Aloe Vera Handbook Cultivation, Research Finding, Products, Formulations, Extraction & Processing
<table>
<thead>
<tr>
<th>Code:</th>
<th>ENI122</th>
</tr>
</thead>
<tbody>
<tr>
<td>Format:</td>
<td>Paperback</td>
</tr>
<tr>
<td>Indian Price:</td>
<td>1275</td>
</tr>
<tr>
<td>US Price:</td>
<td>125</td>
</tr>
<tr>
<td>Pages:</td>
<td>496</td>
</tr>
<tr>
<td>ISBN:</td>
<td>8178330245</td>
</tr>
<tr>
<td>Publisher:</td>
<td>Pacific Business Press Inc.</td>
</tr>
<tr>
<td></td>
<td>Asia</td>
</tr>
</tbody>
</table>
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 soothe 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 hectar, 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.

Content:
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
   Distribution
   Nomenclature:
   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
   Preparation of Land
   Propagation
   Sowing
   Irrigation
   Diseases & their Control
   Harvesting & Storage
   Production & Yield
   Market Price
   Economics of Cultivation per Hector
   Aloe India : Aloe Barbadensis
   Aloe Littoralis
   Aloe Perryi

5. Aloe (Aloe Vera) Investment Opportunity
   Family Liliaceae
   Common Names
   Botanical Trait
   Uniqueness
   Cultivation
   Type & Extent
   Propagation
   Harvest
   Yield
Applications
Variety of Products
Process for Aloe Gel
Process Conditions:
Strategy for Process Control
Advantages of wholeleaf cold process
Price
Global Scenario
International Aleo Science Council
Estimated global market for Aloe Vera Gel:
Speciality, cosmetics and toiletery market
Speciality raw material market for cosmetics/toileteries
Japanese Scenario
Scenario
Important Overseas Players
Forever living
Santrel international
Selected Indian Players
Emami
Siri Agrotech
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 inimunomodulating 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 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 Trials
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 - Doudenal 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
Alvagel 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
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
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 or 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
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. Pal 4,309,180 (1983)
Cosmetic facial preparation containing aloe vera
Detailed Description of the Preferred Embodiment
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

Filleting

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 (â€œBPMâ€)

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-1α Productions:
Microparticulate Factor From FBA and No Production
Macrophage Activation and Anti-inflammatory Activities
Epitheleal Cells (EC) Proliferation
IL-6 Assay
RAW Cells Secreted Interleukin-6 in Response to FBA
αcoeMF Stimulated IL-6 Production
Anti-Inflammatory Activities of Soluble Factors
Filtration with 0.1 μm Filters of Microparticle Factors
Factors of FBA Sized Filtration through Syringe Filters of Various Pore Sizes
Carbohydrate Content in the Filtrate
Factors Sized and Isolated by 5 μm 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
Baslikun Kabir
Preparation
Administration
Uses and indications
Sufuf Dama
Hab Hiltit
Hab Soranjan
Hab Shabyar
Halwa-i-ghaikwar
Qurs Tankar
Kuhl-ul-jawahar
10. Cultivation Practices

General details
Origin and distribution
Propagation
Harvest
Yield
Cultivation Practices
Soil
Climate
Land Preparation
Propagation
Planting
Manuring
Irrigation
Weeding
Diseases and Management
Harvesting the Yield

11. Extraction Process

Organ used for manufacture
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

Sample Chapter:
Clinical Trails

HEART DISEASE

Prevention of Atheromatous Heart Disease

Five thousand patients of atheromatous heart disease, presented as angina pectoris, were studied over a period of five years. After adding the "Husk of Isabgol" and Aloe vera (an indigenous plant known as ghee-guar-ka-patha) to the diet, a marked reduction in total serum cholesterol, serum triglycerides, fasting and post prandial blood sugar level in diabetic patients, total lipids and also increase in HDL were noted. Simultaneously the clinical profile of these patients showed reduction in the frequency of anginal attacks and gradually, the drugs, like verapamil, nifedipine, beta-blockers and nitrates were tapered. The patients, who most benefited, were diabetics (without adding any antidiabetic drug). The exact mechanism of the action of the above two substances is not known, but it appears that probably they act by their high fibre contents. Both these substances need further evaluation. The most interesting aspect of the study was that no known side effect was noted and all the five thousand patients are surviving till date. Patients are being followed up for five years and no Indian plant has ever been tried with such success. So this is a unique study of its own type.

To conclude, the Indian plant Aloe vera, when mixed with the Husk of Isabgol, was given to the patients of atherosclerotic heart disease, there was a definite and substantial improvement (about 95%) in their clinical profile apart from bio-chemical changes and ECG tracings.

Lowered Blood Pressure

Dr. Collier and his group at Medical Institute, England testified Aloe promoted prostaglandin's biosynthesis, causing peripheral veins to expand so that blood pressure can get lowered. Dr. Afzal and his Arabian group confirmed the above phenomenon using Aloe vera.

Immunological Benefits: Cancer, Tumours, HIV & AIDS

A Study of 29 AIDS Patients

Patients took 1200 mg of the active ingredient in Aloe vera juice daily as well as nutrient supplements. We quote directly from Dr. Pulse's report of the results, which are fantastic: "No adverse effects attributable to the essential fatty acid capsules were observed nor any side effects of the nutritional supplementation powder nor of the Aloe vera juice. Most patients who were symptomatic reported that within three to five days their energy levels improved, fever disappeared, night sweats stopped, cough decreased or stopped altogether, shortness of breath decreased, lymph nodes decreased in size, diarrhea stopped, strength improved and the only measurable side effect of this particular study was weight gain, which is a desirable effect. There were no biochemical abnormalities noted on MAC in this particular study. AZT induced anemia improved on this particular regimen. Chest x-rays remained normal throughout the study. No changes in EKG from baseline were observed. There was great improvement in all patients to hypersensitivity skin testing at the end of 90 days... Not only did the patients improve clinically and functionally, but their Karnofsky scores improved in 93.1% of the patients at 90 days and in 100% at 180 days. 5 1.7% of the patient's T4 helper lymphocytes increased at 90 days and 32.2% at 180 days, with 25% reactive HIV P24 core antigen converted to negative at 90 days and 180 days."

In essence, a substantial number of patient's physical condition improved. Energy levels improved, fever disappeared, night sweats stopped, cough decreased or stopped, shortness of breath decreased, lymph nodes decreased in size, diarrhea stopped, weakness improved. Hypersensitivity skin testing improved. In 96.4% of the test patients, their Modified Walter Reed Scores had improved at 180 days. Karnofsky scores improved in 93.1%. T4 lymphocytes increased in some patients and, in some, their reactive HIV P24 antigen converted to negative.
Cancer Research
Research by the immunologist Ian Tizard, Ph.D. and virologist Maurice Kemp, Ph.D. from Texas A&M led to the discovery that Aloe mucopolysaccharide is taken into a special leukocyte, the macrophage, and this cell is stimulated to release messenger molecules called cytokines (interferons, interleukines, prostaglandins, tumor necrosis factor and stem-cell growth factors.) Tumors release a chemical that attracts blood circulation so that malignant cells have a supply to the tumor and it therefore dies. All of the immune modulating effects from Aloe contribute greatly to the prevention and healing of malignant cells.

Aloe Vera & AIDS Research
Various AIDS studies were completed by researchers and others throughout the 1980's using oral mucopolysaccharides. The results were impressive, demonstrating in many of the studies an average of 70% improvement in symptoms and laboratory criteria within 3 to 4 months. Many patients stated that opportunistic infections had stopped and they were able to return to normal activity. In one dramatic case, a man with advanced AIDS had 17 liver tumors and after one and a half years on oral Aloe mucopolysaccharides, his T-Cell count was normal and all the tumors had dissolved (confirmed by x-ray films).

Lab studies showed that helper lymphocytes (CD4) rose to three times the pre-treatment levels. HIV-1 virus could no longer be cultured. P-24 antigen levels for the virus dropped or became negative.

Researchers at Vanderbilt Medical Center in Nashville, Tennessee discovered that Aloe mucopolysaccharides alters synthesis and thus the structure of the AIDS virus envelope necessary for infecting lymphocytes. Further studies at the Southern Research Institute found that there is suppression of the viral messenger RNA in HIV-l infected leukocytes. Therefore, the reproduction of HIV-1 is inhibited with a natural and non-toxic substance.

In studies completed at the Fort Worth Medical Center Complex it was demonstrated that a person's leukocytes were rendered resistant to HIV-l virus in culture tests outside the body.

Aloe vera may mimic azt without toxicity
A preliminary study suggests that the Aloe vera may mimic AZT without toxicity. A substance in Aloe vera show signs of boosting the immune systems of AIDS patients and blocking the human immune-deficiency virus spread without the toxic side effects.

Antimetastatic Properties of Aloe Juice
An evaluation of antimetastatic properties of succus Aloes was carried out using three types of experimental tumors of mice and rats. It was found that succus Aloes treatment contributes to reduction of tumor mass, metastatic foci and metastasis frequency at different stages of tumor progress without affecting major tumor growth. Succus Aloes potentiates the anti-tumor effect of 5-fluorouracil and cyclophosphamide as components of combination chemotherapy.

Aloemannan, Significant Antitumor Efficacy
While conducting a series of animal experiments using aloemannan a mucopolysaccharide of Aloe arborescens, detected aloemannan a significant antitumor efficacy. Unlike usual anticancer drugs killing cancer cells directly, it acts as a stimulus for the body’s defense mechanism, or immunity to suppress tumor. In other words, it prohibits multiplication of cancer cells while it is coexistent with them. Prof. Winters and his group of the Health Science Center at the University of Texas verified their test-tube experiments using human cervical cancer cells that Aloe vera extract prohibits the growth of cancer cells.

Antimutagen of Aloe plants
An antimutagen from Aloe Arborescens Mill was isolated and identified. Methanol exts. from dried leaves of A. arborescens inhibited frameshift mutation induced by 3-amino-1-methyl-5H-pyrido [4, 3b] indole in Salmonella typhimurium TA98. The antimutagen isolated from the methanol exts. was identified as the anthraquinone Aloe-emodin. Aloe-emodin inhibited frameshift mutation by 60.3% at 0.1 mM/plate and
86.3% at 1.0 mM/plate whereas barbaloin, monoglucoside of Aloe-emodin, did not. Fresh A. aborescens leaves contained 1.17 ug/g (wet wt.) of Aloe-emodin. Aloe-emodin was also detected in A. ferox, A. vera, A. eru, and A. compacta by HPLC. These Aloe species may have substances that are useful for prevention of some forms of cancer.

DIABETES
Aloe vera & gibberellin, anti-inflammatory activity in diabetes
Aloe vera inhibits inflammation and adjuvant-induced arthritis. The authors' laboratory has shown that A. vera improves wound healing, which suggests that it does not act like an adrenal steroid. Diabetic animals were used in this study because of their poor wound healing and anti-inflammatory capabilities. The anti-inflammatory activity of A. vera and gibberellin was measured in streptozotocin-induced diabetic mice by measuring the inhibition of polymorphonuclear leukocyte infiltration into a site of gelatin-induced inflammation over a dose range of 2 to 100 mg/kg. Both Aloe and gibberellin similarly inhibited inflammation in a dose-response manner. These data tend to suggest that gibberellin or a gibberellin-like substance is an active anti-inflammatory component in A. vera.

Normalized Blood Glucose Level
A study was conducted of the use of Aloe vera as a possible agent in the reduction of blood glucose in obese middle-aged diabetics. Blood samples were taken from the subjects, both NIDDM (non-insulin-dependent-diabetes-mellitus) and IDDM (insulin-dependent-diabetes mellitus), and injected into laboratory mice whose blood glucose skyrocketed shortly thereafter. After treatment with Aloe vera injections, the blood glucose level of all test groups of rats had completely normalized within eight to twelve hours.

Antidiabetic activity of Aloes: preliminary clinical & experimental observations
The dried sap of the Aloe plant (aloes) is one of several traditional remedies used for diabetes in the Arabian peninsula. Its ability to lower the blood glucose was studied in 5 patients with non-insulin-dependent diabetes and in Swiss albino mice made diabetic using alloxan. During the ingestion of aloes, half a teaspoonful daily for 4-14 weeks, the fasting serum glucose level fell in every patient from a mean of 273 +/-25 (SE) to 151 +/- 23 mg/dl (p less than 0.05) with no change in body weight. In normal mice, both glibenclamide (10 mg/kg twice daily) and aloes (500 mg/kg twice daily) induced hypoglycaemia after 5 days, 71 +/- 6.2 and 91 +/- 7.6 mg/dl, respectively, versus 130 +/- 7 mg/dl in control animals (p less than 0.01); only glibenclamide was effective after 3 days. In the diabetic mice, fasting plasma glucose was significantly reduced by glibenclamide and aloes after 3 days. Thereafter only aloes was effective and by day 7 the plasma glucose was 394 +/- 22.0 versus 646 +/- 35.9 mg/dl in the controls and 726 +/- 30.9 mg/dl in the glibenclamide treated group (p less than 0.01). We conclude that aloes contains a hypoglycaemic agent which lowers the blood glucose by as yet unknown mechanisms.

Aloe vera-anti-edemic & analgesic activity in diabetes
A study by the Davis, Leitner group established a criteria to test Aloe vera as an anti-edemic, analgesic and would healing agent against opportunistic infections in the presence of diabetes, and to prove that Aloe vera works effectively even in "an abnormal physiological state."

In this study, mice were divided into five groups. One control group of non-diabetic mice, and one control and three test groups of mice subjected to a diabetes induction agent (streptozoticin in this case), and given time for the diabetes to set in place. After 48 hours lapsed time, wounds were induced on all groups. Afterward, the control group was administered no Aloe vera while the two test groups were administered decolorized Aloe vera in varying and incrementally higher dosages - 1 milligram per kilogram, 10 mg/kg and 100 mg/kg. Then the five groups were tested at intervals of four and seven days to determine what effect, if any, the introduction of Aloe vera had on pain, edema, and the treatment of wounds. Not only did increased doses of Aloe vera help accelerate healing and aid in the rapid healing of the
wounds. The percentage of wound reduction increased in direct proportion to the amount of Aloe vera administered during treatment. On day four, no significant difference in healing was noticed in the non-diabetic group and the control group of mice (about 18% versus 20%, allowing for a margin of error factor of 3). But by day 7, the wound healing in the normal group had increased to 30 versus only 28% in the untreated diabetic mice.

Test groups given the dosages of Aloe vera showed increased wound healing abilities on both day 4 and day 7. By day 4, the Aloe test groups had shown wound healing ranging from 32% (for the 1 mg/kg group) to 43% for the 100 mg/kg group. On day seven the average level of healing had increased to 43% for the 1mg/kg group all the way to 56.6% for the 100 mg/kg group. That marked a jump of nearly 30 percentage points for the test group of diabetic mice treated with large doses of Aloe vera.

When the mice were tested for analgesic effects and blood edema tests, the Aloe vera test groups showed equally dramatic positive results in exhibiting lessened inflammation and improved pain response.

In a follow-up study, Aloe vera was measured again for its anti-inflammatory activity in diabetes. This time, it was tested in combination with gibberellin. Gibberellin is a naturally occurring glycoside and growth hormone found in plants, including the complex chemistry of the Aloe plant. Again the diabetes was adjuvant induced with the diabetic agent, streptozotecin, on adult male mice in control and test groups. In fact when tested individually and in context with the Aloe over the properly apportioned number of days, the gibberellin did show almost identical anti-inflammatory results. So the evidence, in this test, seemed to point to the fact that the glycoside, gibberellin, might indeed hold the key to the healing plant's anti-inflammatory powers.

GASTROINTESTINAL DISORDERS

Colitis & Crohn's Disease
In 1986 there was an initial sanctioned clinical pilot study for treating ulcerative colitis and Crohn's disease with Aloe mucopolysaccharides, with very encouraging results. A six center clinical study was conducted with Vanderbilt Medical Center Gastroenterology Department. The results were encouraging enough to continue with a second phase.

Research - Gastric Ulcers
Fujita health Institute, Japan, 1992: Physician and research scientist, leads a research team in testing the effects of Aloe vera in the treatment of gastric ulcers. In a study conducted on twelve laboratory rats with experimentally induced gastric ulcers, the Fujita research teams finds that the rats treated with large oral doses of Aloe show marked improvement over the control group of untreated rats.

Research - Ulcers, Stress Related
Dr. Richard tested the effects of stress on various functions of the body, and to corroborate the oft-supported hypothesis that stress has traditionally been the primary cause of ulcer formation, this "stress test" involved two groups of 15 rats each. The test group was fed specified doses of Aloe vera daily, utilizing this as the sole liquid constituent for its diet. The control group was fed water as the sole liquid constituent of its diet. All the rats from each group, the test group and the control group were then placed in cages which could only be defined as maximum confinement spaces, where there was room only for movement of their heads and rear ends. The rats were then left in the cages for three weeks and during that time fed liquid diets for both water and Aloe vera in comparable volumes. After the three week period, the stomachs of each individual rat in the test groups were examined. In each instance, it was found that the stomachs of the test group (fed large quantities of Aloe vera its exclusive liquid constituent) had 85% less ulcers than the group that consumed water alone. Considering the fact, stress ordinarily affects these kinds of creatures in ways that give the same degree of high responses to stress no matter what has been fed them, these findings are nothing less than astounding. Additionally,
researchers & reported that the Aloe drinking gel exhibited some considerable capacity to penetrate skin tissue and alleviate pain and discomfort around bones and joints.

A double-blind trial of a celandin, Aloe Vera & psyllium laxative preparation in adult patients with constipation

The aim of this study was to evaluate the effect of a novel laxative preparation, composed of celandin, Aloe vera and psyllium in patients with chronic constipation. Thirty-five men and women were randomized to receive capsules containing celandin-Aloe vera-psyllium, or placebo, in a double-blind trial lasting 28 days. Symptoms in the last 2 weeks of the treatment period were compared to those in the 14-day pre-trial basal period. In the celandin, Aloe vera and psyllium group, bowel movements became more frequent, the stools were softer and laxative dependence was reduced. In the placebo group, all these parameters were unchanged. Abdominal pain was not reduced in either group. The results of this study show that the preparation is an effective laxative in the treatment of constipation.

Studies of Aloe III. Mechanism of Cathartic Effect

The mechanism of action of Aloe-emodin-9-anthrone a decomposition product of barbaloin, in causing a significant increase in the water content of the rat large intestine, was investigated. Aloe-emodin-9-anthrone inhibited rat colonic Na+, K(+) -adenosine triphosphatase (ATPase) in vitro, and increased the paracellular permeability across the rat colonic mucosa in vivo. Therefore, it seemed that the increase in water content of the rate large intestine produced by Aloe-emodin-9-anthrone was due to both inhibition of absorption and stimulation of secretion without stimulation of peristalsis. Furthermore, pretreatment with loperamide, an antidiarrheal agent, completely prevented the increase of paracellular permeability induced by Aloe-emodin-9-anthrone but did not completely reduce the concomitant increase in residual fluid volume. These findings suggest that Aloe-emodin-9-anthrone has multiple mechanisms of action involved in the increase of water content in the rate large intestine.

Aloe Vera to treat gastrointesinal Problems

Jeffrey Bland, formerly of the Linus Pauling Institute, reported using a concentrate of Aloe vera to treat gastro-intestinal problems. The objectives of Dr. Bland's study were "to evaluate the effect of oral Aloe vera juice supplementation of gastric pH, stool specific gravity, protein digestion/absorption, and stool microbiology" and found that it could be used in "the treatment of inflammatory bowel disorders."

In his patient application studies of ten healthy subjects (five women and five men), Dr. Bland first found that the Aloe vera juice provided caused his subjects no covert or overt adverse effects and was in general "well tolerated" by all ten people in the study group. In his study of five women and five men, Dr. Bland was careful to note that: "...with the taking of two-ounce increments [of the Aloe vera juice] three times daily for seven days no patient among the... (five men, five women) complained of diarrhea... four of the subjects reported improved bowel regularity with greater gastrointestinal comfort after eating... three indicated an enhancement of energy and a greater sense of well being..."

Additionally, he reported that: "The function of Aloe vera juice in promoting proper gastrointestinal function based upon the information from this preliminary study may be to regulate gastrointestinal pH while improving gastrointestinal motility, increasing stool specific gravity and reducing the populations of certain fecal micro-organisms, including yeast [Candida albicans]. This could have significant advantages to some individuals by promoting proper dietary protein digestion and absorption and reducing bowel putrefactive processes in the colon.".

Research - Doudenal Ulcers

A study on human subjects was done an Aloe vera emulsion was made, consisting of 1/2 Aloe gel and 1/2 Petrolatum (a petroleum based ointment used primarily as a carrying medium). Twelve patients - 5 women and 7 men - were knowing participants and were all introduced into the study because X-ray examinations had predetermined them as qualificants: At the commencement of the study, each of the twelve subjects
had exhibited varying degrees of duodenal ulcers. During the course of the test, each were treated with 1 tablespoon of the Aloe/petrolatum emulsion four times a day. All patients showed complete healing of their ulcers. And none experienced any recurrence of his or her ulcers within a year of completion of treatment. Later, another second study on six patients (4 women and 2 men, all with duodenitis), was conducted, again using the same Aloe emulsion. Once more, evaluations showed similar positive results: Five of the six subjects tested showed complete recovery. The only test failure, it was noted, turned out to be a non-compliant subject who subsequently had to be dropped from the sample. They summarized their findings in the following manner: "There can be little doubt that the properties attributed to Aloe vera gel should be therapeutically used in the management of peptic ulcers. Numerous patients, completely recovered from an acute peptic ulcer episode, are now on 'preventive treatment.'"

The "preventive treatment" referred to by the Blitz-Smith research group entailed a post recovery follow-up dosage of 1 tablespoon of the Aloe emulsion a day was used, and seemed to prevent any recurrence of the duodenitis for eighteen months, or as long as rechecks of the sample were conducted. They also concluded from the study that: "Whether or not these properties occasion correction of the ulcer producing process, it is unmistakable that Aloe vera gel, through whatever mechanism is very beneficial in the treatment of this very important disease. In all instances of the study, there were no reportings of side-effects or contraindications from the Aloe."

Aloe Reduction In Ulcers, Erosions & Hemorrhages In the Stomach

Egyptian research scientist reported a set of test ratios involving four groups of albino rats. By every measure of testing, if an albino rat is immobilized in a restrained environment for a period of 24 hours or more, the frustration of that immobilization causes erosions and even hemorrhages in the stomach. Four groups were divided into test groups, each using different modalities of treatment starting twelve hours before restraint. The findings of the test, after the cycle was completed are worth noting.

Control Group

Test/Model Animals

<table>
<thead>
<tr>
<th>Group</th>
<th>Model</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Preventive</td>
<td>Animals were given 4 milliliters of Aloe by mouth every four hours x 3 doses, starting 12 hours before restraint (immobilization).</td>
</tr>
<tr>
<td>2</td>
<td>Preventive</td>
<td>Control animals for Group 1 which were given 0.9% of saline solution in a manner similar to Group 1.</td>
</tr>
<tr>
<td>3</td>
<td>Curative</td>
<td>Animals were given 4 milliliters of Aloe by mouth every 12 hours x 6 days starting the 14th day.</td>
</tr>
<tr>
<td>4</td>
<td>Curative</td>
<td>Control animals for Group 3 which were given 0.9% saline solution in a manner similar to Test Group 3.</td>
</tr>
</tbody>
</table>

The data on the four group study was remarkable in that it showed overwhelmingly the positive benefits...
Aloe vera offered in the animal condition. Of the four groups tested, the group using Aloe vera after restraint showed a nearly 3-to-1 faster healing ratio than the placebo. And the pre-post Aloe treated group showed better than a 4-to-1 healing ratio over the placebo group.

In similar studies over a longer test period using aspirin were used. This time, the study took an even more long term preventive tone in that the animals in the test group received the Aloe vera gel for seven days prior to restrain and, in the curative stage, were given Aloe vera gel for seven days after the restraint. This set of findings was even more dramatic in that the animals treated with Aloe prior to severe restraint showed a convincing 85% reduction in erosive ulcerations compared with the control group of animals given a (saline solution) placebo. Animals introduced to the Aloe regimen after restraint demonstrated a 50% increase in the rate of healing over that of the healing rate demonstrated in the animals given the placebo.

**Radiation, Burns & Frostbite**

Effect of aloe vera gel to healing of burn wound a clinical and histologic study.

In a study of twenty-seven patients with partial thickness burn wound, they were treated with aloe vera gel compared with vaseline gauze. It revealed the aloe vera gel treated lesion healed faster than the vaseline gauze area. The average time of healing in the aloe gel area was 11.89 days and 18.19 days for the vaseline gauze treated wound. Statistical analysis by using t-test and the value of P<0.002 was statistically significant. In histologic study, it showed early epithelialization in the treated aloe vera gel area. Only some minor adverse effects, such as discomfort and pain were encountered in the 27 cases. This study showed the effectiveness of aloe vera gel on a partial thickness burn wound, and it might be beneficial to do further trials on burn wounds.

**Phase III double-blind evaluation of an aloe vera gel as a prophylactic agent for radiation-induced skin toxicity.**

**PURPOSE:** Considerable pilot data and clinical, experience suggested that an aloe vera gel might help to prevent radiation therapy-induced dermatitis. METHODS AND MATERIALS: Two Phase III randomized trials were conducted. The first one was double blinded, utilized a placebo gel, and involved 194 women receiving breast or chest wall irradiation. The second trial randomized 108 such patients to aloe vera gel vs. no treatment. Skin dermatitis was scored weekly during both trials both by patients and by health care providers. RESULTS: Skin dermatitis scores were virtually identical on both treatment aims during both of the trials. The only toxicity from the gel was rare contact dermatitis. CONCLUSIONS: This dose and schedule of an aloe vera gel does not protect against radiation therapy-induced dermatitis.

Aloe vera gel hindered wound healing of experimental second-degree burns: a quantitative controlled study.

In the present study, Aloe vera gel (AVG) was applied to experimental second-degree burns in guinea pigs, and its effects on epithelialization, wound contraction, newly formed granulation tissue, and regeneration of hair follicles was compared with that effected by 1% silver sulfadiazine cream (AgSD). Epithelialization (%mean +/- SEM) on postburn day 8, 16, and 24 of the AVG-treated wounds was 38.72% +/- 2.71%, 60.34% +/- 3.28%, and 92.46% +/- 2.26%, respectively, while that of the AgSD-treated burns was 53.35% +/- 2.65%, 94.84% +/- 2.65%, and 100%, respectively (P less than .001). Contraction of the AVG-wounds was significantly higher than that of the AgSD-treated burns during 24 days of the study (P less than .001). The thickness of the newly formed granulation tissue was higher in the AVG-wounds (P less than .001), while the hair follicles count was significantly lower (P less than .001) compared with the AgSD-treated burns. It is concluded that this preparation of Aloe vera gel hindered the healing process of the present burn wound model when compared with 1 % silver sulfadiazine cream.

**Experimental & clinical observations on frostbite**
Experimental ischemia by the classic frostbite rabbit ear model clearly defined the role of thromboxane as a mediator of progressive dermal ischemia in frostbite injuries. The therapeutic groups consisted of the antiprostanoids, methylprednisolone, and aspirin combined with anti-thromboxane agents Aloe vera and methimazole, while the control group received no therapy. Survival was measured by planimetry for all groups. No tissue survival was evident in the frostbite control group. Methimazole treatment allowed 34.3% survival, Aloe vera 28.2% survival, aspirin 22.5% survival, and methylprednisolone 17.5% survival. The data compare the results of a modified frostbite protocol using ibuprofen with therapeutic modalities used by other clinical services. Of 154 patients treated for frostbite from 1982 to 1985, 56 were treated with our frostbite protocol; 98 were treated with other modalities. Of the 56 protocol patients, 18 suffered 1st degree frostbite, 25, 2nd degree frostbite, and 13, 3rd degree frostbite. For all degrees of frostbite, 67.9% healed without tissue loss, 25.0% healed with partial tissue loss, and 7% required amputation (P less than .001). Of the patients not on protocol, 11 suffered 1st degree frostbite, 51, 2nd degree frostbite, and 36, 3rd degree frostbite. Of these, 32.7% healed without tissue loss, 34.6% healed with tissue loss, and 32.7% required amputation. The morbidity of progressive dermal ischemia in frostbite may be decreased by the therapeutic use of inhibitors of the arachidonic acid cascade.

Alvagel as a therapeutic agent in the treating of radiation burns
In several cases of roentgen (radium) dermatitis, the Collinses found that by treating ulcerated skin tissue of their patients with packs of fresh Aloe vera leaves split and wrapped around the wounds, they were able to witness a markedly improved rate of healing. Additionally, they formulated a compound from fresh Aloe vera gel which also netted effective results in the same patterns of usage. In a medical journal, Creston Collins offered this summary of his report: "Since April, we have treated more than fifty cases of x-ray and radium burns with Aloe vera leaf and an ointment known as 'Alvagel' made from the leaf. While they have not all been perfect cures, the results as a whole have been most gratifying."

Beneficial effects of aloe in wound healing
The therapeutic effects of A. vera [A. barbadensis] were examined in preventing progressive dermal ischaemia caused by burns, frostbite, electrical injury, distal dying flap and intra-arterial drug abuse in man and animal models. In vivo analysis of these injuries showed that the mediator of progressive tissue damage was thromboxane A2 (TxA2). Experimentally, A. vera was compared to a variety of antithromboxane agents (U38450, a lodoxamide, a lazaroid and an Aloe wound gel). In the burn injury, A. vera was comparable to the lodoxamide and lazaroid with an 82% to 85% tissue survival when compared with the control and the Aloe wound gel. Tissue survival in the experimental frostbite injury was 28.2% when compared with the control. Similar results were obtained for the electrical injury, and intra-arterial drug abuse. Clinically burn patients treated with A. vera healed without tissue loss as did those with frostbite. In the intra-arterial drug abuse patients, A. vera reversed tissue necrosis. This therapeutic approach was used to prevent progressive tissue loss in each injury by actively inhibiting the localized production of TxA2. A. vera not only acts as a TxA2 inhibitor but maintains a homeostasis within the vascular endothelium as well as the surrounding tissue.

The external use of Aloe
Dr. J.E. Crewe reported a broader spectrum application of Aloe vera in treating chronic ulcers, eczema, thermal burns, scalding, sunburn, pruritus vulvae, minor injuries, and certain allergies including poison ivy. As the Collinses before him, Crewe had also tried using both the fresh leaf gel and an ointment made from it. In almost all cases treated, Dr. Crewe was able to record healing that ranged from effective to remarkable. And in all instances mentioned healing was complete, and tissue regenerated without scarring.

Treatment of experimental frostbite with pentoxifylline & Aloe vera cream
OBJECTIVE: To compare the therapeutic effects of systemic pentoxifylline and topical Aloe vera cream in the treatment of frostbite. DESIGN: The frostbitten ears of 10 New Zealand white rabbits were assigned to...
one of four treatment groups: untreated controls, those treated with Aloe vera cream, those treated with pentoxifylline, and those treated with Aloe vera cream and pentoxifylline. MAIN OUTCOME MEASURES: Tissue survival was calculated as the percent of total frostbite area that remained after 2 weeks. RESULTS: The control group had a 6% tissue survival. Tissue survival was notably improved with pentoxifylline (20%), better with Aloe vera cream (24%), and the best with the combination therapy (30%). CONCLUSION: Pentoxifylline is as effective as Aloe vera cream in improving tissue survival after frostbite injury.

PSORIASIS
Management of psoriasis with Aloe vera extract in a hydrophilic cream: a placebo-controlled, double-blind study.
The purpose of this double-blind, placebo-controlled study was to evaluate the clinical efficacy and tolerability of topical Aloe vera extract 0.5% in a hydrophilic cream to cure patients with psoriasis vulgaris. Sixty patients (36M/24F) aged 18-50 years (mean 25.6) with slight to moderate chronic plaque-type psoriasis and PASI (Psoriasis Area and Severity Index) scores between 4.8 and 16.7 (mean 9.3) were enrolled and randomized to two parallel groups. The mean duration of the disease prior to enrollment was 8.5 years (range 1-21). Patients were provided with a precoded 100g tube, placebo or active (with 0.5% Aloe vera extract), and they self-administered trial medication topically (without occlusion) at home 3 times daily for 5 consecutive days per week (maximum 4 weeks active treatment). Patients were examined on a weekly basis and those showing a progressive reduction of lesions, desquamation followed by decreased erythema, infiltration and lowered PASI score were considered healed. The study was scheduled for 16 weeks with 12 months of follow-up on a monthly basis. The treatment was well tolerated by all the patients, with no adverse drug-related symptoms and no dropouts. By the end of the study, the Aloe vera extract cream had cured 25/30 patients (83.3%) compared to the placebo cure rate of 2/30 (6.6%) (P < 0.001) resulting in significant clearing of the psoriatic plaques (328/396 (82.8%) vs placebo 28/366 (7.7%), P < 0.001) and a decreased PASI score to a mean of 2.2. The findings of this study suggest that topically applied Aloe vera extract 0.5% in a hydrophilic cream is more effective than placebo, and has not shown toxic or any other objective side-effects. Therefore, the regimen can be considered a safe and alternative treatment to cure patients suffering from psoriasis.

SKIN DISORDERS/INFLAMMATION
Anti-inflammatory activity of Aloe vera against a spectrum of irritants
The authors have evaluated the spectrum of anti-inflammatory activity of A. vera in a number of models of inflammation in the hind paw of the experimental rat induced by kaolin, carrageenan, albumin, dextran, gelatin, and mustard. Croton oil was used in a topical model of inflammation to determine the oral activity and time-dependent dosing of A. vera. The authors found that A. vera was active in all models of inflammation. Of the various irritants tested, A. vera was especially active against gelatin-induced and kaolin-induced edema and, in contrast, had minimal activity when tested against dextran-induced edema. Oral activity of A. vera was demonstrated to be dependent on the presence of anthraquinones. The various irritant-induced edema models provided a broad spectrum of anti-inflammatory activity for A. vera.
Wound healing. Oral and topical activity of Aloe vera.
The influence of Aloe vera, orally and topically, on wound healing was studied. Wounds were induced on both sides of the vertebral column of ICR mice using a biopsy punch. For the oral study, experimental animals received A. vera in their drinking water for 2 months, whereas the control animals received only water. In the topical study, experimental animals were given 25% A. vera in Eucerin cream topically. The control animals received cream only. A 62.5% reduction in wound diameter was noted in mice receiving 100 mg/kg/day oral A. vera and a 50.8% reduction was recorded in animals receiving topical 25% A. vera. These data suggest that A. vera is effective by both oral and topical routes administration.
Processed Aloe vera administered and topically inhibits inflammation

Aloe vera preparations were evaluated for topical anti-inflammatory activity using the croton oil-induced edema assay. The results show that small amounts of A. vera given topically will inhibit inflammation induced by a moderate amount of irritant. In general, the decolorized Aloe was more effective than the colorized Aloe (with anthraquinone). A 47.1% inhibition of inflammation was obtained by 5% decolorized irradiated Aloe. These results may be used as a baseline to assess the biologic activity of A. vera in the treatment of inflammation by podiatric physicians.

Uses of Aloe in treating leg ulcers & dermatosis

In 1973, three Egyptian doctors, El Zawahry, Hegazy, and Helal concluded that the active healing principle existed not only in the anthranols (basic members of the anthraquinone complex) but also in the mucopolysaccharides and through the activity of the enzymes in the plant.

Anti-inflammatory and wound healing activity of a growth substance in Aloe vera.

Aloe vera improves wound healing and inhibits inflammation. Since mannose-6-phosphate is the major sugar in the Aloe gel, the authors examined the possibility of its being an active growth substance. Mice receiving 300 mg/kg of mannose-6-phosphate had improved wound healing over saline controls. This dose also had anti-inflammatory activity. The function of mannose-6-phosphate in A. vera is discussed.

Anti-inflammatory & wound healing properties of Aloe vera

The fresh juice of the indigenous drug A. vera (0.2 ml/100 g, i.p.) was studied for its anti-inflammatory and wound healing properties in rats. Anti-inflammatory action was studied by observing percent reduction in carrageenin-induced paw oedema at 3 h. Wound healing effects were studied on incision (skin breaking strength), excision (percent wound contraction and epithelization time) and dead space (granuloma breaking strength and biochemical parameters) wound models. A. vera showed significant anti-inflammatory activity in acute inflammatory model without any significant effect on chronic inflammation. Significant increase in breaking strength (skin and granuloma tissue), enhanced wound contraction and decreased epithelization period were observed. An increase in lysyl oxidase activity and mucopolysaccharide content were also seen. This drug could therefore increase tensile strength by increasing cross-linking in collagen and interactions with the ground substance.

Effects of topical medications on the healing of open pad wounds in dogs

A triple antibiotic ointment (containing polymixin B sulfate, bacitracin and neomycin sulfate) and an Aloe vera extract gel were evaluated for their effects on open wound healing of pad wounds created under anesthesia in 15 Beagle dogs. The primary difference between the 2 medications was noticed at 7 days when the Aloe-treated wounds had a smaller unhealed area than did untreated control wounds and wounds treated with antibiotics.

Antiinflammatory activity of extracts from Aloe vera gel.

We studied the effects of aqueous, chloroform, and ethanol extracts of Aloe vera gel on carrageenan-induced edema in the rat paw, and neutrophil migration into the peritoneal cavity stimulated by carrageenan. We also studied the capacity of the aqueous extract to inhibit cyclooxygenase activity. The aqueous and chloroform extracts decreased the edema induced in the hind-paw and the number of neutrophils migrating into the peritoneal cavity, whereas the ethanol extract only decreased the number of neutrophils. The anti inflammatory agents indomethacin and dexamethasone also decreased carrageenan-induced edema and neutrophil migration. The aqueous extract inhibited prostaglandin E2 production from [14C]arachidonic acid. The chemical tests performed in the aqueous extract for anthraglycosides, reductor sugars and cardiotonic glycosides were positive. In the ethanol extract, the chemical tests performed for saponins, carbohydrates naftoquinones, sterols, triterpenoids and anthraquinones were also positive. In the chloroform extract, the chemical tests performed for sterols type delta 5, and anthraquinones were positive. These results demonstrated that the extracts of Aloe vera gel have antiinflammatory activity and suggested
its inhibitory action on the arachidonic acid pathway via cyclooxygenase.

Skin Disorders Virus: Bacteria, Fungi & Parasites

The gel of the Aloe vera plant has been known to have healing powers for centuries. Practically everybody is aware of Aloe vera gel for treating burns, skin inflammation, acne, diabetic leg ulcers, shallow wounds, gastrointestinal ulcers and constipation. In higher concentrations (60, 80 and 90 percent) Aloe vera extracts can eliminate dozens of harmful bacteria. The diseases associated with these bacteria are some of the most common and fatal of our time.

Bacteria & Fungi Known To Be Eliminated By Aloe Vera:

<table>
<thead>
<tr>
<th>Bacteria</th>
<th>Causes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Streptococcus pyogenes</td>
<td>Rheumatic fever, strep throat &amp; scarlet fever</td>
</tr>
<tr>
<td>Serratia marcescens</td>
<td>Endocarditis, pneumonia &amp; bacteremia</td>
</tr>
<tr>
<td>Klebsiella pneumoniae</td>
<td>Pneumonia</td>
</tr>
<tr>
<td>Escherichia coli</td>
<td>Diarrhea &amp; fatal food poisoning</td>
</tr>
<tr>
<td>Staphylococcus aureus</td>
<td>Food poisoning &amp; toxic shock syndrome</td>
</tr>
<tr>
<td>Pseudomonas aeruginosa</td>
<td>Severe &amp; fatal blood or urinary tract infections</td>
</tr>
<tr>
<td>Citrobacter</td>
<td>Diarrhea &amp; blood poisoning</td>
</tr>
<tr>
<td>Candida albicans</td>
<td>Vaginal, respiratory &amp; skin infections, thrush endocarditis</td>
</tr>
<tr>
<td>Trichophyton</td>
<td>Fungal infections of the skin, nails or hair</td>
</tr>
<tr>
<td>Mycobacterium tuberculosis</td>
<td>Tuberculosis, lupus &amp; erythematous</td>
</tr>
</tbody>
</table>

DENTAL DISORDERS

Aloe Vera Gel Toothpaste

A toothpaste compn. contains a dentifrice base which includes at least a detergent, an abrasive or, polishing agent, and mixt. of Aloe vera and chlorophyll. The toothpaste compn. is useful in preventing gingivitis, controlling plaque, and stimulating the growth of new tissue while reducing the hazards of bacterial contamination. Thus, a dentifrice contained 25% oil of wintergreen soln. 90.0 mg, sorbitol 9.0, SDS 30.0, CaHPO4 30.0, glycerin 37.5, water 100.0, carrageenan 7.5, CaCO3 60.0, Aloe vera gel 50 g, and Cu chlorophyllin (50 mg/cm3) 250 mg. Use of this toothpaste for 10-14 days reduced the bleeding point in patients with gingivitis.

Aloe in Dentistry

Post-treatment dental discomfort and pain are among the most unpleasant forms of misery we humans inflict upon ourselves. In providing relief from this, the blessed Aloe plant displays yet another example of Heavenly mercy.

This story started for me on a weekend in July of 1991. Dr. Bruce Hedendal gave me a bottle of "Whole leaf" Aloe vera concentrate. He said that a report by Lee Ritter, N.D., showed that all Aloes were not equal, in fact some had no active ingredients whatsoever.

I had been using an Aloe product, which cost approximately $23.00 a gallon, for the past six months, but had not noticed any particular benefit. I was using it simply because I had heard of Aloe's legendary
benefits. The bottle said, "100% pure, tastes like spring water," and according to the Ritter report, it was water. I was skeptical that this whole leaf Aloe product would produce any more noticeable benefits than before, but that is what this article is about.

Within two days of using the products, I noticed a tremendous increase in energy. I had been riding a hypoglycemic roller coaster for years, fueling up on caffeine and sugar to climb out of the slumps, only to find myself in another some hours later. That first week, I felt good, but I really was not paying attention to it. It was approximately two weeks into using the new Aloe that I noticed that I was thinner. Because my weight had been creeping up, I had been avoiding the scale; but that morning I had to check it out. To my surprise, I was a full five pounds lighter. It was only then that I realized why I had lost the weight. I was no longer feeding with sugar and caffeine the roller coaster slumps, but I was cruising nicely along near the top.

I had been using the Aloe on my forehead, which had many patches of recurrent actinic keratosis, a precancerous condition, which had in the past been removed with cryotherapy (liquid nitrogen). It took a month of using the concentrate, but these patches have gone into remission.

I have been an allergy sufferer my entire life, but the situation had been getting progressively worse over the last five years. When I first started using the new whole leaf Aloe the allergy symptoms got much worse, but then they started to clear. I have had a few bad days over the past five months, but generally I am greatly improved.

I have also experienced another benefit worth mentioning. I have suffered with a painful shoulder for two years. The pain is gone. During this time, I mentioned these benefits to others, who also started using these products, and they reported back (in most cases) equally enthusiastic stories.

The next two incidents encouraged me to introduce the products into my practice of dentistry. The first was when a four year old boy fell onto some sharp oyster shells and cut his foot open. I reached him first and covered his wound with 5X Aloe gel. He stopped crying within seconds. It was a deep cut. We cleaned and bandaged it with an Aloe dressing and he was out playing in minutes.

The second incident was in my dental practice. The patient needed his wisdom tooth extracted, and while the site was getting numb we talked about Aloe. He said his wife's grandmother had married a Native American back in the thirties and had used Aloe ever since. He reported that she is now ninety-seven years old, looks like she is fifty, and acts like she is forty. He suggested that we try Aloe on his wound.

I irrigated the socket with the whole leaf Aloe concentrate, and after the sutures were in place, I filled the socket with the 5X Aloe gel. That evening I called to see how the patient was doing. His comments were that "if his tongue didn't feel the space he would not be aware that anything had happened." He continued to apply Aloe for that week and when it came time to remove the sutures, the area appeared pink and healed over. I was quite impressed.

We have since used the Aloe for all surgeries with uniformly gratifying results. One person among many, Mr. Harold Gans, wrote, "I suppose it is unusual for a patient to tell a dentist that he feels he had not even been treated by him. I honestly feel as if I had not been in your chair. I never felt any pain at any time, nor any discomfort after leaving your office..."

What makes that letter so rewarding is that we worked on Mr. Gans for two plus hours, removing numerous teeth, performing bone recontouring, and inserting an upper immediate denture. The check-up the next day showed some mild hematomas, but little swelling. The tissue was a healthy pink. I have not had to prescribe pain medication, except for one very drug-oriented patient, in four months.

I hope these anecdotal stories have piqued your interest to read further, because I have some ideas about what may be happening.

Why Aloe may work

Carrington Laboratories, Inc., has been trying to gain FDA approval for the use of acemannan as a drug.
Acemannan is the name given to the large molecular-weight sugars called mucopolysaccharides that are found in Aloe. They assert that this is the "active" ingredient and have spent considerable time and money doing in-vitro and in-vivo research. Their work has shown that Aloe interacts with the body's immune system, enhancing rather than overriding this system. It stimulates the macrophages, one of the principal immune response steering mechanisms of the body. These studies have shown direct anti-viral activity. On November 4, 1991, Carrington announced that conditional approval was granted by the USDA for the use of Acemannan as an aid in the treatment of canine and feline fibrosarcoma. Although this is an isolate of the plant and may represent only a small fraction of its active ingredients, it is a large step forward and may open the door for Aloe to gain approval for other uses.

Trevor Lyons, a Canadian dentist, deserves recognition as a true pioneer in our quest for the solutions to periodontal disease, as well as the systemic manifestations resulting from this infection. His book, Introduction to Protozoa and Fungi in Periodontal Infections, is a masterpiece of literature review and original research.

There are many thought-provoking ideas presented that will provide answers to many puzzling questions. His basic premise is that one-celled animals, protozoa such as Entamoeba gingivalis, Entamoeba histolytica, Trichomonas tenax, are not opportunistic, but, in fact, precede the host's oral and systemic decline. Equally important in oral and systemic pathology are the fungi most notably Candida albicans. Again, rather than being opportunistic, these fungi actually suppress the host's immune system, are capable of causing death, and have been shown to be distributed throughout all of the host's organs upon autopsy.

Yeasts and trophozoites, contrary to what was previously believed, do not appear to be normal inhabitants of the mouth. They are associated with oral and/or systemic disease, and if left untreated in an apparently symptomless host, will lead to the deterioration of the oral and general health of the patient.

Dr. Lyons, through meticulous and step-by-step development of his theory, proves that these heretofore accepted, "normal" inhabitants should be our target organisms in the treatment of many oral and systemic diseases. He has documented and published proof that the elimination of those parasites restores the host to a state of well being.

Another forward-thinking holistic dentist, Dr. Douglas Cook, from Surfing, WI, read between the lines of Dr. Lyons' work and gleaned the idea of why the Aloe is so effective on so many people. In an interview with Dr. Lyons, he confirmed this information. Aloe vera is one of the most potent protozoa and yeast-killing solutions that he had ever worked with. However, Dr. Lyons did not have at his disposal, nor did he know about, these new, highly concentrated whole leaf Aloe solutions.

Most of Dr. Lyons' successes, which are monumental, were produced using traditional allopathic medicine. Many of these medicaments used are highly toxic to the host, as well as the target organisms. Possibly, nature has provided the perfect solution to this parasite problem: Aloe vera.

In 1929, Kofoid reported finding Entamoeba in the bone marrow of some arthritic subjects. In 1981, Snyderman and McCarty reported similar pathology in rheumatoid arthritis and destructive periodontal disease. In 1982, Dr. Paul Keys, the former head of dental research at the United States National Institute of Health, reported the almost invariable relationship between oral protozoa and periodontal deterioration. E. gingivalis found at the base of periodontal pockets E. Listolytica found in ulcers of the colon behave similarly, causing the lesion to spread laterally as the amoeboae migrate parallel to the floor of the ulcer. Could these one-celled animals really be that destructive? R. Mueller, in 1988, reported a new theory of enzyme destruction. Polymorphs produce a proteolytic (protein-digesting) enzyme, "elastase" which is normally bound to a circulating liver enzyme, "proteinase inhibitor" forming "elastase proteinase inhibitor complex" (EPIC). The leukocytes are disrupted by the contact with amoeboae leaving the leukocytes in an uncontrolled state of maximum production and release of elastase. The EPIC balance
overpowered, leading to rapid, uncontrolled, lytic activity. This concept fits well with the understanding that destructive periodontal disease may be considered an autoimmune disease and shows that "the supreme irony of this state of parasitism is that the very cells which should protect the host in fact destroy the host and are then, in turn, consumed by this predator parasite, Entamoeba gingivalis."

These parasites also are capable of being infected with a virus. From within this safe harbor protected from the patient's immune response, a continuous stream of pathogenic particles could eventually destroy the host. Could this be the reason why Epstein-Barr and HIV patients are helped with Aloe? Does the Aloe destroy the virus' hideout? Whatever research eventually shows, the destruction of these one-celled invaders will leave the host with a stronger immune system.

Many dentists have been dismayed over the rampant decay in the cervical areas of some of their patients' teeth. These lesions tend to rapidly spread along and below the gingival margin. Within just a few months this mostly painless destruction may render the tooth unsalvageable. Dr. Lyons has shown that this rapid decay is caused by Candida, which is capable of both aerobic and anaerobic metabolism. Antibiotics and antifungals have proven effective if the right ones at the right times are used. Reports from the literature show that neither F. gingivalis nor E. histolytica is capable of initiating infection without the concomitant presence of bacteria. And, while antibiotic therapy may be cidal to trophozoites, it may be working due to the change in the bacterial environment.

Aloe, on the other hand, non-toxic to the host, has been reported (in anecdotal stories) effective in the treatment of most digestive and gastrointestinal problems, arthritis, skin lesions, multiple sclerosis, diabetes, and periodontal disease, etc.! Could it be that Dr. Lyons, who first recorded the destruction of the protozoa with Aloe vera, may have found the reason why Aloe appears to be so effective with so many different problems?

Use of Whole-Leaf Aloe
It has been my finding, as well as Dr. Lyons' and Dr. Cook's, that the use of topical antimicrobial therapy, although helpful, should be combined with systemic treatment.

A therapeutic dose of mucopolysaccharides of 15 mg/kg has been established as virucidal. To my knowledge, no amoebacidal dose has yet been established, but working on the 15 mg/kg dose per day, approximately two ounces of the concentrate per day should be effective for the average adult. It is important to take part of the dose before bed, preferably on an empty stomach, since the parasites are particularly active at night.

It is very important to keep the dose within acceptable ranges, so that the "kill" does not produce a flood of toxins, antigens, viruses and viroid particles, which are released into the body upon the parasites' death and disintegration. This is called the Herxheimer Reaction, and will vary depending on the nature and quality of the material released and the host's (patient's) tolerance to those foreign substances. If this reaction becomes severe, it is best to discontinue the Aloe and work on other detoxification programs such as colonics and diet changes, etc.

The best way to start on an oral disinfection program would be to purchase a good soft-bristled toothbrush. Dr. Phillips has developed a baby-soft brush and a technique quite effective in removing plaque and stimulating the tissue. You may purchase these items from Periodontal Health Brush, Inc.

As your dentifrice, the 5X AloeGel works to clean the gums and gently kill the pathogens. If you use an oral irrigation machine, mixing a couple of tablespoons of Aloe concentrate into the water will help kill the pathogens living at the bottom of the pockets. Homozon, a magnesium oxide powder, which releases oxygen in the presence of acid, can be used as a dentifrice or a packing on the gums, then followed with the Aloe. Don't forget to brush your tongue and be gentle with the floss.

It is best to institute a program of oral disinfection prior to rigorous scaling and curettage, due to the potential spread of protozoa and yeast throughout the body through the open blood vessels abounding in
the infected gums. Hopefully, as research catches up with these ideas, we will learn how and why Aloe is so effective in helping our bodies heal themselves. I, for one, see the need for more in office diagnosis of specific pathogens, based on the use of the phase-contrast microscope, as well as the incorporation of a program for heavy metal detoxification.