

# Clinical abstracts

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## Gastrointestinal disorders

### **Colitis & Crohn's Disease**

In 1986 there was an initial FDA sanctioned clinical pilot study for treating ulcerative colitis and Crohn's disease with Aloe mucopolysaccharides, with very encouraging results. In 1993-'94 a six center clinical study was conducted with Vanderbilt Medical Center Gastroenterology Department. The results were encouraging enough to continue with a second phase that began in 1995.

### **Preliminary Study Of Polysaccharide From Chinese Aloe (Aloe Vera Var. Chinensis) On Experimental Gastric Ulcer In Mice**

**Zhong, Zhengxian; Zhou, Guifen**

Guangxi Inst. Traditional Chinese Medicine Materia Medica

*Zhongcaoyao* (1995), 26 (2), 83

The polysaccharide from Chinese Aloe (Aloe vera var. chinensis) was effective against exptl. gastric ulcers induced by water-immersion stress, indomethacin, and ethanol in mice.

### **Anthraquinones In Aloe Vera**

**D'Amico, Maria Luisa**

*Fitoterapia* 1950 Vol 21, pp. 77-79. *Chemical Abstracts* – G.A. Bravo 1950. Vol 44, pp. 11035-11036

In 1949, G.A. Bravo, comparing anthraquinones in the human intestines to their action in Aloe vera, added barbaloin, isobarbaloin, and anthranols to the list. And the next year, Italian research scientist, Maria Louisa D'Amico, found the anthraquinones in Aloe vera to contain pronounced antibiotic properties.

## **Research - Gastric Ulcers**

**F**ujita health Institute, Japan, 1992: Physician and research scientist, Keisuke Fujita, M.D. Ph.D. 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**

**D**r. Richard Phillips, a Ph.D. in physiology and biomedical research, 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, Dr. Phillips 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, Dr. Phillips reported that the Aloe drinking gel exhibited some considerable capacity to penetrate skin tissue and alleviate pain and discomfort around bones and joints.

## **Aloe Reduction In Ulcers, Erosions & Hemorrhages In the Stomach**

In 1979, Egyptian research scientist Kandil Gobran, Ph.D. 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*

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

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 (1) 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 by Dr. Gobran. 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 restraint 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.

## Research - Doudenal Ulcers

In 1963 a study on human subjects was done by Blitz, Smith, and Gerard, 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 doudenal 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 doudenitits), 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. Dr. Blitz 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 reserach group entailed a post recovery follow-up dosage of 1 table-spoon of the Aloe emulsion a day was used, and seemed to prevent any recurrence of the doudenititis 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 Vera To Treat Gastrointestinal Problems

### Bland J

*Journal of Alterative Medicine, 1985*

Jeffrey Bland, Ph.D., formerly of the Linus Pauling Institute, reported using a concentrate of Aloe vera to treat gastrointestinal 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.”

### **Studies Of Aloe III. Mechanism Of Cathartic Effect**

**Ishil Y; Tanizawa H; Takino Y**

School Of Pharmaceutical Sciences, Univeristy Of Shizuoka

*Chem Pharm Bull Jan. 1990, 38(1) p197-200*

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<sup>+</sup>, K<sup>(+)</sup>-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 rat 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 rat large intestine.

### **Aloe Vera Controls The Amount Of Juice & Neutralizes Acidity**

Prof. Hisayuki Yazawa and his group at Shizuoka Medical College witnessed an increase in the amount of gastric juice and gastric acid discharge by use of barbaloin.

Again, Dr. Bland at Science and Medicine Inst., California testified that oral administration of Aloe vera controls the amount of juice and neutralizes acidity. He verified also that Aloe vera can balance the amount between bacteria in the digestive tracts, and help protein digestion.

## **Biotransformation Of Aloenin, A Bitter Glucoside Constituent Of Aloe Arborescens By Rats**

**Hirata T; Sakano S; Suga T**

*Experientia 37(12):1252-3 1981 Dec 15*

Aloenin has been established to be 4-methoxy-6-(2-beta-D-glucopyranosyloxy-4-hydroxy-6-methylphenyl)-2-pyrone; it shows an inhibitory activity for gastric juice secretion. Rats metabolized it to 4-methoxy-6-(2,4-dihydroxy-6-methylphenyl)-2-pyrone, 2,5-dimethyl-7-hydroxychromone and glucose, which were excreted in the feces and the urine. The distribution of the radioactivity originating from <sup>14</sup>C-labeled aloenin was studied. The tracer found in the kidney and the liver reached 60% of the amount administered 24 h after feeding and decreased rapidly in the next 24 h.

## **Effect Of A Plant Extract Combination Preparation On Gastrointestinal Transit Time & Bile Acid Excretion**

**Matzkies F; Webs B**

*Fortschr Med 101(27-28):1304-6 1983 Jul 28*

The effect of a plant extract containing Rhizoma curcumae, Fructus silybi mariani, Herba chelidonii, Aloe, Radix podophylli paltati, Radix gentianae and Cortex chinae on the evacuation of feces and on the metabolism of bile acids was investigated with 8 healthy women for a period of 14 days. In the preliminary period there was a stoolweight of 105 +/- 16 g/day. Under treatment the weight of stool rose to 422 +/- 104 g/day. Frequency of stools increased from 1.1 +/- 0.2 evacuations/day to 3.3 +/- 1.1 evacuation/day. Transit time decreased from 64 +/- 20 hours to 18 +/- 4 hours. Elimination of bile acid amounted to 549 +/- 397 mumol/day. It increased under treatment to 908 +/- 832 mumol/day. No changes were found in the laboratory blood tests. The concentration of potassium in the blood also remained constant.

## **A Double-Blind Trial Of A Celandin, Aloe Vera & Psyllium Laxative Preparation In Adult Patients With Constipation**

**Odes HS; Madar Z**

Intestinal Diseases Unit, Soroka Medical Center

*Digestion 49(2):65-71 1991*

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.

## **Biologically Active Constituents Of Leaves & Roots Of Aloe Arborescens Var. Natalensis**

**Hirata T; Suga T**

*Z Naturforsch [C], 32(9-10):731-4 1977 Sep-Oct*

Several biologically active substances, such as aloenin (1), magnesium lactate, Aloe-emodin (4), barbaloin (5), and succinic acid, were found to be contained in the leaf juice of Aloe arborescens Mill. var. natalensis Berger, which has widely been used in domestic medicines. Aloenin (1) and magnesium lactate were elucidated to exhibit an inhibitory action on the gastric juice secretion of rats. Various constituents other than the above bioactive substances were found in the leaves and the roots of the plant.

## **Effects Of Aloe Extracts, Aloctin A, On Gastric Secretion & On Experimental Gastric Lesions In Rats**

**Saito H; Imanishi K; Okabe S**

*Yakugaku Zasshi 109(5):335-9 1989 May*

Effect of aloctin A, glycoprotein isolated from leaves of Aloe arborescens MILL, on gastric secretion and on acute gastric lesions in rats were examined. Aloctin A given intravenously dose-dependently inhibited the volume of gastric juice, acid and pepsin output in pylorus-ligated rats. Aloctin A given intravenously significantly inhibited the development of Shay ulcers and indomethacin-induced gastric lesions in rats. It also inhibited water-immersion stress lesions induced in pylorus-ligated rats.

## **A Bacteriological Study**

**Shupe-Ricksecker, Kathleen**

In 1994 a biologist and assistant professor at the University of Dallas, Dr. Shupe recently undertook a series of in vitro bacteriological examinations testing various percentages of Aloe vera solutions against tissue cultures of four common pathogens – Streptococcus pyogenes, Staph aureus, Pseudomonas aeruginosa (pseudomonas) and Escherichia coli (more popularly known as E. coli). Strep pyogenes are particularly known to be present in cross-infections and side-infections from improper wound healing, as are pseudomonas. Pseudomonas aeruginosa are also present in a number of secondary urinary tract infections in men and is commonly found as a second microorganism present in prostatitis. E. coli is a potent bacteria common to the rectal cavity of every living mammal. Well behaved in that singular context, once it is released and exposed to outside air it can wreak absolute havoc especially when exposed to wounds, mucous membranes or adjacent to foodstuffs such as meat. Uncaught and untreated, E. coli can be one of the most dangerous bacteria known to medicine.

In her findings, Dr. Shupe noted that all these microorganisms were killed within twenty four hours of exposure to high levels of Aloe vera (85%). The Strep pyogenes and Staph aureus strains were virtually killed (99.5%) within the twenty four hour period. The more resistant

strains, E. Coli and pseudomonas, were killed upon an increase of Aloe percentages to 90%, and at that there was a 90% bactericidal ratio in the same period of time.

Dr. Shupe studies the germicidal effects of Aloe vera on Propionibacterium acnes (ATCC strain 6919). This is a causal agent in the formation of acne, often resulting from the introduction of a comedogenic agent such as an improper oil-base ingredient to the skin. In vitro testing with samples using various percentages of Aloe vera revealed that a 100% killing ratio against the bacteria could be achieved within that twenty four hour period.

### **Aloctin A, Active Substance Of Aloe Arborescens Miller As An Immunomodulator**

**Imanishi K**

Department Of Microbiology & Immunology, Tokyo Women's Medical College  
*Phytotherapy Research (1993) Vol 7, No. Special issue, pp. S20-S22. 15 ref.*

**A**loctin A (Alo A), an active substance isolated from the leaves of A. arborescens, has many biological and pharmacological activities, such as mitogenic activity for lymphocytes, binding of human alpha 2-macroglobulin, complement activation via the alternative pathway, anti-inflammatory activity, anti-ulcer activity and antineoplastic activity. Alo A exhibited immunomodulatory activities on the immune responses of murine and human lymphoid cells in vivo and in vitro.

### **Studies Of The Status Of Antioxidant Enzymes & Metabolites Following Burn Injury, & The Presence Of Antioxidant Enzymes In The Aloe Vera Plant (Tumor Necrosis Factor Glutathione)**

**Sabeh, Farideh**

University Of North Texas

*Dissertation Abstracts International (1995) Vol. 56, No. 12B, p. 6728*

**P**art I. The effects of skin burn injury on the levels of oxidized and reduced glutathione, malondialdehyde, and on the activities of glutathione peroxidase, glutathione S-transferase, and glutathione reductase were determined in liver and lung of rabbit models, 24-h post-burn. The data obtained are indicative of a major oxidative stress in liver and lung tissues due to burn injury at a remote site. Tumor necrosis factor (TNF), a mediator in the pathogenesis of endotoxic shock and burn injury, is associated with decreased glutathione levels. Depletion of cellular glutathione by chemical agents enhanced the release of TNF from lipopolysaccharide (LPS) - stimulated rabbit lung macrophages. Glutathione repletion of macrophages, using glutathione diesters, inhibited LPS - stimulated TNF secretion. Thus, glutathione diesters may have therapeutic value in treating endotoxic shock and burn injury.

Part II. Two antioxidative enzymes, glutathione peroxidase (GSHPx) and superoxide dismutase (SOD), which are involved in scavenging reduced oxygen species, have been purified and characterized from the Aloe vera plant. GSHPx activity was purified to homogeneity by ion exchange and gel filtration chromatography. The enzyme is apparently a tetramer with a sub-unit molecular mass of 16 kD, with one atom of selenium per subunit. The Km values are 3.2 mM for glutathione and 0.26 mM for cumene hydroperoxide. The

enzyme is competitively inhibited by N, S, bis-fluorenylmethoxy-carbonyl glutathione. Superoxide dismutases from both the gel and the rind of Aloe vera were purified by ion exchange chromatography. Seven SOD activities were detected, with identifiable differences in their relative distribution in rind and gel. Two of these contain manganese with native molecular masses of 42 and 43 kD and five others are copper/zinc SODs with molecular masses of 31-33 kD. Aloe vera SODs have high specific activities; these high activities may relate to the plant's healing properties of inflammatory disorders.

## **Purification Of Active Substances Of Aloe Arborescens Miller & Their Biological & Pharmacological Activity**

**Saito, Hiroko**

Dep. Pharm., Aichi Cancer Center

*Phytother Res. (1993) 7 (Spec. Issue, Proceedings of the International Congress of Phytotherapy, 1991), S14-S19*

The authors purified Aloctin A from Aloe arborescens Miller and defined its chem., biol. and pharmacol. activities. Aloctin A consists of two discrete bands, a and b with a combined S-S bond. Its mol. wt. for a is 7500 and the mol. wt. for b is 10,500. Aloctin A has many biol. and pharmacol. activities as follows: 1. hemagglutinating activity; 2. cytoagglutinating activity; 3. mitogenic activity of lymphocytes; 4. ppt. - forming reactivity with  $\alpha$ 2-macroglobulin; 5. complement C3 activating activity; 6. inhibition of heat-induced hemolysis of rat erythrocytes; 7. anti-tumor effect; 8. anti-inflammatory effect; 9. inhibition of gastric secretion and gastric lesions.

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