expanding a current business or while venturing into new business, entrepreneurs are often faced with the dilemma of zeroing in on a suitable product/line.

---

**NIIR PROJECT CONSULTANCY SERVICES** , 106-E, Kamla Nagar, New Delhi-110007, India. **Email:** [npcs.india@gmail.com](mailto:npcs.india@gmail.com) **Website:** [NIIR.org](http://NIIR.org)

Thu, 06 May 2021 15:43:13 +0530