

STUDY OF THE HEALING QUALITIES OF THE ALOE VERA PLANT

The Aloe gel,
with its enzymes and amino acids,
is it a promising tumor inhibitor?

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THE HEALING PLANT

Extracts from most plants when applied to burns on skin have a healing effect, but most often start to irritate the skin after they finish up their healing potency. Aloe vera gel doesn't irritate as much; it will continue healing until it loses its potency and action. However, serial dilutions of the Aloe gel solution was found to be completely toxic to the rabbit kidney cells. That incidence has brought the uncertainty of the efficiency of the Aloe vera gel.

Aloe vera has been one of the healing plants most used and first used in the history of mankind. It is commercially available. There are other plants, however, that even surpass Aloe vera in their healing characteristics, but they unfortunately are not available on a commercial level. Such plants are: acacia, comfrey, house-leek and slippery elm for burns, and meadowsweet, rosemary and birch leaves for acne, pimples and arthritis, and sage, lady's mantle, marigold for wound healing.

In severe burns, there is normal loss of protein and amino acids from the skin and the body. This loss is counteracted by amino acids and nucleic acids. Both traditional and recent phytotherapeutic literature recommended Aloe as one of the plants that is used for wound healing promotion, which means skin regeneration, since it has a granulating and epithelializing effect. Aloe possesses wound healing and inflammation inhibition properties.

A number of pharmaceutical publications eulogize the ability of the Aloe vera gel to promote the healing of burns and other cutaneous injuries and of ulcers. The local application of the freshly split leaves of Aloe vera have been reported beneficial in the treatment of x-ray burns. After some experimental study of the Aloe leaf in cases of x-ray burns, it was found that the curative principle occurs in both the pulp and the rind of the leaf. The Aloe vera leaves were also used for the treatment of cases of dermatitis and various ulcerated conditions of the skin.

The untouched fresh gel from the leaves is more biologically effective than the aged gel. The Aloe vera gel from the leaves will lose most or all of its curative potency within two hours from the moment of extraction; however, the gel might lose its potency toward a certain case and can still be effective toward another. As the gel ages, or as the cut leaf is exposed to air and light, the color of both turns pink and proceeds to brown. If the gel is heated in air and light, it will get darker and form the medicinal Aloe resin preparation. If the gel has been exposed to air and light from one to two hours, it will not be as effective in curing some minor skin abrasions, scratches and insect stings.

We have also found from our own work with Aloe that it is effective nutritiously and medicinally if it is fresh, recently cut or extracted within two or three hours when it has not been directly heated or blanched to room temperature. One more case is when it has been refrigerated for a period not to exceed one month in a dark, non-permeable glass container. But if the gel has already been processed for stability, it will remain effective as long as it has been stabilized within three hours from the time of extraction or a maximum of eight hours from the time of cutting leaves; however, the conditions under which the leaves have been grown, cut, kept until used or processed, may change these figures completely.

OTHER MEDICINAL ALOES

Aloe vera linne or the Aloe barbadensis Miller, or the Curacao Aloe which used to be improperly called Barbados Aloe, grows in the Dutch West Indies and in the Cape area in South Africa. Aloe perryi baker or the socotrine Aloe, grows on the Island of Socotra and in the Strait of Bab-El-Mandeb in the southern part of the Red Sea.

Aloe ferox Mill hasn't been officially used. Also, the British pharmacopeia recognizes the Zanzibar aloe which grows in the Island of Zanzibar in the eastern coast of Africa.

In addition, there are many other species of Aloe that have been used such as Aloe saponaria, Aloe variegata, Aloe conifera, Aloe chinesis, Aloe spicata and Aloe mutabilis; however, Aloe barbadensis or Aloe vera is the most important industrially and commercially.

THE CLASSICAL PHARMACEUTICAL ALOE RESIN

It was used until the beginning of this century in the United States as a laxative, purgative, cathartic and for burn ointment preparations. The Aloe resin was a dark material that was prepared by boiling the gel extracted from the leaves of Aloe ferox (bitteraalwyn, native of South Africa, commercially known as Cape aloe) or Aloe vera plants. The gel was boiled until most of its water content was evaporated. The remaining dark paste has been replaced now by the stable and biocatalytical gel.

There are no laxative properties in the normal dose of Aloe gel. When the Aloe vera gel is consumed internally, its aid in elimination will increase as its fibrous polysaccharides content increases. These fibrous polysaccharides are the indigestible cellulose and hemicellulose.

Doses between 10 and 30 milligrams act as stomachic; from 60 to 200 milligrams act as laxative and from 300 to 1,000 milligrams as purgative.

Rhubarb, which is mentioned in the National Formulary, also is a vegetable drug that is as old as Aloe in the medicinal use. It is more popular in that area as a cathartic because it contains tannin which has astringent action following the cathartic action. And this will, accordingly, promote constipation.

Aloe has been used as a cathartic agent. Its cathartic action is due to stimulation of peristalsis, especially in the large intestine. In most cases, considerable gripping pain is associated with its action. It is more irritating

than the other well-known cathartic drugs, such as cascara sagrada, senna and rhubarb. As we mentioned, the action of the cathartic Aloe is largely limited to the colon. That's why Aloe is not recommended in those conditions in which it is desirable to clean out the whole alimentary system. The cathartic action of Aloe is ascribed to its content of resins, Aloe-emodin, chrysophanic acid, rhein and the other constituents that we have mentioned. And it acts on the colonic peristalsis by stimulating the nerves.

The Aloe in medicine has been used as a cathartic, but the concentrated material causes severe intestinal cramps.

Aloe and its derivatives that are used pharmaceutically can be classified as vegetable drugs. Now, as a drug Aloe is considered a cathartic because of its content of emodin. Aloe does not have an astringent action that follows the catharsis effect and accordingly, it does not promote constipation. The dry material is moderately irritating and has a tendency to cause gripping, but doesn't lose its efficiency on continued use and is especially useful in correcting constipative action of iron medication.

The Aloe vera or Aloe barbadensis Mill used to be called Curacao aloes and was obtained from the islands of Curacao; it was formerly produced on the Island of Barbados and still improperly called Barbados aloes.

The resin from Aloe vera or the barbadensis contains the aloin or the barbaloin, isobarbaloin, the aloe-emodin and also cinnamic acid.

The resin is produced by evaporating the exuded juice from the Aloe vera leaves by boiling and then it is solidified by cooling. These remaining resins are associated with the condensation of the anthraquinones, anthranols and their derivatives that are abundantly contained in the Aloe vera juice.

It was also used by veterinarians for animals as a purgative in the following dosage: for horses, the dose should be between 25 and 50 grams; for cattle, between 50 and 75 grams, for dogs, it should be between 2 and 4 grams.

GEL ANTIMICROBIAL ACTIVITY

The Aloe vera gel was investigated as to whether it exhibits antimicrobial activity. It was reported that the gelatinous gel from the aloe leaves was the only portion of the plant that exhibits antimicrobial activity against different pathogens, such as staph. aureus.

The freshly extracted juice showed a marked zone of staph. aureus inhibition; however, the unstable gel did not show any antimicrobial activity after it became dark.

The stabilized gel, though, whether it was freeze-dried or heated at 80°C for 15 minutes, showed remarkable antimicrobial inhibition.

ALOE FOR GASTROINTESTINAL ULCERS

The effects on the gastrointestinal ulcers has been studied. In comparison to other commonly used anti-ulcer active agents, Aloe showed considerably higher curative action on rats. The Aloe content that was believed to be responsible for the anti-ulcer action was named Aloe-ulcin. Aloe-ulcin was found to have a considerable inhibitory effect on the secretion of gastric juices in the stomach, the secretion that is undesirable in case of ulceration. The mechanism of that inhibition action arises from the effect of Aloe-ulcin on histamine decarboxilate. It is generally known that histamine, which stimulates the secretion of hydrochloric acid from the gastric juices, is the primary amine that is formed upon decarboxilation of the amino acid, histidine. This decarboxilation process is catalized by histamine decarboxilate.

There are contradictory claims on the bacteriostatic activity of Aloe gel and extracts, but some filed scientific reports attribute improved healing of burns to their treatment with Aloe barbadensis.

Yamamoto, from the Second Research Institute in Tokyo, has confirmed that curative effects on stomach ulcers through his experiments with Aloe-ulcin. The newly derived material, Aloe-ulcin, has no gastrointestinal irritating action. The crude Aloe powder has an elevating action on the intestinal mobility.

Soeda, a Japanese researcher, has studied the following: alomycin inactivates the exotoxin of staphylococci. Alomycin also is an anti-tumor substance and has an anti-hematolytic action which makes alomycin effective in vitro for treatment of burns. It is worthy to mention that, hemolysis is the destruction of red blood cells by an antibiotic, the process that takes place in burns.

Recent studies show that the Aloe juice even has a mild antibiotic effect.

Extracts have also been found to be effective against peptic ulcers, skin disorders, and infections in people and animals as well. Aloes have long been recognized by pharmacopoeias over the world as a purgative drug. Pharmacopoeias, such as the United States Pharmacopoeia, The National Formulary, The British Pharmacopoeia, and The International Pharmacopoeia.

ALOE, A TUMOR INHIBITOR? AN APPROACH

Enzymes and amino acids have the most important conitation with the Aloe vera gel, curative and nutritive values. (Testimonies) are reported by people with different cancer cases, that drinking the Aloe vera gel was effective in healing such cases. Until now there has been no catalytical or therapeutic evidence of the Aloe vera gel as a cure for tumors, neoplasms or cancer. Since 1920 though, amino acids/ases have been of interest and have been used either in their free forms or in diets in which they are abundant experimentally -- in curing -- or hopefully trying to find a cure for neoplastic cells.

We are discussing here the most closely related therapeutic and biological facts to the subject of amino acids and amino acids/ases in relationship to neoplastic cells or tumors and, hopefully, highlighting the aloe-cancer cure mystery that could be an existing factor.

Certain tumor cells may lack the enzymes that catalyze the synthesis of other non-essential amino acids (alanine, arginine, aspartic acid) When the circulating level of asparagine is depleted by the enzyme asparaginase treatment, tumor cells were selectively killed. Most normal cells have sufficient constituted levels of asparagine synthetase to survive asparaginase treatment.

The anti-tumor effects of asparagase therapy in animal and man led to interest in other amino acid degrading enzymes for treatment of cancer. Asparagine is an essential amino acid for the sensitive tumor cell. Under normal conditions, asparagine doesn't have to be synthesized by cells since it is readily available in the diet. Asparaginases are found in diverse sources in nature, including the fresh Aloe vera gel. It is prepared for experimental purposes from microorganisms, especially E. Coli.

Phosphate stimulates the glutaminase activity. Glutaminase and glutaminase - asparagerase enzymes - appear to have anti-tumor activity in man.

Definition of tryptophane, lysine or arginine demonstrated inconsistent results and restrictions of glutamine, glutamic acid or aspartic acid - had no effect on tumor growth. Several tryptophane analogs; however, were found to have significant anti-tumor activity.

Deprivation of selected essential amino acids for short periods of time (two to three weeks) is relatively well tolerated by the tumor-bearing host. It is to be expected that depletion of any one of the essential amino acids would inhibit growth of tumor cells. Certain amino acids, however, appear to be more critically needed for cellular proliferation, and deprivation of these may be especially deleterious to the neu-plasms.

Combination therapy with glutamine and phenylalanine antagonists have produced synergistic anti-tumor effects.

All tumors require arginine for growth. Serine and glycine are needed for growth in human leukemic cells. No suitable enzymes are available for selective depletion, for serine or glycine, several sevic anti-metabolites have been tested and appear promising.

If asperaginase depletes glycine in other sensitive tumors, this enzyme might also potentiate serine depleting enzymes or anti-metabolites by decreasing the availability of glycine for serine production. Enzyme depletion of asparagine and glutamine has anti-tumor action in animals and man.

Anti-metabolitics are available for arginine and cysteine and serine. These drugs may greatly potentiate the action of amino acid degrading enzymes by inhibition of biosynthetic pathway and alteration of pool sizes of the amino acids. Such effects on normal cells surrounding the tumors will decrease their ability to supply the amino acid to the tumor cell. Loss of this effect may make solid tumors more sensitive to therapy with amino acid degrading enzymes.

Since tumors frequently have a poorly developed blood supply compared to the normal tissues, it has been postulated that the tumor cells must possess effective means to preferentially nourish themselves. Most tumor cells are better able than normal cells to concentrate a variety of amino acids.

A functional deficiency of a specific amino acid may be achieved by:

1. Feeding tumor-bearing hosts a diet deficient in an amino acid.
2. Injecting a suitable amino acid degrading enzyme.
3. Administering an appropriate amino acid antagonist.

Diets deficient in the essential amino acids were first used in tumor control in animals more than 60 years ago.

Maintenance of tumor-bearing animals on lysine, isoleucine, valine, threonine, histidine, methionine, or phenylalanine deficient diets resulted in significant inhibition of tumor growth.

CASES WHEN ALOE SHOULDN'T BE USED AS A DRUG

It should be avoided in the inflammatory conditions of the intestine. It takes Aloe from eight to 12 hours to act after it has been ingested. There is no evidence that Aloe gel, when it is taken internally, has any effect on the pelvic organs in order to help in cases of lack of menstruation (discharging the menses), the case that is pathologically called amenorrhea. That is the reason why Aloe has been deleted from being used to treat such cases. The only exercise known about the action of Aloe on the pelvic organs is the congestion of the pelvic blood vessels.

It should be warned that in advanced pregnancy, Aloe vera extract should not be used internally. In addition, the extract should not be used on young animals either.

The actual material of the Aloe will be converted into the glycosidal form inside the intestine by its reaction with the intestinal juices. The glycosidal forms (which is the aloin) would be absorbed into the bloodstream and released again into the colon where bacteria will transfer these glycosides into emodin.

The fresh Aloe vera gel will rapidly start to lose its medicinal qualities. A fresh gel will have to be used, otherwise stabilized or lyophilized material.

The proteolytic activity of a 50% diluted sample of a stabilized Aloe vera gel has been found to be less than 10 hemoglobin units per gram.

To receive your copy of the entire Aloe Vera Technology and Industry book, send \$85 to:

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