

Aloe Vera Handbook Cultivation, Research Finding, Products, Formulations, Extraction & Processing

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Aloe Vera is a semi tropical plant. It is one of the oldest known medicinal plants gifted by nature, Aloe Vera often called Miracle plant known by many names. It contains more than two hundred tonic ingredients including essential amino acids, enzymes, glucose and more. Also contains the most essential components required by the human body. It is grown wild in hedge rows in dry soil conditions and almost all parts of India. It can be grown even under constant drought conditions. Commercial cultivation and utilization of this plant with the application of technology can be of great value. There are various benefits of this plant; it is used to support the natural healing of skin that has been damaged. A common usage is to sooth sunburned skin. Aloe Vera can also be made into juices, gels, powders and is often added to products. For example it can be found in cosmetics, shampoos, lotions and many other common household Aloe Vera products. The many benefits of Aloe Vera are not fully researched as of yet. Processing of Aloe Vera gel derived from the leaf pulp of the plant, has become a big industry worldwide due to the application in the food industry. It has been utilized as a resource of functional food, especially for the preparation of health drinks which contain Aloe Vera gel and which have no laxative effects. Given the exponentially growing demand for it in the international market, it presents the finest commercial opportunity among the various medicinal plants. Also, India is among the few countries gifted with the unique geographical features essential for cultivation of Aloe Vera and other high potential medicinal plants.

Some fundamentals of this book are chemical investigations of different parts of the leaf, agro technique: Aloe Vera, economics of cultivation per hector, aloe (Aloe Vera) investment opportunity, specialty raw material market for cosmetics/toiletries, strategy for capacity creation and marketing, influence of Aloe Vera on the glycol amino glycans in the matrix of healing dermal wounds in rats, effects of low molecular constituents from Aloe Vera gel on oxidative metabolism and bactericidal activities of human neutrophils, Aloe Vera & aids research, anti diabetic activity of aloes: preliminary, aloe reduction in ulcers, erosions & hemorrhages, extraction process, processing steps, extraction process of aloe gel and powder etc.

This book highlights such technical details to guide and encourage new entrepreneurs. It is very useful book for consultants, farmers, students of Agricultural universities, libraries etc.

**CULTIVATION, RESEARCH FINDINGS, PRODUCTS,
FORMULATIONS, EXTRACTION & PROCESSING**

1. Historical Developments

Antibacterial findings

Anti-inflammatory findings
Anaesthetic findings
Analgesic findings
Thermal burns
Anti-fungal findings
Immuno-stimulatory findings
Dysmenorrhea
Superoxide dismutases
2. Geographical Distributions
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Geographical origin
Morphology
3. Anatomy of Aloe Vera Leaves
Anatomy of leaf
Chemical investigations of different parts of the leaf
Aloe vera-var. *barbadensis*
Other Aloe species
4. Agro-Technique: Aloe Vera
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Propagation
Sowing
Irrigation
Diseases & their Control
Harvesting & Storage
Production & Yield
Market Price
Economics of Cultivation per Hectore
Aloe India : *Aleo Barbadensis*
Aloe Littoralis
Aloe Perryi
5. Aloe (Aloe Vera) Investment Opportunity
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Uniqueness
Cultivation
Type & Extent
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Yield
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Process for Aloe Gel
Process Conditions:
Strategy for Process Control
Advantages of wholeleaf cold process
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Global Scenario
International Aleo Science Council
Estimated global market for Aloe Vera Gel:
Speciality, cosmetics and toiletry market
Speciality raw material market for cosmetics/toileteries

Japanese Scenario

Scenario

Important Overseas Players

Forever living

Santrel international

Selected Indian Players

Emami

Siri Agritech

Driving Factor For Demand

Indian Skin Cream Market

Driving Factor for Capacity Creation:

Strategy for Capacity Creation and Marketing

6. Research Findings

Aloe vera and the inflamed synovial pouch model

Isolation of a stimulatory system in an Aloe extract

Aloe vera as a biologically active vehicle for hydrocortisone acetate.

The stimulation of postdermabrasion wound healing with stabilized aloe vera gel-polyethylene oxide dressing

Aloe-emodin effects on arylamine N-acetyltransferase activity in the bacterium *Helicobacter pylori*.

Influence of aloe vera on the healing of dermal wounds in diabetic rats.

Influence of Aloe vera on the glycosaminoglycans in the matrix of healing dermal wounds in rats.

Immunochemical distinction of Aloe vera, *A. arborescens*, and *A. chinensis* gels.

Aloe barbadensis extracts reduce the production of interleukin-10 after exposure to ultraviolet radiation.

Influence of Aloe vera on collagen characteristics in healing dermal wounds in rats.

Influence of Aloe vera on collagen turnover in healing of dermal wounds in rats.

Studies of aloe. VI. Cathartic effect of isobarbaloin.

[The action of an aqueous extract of Aloe barbadensis Miller in an in-vitro culture of *Trichomonas vaginalis*].

Biotherapy with the pineal immunomodulating hormone melatonin versus melatonin plus aloe vera in untreatable advanced solid neoplasms.

Nitro chemopreventive effects of plant polysaccharides (*Aloe barbadensis* Miller, *Lentinus edodes*, *Ganoderma lucidum* and *Coriolus versicolor*).

The therapeutic potential of Aloe Vera in tumor-bearing rats.

In vitro angiogenic activity of Aloe vera gel on calf pulmonary artery endothelial (CPAE) cells

Isolation of cDNA for an NADP-malic enzyme from *Aloe arborescens*

Prevention of ultraviolet radiation-induced suppression of accessory cell function of

Langerhans cells by Aloe vera gel components

Beneficial effect of Aloe on wound healing in an

excisional wound model.

Acceleration of the alcohol oxidation rate in rats with aloin, a quinone derivative of Aloe.

Activation of a mouse macrophage cell line by acemannan: the major carbohydrate fraction from Aloe vera gel.

Isolation of a cDNA for a phosphoenolpyruvate carboxylase from a monocot CAM-plant, Aloe arborescens: structure and its gene expression.

A purgative action of barbaloin is induced by Eubacterium sp. strain BAR, a human intestinal anaerobe, capable of transforming barbaloin to aloe-emodin anthrone.

Studies of aloe. V. Mechanism of cathartic effect.

Studies of aloe. IV. Mechanism of cathartic effect.

Prevention of ultraviolet radiation-induced suppression of contact and delayed hypersensitivity by Aloe barbadensis gel extract.

Rhein and aloe-emodin kinetics from senna laxatives in man.

Pharmacokinetic and metabolic studies with ¹⁴C-aloe emodin after oral administration to male and female rats.

Some pharmacological actions of aloe extracts and Cassia abbreviata on rats and mice.

Effects of low molecular constituents from Aloe vera gel on oxidative metabolism and cytotoxic and bactericidal activities of human neutrophils

Studies of aloe. III. Mechanism of cathartic effect.

An anti-complementary polysaccharide with immunological adjuvant activity from the leaf parenchyma gel of Aloe vera.

[Effects of aloe extracts, aloctin A, on gastric secretion and on experimental gastric lesions in rats].

Effect of water extracts of aloe and some herbs in decreasing blood ethanol concentration in rats.

Aloe vera

Comparative evaluation of aloe vera in the management of burn wounds in guinea pigs.

The glucomannan system from Aloe vahombe (liliaceae).

The Aloe vera phenomenon: a review of the properties and modern uses of the leaf parenchyma gel

7. Clinical Trails

Heart Disease

Prevention of Atheromatous Heart Disease

Lowered Blood Pressure

Immunological Benefits : Cancer, Tumours, HIV & AIDS

A Study of 29 AIDS Patients

Cancer Research

Aloe Vera & AIDS Research

Aloe vera may mimic azt without toxicity
Antimetastatic Properties of Aloe Juice
Aloemannan, Significant Antitumor Efficacy
Antimutagen of Aloe plants
Diabetes
Aloe vera & gibberellin, anti-inflammatory activity in diabetes
Normalized Blood Glucose Level
Antidiabetic activity of Aloes: preliminary clinical & experimental observations
Aloe vera-anti-edemic & analgesic activity in diabetes
Gastrointestinal Disorders
Colitis & Crohn's Disease
Research - Gastric Ulcers
Research - Ulcers, Stress Related
A double-blind trial of a celandin, Aloe Vera & psyllium laxative preparation in adult patients with constipation
Studies of Aloe III. Mechanism of Cathartic Effect
Aloe Vera to treat gastrointestinal Problems
Research - Duodenal Ulcers
Aloe Reduction In Ulcers, Erosions & Hemorrhages in the Stomach
Radiation, Burns & Frostbite
Aloe vera gel hindered wound healing of experimental second-degree burns: a quantitative controlled study.
Experimental & clinical observations on frostbite
Alvigel as a therapeutic agent in the treating of radiation burns
Beneficial effects of aloe in wound healing
The external use of Aloes
Treatment of experimental frostbite with pentoxifylline & Aloe vera cream
Psoriasis
Management of psoriasis with Aloe vera extract in a hydrophilic cream: a placebo-controlled, double-blind study.
Skin Disorders/Inflammation
Anti-inflammatory activity of Aloe vera against a spectrum of irritants
Wound healing. Oral and topical activity of Aloe vera.
Processed Aloe vera administered and topically inhibits inflammation
Uses of Aloe in treating leg ulcers & dermatosis
Anti-inflammatory and wound healing activity of a growth substance in Aloe vera.
Anti-inflammatory & wound healing properties of Aloe vera
Effects of topical medications on the healing of open pad wounds in dogs
Antiinflammatory activity of extracts from Aloe vera gel.
Skin Disorders Virus: Bacteria, Fungi & Parasites
Dental Disorders
Aloe Vera Gel Toothpaste
Aloe in Dentistry

Why Aloe may work

Use of Whole-Leaf Aloe

8. Patent

U.S. Patent 6, 027, 728 (2000)

Herbal Skin regeneration and method

A method for skin regeneration comprising

Description

Background of the Invention

Summary of the Invention

Detailed Description of the Invention

U.S. Pat. 6, 030, 622

Herbal Extract composition and method

(2000) with immune boosting capability

Background of the Invention

Field of the Invention

Description of the Background Art

Summary of the Invention

Detailed Description of the Preferred Embodiments

Extract Preparation

Preparation of Extract of ARUM ALOE

Preparation of Extract of POMEGRANATE.

Preparation of Extract of TEA.

Preparation of Extract of HIBISCUS.

Preparation of Combined Extracts of ARUM and POMEGRANATE

Preparation of Combined Extracts of ARUM, POMEGRANATE, TEA and HIBISCUS

In Vitro Blast Transformation of Lymphocytes

From Normal Patients

In Vitro Blastogenesis of Peripheral Blood Lymphocytes from Patients With Renal Failure

Stimulation of Cytokine Production in

Normal Persons

In Vitro Inhibition of gp 120 Binding to MT-4 Cells Measured with OKT4A Monoclonal Antibody.

In Vitro Inhibition of gp 120 Binding to MT-4 Cells Measured with Anti-gp 120 Monoclonal Antibody.

Chemical Analysis of Combined Extracts

Aloe vera gel toothpaste

United States Patent 5, 294, 434 March 15, 1994

Summary of Invention

Detailed Description

United States Patent 5,989,560

November 23, 1999

Herbal intestinal tract cleanser

Field of the Invention

Background of the Invention

Summary of the Invention

Detailed Description of the Preferred Embodiments

Aloe vera ointment

United States Patent 4,725,438 February 16, 1988

Field of the Invention

Background of the Invention

Summary of the Invention

Objects of the Invention

Description of the Preferred Embodiment

Summary of the Achievements of the Objects

of the Invention
United States Patent 5,288,492 February 22, 1994
Decongestant composition containing aloe vera
Background of the Invention
Field of the Invention
Description of the Prior Art
Summary of the Invention
Detailed Description of the Invention
United States Patent: 6,004,558
Technical Field
Background of the Invention
Summary of the Invention
Detailed Description of the Invention
Separation of primary isoflavones using
chromatographic techniques
Method for extraction and removal of genistein,
daidzein, formononetin and biochanin
Anti-cancer activity of isoflavone free cell extracts
Treatment of a sixty two year old male diagnosed
with prostate cancer
Herbal Remedies
Summary of the Invention
Brief Description of the Drawings
Detailed Description of a Preferred Embodiment
Herbs and Preparation of Formulations
Patient Selection
Herbal Preparation and Dosage
Results of the Study
Effect of Discontinuing Usage of the Present Invention
Conclusion
United States Patent 5,904,924 May 18, 1999
Green nutritional powder composition
Summary of the Invention
Detailed Description of the Present Invention
U.. Pat. 5,876,728 (1999)
National Composition extracted from Plants
used in the treatment of Cancer
Background of the Invention
Objectives of the Invention
Summary of the Invention
Detailed Description of the Invention
Test Substances
Cell Culture
Cytotoxicity Assay
Fresh Tumor Specimens
Turmeric & Aloe Vera for treating health ailments
Summary of the Invention
U.S. Pat. 4591, 387 (1986)
Aloe Vera Leaf Processor
Brief Description of the Invention
Detailed Description of the Invention
U.S. Pat. 5, 215, 760 (1993)
Detailed Description of the Preferred Embodiments

U.S. Pat 4,309,180 (1983)
Cosmetic facial preparation containing aloe vera
Detailed Description of the Preferred Embodiment
U.S. Pat. 6,013, 259 (2000)
Aloe Vera Ophthalmic Solution
Background of the Invention
Brief Summary of the Invention
Detailed Description of the Invention
Allantoin
Extract of Lavender
Topical Compositions
Pharmaceutical/Cosmetic Compositions
Cleaning Compositions
Weighing
Washing
Filtration
Grinding
Homogenization
pH Adjustment
Selective Precipitation
Centrifugation
Weighing/Storage
Tray loading
Drying
Milling
Blending
Storage and Exportation
Moderate or Medium Filtration
(Filtration Using A Medium Filter)
Fine Filtration (Filtration Using A Fine Filter)
Ultrafiltration/Concentration
Ultracentrifugation
Low Speed Centrifugation
Dialysis
Anion Exchange Chromatography
Size Exclusion Chromatography
Step-Wise Filtration
Preparation of Bulk Pharmaceutical
Mannan (α-BPM)
Pilot Scale Sizing of Bulk Pharmaceutical
Mannans by Ultra-filtration
Purification and Depyrogenation of FBA using
Chromatography with subsequent Molecular
Sizing (DFBA)
Anti Viral Effects of Different Factors Obtained by
Chromatographic Separation of FBA
Cells and Culture media:
Reagents and Preparation:
Protocol of Mouse Pulmonary Inflammation
Model
Myeloperoxidase (MPO) Assessment of Lavage
Fluid and Tissues
Lavage Fluid

Tissue MPO Assessment
MPO Reaction
Mouse Croton Oil Ear Inflammation Model
Protocol for Cytokine Analysis from Macrophages
Mouse TNF- α . Assay In Biological Fluids
Centrifugation of Suspension of Results Obtained
from Bioassays used to Evaluate Different Factors
Results from Factors using Methods as Described
IL-6 Production:
IL- 1 α . Productions:
Microparticulate Factor From FBA and No Production
Macrophage Activation and Anti-inflammatory
Activities
Epithelial Cells (α EC α) Proliferation
IL-6 Assay
RAW Cells Secreted Interleukin-6 in Response
to FBA
 α MF α Stimulated IL-6 Production
Anti-Inflammatory Activities of α Soluble Factors α
Filtration with 0.1 μ m Filters of α Microparticle
Factors α
Factors of FBA Sized Filtration through Syringe
Filters of Various Pore Sizes
Carbohydrate Content in the Filtrate
Factors Sized and Isolated by 5 μ m Filtration
and No Assay
Topical Anti-Inflammatory Activity of Freeze-
Dried Aloe Vera Extract and FBA
Other Related Applications
Summary of the Present Invention
9. Herbal Formulations
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Administration
Uses and indications
Sufuf Dama
Hab Hilitit
Hab Soranjan
Hab Shabyar
Halwa-i-ghaikwar
Qurs Tankar
Kuhl-ul-jawahar
Kuhl Roshania
Kushta Abrak Safaid
Kushta Busud
Kushta Khubs-ul-hadid
Kushta Khar Mohra
Kushta Tila Kalan
Kushta Faulad
Kushta Gaodanti
Kushta Nuqra
Majun Talkh
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Yield
Cultivation Practices
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Land Preparation
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Planting
Manuring
Irrigation
Weeding
Diseases and Management
Harvesting the Yield
11. Extraction Process
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Timing of Leaf Harvest
Leaf Harvesting and Handling
General process outline for Herbal extract
Cleaning and size reduction:
Solvent extraction:
Solvent recovery
Spray dried extract
Soft extract
Phytochemicals:
Effluent treatment:
Aloe Vera Gel Process
Highlights
Guidelines for production
Process outline
Process conditions:
Advantages of wholeleaf cold process
Strategy for process control
Patent details
Extraction Process
Processing Steps
Extraction process of Aloe Gel and Powder
12. Patents and Know-how
Description
Background of the Invention
Brief Summary of the Invention
Detailed Description of the Invention
Preparation of the Aloe Vera gel eye drops:
Summary of the Invention
Objects of the Invention

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