

# **Aloe Vera: The Succulent With Skin-Soothing, Cell-Protecting Properties**

**Aloe vera - Steven Foster**

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For countless Americans, myself included, aloe vera was the first encounter with a medicinal herb. As teenagers in coastal Maine, my friends and I would head for the beach on a warm spring day to start renewing our suntans, and after frying our pallid winter skin, we'd rub aloe gel on each others' blistered backs.

Aloe gel is perhaps the most widely recognized herbal remedy in the United States today, used to relieve thermal burn and sunburn, promote wound healing, and moisturize and soften skin. Everyone who uses it seems convinced that it works, and its millennia of use for the same conditions support that assumption. In addition, recent research suggests that aloe gel can help stimulate the body's immune system. However, the way aloe works is not yet fully understood.

## **Background**

In the mid-1930s, researchers enthusiastically reported quick and complete healing of skin burns caused by X-rays and ultraviolet and gamma rays. The public became aware of their findings in Gertrude B. Foster's classic, *Herbs for Every Garden* (Dutton, 1966). Foster also noted that aloe was grown as a landscape plant in the tropics and as a houseplant in temperate climates. Although commercial development of aloe vera was already under way, its popularity exploded in the 1970s.

Two products in current use are derived from aloe leaves. The clear gel that forms naturally in the hollow interior of the leaf is the familiar product used to relieve burns and wounds, whereas specialized resin canal cells in the thick leaf epidermis produce a bitter yellow juice that is the source of the laxative drug aloe. Although they share certain components, these two products are distinctly different and should not be confused.

## **Aloe gel**

The conventional pharmaceutical approach to the question "How does it work?" is to determine which individual chemical component of a plant is contributing to its healing activity. This opens the door to commercial extraction and refinement--processes that can be patented. In regard to aloe, however, investigation hasn't yet provided clear-cut answers. The gel comprises more than seventy-five compounds, including polysaccharides (complex carbohydrates), steroids, organic acids, enzymes, antibiotic agents, amino acids, and minerals. One enzyme found in aloe gel has been suggested as the primary component responsible for the gel's ability to heal burns.

Since the first clinical trials of the gel in the mid-1930s, subsequent trials have

produced similar, positive results. However, evidence from those experiments and from many favorable case histories is inconclusive because much of the work suffered from poor experimental design and small test samples. Although recent, more thorough research has confirmed the likelihood of useful physiological effects, the gel's properties still haven't been ascribed to specific components. Among some of the recent findings:

- Researchers at Tokyo Women's Medical College in Japan have shown that certain lectins (a type of protein) in aloe gel may stimulate the immune system to increase production of killer cells, or naturally occurring lymphocytes that kill bacteria and tumor cells.
- Studies in Japan and the Netherlands suggest that constituents in aloe gel can enhance the workings of the immune system by containing the killer cells' lethal chemicals, preventing them from damaging healthy, functional cells.
- A research group at the University of Texas Health Science Center in San Antonio is studying the effects of aloe extracts on normal and tumor cells in humans. Although aloe probably will not emerge as a new cancer drug, such experiments provide more information on how aloe gel heals wounds and burns.
- A review of the medical literature by a group at the University of Texas in Galveston concluded that aloe gel clearly promotes wound healing and prevents progressive skin damage caused by burns and frostbite. It works by penetrating injured tissue, relieving pain, reducing inflammation, and dilating capillaries to increase blood flow to the injury.
- A review of the scientific literature on aloe shows that while many cosmetics containing aloe claim to stop the aging of skin, they actually only moisturize it, thereby temporarily diminishing blemishes. However, aloe vera extracts have the potential--as yet undemonstrated--to stimulate synthesis of collagen and elastin fibers, which could stop the degenerative skin changes associated with aging.



## Aloe as laxative

As in ancient times, drug aloe (prepared from the bitter yellow juice of the leaf) and its derivatives are used extensively today as active ingredients in commercial laxative preparations, most often in combination with other botanical laxatives such as cascara sagrada bark and senna leaves or pods. Aloe leaves are cut at the base to release the juice, which is then heated to evaporate the water. The remaining dark brown mass is drug aloe. Commercial aloin is a refined form of drug aloe that contains high concentrations of barbaloin, aloe's main laxative constituent. In Germany, concentrated extracts of dried aloe leaves are used as laxatives preceding rectal surgery and as a hemorrhoid treatment.

Despite their widespread use in commercial preparations, drug aloe and aloin are considered the least desirable of plant laxatives for home health care. Besides being extremely bitter, they produce cramping and irritation in the digestive tract. Overdose or other misuse can cause abdominal pain, gastrointestinal bleeding, or even kidney disorders. Pregnant or nursing women should not take products containing drug aloe or aloin because they stimulate the uterus (which can bring on premature labor) and because they pass readily into the mother's milk, sometimes causing gastrointestinal distress in the nursing infant.

## Using aloe

In his book *Natural Health, Natural Medicine* (Houghton Mifflin, 1990), Andrew Weil suggests that fresh aloe gel applied directly to the skin provides immediate relief for burns and general skin irritation or inflammation, and he cautions that commercial products which boast of their aloe content may not contain sufficient amounts to be effective.

The gel is prepared commercially by many methods, some of them patented or proprietary processes. Most involve pressing, but some entail solvent extraction; according to Albert Leung, a natural products chemist, properties of commercial gel products produced by solvent extraction vary greatly and generally are not the same as aloe gel squeezed from a fresh aloe leaf.

Aloe products are available in liquid and solid form. The most popular liquids are concentrates of various strengths; "spray-dried" aloe vera is the most popular solid product. Although commercial liquid concentrates are usually genuine, Leung suggests that the higher the concentration of aloe, the more degradation it has undergone. He also warns that despite claims that solid products are 200x concentrates of pure aloe gel, most contain large proportions of fillers such as acacia gum, guar gum, locust bean gum, lactose, and hydrolyzed starch.

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## Growing aloe vera

For a fresh aloe source, your best bet is that plant on the windowsill. Happily, aloe thrives on neglect, but this tropical or subtropical native can't tolerate temperatures much below 40°F. Even a light frost will reduce it to a blackened, oozing mass of dead tissue.

My plants do well in a bright window out of direct sunlight. The soil should be well drained and porous--a coarse, sandy potting soil that's not too rich seems to suit aloe best. Overwatering and poor drainage are the greatest threats to this plant.

If you leave an aloe undisturbed in a slightly oversized pot, it will soon produce suckers which, when they're a couple of inches tall, can easily be separated from the main plant and replanted. You can also cut off an overlong stalk and simply plant it in a pot. It will root readily.

The leaves can be cut with a sharp knife at the base of the plant, wrapped in cellophane, and stored for a week or two at 50° to 70°F (the refrigerator is too cold). Better yet, use the leaves fresh.

Aloe is commercially produced in the Rio Grande Valley of southern Texas, Florida, Mexico, and some of the Caribbean islands, where it has the sandy, chalky soil, good sunshine, and freedom from frost that it enjoys.

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Product quality varies greatly from brand to brand, and distinguishing good products from bad can be difficult, even for scientists. Read the label. Ingredient lists are arranged in descending order according to quantity. If aloe is listed in the middle or last, or if the product contains large amounts of the fillers listed above, you have reason to suspect that the product is not of high quality.

Aloe vera juice is considered helpful for relieving many types of gastrointestinal irritation and juice products are widely available. According to Leung, the commercial "juice" is normally produced by diluting aloe vera gel with water and adding citric acid and/or other preservatives. It is also sometimes mixed with other herbal extracts or fruit juices. Despite label claims of purity, Leung points out that the juice may contain only a very

small percentage of aloe vera gel. Dr. Weil cautions that ingesting too much aloe juice can act as an irritant laxative. He suggests taking no more than one teaspoonful at a time, and only after meals.

## Grow and heal

Few plants can claim a 4,000-year history of use for essentially the same purposes, and few are as easy to grow and use as aloe. If you are like most people, you take the plant for granted, but it's common knowledge that if you take care of your aloe plant, it will help take care of you.

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## Additional reading

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