Promotes Healthy Blood


Identification of five phytosterols from Aloe vera gel as anti-diabetic compounds.


Biochemical Research Laboratory, Morinaga Milk Industry Co., Ltd, Kanagawa, Japan.

m_tanaka@morinagamilk.co.jp

Abstract

The genus Aloe in the family Liliaceae is a group of plants including Aloe vera (Aloe barbadensis MILLER) and Aloe arborescens (Aloe arborescens MILLER var. natalensis BERGER) that are empirically known to have various medical efficacies. In the present study, we evaluated the anti-hyperglycemic effect of Aloe vera gel and isolated a number of compounds from the gel. On the basis of spectroscopic data, these compounds were identified as lophenol, 24-methyl-lophenol, 24-ethyl-lophenol, cycloartanol, and 24-methylene-cycloartanol. These five phytosterols were evaluated for their anti-hyperglycemic effects in type 2 diabetic BKS.Cg-m(+/+)Lepr(db/J) (db/db) mice. In comparison with the hemoglobin A1c (HbA1c) levels of vehicle-treated mice, statistically significant decreases of 15 to 18% in HbA1c levels were observed in mice treated with 1 mug of the five phytosterols. Considering the ability to reduce blood glucose in vivo, there were no differences between the five phytosterols. Administration of beta-sitosterol did not reduce the blood glucose levels in db/db mice. After administration of the five phytosterols for 28 d, fasting blood glucose levels decreased to approximately 64%, 28%, 47%, 51%, and 55% of control levels, respectively. Severe diabetic mice treated with phytosterols derived from Aloe vera gel did not suffer weight reduction due to glucose loss in the urine. These findings suggest that Aloe vera gel and phytosterols derived from Aloe vera gel have a long-term blood glucose level control effect and would be useful for the treatment of type 2 diabetes mellitus.

**Abstract**

We carried out three experimental trials to determine antidiabetic effects of Aloe arborescens Miller components. Firstly, ICR mice which received frequent injections of streptozotocin (Sz) in small doses (low-dose Sz-induced diabetes mice) were fed ad libitum with basal diets supplemented with components of Aloe arborescens Miller var. natalensis Berger (Kidachi aloe) and Aloe vera Linne from 31 days before to 73 days after the Sz injections. Variation in blood glucose levels, incidence rates of insulitis and blood insulin levels were examined during the trial. As a result, groups receiving diets supplemented at the rate of 2% with whole leaf of Kidachi aloe and 10 KDa fraction powder (a fraction with less than 10 KDa molecular weight derived from Kidachi aloe leaf skin juice by ultra filtration) significantly suppressed the elevation of blood sugar as compared to a control group receiving basal diet. In contrast, there was no significant effect with Aloe vera leaf pulp powder. Insulitis emerged at the rate of 87% in the basal diet group. On the contrary, the whole aloe leaf and 10 KDa fraction groups significantly decreased the incidence of insulitis and incidence rates of whole aloe leaf and 10 KDa fraction powder were 51 and 38%, respectively. While insulin levels in the basal diet group averaged at 0.05 ng, more than four times the insulin level was observed in the 10 KDa group relative to the basal diet group. Secondary, the inhibitory effects of test materials on intestinal glucose absorption were observed using the jejunum of rats. A strong inhibitory action on intestinal glucose absorption was observed in the 10 KDa fraction powder group.
Thirdly, phenol compounds derived from aloe in the blood serum and organs were quantitatively measured by a HPLC following forced administration of aloe components to rats to determine absorption kinetics of aloe components inside the body. The primary component of aloe phenol compounds is the same component of the 10 KDa fraction powder and it was found in the pancreas and liver in addition to in the blood serum. The above results indicate that fore and aft when Sz injections could cause selective toxicity to B cells of islets, the dietary administration of 10 KDa fraction powder to mice would lead to the persistence of aloe phenol compound having an antioxidant activity in the pancreas and blood, which could protect islets of Langerhans from the destruction caused by methyl radical derived from Sz. The results also suggested the possibility of the 10 KDa fraction powder to alleviate the burden of insulin secretion as it has an inhibitory action on glucose absorption in the jejunum of rats.

PMID: 16406411 [PubMed - indexed for MEDLINE]

Nerve growth factor, human skin ulcers and vascularization. Our experience.

Aloe L. Institute of Neurobiology and Molecular Medicine, National Research Council (CNR), Viale Marx 15, I-00137, Rome, Italy. aloe@in.rm.cnr.it

Abstract

Cutaneous wound is known to elicit a series of typical cellular responses that include clotting, inflammatory infiltration, reepithelialization, the formation of granulation tissue, including new blood vessel, followed by tissue remodeling and wound contraction. The regulatory molecules implicated in these events are not well known. Neurotrophins and their receptors are trophic factors that are known to play important roles in cutaneous tissues, nerve development and reconstruction after injury. Among the neurotrophins, the nerve growth factor (NGF) was one of the earliest used for clinical studies. NGF has been tested for potential therapeutic application in neuropathies of the central and peripheral nervous system and more recently in human corneal and cutaneous ulcers. Here, I present and discuss data obtained in the last few years on the healing action of NGF in human and domestic animal skin ulcers.

PMID: 14699983 [PubMed - indexed for MEDLINE]
The antidiabetic activity of aloes: preliminary clinical and experimental observations.

Ghannam N, Kingston M, Al-Meshaal IA, Tariq M, Parman NS, Woodhouse N.

Abstract
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.

PMID: 3096865 [PubMed - indexed for MEDLINE]
Promotes Colon Health


Inhibition of azoxymethane-induced aberrant crypt foci formation in rat colorectum by whole leaf Aloe arborescens Miller var. natalensis Berger.


Fujita Memorial Institute of Pharmacognosy, Fujita Health University, Hisai, Mie 514-1296, Japan.

Abstract

We examined the modifying effect of whole-leaf Aloe arborescens Miller var. natalensis Berger (designated as 'ALOE') on azoxymethane (AOM)-induced aberrant crypt foci (ACF), putative preneoplastic lesions, in the rat colorectum. Male F344 rats (4 weeks old) were fed the basal diet, or experimental diets containing 1% or 5% ALOE for 5 weeks. One week later, all rats except those in the vehicle-treated groups were injected s.c. with AOM (15 mg/kg, once weekly for 3 weeks). At 9 weeks of age, all the rats were killed, and the colorectum and liver were evaluated for ACF and cytosolic quinone reductase (QR; a phase 2 enzyme), respectively. In rats given AOM and ALOE (1% or 5% in diet) the numbers of ACF/colorectum, aberrant crypts/colorectum, aberrant crypts/focus and large ACF/colorectum were significantly decreased compared with those of rats given AOM alone (all p < 0.01). No ACF were found in rats treated without AOM. In addition, ALOE significantly increased cytosolic QR activity in the liver (p < 0.01). These results indicated that ALOE inhibited the development of AOM-induced ACF in the rat colorectum, with increased QR activity in the liver, and therefore suggested that ALOE might have a chemopreventive effect against colon carcinogenesis at least in the initiation stage.

Copyright 2001 John Wiley & Sons, Ltd.

PMID: 11746864 [PubMed - indexed for MEDLINE]

Fujita Memorial Institute of Pharmacognosy, Fujita Health University, Hisai, Mie 514-1296, Japan.

We examined the modifying effect of whole-leaf Aloe arborescens Miller var. natalensis Berger (designated as 'ALOE') on azoxymethane (AOM)-induced aberrant crypt foci (ACF), putative preneoplastic lesions, in the rat colorectum. Male F344 rats (4 weeks old) were fed the basal diet, or experimental diets containing 1% or 5% ALOE for 5 weeks. One week later, all rats except those in the vehicle-treated groups were injected s.c. with AOM (15 mg/kg, once weekly for 3 weeks). At 9 weeks of age, all the rats were killed, and the colorectum and liver were evaluated for ACF and cytosolic quinone reductase (QR; a phase 2 enzyme), respectively. In rats given AOM and ALOE (1% or 5% in diet) the numbers of ACF/colorectum, aberrant crypts/colorectum, aberrant crypts/focus and large ACF/colorectum were significantly decreased compared with those of rats given AOM alone (all p < 0.01). No ACF were found in rats treated without AOM. In addition, ALOE significantly increased cytosolic QR activity in the liver (p < 0.01). These results indicated that ALOE inhibited the development of AOM-induced ACF in the rat colorectum, with increased QR activity in the liver, and therefore suggested that ALOE might have a chemopreventive effect against colon carcinogenesis at least in the initiation stage.

Review Article: Complementary and Alternative Therapies for Inflammatory Bowel Disease  L. Langmead & D.S. Rampton  Alimentary Pharmacology & Therapeutics, 23 2006

PMID: 11746864 [PubMed - indexed for MEDLINE]

Purification & Characterization Of Two Lectins from Aloe Arborescens Miller.

Suzuki I; Saito H; Inoue S; Migita S; Takahashi T J Biochem (Tokyo) 85(1):163-71 1979 Jan

Jeffrey Bland, Ph.D.: Effect of Orally Consumed Aloe Vera Juice on Gastrointestinal Function in Normal Humans
**Promotes Heart Health**


**Prevention of atheromatous heart disease.**

*Agarwal OP*.

**Abstract**

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-paththa) 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, most benefitted, 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 untoward side effect was noted and all the five thousand patients are surviving till date.

PMID: 2864002 [PubMed - indexed for MEDLINE]


**Purification and characterization of two lectins from Aloe arborescens Mill.**

*Suzuki I, Saito H, Inoue S, Migita S, Takahashi T*.

**Abstract**

Two lectins have been isolated from leaves of Aloe arborescens Mill by salt precipitation, pH-dependent fractionation and gel filtration. One lectin (P-2) has a molecular weight of approximately 18,000, consists of two subunits (alphabeta) and contains more than 18%
by weight of neutral carbohydrate. The smaller subunit (alpha) has a molecular weight of approximately 7,500 and the larger subunit (beta) a molecular weight of approximately 10,500. The other lectin (S-1) has a molecular weight of approximately 24,000, consists of two subunits (gamma2) with a molecular weight of approximately 12,000 and contains more than 50% by weight of neutral carbohydrate. An interesting feature of the amino acid compositions of these lectins is the high proportion of acidic amino acids, such as aspartic acid and glutamic acid, and the low proportion of methionine and histidine. S-1 has a strong hemagglutinating activity. On the other hand, P-2 has not only hemagglutinating activity but also mitogenic activity on lymphocytes, precipitate-forming reactivity with serum proteins, one of which is alpha2-macroglobulin, and complement C3 activating activity via the alternate pathway.

PMID: 104986 [PubMed - indexed for MEDLINE]

Aloe vera gel alleviates cardiotoxicity in streptozocin-induced diabetes in rats.

Jain N, Vijayaraghavan R, Pant SC, Lomash V, Ali M.

Pharmacology and Toxicology Division, Defence Research and Development Establishment (DRDE), Jhansi Road Gwalior, MP, India. neetijain1@rediffmail.com

Abstract

OBJECTIVES: Persistent hyperglycaemia results in oxidative stress along with the generation of oxygen free radicals and appears to be an important factor in the production of secondary complications in diabetes. The aim of this work was to evaluate markers of oxidative stress in heart tissue along with the protective, antioxidant and antidiabetic activity of 30%Aloe vera gel in diabetic rats.

METHODS: Streptozocin was given as a single intravenous injection and 30%Aloe vera gel was given in two doses for 20 days, orally. Blood glucose, glycosylated haemoglobin, blood reduced glutathione, serum lactate dehydrogenase and serum creatine kinase levels were measured on day 21 after drug treatment. Heart rate and mean blood pressure were
recorded at the end of the study. Different biochemical variables were evaluated in the heart tissue, including thiobarbituric acid reactive substance (TBARS), reduced glutathione, superoxide dismutase and catalase in diabetic and in Aloe vera-treated diabetic rats.

**KEY FINDINGS:** In streptozocin diabetic rats, the TBARS level was increased significantly, superoxide dismutase and reduced glutathione significantly decreased, and the catalase level was significantly increased. Aloe vera 30% gel (200 mg/kg) treatment in diabetic rats reduced the increased TBARS and maintained the superoxide dismutase and catalase activity up to the normal level. Aloe vera gel increased reduced glutathione by four times in diabetic rats.

**CONCLUSIONS:** Aloe vera gel at 200 mg/kg had significant antidiabetic and cardioprotective activity.

PMID: 20723007 [PubMed - indexed for MEDLINE]
Promotes Immune System Health


Identification of optimal molecular size of modified Aloe polysaccharides with maximum immunomodulatory activity.

Im SA, Oh ST, Song S, Kim MR, Kim DS, Woo SS, Jo TH, Park YI, Lee CK.

College of Pharmacy, Chungbuk National University, Cheongju 361-763, South Korea.

Abstract

Polysaccharides isolated from the gel of Aloe species have been known to have diverse biological activities, including immunomodulatory and antitumor activities. The molecular size-immunomodulatory activity relationship of modified Aloe polysaccharide (MAP) was examined in this study. Crude MAP (G2E1) was prepared from the gel of Aloe vera that was partially digested with cellulase. Proteins in crude MAP were removed by passage through a DEAE-Sephacel column, and then the protein-free MAP (G2E1D) was further separated into three fractions, G2E1DS3 molecular weight (MW > or = 400 KDa), G2E1DS2 (5 KDa < or = MW < or = 400 KDa), G2E1DS1 (MW < or = 5 KDa), by Sephacryl column chromatography and ultrafiltration. Immunomodulatory activities of MAP preparations were examined on a mouse macrophage cell line, RAW 264.7 cells, and in ICR strain of mouse implanted with sarcoma 180 cells. We found that polysaccharides between 400 and 5 KDa exhibit the most potent macrophage-activating activity as determined by increased cytokine production, nitric oxide release, expression of surface molecules, and phagocytic activity. In accordance with the in vitro activity, polysaccharides between 400 and 5 KDa also exhibited the most potent antitumor activity in vivo.

PMID: 15652758 [PubMed - indexed for MEDLINE]
Plant lectin, ATF1011, on the tumor cell surface augments tumor-specific immunity through activation of T cells specific for the lectin.

Yoshimoto R, Kondoh N, Isawa M, Hamuro J.

Abstract

The possibility that a plant lectin as a carrier protein would specifically activate T cells, resulting in the augmentation of antitumor immunity was investigated. ATF1011, a nonmitogenic lectin for T cells purified from Aloe arborescens Mill, bound equally to normal and tumor cells. ATF1011 binding on the MM102 tumor cell surfaces augmented anti-trinitrophenyl (TNP) antibody production of murine splenocytes when the mice were primarily immunized with TNP-conjugated MM102 tumor cells. The alloreactive cytotoxic T cell response was also augmented by allostimulator cells binding ATF1011 on the cell surfaces. These augmented responses may be assumed to be mediated by the activation of helper T cells recognizing ATF1011 as a carrier protein. Killer T cells were induced against ATF1011 antigen in the H-2 restricted manner using syngeneic stimulator cells bearing ATF1011 on the cell surfaces. When this lectin was administered intralesionally into the tumors, induction of cytotoxic effector cells was demonstrated. These results suggest that intralesionally administered ATF1011 binds to the tumor cell membrane and activates T cells specific for this carrier lectin in situ, which results in the augmented induction of systemic antitumor immunity.

PMID: 3496156 [PubMed - indexed for MEDLINE]
History - Internal Uses Of Aloe Vera

Historical evidence encompassing more than 4,000 years testifies to the high regard of ancient peoples to the benefits of Aloe vera.

In the 1930’s, interest in the internal gel was enhanced when the material was found to be remarkably effective in treating radiation-induced dermatitis. Since that time, a number of external and internal uses for the internal gel of Aloe have been reported in the literature, some of which are truly remarkable. Owing to increasing anecdotal reports purporting to corroborate beneficial effects of drinking the ground, preserved, internal gel of Aloe, a number of scientific investigations have been undertaken to evaluate the validity of the anecdotal reports.

A few of the scientifically documented beneficial uses of drinking Aloe beverages will be delineated in contradistinction to untold numbers of anecdotal reports which represent subjective impressions or appraisals.

Gastrointestinal Disorder

For over 300 years the curanderos and curanderas in the Rio Grande Valley of Texas and the northern states of Mexico have recommended internal Aloe gel for “Las enfermedades del estomago y los intestinos, pero especialment para las ulceras.” (The diseases of the stomach and intestines, but especially for ulcers.) As a result of these anecdotal reports, scientific investigations have been undertaken in animal models (laboratory rats) which have shown that if Aloe gel is administered prior to the ulcer-inducing stress (immobilization), there is an 80% decrease in the number of ulcers formed compared with the control animals given saline instead of the Aloe gel. Similarly, if the Aloe gel was given after the ulcers were formed, healing was three times as fast compared to the healing in the control animals. (Galal et al, 1975)

In a second laboratory investigation, Aloe gel pretreatment was 85% effective in preventing stomach lesions, and 50% better than the controls in healing the gastric ulcerations. (Kandil and Gobran, 1979)

Additional studies showed that a common group of plant constituents, the triterpenes, including lupeol, possess ulceroprotective activity against the formation of gastric ulcerations in albino rats induced by immobilization restraint. (Gupta et al, 1981) Other investigations have shown that Aloe gel preparations contain lupeol as well as other triterpenoids. (Suga and Hirata, 1983)
Aloe gel mixed with heavy liquid petrolatum (2:1) was given to 12 patients, 7 males and 5 females, ages 24 to 84 years, with definitive x-ray evidence of duodenal ulcers. All 12 patients showed complete recovery with no recurrence for at least a year after ulcer healing. This study suffers, however, from the fact that (1) Duodenal ulcers are often self-healing without any treatment, and (2) There was no control group of patients treated in a similar manner without the administration of Aloe. Nonetheless, the physicians who conducted the study represent trained, clinically-experienced observers, and thus even these uncontrolled observations have some scientific merit. (Blitz et al, 1963)

**Atherosclerosis And Coronary Heart Disease**

Coronary heart disease associated with the accumulation of blood fats (Lipids) in the lining of the arteries is still one of the major causes of death in the Western world. Several studies in animal models as well as in human subjects have suggested that the ingestion of Aloe gel may have a beneficial effect by lowering serum cholesterol, serum triglycerides, and serum phospholipids, which, when elevated, seem to accelerate the deposition of fatty materials in the large and medium-sized arteries, including the coronary arteries of the heart.

In one study, albino laboratory rats were fed high cholesterol diets with the experimental group fed the polysaccharide (Glucomannan) from Aloe. Compared with the control animals, the group fed the Aloe fraction showed:

1. Decreased total cholesterol levels.
2. Decreased triglyceride levels.
3. Decreased phospholipid levels.
4. Decreased nonesterified fatty acid levels.
5. Increased HDL cholesterol (the “good” cholesterol) levels.
6. Markedly increased HDL/Total cholesterol ratios.

The evidence suggests that the ingestion of Aloe gel, may have a salubrious effect on fat (Lipid) metabolism which, if active in human subjects, would tend to decrease the risk of coronary artery disease in people. (Joshi and Dixit, 1986)

Monkeys given Triton, which causes marked increases in blood lipids, were divided into two groups. The first group was given Aloe, while the second group received the drug, clofibrate, which is used clinically to lower serum cholesterol and triglyceride levels. The following data show the reduction in the various parameters compared with the control animals.

Monkeys given Triton, which causes marked increases in blood lipids, were divided into two groups. The first group was given Aloe, while the second group received the drug, clofibrate, which is used clinically to lower serum cholesterol and triglyceride levels. The following data show the
reduction in the various parameters compared with the control animals.

There was a marked in the beneficial HDL/Total Cholesterol ratios. *(Bixit and Joshi, 1983)*

A third investigation was performed studying 5,000 patients who were fed the husks of a local Indian plant, isabgal, which provided fiber, and Aloe gel as a beverage. There were some remarkable effects in three important areas:

1. **Lipid Metabolism**
   a. Decreased total cholesterol.
   b. Decreased triglycerides.
   c. Increased HDL cholesterol.
   d. **Carbohydrate Metabolism**
      a. Decreased fasting blood sugar levels in diabetic patients.
      b. Decreased post-prandial (after a meal) elevation in blood sugar levels in diabetic patients.
      c. **Angina pectoris** (chest pain from insufficient delivery of oxygen to the heart.)
         a. Decreased frequency of anginal attacks.

These data in the human study suggest that the benefit from the regimen, at least in part attributable to the ingested Aloe beverage, may have salubrious effects on several systems in the body. *(Agarwal, 1985)*

### Anti-Cancer Actions

One of the common experimental cancer models is sarcoma-180. When Aloe was administered to mice bearing S-180 tumors, the tumor growth was inhibited. *(Soeda, 1969; Suzuki, 1979)*

Similarly, Alexin B, a specific molecule species derived from Aloe, was shown to possess anti-cancer activity against lymphocytic leukemia. *(Suzuki, 1979a)* Additional investigations revealed that another molecular species derived from Aloe, Aloctin-A, had anti-tumor activity, but the action was to bolster the immune system rather than a direct anti-tumor activity. *(Imanishi et al, 1981)*

### Immune System

There are several mechanisms which contribute to the immunological protection enjoyed by normal persons. Among these mechanisms the ingestion of bacteria and other potentially harmful agents by certain white blood cells (a process termed phagocytosis) and the formation of antibodies.
(formed by another group of white cells, the beta-lymphocytes) are probably the most important. Scientific evidence suggests that Aloe gel contains substances which are active both in stimulating phagocytosis as well as stimulating the formation of antibodies.

In one study, the Aloe fractions were shown to increase phagocytosis when injected into guinea pigs. (Stepanava et al, 1977) In another study, mice were injected intraperitoneally with Escherichia coli, which caused a serious infection to develop in the abdominal cavity, namely, peritonitis. Injects of materials from two species of Aloe (Aloe barteri and Aloe ferox) both stimulated phagocytic activity in the animals. (Delaveau et al, 1980) It was demonstrated that phagocytic activity was depressed in adult patients with bronchial asthma. A mixture of amino acids derived from Aloe enhanced the depressed phagocytic function of the white blood cells in these asthma patients. (Yagi et al, 1987) In an additional study when certain materials (lectins) purified from Aloe were added to human lymphocytes raised in tissue cultures, the human white cells were stimulated to produce antibodies. (Suzuki et al, 1979)

Perhaps the most remarkable studies concern the effect of Aloe fractions on the status of patients with HIV which causes AIDS. The polysaccharide fraction of Aloe was shown to exhibit antiviral activity and enhance cell function. The polysaccharide was given orally, 250 milligrams four times a day, to 8 patients with ARC (AIDS Related Complex), with Walter Reed staging from 3 to 6. Eight of eight patients showed improvement within 90 days of therapy with an average reduction of 2 Walter Reed stages. Fever and night sweats were eliminated in all patients; diarrhea was alleviated in two of three patients, and opportunistic infections (which are usually responsible for the death of the AIDS patient) were controlled or eliminated in six of eight patients. Two patients, unemployable because of the intensity of their symptoms, returned to full employment. Three of three patients showed a decline in HIV core antigen (P-24). Initially positive HIV cultures became negative in three patients. Clinical toxicity and side-effects were entirely absent. Acute toxicity studies in animals showed no toxicity whatever at dosages 100 times those used in the pilot human experiments. (McDaniel and McAnalley, 1988) These experiments however, were uncontrolled, and additional studies, utilizing appropriate scientific study design would need to be done before the data would be acceptable to the scientific community.

In plasma there are four interacting systems which serve vital protective functions. These include the following:

1. Intrinsic coagulation (blood clotting)
2. Plasminogen (prevention and dissolving of intravascular clots)
3. Kinninogen (inflammation)
4. Complement (destruction of intravascular bacteria)

The latter system, the complement system, consists of a series of proteins which require activation. When activated these proteins interact sequentially - a cascade phenomenon - and form circular, doughnut-shaped proteins, which are inserted into the surface membranes of bacteria, literally causing “holes” which permit the interior of the bacterium to become exposed to the environment, causing the death of the organism. Normally this complement system is stimulated by the presence of polysaccharides on the surface of the invading organism. Studies have shown that the
polysaccharides (glucomannans) of Aloe can perform this function. (*t’Hart et al, 1988; t’Hart et al, 1989*)

There are several additional beneficial actions of ingested Aloe presented in the literature. True, many of the anecdotal reports have been studied in animal models, giving credence to the anecdotal information. Other reported benefits in human subjects have yet to be documented by scientific investigations. A number of studies are currently underway in various laboratories across the country and in other countries as well.

Three salient points are of vital significance in providing credibility to scientific studies: (1) How are the polysaccharides handled in the digestive tract? (2) As the juice is so “dilute” is there really sufficient material absorbed to account for the reported benefits? (3) What amount of juice would be required orally, on the average, to provide a beneficial effect?

The answers are:

- The polysaccharides are not digested by the enzyme systems in the human digestive tract; these mannose-containing molecules are absorbed by endocytosis, i.e., they are taken up into the cell intact.
- Apparently, from the animal experiments, very small amounts of Aloe constituents are required to produce a beneficial effect.
- In human subjects, beneficial actions are readily apparent with the ingestion of 2 ounces twice daily.

**References**


*t’ Hart LA; van Enkevort PH; van Dijk H; Zaat R; de Silva KTD; Labadie RP: Two functionally and chemically distinct immomodulatory compounds in the gel of Aloe vera. *J Ethnopharmacol* 23: 61-71, 1988.*


Stepanova OS; Prudnik NZ; Solov’eva VP; Golovchenko GA; Svishchuk AA; Grin Erg BG; Dubkova OM: Chemical composition and biological activity of dry Aloe leaves. *Fiziol Akt Veshchestva* 9: 94-97, 1977.


