Ancient Herb In New Form Delivers Proven Effects

By Keisuke Fujita, M.D., Ph.D.; Hidehiko Beppu, Ph.D.; Kaoru Kawai, Ph.D. & Kan Shinpo, Ph.D.
Institute of Pharmacognosy, School of Medicine, Fujita Health University - 1992

Originating along the Mediterranean coast, Aloe (Aloe arborescens Mill var. natalensis Berger) has served mankind through the ages, preventing disease in Alexander the Great's soldiers during military expeditions, curing the obstinate eczema of Chinese Tang dynasty poet, Liu Yu Xi, and treating some latter-day ills like gastric ulcers, cancer, as well as burns.

In ancient Greece Aristotle taught Alexander the Great about the efficacy of Aloe. The hero gave it to his soldiers to maintain their health on campaigns.

Liu Yu Xi recorded his experience with Aloe or "rokai" as it was known in Chinese medicine: "When I was a child, I suffered from obstinate eczema. I used various medicines, but they were ineffective. However, when I used Aloe, which a drug merchant recommended me, the eczema healed rapidly."

Our team recently assessed the effects of Aloe scientifically, using modern medical methods, and recorded its findings of Aloe's effects as an anti-inflammatory agent, gastric ulcer suppressant, blood glucose normalizer, anti-cancer treatment and Aloe's anti-inflammatory suppressant action on burn and injury aggravation.

The most common use of Aloe is to apply it to cuts and burns. Some readers may recall their grandmother picking Aloe, growing along the veranda, and applying its juice to a cut or burn, and feeling the rapid relief of pain.

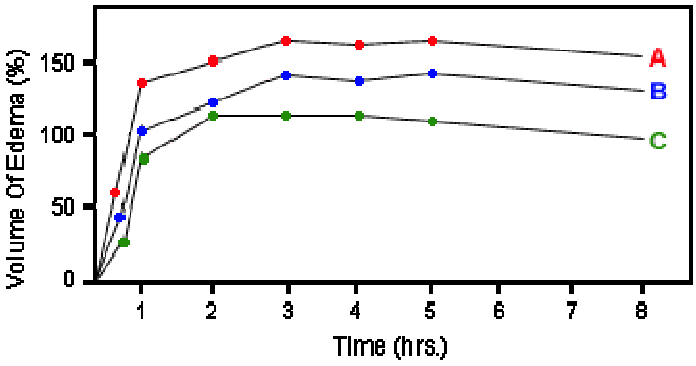
In vitro demonstrations show that extracts from Aloe degrade bradykinin, a substance responsible for pain and inflammation after injury. Carboxypeptidase is the active ingredient of Aloe which produces the anti-inflammatory action.

Figure 1 *(not shown)* shows the back of rabbits with experimentally induced burns. The left picture shows a cross-section of the rabbit's back without Aloe treatment, while the right shows the back treated with Aloe. The untreated back tissue showed progression of inflammation into the subcutaneous lipid layer. The Aloe-treated back showed inflammation only in part of the epidermis.

Burns are known to progress along the following course: pain, redness and fever, edema, necrosis and dysfunction. Aloe suppressed the burn's aggravation by suppressing the pain and edema.

Aloe is effective not only when applied topically, but also when taken orally. Oral treatment is more effective because it acts on the affected tissue via blood vessels.

Figure 2
Suppression of edema
The size of edema is larger in Group A (without oral Aloe treatment) than in Groups B and C (orally treated with Aloe).



Group A: no oral Aloe treatment
Group B: oral treatment with Aloe extracts rich in ingredients of moderate molecular weights (10,000 to 50,000)
Group C: oral treatment with Aloe extracts rich in ingredients of higher molecular weights (over 50,000)

Figure 2 shows the effect of oral Aloe treatment on rats with experimentally induced foot burns. The rats were divided into three groups: Group A (rats without oral Aloe treatment) and Groups B and C (rats orally treated with Aloe). The size of edema was smaller in Groups B and C than in Group A. If grandmother had said "chew on this piece of Aloe," your wound would have healed more rapidly than with a topical application.

Effect On Gastric Ulcers

Aloe is also known to favorably affect the stomach and intestinal track. Gastric ulcers is a very common disease in our modern stress filled world. Aloe, which suppresses gastric ulcers, can be regarded as a household medicine for people who suffer from this disease.

Simply speaking, gastric ulcers is a condition where one's own gastric juice has digested the stomach. Gastric juice, primarily containing pepsin, is secreted from the stomach to digest food. Normally, gastric juice does not digest the stomach because of a protective

layer of superficial membrane composed of neutral mucous cells shielding the gastric wall.

However, once a hole is created in this membrane due to stress or other causes, the pepsin digests the gastric wall, resulting in an ulceration.

Aloe first suppresses the action of pepsin itself, and then, a polysaccharide contained in Aloe promotes the repair of the protec-tive membrane.

Figure 3 *(not shown)* shows this effect. Gastric ulcers were experimentally induced in rats by occluding the pylorus (the exit of the stomach). If the pylorus is occluded, gastric juice cannot be eliminated from the stomach, and results in the onset of gastric ulcers. However, rats treated with Aloe did not develop gastric ulcers. Rats without oral Aloe treatment showed many gastric ulcers.

The lower two pictures show the cross section of the gastric wall. The surface of the gastric wall without oral Aloe treatment has been destroyed, and shows ulceration. The right picture shows the gastric wall in rats orally treated with Aloe.

Reduction Of Blood Glucose In Obese, Middle-Aged Diabetics

At the present time, people tend to eat excessively and get little exercise, factors that can be attributed to an increasing prevalence of diabetes mellitus. Aloe has been shown to be a highly effective treatment for diabetes.

There are two of diabetes mellitus: insulin-dependent diabetes mellitus (IDDM) and non-insulin-dependent diabetes mellitus (NIDDM).

In patients with IDDM, insulin is deficient, requiring daily insulin injection. On the other hand, NIDDM can be controlled with diet therapy without requiring insulin injections.

Obesity triggers NIDDM among people in age groups susceptible to adult diseases. Some strains of mice used to test Aloe's effect also developed NIDDM in the presence of obesity. We examined two such strains.

Figure 4 shows that in both strains of mice, Aloe injection reduced blood glucose level to a normal range (120 mg/dl) 8-12 hours after injection.

Additional studies focussed on testing Aloe's effects on IDDM induced mice.

Insulin is secreted from the beta cells of the islet of the pancreas. Treatment with streptozotocin (Sz) is known to destroy the beta cells causing diabetes mellitus. We experimentally induced IDDM in mice by Sz treatment, and then administered Aloe.

In this experiment, Aloe was given in two forms: Aloe A (superficial green-colored portion of Aloe leaf) and Aloe B (the inner white-colored fleshy portion of Aloe leaf). Both Aloe A and Aloe B reduced blood glucose level to a normal range.

Figure 4
Normalization of blood glucose level
Blood glucose level normalized in diabetic rats 8-12 hours after Aloe treatment.

Figure 5 *(not shown)* shows micrographys of the islet. In mice treated with Aloe A, the islet remained intact, and beta cells were preserved. This is probably because the active ingredient derived from the superficial Aloe leaf, protected beta cells from Sz or promoted the normalization of degenerated beta cells.

In mice treated with Aloe B, the islet and the beta cells were destroyed, resulted in the insulin-secreting dysfunction. However, these mice also showed normalization of blood glucose level. This is probably because Aloe B contains a substance which reduces blood glucose level, like insulin.

At the present time, the leading cause for blindness is diabetic retinopathy. In view of this fact, the effects of Aloe are highly promising.

Suppression Of Precancerous Lesion

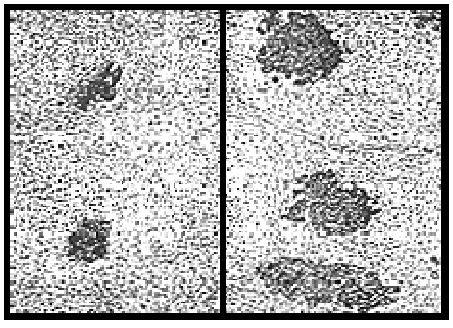
The greatest theme of 21st century medicine is to overcome cancers. Allegorically speaking, it is a military expedition, led by Alexander the Great, that continues toward the goal of defeating cancers, with Aloe a potent soldier in the expedition.

Canceration is known to involve two steps. First, an initiator acts in the genes of cells, causing mutation (precancerous lesion). Subsequently a promoter enhances the proliferation of these cells, leading to the onset of tumors. Tests showed that Aloe suppressed the formation of precancerous lesions by initiators.

If an agent called DEN is administered to rats, their liver develops precancerous lesions, the size of which was reduced by oral Aloe treatment.

Figure 6 compares the size of precancerous liver lesions (black areas) between Aloe-treated rats and untreated rats. The difference is clear.

Figure 6
Suppression of precancerous lesions
The size of precancerous lesions was reduced in the Aloe-treated group (left), when compared to the untreated group (right).



When the effect of Aloe in preventing canceration was examined by administering it before DEN treatment, Aloe appeared to have some potential for preventing canceration.

In daily life, initiators and promoters of cancer are contained in tobacco, food additives, air pollutants, scorched fish, etc. However, it is impossible to completely avoid such

foods or factors. It is, therefore, reasonable to utilize the effect of Aloe, etc., in parallel to the efforts of avoiding ingestion of such factors, for the goal of preventing cancers.

Although it is ideal to ingest raw Aloe, its bitter taste makes it difficult to take daily doses in such a form. For this reason, Aloe is often ingested in the form of heat-dried powder. However, if Aloe is heated, its active ingredients (anti-inflammatory carboxylpeptidase, and anti-ulcer glycoprotein and enzymes such as protease inhibitors) can be impaired, and be accompanied by an increase in aloin due to exposure to heat and oxygen.

Aloin is a potent laxative, but its excessive increase can aggravate gastric ulcers and diabetes. To avoid such problems, it is desirable to freeze-dry Aloe into a powder form. Freeze-dried Aloe powder was used in examining the anti-cancer effects of Aloe in rats.