W.R. SAGE, INC.

ALOE VERA REPORT

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11 FORREST AVENUE RUMSON, NEW JERSEY 07760

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ALOE VERA

THE HISTORY

In an age of science and synthetic creations, it is remarkable that more than half of the prescriptions filled in the United States contain products derived from plants. These natural botanical derivatives include steriods, vitamins, alkaloids, antibiotics and glycosides. Perhaps even more remarkable is the broad therapeutic effectiveness of these natural organic substances in the treatment of many diseases such as pellagra, pernicious anemia, malaria, and acute infections.

There are several methods used to demonstrate the effectiveness of a product. One approach is the double-blind clinical study. In this method the product to be tested is given to certain individuals and a placebo (a product which contains no active ingredients) is given to other individuals. Then the results in the two groups are compared. Another method is clinical observation. Many important medicines have been discovered solely through observation of the patients by a sensitive, careful physician. The accumulation of many such confirmatory reports can demonstrate the benefits of a given product. The use of Vitamin B-12 in the treatment of pernicious anemia came about because a physician discovered through a detailed interview that certain patients with this previously incurable disease were improving on diets of liver.

The aloe vera plant, a member of the lily family, has a long history of use by people who discovered its benefits in many countries throughout the warm climates of the world. In many different languages, aloe vera was called "wonder plant", "medicine plant" or even "heaven's blessing".

Aloe vera gel was discovered by useage and observation. Many reports on its benefits have been written throughout history in many lands. In fact, it would be difficult to imagine a natural substance more widely described. This rare old plant was reported in Papyrus Ebers 3,5000 years ago for its medicinal properties which were known for many centuries before that time. Drawings of the plant on the walls of tombs were a symbol of immortality. In the years that followed, there were reports of relief from a wide variety of ailments when aloe vera was used. In both medical and cosmetic practices, the aloe vera plant was used consistently through the centuries for such varied conditions as wounds, stomach disorders, headaches, gum and mouth diseases, constipation, hemorrhoids, kidney problems, insomnia, pruritis, burns, dermatitis, herpes, fungal infections, loss of hair, indigestion, insect stings, dysentery, prostatitis, colds and body odors.

The Chinese, Mayans, Egyptians, Romans, Moroccoans, Indians, Arabians, Greeks, Algerians, Tunisians, Africans, Phillipinos, Malayans, Jews Jamaicans, Spaniards, Tahitians, Hawaiians, and many of the Southn American cultures have endorsed this

effective medicinal plant throughout the ages. The properties of the aloe vera plant were documented by men such as Aristotle, Alexander the Great, Marco Polo and Christopher Columbus. Aloe vera has been highly regarded by many people for thousands of years all around the world as a valuable remedy for dozens of diseases, functional disorders and malnutritional conditions, both internal and external, right up to the present time.

While over 1,200 species of aloe are reported worldwide, we shall concern oursleves here with "aloe perfoliatea vera", "Linne" or just "aloe vera", often called "Savila". At this time, aloe vera is grown commercially in Florida, Texas and Mexico, and grows wild in great abundance in India, the Mediterranean countries, South and Central America, Africa, Puerto Rico, Jamaica, Bonaire, Barbados, and other tropical regions.

MEDICINAL PROPERTIES

The full scope of therapeutic efficacy of stablized aloe vera gel and its consequent combinations and compounds may be estimated at this time on the basis of its known characteristics. So far it has been shown to be Trichomonacidal (Destructive parasitic virus called trichomonads), Bactericidal, Virucidal, Fungicidal, Anti-Inflamatory, Anti-Puritic (Anti-Itching), Proteolytic (Effecting the degestion of proteins as a solvent), Enzymatic, Tissue penetrating and Stimulating to normal cell regeneration, Non Allergenic, Non Toxic, and without Contraindication (Any condition of

disease which renders some particular line of treatment improper or undesirable) under broad laboratory and clinical examination. It is appropriate, therefore, to list the indications for stablized aloe vera preparation which correspond to the activities mentioned above and which also have been reported by significant numbers of practicing clinicians, investigators, and research personnel. Such indications include: (1) Bacterial infections (Staphylococcus, Streptococcus, Corynebacterium xerosis conjunctivitis), and Trichomonas vaginalis; (2) Viral infections (Herpes simplex oral and lip and Herpes zoster shingles); (3) Fungal infections (Candida Monilia Albicans, Trichophyton rubrum "Ringworm of the Nails" or "Tinea urguium", and Dermatophytes which cause "Tinea barbae" and conditions such as "Intertriginous eczema" or "Tinea of Hands"); (4) Inflamation (arthritic "flare-ups, edema from allergic reactions, trauma, surgery, infections, burns, irritations, ulceration and insect stings, etc.); (5) Pruritis (ani, vulvae, etc.); (6) Chloasma (liver spots), burns and infections where removal of dead cells by proteolytic enzymes is indicated; (7) Healing process (to further stimulate normal cell regeneration as in postoperative periods of hemorrhoidectomy, gingivectomy, etc., following tissue trauma such as burns, injury, infection, contusion, radiation or malnutrition), and (8) Conditions requiring extra penetration to reach target areas. These are but a few of the most obvious applications of aloe vera according to those properties which not only are best known but also are supported by scientific testimony.

TOXICOLOGY

Stabilized alce vera gel was evaluated for tcxicity under standard testing procedures fcr pharmacueticals of this type by Hazelton Laboratories, Inc., of Falls Church, Virginia, to establish values for (1) Acute Oral Administration Rats, (2) Acute Oral Dose Range Dcgs, (3) Acute Dermal Application Rabbits. Details of these tests are available on file to answer all inquiries. It is sufficient to say that under series (1), the LD 50 determined was greater than 21.5 g/kg. Under series (2), no deaths were recorded during the 14day period postdose and the maximum tolerated dose would be greater than 31.6 g/kg. No signs of ccmpound effect were noted regarding appearance, behavior, appetite, elimination, or gross necapsy. Under the dermal series (3), no deaths nor signs of toxicity from skin absorption of the material were noted in the animals exposed. Thirteen-Week Repeated Dermal Application -- Rabbits -- showed no compound-induced alterations among any of the hematological or urine parameters evaluated, no compound-related histopathologic changes in the tissues examined, and no changes in appearance, behavior, body weight, or survival took place. Stablized aloe vera tested on rabbits for 13 weeks produced no skin irritation nor signs of systemic toxicity from percutaneous absorption.

HAZLETON LABORATORIES, INCORPORATED

FALLS CHURCH, VIRGINIA

Sponsor: Lakeland Laboratories Date: May 14, 1968

Material: Stabilized Aloe vera gel Lot No: SF-0001

Subject: FINAL REPORT
Acute Oral Administration - Rats
Acute Oral Dose Range - Dogs
Acute Dermal Application - Rabbits
Projects No. 534-100, No. 534-101, and No. 534-102

SUMMARY

Stabilized Aloe vera gel was evaluated for acute oral toxicity as a single dose administered by gastric intubation to adult male albino rats. Rats were observed for mortality and toxic effects for a postdose period of 14 days. The acute oral LD_{50} determined was >21.5 g/kg.

Single oral doses of Stabilized Aloe vera gel were administered by stomach tube to four groups of one male and one female mongrel each at levels of 1.0, 3.16, 10.0, and 31.6 g/kg. No deaths were recorded during a 14-day period postdose; therefore, the maximum tolerated acute oral dose for mongrel dogs would be greater than 31.6 g/kg of body weight. Slight terminal weight loss (0.5 to 0.7 kg.), not dose related, was noted in several animals; otherwise, no signs of compound effect were observed in the animals regarding appearance, behavior, appetite, elimination, and gross necropsy.

Stabilized Aloe vera gel was also evaluated for dermal irritation and toxicity by a 24-hour application to intact and abraded abdominal skin of albino rabbits at dosage levels of 1.0, 2.15, 4.64, and 10.0 g/kg of body weight. No deaths nor signs of toxicity from skin absorption of the material were noted in the animals exposed. The acute dermal LD_{50} is, therefore, assumed to be greater than 10.0 g/kg of body weight. Dermal irritation was minimal and consisted only of slight transient erythema at all levels which subsided within two to four days.

MATERIAL

Identification Stabilized Aloe vera gel.

Description Clear, yellow, watery fluid with a slightly unpleasant odor.

Receipt Date March 26, 1968.

Purity Assumed 100% active ingredient; dosages calculated gravimetrically based on a specific gravity of 1.03 (as determined in this laboratory) and were administered volumetrically.

ACUTE ORAL AIMINISTRATION - RATS

Methods

Animals: Five groups, each composed of 10 adult male albino rats of the Holtzman Sprague-Dawley derived strain.

Sponsor: Lakeland Laboratories Date: January 31, 1969

Material: Stabilized Aloe vera Gel

Subject: FINAL REPORT
13-Week Repeated Dermal Application - Rabbits
Project No. 534-103

SUMMARY

This study was conducted to evaluate the dermal toxicity of Stabilized Aloe vera Gel at dosage levels of 0.25, 1.0, and 2.0 ml/kg by repeated exposures on abdominal rabbit skin clipped free of hair. Dermal applications were made daily, seven days a week, for 21 applications on intact and abraded skin (three-week phase) and daily, five days a week, for 65 applications on intact skin (13-week phase). Criteria used to evaluate compound effect were general appearance, behavior, body weight, clinical laboratory studies, gross signs of dermal irritation, eye examinations, and gross and microscopic pathology.

No effect attributable to the repeated dermal exposures to the material was evident with respect to general appearance, behavior, body weight, and survival.

Repeated applications of Stabilized Aloe vera Gel produced negligible, transient dermal irritation. Skin responses were not dose related and were confined to slight erythema of 24-hour duration in two abraded and one intact skin animals at the low level (0.25 ml/kg) and one intact skin rabbit at the intermediate level (1.0 ml/kg). No signs were noted in the high level group.

Results of clinical laboratory studies showed no compound-induced alterations among any of the hematological or urine analysis parameters evaluated.

Gross alterations observed at necropsy were considered spontaneous in nature and unassociated with the experimental regimen. Histologic examination indicated that the repeated dermal application of Stabilized Aloe vera Gel at the levels tested failed to cause demonstrable, compound-related histopathologic changes in the tissues examined.

MATERIAL

Identification Stabilized Aloe vera Gel.

Description Clear, yellow liquid with a faint, unpleasant odor.

Receipt Date March 26, 1968.

Purity Considered to be 100% pure.

METHODS

Experimental Animals

Species: Adult male and female albino rabbits, New Zealand White variety.

Weight Range: At initiation, 1.7 to 2.8 kg.

Diet: Purina Rabbit Chow and water available ad libitum.

DALLAS MICROB-ASSAY SERVICE
P. O. BOX 28883
CASA VIEW STATION
DALLAS, TEXAS 75228
June 29, 1971

Technical Report to:	W.R.Sage, Inc.
Concerning the Product:	Aloe Vera powder (250 mg. equals 1 gallon of the Aloe - 99 gel)
Date Received:	June 2, 1971
Received From:	
Assay Service product number:	369-2
Sample identification:	Aloe Vera powder
Sampled by:	Client

Test Procedure:

We were to run a pilot test to determine the effectiveness of the non-stabilized freeze-dried powder against the following bacterial organisms:

Staphylococcus aureus (6538-ATCC)**
Streptococcus viridans (ATCC)
Pseudomonas aeruginosa (hospital contaminant) ATCC 15422
Salmonella choleraesuis (water contaminant) ATCC 10708

Method: Official test procedures as outlined in Official Methods of Analysis of the Association of Official Analytical Chemists, 11th edition, 1970, the USE-DILUTION method.

Dilution of Sample: Powder diluted in distilled, sterile H_2o to give 100% concentration.

** ATCC= American Type Culture Collection standard bacterial strains.

DALLAS MICROB-ASSAY SERVICE
P. O. BOX 28883
CASA VIEW STATION
DALLAS, TEXAS 75228

Results (using non-stabilized, freeze-dried powdered Aloe Vera at 100% concentration)

Organism	Carrier Number (tubes) 1 2 3 4 5 6 7 8 9 10
Staph. aureus	+ + + + + + + + + +
	+ + + + + + + + + +
	+ + + + + + + + + +
Strep. viridans	+ + + + + + + + + +
	+ + + + + + + + + +
	+ + + + + + + + + +
Pseudo. aeruginosa	+ + + + + + + + + +
	+ + + + + + + + + +
	+ + + + + + + + + +
Sal. choleraesuis	+ + + + + + + + + +
	+ + + + + + + + + +
	+ + + + + + + + + +

\+ denotes bacterial growth
0 denotes no growth

Remarks and Conclusions

Aloe Vera in freeze-dried non-stabilized powder form is not effective, even at 100% concentration, against the four bacterial organisms tested.

Ruth A. Sims, Ph.D.

Eugene R. Zimmermann, D.D.S., M.A.

Baylor College of Dentistry
Department of Biochemistry

800 Hall Street, Dallas, Texas 75226

EVALUATION OF ALOEVERA PRODUCTS

I. METHODS OF EVALUATION

A. Ultra-violet spectrophotometry

B. Infra-red spectrophotometry

II. PROCEDURES

A. Ultra-violet

Five-milliliter samples of each product were diluted to 100 ml with distilled water. Solid plant gel was weighed out as a 10.0 gm. sample, homogenized with 40-50 ml distilled water, then diluted to 100 ml with distilled water.

Each diluted sample was then scanned through the ultra-violet spectrum (200-340) nm) with a Backman DB-G spectrophotometer and the absorbance recorded on a Sargent strip-chart recorder.

Absorbance readings were also taken directly from the spectrophotometer dial for calculation of concentration of "active" principle.

Allantoin, U.S.P. grade, 1 mg/ml. was used as a standard.

B. Infra-red

In order to facilitate preparation of suitable samples for infra-red scanning, alcoholic extracts were prepared for each sample of Aloe vera. A 2 ml. sample of each product was extracted with 4 volumes of 95% ethanol and allowed to stand approximately 30 minutes while a light precipitate formed. The samples were centrifuged and the alcoholic supernatant decanted for final preparation of samples for IR scanning.

For the infra-red evaluation, 1 ml volumes of the alcoholic extracts were evaported to dryness under heat lamps with a gentle stream of air. The residue was then macerated with a suitable quantity of potassium bromide (KBr), pressed into a pellet and scanned in the Beckman Accu-lab 4 infra-red spectrophotometer.

Alcoholic extracts were used because of the ease of evaporation to dryness. The presence of moisture masks certain absorption bands in the IR and also makes KBr pelleting much more difficult.

Allantoin, U.S.P. powder in a KBr pellet was scanned for general comparison.

III. RESULTS AND INTERPRETATION

A. Ultra-violet

The ultra-violet spectrum is of value for general identification of some types of substances and for determination of concentration, based on Beer's Law, which states that the amount of light absorbed by a substance is proportional to the concentration of that substance.

U.V. scans of crude plant extract were essentially identical to scans of allantoin standard, suggesting that allantoin is the main component of aloe vera gel. All "stabilized" products exhibited an absorption peak at 276-278 nm (nanometers) which was not present in the standard allantoin solution, nor in the crude plant extract nor AVA's unstabilized product.

Absorbic acid (vitamin C) was the suspected additive responsible for this absorption peak. Addition of a solution of ascorbic acid (U.S.P. grade) to the crude plant extract confirmed the identity of the additive as ascorbic acid, added as a stabilizer. Ascorbic acid content varied considerably from one product to another, no attempt was made to determine ascorbic acid concentration.

Concentrations of the active principle, based on an allantoin standard are listed in the following table.

TABLE 1.

PRODUCT	CONCENTRATION (mg/ml of original product)
Allantoin (standard	1.0 mg/ml
Derma-Science cosmetic	22.20
Derma-Science drink	21.86
CIC	23.34
AVA-non-stabilized	36.20
AVA-stabilized	38.60
AVA Aloe-99	37.00
Crude Plant Extract*	14.80 mg/gm plant tissue

*Crude plant extract was prepared simply by homogenizing a weighed sample of plant tissue, from the inner part of the plant, in approximately 50 ml of distilled water followed by dilution to 100 ml. No squeezing, digestion or other forms of processing were utilized, which undoubtedly accounts for its apparent lower concentration of active principle.

B. Infra-red

Infra-red spectrophotometry is most suitable for studying molecular structure and its modifications and is most reliable when studying highly purified materials.

For best results in evaluating Aloe vera by IR spectrophotometry, the material should be separated into its chemical components by some form of chromatography technique. Then individual components could be evaluated more reliably. In my opinion infra-red spectrophotometry is of little value for simple comparisons of various commercial products.

With these consideration in mind and with advice and assistance from Dr. Rao, Department of Biochemistry, special chemistry section, Baylor Medical Center, attempts were made to scan several samples of Aloe vera products. We did not attempt the chromatographic purification due to the extensive effort and equipment demands for such procedures.

Samples of the following products were evaluated by infra-red spectrophotometry:

AVA-stabilized
Derma-Science cosmetic
Derma-Science drink
CIC
Dessicated plant gel
Allantoin standard U.S.P.

The appearance of the resulting scans varied widely but there were general similarities, with certain identifiable peaks appearing regularly in each specimen.

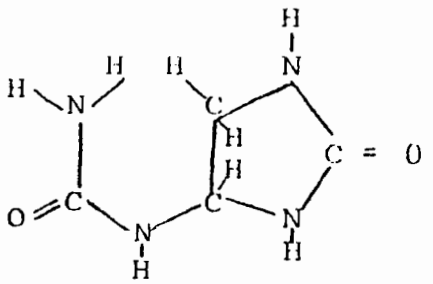
Major peaks occurred in the standard and every Aloe vera sample at the following wave numbers: 3400, 2900, 1610, 1410-1425 and 1050-1085. These wave numbers are correlated with characteristic chemical groups in Table 3.

TABLE 3.

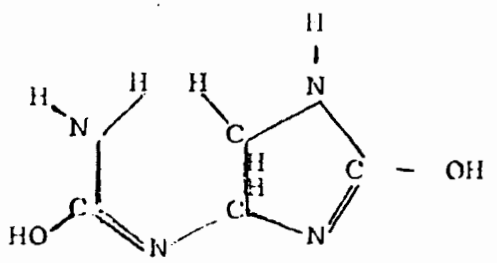
Wave #(cm^{-1})	Chemical group(s)
3400	$-NH_2$ +/or $\rangle N-H$
2900	$\rangle C-H$ +/or $\rangle CH_2$
1610	$-N^+H_3$ +/or $\rangle NH$
1410-1425	$-\overset{\overset{O}{\|}}{C}-NH_2$
1050-1085	$-C-OH$

It should be noted that the infra-red scans are qualitative and not quantitative. That is to say, peak height has not been correlated with concentration.

The chemical structural formula for allantoin is as follows:



The various groups and their corresponding wavenumbers (cm^{-1}) are listed in Table 3. The absorbance bands in the range of 1050 to 1085 correspond to C-OH, an alcoholic groups, which could readily be accounted for as a resonance form of allantoin as follows:



Summary

Comparisons of both ultra-violet and infra-red spectrophotometric data strongly suggest that the main component of Aloe vera is allantoin and that this substance is present in each Aloe vera product tested.

Allantoin is a normal metabolic end-product of purine metabolism in some lower species of animals but not in man. It could conceivably have effects, desirable or undesirable, on living tissues. According to the Merck Index, allantoin "stimulates growth of healthy tissues."

Aloe vera appears to be a good natural source of allantoin, along with other less well-defined entities that, if not beneficial, at least are not harmful when used either internally or externally on human tissues.

William H. Bowles

William H. Bowles, Ph.D.

EFFECT OF ALOE VERA ON THE GROWTH OF CERTAIN MICROORGANISMS *

Organism	% Aloe Vera in Culture Medium	% Survival of Organisms	% Reduction of Organisms
Staphylococcus Aureus	None	100.0	0
	25	92.6	7.4
	50	40.0	60.0
	60	23.0	77.0
	70	2.3	97.7
	80	0.24	99.76
	90	0.22	99.78
Streptococcus Viridans	None	100.0	0
	25	90.0	10.0
	50	38.0	62.0
	60	21.0	79.0
	70	7.7	92.3
	80	3.5	96.5
	90	1.6	98.4
Candida Albicans	None	100.0	0
	25	84.0	16.0
	50	15.7	84.3
	60	8.4	91.6
	70	5.1	94.9
	80	3.05	96.95
	90	2.9	97.1
Corynebacterium xerosis	None	100.0	0
	25	88.0	12.0
	50	26.3	73.7
	60	15.4	84.6
	70	8.8	91.2
	80	1.4	98.6
	90	0.077	99.93

*Standard counts of colony-forming units per ml., based on average of 3 plates/dilution.

In vitro studies: The effect of Aloe Vera on Herpes simplex virus

A Preliminary Report

Purpose: This preliminary study was designed to establish the virucidal action of Aloe Vera on Herpes simplex virus.

In vitro system - Primary hamster kidney monolayer cultures prepared in Falcon plastic petri dished were selected for two reasons:

(1) Herpes simplex virus produces a characteristic cytopathic effect on these cells which is readily reproducible.
(2) A primary culture was chosen to simulate, as closely as possible, a correlation between in vitro and in vivo effects of Aloe Vera

Dilutions used:

(1) Aloe Vera
    a. undiluted (i.e., stock)
    b. 1:2 of the stock
    c. 1:4 of the stock
(2) Virus
    a. 1:100 dilution of stock virus
    b. 1:10,000 dilution of stock virus

Procedure:

(1) Equal portions of undiluted (stock) and diluted Aloe Vera were incubated with the various dilutions of virus for a period of 90 minutes, to allow time for the action of Aloe Vera to take effect.
(2) The various combinations of Aloe Vera and virus were placed on hamster kidney monolayer cultures (5 plates/combination) for 1 hour (the established time necessary for virus adsorption to the cells).
(3) Following the adsorption period, each plate was washed thoroughly to remove any residual virus, etc.
(4) The plates were incubated at 37° C, and, at frequent intervals were observed for signs of CPE (cytopathology)

Final Results:

COMBINATION	CPE* 24 Hrs.	48 hrs.	72 hrs.
Virus only (1:100)	0	2+	4+
Virus only (1:10,000)	0	0	3+
Aloe Vera only (stock)	0	0	0
Aloe Vera only (1:2)	0	0	0
Aloe Vera only (1:4)	0	0	0
Aloe Vera stock plus virus (1:100)	0	2+	4+
Aloe Vera 1:2 plus virus (1:100)	0	2+	4+
Aloe Vera 1:4 plus virus (1:100)	0	2+	4+
Aloe Vera stock plus virus (1:10,000)	0	0	1+
Aloe Vera 1:2 plus virus (1:10,000)	0	0	2+
Aloe Vera 1:4 plus virus (1:10,000)	0	1+	4+

*Cytopathology read as standard testing 0 - no CPE
(Average of 5 plates each)

1+ - 25% cells exhibiting CPE
2+ - 50% cells exhibiting CPE
3+ - 75% cells exhibiting CPE
4+ - 100% cells exhibiting CPE

These results indicate that Aloe Vera is virucidal against 100 tissue culture doses of Herpes simplex virus in the test system used.

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THE EFFECT OF ALOE VERA ON MYCOTIC ORGANISMS(FUNGI)

ORGANISMS

1) Trichophyton mentagrophytes
   Common name: Tinea pedis
   Causal agent of athlete's foot

2) Trichophyton rubrum
   Common name: Tinea unguium
   Causal agent of onychomycosis or ringworm of the nails

MEDIA Two types used:

1) Sabouraud's agar, modified to contain glucose and neopeptone (to accelerate growth)

2) Corn meal agar, containing glucose

Note The antibiotic, chloramphenicol, was incorporated into the media at 0.05mg/ml to suppress any bacterial contamination.

ALOE VERA (stabilized, batch #4B)

Used at the following percentages:
25,35,45,55,65,70,75,80,85,90,95,100

Dilutions made in sterile saline, pH 6.5 (optimal pH for the organisms)

PROCEDURE

1) The organisms were inoculated onto agar slants, of both types of media, and incubated at room temperature. The slants were checked periodically for signs of mycotic growth.

2) Length of time reguired for growth:

a) T. mentagrophytes
   Sabouraud's agar..... 22 days
   Corn meal agar..... 26 days

b) T. rubrum
   Sabouraud's agar..... 25 days
   Corn meal agar..... 30 days

3) Approximately one loopful of each organism inoculated into tubes containing 2.0 ml of the various %'s of Aloe Vera plus saline.

4) The tubes were shaken to disperse the organisms, and allowed to set for 1 hr., 3 hrs., or 5 hrs.

5) The tubes were shaken again and two loopfuls from each tube were transferred to agar slants. Control tubes containing saline only also received one loopful of each organism.

6) All slants were incubated at room temperature and checked periodically.

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800 Hall Street. Dallas. Texas 75226

RESULTS

A. T. mentagrophytes observation period: 6 weeks

% Aloe Vera	Sabouraud's agar — Growth of Organism (exposure to A.V.) 1 hr	3 hrs	5 hrs	Corn meal agar — Growth of Organism (exposure to A.V.) 1 hr	3 hrs	5 hrs
25	+	+	+	+	+	+
35	+	+	+	+	+	+
45	+	+	+	+	+	+
55	+	+	+	+	+	+
65	+	+	+	+	+	±
70	+	+	±	+	+	-
75	+	+	±	+	±	-
80	+	±	-	+	±	-
85	+	±	-	+	-	-
90	+	±	-	+	-	-
95	+	-	-	±	-	-
100	+	-	-	±	-	-

B. T. rubrum observation period: 6 weeks

% Aloe Vera	Sabouraud's agar — Growth of Organism (exposure to A.V.) 1 hr	3 hrs	5 hrs	Corn meal agar — Growth of Organism (exposure to A.V.) 1 hr	3 hrs	5 hrs
25	+	+	+	+	+	+
35	+	+	+	+	+	+
45	+	+	+	+	+	+
55	+	+	+	+	+	+
65	+	+	+	+	+	+
70	+	+	+	+	+	+
75	+	+	±	+	+	±
80	+	+	±	+	±	-
85	+	+	±	+	±	-
90	+	±	-	+	±	-
95	+	±	-	+	-	-
100	+	-	-	+	-	-

Symbols: +..... normal growth of organism

±..... growth inhibited for 4-6 days longer than controls

-..... no growth

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800 Hall Street. Dallas. Texas 75226

REMARKS

1) Aloe Vera possesses killing power against both organisms at high concentrations and inhibitory power at lesser concentrations.

2) Aloe Vera is slightly more effective against T. mentagrophytes, causal agent of athlete's foot, than against the other organism.

3) A slight difference was noted between the two culture media; Aloe Vera was more effective at a lesser concentration, in general, against the two organisms when grown on corn meal agar.

4) Aloe Vera was significantly more effective as the exposure time (of the organisms in Aloe Vera) increased.

What Does Aloe Vera Do For You?

The stories of the effects of Aloe Vera seem incredible. You may wonder how a simple plant juice can have so many different effects on the skin and body.

Some of the earliest scientific research on Aloe Vera was performed in 1935 by researchers for the Atomic Energy Commission. They concluded that Aloe Vera was the most effective product known for the treatment of radiation burns of the skin. Still, they did not uncover what actually happens when Aloe Vera comes into contact with the skin. Later, scientists began to analyze the specific chemical makeup of Aloe Vera. It was only then that the explanation for the many properties of Aloe Vera began to unfold.

First, Aloe Vera was shown to be very, very complex, not a simple juice like many plants, but a composite of numerous biologically active ingredients.

(1) Aloe Vera is an excellent nutrient. It contains important proteins, vitamins, minerals and substances essential to the release of energy.

(2) In addition, the chemical makeup of Aloe Vera causes it to penetrate into the skin rapidly, thus carrying the nutrients to the living cells of the Epidermis.

(3) Aloe Vera contains several enzymes, the activities of which are not fully understood. However, it has been demonstrated that Aloe Vera promotes the removal of dead skin and stimulates the normal growth of living cells.

In order to understand the importance of these characteristics it is necessary to comprehend the structure of the skin itself.

As you know, skin has three layers:

A. **Epidermis** — Consists of living surface cells which both protect the body against the environment and provide an additional means of removing waste products as the outermost layers die and slough off. All of the dead skin you remove when you bathe is the uppermost area of the Epidermis. Although the Epidermis contains living cells, it has no blood supply. Its nutrition must come from the Dermis below.

B. **Dermis** — Beneath the Epidermis is the Dermis which provides the strength and toughness of the skin and contains the blood supply. It also contains the hair shaft, tiny muscles and oil glands.

C. **Hypodermis** — Is comprised of a soft layer of fatty tissue. Along with the Dermis, it contains the sweat glands, hair follicles, nerves and blood vessels.

Considering, then, the structure of the human skin, and the makeup of Aloe Vera, you can begin to see why the Aloe juice improves skin health. Nutritional elements in the Aloe Vera are carried deep into the layers of the skin, stimulating the growth of normal cells, removing dead cells and bringing in vitamins and proteins.

Why doesn't the body's blood stream do this same job from within? You might ask why is it necessary to "feed" the skin when that is the function of our blood system. The fact is that the youthful skin of a young child is well nourished, but as we pass from childhood to maturity a process takes place within our blood vessels which thickens their walls and reduces their ability to supply nutrients to all body tissues.

This particularly effects the Epidermis. As you recall, it has no blood supply, but depends on the nutrients which come to it through the Dermis layer. Aging slows this down. By supplementing this nourishment to the skin, Aloe Vera creates a younger look. You may notice an actual youthful glow in the skin of a person who uses a good Aloe Vera skin care program. It can take five to seven years off the appearance of many adults.