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THE GREAT ALOE BOOK

History, botany, composition, and pharmacological aspects
of this legendary plant.

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*We dedicate this text
to Aloin and Aloe-emodin,
molecules unreasonably relegated
to the fringes of the pharmacopoeia
for reasons "unknown".
Long live these molecules.
May their popularity and success
continue to care for the health of millions of people
as they have done for thousands of years . . .*

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Introduction

What becomes immediately apparent to anyone approaching the subject of Aloe in depth are the numerous historical references available. This observation reveals a fundamental piece of important information – the therapeutic values of this plant have been known and used since ancient times.

Aloe Vera has been used for over five thousand years. Throughout history, it has been considered a magical plant, almost a panacea, capable of remedying many of mankind's ailments. Behind Aloe's humble and discreet appearance lies hidden what has been defined as a prodigy of nature because of its therapeutic values.

It is only in the last 20 years, after a series of proven research, that we can highlight the characteristics of this plant whose secrets have been hidden behind a blanket of botanical and pharmacological puzzles that only today begin to yield some answers.

In summary, what we wish to present in this brief study is an outline of Aloe's character as a therapeutic plant whose make-up is principally divided into three large groups of active constituents and nutrients.

The first group of components includes the complex sugars, called mucopolysaccharides.

These carbohydrates have a filamentous consistency similar to the elice secreted by snails.

The slimy or viscous capacity of this substance suggested its gastro-protective effect to the first researchers. In fact, mucopolysaccharides spread themselves throughout the digestive tract, preventing many of the various imbalances which can alter the structure and proper function and absorption of the digestive tract.

This extraordinary effect has distracted the scientific community from a much more important and qualifying aspect of these structured sugars: that is, their extraordinary capacity to stimulate the immune system and therefore generate strong and effective reactions to a great number of pathologies.

The second large group of active principles present in Aloe are the anthraquinones. Without expanding further on this

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subject, which will be evaluated later in the book, we will limit ourselves to outlining their laxative action, and the restorative and repairing effects of these substances that can truly be called the body's "garbage disposals".

It is important to remember that a laxative substance often carries a secondary effect which seems to know how best to eliminate that which is toxic to the body.

Finally, but of no lesser importance, is Aloe's wealth of vitamins, minerals, and general nutritional value. Each and every Aloe plant constitutes a veritable chemical synthesis factory, producing a vast range of varied elements.

The extraordinary qualitative richness of this plant, when compared to its substantial shortage of citrate components, has inopportunely caused many expert nutritionists to miss what may be considered a fundamental fact: the synergistic and homeopathic microstimulus of the plant's constituents. Modern homoeopathy teaches us that, often, the body greatly prefers microstimuli coming from synergistic microdoses of vitamins and mineral salts, rather than the typical "overdosing" which, even at the best of times, brings about dependency or overload.

The Aloe plant contains over 150 active constituents which will be analyzed and described later in this text. However, we need to remember that the role played by Aloe juice is not a strictly nutritional one, but rather more that of an "advisor" to the body, pointing out the best way to retain and synthesize all nutrients – an art in which this plant is specialized.

These three evaluations and interpretations of Aloe's therapeutic potentials constitute the greater part of this text, offering an exploration into the numerous cultural and instructive aspects of this plant, including the historical, botanical, productive, chemical, therapeutic, and medical scientific aspects. After a careful reading of this in-depth look into Aloe, the reader will find suggestions on the correct use of the products derived from this plant. In fact, despite the primary use offered by the Aloe leaves' juice, we will point out how the many products derived from Aloe can, in our own day and age, significantly improve the quality of our health.

**Aloe, an ancient plant:
important historical aspects**

1. Aloe, an ancient plant: important historical aspects

1.1 Aloe in Assyrian and Babylonian culture

The ancient Assyrian race used the juice of Sibarū (Aloe) as a remedy for the disturbing symptoms of ingestion of rancid or stale food and for intestinal gas.

Towards the end of the 19th century, a group of archaeologists, experts in the Sumerian race and their culture, identified clay tablets inscribed with cuneiform texts describing the Aloe plant. On these clay tablets, found in the city of Nippur, in what would have been the general quarters of King Assurbanipal, can be clearly read – "...these leaves resemble knife sheaves ...". This information reveals two aspects relative to modern archaeobotany. Firstly, the Assyrians knew the plant and some of its properties well and, secondly, the description demonstrates the use of the species of Aloe called *barbadensis* Miller, commonly known as Aloe Vera.

1.2 Aloe in Egyptian culture

The Egyptians called it the "plant of immortality" and placed it at the entrance of the pyramids to indicate the pathway for the dead pharaohs towards the Land of the Dead.

Precious information relative to this plant is contained in the "Papyrus of Ebers", discovered during the excavation of an Egyptian tomb in 1858 and so called after its discoverer, the German Egyptologist, George Ebers. In this papyrus is found the Aloe symbol and a detailed description pertaining to the plant, with indications for its therapeutic uses. Aloe juice formed an integral part of the ingredients used for the mummification of the dead, as in the case of Pharaoh Ramses II.

The ancient Egyptians, inventors of the first enema, used Aloe in combination with other herbs for their purging enemas. Also, the beauty of Cleopatra and Nefertiti was attributed to the use of Aloe as one of the ingredients of their regenerating and nutrient-rich milk baths.

Aloe juice was also used in numerous ways at the esoteric

level. In fact, many recipes for propitiatory potions include Aloe as the principal ingredient. Among those worthy of mention are those dedicated to the goddess Isis and the sun god Ra.

Today, in Egypt, this succulent plant is still considered a symbol of happiness and protection, especially if placed inside a house – it is thought to protect the family by absorbing the negative energies brought into the home by visitors.

It is not uncommon to find Aloe in shops or public structures. Decorated with a red bow, the Aloe plant serves to invoke love and, if decorated with a green ribbon, it is propitious in invoking the blindfolded goddess. In some rituals, it is still used for its energetic powers.

1.3 Aloe in Ancient Greece and Ancient Rome

The etymology of the word Aloe derives from the Greek “àls – alòs” (salt), because the bitter taste of the plant is reminiscent of sea water.

A folk legend tells us that, during Alexander the Great’s endeavors to expand the Persian Empire, he sought to conquer the island of Socotra under the advice of Aristotle, with the intent of gaining possession of the vast quantities of its Aloe plants and their succotrine constituent.

This small island, situated off the eastern coast of Somalia and south of the Arab peninsula, was, in fact, a fertile area for the growth of this precious plant, which was used as a healing salve for the often serious and extensive wounds suffered by Alexander’s soldiers in their long and arduous military expeditions.

There are numerous references to this plant in many books of the Holy Bible. In the Book of Psalms (45:8), for example, it is clearly stated “...the King’s robes are perfumed with Myrrh and Aloe...”. In the Gospel of John, chapter 19, verse 39: “...Nicodemus prepared a mixture of Myrrh and Aloe to prepare the body of Jesus for burial ...”.

This unguent was later given the name “Elixir of Jerusalem” and used by the templar and masonic cultures, who exalted its amazing curative and rejuvenating virtues for skin, body, and soul.

In the first century, A.D., both Dioscoredes, Greek physician to the Roman Empire, and Pliny the Elder, author of the treatise, “*Historia Naturalis*”, described the therapeutic uses

of Aloe juice to cure wounds, stomach problems, constipation, headaches, alopecia (balding), skin irritations, oral problems, and many other disturbances.

1.4 Aloe in the various Eastern cultures

Among the hundreds of Aloe species found in the world, some have larger trunks than others. These are the species that Tibetan medicine and culture uses to make therapeutic remedies and incense for meditation.

They are still used today, especially for their calming, soporific, and harmonizing effects.

To no lesser degree, Ayurvedic medicine today still uses the cortex, or skin, of the Aloe species *Aloe aquilarius agallocha* in many of its prominent preparations.

One of these formulations including Aloe, called “Agar” in Hindi or Agarú in Sanskrit, is mainly used to treat ear infections and open wounds.

Aloe is also mentioned as an aphrodisiac in the *Kamasutra*. Other mentions are found in the “*Milione*”, in which the famous Venetian, Marco Polo, describes clearly and concisely, the story and legend created around the Aloe plant with regard to its use and its widespread growth and distribution from the island of Socotra to all the Orient and in the flourishing trade routes of the mighty Chinese Empire.

1.5 Aloe in the Mayan culture and in the New World

In the Mayan culture, the *Hunpeckin-ci* (Aloe) was considered a wondrous remedy for headaches. The juice was prepared as an infusion and was taken diluted with water. The Mayan women rubbed the oozing gel from the cut leaves onto their breasts when they wanted to wean their babies off breast milk – the bitter taste from the nipple was unappetizing to the infant.

During his voyage to the New World, Christopher Columbus wrote in his diary a phrase which demonstrates the known and accepted versatility and efficacy of Aloe at that time – “*Todo esta bien, hay Aloe a bordo*”. (“All is well, there is Aloe aboard.”)

The therapeutic properties of the Aloe plant were also known to the Native Americans who made use of the *Aloe barbadensis* Miller species as an elixir for longevity and health.

In their magic rituals, witchdoctors combined the amazing curative values of this succulent plant with their magic and esoteric knowledge.

Thanks to the work of the Jesuits who spread Christianity across the seas at the end of the 16th century, these wonderful plants were imported into the Caribbean, especially to the islands of Barbados. Actually, this species of Aloe carries their name, *Aloe barbadensis*, though in the past it was named *Aloe vera* according to the botanist Linnaeus. In the 17th century, Aloe also spread across the world, thanks to the Dutch conquests of the African continent during this time, creating a flourishing herbal market, commercial stronghold of the Dutch East India Company, the great importer and exporter of special herbs and spices from around the world.

Between the 1700s and 1800s, many of the experts in the "old continent" understood the importance of this plant, thus increasing importation of Aloe, which was, by that stage, quoted and classified in the major botanical collections and had become a popularly used remedy by both the aristocracy and the newly emerging middle classes. Many English nobles created prestigious and elegant hothouses filled with these succulents, giving rise to various species of Aloe.

1.6 Aloe in the contemporary world

The first scientific study to discover the active constituents responsible for the extraordinary effects of Aloe was carried out by the English scientists Smith and Stenhouse in 1851. These two luminaries identified and named the first constituent, known today as "aloin". That rudimentary research is an integral part of the information contained in today's pharmacopoeias, describing the uses of this substance and attributing a laxative effect to it.

The extracts of Aloin and aloe-emodin are cited in the British Pharmacopoeia Codex of 1907, with indications for its use mainly as a purgative.

Aloe became a subject of further study only after 1930, in both the U.S. and Russia.

In 1935, two doctors from Maryland, Collins and Collins (father and son), published their studies on the use of *Aloe vera* in the treatment of radiodermatitis.

In the year preceding the publication, they were treating a woman with dermatitis caused by clinical x-ray therapy. Medical technology was still in its early years and the doses administered in cancerous pathologies were not well-calibrated. Therefore, side effects were expected, including extensive burns to the epithelial area covered in the treatment. The doctors knew that the gel from the Aloe leaves was used in folk medicine for treating serious sunburn and decided to try it.

With great amazement, they observed that, after only 24 hours, the intense itching suffered by the patient was greatly alleviated. After a few weeks, there was a regrowth of skin on her forehead. Five months from the onset of the Aloe treatment, the patient was dismissed from the hospital, completely recovered – something unheard of for any patient suffering from such a condition.

Encouraged by these promising results, interest in Aloe began to grow among the medical dermatologic community, followed by research and many clinical trials carried out on humans and laboratory animals.

The first real analyses oriented towards gaining a knowledge of the phytochemical content of Aloe were conducted in 1940, by Professor Tom Rowe of the University of Virginia who, through a series of studies carried out on laboratory rats exposed to radiation and their subsequent treatment with Aloe gel, understood that the curative agent was to be found in the hard part of the leaf.

In 1959, the Food and Drug Administration (FDA) of the United States Department of Health documented and definitively attested to the skin-regenerating capacity of preparations based on Aloe. This plant, heretofore left at the fringes of any pharmaceutical consideration, gained the favor of the international medical-scientific community.

Parallel studies in the USSR in 1957 came to the same conclusions as those conducted in the United States, using two different species of Aloe – *Aloe arborescens* and *Aloe striatula*. The Russian researchers found the gel to be useful in gynecological and parodontal pathologies, concluding that it reduced the healing time of cutaneous lesions caused by freeze burns, burns, and sunburn rashes by fifty percent. Other Russian studies observed that the internal section of the leaf contained numerous healing substances, including salicylic acid and cinnamic acid, respectively an analgesic

and an anti-helminthic or vermifuge.

The discovery which finally ordained this plant into the wide ethno-medical panorama came from Texan chemist Bill Coats at the end of the 1950s. Coats was able to stabilize the pulp, eliminating the undesired oxidation and fermentation problems which compromised the product's value either as an ingestible juice or a topical skin cream, thereby facilitating its commercialization worldwide. In the following decades, a great deal of research was carried out on the numerous and now well-recognized properties of this plant, a plant that can rightly be classified the "queen" of all therapeutic plants on Earth.

**Botanical system
and chemical composition**

2. Botanical system and chemical composition

2.1 Botanical classification

The botanical genus of Aloe has always been classified in the family called Liliaceae, because it germinates from an original bulb in the same way as lilies. Other plants well known to us in this family are onions, garlic, and asparagus. Tom Reynolds, a researcher from London, England, coined a new classification. In assessing the specifications and particular characteristics of the Aloe plant, he inserted it into a new botanical family, that of the Aloaceae.

Aloe is a perennial evergreen shrub with succulent leaves having flowers of an elongated tubular form varying in color according to the species, from orange to bright scarlet red, particularly spectacular and reminiscent of an autumn landscape.

The Aloaceae family contains approximately three hundred and fifty varieties of the plant throughout the planet. In South Africa alone, in 1955, a total of 132 species were catalogued! The range spanned from the miniature type like Aloe aristata and Aloe brevifolia, to one which can be defined as the most beautiful in existence in the world, the Aloe striata. Among the larger-sized Aloes, and those having a cosmetic, curative value, we can mention Aloe arborescens Miller, Aloe ferox, Aloe barbadensis Miller Vera, Aloe chinensis, Aloe saponaria, and Aloe succotrine.

A more generalized botanical distinction is achieved by observing the trunk and leaves. In this way, we can distinguish three large groups of Aloe: acauleas (without a trunk), subcauleas (visible trunk but with a reduced size), and cauleas (having a large and branched trunk).

The first group contains the plants that don't have a trunk and, if present, is very short, soft, and thick, covered by the leaves which are arranged in a rosette, rising outward from the base of the stem. Belonging to this first group are Aloe barbadensis miller, Aloe saponaria and Aloe aristata.

Belonging to the second group are aloe succotrine and Aloe chinensis. The short, woody trunk is easily visible and can

reach a foot in height.

Finally, in the third group, with a woody, branching trunk and bushy boughs reaching a height of as many as several feet, belong the species like *Aloe ferox*, *Aloe arborescens*, and the very famous and distinctive *aguiaria agallocha*.

The Aloe, which comes from Barbados, named *barbadensis* according to Miller, or *Aloe Vera* by Linnaeus, or yet still called *Aloe vulgaris* by Lamark, are one and the same botanical species. Much confusion has arisen from the added word "Vera", since Miller named Vera a species different to the one named "Vera" by Linnaeus. As a result, today we tend to accept a plant classification which is unclear, not allowing us to distinguish between the two varieties. We shall call Vera the species *barbadensis* Miller, and add the word (Vera) "Quality", to the Aloe described by Linnaeus. This is as much as has been understood from the writings of the great herbalist, Burman.

2.1.1 *Aloe barbadensis* Miller or Vera

Vera is a perennial that grows into the shape of a tuft, whose base is surrounded by a rosette of succulent and thorny-edged leaves with a spiral development. This is the characteristic that clearly distinguishes this species among all the existing species. Its structure and consistency are vaguely reminiscent of the cactus. (fig. 2.1)

Originating in Africa, *Aloe barbadensis* then spread to the Americas after the expeditions of Columbus and Vespucci. The hot, humid climate of Central America favors its growth, as well as the Caribbean archipelago to which we owe the actual denomination of *barbadensis*, from the islands of Barbados. After 1950, plants arose in the central and southern states of the United States, such as Texas, Arizona, and Florida, and extending into Mexico and throughout South America.

Aloe Vera has succulent, fleshy leaves of a mottled light green color with delicate edges sometimes punctuated with a pink hue during the winter months. Over time, the brilliant green color tends to fade to a grey green.

The plant reaches maturity after four years and has leaves with a length averaging between two and three feet and a base width from three to five inches, each leaf weighing from two to four pounds. The plant's complete life cycle

Figure 2.1 – Example of a flowering *Aloe barbadensis*, commonly called Vera.



is twelve years. It produces an average of twelve to thirty leaves. When these are cut, two or three times a year, one can observe the almost instantaneous remargining of

the “wounds” suffered from the severing of the leaves. The plant produces a protective fluid that prevents the loss of sap from the leaf.

As we previously mentioned, this variety does not have a trunk that supports the plant itself. Instead, the plant is formed like a large lanceolate-leaved bush, anchored well into the ground by an adequately developed root system.

Aloe barbadensis flowers once a year. From the center of the leafy tuft rises an erect, rigid, and woody flowered stalk which can reach a height of four to five feet. Flowering occurs during summer, with yellow colored tubular flowers growing in a raceme at the far end of the spike.

Aloe Vera propagates easily by cutting the shoots that sprout from the base of the plant.

It is important not to expose the plant to climactic extremes such as high temperatures or excessive humidity. Young plants love semi-shade, while adult plants adore full exposure to the sun. This type of Aloe requires sandy soil with good porosity.

Its leaves are very rich in gel in comparison to the external cuticle or the skin encasing it.

The predominant substance in this gel is mucopolysaccharide acemannan, a complex carbohydrate involved mainly in the processes of immune-modulation, wound healing, and anti-inflammatory reactions, all of which shall be explored in later chapters.

The aloin contained in the plant, an anthraquinone, has numerous actions, i.e., laxative, blood purifying, and diuretic. In Aloe barbadensis, the specific characteristics of barbaloin are recognizable by an ochre color and unpleasant fleshy odor.

Aloe barbadensis is the type of Aloe most used and known in the world today because its leaves give the highest yield of substances due to its size, and the ease this presents in transforming the yield into the production of a pulp, juice, and gel.

The gel is used for external purposes. The active quantity of constituents contained in this variety cannot be compared to the smaller, rarer varieties which are also more difficult to process commercially.

Aloe Vera remains, despite its limitations compared to the other varieties, an excellent therapeutic product for the human body and its health.

2.1.2 Aloe arborescens Miller

Another species of Aloe is the arborescens Miller which, like the barbadensis (Aloe Vera) species, has its origins in central-south Africa. It remains widespread in South Africa, in Asia, and, above all, in Russia and Japan.

Unlike the barbadensis Miller (Aloe Vera), Aloe arborescens Miller does not develop from a single stump. Rather, it extends along a long central woody trunk, with alternating leaves that reach a height of six to nine feet at maturity. The plant produces a chaotic bushy formation with many stems and no discernable starting root, as in the case of Aloe Vera (barbadensis Miller). (fig.2.2)

Figure 2.2 – Example of Aloe arborescens Miller in its full productive phase.



Aloe arborescens Miller is also a perennial plant with succulent lanceolate leaves, thorny borders, and a spiral formation. These leaves are grey-green in color and less fleshy, thinner, and threadlike, with a length between 20 and 24 inches and a weight of between .35 ounce and 3.5 ounces each.

Its tight, threadlike leaves have a thicker external cuticle, rendering this plant resistant to rigid climatic and environ-

mental factors. This characteristic supplies a high presence of anthraquinone elements, mainly aloin, responsible not only for its laxative effects, but also cyto-protective and anti-tumoural effects. The gel inside the leaf is proportionally less compared to the *Aloe barbadensis* Miller variety. This latter observation has unfortunately relegated *Aloe arborescens* to less popular usage even though its therapeutic properties are undisputably superior to its big sister, *Aloe barbadensis* Miller.

The yield per leaf and the manual labor involved to extract the juice derived from this plant variety has inflated the cost, making it difficult to mass market unless it is justified by a very real need for its use as a therapeutic agent.

2.1.3 *Aloe ferox*

Aloe ferox is also known as Cape Aloe, Wild Aloe, or African Aloe.

It also has its origin in sub-Saharan regions of Africa, and is widespread in India and in the tropical and subtropical American continents.

This plant extends from a central woody trunk, with alternate leaves, similar to the *Aloe arborescens* Miller species, but with a more robust constitution and chaotic bushes that

Figure 2.3 – An *Aloe ferox* plant



extend up to a height as great as 16 feet. (fig.2.3)

This species also manifests characteristics of the perennial botanical varieties, such as the fleshy consistency of its leaves and a hard, leathery foliage structure. The leaves' outer edges have dark thorns, evolve in a spiral form, are grey-green in color, with a length at maturity of between 1¾ to 2¾ feet and a weight that ranges between 3.5 to 17.5 ounces each.

The flowers, like the majority of the world's *Aloe* species, are of a tubular form, in a raceme on the upper end of a strong, woody stalk which begins at the base's leaf rosette and extends to a total height ranging from 1¾ to 2¾ feet. The plant flowers from May to August in tropical climates and from September to November in sub-tropical regions, with orange-tinged coral pink blooms.

The leaves of this variety have a consistency halfway between the *barbadensis* Miller variety and that of the *arborescens* Miller. The gel is rich in vitamins and minerals, among which iron is the most predominant. The botanical denomination *ferox* originates precisely from this latter characteristic, as Fe is the elemental symbol for ferrous or iron. Its production of mucopolysaccharides is good, but the presence of anthraquinones is very limited. For this reason, the use of *Aloe ferox* is recommended in conjunction with other varieties. Its invigorating effect with regard to anemia and symptomatology caused by menstrual problems will be discussed later in the book and are worthy of mention.

2.1.4 *Aloe chinensis*

This variety of *Aloe* is precious because it is not very widespread. Originating from China, from which we obtain its species name, it is present in various parts of the planet but in limited quantities. It is found on the coasts of Venezuela and in the Mediterranean, always in areas with sub-tropical climates. Some crops are sited in Spain, but its use is limited to the ornamental plant industry.

Obtaining quantities of juice from this variety is not feasible because of its excessive cost to produce.

The plant grows from a woody central trunk, with alternate leaves similar to those of the *arborescens* and *ferox* varieties, but smaller and more fragile, with chaotic tufts up to a foot in height. (fig.2.4)

Like the other three species we have examined, *Aloe chi-*

Figure 2.4 – Detail of *Aloe chinensis*

chinensis also exhibits the characteristics of the perennial botanical variety, such as hard, thick leaves with a fleshy consistency. These emerald green leaves are defended at their outer edges by a number of thorns and reach a length of 20 to 24 inches and a weight of .35 ounce to one ounce each at maturity.

Flowering occurs between May and August in tropical climates and from September to November in sub-tropical climates. The blooms have a coral red color with yellow tinges. Reproduction occurs from cuttings. This plant can be cultivated in a greenhouse or an apartment.

The fine, long leaves are thick, as in the case of *Aloe arborescens* Miller, and have little gel and a thick outer skin. Therefore, a predominance of anthraquinones is found in respect to the mucopolysaccharides.

Also, there is a consistent quantity of minerals and vitamins which are likewise found in the framework of the human body, such as calcium, magnesium, and potassium.

This peculiarity has made *Aloe chinensis* popular in the Chinese medicine repertoire as a plant suitable in aiding the elderly and women in menopause.

Its use is recommended in combination with at least two other varieties in order to obtain satisfying and generally targeted effects.

2.2 Physical aspect, sense organ effect, and specificity

The leaf resembles a long triangular sheaf with two external membranes which are green and leathery. Inside this tough resistant covering is the gel, which presents itself as a compact, gelatinous mass with a translucent pearly aspect.

It is common practice to liberate the pulp from the leaf's outer skin in order to extract the juice by a decortication process.

In reality, the skin contains some active constituents, some of which should be kept. These include the anthraquinones (mentioned in the introduction and which will be further elaborated in the following pages) which offer our body a good detoxifying cleanse. In the case of Aloe Vera, the presence of these substances brings about unpleasant sensations. In fact, the anthraquinones in Aloe Vera are primarily made up of barbaloin, which is distinguished by its very bitter taste and unpleasant acrid odor. These two unfavorable notes have gradually diminished the tendency for manufacturers to use even small parts of the plants' cortices.

Regarding the other three botanical varieties presented, suffice to say that the difficulties encountered in the decortication of the leaf and the bitter, yet pleasant enough, taste of the anthracine constituents have safeguarded its use.

Furthermore, the above-mentioned gel is definitely better tasting and has a lighter aroma. The latter also contains a marked dose of mucopolysaccharides (if safeguarded by production methods respectful of their delicate chemical structure) which can produce an immune-stimulating property worthy of highlighting.

The nutritional components of Aloe are equally distributed between the pulp and the cortex of the leaf.

2.3 Plantations

The Aloe plant is cultivated in many areas of the world and in climates which are hot and dry. Plantations exist in Africa, Australia, Central America, Mexico, Russia, Japan, and in southern Europe, especially in Spain. (fig.2.5) Some plantations have been started in Italy, but they are still small and few.

Unlike most of the African, South American, and Asian countries, Spain, as part of the European Community, is

Figure 2.5 – An organic plantation in the Spanish region of Andalusia.



obliged to follow stringent quality control and production procedures according to European Economic Community standards. Therefore, whatever is declared as organically produced is guaranteed by state certification. This certification process assures that Aloe comes from cultivations which are not physically and chemically exploited.

It is believed that Spain, Greece, and Israel today constitute the best areas in the world for the production and supply of organically-grown Aloe.

As a guarantee to the consumer, the producer has to declare the country of origin and the plantation's quality on the product label.

The closer the plantation is to the processing and utilization area, the higher the guarantee of the freshness and true efficacy of the gel, because it has not deteriorated from months in a ship container at temperatures which would make it impossible to keep the quality of the product intact.

The exclusive methods of cultivation, harvesting, extraction, and stabilization existing today allow us to obtain a juice the consistency of which is easily comparable to the authentic fresh leaf.

Despite the fact that the quality of the product has generally improved through the years, there are still some companies, attracted by easy profit, who think exclusively in terms

Figure 2.6 – An example of an overfarmed plantation.



of product quantity and economical production processes, bringing to market products that do not even vaguely resemble freshly squeezed juice.

The following paragraphs describe the ideal production process, giving the reader an opportunity to identify a product that comes close to the rigorous process presented.

This will enable you, as an end consumer, to enjoy the famous qualities of Aloe barbadensis Miller and the other varieties available in the market, in the most effective way, and without the possible disappointments that may result from products that do not (or cannot) guarantee those qualities.

2.4 Harvesting

Another important aspect in the evaluation of a company producing and exporting Aloe is the care it takes during the harvesting process.

The gathering of the leaves has to be done manually, leaf by leaf. A precise, quick, clean cut made at the base of the leaf ensures that the precious gel is not exposed to the open air for too long, causing irreparable oxidation before it reaches the stabilization process. (fig.2.7)

The leaves have to be delivered to the processing center in lots of no more than one ton at a time.

Figure 2.7 – A skillful cut being carried out on the Vera variety.



This center is usually situated a hundred yards from the cultivation itself.

In this way, the processing can begin within three hours from the first cutting and avoid excessive accumulation of the product, which could slow down the manufacturing pro-

Figure 2.8 – The leaves are gathered into piles containing only limited pieces.



cess and create oxidation of the plant. (fig.2.8)

Harvesting of the smaller and thinner varieties like *Aloe arborescens* Miller, *Aloe ferox*, and *Aloe chinensis* requires more attention in order to avoid any problems that may occur because of the reduced size of the leaves.

A cut made without particular care or a hurried harvesting can lead to a rapid oxidation of the leaf with dire consequences for the product quality. (fig.2.9)

Figure 2.9 – Careful slicing of one of the lesser-known varieties, *Aloe arborescens*.



2.5 Washing procedure

Once the Aloe leaves have been gathered, they are then secured, and a thorough washing of the outer surface is carried out through a detergent solution based on quaternary salts, which eliminates any bacteria. (fig.2.10)

The washing process of the smaller varieties requires more attention and a manual procedure. (fig.2.11)

2.6 Extraction, preparing the leaf for the de-aloinization process

As already stated, the aloe leaf is made up of an internal gel called "parenchyma", encased in a green covering cuticle or skin, which is tough and leathery.

Figure 2.10 – The delicate phase of washing with the quarternary salts.



Figure 2.11 – Manual washing of the lesser known varieties.



Preparation of the leaf is usually done by finely mincing the whole leaf.

The result is a dense, greenish pulp with a very bitter taste and a highly laxative effect because of the various anthraquinones present, like aloin and aloetic acid, which are found mainly in the external part of the leaf.

The elimination or extraction of these substances results in a somewhat less bitter and more palatable taste, achieved via a carbon filtering process which absorbs the undesired substances.

The generally widespread use of this procedure guarantees unparalleled speed and economy but, unfortunately, the end product does not retain the natural characteristics of a freshly minced internal gel.

For this reason, some serious-minded companies peel or decorticate the leaves by hand, one by one, following the phases illustrated (see figs.2.12–2.18), in order to avoid the damage that can be caused by the carbon filtering process. The manual decortication of the leaf is heavy and labor-intensive work, but is necessary in order to achieve a higher quality product.

By hand processing, the industrial filtering process is avoided and the active, natural ingredients of this wonderful plant are kept intact.

Figure 2.12 - Cutting the base of the leaf to allow its self-sealing action.



Figure 2.13 - The gel's first contact with the air.



Figure 2.14 - Elimination of the tips, which contain a high percentage of aloin.



Figure 2.15 - Removal of the leaf's tougher outer edges, which have a high aloin content.



Figure 2.16 - Vertical sectioning of the leaf to facilitate extraction of the gel.



Figure 2.17 - By vertically sectioning the leaves, the gel's integrity is maintained. Also, any contamination is immediately evident, facilitating quality control.

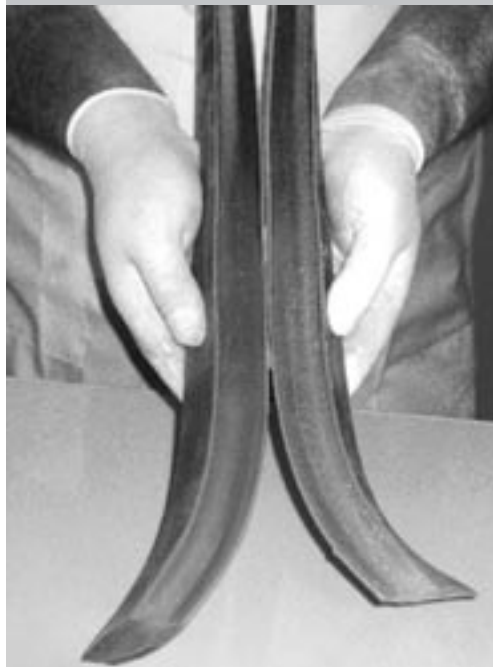


Figure 2.18 - The final phase of decortication. The leaf's internal gel fillet is now free of its outer skin and ready for the production of the juice.



The leaf's outer casing is completely peeled off, leaving the internal gel fillet free to be minced into a pulp which is both rich in nutrients and then of a more fluid consistency. The manufacturing process for the minor varieties, like *Aloe arborescens* Miller, *ferox*, and *chinensis*, avoids the decortication process and consists mainly of chopping the whole leaf. (fig.2.19)

Figure 2.19 - An example of the simple cutting procedure of one of the lesser known varieties, *Aloe arborescens*.



2.7 Stabilization

The pulp obtained through the previously described extraction process remains too thick and unstable at this point. (fig.2.20)

What manufacturers normally do at this point is introduce the enzyme cellulase into this gelatinous mass, which breaks down the gel into a juice.

Yet other producers use heat, which liquifies the gel by breaking down the bonds in the mucopolysaccharides. This heat can often reach temperatures as high as 158°F, typical of the pasteurization processes.

Sometimes the product is purposely pasteurized to ensure further stabilization and even better preservation of the product.

It is needless to say how these procedures may seriously compromise the final objective.

These procedures may help preserve the product; however, the original characteristics and nutrients are either diminished or destroyed. Years of manufacturing experience now permit a few companies to manufacture a thick Aloe pulp, avoiding the use of any form of heat or enzymes. Long and costly mechanical beating produces reasonable lique-

Pozycja 2.20 – Miąższ wydobyty w ten sposób nadaje się do sproszkowania i stabilizacji.



faction, which retains the important components of the fresh product. Moreover, stabilization by pasteurization, for reasons already mentioned, must absolutely be excluded. Only in this way can the final product be guaranteed to retain its integrity for the length of time needed to enter into the production and sales chain to the consumer.

2.8 Transportation and protection of the raw material

The last phase of production, underestimated by many, is the transportation of the raw material to the bottling plant via large containers (with a one-ton capacity), that protect the product from UVA and UVB rays. (fig.2.21)

Light can alter some of the qualities of the Aloe product; therefore these protected containers ensure that Aloe will never again come into contact with light, except for a few seconds during the bottling phase.

Pozycja 2.21 – Specjalny pojemnik, chroniący przed promieniowaniem UVA-UVB, o pojemności 1 tony.



Refrigerated transportation to the manufacturing plant that will protect the raw material is best. Normal transportation could prove deleterious to the primary product. This problem increases especially in the summer months when temperatures during transportation can reach up to 140°F and potentially cause undesired effects similar to pasteurization.

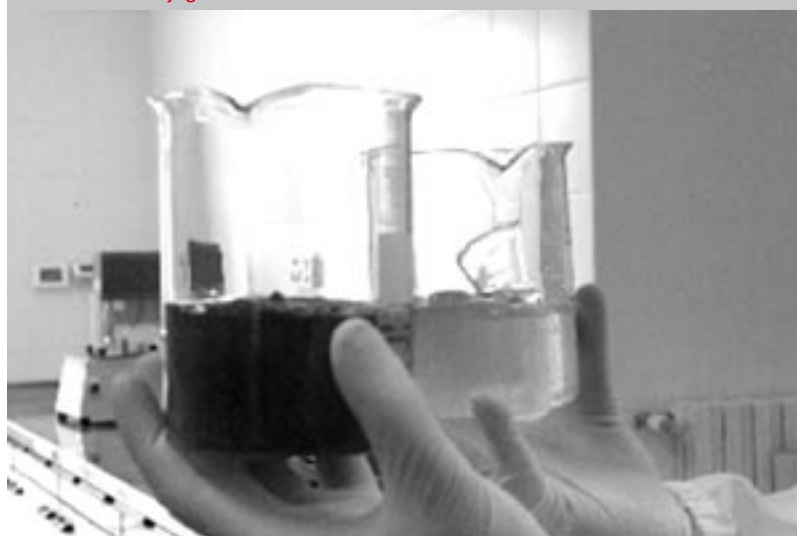
2.9 Processing of the raw material and derivatives

The material so obtained from the pulverized gel can be used in two different ways and therefore constitutes two major classes of products.

Products destined for internal use, food, and those an destined for external use, cosmetics.

The indisputable richness of this juice, as discussed later in the book, makes it a raw material among the most prized

Pozycja 2.22 – Wyraźna różnica pomiędzy czystym 100% sokiem z Aloesu i jego roztworem.



and effective existing in nature. (fig.2.22)

Aloe juice can give rise to a multitude of cosmetic derivatives, cosmeceuticals, and even pharmaceuticals, effective in caring for the human body in a complete and efficient manner.

Like all raw materials that boast a prestigious quality, Aloe has been, is, and will be put on the bandwagon by companies wanting to exploit its benefits by using small amounts of Aloe to produce low-quality products for sale. Some of these companies do not even produce the juice themselves. They buy the raw material in lots of dubious quality, offering a final product where the Aloe content can only be read either on the label or with micrometric instruments. Before choosing an Aloe-based product, it is best to check the real content of active components contained therein so

one does not have false hopes for the effectiveness of the product.

Some of the larger manufacturers who boast of pure 100% aloe juice in their catalogues may not prove a sufficient guarantee of quality either.

2.9.1 Pure gel for internal use

Aloe juice is aqueous with a viscous consistency made up of 96%-97% water. This percentage, which characterizes the world's average production, cannot be taken as a reference value in determining quality.

In fact, the cultivation's location, irrigation, and the bulb of the plant can make this variable oscillate between extremes that range from 93% – 99%.

It is enough to note that, in the late nineties, a number of South-American "good time" producers came up with the idea to over-irrigate their plantations just before harvesting, thereby obtaining a quantity of juice that was "legally" almost triple that of their harvest's normal yield and their profits!

Furthermore, the active components present in the juice, being in an aqueous solution, are unstable, giving rise to to what is known as "molecular breakdown" over time, self-reducing their quantity in the juice itself. This last piece of information enables us to understand how it is nearly impossible to state that an Aloe juice is 100% pure when such measurements are not and cannot be reliable over time.

It becomes difficult to know the best product to choose when we are confronted with information and labels that can be confusing and sometimes misleading.

Firstly, and above all, one should choose companies which have a professional image and that try hard to clearly communicate their attention to quality in a credible and reasonable manner.

Secondly, it is very important that the manufacturing companies provide a technical schedule specifying the average content of active components at the time of bottling.

The consistency of the juice should give clear indications regarding its purity. Fortunately, there are still no illegal ways to thicken Aloe juice without being caught by those who check for any such adulterations.

We believe, however, that the products coming from the European Community sources are, by far, superior to those

**99.6%
Pure gel**

coming from other areas of the world.

The reasons supporting this theory are many, but can basically be reduced to two: production control is carried out inside the E.U. and the production methodology is comparatively less corrupt than that of the North Americans or Australians, who often proceed too easily and superficially with damaging manufacturing processes, like filtering, over-irrigation, and even pasteurization, all of which lower the product's quality and effectiveness.

If the quality control of 100% pure Aloe gel is difficult to achieve and, in some cases, practically impossible, national legislation on fruit juices and vegetable derivatives does not help the current situation. This is the case of some of the Europeans and Americans who use the wording "Pure Aloe juice", while introducing only 12% of the raw material and then reaching that 100% by simply adding some good, healthy thirst-quenching water! This kind of superficiality, and the substantial gap in the legislative systems of some countries, is born from the need to resolve the productivity problems of markets in other countries. Drinks and juice concentrates present an unparalleled opportunity for most producers who avail themselves of this "legal" loophole in order to considerably reduce their costs and greatly increase their profits. Some, not content enough with this, go further; because the wording "100%" is so scarcely credible, due to the presence, always, of the obligatory 0.3-0.4% of stabilizers required by law, they write "99.6% pure juice of 100% Aloe", indicating that in that bottle there is in fact 99.6% of the 12% of real Aloe juice. All the more serious-minded companies avoid these bureaucratic games which come close to the point of fraud and of confusing the consumer by writing clearly under ingredients, "99.6% of 100% pure Aloe juice". This finally corresponds with what the consumer would expect – a good juice that closely corresponds to the freshly pulverized leaves of the Aloe plant. This is called "Just as inner leaf" or "Just as fresh leaves". Our advice is to buy products only from retailers and companies that are absolutely trustworthy. Juices made up exclusively of Aloe barbadensis Miller, called Vera, boast a percentage of active principles that, in some cases, can be less in respect to the multivariety pulps containing Aloe arborescens Miller, ferox, saponaria, chinensis, etc.

The large market in flavored Aloe juice is gradually expanding. The careful consumer believes in and prefers the pure juice which he can dilute with either water or the juice of his choice. By making dilutions with fruit juices, producers are able to present a greater selection/variety of products. Choose a trustworthy producer when opting for fruit-flavored Aloe juice products, which are cheaper and adequate for everyday family use. Check the bottle labels as a matter of course for explicit indications on the percentage of "100% pure Aloe juice" contained in the product.

2.9.2 Pure gel for external use and gelification

In the vast range of cosmetic products available, there exists a pure gel which can unarguably boast of cosmetic reparative properties.

When speaking of pure gel, it is understood to be pure 100% Aloe, simply gelified with thickeners, enabling topical use.

The properties of this composition are many, ranging from simple detergents to skin products for dermatological problems, including some serious ones. The full potential of this derived product can be seriously diminished whenever dry extracts or freeze-dried extracts lacking the properties of the fresh juice are used. The gel, applied topically on a daily basis, has a cleansing, refreshing, and regenerative action, supplying the correct contribution of vitamins, stimulating the blood supply, and guaranteeing greater oxygenation and a faster elimination of toxins. Skin becomes smoother, moisturized, and more elastic, providing a protection against free radicals and their degenerative or aging action on epithelial tissue, because of the anti-oxidant and anti-aging effects.

The use of the gel on skin and on pathologies, wounds, and problems of the dermal system, offers remarkably beneficial effects.

In the case of wounds, proteolytic enzymes "digest" waste tissue, including pus, and accelerate the regenerative phase of tissue during the healing process. The enzyme bradykinase blocks the inflammatory reactions, which are a response to the external necrotic event, and stimulate immune system defenses. Barbaloin and aloetic acid carry out an antibiotic and antibacterial action. Isobarbaloin, a

***Diluted and
flavored
juices***

cinnamic acid ester, and salicylic acid have an analgesic action. Acemannan accelerates the re-epithelialization phase: that is, the regeneration of epidermal tissues, by stimulating macrophages and increasing the production of fibroblasts and collagen.

Lastly, the scar tissue generated from the above cycle is also supported by the presence of acemannan which, together with the amino acids, vitamins, and minerals, fosters a faster and more organized healing of the tissue, without long term scars.

Those who have tried, believed in, and appreciated the extraordinary therapeutic virtues of pure Aloe gel can understand not only its value as a therapeutic ointment, but also as a cosmetic and sun screen/protectant, the property for which Aloe shines best.

2.9.3 The making of cosmetics and cosmeceutical

100% pure Aloe juice is a prime ingredient in some of the finest cosmetics in the world today. Many famous companies boast the presence of Aloe-based products in their catalogues and advertising. Though these companies have had products containing Aloe in the past, its presence is more highly valued now and worthy of inclusion on labels, as the effects of this unique plant have become well known and widespread as common knowledge to the greater general public.

Unfortunately, several years ago, some North and South American producers introduced a stabilization method that prevents the further processing of the pure juice for making cosmetics or body care products. In fact, the widespread custom of using cellulase enzyme to break down the bonds in the gel creates a precipitate of the same enzyme during the production process, resulting in a poor quality product. Many American manufacturing companies are therefore obliged to dehydrate and then rehydrate the juice during the production phase, resulting in an inferior finished product, due to the drastic reduction of its active constituents. We believe that a high-quality cream made with pure 100% Aloe juice can be considered one of the best cosmetics available.

The last few years has seen an explosion in the cosmetics industry and, above all, in those based on Aloe. This uncontrolled phenomenon has given market share to many products which have a low content of active principles but are unable to meet expectations.

Carefully look for, and experiment with, a real Aloe-based cream, perhaps one based on the pulp of several varieties. You will soon forget past disappointments and understand the extraordinary effect of the active constituents of this plant, and how the hundreds of substances it is gifted with can be useful to the care and beauty of our skin.

A serious line of sun protection products based on Aloe simply has no competition. A deeper explanation of the extraordinary filtering, protective, and skin repairing effects of Aloe will be discussed in paragraph 4.8.35: Sunburns.

**Repair creams
and UV
protection**

Aloe is an excellent base ingredient for the creation of shampoo, especially invaluable in resolving hair problems.

Aloe juice possesses several substances and a particular characteristic which makes it useful in stopping hair loss – its acidity or, rather, its pH. Aloe has a pH of 6, weakly acidic and very close to the pH of skin, which has a pH of around 5.5 which allows easy penetration of the scalp's corneal stratum and, together with Aloe's nutrients, revitalize the hair's bulb or follicle, strengthening it and promoting hair regrowth. The scalp acts as the hair's protection from external assaults, a reason why more people are turning to treatments based on Aloe. The solution proposed is a valid one which nourishes the epidermis that hosts the hair itself, supplying the best revitalizing compounds. Dandruff, for example, is caused by liver problems, stress, or perhaps poor diet. Inositol and threonine carry out a lipotropic action, thereby improving liver function.

Digestive enzymes help digestion, no longer overworked, and other substances add to the reconstitution of the tissues of the scalp. The anti-fungal action of various active principles contained in Aloe juice is useful for curative purposes as well, as in the case of seborrheic eczema, where noteworthy results are obtained and supported by accredited research.

Shampoo

Bathfoam

A bathfoam based on Aloe is a superior cleanser, leaving a protective film on the skin (owed to the presence of acemannan) which prevents the invasion of dirt for an extended period and gives it a pleasant "fresh and clean" sensation.

Products for bedsores

Long-term or elderly hospital patients, confined to static positions for weeks at a time, can develop problems with blood circulation in the bodily regions which get little movement. Stroke victims who become bedridden are one example. Bedsores are inflamed areas affecting the part of the body being compressed by the body's weight and the subsequent diminished blood supply to the area involved. This can create purulent canker sores which "corrode" the tissues. These sores can extend and deteriorate into a general inflammation and blood infection called septicemia. Modern research on Aloe for the resolution or the containment of such a heartfelt problem demonstrates potential for Aloe in this field, making us hope for the future creation of effective products in this area.

2.9.4 Ophthalmological products

The delicate equilibrium of the eyes should be protected and safeguarded with the use of Aloe juice. An eye lotion based on Aloe is, without a doubt, an optimum choice guaranteeing properties that cannot be compared with other solutions. The technical and bureaucratic difficulties in making this eye solution have reduced the number of manufacturers of such products to only a few. A further look into an Aloe-based eye solution will acquaint you with a product that has many "pluses" compared to currently well-known products.

2.9.5 Food supplements derived from the dried extract

Although supplements made from the dried or freeze-dried extract of Aloe cannot guarantee the same properties as the 100% pure juice, this user-friendly form is growing to dizzying proportions. Unfortunately, the mucopolysaccharides contained in Aloe are responsible for at least 50% of its properties and have a very complex molecular structure which, thanks to the presence of water, is typically filamentous and viscous. The dehydration process of the compound com-

promises it by making these immune-modulating sugars degrade to simple polysaccharides or, worse, by turning them into simple sugars. The dried extracts are more suitable for those wishing a metabolically rebalancing quantity of nutritional vitamins and minerals with a positive effect.

2.9.6 Dental products

Dental preparations containing Aloe are also found commercially, being optimal aids for the stomatologist. These products, in fact, form a subtle protective layer that alleviates pain and quickly heals lesions in the oral cavity, such as stomas, various mouth diseases, and wounds derived from periodontal intervention.

2.10 The chemistry of Aloe

This plant, known and used by people of numerous cultures throughout the centuries, has now reached us intact with the curative potential which was historically obscured behind an air of intrigue and mysticism.

Knowledge of the several components and the specific chemical, physical, botanical, and biochemical characteristics are now being revealed, since the in-depth studies and instrumental analyses carried out by Prof. T.D. Rowe and his staff of researchers who, in 1941, described his findings in a speech to the scientific world.

In the many years that followed, armies of analysts and scientists ventured into the microscopic world to understand the secrets that this magnificent plant continues to guard fiercely between its thick, leathery leaves protected by prickly thorns. Numerous works were created and much research was carried out, reaching an apex between the 1980s and the 1990s.

These years provided a map of Aloe's major constituent substances and initiated a series of studies in the medical science field in a more precise manner and with pharmacological substantiation. Aloe is made up of a vast range of compounds which can be divided into three large groups. The first group, complex sugars (among which acemannan stands out), are inside the leaf's gel and have an immune-stimulating action. Next are the anthraquinones, contained in the outermost part of the skin, with a strong laxative action. Last of all are several substances with a wide array of

actions: nutritive, anti-inflammatory, antifungal, mineral, vitamin, analgesic, essential, non-essential, and semi-essential amino acids, organic acids, phospholipids, enzymes, lignine, and saponine. The following pages represent a brief description of the chemical, physical, botanical, and biochemical characteristics of each component.

2.10.1 The great world of sugars

The saccharide group makes up most of the organic substances existing in the world, is the significant component of nutrition, and supplies an energy-producing action. Also called carbohydrates, the saccharides are present in plants where its synthesis occurs via the well-known reaction of chlorophyll synthesis or photosynthesis.

The simple molecules water, carbon dioxide, and chlorophyll, are present in the green part of the plant and are converted by solar energy into chemical energy, producing sugars and gaseous oxygen, which is then liberated into the atmosphere. Aloe has two sugary elements, glucose and mannose, which are monosaccharides (simple molecules), and acemannan and cellulose, which are polysaccharides (complex molecules).

From the above, we can understand how important the saccharides are from the moment they are synthesized. Made up of carbon and hydrogen, these sugars have two characteristic functional groups beyond the hydroxyl group they have in common. One is ketonic, and so names its ketones. The other is aldehydic, from which are named the aldoses. The polyhydroxyl ketones and the polyhydroxyl aldehydes with three, four, five, six, or more carbon atoms, form the so-called monosaccharides which then take the name of trioses, tetroses, pentoses, hexoses, etc. These cannot break down into smaller molecules but, on the contrary, many monosaccharides can join to form disaccharides, oligosaccharides or polysaccharides, according to the number of monomers they contain.

Glucose has the singular action of producing energy. Cellular metabolism depends on it for survival and duplication. Glucose supplies the energy necessary during the healing process, and is easily digested and absorbed with a rapid availability to metabolic processes.

Glucose is a monosaccharide "par excellence", made up of six carbon atoms with a functional aldehyde called an aldehydohexose with a molecular weight of 116 a.m.u. It has an important biological role, because it is a basic constituent of many oligo- and polysaccharides. It has a dextrous rotatory action of $+53^\circ$. The rotatory force is a physical characteristic of some substances, especially organic ones, causing a rotatory clockwise or counterclockwise action of the band of light passed through it. Glucose also forms part of the glycosides, the union of a monosaccharide with a molecule from a non-sugar functional group. The glycosides are very important

**Mono-
saccharides**
Glucose

in the plant kingdom, because they possess several pharmacological properties. These compounds starting with a glucose molecule are called glucosides.

Like the preceding monosaccharide, the mannose present in Aloe has a role in supplying energy to the rehabilitation processes of the body.

A monosaccharide, numerically an aldehydohexose, also has an important biological role as a constituent of the oligo- and polysaccharides. It has the same basic formula as glucose; that is, it has the same number of carbon and hydrogen atoms as glucose, but is structured differently. Its molecular weight is also 116 a.m.u. However, it differs from glucose in that its atoms are arranged differently. Mannose is a stereoisomer of glucose. In organic chemistry, when one is faced with two molecules which are the same yet are mirror images and cannot be superimposed, while having different characteristics in their physical chemistry, this type of molecule is said to be a stereoisomer. Mannose has a dextrous rotatory force of $+14^\circ$. Like glucose, it can bond with a non-sugar functional group, forming one of the most active pharmacological compounds.

Aloe has attained widespread recognition mainly due to its rich gel containing complex sugars, polysaccharides, formed by the bonding of two or more monosaccharides. These polysaccharides are important in the cosmetic and pharmaceutical industries because of their many properties. Polysaccharides are also called glucomannans since their long chains are made up of two monomers, glucose and mannitolose, repeating themselves hundreds and thousands of times. Of the two monosaccharides, the one which undoubtedly prevails is mannose. The glucomannans possess several interesting peculiarities, such as their ability to be entirely and easily absorbed through the intestinal mucosa without its chains being modified in the slightest way. Their stringy or filamentous consistency acts as an excellent coating for the whole digestive system mucosa, guaranteeing it a protection from hyperacidity and/or the presence of bacteria and other invasive organisms. All of this is defined as "the gastroprotective effect of the mucopolysaccharides in Aloe gel". This makes us understand how, by the same yardstick as amino acids and fats, the polysaccharides are biologically active only in long-chained structures.

Another characteristic specific to the polysaccharides contained in Aloe is the water retention function. The leaves keep their ability to hold moisture intact over time, especially since the Aloe plant has had to adapt to adverse and arid climates as part of its natural development.

These same complex carbohydrates "hold" the water between

Mannose

**Poly-
saccharides**
*Glucomannans
or mucopolysaccharides*

*Carrysin or
Acemannan*

their long chains which are present in the sap of the Aloe gel. Aloe sap has substances similar to hyaluronic acid, which act like a moisture shield on the skin, called glucomannans. When Aloe gel is applied to the skin, the long-chained mucopolysaccharides become polymerized and form a thin semi-permeable film that produces a hydrating effect, leaving the skin with a soft and delicate sensation. Their function goes well beyond that of a cosmetic one. In fact, mucopolysaccharides can activate the non-specific immune defense system, the macrophages – cells which have a phagocytic activity, catching and “swallowing” the toxins and damaging waste products in our bodies into its own cytoplasm and then digesting them.

The forefather of glucomannan is beta – (1,4) – acetyl-polymannose, better known as the acemannan in Aloe gel, and is made up of 97% water, 0.7% solids, a mix of simple sugars, and polysaccharides with varied chain lengths and of varying molecular weight. The longer chained polysaccharides, including from 10,000 to 20,000 monomere units of glucose and mannose, are called mucopolysaccharides. This denomination derives from the fact that, being water bound, they develop a viscous form similar to mucilages.

As mentioned in the preceding paragraph, acemannan is a forefather of the very long chained complex carbohydrates, the mucopolysaccharides, and the most well-represented among them. Acemannan is biologically active in both humans and animals, and is absorbed through the intestine unchanged by digestion. It holds moisture in the fresh, live leaf and brings the same function to skin treated with its gel, thereby favoring a very moisturizing and softening effect on the skin. This effect is obtained thanks to the numerous hydrocarbon chains of the hydroxylic groups, which have the ability to form tight hydrogen bonds with the water coming out of the hair bulbs during perspiration, thereby preventing its loss. Immersed in water, acemannan becomes viscous in water in the same way as mucilage. The recent research carried out in the United States by Dr. Pittman is interesting and supports in its testimony what has just been stated. He states that acemannan carries out important activities in the human body, principally on the gastrointestinal and immune systems, two systems which are interdependent. This mucopolysaccharide deals with the damaging processes of the body by acting as an immune stimulant, principally by stimulating the production of T lymphocytes and macrophages from the thymus and the

beta cells of the pancreas. Acemannan has bactericidal and germicidal actions as well as an antifungal action that combats intestinal Candidiasis. This special mucopolysaccharide also guarantees protection to the spine marrow against toxic agents used in medicine, such as AZT which inhibits the duplication of the HIV virus. A common denominator in all the beneficial actions of acemannan is the ability to coat and permeate all the gastrointestinal surfaces, increasing the fluidity and the permeability of these membranes. In this way, it allows the easy expulsion of toxins and an even faster absorption of nutritive factors. This stops the immune system from intervening in internal digestive support, which could cause its compromise, and saves the immune defenses for where they may be really needed.

The chemical name of acemannan is defined as beta-(1,4)-acetylpolymannose, because it contains a long chain polymer made up of glucose and mannose, and reaches a molecular weight of about 18,000 to 20,000 units of molecular mass.

Cellulose is part of the rigid structure of the Aloe stem and the outer part of the leaf. The fiber support provided by Aloe-based preparations is important and necessary in maintaining clean intestinal villi and in producing consistent and hydrated or moist stools.

The color of this polysaccharide is white, with a fibrous structure, and it is a component of plant cell walls. It is used to produce paper, explosives, paints, plastic wrapping, and artificial parchment/film/skin. Together with lignin, cellulose is responsible for the characteristic rigidity of trees. It is a polymer made up of dimeric units of cellobiose disaccharide coming from a glucose monomer. In the long chains thus formed from cellulose are present from 3,000 to over 20,000 units of glucose.

2.10.2 The world of anthraquinone products

The anthraquinones are a vast group of substances very widespread in the plant kingdom, possessing a wide range of pharmacological properties, both curative and toxic.

The exact mechanism for this substance's ability to have indirect and yet potent effects on the body is not yet known. What is clear, however, is that these substances regulate intrinsic intestinal motility (i.e., not due to the sympathetic or parasympathetic nervous systems, but due to the stimulation of intestinal plexuses, with a subsequent increase of peristalsis and, hence, a laxative action).

This strong purging action is closely related to the chemical structure of the molecule. In fact, the anthraquinones present

Cellulose

in Aloe are many and the effects differ slightly between them. They include aloe-emodin, aloetic acid, anthranol, crysophanic acid, an ester of cinnamic acid, and resistannol.

The typical bitter taste of Aloe is due to these compounds. Their effect on the body is slow, taking between six and twenty-four hours.

Botanically, the anthraquinones are found in high concentrations in the sap that runs through the trunk of the plant, with a smaller amount of sap evidenced in the outer layer of the cuticle or skin of the Aloe leaves. Similar anthraquinone substances have been found in Senna, Rhubarb, Cascara, and in Polyganum cuspidatum plants, all of which have a laxative and digestive use in the herbal pharmacopoeia. Anthraquinones in fresh plants are in a reduced form called anthranols. When these anthranols go through the drying process, the drug quickly converts and is reduced to an oxidized state. This transformation from anthranols to anthraquinones is very important to our health. Indeed, the oxidized form of these compounds is irritating to the intestinal mucosa to a lesser extent than the reduced form, to the point of not bringing about the strong colic or gripping that hits the heavy users of the whole plant juice.

Prolonged use of plants containing these drugs can eventually cause lack of colon tone. Excessive doses cause diarrhea with imbalances in intestinal absorption of food or nutritional malabsorption, and electrolyte imbalances. These substances are, therefore, not recommended for people with hemorrhoids and pregnant women, exactly because of the strong peristalsis which can occur in the lower abdomen.

In few words, this is the reason why it is good practice to produce Aloe juice by first extracting the anthraquinones potentially present when the decortication process has not been carried out. Though the potency of these substances means we must be careful and prudent in their use, we also need to be aware of their extraordinary curative capacity, and above all, their clever way of being able to "advise" the body on the most ideal way to cleanse itself of impurities or waste matter. In order to avoid the loss of this important effect, it is best that the anthraquinones of the juice not be removed, but allowed to remain in the right amounts determined by experts in the industry. Again, we restate how carbon filtering of the gel does not allow a single molecule

of anthraquinone to be left in the final product, resulting in a marked disadvantage to the consumer.

Make sure, before buying Aloe juice, that it has not been carbon filtered. In fact, according to recent research findings, aloins in an isolated form destroy the herpes and influenza viruses by deactivating the protein membrane (coating shell) of the virus. Other studies support the therapeutic use of anthraquinones by emphasizing their numerous antibacterial properties, presenting data of strong, rapid and effective results in treating viral and bacterial pathologies. Recently, research has been carried out to determine if aloin induces cytotoxic activity, and some of the compounds showed positive results. It is these very results that instigated research in many cancer centers in an attempt to find anti-tumoral action in the anthraquinones. Among the many researchers, we wish to highlight the work of Professor Palu of the University of Padua in Italy, who demonstrated the marked anti-cancer effect of aloe-emodin on a young tumor. More on this will be discussed in the following chapters. The anthraquinones are part of the aromatic polynuclear hydrocarbons and originate from two main substances: anthracene and phenanthrene. In their structure, comprised of three joined benzene rings, eventual substitutions preferentially occupy positions 9 and 10, which are the most chemically active.

The specific properties of aloetic acid are not yet fully known, but it seems to act as a natural antibiotic, especially if synergistically combined with barbaloin, isobarbaloin, and aloe-emodin.

This hydroxymethylanthraquinone comes from the division of aloe-emodin in acid and a simple sugar.

The cinnamic acid present in Aloe has an antiseptic and germicidal action. In "Aloe Vera: Nature's Legendary Healer", author Greg Henderson states that pure Aloe juice is effective against organisms such as salmonella, streptococci, staphylococci, and can even destroy the helicobacter pylori bacteria that cause peptic ulcers. According to the author "this is due to the combined antibiotic, bacteriocidal and germicidal actions of aloin, aloe-emodin and cinnamic acid". This acid also has a role in inflammatory processes, producing an anesthetic and analgesic effect with an added

Aloetic acid

Cinnamic acid

Chrysophanic acid

sun protection providing a shield via its UVB ray reflective substances. Similar effects are found in several substances in nature, such as camphor, cumarin, gallic acid, and salicylates. Lastly, this acid has a strong detergent action because its molecular structure is very similar to a saponin. This explains why cinnamic acid is present throughout the cosmetics industry and in anesthetic medicine.

Cinnamic acid is an organic acid whose identifying formula is R-COOH, where R is a radical made up of long and short chained carbons of varying complexity. In this case, the radical is a modified anthracenic compound. The radical -COOH represents the group that gives the compound its main characteristic, which, in this case, is an acid. We find this under the form of a resin like styracine, or in aromatic spices like cinnamon.

Chrysophanic acid is an organic acid which, like cinnamic acid, has an anthraquinoid radical. Its properties are similar to those described for the anthraquinones. It is a good purifying agent, laxative, diuretic, and it stimulates bile secretion. Its strong, bitter taste gives it a tonic and digestive effect. In fact, we find it together with isomethylanthraquinone, a principle which is also in rhubarb, famous for its digestive properties. The chrysophanic acid present in Aloe also functions as a fungicidal, especially in the intestine.

Salicylic acid

Salicylic acid forms part of the organic chemical compounds called hydroxylacids because they possess both an hydroxyl and a carboxyl component, similar to lactic acid and malic acid. While salicylic acid is present in several woody plants like the weeping willow tree, lactic acid is also present in yogurt and in muscle tissue, and malic acid is present in fruit. Salicylic acid is the principal component of aspirin and its salts, the salicylates, are used as analgesics and anti-rheumatics in the pharmaceutical industry. In Aloe juice, salicylic acid functions as an antiseptic, anti-bacterial, and an anti-inflammatory.

Aloe-emodin

Aloe-emodin is a molecule present in the yellow exuded matter, rich in anthraquinones, found in the lining or under the cuticle of the Aloe leaf. It possesses bacteriocidal and laxative properties and can boast a marked anti-tumoral effect, especially in pre-cancerous and cancerous cells of ectodermic tissues, as is being demonstrated in some of the recent research. This much has been gained from recent studies, conducted by Profesor Palu of the University

of Padua in Italy. Professor Palu studied the aloe-emodin molecule to the extent that he and his university staff were able to patent its effects.

Aloe-emodin's chemical description is that of a methoxyanthraquinone derived from the splitting of aloin to form a simple sugar called arabinose and a composite called anthracene.

Aloin is an active principle exclusive to the Aloe plant and made up of anthraquinone glycosides. Aloin is the conventional name given to molecules which most represent this class of compounds. If this compound is derived from the barbadensis variety, there is a predominance of barbaloin. Likewise, if we look at the succotrine variety, then socotrine dominates among the glycosides.

Its therapeutic effects are summed up as purging, detoxifying, and markedly antibiotic.

Its chemical composition and physical properties are similar to one another and vary according to the source from which they are derived. Pure barbaloin is a crystalline solid made up of small needles prismatically colored, varying from yellow to a yellow-brown and the odor may vary from none to the typical green plant smell, with a decisively bitter taste. The two aloins are distinguished from each other by the differences present in some of their chemical and physical properties, and are recognized by whether they are soluble in water, alcohol, ether, or in inorganic acids.

Isobarbaloin possesses a marked analgesic effect and acts as a natural antibiotic.

Isobarbaloin is also part of the anthrocyanic glycosides. It is specifically a geometric isomer of aloin, meaning that it has the same molecular weight as aloin, but with differently arranged atoms. They are therefore slightly different in their physical and chemical characteristics.

2.10.3 The world of nutrient constituents

Despite the fact that the Aloe plant's original place of cultivation categorically determines its mineral content, one can say that this succulent plant is so rich in minerals (in most cases over twenty different ones) that there is little cause for concern. This attribute gives Aloe juice properties comparable to the most modern of multivitamin and mineral supplements, something which is very rare indeed.

These inorganic chemical elements without carbon have a role in many biological and physiological processes.

In reality, mineral deficiencies are much more prevalent than vitamin deficiencies, mainly striking the elderly, pregnant women, people who follow low calorie diets, and people who

Aloin or barbaloin or socoloin**Isobarbaloin****Mineral salts**

Iron is indispensable to our cellular metabolism and, in a broader way, the correct functioning of our body. In fact, hemoglobin, which transports oxygen throughout our body, contains it.

The regular intake of iron helps to prevent anemic states in individuals at risk, such as the elderly, pregnant women, or women with an irregular menstrual cycle.

Iron is an essential constituent of hemoglobin, the element responsible for the transportation of oxygen giving it its color – red if oxygenated, blueish in cyanotic states.

Its deficiency causes a pathology called sideropenic anemias, with its classic symptoms of facial pallor, muscular fatigue, difficulty in concentrating, forgetfulness, and palpitations, all derived from the fact that the hemoglobin present is no longer able to transport enough oxygen necessary for normal metabolic processes.

Therefore, there is an indirect decrease in available oxygen, the primary energy source to the cytoplasm inside the mitochondria. Iron deficiency often affects women in pregnancy, or during the menstrual cycle, adolescents, and growing children.

With regard to iron abuse, it should be pointed out that the recommended daily dose (RDA) should not be exceeded, as it could lead to genetic mutations, arteriosclerotic plaques, and tumors, because of its excessive oxidizing effect. Exceeding the recommended dose may also compromise the biological availability of Vitamin E (tocopherol), in that ferric chloride inhibits it.

Together with Calcium, phosphorus has a role in the formation and maintenance of bone tissue in the body.

Phosphorus is an element of primary importance to our metabolism. In the phosphate form, phosphorus is one of the principal components involved in bone remineralization. In the phospholipid form, it is a principal component of cell membranes.

Phosphorus deficiency is rare. This mineral is present in many foods such as meat, fish, milk and other dairy products, vegetables, and eggs. A deficiency is mainly suffered by alcoholics, severely malnourished individuals, and patients who take high doses of antacid drugs, usually prescribed for heartburn and peptic ulcers.

Actually, these preparations contain magnesium and aluminium which bind easily with phosphates and inhibit their absorption. For these patients, supplementation with phosphorus creates a sense of well-being with increased energy and vitality. In homoeopathic medicine, phosphorus is used in the form of potassium phosphate, in cases of psychic fatigue and in nervous exhaustion or nervous breakdown.

In these cases, a good fortifying tonic may also be necessary.

Taken by athletes to increase physical stamina or endurance, it accelerates muscular metabolic activity. Some side effects, such as diarrhea, can occur, especially in patients with kidney disease or who are gravely ill.

take pharmaceuticals which have a diuretic effect.

Accredited studies, supported internationally, demonstrate the relationship between the low intake of minerals and the emergence of some types of tumors and cardiovascular and degenerative pathologies. Without resorting to extreme cases, it is important to note how a simple 0.3% of minerals present in our diets allows the assimilation and use of the remaining 99.7% of nutritive elements required to support our physical structure.

Let's look at the various minerals contained in Aloe, remembering that the problems that can be caused from overdose cannot manifest themselves here, not even from an abuse of the substance, since, all in all, the modest concentrations available in Aloe can only complement our daily diet and certainly not replace it.

Calcium

Calcium is essential to our health in the osteo-articular system (joints), in the skeletal system, and in the cardio-muscular system.

This important mineral is so crucial that it is used in a quantity of at least 1000mg per day in a healthy individual. It plays a role in numerous physiological activities such as prevention of mood swings, anxiety, and nervousness, unwanted muscular contractions of the lower limbs, especially if associated with a ample presence of vitamin E. As well as its known role as a constituent of bones and cartilage, calcium prevents rickets and rigidity. Combined with phosphorus, it helps eye problems such as chronic conjunctivitis and, when combined with Vitamin A, it helps to prevent sunburn.

Calcium works well with other minerals, such as its combination with magnesium, which creates a wonderful auxiliary for a healthy heart. Calcium deficiency is often evidenced by the tendency to osteoporosis, arthritic, and rheumatic problems. Stress, combined with a lack of exercise, can considerably compromise the presence of this mineral which is so important to our bodies.

Chromium

Chromium assists in supervising and promoting the activity of enzymes and fatty acids, helping the body to control glycemia and cholesterolemia.

This mineral could be called the diabetic's friend, since its main ability is to act as a principal constituent in the metabolization of glucose in the blood. An excess of sugar can, in fact, irreparably damage some of our body's biological components, from hemoglobin to the proteins present in the membranes of cells, and from RNA to the DNA itself, which are responsible for cell duplication and therefore the very life in our bodies.

To this very important attribute of chromium we can associate a further action, that of a metabolic stimulant in regard to the cholesterol LDL/HDL ratio, whose excess constitutes another degenerative element in our entire cardiovascular system. The presence of chromium in our body is definitely affected by aging, pregnancy, the consumption of refined foods, and, it seems, even from intense physical activity.

Germanium

It is difficult to point out specific properties of germanium since modern research is attributing germanium with different properties every day. It is believed, however, that its main effect is its capacity to rebalance the body, especially in acute cases dealing with immune-defense systems, as are auto-immune and immune-deficiency states.

This biologically active oligomineral is a metal and is present in the earth's crust in only minimal quantities. Thrust into notoriety by the press in the late 1980's, germanium was acclaimed as the most interesting pharmacological discovery of the 20th century. It was acclaimed to have therapeutic properties which made it sound like a universal panacea, from combatting cancer to being a rehabilitative of major illnesses suffered from immune deficiencies, and from virus infection to relief of arthritis pain. These powers were alleged by a Japanese engineer who hypothesized the high therapeutic value of organic synthetically produced germanium, known as the famous Ge-132. Although this subject is covered in skepticism in scientific circles, especially within the medical community, according to recent studies germanium has immunomodulatory, anti-cancer, and anti-viral effects. Russian doctors at the International Conference on AIDS in 1989 reported the findings of their research, which deduced that germanium has the ability to inhibit the AIDS virus in vitro. In this respect, although germanium seems to show no forms of toxicity, more research has to be conducted. Ge-132 is also used in some of the experiments aimed at finding adequate therapy for human tumors, and in the treatment of Epstein-Barr Syndrome, widely known as Chronic Fatigue Syndrome, which produces a debilitated psycho-physical state in the individuals affected by it. With the results obtained so far, there is hope for the development of this product. In the meantime, it is recommended it be taken only on medical advice with an in-depth understanding of the factors at work, since secondary effects can occur, such as skin rashes and fatty stools. It remains evident, however, that more medical studies are needed.

Magnesium

Magnesium is present in great quantities in our bodies, especially in bones and extracellular fluids. Magnesium (and manganese) are necessary for proper functioning of muscular activity and adequate neuron synapses.

It has a calming action and is a natural antidepressant. Additionally, it guarantees the contraction of muscle tissues and electrical stability inside and outside the cell. Magnesium also plays a role in many biological processes among which is glucose metabolism. It regulates the heartbeat and is a great help in cases of ventricular fibrillation, arrhythmia, and angina pectoris. Together with calcium, magnesium assists in the formation of ATP, a compound very important in the production of cellular energy. This mineral also proves to be important in the treatment of premenstrual syndrome, which manifests in symptoms of anxiety, irritability, frequent mood swings, breast tenderness or pain, headaches, dizziness, etc.. It is believed, in fact, that a deficiency in magnesium, zinc, and some vitamins are the main cause of these symptoms. It has also been noted that high consumption of refined sugars and dairy products tends to considerably reduce intestinal assimilation of magnesium contained in foods. This creates a decrease in the neurotransmitter dopamine, partly made up of magnesium, and alters the delicate balance between the different molecules of the central and peripheral nervous systems. Magnesium is found in foods like, meat, shellfish, leafy green vegetables, and dairy products.

Manganese is an element with a powerful antioxidant effect, able to slow down the aging process. In fact, cells rich in this element have a greater capacity to fight off the negative effects of the broad spectrum radiation to which we are exposed daily.

Manganese is important in maintaining an efficient enzyme system in the bones. Its deficiency may cause joint weakness and bone fragility. Research is currently being carried out which could confirm the importance of manganese as an element in mucopolysaccharides, the main complex carbohydrate components of bone cartilage and immune defense stimulants.

Manganese is, therefore, a useful element in treating osteoarticular (joint) and immunological pathologies. This mineral also plays a role in glucose metabolism and is a constituent of the enzyme superoxide dismutase (SOD). It is an important ally of the pancreas, liver, and kidneys. For this reason, it is used as one of the supplements in assisting for diabetes mellitus. Some of the research shows that manganese has a partial role in thyroid processes. As a result, it could be useful in multiple sclerosis therapy and in the treatment of severe forms of myasthenia (myasthenia gravis), helping to reduce fatigue, stress, irritability, and acute hoarseness.

Potassium has a fundamental role in our body's metabolism. Thanks to its collaboration with sodium, it facilitates the elimination of waste products produced by oxidation and stimulates the body's nutrition.

This valuable mineral acts within the metabolic processes in various ways. It is mainly important in the contraction of muscle fibers and in electrical impulse transmission between cells.

A typical paradox of statistically based research has made us believe, for many years, that an increase in sodium chloride in our diet could generate high blood pressure and arterial and cardiocirculatory dysfunctions. Actually, new studies demonstrate how the increased desire for sodium chloride is caused by the increasing presence of processed foods, which can be low in potassium. This new awareness is slowly shifting attention towards the deficiency factor of this element. We have, in fact, substituted the healthy daily habit of eating lots of fresh fruit and vegetables with some bad habits, like the preference for processed cooked foods containing artificial chemicals which enhance or completely alter their taste.

Another interesting fact revealed by some studies is that diets rich in potassium prevent heart attacks and hypertension. There is a close correlation between essential hypertension and the reduction in its incidence in those who eat foods rich in potassium and those whose food contains limited amounts of this element. The use of this mineral improves sport performance in athletes who, because of their training, lose large amounts of this mineral through the perspiration process. A small quantity of raw vegetables and a medium-sized banana are sufficient to replenish this mineral loss. Potassium can be found in considerable doses in fresh fruits like watermelon, bananas, oranges, and in fresh vegetables such as spinach, raw cabbage, or raw celery. It then becomes clear how a possible deficiency in potassium can cause symptoms like tiredness, general weakness, and muscular aches and pains if the body is not properly nourished.

*Manganese**Potassium*

Copper

Copper is an oligo-element essential to our health. Results of numerous studies indicate that it has an anti-cancer property.

It acts as a strong antioxidant, limiting the damage caused by free radicals, principally through its enzyme, superoxide dismutase (SOD), which prevents the oxidization of polyunsaturated fatty acids, keeping cell membranes strong. Copper has an anti-inflammatory property and can combat some forms of arthritis.

The popular use of copper bracelets is widespread, although its value is not yet recognized by the scientific community. It seems that some of the bracelet's copper atoms are absorbed into the body by transpiration through the dilated pores of the skin it covers, thus imparting an anti-inflammatory effect due to an increase in the SOD enzyme.

The largest concentration of blood copper is in the synovial fluid of osteoarthritic and rheumatoid arthritis patients, and is attributed to the body's effort to inhibit inflammation by placing a maximum concentration and availability of this metal in the area surrounding the joints.

In fact, copper possesses the capacity to react in "emergency" situations, such as trauma infections and vascular insufficiency. Intravenous administration of SOD cupric-zinc, known with the trade name "Orgotein", is efficient in the treatment of these types of pathologies, or else by subcutaneous injection of liposomes containing a copper enzyme of bovine extraction. The other side of copper's dual nature is as a constituent of elastin, the protein which gives elasticity to blood vessels in the lungs and in skin tissues.

A deficiency of this metal can cause emphysema, in which the air sacs that allow us to breathe lose their membrane wall elasticity, in alveolar distension, diminishing the surface area available for gas exchange and, subsequently, reducing oxygenation to the blood. Good concentrations are found in all shellfish, liver, walnuts, and berries.

Selenium

Selenium is an element found in the body in only trace amounts but with many uses, making it invaluable.

It is well-known as an anti-tumoral and also as important in preventing varied pathologies connected to aging. Adequate intake is required to guarantee health and longevity.

This oligo-element constitutes the enzyme glutathione peroxidase which is able to combat the degenerative processes that afflict cell membranes. This enzyme acts directly to inhibit platelet aggregation processes, thereby preventing heart disease, apopleptic attacks, and heart attacks. Recent tests carried out on tumoral cells in vitro clearly resulted in a net inhibition of cells that had "lost" their prior control. The anti-cancer mechanism of selenium is not yet known. It has been suggested that the highly specific enzymatic processes assisted by selenium neutralize cancerous substances inside the DNA, activating an immediate repair of the damages incurred.

Selenium also has powerful immuno-stimulant properties. As demonstrated on several different types of animals, the efficacy of doses administered above the recommended norm is surprising. In infective pathologies we can see an increased number of phagocytes, well over 30 times the norm, if treated in a synergistic manner with Vitamin E. It is thought that selenium can inhibit prostaglandin syn-

thesis, due to its immuno-depressive property.

There are numerous anecdotes regarding selenium as an anti-inflammatory and a detoxifier. It, too, combats joint pain, osteoarthritis, rheumatoid arthritis, and the harmful toxic effects of some drugs.

Use of this mineral, added to the daily diet of people afflicted with these pathologies, demonstrates a definite improvement due to its marked action on cellular metabolism. Selenium is found in several foods: cauliflower, onions, celery, cabbage, cucumbers, brewer's yeast, grains, fish, and certain animal organs known generally as "sweetbreads".

Sodium is an essential mineral to our body. It helps to regulate fluid balance, and, in particular, takes care of the fluid going in and out of cell membranes.

This salt is made available to us in the form of the sodium chloride in common table salt and in all seasoned products. It is lost through perspiration, urination, diarrhea, and vomiting. Our diet, though, is so abundant in it that we do not have the problem common to the other minerals, deficiency, but rather the opposite.

On a daily basis, we consume a quantity of cooking salt equal to 3-6 times more than our body's metabolic requirements. As a result, problems related to poor electrical transmission in nerves and muscles are created.

These problems have the negative repercussions of raising arterial blood pressure due to the imbalance in the relationship between sodium and potassium. A general recommendation is to reduce the intake of salt through the use of smaller quantities or by using products flavored with substitute salt.

Zinc is a micro-element that can stimulate and strengthen the immune system. An important enzyme "activator", it is a facilitator of chemical and biochemical reactions inside the human body for over 200 different enzymes. Zinc stimulates the immune system, acting on cellular metabolism by increasing its antibody activity and the production of lymphocytes.

Normal immune system functioning can be compromised if zinc is missing in the diet.

It has been observed that the amount of zinc in the serum of patients suffering from AIDS is considerably low, and that their condition improves through integrated administration. Recent research shows that it is useful in the treatment of colds.

As an immuno-stimulant element absorbed through the throat, it can greatly accelerate the course of this seasonal ailment. Its primary activity, an important one, is the cell regeneration process.

This makes zinc a valid aid in post-operative care, facilitating the healing or remargining of wounds. This metal exhibits many anti-inflammatory properties. It has been proven to block the production of histamine, an inflammatory response by

*Sodium**Zinc*

Vitamins

the organism, which slows down the healing process. Therefore, it is useful in the treatment of juvenile acne and also in rheumatoid arthritis. Studies conducted on patients affected by this illness demonstrated that there is a close relationship between oral intake of zinc sulphate and an improvement in their general health. Zinc has an important role in the treatment of diabetes.

An interaction exists between zinc and insulin, created in the pancreas, to regulate blood sugar metabolism and fat metabolism in the liver.

Many diabetics show a low serum zinc level, and a high level of zinc in urine. An unusual property of zinc is that it is important in maintaining the integrity of smell, touch, sight, and the male gonads.

An insufficient intake of this mineral has been connected to reduced sexual activity in men, as well as a reduced sperm count. In fact, zinc-deficient males demonstrate a low libido, low appetite, and a decline in intellectual faculties.

The proper functioning of our body relies on the intake of vitamins through our daily diet because our bodies do not produce them. Thanks to vitamins, cells can generate molecules important to metabolism, without which life could not exist.

Vitamins are divided into classes according to their absorption: liposoluble (absorbed through fats and stored in the cells) and hydrosoluble (absorbed through aqueous solutions or foods containing water, stored in only small quantities).

From the liposoluble group found in Aloe are Vitamins A and E. From the hydrosoluble group, we have vitamins from the B group (B1, B2, B3, B6, B9, B12, B15) and vitamin C. If these eleven invaluable substances, together with the minerals, were to be missing in our bodies, it would be an obstacle to our health and well-being.

Vitamins are a group of organic substances – a chain of straight or branched hydrocarbons, chemically different from one another, which are indispensable to metabolic activity.

*Vitamin A
(Betacarotene)*

Vitamin A was the first vitamin to be discovered in 1913 and, in the last ten years, has continued to be widely discussed in the general public for its anti-cancer and dermo-curative properties. It is believed that this vitamin is essential to twilight and night vision. Some studies give it a role in preventing the formation of calculi (stones).

Within the organism, variable quantities are introduced through the food we eat, in two forms: vitamin A, known as retinol, and provitamin A, more widely known as betacarotene. Retinol is present in all types of meat and animal

products, while betacarotene is in carrots, sweet potatoes and in fruit and vegetables with a yellow-orange color.

Several studies, conducted on experimental animals as well as human subjects, have enabled us to observe how a deficiency in vitamin A is accompanied by major predispositions to infective illnesses such as dysentery, measles, and diseases of the lungs.

Supplementation clearly stimulates an increase in antibody activity and a greater production of leucocytes (white blood cells). Research carried out on HIV and its degradation, AIDS, on cells in vitro, demonstrated that betacarotene increases endocellular immune defense giving these cells a greater capacity to fight opportunistic infections such as *Candida Albicans*, typical of immune-suppressed individuals.

Very effective in combatting acne and psoriasis, vitamin A facilitates rapid resolution of wounds and is considered the best substance for the regeneration and prevention of premature aging of the skin by the cosmetic industry. Another fundamental characteristic of this wonder of nature is, without a doubt, its capacity to maintain good vision.

The main symptom of its deficiency within the body is night blindness. Of the two forms available, those from a vegetable source are recommended when a high dosage is required. Retinol taken from animal sources can be toxic in high doses, and can produce reactions that range from headaches to nausea.

Vitamin B1 plays a fundamental role in the metabolism of carbohydrates, especially in the transformation and availability of glucose into biological energy. Its deficiency promotes the need for sugar and the well known energy boost derived from it.

Thiamine helps the appetite and digestion.

More useful to adults than children, thiamine protects the nervous system, and combats metabolic imbalances caused by alcohol abuse, like the obvious symptoms of mental confusion, swaying or ataxia, and/or sensory loss in the lower limbs. Supplementation with B1 also resolves serious disturbances of the nervous system caused by its deficiency, such as hypotonic muscles, or paralysis of eye muscles. Thiamine strengthens the cardiac apparatus, helping to keep the fibrous structure of the muscle smooth and elastic. It also promotes the production of red blood cells in combating anemia by playing a part in the biochemical reactions of the spine's bone marrow.

A deficiency of this vitamin induces a disease called *Beri Beri*, with symptoms of extreme weakness, which attacks the nervous system or the cardiovascular system. Vitamin B1 carries out a specific detoxifying function. It binds easily to the lead atoms inside our body, absorbed from pollution, and expels them as harmless products.

It is found in whole grain cereals, brown rice, shellfish, and legumes. It is important to remember that food-refining processes reduce thiamine content.

*Vitamin B1
(Thiamine)*

*Vitamin B2
(Riboflavin)*

This vitamin also has a yellow-orange color, is water-soluble, and takes part in complex cellular metabolic processes. Vitamin B2 is an indispensable metabolism regulator. Together with the enzyme glutathione reductase, it contributes in maintaining stable levels of glutathione, an anti-free radical protein also called a free-radical scavenger.

Riboflavin itself has an antioxidant property.

It limits in part the toxins produced by cellular respiration, a natural metabolic process which is highly oxidative. Its constant use seems to be a good treatment in general anemic states, since it is a proven fact that it helps in the absorption of iron.

Vitamin B2 basically facilitates the process of transforming food into bio-available energy, with an obvious advantage for the entire body.

Our body cannot store this vitamin, as it is water-soluble. Therefore, it has to be continually assimilated from outside sources through food or supplements.

The main foods containing riboflavin are milk, cheeses, yogurt, berries, and leafy green vegetables. It is interesting to note that vitamin B2 decomposes under light and, if it were to be left in a glass bottle, would be destroyed in a matter of hours from the time it was bottled.

This is why the old glass bottles which once formed part of the milkman's "tools of trade" have been replaced by polyester cartons. The principal cause of its deficiency is a poor diet, made up of excesses of sweets, cakes, pastries, etc., and coffee. Its most frequent symptoms deal mainly with the skin and mucous membranes.

Typical symptoms of this deficiency are cracks at the corners of the mouth or on the lips, a burning sensation of the tongue, and eczema on the face and genitals.

*Vitamin B3
(Niacin)*

Part of the B group of vitamins, and water-soluble, Vitamin B3 is present in nature in two forms: nicotinic acid and nicotinamide.

It is said to be the best antidote to problems caused by cholesterol, because of its rapid action, product economy, and absence of unpleasant side effects. It aids in promoting an increased lifespan for patients who have had multiple heart attacks.

A good vasodilator, niacin can widen blood vessels, increasing circulatory flow and, in this way, facilitate a cleansing of the large network of capillaries. It also acts as a potent detoxifier of every type of toxin, drug, and polluting agent. This demonstrates niacin's powerful capacity to stimulate the metabolism and the production of sexual and thyroid hormones.

Vitamin B3 was studied and used in the United States after the Vietnam war to detoxify soldiers who were victims of high concentrations of Agent Orange, the potent defoliant used to open up large areas of forest in the Indo-Chinese peninsula. It has the capacity to extract and free toxins from fatty tissue, promoting their expulsion from the body. Deficiencies in the body cause skin lesions, diarrhea, and nervous disturbances.

These are commonly grouped as the symptoms of Pellagra, the first "mental" illness to be correlated with a concrete cause and not a supernatural one. Only recently, it was discovered that nicotinic acid potentiates the efficacy of insulin in diabetic patients, forming the so-called "glucose tolerance factor".

Exceeding the recommended dosage of this vitamin can unleash undesired effects and discomfort, such as sudden heat sensations, itching, flushing, and redness of the face.

Vitamin B6 is indispensable in cellular division, in the metabolism of nucleic acids and proteins. This is how life and efficiency is guaranteed to over sixty enzymes involved in several biochemical reactions. All this is possible through the combined and coordinated actions between minerals and brain neurotransmitters. This B group vitamin regulates the passage of electrical information through the central and peripheral nervous systems.

Recent medical studies put pyridoxine among the most potent substances having an immuno-stimulant action.

Of particular note is the amazing biochemical coordination between vitamin B6 and the activities of enzymes, neurotransmitters, and immunomodulation of the various protective cells of our body.

A deficiency in this substance can provoke a breakdown of the entire immune system. In its absence, the elderly run the greatest risks, as do those who are affected by AIDS or cancer.

Taking pyridoxine through specific artificial foods or products limits the devastating effects of metastasis or the breaking down of physical barriers caused by immune suppression.

Used in research carried out on in vitro cultures of human epithelial cells, high doses of vitamin B6 reduced the growth of melanoma, one particular type of skin cancer, by 50%. Taking B6 alleviates premenstrual symptoms such as breast tenderness and pain, headache, and fluid retention, by rebalancing the levels of estrogen.

This multipurpose vitamin also keeps diabetes under control. Its deficiency can create abnormalities in the metabolism of tryptophan, an essential amino acid and powerful antioxidant important in protein synthesis. The latter also takes care of the concentrations of glucose in the cardiocirculatory system. There is an evident correlation between blood glucose levels, concentrations of tryptophan, insulin demand, and vitamin B6. Foods rich in vitamin B6 are meat, whole grain cereals, and brewer's yeast.

*Vitamin B6
(Pyridoxine)*

Vitamin B9
(Folic acid)

Folic acid is a vitamin that supervises protein synthesis more completely than any of the other vitamins. Folates, the salts derived from folic acid, take part in several cellular metabolic processes. In particular, they carry out a cardinal function in protein synthesis and, above all, in DNA duplication. For this reason, it is very important in the fight against cancer. Folic acid is part of the water-soluble vitamins of the B group.

It is at the head of the folates, a group of compounds that are present in nature in green plants and leaves such as broccoli and spinach, animal organs like liver or kidneys, and in yeast.

From some of the research conducted on smokers in 1986 by the National American Institute for Cancer, low blood levels of folic acid were observed. High doses of folic acid were effective in reducing bronchial and lung lesions that were potentially precancerous. For the very same reason, this strengthens the cell in delicate moments of cell division.

This is why folic acid is used in pregnancy to prevent fetal malformations, especially of the neural tube, from which develop the brain and the spine. B9 is also able to improve the behavioral abilities of people born with a particular psychic malformation called "fragile X chromosome syndrome".

A strong and prolonged deficiency of this vitamin can cause serious forms of erythrocyte penuria of the blood, causing megaloblastic or falciform anemias. Lesser deficiencies may instead generate a sense of fatigue, general muscle weakness, cramping, and irritability.

It is mainly the elderly, alcoholics, pregnant women, those with a B12 deficiency, or those who have undergone a low calorie diet that suffer a deficiency of folic acid. Low levels of folic acid in the blood are largely due to a diet which, for any number of reasons, is insufficiently balanced. An excessive intake of this vitamin without medical supervision can create negative effects and give rise to problems associated with the neuromotor system.

Vitamin B12
(Cobalamine)

Vitamin B12 is a precious fountain of energy, recharging the body and producing an increased sense of vitality.

It offers tonic and energizing qualities, prevents the decline of intellectual faculties, and improves memory and concentration.

It has a primary role in nervous tissue metabolism and, although its active mechanism is not yet understood, it is known that deficiencies cause great damage to the nervous system and the brain.

Vitamin C
(Ascorbic Acid)

Recent studies show vitamin B12 to be a potent front line anti-cancer agent. This is what emerges from a clinical study done on patients who were smokers. After four months of supplementation of this vitamin together with folic acid, results demonstrated a truly surprising epithelio-protective effect. Lung cells were healthier and there was a reduction in the number of cells with precancerous characteristics. Cobalamine combats the damaging effects produced by toxins and allergens. This property is particularly outstanding in food intolerances produced by sulphites, often used as preservatives in wines and in many foods, provoking the characteristic symptoms of headaches, congestion and bronchial spasms. Foods rich in B12 are fish, organ meats, dairy products, liver, eggs, and beef.

Vitamin C plays a marked antioxidant role and inhibits free radicals that are produced in cellular respiration reactions, highly dangerous to human health.

It favors the absorption of iron in the large intestine, stimulates immune defense in general, and has a part in the formation of collagen, an important component of bones, cartilage, and skin.

Ascorbic acid is the first vitamin in history to be involved in generalized clinical testing and extended to a great part of the population. In 1750, an English doctor began to study the scurvy which afflicted sailors of the Royal British Navy. Scurvy is a disease with symptoms including wounds that do not heal easily, bleeding gums, rough skin, and a reduction in muscular mass.

It was discovered that the antidote to scurvy was the addition of citrus fruits to the normal diet. From then on, many informative campaigns were made and, during the twentieth century, scurvy was conquered. There is still a mild deficiency in the general population, mainly due to poor diet.

Many health-damaging effects, such as the prevention of or speedy recovery from colds and flus, can be overcome through eating foods rich in vitamin C or the intake of appropriately aimed supplementation.

This wonderful property of vitamin C is explained by the fact that ascorbic acid is a strong antioxidant, which limits the damage caused by free radicals to the white blood cells. As we know, white blood cells are responsible for the immune defense, which helps us to overcome disease states more easily.

For the same reason, vitamin C helps to keep gums stronger and healthier, and protects them from pollution such as smoking, and also heals wounds more rapidly.

In addition, ascorbic acid is an important "wedge" in the production of collagen, the protein that has a large part in the makeup of bones, cartilage, and skin. Furthermore, vitamin C has marked anti-cancer properties. Various epidemiological studies conducted around the world confirm that it fights against the development of cancerous cells in skin and in gastro-esophageal tissues. This is owed largely to its aforementioned antioxidant properties which are able, in this way, to inhibit the production of free radicals and the intermediate reactions which are potentially carcinogenic.

These are mainly the nitrosamines, contained in foods in the form of preservatives like nitrites and nitrates, which produce biochemical oxidation in the body and are therefore very dangerous. Cigarette smoke, alcohol, malt-based drinks and delicatessen meats, like hams and processed meats, reduce the availability of this vitamin to all the body's metabolic functions.

A British staff made up of several scientists recently demonstrated the relationship between concentration levels of vitamin C and the development of cancer.

Vitamin E (Tocopherol)

When entering in contact with the gastric mucosa, vitamin C is able to reduce the number of cancerous cells inversely proportionate to its presence.

Daily supplementation of high doses of ascorbic acid, synergistically accompanied by betacarotene, also reduces the progression of some forms of tumors in women affected by cervico-uterine neoplastic pathology.

High doses of ascorbic acid can, however, create problems in advanced cases of kidney stones or gout and could cause relapses.

Vitamin E promotes the formation of new cells, a necessary factor for a healthy neuro-vegetative system. Its action as an antioxidant is renowned. Its most noted effect is in the prevention of cardiovascular disease.

Tocopherol was a misunderstood and well-discussed vitamin for a long time. It is "pregnant", as Greek etymology says, with a large quantity of positive properties.

Vitamin E was the first vitamin in the history of biology to supply an antioxidant identikit of itself: that is, it was the first to allow researchers to understand the antioxidants' mode of operation.

It takes part in the processes of cellular energy production and is important for our health in combating diseases of the nervous system and of the immune system. It impeccably coordinates several substances, improving all of their biochemical activities.

That is why, in high doses, it has shown to be useful in alleviating angina pectoris, the pain symptomatic of insufficient oxygenation to the heart muscle.

It has also been observed that its activity raises HDL – the good cholesterol present in blood – and in preventing the formation of dangerous post-operative thromboses. A state of vitamin E deficiency can provoke severe neuropathies that can be limited or cured by its supplementation. Pathologies like chronic pancreatitis, gluten-enteropathy, mucoviscidosis, or Cystic Fibrosis, the malabsorption of fat in the villi of the intestine, can all be traced back to a vitamin E deficiency. Deficiency symptoms include loss of reflexes and reduction of muscular mass, together with generalized weakness and a reduction in the field of vision. An evident neurological symptom, instead, is diarrhea containing fats that the body has eliminated. All these cases have shown that high doses of tocopherol are useful, but only under medical supervision. Several studies see a role for Vitamin E as a potentially useful substance for reducing convulsions in epileptic syndromes and as a powerful blocking agent in Parkinson's disease. The outcome of this research is still to be confirmed.

Tocopherol has immuno-stimulant properties. It seems that as well as providing protection from free radicals, it carries out an inhibitory activity to prostaglandins that slow down the reactions of the immune system, and therefore protect cellular membranes by making them less vulnerable to attacks from pathogenic germs and viruses. Recent studies have also demonstrated Vitamin E's marked effectiveness in reducing premenstrual symptomatology. Although there is no clinical evidence, many testimonies attest to vitamin E as being among the substances that increase sexual desire or libido and to its role in promoting an increase in size

of masculine genitals. Its action is activated when combined with minerals and other vitamins. But it is best not to cross-use it with iron or with an anti-conceptional (the birth control pill), as both these substances interfere with its efficacy.

Choline is very important for the body because its action in phosphatidyl choline has the effect of improving the fluidity of cellular membranes.

This characteristic generates results which are important throughout the body. For example, it favors greater elasticity of the veins and arteries, improved cellular exchange of microelements and nutritional substances, better biochemical reactions and, therefore, an overall improvement in health.

Choline, a tertiary amine of ethyl alcohol, is present in the animal and plant kingdoms.

Together with a phosphorus group, it makes up phosphatidyl choline, the leading component of the lecithins, which are lipids made up of saturated and polyunsaturated fatty acids. It has been demonstrated in animal studies that choline acts on lipid metabolism by aiding the re-absorption of fats in the liver. Test results on human trials have not yet proven positive, although there is hope to find proof that, in its simplicity, this lipid possesses the ability to control high cholesterol and triglyceride levels in the blood. Such things are the cause of many a sleepless night to a great number of people in the western world whose diets are high in fats and calories.

Crossed studies between the English, the Czechoslovakians, and others throughout Europe, have demonstrated the efficacy of polyunsaturated phosphatidyl choline in the treatment of three types of hepatitis: hepatitis A, hepatitis B, and hepatitis C. Subjects obtained a more rapid resolution of symptoms, together with reduction in the time taken to re-establish medical-clinical blood levels to within the normal parameters.

Histological observation of hepatic cells resulted in improved cell regeneration, so researchers hypothesized that choline acts on the liver cells' membranes by restructuring them.

This demonstrates that choline has an important effect on liver metabolism even though the regulatory mechanisms are not yet understood. Other studies on this aspect carried out on monkeys obtained excellent results in the prevention of gallstones.

It has been well-known for some time now that the relationship between cholesterol and phosphatidyl choline in bile plays a determining role in the solubility of bile salts. In fact, when this relationship is unbalanced in favor of high concentrations of cholesterol and low levels of choline, cholesterol can become agglutinated and lead to the subsequent formation of bothersome and very painful gallstones. Current studies are looking for similar results in humans.

The multifaceted nature of this amine is such that it is also involved in the structuring of the important neurotransmitter acetylcholine, which addresses a fundamental role in the management of emotions, behavior, and memory. Experimental studies have shown that a correlation exists between the intake of choline and an increase in the concentrations of acetylcholine in cholinergic neurons, involved in the elaboration and storage of memory. Choline supplements can markedly improve short term memory in people between the age of 50 and 70 years.

Another study on choline supplementation was carried out on patients affected

Phospholipids Choline

with Alzheimers syndrome, which effectively lead to an improvement in memory processes but which still does not, to date, provide the information required to warrant its validity for use in these cases. Effective results were instead obtained in the treatment of tardive dyskinesia, a neurological disease characterized by involuntary movements and convulsions of the fascial and lingual muscles, typical of Parkinson's disease.

Choline and phosphatidyl choline supplements were able to reduce involuntary movements by 50%. The same principle which makes choline able to act on neurotransmitters proved useful in aiding psychotropic drug therapies in patients affected with manic-depression. Studies carried out on several groups of people with affective psychosis observed an improvement in symptoms in those cases where drugs had no effect. From the double blind studies conducted over a time-span of years, on the supplemental use of this lipid on animals, it was observed that the placebo group progressively lost cell elasticity, while the group supplemented with choline had no change in the youthful dynamic characteristics of the cell. This rejuvenating effect seems to occur as a combined effect produced from the action on cellular metabolism as well as its action on the neurotransmitters. It should be noted that egg yolk makes choline available with a high percentage of saturated fatty acids, while soy beans, cabbage, and cauliflower have a high percentage of polyunsaturated fatty acids.

Inositol

This phospholipid is known as a strong inhibitor of cholesterol and triglycerides, able to control arterial blood pressure and act as a preventive agent in cardiovascular disease. Myo-inositol is used as a supplement to induce sleep, naturally treat insomnia, and also carries out mildly tranquilizing functions in the management of anxiety. Experiments are currently underway, seeking scientific validation of the latter-mentioned hypotheses.

Inositol belongs to the important nutritional class called phospholipids – fats containing a phosphorous group. Its chemically active form is myo-inositol. The latter has several possible forms and sizes and constitutes phosphatidyl choline, which plays a prominent role inside the central and peripheral nervous system, as a molecule carrying messages aimed at controlling the status quo of cellular metabolism.

In animals, myo-inositol carries out a lipotropic activity – that is, it limits or prevents the formation of fat in the liver.

Good concentrations of myo-inositol are found under the form of a phospholipid or as phytic acid in fresh vegetables as well as in all types of fruit, nuts, beans, and cereals.

Plant steroids

Steroids are organic substances present in nature, having a complex structure, and are constituents of many hormones and bile acids. Commonly known to us instead are the artificial steroids, of which the best known is cortisol or cortisone. This drug is a powerful anti-inflammatory, but produces many side effects. Natural plant steroids act in the same way, but are less concentrated, and do not create unwanted damaging secondary effects. The steroids pre-

sent in Aloe are four: cholesterol, lupeol, B-sitosterol, and campesterol. All four of them present distinctively anti-inflammatory properties. Lupeol also carries out antiseptic and analgesic actions.

Other determining building materials which contribute to life are enzymes. The term “enzyme” describes a particular protein composition within the body which promotes chemical and biochemical reactions. Enzymes facilitate a series of processes, providing physical support to the involved molecules to more easily break down their own chemical bonds, encouraging the creation of new ones. In this way, they act on the activating energy of these compounds to catalyze or facilitate a chemical reaction.

In practice, every enzyme is made up of two parts. The first has a protein origin, called an apo-enzyme, and the second, a non-protein origin called a prosthetic group. Without these natural biocatalysts, which even at body pH and temperature are able to speed up the reactions occurring in our tissues, our bodies would not be able to deal with the innumerable reactions that would otherwise be slowed down and, thus, be incompatible to life itself. Maintaining a high level of enzymes in our body is very important to life and to our health.

A sub-category of enzymes is represented by those foods, or rather, whatever relates exclusively to the digestion and the assimilation of foods. A major part of the modern diet is mainly made up of cooked or processed foods and, therefore, limited in their content of enzymes. A cardinal law of natural nutrition is that every raw and unprocessed food contains all the necessary enzymes for proper digestion. Knowing that after its mastication with the aid of saliva, food is reduced to a bolus and arrives in the stomach where it remains for nearly an hour, we can understand how the perfect machine that is our body has already provided for a pre-digestion of foods. This pre-digestion of foods is extremely important, because it takes the burden of producing an overloading excess of enzymes off our pancreas, therefore leaving a greater number of other enzymes the availability to act in the various energy processes required for digestion. This predigestion of foods is extremely important because it unburdens the pancreas from an excessive enzyme production overload, therefore making a higher quantity of enzymes available to the various energy processes, leaving them more available for acting on other processes. It has been observed through clinical evaluations of blood test levels that cooked or processed foods, deficient in enzymes and therefore only partially digested, alert the macrophage leucocytes in the blood. Because the types of substances absorbed this way are unrecognized by the body and therefore identified as alien antigens, it subsequently activates immune defenses and reduces the efficacy and number of these defenses wherever there is an active infection or disease. There can be no confusion in the fact that chronic infections are always accompanied by low levels of enzymes, especially in the blood, urine and in tissues. Instead, during the acute phases of diseases like pneumonia, tuberculosis, fevers and childhood diseases, the enzyme levels increase and, with it, an increase in metabolic rate and body temperature, which can reach up to 100.4°F. The fact is evident that, if enzymes respond to fevers and infections, they are closely related to the defense mechanisms of the body. The higher the enzyme reserve levels are in the individual, the faster his immune response will be, and

Enzymes

Amylases

the increase in his energy level.

Finally, the importance of a balanced diet, including an attention to enzymes, should be emphasized.

This enzyme is in human saliva and allows initial partial digestion of starches while chewing. Blood levels of this enzyme should be checked as a rapid increase can indicate a pancreatic, biliary, or intestinal lesion, or an infection of the parotid or salivary glands, burns, or cerebral trauma.

High levels of amylase can occur during pregnancy, in alcoholic patients, or in women using contraceptive pills.

Amylases are enzymes involved in the breakdown of complex sugars like oligosaccharides and polysaccharides, and simple sugars like mono- and disaccharides. They are divided into two classes, alpha or beta amylases, according to the attached primary functional group. The first, alpha-amylases, are found inside plant and animal structures, including humans. The second, the beta-amylases, are found substantially only in bacteria. Of the alpha-amylases inside our body, there exist two variants called isoenzymes, (i.e. the atoms in its structure have a different position). One of these is in saliva and is called ptyalin, while the other is in the pancreas and is called pancreatin.

Bradykinases

Before describing this enzyme, we should analyze what happens when we are confronted with an allergic reaction.

An allergenic agent (allergen) can enter into contact with our body through the mucosa or open passages, or possibly wounds.

The immune system responds to this intrusion by concentrating the invaded area with a high number of granulocytes that envelope and possibly destroy the antigen. However, the elevated level of necrosis calls up the liposomal enzymes which help to fight against the alien substances and, in doing so, damage the lymphotropic tissues.

This is where bradykinase comes into play by stimulating the inflammatory response.

The bradykinase enzyme contained in Aloe stimulates the immune system to increase the presence of macrophages in the area invaded by the external attack, as well as inhibiting the bradykinine responsible for post-traumatic pain and swelling.

In this sense, the bradykinase enzyme takes a part in the complex pain arena with its analgesic action. If used topically, Aloe, containing the bradykinase enzyme, is a good anti-inflammatory remedy.

Carboxypeptase

This enzyme is responsible for the wound healing and analgesic effect of Aloe. It acts in the breakdown of long-chained proteins, called peptones, by reducing their size and so increasing their organic assimilation.

Catalase

The catalase enzyme is able to breakdown hydrogen peroxide rapidly, an intermediary substance in our cellular metabolism. Hydrogen peroxide has an intermediate reaction which is highly toxic to the vital functions of our cells. From H₂O₂, two radical hydroxyls are formed, OH⁻, proven to be among the most dangerous and reactive of the free radicals. To protect ourselves from this noxious effect, the cells begin to produce an enzyme, catalase, which degrades the hydrogen peroxide into oxygen and water. For this reason, when we disinfect a wound with a hydrogen peroxide solution a strong immediate effervescent action is produced, which is a result of the prompt intervention of catalase in breaking down the applied product.

Catalase, in producing active oxygen in tissues, also carries out a detergent action on burns and ulcerations, promoting wound healing and stimulating the production of new fibroblasts, together with a revascularizing action.

Cellulase

This is an enzyme which assists in the digestion of cellulose, the complex carbohydrate in many fibrous foods that was discussed earlier. What was previously discussed on the matter is also valid for this particular enzyme. Its presence in a raw and unpasteurized food brings about predigestion and thus lightens the load of the digestive system and the functions connected to it. This makes the intervention of digestive leucocytes unnecessary and allows the immune system to carry out its activity wherever it is most needed.

Creatine phosphokinase

This enzyme takes part in many biochemical processes. Creatine phosphokinase can be defined as a supplier of ready and immediate energy to muscles, which explains its wide use for sports performance. It is contained in many foods like meats and dairy products and, if included in a balanced diet, guarantees the required amount necessary for good muscle tone. For those who, for various reasons, carry out heavier activities, supplemental intake is recommended, under medical supervision.

The interaction of the non-essential amino acid, creatine, with the enzyme phosphokinase constitutes an enzyme,

Phosphatase

creatine phosphokinase, and releases ATP or adenosinetriphosphate as a by-product of the reaction, a very important molecule for the production of cellular energy in the Krebs Cycle.

The role of phosphatase is closely related to the bone calcification process and to the assimilation of nutrients from food after its digestion.

Increased alkaline phosphatase values indicate an active disease state in bones or in the liver. This information can provide values which can indicate rickets in children, bone disease in the elderly, and hepatitis, mononucleosis, hyperthyroidism, and bone metastasis in adults.

The drugs methyltestosterone, erythromycin, and the sulphonamides create an increased serum phosphatase level. These values are instead decreased, normally, in pathologies from hypothyroidism or from the use of contraceptive drugs. Phosphatase is an enzyme that interacts metabolically with the organic phosphorous compounds present in all tissues, particularly in the liver, bones, the intestines, and the kidneys.

Phosphatase is a glycoprotein containing zinc, produced by the duodenum, bones, and the liver, catalyzing the reactions of numerous phosphorous esters. Phosphatase is an enzyme associated with cytoplasmic membranes, microsomes in the mucosa of the small intestine, and in the osteoblasts (constituents of bones).

Lipase

Lipase is an enzyme highly specific to the digestion of fats. It is highly efficient in regulating cholesterol and triglyceride levels in the blood. This enzyme controls the proper functioning of hepato-biliary activity and generally checks any lipid overload in the cardio-circulatory system. Fats can be potentially dangerous should they deposit on the walls of veins and arteries, creating obstructions which could give way to hypertension and the degenerative processes of arteriosclerosis.

Supplementation is useful in weight reduction programs, and if taken before all main meals can improve the digestion of fats. Instead, lipase taken between meals, once absorbed in the intestine, starts working directly on fatty tissues and liver tissues stimulating them to release it in a fatty acid form.

Protease

The protease enzyme works with the digestion of proteins. Protease is important because it allows the availability of essential amino acids and materials for construction, protection, and repair of the body, supplying it with an immunostimulant and, as shown by recent studies, anti-tumoral action.

The best way to emphasize this aspect is to explain that if proteins were not well digested, other proteins, like viruses, yeasts, and bacteria, would penetrate more easily through the intestinal walls and be released into circulation along with their potentially toxic effects.

These undesired guests attach to protein molecules that have been badly digested and are absorbed by the body into the blood stream.

All this equates to a protein bombardment which determines and increases the protease enzyme requirements and major pressure on the immune system to perform.

These are two enzymes produced by the cytoplasm and by the mitochondria of the liver and muscles, and especially in the heart.

From this brief mention alone, we can understand their importance in the delicate equilibrium of the metabolism.

They indicate the state of health of two organs.

This can be seen by their function, carried out in the blood, of promoting cellular absorption of the sugars and fats that are invaluable to us as food and energy sources.

Along the same terms, they are also used for medical blood tests aimed at determining the quantity of enzymes present in our blood.

The doctor interprets the results of the scientific tests and diagnoses the presence or lack of any active or underlying pathology. For example, values of the transaminases SGOT and SGPT that are prolongedly above the norm indicate the presence of hepatitis or the use of drugs that are creating a lesion in liver tissue.

They may also indicate toxicity produced by chemical substances, from overeating, alcohol abuse, or the presence of mononucleosis, which weakens the individual affected and makes him or her susceptible to attack from several pathogens.

*Transaminase
SGOT/SGPT*

Lignin

Lignin is an amorphous, non-fibrous substance, yellow-brown in color, and is responsible for the lignification (or the hardening) of plant tissue.

The process that substitutes cellulose cells with an equal number of lignin cells is still unclear.

Lignin has an average molecular weight equal to 2000-3000 a.m.u. In its large structure, it contains aromatic nuclei with lateral methoxyls from which we obtain methyl alcohol by distillation of wood, the so called "Wood Spirit".

Aloe's contribution of lignins provides supportive material for forming the fecal bulk of stools.

Saponins

Saponins, also called saponocycles, are irritating to the digestive tract. They also have a hemolytic property, meaning they can break down red blood cells. In particular, they bind with the lipid membrane of erythrocytes, making it more permeable and at the same time more fragile, enabling a loss of hemoglobin through leakage. The hemolytic effects are only evident if the saponin is administered intravenously. Even so, the hemolytic effect of saponins varies, depending on the species. For example, cyclamin is a saponin in the cyclamin tuber or root, and is very toxic to humans, whereas the drug extracted from ginseng is so slightly toxic that the concentrated extract can be injected without any deleterious consequences. In Aloe, the saponins have a purifying, antiseptic, and antimicrobial action.

Amino Acids

Amino acids represent the "building blocks" of large protein molecules and are the fundamental constituents of living organisms. Proteins represent 15 – 20% of the average body's weight. They are so important that, if we were to follow a diet without them, there would be a reduction of muscles mass, hair diameter, skin pigment, and considerably increased frailty in only six days. Proteins play a central role in the architecture of enzymes, hormones, and cellular respiration, catalyzing fundamental biological reactions that correspond to the maintenance and increase of muscle tissue. In fact, proteins are made up of tens and tens of amino acids, linked together by peptide bonds called "-CO-NH-" forming chains of various lengths.

Amino acids are organic compounds made up of long chains of carbon with a functional amino group at one end and an acid on the other end.

There are twenty core amino acids that are important to human and animal metabolism. They include the following: alanine, arginine, asparagine, aspartic acid, cysteine, glutamic acid, glutamine, glycine, histidine, isoleucine, leucine, lysine, methionine, phenylalanine, proline, serine, threonine, tryptophan, tyrosine, and valine. In the human body there are two other amino acids, taurine and ornithine, that intervene in protein synthesis. Several amino acids collaborate in the synthesis of neurotransmitters, and recent studies show that they play an active role in the complex reactions of the immune system.

The essential amino acids are those which the body is not able to produce and, therefore, have to be taken through the diet. In adults, there are eight essential amino acids, seven of which are present in Aloe: phenylalanine, isoleucine, leucine, lysine, methionine, threonine and valine. In children, taurine and cysteine are also essential. Let us analyze these one by one.

Phenylalanine is an essential amino acid with an aromatic (benzene) ring. It exists in two versions: L-phenylalanine and D-phenylalanine, levidextros and destrorotors molecules which are chemically identical, but different because they are specular. The levidextros form is an essential amino acid that acts in various biochemical processes dealing with the synthesis of neurotransmitters including dopamine, norepinephrine (commonly known as noradrenalin), and epinephrine. It stimulates mental activity, sexual and secretory activity, and inhibits the desire for substances which induce drug addiction. The destrorotors form is, however, not a nutritive substance, but has been shown to be effective at inhibiting the breakdown of encephalins – substances in the brain that have properties similar to opiates and, as a result, are able to alleviate chronic pain.

This substance's anti-inflammatory and analgesic effects, seen in animals as well as humans, contribute to alleviating backaches and toothaches. This is due to their ability to slow down the digestion of the encephaline molecule, which has the magical power to inhibit pain. The balanced mix of these two substances, D- and L- phenylalanine, has been shown to be effective in the treatment of arthritic and fibrositic pain. The anti-depressant and mental stimulant properties generated by L-phenylalanine is owed to its effects on neurotransmitters and was discovered by chance. An investigation conducted on a sample of 40 depressed people given doses of L-phenylalanine with vitamin B6, for a specific time period, showed improvement in 75% of cases and definite resolution in 25% of cases. A recent hypothesis has been formulated, stating that phenylalanine can be helpful in reducing appetite. This hypothesis is not yet sufficiently validated by clinical medical studies. Studies conducted on drug-addicted patients ultimately demonstrate a certain correlation between the use of L-phenylalanine supplements and inhibited desire to take drugs during the detoxification period.

Essential amino acids

Phenylalanine
Phe
PM 165.09

Isoleucine
Ile
PM 131.11

Isoleucine has proven to be a useful supplement for those who participate in sports, due to its remarkable anabolic capabilities. It facilitates the conversion of all assimilated substances into immediate sources of energy, or reserve energy. This amino acid also carries out anti-catabolic activity by retaining energy and blocking the decomposition of matter.

It is an essential branched amino acid with aliphatic side chains and is also called by its acronym BCAA (Branched Chains Amino Acids). It has been shown to be effective when used in amounts well balanced with the other two BCAAs, leucine and valine, in a stoichiometric ratio of 2:1:1.

Isoleucine is intercepted directly by the muscle and not by the liver like the other seventeen compositions. According to bodybuilders, if taken before a workout, it fights against muscle catabolism, – the breakdown of muscles to generate the BCAAs. In this way, it delays the production of lactic acid, allowing more time for physical and muscle work and stabilizing sugar levels (glycemia).

From the medical point of view, on the other hand, the data gathered in most cases is not objective enough proof for such a statement of anabolic and catabolic effects. Results have been observed, however, in restoring muscle mass in individuals with liver problems or those who have suffered trauma or surgical interventions.

Ambitious goals were also reached in treating Parkinson's disease and Amyotrophic Lateral Sclerosis (ALS or Lou Gehrig's disease), whereby a group of patients treated with a mixture of three branched chain amino acids obtained an improvement in health to the point of being able to contract muscles and walk again. In-depth studies are currently being undertaken in this area. A deficiency of this amino acid produces hypoproteinemia and considerable weight loss.

Leucine
Leu
PM 131.11

This amino acid could be defined as having a versatile personality, considering the many chemical and biochemical reactions in which it plays a leading role. It promotes the healing of skin and broken bones, constitutes a part of elastin, and reduces high blood sugar because of its presence in hemoglobin.

This is how it speeds up the transporting of nutrients to cells, allowing faster tissue absorption with a general rebalancing of the carbohydrates present in the red blood cells. This essential amino acid is laterally branched with aliphatic chains. As a BCAA, it is metabolized in muscle tissue, in contrast to all the others, which are either assimilated or synthesized in the liver and pancreas.

This BCAA also has a part in the management of hormonal glands, controlling a large part of the body in this way. Leucine must be well balanced with the other two essential branched amino acids, isoleucine and valine, in a ratio of 1:2:1.

Lysine is an essential amino acid that strengthens the immune system and promotes healing of herpes, a widespread pathology that affects 60 – 70% of the human population.

Several studies aimed at finding an answer to this subject were conducted, but resulted in partial or unreliable results, since the placebos were comparable to positive results. Only one experiment proved reliable, carried out in the prestigious Mayo Clinic in Denmark. For a specific period of time, 21 patients were given increasing doses of lysine. Nothing happened until a dose of 1248 milligrams per day was reached, a quantity which indicated a clear and evident regression in the frequency of herpetic infections, but not their length or intensity.

Methionine is a sulphur-based essential amino acid with hydroxyl side chains. Similar to choline, it has lipotropic action. This means it contributes to the reduction of fats in the liver and in the circulatory system's network of blood, preventing excessive accumulations of lipids and helping to avoid eventual obstructions in the arteries. For this reason, supplementation with this amino acid is considered a valid tool in treating patients with cirrhosis of the liver. Methionine is destroyed by high doses of alcohol.

This can lead to serious consequences, since its absence limits numerous metabolic processes, among which are cysteine and taurine synthesis, the latter being closely connected with the proper functioning of the retina. Methionine has the property of strengthening the hair bulb, showing breakthrough results on many fronts in the fight against the hair loss syndrome alopecia.

Threonine is a lipotropic amino acid, meaning it prevents the accumulation of fat in the liver by metabolizing complex lipid chains and facilitating their expulsion through the urinary system. It is the source of liver and muscular glucose energy reserves. It has apparent glucogenic properties. It also intervenes in biochemical reactions during growth. Threonine has two hydroxyl side chains.

An increased level of threonine corresponds to an increased level of glycine.

The latter influences glycinergic neurotransmitters and, consequently, brain development in the first stages of life.

Lysine
Lys
PM 146.13

Methionine
Met
PM 149.13

Threonine
Thr
PM 119.08

Valine
Val
PM 117.09

Glycine is an important post-synaptic inhibitory transmitter in the spine marrow and cerebral trunk, and is also an amino acid involved in locomotive function.

Valine has glycogenic properties, that is, it is a source of energy reserves for the liver and muscles. Third and last of the branched essential amino acids with an aliphatic side chain, it is metabolized by muscle cells and respects the stoichiometric ratio of 1:2:1 with the other two amino acids, isoleucine and leucine. The branched chains of this "special trio" increase the availability of nitrogen in the body. The three of them together constitute 25% of muscle proteins, making them indispensable in protein synthesis. This synthesis slows down during sports training which strains the muscle, or during fasting, and is instead favored during recuperation, thus limiting the fatigue of the muscle. Valine is also useful in treating ataxia, a lack of coordination in voluntary muscle movements. Glycogen is a reserve polysaccharide in animals. When it is deficient in the body, the latter reacts by cleaving the proteins via catabolic reactions to gain alanine and BCAAs, useful for the production of glycogen itself. Like the other BCAAs, valine participates in glutamine synthesis. Valine is a detoxifying amino acid that eliminates both toxins and the ammonia formed after muscular activity. Finally, it is used in the treatment of serious amino acid deficiencies caused by drug abuse. Drugs alter muscle metabolism, favoring catabolic rather than anabolic processes, which result in a marked deterioration of muscle fibres.

Non-essential amino acids

Non-essential amino acids are those which the body is able to synthesize in adequate amounts under normal physiological conditions. The non-essential amino acids present in Aloe total nine out of the twelve necessary for human life. These include: aspartic acid, glutamic acid, alanine, arginine, asparagine, glycine, glutamine, proline, and serine.

Aspartic acid
Asp
PM 133.06

Aspartic acid controls and balances blood concentrations of glucose and fatty acids, reducing the first and increasing the second. Recently, it has been effectively used in the therapeutic treatment of chronic fatigue. It is a non-essential amino acid with side chains of acid groups. It is involved in the conversion of carbohydrates, and sugars in glucose and therefore in glycogen. The glycolysis reaction is

the primary source of muscular energy. An eighteen month scientific investigation conducted on 150 subjects, with placebo control, demonstrated improvement in those who had been given the product. Conclusive studies are still needed to understand the metabolic reaction mechanism or how this amino acid's activity actually affects the body. Some studies show it to be valid in the fight against opiate addiction because of its tranquilizing properties. It is an ingredient in several food supplements. It should be taken in moderation because of its role as a neurotransmitter which, if taken at certain dosages, can be toxic. The artificial sweetener "Aspartame" for example, can be converted into aspartic acid and phenylalanine. Its excessive use could create toxicity evidenced by headaches and dizziness.

Glutamic acid has a main role in carbohydrate metabolism and, for this reason, it seems to improve alertness, and create a sense of well-being in some people. It acts as brain fuel in its role as an excitatory neurotransmitter and potassium transporter through the blood brain barrier. It also detoxifies the large amounts of ammonia produced in muscles during exercise through its transformation into glutamine.

A non-essential amino acid with side chains containing acid groups, it is required in the energy-producing processes of the body from the BCAAs. Its use is recommended for athletes and people who participate in sports, in doses of 0.5 to 2g per day, together with B6. According to recent medical research, glutamic acid seems to be useful in the treatment of mentally disabled individuals, improving their I.Q.

Alanine is capable of inducing a better immune response in the body, intervening in oxidative processes and producing immunoglobulins and antibodies.

A secondary amino acid with an aliphatic linear chain, it is important in the conversion of energy in the Krebs Cycle. It specifically controls the production of reaction intermediates like pyruvate and, in general terms, the energy management of glucose and organic acids in muscle tissues. From the metabolic point of view, it is associated with branched chain amino acids like leucine, isoleucine, and valine – the BCAAs. It makes energy support available to the muscles easy to assimilate and utilize.

It positively improves muscle performance by controlling and diverting glucose from localized areas of the muscle to its periphery, with a delay in the formation of lactic acid

Glutamic acid
Glu
PM 147.08

Alanine
Ala
PM 89.06

L-Arginine
Arg
PM 174.14

which is responsible for the pain felt in post-workout muscles. In this way, it allows for longer "workouts" or use of the muscle.

L-Arginine has become famous to the general public as an important aid in the sports world because it is believed to improve muscle mass. The properties of this amino acid are under much discussion, particularly because of its presumed ability to stimulate or inhibit human growth. L-arginine stands out because of its effects on the main endocrine hormones and in the processes of rehabilitation and skin repair.

From recent research, it has been understood that arginine stimulates the thymus to produce a greater quantity of active and effective lymphocytes. The data has been confirmed in all animal tests as well as tests on both healthy and unhealthy individuals, and has had a proven immuno-modulating effect in all of these cases.

This molecule has been studied for over fifty years, and has recently been re-assessed for further studies on its anti-tumoral properties, since it is available to everyone and is not patentable. Results on arginine as an anti-tumoral are very encouraging. Thanks to its use, several types of tumors are frequently controlled.

This amino acid also carries out an important role in growth and in muscle development, particularly muscle mass, by burning adipose tissue. It has also demonstrated a stimulating action on the pituitary gland. Children can be affected by a deficiency and, for this reason, supplement support is indispensable for the balanced growth and development of children and adolescents. Adults also need arginine, especially in limiting post-traumatic stress, post-operative stress, and numerous other conditions. Its parallel action on the immune system, in fighting against secondary infections that can slow down the healing of wounds and burns, is well-established. It has been observed that concentrations of arginine in the blood are lower in patients with severe burns creating a predisposition to infections.

Arginine also has a detoxifying and protective action on the liver. A study conducted several years ago on laboratory mice showed how the synergistic administration of arginine with ornithine could prevent the toxic and, at times, even lethal effects of ammonia. In consideration of these results, arginine was given to people with widespread liver disease, and with excellent results.

Finally, this amino acid promotes male fertility. By now, it is well known that a correlation exists between a low sperm count and diets low in arginine. A healthy group of patients with fertility problems that was given 4g of arginine daily had lasting net results in 80% of cases.

Taken in high doses, however, it can lead to skin eruptions, nausea, and diarrhea – symptoms that disappear within a short time with a reduced dosage. Overdosage seems to limit its efficacy on the immune system and can even deactivate it in the case of herpes simplex.

Glycine is the simplest and sweetest amino acid and is also used as a sweetener. It is especially valuable as a primary source of creatine, the protein that, together with ATP (Adenosine triphosphate), creates the main energy transportation in the human body. Through a reaction called phosphorylation, utilization sites spread throughout the body – the creatine shuttle. It is through this cycle that we can produce and give energy to our body after intake of these nutritive substances.

Glycine is a non-essential amino acid with aliphatic side chains, with several important properties. It stimulates a complex chain of events soliciting hormones aimed at the production of somatotropine (GH factor) for growth, from the pituitary gland. All this promotes the absorption of amino acids and improves muscle development. Glycine is also a determining factor in the synthesis of bile acids and is therefore quite effective at creating a buffering effect in cases of gastric hyperacidity. It is also essential in the synthesis of nucleic acids, DNA and RNA, the two custodians responsible for our genetic heritage. Glycine counts, among its properties, glucogenic ones which intervene (as stated earlier) in the metabolism of glucose, making it available for several metabolic requirements.

Several studies confirm that glutamine lessens the desire to drink in alcoholics, producing a substance that inhibits the sense of thirst and therefore the need to drink in people affected by this disease. It also protects against the damaging effects of alcohol on neurons by producing harmless reaction intermediates. This amino acid also contributes to the management of several pathologies, such as slowing down the aging process and significantly reducing the symptoms of depression and schizophrenia. Recent studies confirm its capacity to accelerate the healing of peptic ulcers as well as increasing mucous production. Glutamine is an amino acid with functional amyl side chains. Produced by cellular metabolism, it is very similar to glutamic acid from which it is derived, from its reaction in the presence of ammonia. It allows particular biochemical reactions like the synthesis of niacin and vitamin B6 and controls the levels of cortisone by limiting the normal catabolic effects.

This amino acid mainly occupies itself with the supervision of bone and collagen synthesis. Hydroxyproline is a secondary amino acid, with a hydroxyl in position 4, on the pyrrolidine ring. It is the product of the hydroxylation reaction of proline, another non-essential amino acid. Hydroxyproline is almost exclusively in collagen, where it accounts for 14% of all the amino acids present in connective tissues.

Glycine
Gly
PM 75.05

Glutamine
Gln
PM 116.08

Hydroxyproline
Hyp
PM 131.08

Histidine
His
PM 155.09

Collagen is the main protein component of bone structure, occupying over 50%. It is formed by repeating sequences of glycine, proline, hydroxyproline and hydroxylysine.

In bone reabsorption, collagen amounts are diminished; therefore, the bone is more fragile and high concentrations of unused hydroxyproline are released proportionate to the measure of collagen destruction present. Hydroxyproline is then excreted via the urine. Initially, it passes through the renal glomeruli to be 90% recycled, then the remaining 10% is excreted through the bladder. This is why the amount of this amino acid in urine is an important marker for pathologies dealing with bone reabsorption, like osteoporosis, bone decalcification in menopause, hyperthyroidism, and neoplasms with bone lesions. Many existing studies correlate the concentrations of urinary hydroxyproline with direct measurements of bone reabsorption with bone densometry and calcium kinetics.

Histidine is an essential amino acid for children, as it greatly influences development. Alternatively, in adults it is produced from other amino acids and thus not considered essential. Histidine is metabolized by transforming itself into a histamine neurotransmitter that directly influences muscular function, contraction, and blood vessel dilation. Histidine has beneficial effects in combatting various forms of anemia, intervening in erythrocyte stimulation inside the bone marrow. Histidine is a secondary amino acid with side chains of base groups, of which little is known. Results of its effects on the brain show it to be useful in reducing stress and increasing libido. Histidine preserves myelin sheaths, the protective nerve coverings with the task of conveying electrical information in the body, and takes care of the proper functioning of the acoustic nerve. Medical research has established that patients affected by rheumatoid arthritis have very low amounts of serum histidine. In this autoimmune disease the T-lymphocytes killer cells no longer recognize external pathogens from internal cells with specific activities. The cells, in this case, become all-round targets creating an autodestructive (or "self-destructive") effect in the body.

Prolin
Pro
PM 115.08

Proline is used by the body for constructing cartilage, bones, blood vessels, joints, and skin. It is of extreme importance for good health and the functioning of joints, tendons, and the cardiac muscle. It is also helpful in speeding up wound healing. Proline is a non-essential amino acid, synthesized from ornithine and glutamic acid. In combination, histidine, hydroxyproline, glycine, and hydroxylysine participate with vitamin C to make up the most important fibrous protein

of connective tissue – collagen. Like hydroxyproline in cases of bone reabsorption pathology, proline also is released into the blood and lost after renal filtration and urinary excretion. It also has glycogenic properties in that proline generates reserve energy for the liver and muscles making glucose widely available to the body should it require higher than normal amounts, as in the case of muscle effort or strain. A deficiency of this amino acid can provoke reductions in the body's collagen and create damage to the blood vessel flow resulting in arteriosclerosis and perhaps eventually a heart attack.

Serine is a very important amino acid in lipid metabolism. It activates the immune system's production of immunoglobulins and antibodies. It is the amino acid that constitutes over 30% of sericine, the main protein of silk. This same characteristic is responsible for the hydrophilic ability of skin. It is a non-essential amino acid with hydroxylic side chains. It can be synthesized by the body from glycine and threonine. In cellular metabolism it is transformed into a peptide, cysteine, and into the neurotransmitter acetylcholine, which helps mnemonic processes together with other parasympathetic functions. Serine is glycogenic; that is to say, it also plays a fundamental role in producing cellular energy and taking part in the Krebs Cycle. Any serine supplement should always include magnesium, phosphorus, and vitamin B6 in order to enable it to carry out its function appropriately.

The semi-essential amino acids contained in Aloe are cysteine and tyrosine. This means they are synthesized in the body from phenylalanine and methionine when these are available in adequate amounts.

This amino acid containing sulphur is considered, with good reason, a guarantee of health and longevity. Firstly, cysteine is responsible for deactivating free radicals and, secondly, for protecting and strengthening cellular membranes against external attacks. These are the results obtained from research conducted in both laboratory and human experiments.

The currently accepted hypothesis is that cysteine participates in inhibiting mutation and degeneration processes through its sulphuric functional group, a highly

Serine
Ser
PM 105.06

**Semi-essential
amino acids**

Cysteine
Cys
PM 240.23

effective antioxidant. Data shows that the aging process displays progressive lessening of sulphuric substances present in the body. This partly explains the upsurge of degenerative pathological states. Cysteine is a constituent of glutathione, a molecule formed by three amino acids, known in medicine as the body's hub of defense against polluting agents. Recent studies have demonstrated that the aldehydes, a toxic by-product of alcohol, fats, smoking, and smog, can be neutralized by cysteine combined with vitamins from the B group. In particular, glutathione bonds itself to toxic molecules, forming inoffensive and inert compounds. From British research not, as yet, clinically conclusive, we know that cysteine combined with pantothenic acid is useful in the treatment of arthritis, osteoarthritis, and rheumatoid arthritis.

Tyrosin
Tyr
PM 181.09

Tyrosine is attributed to stress inhibition, antidepressant, and mentally stimulating actions. It has shown to be useful in alleviating the symptoms of premenstrual syndrome and drug detoxification.

This is an amino acid which our body synthesizes starting from phenylalanine. The latter is an essential amino acid that intervenes in the synthesis of the important neurotransmitters epinephrine, noradrenalin, and dopamine. On the basis of data obtained from laboratory animals exposed to stress with and without tyrosine, we can easily confirm that this amino acid is involved in stress reduction. Later studies were conducted on soldiers in military drilling practice, exposed to the usual routine of fast climbing at high altitudes with inadequate protection from the elements. Those given tyrosine before the drill had less discomfort, greater resistance to cold, fewer headaches, and a generally improved efficiency compared to the control group who had not taken tyrosine. Similar research is being conducted on the antidepressant property of tyrosine as well as its capacity to fight off the discomforts that occur in women's bodies in the premenstrual phase of their cycle. Slight success has been achieved in its use in cocaine detoxification programs. Many of the patients observed reduction of confusionary excitation provoked by cocaine as well as a reduction in the state of depression caused by withdrawal from the drug.

***Vegetable
hormones***

The two specific regulators of vitality are vegetable or plant hormones. Both are found in the precious juice of the Aloe plant. These hormones are called gibberellines and auxines, or indole3acetic acid which, according to several studies, are responsible for stimulating cellular growth and skin-repairing processes in both vegetable and animal tissues.

**Outlines on the pharmacology of Aloe
and published research**

3. Outlines on the pharmacology of Aloe and published research

In the course of this book's in-depth look into the intrinsic properties of Aloe, having completed an overview of its history, botany, and chemistry, we will proceed to address the pharmacological aspects of this plant. Even though an analysis of each chemical component gives a clear idea of its primary potential, it is believed by the authors of this text that the synergy of all the specific acts studied from the pharmacopoeia provide further evidence of the extraordinary effects of this miraculous plant.

This chapter will be completed with an in-depth look at published research sources, along with summaries of the abstracts.

3.1 Pharmacological aspects

The work is a condensed synopsis of the knowledge gained from relevant publications present in scientific libraries.

The authors are conscious of the fact that providing an overview may be at the expense of some arguments providing greater depth and understanding.

The constituents of Aloe are derived from the leaf or, more precisely, from its three main sections. The first section is the external cuticle, made up of pericyclic plant cells, xylems, and floemes which allow the passage of sap and where photosynthesis takes place. Next is the mucilaginous strata. Finally, there is the internal parenchyma which is its famous gel. The relative quantities of the defining substances that create the Aloe plant are quite small and represent about 3% of total solids. This means that Aloe is virtually composed of 97% water. This water, however, is not just randomly present, but is sought out by the plant, time after time, for its own growth requirements. Those who are aware of homoeopathic principles and the theory of "water memory" can well understand the important role of this apparently simple substance in the final juice product.

Many researchers maintain that these effects are, however, due to the synergistic action of over 80 classes of different

compositions and more than 200 biologically active molecules. The greater number of these assets are contained in the gel and the anthraquinoid and anthracenic glycosides. Like aloin, they are contained beneath the protective covering of the cuticle and skin of the leaf, together with calcium hydroxide crystals. Manual peeling of the leaf guarantees their continued presence, although there is a noticeable (yet reasonable) reduction of these effects in the finished juice. The xylems are easily visible in the gel and are present in quantities of six-tenths to nine-tenths of an ounce per quart of juice. When Aloe is applied to a burn, wound, or skin irritation, a multitude of substances move in a coordinated way. It is never casual or "arbitrary" and in a single and well-defined direction. The chemical mechanism that stimulates the different molecules participating in this great healing is not yet understood by the scientific community. One curiosity that may be useful to the reader is that, in the clinical medicine arena, there are two basic theories with slight differences in their interpretations of the innumerable coordinated activities of Aloe.

The first theory suggests that the entire healing process is due to the singular action of one molecule – the polysaccharide acemannan. The studies that support this theory originate basically from American and South American schools of thought, so much so that it is defined as "the American theory". In these countries, Aloe is mainly known as a substance that must be entirely de-aloinized before its commercialization and subsequent use.

The second theory sustains that the multiple actions carried out in the body with the use of Aloe occur due to the coordinated activity between the polysaccharides and human fibroblast proteins present. This action is then extended, in a coordinated manner, to the other molecules present including the amino acids, vitamins, minerals, enzymes, simple sugars, and fatty acids that are all part of the grand symphony of healing. This theory, proposed by Prof. Robert Davies of the Department of Biomedical Sciences in Philadelphia, Pennsylvania, has the potential to influence current pharmacological concepts in the future, not only in regard to the Aloe plant but in all phytotherapeutic science generally. The research approach and contributions from European scientists have led to this theory being defined as "the European theory". A matter of interest is that the scientific

world is showing a tendency towards the latter study on the synergistic interactions of the active components of the Aloe plant and receptor cells that support greater coordination of activities within our bodies. In addition, numerous studies in European circles are oriented towards the therapeutic and anti-tumoral action of anthraquinones and the many enzymes contained in these substances.

According to this understanding of the active mechanisms in Aloe, pain and inflammation are inhibited and wound healing is stimulated through acemannan and the growth factors that increase collagen and proteoglycans.

This could be the way that nature makes itself available to the human species, offering its services and its simple yet complex answers. The therapeutic properties produced by the sum of Aloe's botanical parts are listed below.

3.1.1 Skin and body anti-aging properties

The invaluable oligoelements present in Aloe juice, manganese and selenium, constitute the enzymes superoxide dismutase and glutathione peroxidase, recognized as powerful antioxidants and cellular anti-aging agents. Their high antioxidant properties slow down the aging process. This helps cells to become stronger in combating the negative effects caused by oxygen and the broad spectrum radiation we are exposed to daily. The non-essential amino acid, proline, is instead a constituent of collagen, whose role it is to ensure the perfect holding capacity and elasticity of epithelial tissues. It naturally follows that the intake of the vitamins and minerals present in Aloe stimulates proper blood saturation, thus guaranteeing better oxygenation and faster expulsion of toxins. Skin becomes smoother, hydrated, and more elastic, protected from free radicals and their degenerative activity, resulting in impressive/substantial anti-aging effects. This extraordinary anti-aging effect can easily be obtained and appreciated through the regular use of cosmetics and gels based on Aloe as well as the daily intake of at least 4 tablespoons of fresh juice.

Recommended reading:

- Danhof (1993), Potential reversal of chronological and photo-aging of the skin by topical application of natural substances. *Phytotherapy research* 7, 53-56.
- Byung (1993) Cellular mechanisms of biological aging. *Phytotherapy research* 8, 57-59.

3.1.2 Antibiotic properties

Aloe has an extraordinary natural antibiotic capacity. This effect is accomplished via the different anthraquinoid glycosides, such as aloin and aloetic acid.

Acemannan's preparation of the tissues for receiving the anthraquinones allows aloe-emodin and the bradykinase enzyme to more easily carry out their antibiotic, bactericidal, and germicidal activity. This is thanks to their cytotoxicity being expressed in a coordinated manner, after the protection of the cytoplasm. This is how the immune system becomes involved in a rapid reaction against external pathogens, producing more macrophages, interferons, and interleukins.

This antibiotic activity can be appreciated through the use of aloe-based disinfecting and antibiotic creams for topical use, as well as an aloe juice drink regularly or sporadically targeted to the body's problems.

Recommended reading:

- G. Henderson, Nature's legendary healer.
- Atherton, (1966). The essential Aloe Vera, Mill. Enterprises.

3.1.3 Antibacterial properties

The bacteria that attack our body are rapidly combatted with the use of Aloe gel or juice. The combined antibacterial effects of the lignin, cinnamic acid, and chrysophanic acid are immediate. The cytotoxic characteristics owed to their anthracenic structure respond quickly on superficial cells, liberating these cells from unwanted guests.

Recommended reading:

- Grindlay, Reynolds (1986), the Aloe Vera phenomenon: a review of the properties and modern uses of the leaf parenchyma gel. *Journal of Ethnopharmacology*, 16 (2-3).
- Atherton, (1966). The essential Aloe Vera, Mill. Enterprises.

3.1.4 Analgesic properties

The analgesic action of Aloe is dominated by three different molecules, all of which collaborate with the beneficial action of anthracenes and anthraquinones on the cell. To these, an enzyme is added. They are the ester of cinnamic acid, isobarbaloin, and salicylic acid. The enzyme added is bradykinase.

The ester is found in high concentrations in camphor and cinnamon essences and has a detergent action because its molecular structure is very similar to that of soaps, which are esters of fatty acids. The second molecule is one of the bitter compounds of Aloe and the third is a natural anesthetic similarly produced from the weeping willow tree (*Salix*), yielding the well-known acetylsalicylic acid or aspirin.

To these, the effects of bradykinase can be added.

Bradykinase stimulates the immune system, particularly the macrophages, and becomes a part of the pain system on which it has an analgesic action. It inhibits bradykinine, responsible for post-traumatic pain and swelling, called to action by the liposomal enzymes after an elevated loss of granulocytic macrophages that are unable to block the invading foreign bodies that may enter the body. Used topically, Aloe, and the enzyme bradykinase contained in it, is an effective analgesic and anti-inflammatory remedy.

These four compounds synergistically offer their valuable actions in support of the principal effects of acemannan, the manager of the entire healing process.

Recommended reading:

- Bitz, Smith, Gerard, (1963). Aloe Vera gel in peptic ulcer therapy: preliminary report. *Journal of the American Osteopathic Association* 62, 731-735.
- Firenzuoli (1993) *Fitoterapia*, Ed. Masson, p.208 and 222.
- Udupa (1994), Anti-inflammatory and wound healing properties. *Fitoterapia* vol.65, n°2.
- Ayala, (1996). Possibile ruolo dell'Aloe Vera succo intero della polpa spremuta a freddo nella patologia infiammatoria-erosiva ed ulcerosa gastrointestinale. Risultati preliminari di dodici casi clinici. Congresso nazionale ANMFIT, comunicazioni ai congressisti.

3.1.5 Anti-inflammatory properties

This quality of Aloe is, without a doubt, the most observed and documented property.

Aloe gel has a calming and soothing action on inflamed and painful tissues, of an intensity equal to synthetic pharmaceuticals based on steroids, but with the advantage of not producing the harmful and toxic side effects.

The same effect occurs when the gel is applied to chronic or acute inflammations. The anti-inflammatory action of Aloe manifests through its three plant steroids: lupeol, beta-sitosterol, and campesterol.

It is followed by the inhibitory effect of prostaglandin type 2, known as PG2, and the synthesis of cholesterol in the

lymphocytes. Other elements would flock in numbers to combat the invading agent, producing the swollen and enlarged appearance of an inflammation. Macrophages come into play that can phagocytose or "swallow" molecules and organisms incompatible with proper metabolic functioning, thereby diminishing the evident effects of tumefaction or inflammatory swelling.

This intervention is amplified by the further assistance of the enzyme bradykinase, which enters into this complex organic system of pain management by inhibiting the formation of kinines, including bradykinine and interleukin, molecules produced by the body as a primary response to inflammation. As we know, Aloe juice used topically is an effective anti-inflammatory and analgesic remedy.

Recommended reading:

- Davis, Leitner, et al. (1989) Anti-inflammatory activity of Aloe Vera against a spectrum of irritants. *Journal of American Podiatric Medical Association* 84 (2), 77-81.
- Davis, Maro. (1989) Aloe Vera and giberellin: anti-inflammatory activity in diabetes.
- Hegggers, et al. (1993) Beneficial Effects of Aloe in wound healing. *Phytotherapy Research*, 7, 48.

3.1.6 Antimycotic properties

This property is admirably carried out by two organic acids contained in Aloe – cinnamic acid and chrysophanic acid. The first produces a germicidal action against fungi that enter and attack the body. This is due to the cytotoxicity upon the attacking external pathogens, expressed in a coordinated manner, after the cytoplasm has initially been protected by the sugar complex acemannan.

In this way, more macrophages are produced and the cell walls are strengthened.

Chrysophanic acid, on the other hand, is a good fungicide, depurative, laxative, diuretic, and also stimulates bile secretion (choleretic). This is due to its molecular structure, which contains an anthraquinoid radical which results in a net clean-up of the toxic waste produced by fungi and similar organisms. The chrysophanic acid present in Aloe carries out its fungicidal action mainly in the intestine.

In the case of *Candida Albicans*, we recommend that treatments with Aloe should include the complementary effects of a high quality Tea Tree essential oil.

Recommended reading:

- Grindley, Reynolds (1986), The Aloe Vera phenomenon: a review of the properties and modern uses of the leaf parenchyma gel. *Journal of Ethnopharmacology* 16, (2-3).
- Atherton, (1996). The essential Aloe Vera, Mill. Enterprises.

3.1.7 Antioxidant properties

There are many substances in Aloe juice that exhibit the antioxidant effects that combat free radicals. Monovalent or singlet oxygen occurs by secondary reactions which are responsible for the destruction of intercellular tissues and the insurgence of precancerous activity is interrupted to some degree. The acting substances are the minerals manganese and copper, vitamins B2, B6, C, and E, and the amino acid cysteine.

Manganese is a powerful antioxidant that slows down the aging process and makes cells stronger in the fight against the negative effects of oxygen and broad spectrum radiation, to which we are exposed daily. It constitutes a part of the enzyme superoxide dismutase, an allied anti-free radical of the pancreas, liver and kidneys.

Copper is an oligoelement essential to health. Also a strong antioxidant, Copper greatly limits the damaging effects of free radicals, mainly through the protein ceruloplasmin, which oxidizes the reduced form of iron responsible for the formation of free radicals. Through the enzyme superoxide dismutase, the copper element, which is one of its constituents, prevents rancidity of polyunsaturated fatty acids and keeps the cellular membranes strong. Similarly, it also produces an anti-cancer property.

Vitamin B12 actively takes part in complex cellular metabolic processes by being an indispensable regulator together with the enzyme glutathione reductase, as part of the process of maintaining stable levels of glutathione, a highly active anti-free radical. Riboflavin limits and inhibits, in part, the toxic byproducts of cellular respiration, a natural metabolic process which is highly oxidative.

Vitamin B6 plays a role in the metabolism of the important essential amino acid, tryptophan, which is involved in protein synthesis and is a strong antioxidant.

Vitamin C, another strong antioxidant, limits the damage caused by the oxidation of free radicals to the white blood cells. It is known that white blood cells are responsible for

our immune defense, by which sickness or disease is overcome more easily.

Vitamin E interacts in cellular energy production processes and is truly important to our health, especially during nervous system and immune system illnesses.

Cysteine is also a member of Aloe's antioxidant team. This non-essential amino acid is considered a guarantee to our health and longevity, by de-activating free radicals through its sulphurous function group, a good antioxidant, and, secondly, by protecting and strengthening cellular membranes from external attacks. Recent studies have demonstrated that cysteine, together with the B group of vitamins, can bind toxic molecules formed by disease processes and create inoffensive and harmless compounds.

After reading this list of substances capable of combating the negative effects of free radicals produced by radiation, smoke, and toxic agents generally, we can better understand the importance of including Aloe juice in our diet. The daily intake should be no less than 4 oz of pure juice daily.

Recommended reading:

-Yamaguchi et al. (1993). Components of the gel of Aloe Vera. Bioscience biotechnology and biochemistry. 57-8. 1350-1325.

-Saben-Farideh (1993) Studies of the status of antioxidant enzymes and metabolites following burn injury, and the presence of antioxidant enzymes in the aloe vera plant (tumor necrosis factor, glutathione), p 138.

-Saben-Farideh et al. (1993) Purification and characterization of a glutathione-peroxidase from the aloe vera plant. Enzyme Protein 47, 2:92-98.

3.1.8 Antiseptic properties

There are three antiseptic hinges present in Aloe: the saponins, cinnamic acid, and salicylic acid. The saponins are glycosides and are very particular. Unlike the saponins of some plants which exhibit irritant and hemolytic actions, especially in the digestive tract, the saponins in Aloe have purifying, antiseptic, and antimicrobial actions which are not destructive to surrounding cellular tissues.

Cinnamic acid, present in several spices like cinnamon, is an organic acid with outstanding antiseptic and germicidal activity.

Greg Henderson author of "Aloe Vera: Nature's Legendary Healer" states that the pure juice of Aloe is effective against organisms like salmonella, streptococci, staphylococci, and can even destroy the bacteria that cause peptic ulcers – he-

licobacter pylori. As well as being a good analgesic, salicylic acid also exhibits an antiseptic action.

Recommended reading:

-Grindley, Reynolds. (1986). The Aloe Vera phenomenon: a review of the properties and modern uses of the leaf parenchyma gel. Journal of Ethnopharmacology 16, (2-3).

3.1.9 Anti-tumoral properties

Aloe supplies a wide range of substances that block and improve precancerous cellular situations that are difficult and hostile. We can include zinc, a mineral, and B12 and folic acid, B vitamins, among the many antioxidant substances mentioned earlier in the text.

According to the various tests conducted on laboratory animals, zinc has a marked action on lymphocytic activity, inhibiting tumors induced by toxic substances. However, its work inside the cell, and particularly inside the nucleus, is not yet completely understood. Therefore, more research is needed to determine, with any certainty, its anti-tumoral property.

Some clinical investigations place B12 in the front line as a powerful anti-cancer agent. It has been discovered to prevent tumors, especially those generated by smoking. A trial group of smokers were shown to have low levels of B12 and folic acid.

These two substances, together, carry out a synergistic function in both mitotic and meiotic cell division processes, particularly in bronchial and pulmonary tissues. Treatment of patients with daily doses of the two vitamins showed surprising results. Lung cells were healthier and the cells with precancerous characteristics diminished in number.

Folic acid is at the head of the folate compound group that in nature is present mainly in plants with green leaves, such as broccoli and spinach, and in Aloe which contains a considerable amount.

Folates participate in several cellular metabolic processes, particularly in the basic function of protein synthesis, especially in DNA duplication. For this reason, folic acid is an important anticarcinogenic. It is during cellular division that high risk and fragile situations occur in the genetic complement. Based on research conducted on smokers in 1986, at the National Institute of Cancer Research, it was obser-

ved that the blood values of folic acid were lower in these subjects.

Successive studies from the University of Alabama confirmed that the administration of high doses of folic acid resulted in the reduction of potentially precancerous bronchial and pulmonary lesions.

An official study carried out at the University of Padua in Italy in 2000, clearly demonstrated the effect of the anthraquinoid molecule of aloe-emodin on a particular infant tumor of the skin, a neuroectodermic tumor. This encouraging study clearly highlights the anti-tumoral role of this substance, and will be looked into further in the appendix, "Aloe and tumors".

Recommended reading:

- Winters, et al. (1981). Effects of aloe extracts of human normal and tumor cells in vitro. *Econ. Bot.* 35, 89-95.
- Jeong-He-Yun, et al. Anticancer effects of Aloe on sarcoma 180 in IRC mouse and on human cancer lines. *Yakhak Hoechi* 38(3), 311-21.
- Gribel, Pashinskii, (1986). Antimetastatic properties of Aloe Juice. *Voprosy onkologii* 32 (12), 38-40.
- Michel, Pignon, et al. (1989). Prospective study of the immunomodulator properties of i.m. administered "ALVA" extract in patients with solid tumors under a course of chemical immunosuppressive therapy. *Archives de l'institut Pasteur de Madagascar* 56 (1), 253-259.
- Palu, Pecere, Gazzola, Mucignat, Parolin, et al. Dipartimento di istologia, microbiologia, e tecniche mediche. Università di Padova. Italia, Giugno, 2000.

3.1.10 Anti-viral properties

Aloe juice contains substances having a powerful effect against viruses, the infective agents of a spheroidal or polyhedral shape that live and reproduce inside living cells. The acemannan molecule, in particular, produces antiviral and immunomodulating effects that regulate immune defenses according to the body's requirements.

The immune system, our bodies' defense unit, is actively on guard to combat the external attacks of pathogenic agents like bacteria and viruses. If, for any reason, its activity becomes reduced or compromised, the body becomes more vulnerable to disease.

According to recent medical studies, a remedy aimed at increasing a compromised immune defense system comes from the active principles contained in Aloe juice and, more precisely, acemannan.

This polysaccharide has the extraordinary property of ac-

ting directly on the various cells that are in charge of immunological activity in the human body.

According to the studies made public by scientist Bill McAnally, acemannan is a molecule that interacts with the body's immune system, based on the results of laboratory trials given carrysin daily.

What emerged from the studies of two European researchers, Hermans and Clumeck, is even more interesting. They set out to study the interaction of mucopolysaccharide with HIV and found surprising results.

Acemannan carries out an action directed at increasing the production of macrophages, T-lymphocytes, and the beta cells of the pancreas.

Acemannan also limits the damage caused by the use of anti-retrovirus drugs like AZT. Spine marrow, extremely delicate, can also be subjected to irreparable damage by the use of potent drugs like AZT and can benefit from acemannan's antiviral and protective action on the body's organs. In short, acemannan is able to increase the depurative action in blood, giving the body a greater ability to fight disease and find a road to recovery.

More and more doctors are combining curative medicine with nutrition and targeted supplementation. Patients affected by AIDS and HIV often integrate their official medical therapies with diet and nutritional substances, among which is Aloe.

In this way, pharmacological medicines together with phytotherapeutic supplements and a lifestyle more respectful of the individual, can inexorably lead to more immediate and lasting results and arrive at a new and broader understanding in the concept of health.

Recommended reading:

- Imanishi, et al. (1981). Pharmacological studies on a plant lectin Alocti A. growth inhibition of mouse methylcholanthrene-induced fibrosarcoma. *Experientia* 37, 1186-1187.
- McKempton, Kahlon, et al. (1990). In vitro evaluation of the antiviral effects of acemannan on replication and pathogenesis of HIV-1 and other enveloped viruses; modification of the processing of glycoprotein precursors. Brussels. Conference on Antiviral Research.
- Pittman. Immune enhancing effects of Aloe. *Health Consciousness*. 13 (1), 28-30.
- Carpenter, Harris, et al. (1991). Effect of acemannan in treatment of feline immunodeficiency virus infected cats. First conference of feline immunodeficiency virus researchers.

3.1.11 Wound healing and re-epithelializing properties

Aloe juice perpetually amazes us with its numerous properties. With topical aloe gel use, its anti-inflammatory actions are complemented by its capacity to heal wounds and regenerate skin cells in affected areas. The mechanisms for this action are quite different. If the anti-inflammatory response displays a tendency towards inhibitory reactions, then its wound-healing response shows the opposite phenomenon – that is, the stimulation of cells whose job is the formation and repair of tissues. The reabsorption of a wound is promoted by at least two factors.

The first factor includes several active principles and a high molecular weight composed of long chains of a sugar called mannose, a glucomannan monomer which stimulates macrophage activity. Growth of cells and tissues is promoted, along with the proliferation of fibroblasts, the precursors of epithelial cells. Glucomannan also interacts with particular receptors on the cells' surfaces, assigned with the task of repairing wounds or lesions in tissues. This polysaccharide, with its polyhedral properties, creates an increase in collagen synthesis and speeds up re-epithelialization.

The second factor in the remargination of a wound is found in the plant hormones' actions – the gibberelline and auxine present in Aloe which stimulate cell reproduction.

Recommended reading:

- Penso, (1984). Piante medicinali nella cosmetica. OEMFR207.
- Davis, et al. (1998). Edema is inhibited by Aloe Vera. *Faseb Journal* 2 (4), 371.
- Davis, Didonato, Hartman, (1994). Anti-inflammatory and wound healing activity of a growth substance in Aloe Vera.

3.1.12 Immuno-modulating property

This property is carried out by the glucomannans, a class of long-chained sugars derived from plants, which have demonstrated in clinical and laboratory studies to have a wide variety of protective and immunostimulating effects in the human body. Studies investigating the various sources for this glucomannan have discovered that the Aloe barbadensis Miller and Aloe arborescens Miller contain the largest concentrations of acetylmannan, the most active form available existing in nature.

Before elaborating on the beneficial effects of acemannan, it would be useful to discuss the type of pathology often pre-

sented in an individual with immune system depression. What immune depressive conditions like Epstein Barr Virus, Candida Albicans, HIV infections, and others have in common is a high incidence of digestive dysfunctions, generally manifested by poor digestion. Several effects are produced overloading the immune system, thereby weakening it. Poor digestion causes an improper breakdown of the ingested food elements necessary for the body to reconstruct itself and generate energy for the metabolism of cells. This translates into "cell hunger" in tissues that suffer this malnutrition. When this happens, the normal process is altered – the classification and transportation of toxins from the cell, the movement of intracellular nutrients, and the production of energy for general functioning. This influences all cells in the body, including those of the immune system, the white blood cells, macrophages, monocytes, and lymphocytes. Poor digestion leaves residuals of partially digested food that can also be involved in large pathological reactions. These residuals can irritate and cause inflammation of the mucosa on the intestinal walls.

Many damaging and powerful enzymes and chemical agents are released, destroying the intestinal wall and causing an increased permeability of the intestinal mucosa itself. The proteins, now foreign to the digested food particles, cannot interact normally and, so, cross through the mucosa via the lymphatic canals of the intestinal walls. From there, they are able to access the blood stream or circulation. The proteins absorbed in this manner are then recognized as foreign elements and are attacked by the cells of the immune system. The antibodies produced bind to these proteins and summon the macrophages and monocytes.

The T-cells arrive secondarily, releasing enzymes and using oxygen to guide the foreign proteins to their metabolic breakdown. The end result is an immune system that is constantly active.

The negative effects of ingested food residuals cause the immune system cells to wear out more rapidly than is the norm and to reproduce in insufficient numbers.

In addition to this hyperimmune state, the undigested food residuals become feeding material for the overgrowth of fungal organisms of the fermentive type, such as Candida Albicans and many other types of parasites.

The increase of Candida Albicans inside the intestine is due

largely to the absorption of the toxic by-products of metabolism that can foster severe food allergies, hypoglycemia, digestive disturbances, excess mucus, swelling, flatulence, skin eruptions, and extreme fatigue. This chronic infection further wears down the immune system, complicating the general picture to an even greater degree, even to cellular membranes.

Even more damage is caused to the cellular membranes by the generalized inflammatory effects of poor digestion.

These metabolic reactions use up a great amount of oxygen and produce highly oxidated free radicals as by-products in matching quantities. These negatively charged molecules are highly unstable and rebalance their electrical imbalances by beginning to make holes into the cellular membranes, stealing their positive charges.

The result is more damage to the intestinal mucosal walls, with increasing intestinal permeability. The multiplicity of the mechanisms that orchestrate these processes is clear. All the above processes working together in a vicious circle of events progressively lead to the weakening of the immune system. Without a therapy targeted at each of the immune system's pathologies, a downward spiral is created that can only lead towards an inevitable death. Fortunately, we are able to fight this process through a treatment protocol directed at each of the body's components, in which Aloe seems to play a key role. Based on the list of principles discussed, acemannan has demonstrated a biological mode of action with an excellent ability to normalize these damaging processes and significantly contribute to and "heighten" the immune system's functions.

At the intestinal level, glucomannan acts as a powerful anti-inflammatory and neutralizer of the many enzymes responsible for damage to the mucosal membranes. It acts much like a fire extinguisher, lessening the effects of these harmful enzymes. This occurs due to a reduction of the number of leaks in the intestinal wall and a diminishing of the foreign protein absorption that can stimulate allergic reactions in the body. Acemannan, therefore, clearly carries out direct viricidal, bactericidal, and fungicidal properties through which it can help the body to control the production and growth of *Candida Albicans*, and through which normal gastrointestinal function is re-established. Assisted by the anthraquinones, acemannan also stimulates intesti-

nal motility, helping to remove allergenic proteins from the small intestine into the colon for elimination.

All these reactions have a normalizing effect on the function and structure of the gastrointestinal walls and, therefore, stop the vicious circle of damage to the immune system. Also, acemannan has a powerful and immediate effect, activating and stimulating macrophages, antibodies and T-cells.

Laboratory studies conducted have demonstrated that acemannan acts as a bridge between foreign proteins like virus and macrophage particles, facilitating the ingestion of the proteins by the macrophages in a process known as phagocytosis. The activation of this receptor site is a key component of cell-mediated immunity, which is deficient in HIV infections. The Aloe component, acemannan, increases the number and activity of macrophages, killer T-cells, and monocytes. Pancreas beta-cell antibodies are also increased and the spine marrow is protected from damage incurred from the use of drugs and toxic agents, such as AZT, the active principle of many medicines given in the management of HIV. These diverse effects, while seeming at first glance too broad and not at all related, are due to a single and simple process at the cellular membrane level. Acemannan, a mucopolysaccharide, is a long-chained sugar that interacts with the cellular membrane. This determines increased fluidity and permeability of the membrane, allowing toxins to flow easily and with the same ease that allows nutritive substances to penetrate cells. Consequently, cellular metabolism is improved and an overall increase in energy production is achieved. The vicious cycle of poor digestion and cellular malnutrition is thus broken. In this way, acemannan normalizes the absorption of nutrients and increases the tolerance threshold to allergy-provoking foods. The immune system is strengthened, under greater control, and is better prepared for a new attack.

Recommended reading:

- Hart, et al. (1987). Analysis of two functionally and chemically different immune-modulators from Aloe vera gel. *Pharmaceutisch Weekblad Scientific Edition* 9 (2), 157.
- Pittman. Immune Enhancing effects of Aloe. *Health Consciousness*. 13 (1), 28-30.
- Karaka, et al. (1995). Nitric-Oxide production by chicken macrophages activated by acemannan, a complex carbohydrate extracted from Aloe Vera. *International Journal of immunopharmacology*. 17(3), 183-188.
- Plaskett, (1996). Aloe Vera and The Immune System. The Aloe Vera Information Service.

3.1.13 Nutritive properties

There are many substances in Aloe that are of a high nutritive value. Over ten minerals can be mentioned, carrying out diverse activities in cellular metabolism, and exhibiting properties that range from the constitution of bones and cartilage from calcium to the proper functioning of the cardiac muscle thanks to magnesium, and from the intervention of chromium in glucose metabolism to the strong antioxidant powers of copper.

This is matched by the profound effects of Aloe's vitamins, whether they be the liposoluble A, C, E or the water-soluble B group.

Without these vitamins, we could not live. Therefore, it follows that we need to include them in our daily diet.

Their properties range from the metabolism of carbohydrates, proteins and lipids to their constituting part of the antioxidant enzymes, from their participation in the phenomena of cellular division to constituting part of cells entrusted with the body's immune defense.

We shall continue the broad descriptions of these highly nutritive substances by approaching the amino acids, humble and versatile building blocks, constituents of many enzymes, hormones, and of our tissues, particularly the muscular and epithelial tissues.

A vast number of simple sugar molecules queue up to supply immediate energy and digestive enzymes, improve nutrient absorption and, therefore healthy bodily conditions. Acemannan, the long-chained mucopolysaccharides able to interact with weakened cellular membranes created by poor digestion and nutrition, promote the flow of toxic substances to the body's exterior and nutritive substances to the body's interior.

The "cocktail" of substances contained in Aloe guarantees that it can furnish a proper and balanced intake of these nutrients, comparable to the most modern multivitamin, mineral, or protein supplements available.

Recommended reading:

- Pittman. Immune Enhancing effects of Aloe. Health Consciousness. 13 (1).
- Leung, (1977). Effective Ingredients of Aloe Vera. Drugs and Cosmetics.
- Bloomfield, (1995). Miracle Plants: Aloe Vera. Century Publishing.

3.1.14 Purifying properties

The purifying action of Aloe juice is due to several molecules. The aloin contained in the plant has laxative and blood purifying effects. Saponins are also present in the gel, with their detergent and exfoliating action, especially in relation to pathologies and problems of the integumentary apparatus. Potassium, a mineral, carries out a fundamental role which makes it possible to eliminate waste products derived from oxidation processes that occur in the cytoplasm. Even in this case, the complex sugar, acemannan, strengthens cell walls, so that the toxins created by metabolism and secondary reactions due to partially digested food can be properly eliminated from the body.

Recommended reading:

- Pittman. Immune Enhancing effects of Aloe. Health Consciousness. 13 (1), 28-30.
- Coats, Ahola, (1996). The Silent Healer – a modern study of Aloe Vera.
- Plaskett, (1996). The Health and Medical Use of Aloe Vera. Aloe Information Service.

3.1.15 Radioprotective properties

This last property which we are about to explore is also supplied with a vast array of molecules that function synergistically to protect our skin from the damage that can result from exposure to various radioactive sources.

A combination of calcium with vitamin A (retinol and beta carotene) provides adequate defense of the epidermic layer of our skin against sun damage and the various forms of radiation that can strike us daily.

If we are instead faced with more serious skin damage, perhaps due to exposure to radiotherapy, other restabilizing agents are certainly to be recommended. Proteolytic enzymes make up the team that "digests" the waste tissues and accelerates the tissue's regenerative phase.

The bradykinase enzyme, for example, blocks the inflammatory reactions, the responses to necrotic external events, and stimulates the body's immune (defense) system.

Isobarbaloin, an ester of cinnamic acid and salicylic acid, carries out an analgesic or pain-relieving action.

Acemannan accelerates the re-epithelialization phase, or the regeneration of skin tissue, by intervening in the stimulation of macrophages and by increasing the production of fibroblasts and collagen.

This ensures a rapid attenuation of the typical pain of radiation and equally rapid tissue reabsorption, either from sunburn or radiotherapy.

Recommended reading:

- Sato, Ohta, et al. (1990) Studies on chemical protectors against radiation. Protection effects of Aloe arborescens on skin injury induced by X-irradiation. -Yakugaku Zasshi-Journal of Pharmaceutical Society of Japan. 110 (11), 876-84.
- Burk, et al. (1993). Phase II Evaluation of an Aloe Vera Gel for Preventing Radiation-induced Dermatitis. International Journal of Radiation Oncology Biology Physics. 27.

3.2 Bibliography of Scientific Experiments

The following paragraphs concisely report more recent information, based on scientific research, of the therapeutic effects of Aloe. The numerous experiments listed here are divided into five areas of interest. The abstracts of each area of research have been abbreviated and simplified for this purpose. The following experiments have the utmost credibility. The minimum criteria for their inclusion here was their publication in medically and scientifically accredited journals of an international scope.

To facilitate comprehension, this area will also be divided into five large subdivisions. The first will supply a summary in reference to anti-tumor research, the second in the dermatological sector, the third on long-term pathologies, the fourth to analyze immunity pathologies, and the last will take a look at several pathologies of general significance.

3.2.1 Research in the field of anti-tumors

The anti-metastatic properties of Aloe juice.

Anti-tumoral research laboratories USSR, 1986. Gribel, Pashinskii.

Studies were conducted on the anti-metastatic properties of Aloe juice in three types of tumors induced in mice and rats. The results demonstrated that Aloe juice, used in medical treatments, contributes to the reduction of the tumoral mass and the metastatic ramifications at various stages without increasing the growth of the tumor. It was also observed that the Aloe juice potentiates the anti-tumoral effect of 5-fluorouracil and cyclophosphamide, active components of combined chemotherapy.

Diminished mortality for the Norman Murin sarcoma, of mice treated with the acemannan immunomodulator.

Anatomy Department, School of Veterinary Medicine, University of Texas, U.S.A.. 1991. Peng, Norman, Curtin, Corrier, et al.

It was demonstrated that a botanical extract obtained from the internal parenchyma of Aloe barbadensis Miller contained long polymeric chains classifiable as beta (1-4) mannans, bound polymetrically in ortho-acetylic groups called acemannan (carrysin).

These polymers increase the production of phagocytes and monocytes, stimulating cell cytotoxicity of antibodies and the blastogenesis of thymocytes.

In laboratory experiments induced with Norman Murin sarcoma, intra-peritoneum quantities of acemannan were introduced.

The rapid growth of the sarcoma, highly invasive and malignant, determined a mortality of 100% for untreated mice within 46 days from the start of the experiment. However, a survival rate of over 40% was shown for the same time period with the administration of acemannan.

The conclusion of this study demonstrated that acemannan stimulates the various cells of the immune system, particularly the production of cytokines, including interleukin-1 and the tumoral necrosis factor, bringing about necrosis and consequent regression of tumors.

Therapeutic potential of Aloe Vera on induced tumor-affected rats

Institute of General Pathology, Faculty of Medicine, University of Milan, Italy. 1998. Corsi, Bertelli, Gaja, Fulgenzi, Ferrero.

Aloe Vera, acclaimed as a plant with varied therapeutic properties, also possesses an anti-cancerous/anti-carcinogenic effect.

Research was conducted on pleural tumors in rats.

The final results definitively proved the validity of the Aloe-based therapeutic method and suggested that the present therapeutic model could be used in other studies, especially in vitro treatments.

Vitamin C supplementation and Aloe Vera protect induced hepatocarcinogenesis in rats.

Department of Biochemistry and Microbiology, University of Putra, Malaysia. Nov. 1998. Shamaan, Kadir, Rahmat, Ngah.

The effects of vitamin C supplementation, in conjunction with an Aloe Vera-based gel, were analyzed on rats with induced hepatocarcinoma.

The research had forseen evaluations of various clinical parameters, like GGT, GSTP, ALP, and UDPGT. At the study's conclusion, it was discovered that these two substances, used as a supplement, possess a real capacity to reduce the severity of chemical hepatocarcinogenesis.

Aloe-emodin is a new type of anti-cancer agent with selective activity against neuroectodermic tumors.

Department of Medical Histology, Microbiology, and Biotechnology. University of Padua, Italy. June, 2000. Palu, Pecere, Gazzola, Mucignat, Parolin, et al.

The Italian study by noted Professor Palu evidences how aloe-emodin, a hydroxyanthraquinone present in the Aloe leaf, specifically targets and works to eliminate tumors of ectodermic nerve tissue, in vitro and in vivo, producing specific cytotoxic mechanisms.

For this reason, aloe-emodin could represent an inroad in anti-tumoral drug concepts.

3.2.2. Research in the field of dermatology

Beneficial effects of Aloe in wound healing.

Department of Surgery, Galveston, University of Texas. U.S.A. 1989. Hegggers.

A clinical investigation is presented below, analyzing the delicate role of Aloe in obstructing progressive dermal ischemia caused by thermal lesions, freezing, or electrical abrasions.

The experiments were carried out first in vitro, and, subsequently, on pigs.

The results in both cases coincide and demonstrate inhibition of thromboxanes (vasoconstrictors that suppress blood circulation in tissues affected by one of the above-cited injuries) produced by the immune response, with preparations based on Aloe.

Influence of Aloe Vera on wound healing of skin on diabetic rats.

Research Institute of the Department of Biochemistry, Adyar, Chennai, India. January 1998. Chithra, Sajithlal, Chandrakasan.

Research has demonstrated that Aloe Vera treatments on wounded rats, previously induced with diabetes, accelerates the healing process by both oral administration and topical application. These effects can be attributed to the hypoglycemic property of Aloe.

Therapeutic effects of Aloe Vera on cutaneous microcirculation and wound healing in second degree burns in rats.

Department of Physiology. Faculty of Medicine. University of Chulalongkorn. Bangkok, Thailand. April, 2000. Somboonwong, Thanamitramanee, et al.

Studies were carried out on the therapeutic effects of Aloe Vera on epidermic microcirculation during the healing of second-degree burns induced on rats. In conclusion, the existence of therapeutic effects was proven for both anti-inflammatory and vasoconstrictive actions on the skin.

Anti-inflammatory agents derived from herbs and their use in skin affections.

Department of Dermatology. University Medical Center. New York, U.S.A. 2000. Graf.

This research confirms the usefulness of herbs in various dermatological pathologies, particularly if characterized by inflammation and pruritis. According to the author, an increased collaboration between alternative and traditional medicine is needed. Of the plants evaluated in this work, Aloe is attributed with fundamental importance.

3.2.3 Research in the field of immunology

Activation of macrophage cells in a mouse with acemannan: the biggest fraction of carbohydrates derived from the gel of Aloe Vera.

Departments of Veterinary Pathobiology, University of Texas, U.S.A. 1996. Zhang, Tizard.

Acemannan is the name given to the largest fraction of complex carbohydrates within the gel of Aloe Vera, obtained from the leaf. Much has been said about this class of molecules and their various therapeutic properties.

In particular, the themes of accelerated wound healing, immunity stimulation, anti-cancer, and anti-viral effects have been treated. In this study the many effects of macrophagic cells were analyzed. It was discovered that acemannan can stimulate the production of macrophagic cytokines, the release of nitrogen dioxide, and can produce morphological changes in cells. The production of these molecules were closely correlated, however, to the quantity of acemannan supplied. All of these results suggest that the acemannan sugar molecule can act, at least in part, as a macrophagic activator.

Immunoregulatory activity of modified Aloe barbadensis Miller polysaccharides.

Drug Investigation and Discovery Department. Universal Pharmaceuticals Inc. Broomfield, Colorado, U.S.A. March, 2000. Qui, Jones, Wylie, Jia, Orndorff.

Experiments are currently being undertaken to synthesize the molecules of various types of sugars into polymers with extremely long chains, 80.000 Dalton.

From the analysis of these modified polysaccharides, derived from Aloe barbadensis Miller through partial digestion with the cellulase enzyme (tested on laboratory mice), a marked immunomodulating action is observed, along with increased macrophagic activity and stimulation of epidermic fibroblastic growth. The macrophagic activity results were not obtained with the use of the modified juice. Also observed were obstacle effects in immunosuppression caused by UVB radiation.

Activation of macrophages on chickens, in vivo, with acemannan, a complex carbohydrate derived from Aloe Vera.

Centre for Birdlife Virology and Oncology. Nouzilly, France. May, 2000. Djeraba, Quere.

Studies conducted on chickens with the use of the acemannan polymeric sugar derived from Aloe observed it to be a valid adjuvant to vaccinations for viral birdlife pathologies.

Of particular interest were the results observed in the blood test parameters of the chickens after the administration of the isolated molecule, which demonstrated an increase of macrophage activity and a reduced pathological stasis time.

Polymannose contained in Aloe increases anti-coxsackievirus antibodies in mice.

Department of Microbiology. University of Texas.

Polymannose Aloe is also known as acemannan, and is a high profile exponent of biological response modifiers (BRM) from the Aloe barbadensis Miller plant.

It can immunopotentiate antibody production against an undeveloped external protein virus called picorna virus.

Its beneficial ability to combat enteroviruses, including those found in natural infections and the polio vaccine, are hypothesized.

3.2.4 Research in the field of chronic pathologies

The anti-diabetic activity of Aloe: preliminary clinical and experimental observations.

1996. Grannam, Kingston, Al-Meshaal, Tariq, Param, Woodhouse.

The dried sap of the Aloe plant is one of the various traditional remedies used for diabetes in the Arab countries.

Its ability to reduce blood glucose levels was studied with five non-insulin dependent diabetic patients and on Swiss albino mice with alloxan-induced diabetes.

This research abstract concludes in stating that Aloe contains hypoglycemic properties that lower blood glucose levels through a mechanism not yet fully understood.

Effects of Aloe on blood glucose levels in cases of normal diabetes and alloxan diabetes.

Department of Clinical Biochemistry, University of Medicine and Applied Science, Jeddah, Saudi Arabia. February 1990. Ajabnoor.

Studies made on rats with alloxan induced diabetes revealed that, with oral administration of Aloe and oral administration of its bitter principle, a maximum reduction of plasma glucose levels was obtained after five days of therapy. The hypoglycemic effects of Aloe and its bitter principles could be mediated through the stimulation of insulin synthesis and the release of beta cells from Islets of Langerhans in the pancreas.

Aloe Vera: methodology, systematic revision of its clinical effects.

Department of Complementary Medicine, School of Postgraduate Medicine, University of Exeter, UK. October, 1999. Vogler, Ernst.

A systematic review of the clinical effects of Aloe Vera use, conducted with parallel studies carried out in four different research institutions, revealed that oral administration of Aloe juice may be used as an adjunct to the daily diet for the purpose of lowering glucose levels in diabetic patients as well as reducing fat levels in the blood of hyperglycemic patients. Topical use was revealed to be helpful in treating genital herpes and psoriasis as well as proving to be effective, as hypothesized, in healing the lesions caused by radiation.

Effects of Aloe Vera leaves on blood glucose levels in rats with Type I and Type II diabetes.

Department of Pharmacology, Pharmacy Faculty, University of Istanbul, Turkey. March 2001. Okyar, Can, Akev, Baktir, Sutlupinar.

Aloe barbadensis Miller, a native of North Africa, is widely cultivated in Turkey and is used throughout the world for its various therapeutic properties.

Presented here are the findings of research conducted over a period of 15 years, which prescribed the administration of pure Aloe juice for rats affected by induced diabetes. It was clearly demonstrated that the extract from the leaf's pulp considerably increased the hypoglycemic activity in diabetes Type I.

In addition, even higher levels of hypoglycemic activity in diabetes Type II were observed. Aloe barbadensis Miller could, therefore, be useful in the treatment of diabetes mellitus.

3.2.5 Research in other fields***Aloe Vera and the giberellines: anti-inflammatory activity.***

PubMed. January, 1989. Davis, Maro.

Aloe inhibits induced arthritis inflammation. The authors of this study demonstrated that Aloe Vera aids in the healing of wounds and suggest that its action is not of an adrenosteroidal type. Laboratory experiments were used because of the limited capacity to induce organic anti-inflammatory

reactions or spontaneous wound healing responses. The anti-inflammatory activities of Aloe Vera, and the isolated giberelline it contains, was measured through evaluations of the clinical parameters for polymorphonuclear leucocyte inhibition. Both substances brought about an evident reduction of inflammation, leading to the conclusion that the giberellines contained in the pulp of Aloe Vera are active anti-inflammatory compounds.

The effect of chemotherapy combined with a preparation of non-specific immunity tissue in patients with pulmonary tuberculosis.

1990. Noresian, Bogatyreva.

The contribution of two scientists was added to the body of research devoted to finding medical solutions without using artificial medicine for resolving diseases of a serious or long-term nature. They conducted studies examining local general and non-specific immunity in 143 cases of pulmonary tuberculosis. The results of that study showed that the combination of chemotherapy, in conjunction with desensitizing agents and a preparation made of tissues (according to the Filatov protocol which is a suspension of placental tissue and Aloe gel) produced an immunomodulating effect. Efficacy reached an 87% positive gain in the general state of health of these patients.

Investigation of the electrochemical behavior of aloe-emodin and its applications.

Sinaic Academy. Saudi Arabia. April 1997. Zou, Yuan.

This particular study analyzed modalities of sample preparations of medicinal herbs with particular attention to the electrochemical system of analytical investigation. The study showed how it is possible to determine the concentration of emodin in medicinal herb samples via analysis of a graph obtained by measuring variations in tension (expressed in Volts), and the time variable (expressed in seconds). Various substances were evaluated, including emodin, aloe-emodin, chrysophanol, and reine. It was demonstrated that these substances move through the electrodes with differing intensities, reacting with a radical superoxide anion. Based on this research, it can be deduced that the displa-

cement force follows the pattern: emodin > aloe-emodin > chrysophanol > reine. These molecules are able to find free radicals within the body, rendering them inactive.

The efficiency and acceptance of a medical strategy for the treatment of aphtous stomatitis. Clinical observation of pediatric age.

General Practice Medicine Service, Institute for Social Security. Rep. San Marino, Italy. January, 2000. Adriani, Bugli, Alders, Castelli, et al.

This study evaluates the efficacy of a new adhesive patch based on Aloe Vera for the treatment of aphtous stomatitis in pediatric patients. A total of 77% of treated patients showed total resolution of the problem, while the remaining 23% showed a noticeable reduction of discomfort, despite lack of resolution. The 90% patient compliance was also judged a positive factor.

Increased concentration of soluble carbohydrates and aloin in Aloe Vera plants exposed to three levels of radiation.

Laboratory of Ecophysiology, Faculty of Science, Maracaibo, Venezuela. October 2000. Paez, Gebre, Gonzales, Tschapinski.

Studies were carried out on the effects produced by three different sources of light on the Aloe plant to observe the factors responsible for its growth. Three different degrees of luminosity were supplied: full light, partial with 30% light, and shaded with 10% light. The plants exposed to full light grew larger in mass and had higher concentrations of active constituents, eventually doubling the results of the partial light trials and ten times greater than those exposed to shade. One notable fact resulting from this study is the lower amounts of aloin in the overgrown plants.

4. Practical applications of Aloe

This chapter intends to point out the best ways to use products derived from the Aloe plant, so that its talented components can offer us their most beneficial service in a well-orchestrated manner.

The wealth of beneficial components in this plant make it easier to understand how the vast range of pathologies, both large and small, suffered by the living beings on this planet can be helped or even resolved.

Despite the great versatility of this plant, the user ought to consider the importance of accurate and expert usage. It is important to note that, while some of the indications mentioned have medical and scientific parallel usages, other recommendations are rooted in tradition, good sense, and intuition, along with the competence of their prescribers. Many are suggestions that come from folk traditions of ancient Egyptian, Greek, Roman, and Eastern cultures.

Other prescriptions are taken from Russian folk medicine, which has always used Aloe, especially of the *arborescens* and *saponaria* varieties, widespread in the arid regions.

Each individual's reaction to such complex stimulus is decidedly subjective and individual, so much so that the authors cannot unconditionally guarantee that anyone faithfully following the indications will necessarily obtain the same effects obtained by those in the pathology of diseases directory that follows. Those suffering from severe symptoms should resist the temptation to use only botanical preparations, in favor of consulting a good doctor, who will be able to prescribe and combine natural medicines and traditional medicines, synergistically and with the expert knowledge of traditional medicine. Choice is an individual right, but it is also personal, requiring a natural sense of respect and awareness of self and others and, indeed, our planet – particularly when setting out on the search to cure a lost sense of well-being and health; a search that should not be blinded or “set in stone” by the written word.

A preference for the alternative road to health, to that of the heavy-handed use of pharmaceuticals is, without a doubt, the proper lifestyle in our view, and an index of the higher

human attempt to go beyond the confines of our daily activities. It is a wise and suggested practice to rub a bit of any prescribed Aloe product on the wrist with a cotton ball soaked or moistened with the juice. If, within ten minutes, there are no skin eruptions, reddening, or unusual itching, you can proceed with the tested product, with the certainty that the body can tolerate it.

We wish, however, to specify that cases of allergy or intolerance to Aloe are very infrequent; in fact, the pure juice of this succulent plant acts as an anti-allergic product.

Pregnant women are advised to avoid the use of Aloe juice, which contains anthraquinone compounds – that is, the various aloins. These have a laxative effect caused by increasing intestinal peristalsis, and could (although not yet scientifically proven) induce parallel indirect peristaltic motion in the uterus and cause spontaneous abortion.

The majority of the products present on the market do not contain the skin of the plant, which contains aloin. Therefore, it is possible for pregnant women to take this type of beverage. This information is applicable only in the case of internal use. External application presents no problems. De-aloinized Aloe juice is therefore a perfect tonic and re-constituent for the newborn as well as the mother.

Another particular class of patients that ought to use caution and consult with a trusted physician when using Aloe are diabetics. Aloe can stimulate the pancreas' production of insulin, with a negative effect on an individual who is insulin-dependent. In fact, a high insulin concentration in the body combines with all the sugars present to be metabolized into the blood stream. This could, therefore, induce a hypoglycemic state, with detrimental consequences: from hypotonic muscles to vision difficulties, and from ringing in the ears to fainting, all well-known symptoms to those affected by this illness. Fortunately, this side effect is manifested only during the first few administrations and regulates itself over time. The use of pure Aloe juice under medical supervision can treat these symptoms, and has been shown to be useful in decreasing or reducing the doses of total insulin taken daily.

In order to make the following disease pathologies and uses easier to consult, we have divided the chapter into ten bodily systems, with a specific analysis of 110 pathologies, showing how Aloe can be helpful.

4.1 Digestive system

4.1.1 Halitosis

This widespread problem produces an unpleasant sensation in the individual who has it, as well as the people interacting with him or her. The principle causes of this imbalance are mainly two: gum inflammation, which can extend also to the buccal mucosa, generating an acid pH and the consequent offensive odor, or temporary digestive difficulty in the case of deficiency or excess of gastric juices, due to stress or a bad diet. In this case, esophageal reflux manifests with a burning sensation in the oral cavity, often called heartburn.

In the first case, benefit is derived from the emollient, wound-healing and re-epithelialization actions of acemannan and plant hormones in Aloe juice by spreading it over teeth and gums 2-3 times daily, after having first cleaned the teeth thoroughly. For routine daily use, a mouthwash can be used composed of 4 tablespoons (50ml) of pure 100% Aloe mixed in a glass of water.

In the case of gastric difficulties, see the paragraph on Digestive difficulties (deficiency of gastric acids/hyperacidity).

4.1.2 Allergy to strawberries

Within the subject of allergy pathologies are the food allergies. When, in late spring, nature delights us with a bounty of cherries or strawberries, in which we are sure to indulge, we could suffer an allergic reaction characterized by little pustules, eruptions, or reddish itchy rashes, especially on the face and neck.

Allergic reactions arise from the body's incapacity to distinguish between agents that are truly damaging and those that are harmless.

The acemannan sugar complex, along with the bradykinase enzyme, help the body to improve its objectivity (as will be further explored in General allergies.).

To locally treat these unpleasant and uncomfortable symptoms, massage the affected area with a lotion made of pure Aloe juice and lukewarm water in equal parts or with an Aloe-based cream, using a circular motion.

We recommend, at the same time, drinking a glass of water with 2 tablespoons (25ml) of pure 100% Aloe juice at the

onset of symptoms, every three hours, until they disappear completely. Caution: keep in mind, however, that some people who are allergic to strawberries could also be allergic to Aloe. As a preventative measure, it is always good practice to apply a little pure 100% Aloe juice on the wrist or behind the ear and wait several minutes before beginning its use. If any reddening appears, it is probably best not to use this type of herbal remedy.

4.1.3 Appetite

In cases of loss of appetite, especially in children, Aloe juice is a useful recourse. The large range of digestive enzymes help to stimulate the gastric mucosa that, through neurotransmitters, summon the intervention of appetite hormones. Following this pleasing result, one notices improved digestion of food, a satisfied feeling, and proper absorption of the necessary nutrients.

The following is recommended: 2 tablespoons (25ml) of pure 100% Aloe juice before the three main meals, diluted in a glass of water, orange juice, or other citrus fruit.

4.1.4. Colitis

The anti-inflammatory, detoxifying, and sedative actions of the valuable Aloe components make it a very good remedy for colitis, diverticulitis, and pathologies of the small and large intestines. Taken in the form of 2 tablespoons (25ml) before meals and 1 tablespoon (12.5ml) after meals, 100% pure Aloe juice helps to create the right digestive environment, enabling easier healing of the chronic inflammation in the large intestine. This part of the digestive system goes from the entrance of the small intestine to the rectum and is charged with the absorption of the nutrients broken down during the digestive processes. This allows us to understand the absolute importance of having highly efficient organs and tissues.

4.1.5 Diabetes and hypo/hyperglycemia

Aloe contains two mineral salts – zinc and manganese. Together with vitamin B6, they carry out coordinated activity to produce insulin from the pancreas' beta cells to control blood sugar levels. They act in such a way that their con-

centration remains between 80 and 120mg/dl. Anything under this measurement parameter is said to indicate a hypoglycemic state while, if above the normal values, is called hyperglycemia. If this value is over 140 units, then diabetes is present. Taking 2 tablespoons (25ml) of pure 100% Aloe juice before the three main meals for a few months following the diagnosis of these disease states can be an effective natural remedy.

4.1.6 Diarrhea

The knowledge that the anthraquinone action of aloin contained in Aloe produces laxative effects would lead one to assume that the contrary, or the cessation of diarrhea, is impossible. Yet, it is possible because of the many components of Aloe juice – nutritives, anti-bacterials, antiseptics, and anti-inflammatories – which practically render the laxative activity of certain of its substances virtually harmless. More precisely, diarrhea is a bodily reaction and symptom that indicates that something within the body, generally the digestive system, is not functioning.

The precious elements of this succulent take on the task of resolving these causative problems and reconfiguring the diarrheal symptom. We recommend the intake of 2 tablespoons (25ml) of pure 100% Aloe juice, several times a day, until the problem is resolved.

4.1.7 Digestive difficulties (deficiency of gastric acids)

The precious juice derived from Aloe acts as a gentle rebalancer in cases of improper digestion, indigestion, and the sense of heaviness in the stomach that create intense disturbances like postprandial sleepiness, headache, nausea, retching, vomiting, cold sweat, constipation, diarrhea, and other symptoms.

Aloe reveals its usefulness by taking away the typical malaise or heaviness in the "pit of the stomach", with stabbing or sharp pain, that could be confused with cardiac pathology symptoms. These symptoms arise from an unbalanced relationship between the gastric juices and the quantity of food ingested.

When we are faced with a deficiency of gastric juices and a symptomatology as described above, an efficient remedy is to take 2 tablespoons (25ml) of pure 100% Aloe juice after

meals, as a non-alcoholic digestive. Aloe's digestive enzymes, together with its sedative and anti-inflammatory components, produce amazing and rapid effects, strengthening the stomach and regulating the intestines.

4.1.8 Digestive difficulties (hyperacidity)

Taken in dosages of 2 tablespoons (25ml) before meals, pure 100% Aloe juice can, due to the gastroprotective effects of acemannan, reduce gastric acidity by as many as two percentage points and substantially influence intestinal walls, specifically in areas where there is hyper-production of gastric juices, giving relief to ulcers and perforations of the stomach.

It is thought that only 7 days of use can reduce intestinal putrefactive activity, improving protein absorption and recreating the proper environment for the maintenance and reproduction of healthy intestinal flora.

It improves the consistency of feces, hydrating them and therefore promoting evacuation. See Diarrhea and constipation.

4.1.9 Seasonal detoxification

The large quantity of botanically active components in pure Aloe concentrate or gel, or finely chopped fresh Aloe leaf is a very good "detoxifying and reconstituting" elixir, especially during the change of seasons. In fact, the synergistic activities of the mucopolysaccharides with the immune system, and the anthraquinones and enzymes on the liver, gall bladder, and pancreas, generate a rapid energetic and physical detoxification.

Four tablespoons are recommended (50ml) in the morning on an empty stomach and at night before bed for a period ranging from 4 to 8 weeks. An old Russian recipe says to finely chop 100g of Aloe leaves together with 150g of apples, adding 150g of sugar. Allow this mixture to macerate in a dark place for 3 days. Then add a glass of good dry red wine, stirring well and letting it rest for a further 24 hours. Drink this in doses of 4 tablespoons taken before the 3 main meals of the day for a month. The resemblance of this recipe to Padre Zago's famous recipe is evident.

More on his famous recipe will be found in the final appendix of this text.

4.1.10 Esophagitis

Esophagitis is a widespread inflammation of the mucosa of the entire tract that connects the throat with the stomach. The relaxation of the esophageal sphincter, and the stringy structure of the muscles lining the canal, create the possibility for prolonged contact of the gastric juices with the mucosa.

Obvious symptoms in this pathology are a burning sensation rising up the throat-stomach tract and acid regurgitation after a meal. The passage of incompletely chewed food makes it easy for irritations and inflammation with bleeding to occur. Generalized anemia can also develop.

The intervention of Aloe juice is indispensable. The anti-inflammatory ability of the plant steroids (lupeol and sitosterol with the bradykinase enzyme) along with the wound-healing ability of acemannan and the reconstituting ability of the vitamins and minerals brings about rapid relief of these symptoms. At the onset of these symptoms, take four tablespoons (50ml) three times a day for the first two days and, successively, take two tablespoons (25ml) before meals.

4.1.11 Gastritis

Strong stabbing pains in the chest, together with high acidity after a meal, are symptoms of gastritis, caused by poor eating habits or nervous tension. In the summer months, we tend to eat more irregularly and drink cold beverages. This continual mistreatment of the stomach mucosa for an extended period, along with possible stress, and the use of alcohol and nicotine, can give rise to a problem commonly called gastritis. Take two tablespoons (25ml) of pure 100% Aloe juice three times a day, at least 15 minutes before meals, until the symptom is resolved.

4.1.12 Indigestion

See *Digestive difficulties (deficiency of gastric acids)*.

4.1.13 Liver or Hepatic insufficiency

Choline and inositol, along with zinc and selenium in Aloe juice, intervene to improve the elasticity and fluidity of hepatic cell membranes and their metabolic capacity, resol-

ving a large part of the liver's functional difficulties.

We recommend the use of pure undiluted Aloe juice three times a day for four weeks in a dose of at least four ounces per day. In the first days of this therapy, it would be more useful to synergistically combine a liquid diet to help the unblocking of the compromised liver functions.

4.1.14 Sluggish intestine or lazy bowel

Aloe's fresh juice or gel contains mucilage, fibrous substances that are highly viscous, chemically identified as mucopolysaccharides.

These substances can absorb a great deal of water and incorporate all the ingested food into a single well-hydrated mass. The sum of the laxative potential of the anthraquinones – aloin, barbaloin, and isobarbaloin – stimulate the small intestine's walls to evacuate the feces, in this way resolving the problem of a lazy bowel.

Drink two tablespoons (25ml) in the morning on an empty stomach. The World Health Organization directives instruct that a fiber-rich diet is preferable, including lots of fresh fruits and vegetables, with plenty of water (up to two quarts a day) mainly between meals.

4.1.15 Toothaches

Dental pain is mainly due to an advanced degenerative state of decay that attacks the protective enamel of the tooth pulp or limits blood supply to the capillaries in the area concerned. In both cases, brushing the gums and the tooth decay area with Aloe can bring relief. The various anti-inflammatory and analgesic components of Aloe produce rapidly visible results.

Using a sterile brush dipped in Aloe, coat the affected area every two or three hours until the pain subsides. A visit to the dentist is, of course, advised.

4.1.16 Flatulence

To ward off the unpleasant and embarrassing effects of bad digestion, such as intestinal gas, it is undoubtedly useful to drink a glass of lukewarm water, adding two tablespoons (25ml) of fresh Aloe juice or gel after lunch or dinner.

This remedy was described very early in history, in the An-

nals of Pliny the Elder.

In the centuries that followed, this same extract became a part of the digestive remedies in monastery apothecaries, which provided herbal medicines still remembered in popular folklore. In the 1900s, Aloe became, together with rhubarb and artichoke, the plant most popularly used in distilled preparations known as bitters or bitter digestives.

4.1.17 Constipation

Constipation has three main causes: a sedentary lifestyle and a lack of adequate exercise, strong emotional and psychological tension, and a poor diet lacking in the digestive enzymes important for the chemical breakdown of food. The chemically derived purgatives used today are based on two modes of action. The blander ones are limited to giving body to the feces, while the stronger ones cause an increase in the muscular contraction of the intestines. These are interventions aimed at resolving the problem of constipation and can create dependency and even complications if they are not used correctly. Aloe juice, instead, intervenes with its numerous components in a holistic resolution of the imbalanced intestinal system, supplying the necessary enzymes for digestion, the mucilage to give body and hydration to the feces, and anthraquinone compounds that promote muscular contraction (peristalsis), in the lower end of the intestine. Ancient Greek and Roman sources had already cited the laxative and beneficial properties of Aloe in cases of constipation. We recommend 2 tablespoons (25ml) of pure 100% Aloe juice at meal times and, in more serious cases, 4 tablespoons (50ml) at bedtime. Another indication for use comes from ancient Russian tradition. Take a whole leaf of Aloe barbadensis or arborescens, and remove the outermost cuticle with care. This leaves a gel and a brownish yellow parenchyma containing aloin, which has a laxative action. Chop this substance up roughly and place it in a container with 12 ounces of water and allow it to rest in the refrigerator. Drink one tablespoon of this juice in the morning on an empty stomach and a tablespoon at bedtime, until the situation is resolved. In more serious cases, where the symptoms persist, we recommend a consultation with your family doctor.

Warning: Pregnant women should avoid taking any Aloe product that includes the skin or cuticle and use only the gel.

Otherwise, the increased intestinal muscular motility could induce natural abortion.

4.1.18 Stomatitis

In the resolution of inflammations in the mouth, such as weak and bleeding gums, a resolution can be obtained by combining equal parts of Aloe gel and honey. This composition should be kept away from light and applied with a soft clean brush and light circular motions on the affected area.

The many wound-healing, sedative, and antiseptic substances work together synergistically to give a rapid and effective result.

4.1.9 Duodenal ulcers

Lesions in the duodenal walls, the first tract of the intestine and its mucosa, have symptoms which are noticed especially if a meal has been missed, or when not eating for a long period of time. The main symptom is a gnawing or aching pain or empty feeling in the epigastric region (pit of the stomach), which is relieved by eating or the introduction of food. This substantially differentiates a duodenal (also called peptic) ulcer from a gastric ulcer, wherein the pain symptom worsens with the introduction of food. This is caused by the leakage of gastric juices into the intestine, causing corrosion of the mucosa, and can lead to even further erosion through the duodenal wall, developing into the dangerous complication called a perforated ulcer.

To benefit from acemannan's gastro-protective effects, take two tablespoons (25ml) of pure 100% Aloe juice with a ½ glass of lightly warmed milk, apart from mealtimes.

4.2 Cardiovascular and lymphatic systems

4.2.1 Anemia

There are many forms of this disease. The most widespread and frequent is the form in which the body cannot produce a sufficient quantity of red blood cells or hemoglobin, or both. If the oxygen carriers in our body are insufficient, unpleasant effects are produced, such as headaches, tachycardia, tiredness, muscular dystonia, ringing in the ears,

and sleep disturbances. The causes of reduced iron intake are varied, and include self-imposed low calorie diets, difficulty in assimilating the iron ion contained in foods, and heavy blood loss, as can be the case in menstrual situations or hemorrhoids. The Russian in-depth study on the Aloe ferox variety combined with barbadensis or arborescens Miller revealed it to be very useful in resolving even complex anemias. Aloe acts as a bio-energetic stimulant in the formation of hemoglobin. The immunostimulant function of acemannan predisposes the cellular walls of the body, particularly of the spinal marrow, an organ which forms red blood cells, for improved reception of magnesium and iron, two salts that always act as a couple.

By introducing daily use of the juice, together with plenty of fruits and vegetables such as raw spinach, the deficiency is quickly resolved. The dose is two tablespoons (25ml) three times a day. Blood tests will then be required and interpreted by your physician. See Pain and menstrual disturbances.

4.2.2 Angina

Its maximal concentrations of magnesium, folic acid, and vitamin E make Aloe juice a rich botanical mixture unique in the world. These three substances together contribute to the management of ventricular muscular contractions, allowing better oxygenation of cells and limiting or even eliminating the symptom of angina pectoris, which includes involuntary spasms of the myocardial arteries.

We recommend the use of two tablespoons (25ml) every day before breakfast as a preventive, or 4 tablespoons (50ml) in the presence of a pathological state, until the resolution of symptoms. It is always recommended that angina sufferers visit their cardiologist at regular intervals throughout the year.

4.2.3 Cardiac arrhythmia

All people of an advanced age should take at least two tablespoons (25ml) of pure 100% Aloe juice daily, as it helps to normalize cardiac rhythm which, with advancing years, can tend to become slightly out of balance. The most damaging consequence, however, is not the arrhythmia itself but the fear it provokes in our minds.

Aloe's fabulous juice is a good source of magnesium ions that, together with calcium ions, aid in the electrical conduction of cells and, above all, cardiac muscles, regulating their rhythm of activity and pulsation.

Take two tablespoons (25ml) three times a day for one month, especially during the change of season.

4.2.4 Arteriosclerosis

Arteriosclerosis, the obstruction of veins and arteries in the cardiovascular or circulatory system, is normally caused by unhealthy eating habits and lifestyles. These weaken the body and render the sufferer more vulnerable to external aggressors. Low intake of fiber, vitamins, and minerals, with a preference for a high-fat and fried foods only, adds to the body's vulnerability and leads to a concentration of lipids in the blood. This thereby facilitates the deposit of fat on the vein and artery walls, the starting point for their obstruction. Aloe juice is rich in substances that help the body to lower the amount of fats in the blood and prevent their deposit on vein and artery walls. Methionine, for example, works with the lipase enzyme to metabolize excess fats in the blood. The non-essential amino acid proline, instead, is a constituent of collagen, which ensures a perfect holding and elasticity of tissues, including the veins and arteries. Microdoses of selenium make up part of the glutathione peroxidase enzyme, well known for antioxidant and cellular anti-aging properties. All of these combined benefits can be obtained from taking two tablespoons (25ml) of pure 100% Aloe juice in the morning, before breakfast, as a "reconstituting" tonic, for one month during the change of season, or otherwise. We add here, as we would for all pathologies, that prevention is always better than a cure; a good dose to take as a preventive measure is two tablespoons (25ml), which also helps with already existing degenerative dysfunctions.

4.2.5 Cholesterol and liver weakness

The great presence of vitamins and fatty acids in Aloe juice contribute significantly in the management and control of the ratio between "good" and "bad" cholesterol (HDL/LDL). The vitamins A, C, and E, are all liposoluble and are easily absorbed by tissues, together with choline helping lipid metabolism and guaranteeing a better state of health.

Taking two tablespoons (25ml) of pure Aloe juice daily before main meals ensures a low blood cholesterol level and efficient prevention of cardiovascular disease.

4.2.6 Blood purification

The role carried out by Aloe during the change of seasons is certainly that of a blood purifier, and it accomplishes this more effectively and easily than the traditional methods, including fasting, laxatives, and blood-letting.

What makes it the most effective purifier is its composition. Aloe not only possesses depurative elements, the anthraquinones, but also nutritional elements needed to reconstitute and repair the body wherever there is a requirement, bringing it back to a state of equilibrium and health.

Take two tablespoons (25ml) of pure 100% Aloe juice in the morning on an empty stomach with a cup of green tea or with lemon juice and a teaspoon of natural organic chestnut honey. This depurative procedure will bring back a state of well-being within a short time.

4.2.7 Migraine

Massage the painful area of the head with Aloe gel and, at the same time, drink a glass of water with four tablespoons (50ml) of pure 100% Aloe juice.

The triple analgesic, anti-inflammatory, and antibiotic effects should ease the migraine. The bradykinase enzyme intervenes in inhibiting pain processes through its anti-inflammatory action by blocking the kinins and interleukins produced by the body as a response to danger, which could threaten the body's health in general. The analgesic action is determined in the gel by the presence of salicylic acid and cinnamic acid.

One can begin to see results shortly after taking the liquid.

4.2.8 Hemorrhoids

These internal/external lesions of the terminal part of the anus tend to be due to the stasis or stagnation of the blood flow in the veins and capillaries in the area. This condition is mainly a consequence of a diet lacking in fiber. The initial symptoms of this painful problem are overheating, anal itch, and successive laceration with a small or greater amount of bleeding.

Aloe supplies two types of intervention: an external one and an internal. The first is obtained by applying the gel derived from the decorticated leaf on the affected area of the anus. However, the aloe gel does not always remain in place for a sufficient time period.

The way to remedy this inconvenience is to use an Aloe cream over the entire area. The numerous nutritive and sedative principles contained in Aloe will accelerate the reabsorption of the wound. The second way of treating this condition is to drink 100% pure Aloe juice in the quantity of two tablespoons (25ml) three times a day generally before meals, until resolution becomes evident and then continue to take it for another 2 weeks with the same dose.

4.2.9 Hemostasis

The substantial amounts of Iron, vitamin B1, and vitamin B6 make the pure 100% Aloe juice an important remedy against bleeding wounds or blood loss of any type. These three substances, together with acemannan, induce the production of red and white blood cells and platelets – instruments necessary for blocking and remargining or healing any wound. The marked hemostatic action is obtained by protecting the area involved with a sterilized gauze soaked in aloe gel and leaving it in place until the bleeding has completely stopped. Successively apply the gel and allow it to be absorbed twice a day, preferably in the morning and at night.

4.2.10 Hepatitis A-B-C

According to recent medical research conducted in Eastern Europe, the presence of choline, an active biological lipid in Aloe, is able to cure hepatitis of types A and B, and even some of the C types.

It was observed that the continued use of Aloe determines a functional improvement of hepatic cells. Acemannan activates the immune system, strengthening the phagocytic action of the killer T cells and B cells and, together with the liposoluble vitamins A, C, and E and folic acid, rapidly restore the hepatic activity of the cells previously compromised by inflammation. We recommend taking 100% pure Aloe juice, available in selected markets, in a quantity of two tablespoons (25ml) three times a day.

4.2.11 Frostbite

In order to resolve the devastating effects generated by prolonged exposure to cold, we suggest the coordinated use of Aloe, both internal and external. Drink the pure juice of 100% Aloe three times a day, in quantities of two tablespoons (25ml), and massage with a high quality Aloe gel two to four times a day, according to the severity of the frostbite.

This is the best way to gain the benefits of the many components of this prodigious plant to bring about improved blood circulation and a rapid restoration of tissues.

4.2.12 Hypertension

There is a proven relationship between a diet rich in potassium and the control of high arterial blood pressure.

Aloe juice allows arterial blood pressure to return to the normal range through its generous amount of potassium ions, regulators of many biochemical processes.

There are other substances, such as digestive enzymes and polyunsaturated fatty acids, that act positively on processes which control blood pressure.

Aloe juice, taken in quantities of two tablespoons (25ml) three times a day, diluted in freshly prepared fruit or vegetable juice, normalizes and stabilizes high blood pressure over time.

4.2.13 Hypotension

The individual who has low blood pressure manifests difficulty in maintaining adequate levels of internal blood pressure and, above all, suffers from frequent and rapid changes or drops in blood pressure levels, which cause dizziness and chronic tiredness.

The B vitamins, especially B1 or thiamine, act on the cellular metabolism of muscles and improve their elasticity.

In the cardiac muscle, vitamin B1 facilitates the pumping of blood throughout the entire cardiocirculatory network by rendering the cellular walls in the veins and arteries more elastic and fluid, and therefore making their workload lighter.

Take two tablespoons (25ml) of pure 100% Aloe juice before meals, for two weeks, during the change of season.

4.2.14 Lymphatic stasis with inflammation

Whenever an enlargement of lymph nodes is present in the body, it can be useful to turn to Aloe gel or juice. Its immunomodulating, anti-inflammatory, analgesic, and sedative actions interact and "compete" to find a resolution to the problem acting externally at the skin level, as well as internally on the circulatory and lymphatic systems. All the immune defenses are activated through acemannan.

The analgesic and anti-inflammatory actions are produced by the anthraquinones, the aloins. The amino acids with the vitamins and the mineral salts reconstitute the interrupted or reduced metabolic activities.

Apply the gel along the affected area, with light circular motions, until the product is completely absorbed, three times a day for the more serious cases. During this same period, drink two tablespoons of pure 100% Aloe juice (25ml) three times a day.

4.2.15 Hepatic steatosis (fatty liver)

This degenerative liver disease manifests when the fat that needs to be metabolized is in excess in respect to the normal rate of liver fat metabolism. This brings about an enlargement and hardening of the hepatic mass, with a subsequent compromise of its filtering ability.

Aloe juice proves very useful in these cases. The lipase enzymes, the proteases, and the transaminases support this organ's functions as a rapid cell detoxifier through the assistance of choline and inositol phospholipids, which are potentially lipotropic. Therefore, for two months, take 2 tablespoons (25ml) of pure 100% Aloe juice three times a day before meals.

4.2.16 Varicose veins

Varicose veins are created when there is diminished elasticity of the cells from which they are made. Varicose regions also display difficulty in maintaining good peripheral cellular oxygenation and nutrition. If this phenomenon is not kept in check, it can expand. There are many testimonials to the valid use of Aloe gel in resolving these problems, even if not supported by medical proof. Aloe penetrates the blood flow, producing its beneficial effects on the circulation through

the digestive enzymes, vitamins, and phospholipids. Due to the polysaccharide complexes like acemannan, fibroblasts and collagen are stimulated and can now go about re-establishing lost elasticity. Enzymes, vitamins, and antioxidants act as aids in preventing external attacks. In the case of varicose veins, take 2 tablespoons (25ml) of pure 100% Aloe juice three times a day, before meals, and apply Aloe gel to the affected area in light circular movements twice a day, preferably morning and night. For more prolonged and complex situations, we recommend Aloe-based packs or plasters, kept in place throughout the night.

4.3 Respiratory system

4.3.1 Asthma

Asthma is a disturbance that has become increasingly widespread throughout the world. Its origins and causes are varied, and include atmospheric pollution, as well as the 20th century lifestyle with its frenetic pace and high emotional tension, the effects of which our bodies are constantly trying to overcome. The symptom consists of difficulty in breathing in a natural way, or effortlessly, and it occurs because of air displacement between inhalation and exhalation. Air remains in the lungs a little longer with the result that there is less oxygen intake in the ensuing breaths.

Aloe intervenes in this pathology on the immune defenses. It works so that various molecules are made active, thus coordinating the biochemical reactions that support pulmonary respiration and respiration in general, helping the asthmatic individual.

Internal use, in the form of 2 tablespoons (25ml) of 100% pure Aloe juice three times a day, is recommended. External use, by placing the juice in a nebulizer in the dose just described, and breathing

in the vapor morning and night, is also recommended. A useful alternative is an inhalation procedure, using a preparation made by placing one roughly chopped Aloe leaf in boiling water for 1 minute.

4.3.2 Catarrh or phlegm

This condition of inflamed buccal mucosa is often caused by poor eating habits, such as not chewing food thoroughly

or eating under stress and tension. Often, our bodies fall prey to seasonal influenza attacks and respiratory infections as the result of frenetic and stressful lifestyles. The doubly increased effort created by large pieces of food that have not been well-chewed and the tension of the esophageal muscles trigger the production of protective mucus which contains bacterial agents with a tendency to proliferate.

Turning to Aloe is a wise practice in these cases. The combined effects of acemannan, aloin, and enzymes like bradykinase, have anti-inflammatory, immunostimulating, and reparative effects on muscular tissues that are stressed or damaged. Thorough cleaning of the mouth, along with a throat gargle, helps to clear this problem. Gargling should occur 2 or 3 times during the day after meals, according to the severity of the problem. Place 2 tablespoons (25ml) of pure 100% Aloe juice in a glass of warm water and gargle.

4.3.3 Laryngitis and bronchitis

Bronchitis is an infection of the branches that connect the trachea to the pulmonary alveoli, responsible for the gas exchange between oxygen and carbon dioxide. Laryngitis involves the cylindrical organ which contains the vocal cords and acts as a connection between the upper portion (pharynx) and the lower portion (trachea). The causes of these two pathologies can include changes in temperature, lowered immunity, heavy pollution, or cigarette smoke, any of which can obstruct part of the respiratory canals. Infections of the bronchioles (small bronchi) are more serious because they are closer to the lungs and more susceptible to inflammations. Through inhalation of vaporized 100% pure Aloe juice using a nebulizer, brilliant resolution of infections of the respiratory system can be achieved. This result is obtainable due to the special mix of active botanical components contained in the Aloe plant.

Acemannan activates the immune defenses, summoning numerous macrophages and lymphocytic cells that attack germs and pathogens. Aloe's plant steroids, like lupeol, carry out an anti-phlogistic action. Wound-healing is carried out by the plant growth hormones giberelline and auxine, all acting together to provide valuable mineral, protein, and vitamin support. This mix of active substances represents the healing potential of Aloe gel or juice.

We suggest that the treatment be carried out by inhalation

three times a day, using one tablespoon of pure juice. To this vaporization liquid, add the old Russian folk remedy obtained by mixing one ounce of Aloe juice with two ounces of honey and three ounces of vodka, or by that 1:2:3 ratio for a larger amount. This preparation is then applied to the affected area, specifically the throat for the laryngitis and the chest for the bronchitis. This area is then covered with cotton gauze or linen, kept firmly in place with a wool cloth. The bandage should be changed two or three times a day, and the treatment carried out for two or three days, or until resolution of the symptoms. Because of the possibility of complications, it is always best to consult one's family doctor first.

4.3.4 Rhinitis

Aloe gel can be useful in those cases where the nasal mucosa is irritated by the presence of cold germs or by sudden changes in temperature, making it necessary to blow one's nose continually. In these cases, massage the nose both internally and externally with the gel, using light circular movements until the product is completely absorbed. Apply this gel morning and night. The sedative and wound healing properties of Aloe due to the glucomannan, together with the plant steroids, has been found to be very useful in restructuring the collagen in the keratinic layer of the nose and restoring normal functioning to the nasal mucosa.

4.3.5 Tonsillitis

The "palatine" tonsils, meaning they are found on each side of the palate, are a part of the lymphatic system and carry out an action of immunity or defense for the body, warding off attacks by bacteria, germs, and viruses. Tonsillitis is an infection of these organs that tend to enlarge when the body is faced with imminent bacterial attack, producing pain on swallowing and a very sore throat, ear discomfort, and fever. The afflicted person can also suffer strong headaches and difficulty eating. Tonsillitis is defined as a "communal" pathology because it tends to spread in closed and crowded environments, like schools, barracks or youth recreational centers.

The use of Aloe in these cases reveals itself to be extremely efficacious. The inflammatory action and the analgesic from

the salicylic acid and isobarbaloin together with the immunostimulant of acemannan have a sedative action on the pain and promote healing. We recommend a mouthwash and gargle three to four times a day with 4 tablespoons (50ml) of 100% pure Aloe juice in a glass of warm, not boiling, water into which one teaspoon of honey has been dissolved. In a pathology of greater severity, take an oral dose of 8 tablespoons (100ml) of 100% pure Aloe juice per day.

4.4 Urogenitary system

4.4.1 Cystitis

This is an inflammation of the bladder caused by germs contaminating its mucosa. This can happen because of sudden cold air hitting the lower abdomen or habitually withholding urine frequently or for long periods of time. This facilitates the proliferation of bacteria and pathogenic agents. Cystitis manifests as an increased frequency in the urge to urinate with a burning sensation upon urinating, and the presence of blood (microscopically or otherwise) in the urine. It can sometimes cause fever and the spread of the infection to the kidneys, compromising their function.

The acemannan in Aloe ensures significant anti-inflammatory action and the lignins, together with the saponins, ensure effective antifungal action, limiting the spread of the inflammatory state and leading to speedier resolution.

We recommend that the affected area be kept warm and that the sufferer drink plenty of fluids, as much as 2 liters a day, preferably in the form of warm herbal teas made with 4 tablespoons (50ml) of 100% pure Aloe juice per liter.

4.4.2 Menstrual disturbances and pain

Aloe is helpful to women who may experience painful menstruation. The variety of vitamins, mineral salts, and other molecules present in Aloe, make it a unique mixture effective in the reestablishment of general well-being.

Ayurvedic medicine contains indications for Aloe as the best antidote for these disturbances, with the claim that it brings back youthful energy. In this case, they recommend it be taken in the form of 1 tablespoon of gel in apple or pomegranate juice or in hibiscus herbal tea. Another Ayurvedic remedy is to use fermented Aloe gel with honey and turmeric,

which serves as a tonic against anemia, bad digestion, and a blocked or irregular menstrual flow. It is an effective treatment for painful menses when used in the form of 100% pure Aloe juice in quantities of 2 tablespoons (25ml) two days before the onset of menstruation and 2 tablespoons three times a day during the course of the period.

4.4.3 Pregnancy

Oral use of Aloe during pregnancy necessitates certain precautions, as the whole leaf contains anthraquinones, like aloin, barbaloin, and aloetic acid, which have a strong purging action and can stimulate uterine contractions, possibly inducing spontaneous abortion. If using the products on the market which do not contain anthraquinones, then it is possible for pregnant women to take Aloe-based preparations as described in earlier chapters. Mothers-to-be have the opportunity to offer themselves and their babies the many properties contained in this precious plant. Aloe, without the anthraquinones from the plant's skin, can then be safely consumed during the entire pregnancy in quantities of 4 tablespoons (50ml) per day.

4.4.4. Impotence

This pathology usually manifests itself in adult males as an incapacity to have a satisfactory sexual relationship. The causes are many and, often, both organic and psychological. Various Russian clinical studies demonstrate that subcutaneous injections of Aloe (specially prepared for this purpose) produce interesting results in the fight against impotence. Many Russian folk remedies have been handed down ranging from herbal medicine to popular folk beliefs, of which we will cite a few examples. Mix together an equal quantity of Aloe juice, butter, duck fat, honey, and ground dried dogrose or wild rose herbal. Heat the mixture in a small pot and stir continually. Remove the mixture from the heat before it begins to boil and place it in a cool, dark place. This mixture is to be taken 30 minutes before meals in a dose of one tablespoon, diluted in a glass of warm milk.

A second remedy is obtained by making a mixture of 5.25 ounces of 100% pure Aloe juice, 8.75 ounces of honey, 12.25 ounces of red wine, 3.5 ounces of powdered dogrose or wild rose, and 1.05 ounces of powdered parsley. Mix these ingre-

dients together and pour into a bottle. Allow this mixture to macerate in a dark place for two weeks, during which time it is to be occasionally stirred or shaken. Take 1 tablespoon of this mixture 30 minutes before meals, three times a day.

4.4.5 Menstrual irregularities

See *Menstrual disturbances and pain*.

4.4.6 Menopause

The ancient and wise Ayurvedics saw Aloe as a powerful antidote to the minor pathologies that assail women. Among these are the premenstrual problems and menopausal problems that can affect the female body. This can bring about hormonal imbalances with varied disturbances.

The practice of drinking 2 tablespoons (25ml) of 100% pure Aloe juice, twice a day, is as useful today as it was then.

4.5 Nervous system

4.5.1 Sleep disturbances

Insomnia affects many people, particularly if they are under stress or have certain types of problems. Aloe can be useful in this case. The balanced quantities of inositol, and plant phospholipids it contains, guarantee the body a perfect balance of energy and an especially good supply of electrical transmissions to the central and peripheral nervous system, helping to stabilize deficiencies. Take 2 tablespoons (25ml) of 100% pure Aloe juice before going to bed.

4.5.2 Intellectual/Mental efficiency

The harmonious union of various substances present in Aloe are formidable in their ability to improve and render more efficient that impressive "control panel" we call the brain. The amino acid phenylalanine, for example, stimulates mental activity as a participant in the creation of neurotransmitters. The phospholipids are also important for the transmission of data between cells, and their presence is especially significant within the central nervous system. Drink 2 tablespoons (25ml) of 100% pure Aloe juice in the morning, before breakfast, with a glass of water or fruit juice, to guarantee an improvement in all mental activities,

especially in the case of students or workers in any field requiring use of the intellectual capacities.

4.5.3 Nervous breakdown/exhaustion

This illness is characterized by the appearance of disturbances like anxiety, phobias, psycho-physical conditions, or hysterical fainting due to an electrical malfunction in one or more areas inside the brain's encephalus. Aloe's amino acid and phospholipid components, together with its vitamins and minerals, create a valid support system for this type of imbalance. For re-found vigor, we recommend 2 tablespoons of 100% pure Aloe juice three times a day for at least three weeks. Repeat the therapy during change of seasons or whenever required.

4.5.4 Ischialgia (sciatica)

Normally, irritation of the sciatic nerve or sciatica arrives without notice. Its origin is none other than the "straw that breaks the camel's back". That is to say, it represents the last stage of a series of degenerative events. If a disc hernia is not present, i.e. pathology of the vertebra, then the cause is certain to be found in a metabolic imbalance or vitamin deficiency. In this case, Aloe's rich supply of vitamins and minerals is a good tool in the fight against this painful problem. Take 2 tablespoons (25ml) of 100% pure Aloe juice three times a day for the first two days and, if necessary, continue usage until the pain disappears.

4.5.5 Chronic fatigue syndrome

This syndrome, most probably due to a former Epstein Barr virus (EBV) infection, is not yet very well-defined clinically. It provokes a state of extreme fatigue in the affected individual, in which fatigue is continually experienced. Various substances in this wonderful plant are useful in restoring the pre-existing state of energy. Magnesium, together with vitamin E, enters the "electrical control centers" of the cells and provides a valuable contribution. Digestive enzymes, together with acemannan, facilitate the breaking down of food and its assimilation, without overloading a physical structure that is already weak. In the case of chronic fatigue syndrome, it is useful to take 4 tablespoons (50ml) of

100% pure Aloe juice each day, until energy and well-being is completely restored.

4.6 Osteo-articular/skeletal system (joints)

4.6.1 Arthritis

Arthritis is an inflammation of the joints that support agility and movement in our body. It is caused by many factors, which can often be attributed to an unbalanced diet, irregular lifestyle habits, and a mineral deficiency (especially copper, which is one of the elements fundamental to good health). These factors facilitate the regeneration or repair of muscles, joints, and cartilage. We should not confuse arthritis with arthrosis which, in medical terms, indicates progressive damage of the joints' cartilage, while the term arthritis is used to indicate the inflammation caused by the process of arthrosis. Thanks to the potent anti-inflammatory properties of cinnamic acid and chrysophanic acid, Aloe is able to treat arthritis by actually reducing and, in some cases, stopping the pain and restoring free movement to the joints. The complex sugars of acemannan, present in Aloe, intervene in biochemical reactions, guaranteeing lubrication of the joints. The colon walls are also coated, preventing toxins from being absorbed into the circulatory system and allowing, instead, the absorption of nutritive substances of the electrolytic type important to the body. All in all, these complex carbohydrates act as a selective barrier to substances entering the body. The anthraquinone compounds, aloin and barbaloin, strengthen the entire immune system. We recommend the consumption of two tablespoons (25ml) of 100% pure Aloe juice, in the morning and at night before bed, preferably diluted in a glass of water or fruit juice. A topical Aloe cream or gel can be used as an external adjuvant during times of strong neuralgia. The powerful substances lending their analgesic, sedative, nutritive, anti-inflammatory, and immunostimulating properties, can only serve to further ease this disease.

4.6.2 Gouty arthritis

This type of arthritis is also called uric acid arthritis. It begins by manifesting an increase in uric acid in the blood and uric acid crystal deposits in the joints. This condition is, in most cases, caused by a deficiency of the range of enzymes

available. Uric acid crystal deposits in a joint articulation are not immediately identifiable and can remain latent for a long time before the problem manifests itself. Cold temperatures often cause the situation to intensify and create pain. The joint most commonly affected is the big toe, which becomes swollen, red, and sensitive to the touch.

For areas afflicted with gout, massage the area (often the foot) with Aloe gel a few times a day. At the same time, drink 4 tablespoons (50ml) of 100% pure Aloe juice three times a day during the acute stage; otherwise, 2 tablespoons (25ml) three times a day until the emergency has ended. Continue to take it for a few months. Repeat this therapy twice a year.

4.7 Endocrine system

4.7.1 Mastitis

Inflammation of the mammary glands can occur during the breast-feeding period, when their activity is almost incessant and it becomes easier to come into contact with germs, usually staphylococci, which penetrate the gland tissues. Aloe juice can be a very useful remedy in this situation.

The analgesic action of cinnamic acid, the antibiotic action of barbaloin, and the intervention of acemannan on cellular collagen activity, allow Aloe juice to enter the deeper layers of the skin and reach the inflamed lymph nodes for rapid resolution of the problem. Even Russian folklore mentions an Aloe-based remedy for this condition: a small Aloe leaf is cut lengthwise, and a half is placed on each nipple, massaging with small delicate circular motions on the surrounding area. Apply a cloth bandage to hold the leaves in place and leave it in place for a few hours. This treatment should be repeated morning and night until the problem is resolved. Another method, which is just as efficient, is to rub the nipple with Aloe gel after each feeding of the baby and rinse it off afterwards with warm water.

4.7.2 Metabolic normalization

The prodigious grouping of substances that nature has given us in the Aloe plant allows us the possibility to intervene for a vast range of dysfunctions, especially those dealing with metabolism – all the processes that turn food into thermal energy, to mechanical functions, to organs, and to

the internal tissues of the body. These processes become affected whenever cellular activity is affected. The regular use of 2 tablespoons (25ml) of 100% pure Aloe juice in the morning before breakfast can re-establish the equilibrium of cellular functions.

4.7.3 Stimulating the endocrine glands

The Aloe plant, which closely resembles a “fleshy or succulent” lily plant, has various properties, including the ability to stimulate the endocrine system in general. The effects of this stimulant action range from the pancreas to the adrenals and from the thymus to the thyroid. Aloe co-ordinates the activities of the endocrine glands through its many medicinal substances, like its enzymes and plant steroids, the aloins, the complex carbohydrates (like acemannan), and its immunomodulating functions. We recommend taking 2 tablespoons (25ml) of 100% pure Aloe juice twice a day until the situation is resolved and balance is re-established.

4.8 Integumentary system (skin affections)

4.8.1 Abrasions

See *Wounds*

4.8.2 Acne

Acne is an inflammation of the sebaceous glands with the production of pus, generally on the face or the back. These glands are at the base of the hair bulb and produce an acid called sebum, which lines, protects, and softens the entire body with a thin film. This substance is directly controlled by our hormones. Testosterone allows the production of sebum, while estrogen inhibits the production of sebum. Pathogenic agents can nest at the base of the hair, especially if not enough attention is placed in a proper cleansing of the skin or if a hormonal imbalance is present. This situation occurs frequently in young people and often gives rise to the inflammatory process mentioned. The varied antimycotic, antifungal properties of lignins, saponins, chrysophanic acid, and cinnamic acid, together with the stimulating and strengthening properties of acemannan, make Aloe useful in a large range of disturbances inherent to the skin. The effect works on many levels, healing the inflammation, stimu-

lating tissue production, and repairing open scars as well as the old existing scars. The first recommendation is to start with a thorough cleansing of the skin with an Aloe-based soap, followed by an application of the gel, three times a day in severe cases, and morning and night in those less severe, continuing for a period of one month. The focus, at this point, is on the characteristic astringent actions of Aloe. If the skin, at this point, becomes overly dry, an Aloe-based cream should be used as a hydrating moisturizer. In this way, acne's classic skin eruptions can begin to slowly disappear. When dealing with a pre-existing situation, it is best to continue the treatment for a few months. These results may seem to take longer than remedies that are not “natural”. This is the nature of a natural product, which endeavors to heal in a natural way. To accelerate and consolidate the results, we also recommend drinking 2 tablespoons of 100% pure Aloe juice, morning and night, in a glass of water.

4.8.3 Acne rosacea

This pathological state produces a strong reddening of the afflicted area, especially the face, and implies a gastro-intestinal or glandular dysfunction.

From this definition, we can see that Aloe has the proper substances for this condition, like digestive enzymes, phospholipids, amino acids, complex sugars, and plant hormones that act at the glandular level. We recommend taking 2 tablespoons (25ml) of 100% pure Aloe juice three times a day for at least two months. Noticeable improvement should begin by the sixth week.

4.8.4 Actinomycosis

This affliction is common in children that put various objects in their mouths and who taste grass when playing outdoors. The surface of many objects and vegetable composites is inhabited by bacteria called actinomyces. These bacteria die when they come into contact with the buccal mucosa. However, if cracks or wounds are present, these bacteria may proliferate and create infection.

If this inflammation is caught at the start, it can be contained with frequent mouthwashes made of solutions of up to 4 tablespoons (50ml) of 100% pure Aloe juice in a glass of warm water. The cinnamic and chrysophanic acids in the

solution provide good antifungal function. If the infection is widespread and the discomfort is obvious, it is best to consult a physician.

4.8.5 Allergies and itching

Allergic reactions are none other than the body's inability to distinguish between threatening, harmful agents and friendly, harmless agents. This loss of molecular "recognition" stems from many factors, including environmental pollution, poor diet, and modern fast-paced lifestyles, all of which create deficiencies on various fronts in many organs and systems. These are the situations that create general energy imbalances, particularly in the immune defenses. This gives rise to hyper-reactions to external stimuli with allergies to pollens, dust mites, and animal hair. The symptoms range from rhinitis to lacrimation, from photosensitivity to difficulty in breathing, and widespread itchiness. Aloe acts in an anti-allergic way and is efficacious in over 90% of cases. The complex sugar acemannan, present in Aloe together with the bradykinase enzyme and some of the anthraquinones, has a strengthening and modulating activity on the defense system, as well as an anti-inflammatory and natural antibiotic action. To treat this symptomatology, drink 2 tablespoons (25ml) of 100% pure Aloe juice before meals three times a day for a period of 20-30 days, especially during changes of season, periods which manifest cellular turnover and instability of the immune system.

4.8.6 Alopecia and balding

Balding presents itself as the problem of hair loss that is faster than hair re-growth. This condition primarily affects men and can be due to heredity or to circumstances where stress and poor diet are the norm. Aloe juice possesses several substances and a particular characteristic which make it very useful in the treatment of hair loss. The helpful characteristic in this case is its acidity or, rather, its pH. Aloe's pH level is 6, weakly acid, and very close to the normal pH 5 of skin. This characteristic facilitates the penetration of the nutrients to revitalize the hair bulb, strengthening it and promoting its re-growth. In this way, hair loss can be stopped. We recommend an application of Aloe, morning and night, for a few months on the affected area. A Native American

procedure includes applying the gel at night and washing it out the next morning, making sure to gently massage the scalp. This stimulates and reactivates the scalp and helps hair to grow stronger and shinier.

4.8.7 Abscess and pimples

An abscess is the production of pus in an area of the body caused by varying factors. It presents itself as an inflammation caused by invading external bacteria. The natural antibiotic action of the anthraquinones in Aloe have a regenerating effect on collagen tissue and the vast array of micro-nutrients help to more quickly control the inflammation without leaving scars. Lightly heat some 100% pure Aloe juice with some honey, without bringing the liquid to a boil. Spread this mixture on the area affected, then cover with a moistened gauze cloth for half an hour, twice a day. Between treatments, the affected area should be covered with a band-aid or adhesive patch with a little gel on it.

4.8.8 Scars

Tissues which repair with the use of non-organic aids heal but often leave an unpleasant marking called a scar. The acemannan contained in Aloe stimulates correct and coordinated tissue repair which, together with the amino acids, vitamins, and minerals, promotes faster and more ordered healing, preventing the formation of a permanent scar. To gain visible results on pre-existing scars, treatment with 100% pure Aloe juice should be carried out for a few months. This allows the time needed to stimulate and correct the production of collagen and connective tissue. The same treatment is recommended for stretch marks. Stretch marks often occur in women, especially on the thighs, or on the abdomen, due to a thinning of the skin tissue after pregnancy. These marks are formed by a physical stretching of the skin together with changes in its protein structure caused by hormones present in the skin's collagen tissue. Stretch marks manifest after a rapid increase or loss of weight, an excessive and rapid increase in muscular mass, or after infectious illness. In any of these situations, apply Aloe gel twice a day for a period of a few months, until they are visibly reduced or disappear. It is also helpful to eat foods rich in vitamin E, to consolidate and potentiate the actions of Aloe.

4.8.9 Skin care

The rich nutrient and medicating substances contained in Aloe are widely used in the cosmetics industry, in skin creams, lotions, and special treatment preparations aimed at resolving a large number of skin problems.

Topical application of the gel, on a daily basis, cleanses and regenerates the skin, supplying the correct amount of vitamins and stimulating blood circulation to guarantee improved oxygenation and rapid expulsion of toxins. Skin becomes smoother, moisturized, and more elastic because Aloe's antioxidants defend it against free radicals and their degenerative action on the epithelial cells. Its anti-aging effects, are an added bonus.

A face mask recipe, handed down in the Russian tradition, is simple and easy to use. Mix together a teaspoon of honey with one tablespoon of pure Aloe juice, the yolk of an egg, a teaspoon of castor oil, a teaspoon of lemon juice, and a teaspoon of black currant juice. Add a pinch of oatmeal to this mixture to give it a thicker consistency. Apply the mask on a cleansed face and leave it on for fifteen minutes. Rinse it off with warm water and then finish the rinse with cold water. This remedy is an excellent bio-stimulant for the skin, cleansing it and feeding its deeper layers.

4.8.10 Treatment and maintenance of hair

Hair can be kept strong, healthy, and shiny by using Aloe juice as a hair conditioner after a normal shampoo. Apply the juice and vigorously rub the hair and scalp, leaving it in to act on the hair for another ten minutes. The benefits of this particular hair conditioner are due to the richness of its active nutritive constituents, which strengthen and correctly stimulate the scalp.

Russian tradition grants us yet another folk remedy: mix 1 tablespoon of 100% pure Aloe juice with honey and castor oil, in equal amounts. Massage the hair and scalp with this mixture and leave it in for approximately 30 minutes, repeating the treatment every week.

This treatment helps to prevent the damage caused by frequent exposure of our hair to damaging environmental agents, like strong sunlight, chemical agents, hair colorings, and permanents, which tend to damage the keratin fiber structure of the hair.

4.8.11 Dermomycosis

This disease is produced by the skin's fungal parasites and is easily contracted in the summer months. A hot, humid climate helps their proliferation. Certain habits during the summer months can also make us more prone to attack.

The symptomatology includes localized itching and widespread reddened areas. Involuntary scratching worsens the situation, creating abrasions and fertile areas for further inflammation. Aloe juice is particularly indicated in these cases. The antibacterial and antimycotic effect of the lignins and the cinnamic and chrysophanic acid in Aloe produce immediate effects. Instantaneous relief is supplied by the anti-inflammatory and analgesic components of acemannan and salicylic acid. Apply Aloe juice or gel to the affected areas, three or four times each day.

4.8.12 General Eczema

Eczema is characterized by skin inflammations which produce small itchy vesicles, sometimes purulent or weeping, and which proceed to form a crust. There are many types of eczema, with the most common type being non-contagious, and caused by metabolic dysfunction. Aloe juice should be applied to the affected area, from the moment it first appears and, in addition, 4 tablespoons (50ml) should be eaten at breakfast together with some yogurt or fruit juice. Externally clean the affected area with warm water to which 2 tablespoons of gel has been added, morning and night.

4.8.13 Seborrheic eczema

Seborrheic eczema is an inflammatory skin pathology which produces vesicles, or localized in areas where there is a major concentration of sebaceous glands such as the head, back, and chest. They are clearly distinguishable by the small red and itchy patches that become epithelial desquamation. Medical studies indicate that the cause is a particular fungus found in nature called *saccharomyces*.

The antimycotic action of some of Aloe juice's active principles is a useful remedy for cases of seborrheic eczema. Bathe the irritated areas with an aqueous solution composed of 2 tablespoons (25ml) of 100% pure Aloe juice in 4 ounces of water or warm chamomile tea.

4.8.14 Bruises

Warm Aloe gel or juice packs have been used for speeding up the healing of unsightly bruises, since ancient times. The classic purple-blue patches followed by a yellowish tinge, typical of a contusion or a hard knock, are caused by the breaking of capillaries and their network in the surrounding layer of the skin. The healing of these bruises can be sped up by the actions of acemannan, which reactivates and speeds up the functioning of the whole epidermal layer. Apply the packs twice a day until these bruises disappear.

3.7.15 Erythema nodosa

This inflammatory disease of the skin and subcutaneous tissue is characterized by tender, dark red nodules which usually appear on the inner arms or thighs. The accompanying irritating itch, due to the elevated vasodilation of the capillaries, can be relieved by the use of Aloe.

Although the cause is usually linked with an underlying disease or drug-induced dysfunctions, evidence rarely supports this.

There may, however, be a psychosomatic link that is evidenced by a worsening of symptoms when the afflicted individual is under stress, and a subsequent improvement or disappearance of these symptoms when the anxiety and stress factors are removed.

We recommend that the affected areas be rubbed with 100% pure Aloe juice or gel, two to three times daily until the itchiness is completely relieved.

4.8.16 Erythrasma (skin inflammation on the inner part of the thigh)

This light skin inflammation, which generally occurs in men, may form on the inner thigh, creating localized red patches. It is caused by the sweat particular to men.

If the skin is not allowed to breathe properly, an inviting habitat for bacteria is created, particularly during the summer season.

The various anti-inflammatory, sedative, and regenerating substances in Aloe help the repair of the damaged skin. Simply massage the affected parts with 100% pure Aloe juice twice a day until it is no longer required.

4.8.1 Wounds

Aloe is truly an all-purpose plant and its juice merits a place in every medicine cabinet. Its usefulness is not limited to wounds, but also extends to abrasions and burns.

Proteolytic enzymes "digest" waste tissue, including pus, and accelerate the regenerative, repair stage of tissues in the healing process. The bradykinase enzyme arrests the inflammatory reaction, the body's response to the necrotic event, and stimulates the immune system's intervention.

The barbaloin and the aloetic acid have an antibiotic and antibacterial effect. The isobarbaloin, the ester of cinnamic acid, and the salicylic acid carry out an analgesic or pain-killing action. For this purpose, use a fresh leaf, cut lengthwise, and place it directly on the wound, leaving it on for a few minutes, and repeating this morning and night until resolution. Today it is easier to opt for a 100% pure Aloe juice or gel, which can easily be found in pharmacies, drug stores, and health food stores. Gently place a small amount of this preparation on the open wound, cut, or burn. All three of these inflammatory states will benefit from a faster tissue re-absorption and healing time.

If it becomes necessary to treat deeper cuts, apply a pack made with Aloe gel and keep it in place during the day, covered with a bandage. This guarantees greater control of the swelling and pain, and a faster healing time.

4.8.18 Dandruff

Aloe-based preparations are very effective at slowing down the desquamation of the corneal layer of the scalp, which acts as the hair's protection from external attack. The solution proposed supplies the most effective revitalizing and nourishing compounds for the skin that houses the hair. This pathology finds its origins in the liver, poor diet, or stress.

Inositol and threonine have a lipotropic action and therefore help the liver. The digestive enzymes help digestion, thereby removing metabolic overloads, and Aloe's other nutritive substances assist in the repair of the scalp. We recommend 2 tablespoons (25ml) of 100% pure Aloe juice before meals, and the application and massaging of the hair and scalp with a preparation made in the following way: mix pure Aloe juice with brandy and castor oil in equal parts and, after applying the preparation, massage the hair and

scalp with gentle circular massaging motions. Leave this solution on the scalp for several hours and follow with a thorough rinse with plenty of water.

4.8.19 Pimples in the ear

Pain in the inner ear is often followed by the appearance of a pimple or pimples, due to a variety of factors. This inflammation and ulceration of the ear tissue can create significant damage to this delicate and important area, which contains many nerve endings.

Wash the affected ear with 100% pure Aloe juice diluted in a little warm water. This will ease the pain and help re-absorption and restoration of the perceptive functions of sound. Repeat this three times a day until the pimple has disappeared.

4.8.20 Pimples in general

Pimples are the degeneration of small pustules that arise at the bulb of the hair follicle, thanks to the entrance of pathogenic germs, which create pus. It is important to stop the spreading of germs during the first phase of tissue infection if we want to prevent the infection from reaching the surrounding surfaces and aggravate the pimple into becoming a boil. Aloe, with its numerous active principles, can stop the infection stage and prepare for the re-growth of strong, healthy skin. This problem is often produced by underlying long-term metabolic imbalances.

We recommend that the affected area be massaged with Aloe gel three times a day, and taken orally during the same period, in doses of 2 tablespoons of 100% pure Aloe juice before each main meal.

4.8.21 Comedones and sebaceous deposits on the face

Whenever there is an over-production of sebum by the sebaceous glands, this oil in the skin can accumulate, stagnate, and obstruct the hair follicle (canal), preventing the outgoing passage of sweat from the skin's surface. This subsequently alters the regulation of body temperature and the elimination of toxins (produced as by-products of cellular metabolism) via these tiny canals. The tiny whitish,

fatty rounds that are created resemble semolina grains and can be easily removed with an exfoliating almond powder. However, if left to dry out and form a crust, they can take some time to remove.

These comedones can be treated with Aloe juice or gel to quickly repair the empty space left from their removal. These manifestations are usually a result of metabolic imbalances, for which 2 tablespoons (25ml) of 100% pure Aloe juice can be taken in the morning before breakfast. This should ensure proper support in treating the underlying dysfunction.

4.8.22 Anal irritations with eczema or fistulas

Some people who engage in sports can create great friction and strain on the skin in the perineal area. Because of the fragility of this bodily area, it is easily prone to irritation and reddening, especially in cyclists or body builders. The sedative properties of acemannan and the plant hormones quickly repair the abraded tissues.

Wash the area with a solution made up of 100% pure Aloe juice in warm water.

Dissolve 4 tablespoons (50ml) in 10 ounces of water. Continue the washes once a day before going to bed, for a few days, until the irritation is healed.

4.8.23 Tinea (Athlete's foot)

This pathology is easily picked up by walking bare-footed in swimming pools, saunas, and beaches. These are places frequented by many people, creating an increased proliferation of skin fungi.

The infection manifests as irritating vesicles that desquamate and leave an abraded area that is prone to microbial attack. It is a pathology that can spread and worsen easily. Aloe juice or gel creates a barrier with its antimycotic, anti-inflammatory, sedative and restructuring properties.

Prepare a foot bath with 1 quart of warm water and 8 tablespoons (100ml) of 100% pure Aloe juice. Soak the feet for 15-20 minutes.

After drying them thoroughly, rub Aloe juice, gel, or an Aloe based cream on the affected and surrounding area.

Repeat this treatment twice a day until the pathology is resolved.

4.8.24 Nail inflammation (Onychitis)

Nail inflammations can be very painful because the area around the nail contains many nerve endings. This condition is greatly alleviated in just a short time by the analgesic properties of isobarbaloin and salycilic acid, and the restructuring of the tissues is taken care of by the complex sugar acemannan.

Apply Aloe gel on the affected area and protect it with a light bandage. Repeat the treatment morning and night for several days.

4.8.25 Hives (Urticaria)

If persistent itchy, tiny, reddish-white swellings become widespread, the condition known as hives is being observed, if there has been no contact with nettles or marine jellyfish. Hives can be an irritating state, likely due to one or more substances ingested and not well-absorbed at the gastro-intestinal level, bringing on an allergic skin reaction.

Acemannan and the bradykinase enzyme are two principles that supply a valid solution in their strengthening of the defense system when taken internally, as well as providing an anti-inflammatory and sedating effect on the discomfort created by the rash. Topical application of gel or juice is also recommended on the affected area at least twice per day.

4.8.26 Nail infections (Paronychia)

This type of inflammation is well-known by the popular name of "whitlow". This is an inflammation of the margin that runs around the nail. It is usually caused by bacteria that enter through a break in the skin, following abrasions from trauma or chemical detergents, manicures, pedicures, or hangnail. These abrasions promote the proliferation of germs, creating pus and irritating pain because of the numerous nerve endings in the pads of fingers and toes.

Cinnamic and chrysophanic acids supply the antibacterial action that, together with the analgesic action of salycilic acid, give immediate relief. We therefore recommend soaking the affected finger(s) or toe(s) in a small amount of water with 8 tablespoons (100ml) of 100% pure Aloe juice. Repeat this treatment 3 times a day for several days.

4.8.27 Bullous infections

Bullous dermatitis is purulent, and often found on the skin of babies affected by bacterial agents. It manifests with vesicles the size of a pea, filled with a milky liquid which can spread the inflammation to the surrounding area. The vesicles should be lightly cleaned and dabbed with a cotton ball moistened with 100% pure Aloe juice. Repeat this procedure three to four times a day and Aloe's strong antibacterial, antimycotic, and anti-inflammatory agents will encourage healing.

4.8.28 Dry and Cracked lips

This is a problem that manifests as small cuts and reddening in the area around the lips. Cracked lips are mainly caused by the presence of bacteria in the buccal mucosa, lowered immune defenses, or vitamin and mineral deficiencies. Aloe gel can be very useful in treating dry and cracked lips by simply moistening the lips several times daily as one would with any lip emollient. This should be done gently to avoid aggravating the existing cracks and abrasions.

It is suggested that daily diet is an important support in combatting this condition and should include an increase in foods rich in vitamins and minerals. For this reason, the added support of 4 tablespoons (50ml) of 100% pure Aloe juice is needed, to be taken in the morning before breakfast for a week.

4.8.29 Bed sores

Long-term hospital patients or elderly people confined to static positions for long periods of time can develop blood circulation problems in the bodily areas that are not moved. Stroke victims (cerebro-vascular disease) are one example of those who can be almost entirely confined to bed. Bed sores are due to the inflammatory state that affects the body in areas that remain compressed under the body's weight, with the consequence of reduced blood supply to those areas. The above-mentioned situation could lead to more serious sores, which become purulent and "corrode" the tissues. If prolonged, this condition can even lead to a general infection of the blood, septicemia – a truly dangerous complication.

To avoid discomfort and unpleasant complications, lightly wash the affected area concerned, twice daily (morning and night) with 8 tablespoons (100ml) of 100% pure Aloe juice in half a quart of lukewarm water, using a soft light cloth while being careful to avoid further aggravation to the existing wounds.

4.8.30 Itching

Itching is an allergic response to a harmful substance coming in contact with the body and can easily be sedated by the use of an Aloe-based cream or gel.

Apply the product topically a few times a day until the symptom disappears. This product can also be useful in all areas affected by this symptom to include conditions like vaginal itch, inguinal itch, and general itchiness.

4.8.31 Insect bites

The Native Americans have an ancient traditional remedy for insect bites. This wise and ancient people would cover their bodies with Aloe gel, whose odor would repel insects and protect them from the many mosquitoes present in the marshes where they hid to protect themselves from the "white man".

The antibacterial and anti-inflammatory effects of Aloe juice are also valid in helping heal areas already "punctured" by an insect.

Aloe is very useful during hot summer months in the humid climates where mosquitoes proliferate. For use as an insect repellent, apply Aloe juice to the skin. Once bitten, gently rub a bit of gel on the affected area, several times a day, to relieve and heal the bite.

4.8.32 Cracked nipples

Very painful cracks sometimes occur in the breast nipples of lactating women. These cracks may also occur during menstruation, which could be considered greatly debilitating to the mother after she has been through the effort of labor.

These unfortunate lacerations in the nipple are caused by a deficiency of nutrients and an overall low energy level. Here, Aloe brilliantly intervenes by supplying the many nu-

trients needed for physical rehabilitation, as well as adding the analgesic property to sedate the pain caused by the open wounds produced in this pathology.

Aloe also supplies the reconstructive and reparative materials needed for the rapid healing of the tissues involved.

4.8.33 Wrinkles

Wrinkles are creases in the skin that develop with advancing age, due to the skin's loss of collagen, whereby its elasticity and structure begins to cede. This phenomenon relates to the whole body but, principally, the face, neck, neckline and hands – the areas of the body exposed to the sun and the damaging effects of UV rays.

This general area of research, the damaging effects of the sun on the skin, has gained increased interest from both the male and female public.

This increased interest is due to the growing amount of interest in maintaining one's looks well into maturity. This is occurring because we are becoming more careful in the way we look with the passing of time.

Regular use of Aloe, with its healthy elements, can act as a preventative measure in the fight against aging skin and can promote a prolonged state of well-being and youthfulness.

Aloe's various nutritive substances, with their marked astringent effect, as well as its acemannan, serve to stimulate the production of collagen and aid in the fight against wrinkles. To achieve visible results, use an Aloe-based cleanser on the face and neck in the morning, freshly prepared with 2 tablespoons of 100% pure Aloe juice in half a quart of warm water. Rinse with this solution thoroughly several times, for about 2 minutes. The sensation remaining after this procedure is one of softer, smoother skin that is more elastic and looks more luminous.

Remember to dry the areas well with a very soft towel, never scratching or rubbing, so that the last bit of moisture on the skin evaporates naturally with the heat of the body. This procedure gives a very pleasing result.

4.8.34 Stretch marks

See *Scars*

4.8.35 Sunburns

As summer months approach, advertising increasingly informs us about the various sunprotection methods and products available to us. The media, including television, radio, newspapers, magazines, and a myriad of experts, advocate the use of protectant creams and lotions for the beach, mountains, hiking, or any sort of outdoor activity. Suntans will have to wait in favor of avoiding the dangers and consequences of UV rays, sunburns, and, even worse, melanomas.

It has been well-demonstrated that there is a close relationship between unprotected exposure to the sun and an increase in melanomas, a form of tumor. Despite the availability of the many sun protectant and soothing products found in pharmacies and beachside shops, people continue to get sunburned. Aloe juice should be found in the first aid kit of any vacationer.

Its use is valid in the treatment of this kind of burn. As has already been stated, in reference to wounds, the enzyme bradykinase in Aloe stops the inflammatory reactions which (in this case) are caused by an over-exposure to the sun's rays and stimulate immune system intervention. Barbaloin and aloetic acid have an antibiotic and antibacterial action. The isobarbaloin, ester of cinnamic acid, and salycilic acid carry out action aimed at easing pain.

Acemannan speeds up the repair phase (the regeneration of skin tissues), intervening in the stimulation of macrophages and the increased production of fibroblasts and collagen. Gently apply Aloe to any sunburned areas. Repeat the procedure several times a day, avoiding exposure to the sun for a few days.

4.8.36 Blisters

Blisters are formations produced from the draining of the outer layers of the skin, which fill with water to protect the part of skin that has been forced into an action uncommon to it.

Externally, it appears as a spherical protrusion of a milky color, which collects water in its inner shell membrane which can be of varying dimensions, from a tiny spot to the size of a hazelnut.

When this thin membrane is broken and the fluid escapes, the remaining tissue underneath remains in a preparative state, and is therefore very weak and prone to bacterial attack. We recommend that the area surrounding the blister be brushed with Aloe gel a few times a day and protected with a band-aid.

4.8.37 Burns or Scalding from heat and radiation

Lesions in dermal and epidermal tissues due to contact with agents of a temperature much higher than the body's are defined as burns or scalds. Scalding is also possible from radiation received by X-rays.

Past a certain level, X-rays produce certain harmful superficial effects which have not yet been determined. Those who work closely with these energies can, instead, have problems of a radioactive type. The consequences, in this case, are evident on the external cutaneous layers. One example of this type was the effect on the workers and inhabitants of Chernobyl, when, in the spring of 1986, a reactor exploded inside the Russian nuclear center.

Several studies in regard to radioactivity have been carried out by American medical teams since the 1930s, when the very first studies in this branch of Nuclear Physics entered medical radiotherapy.

The proteolytic enzymes of Aloe "digest" the waste tissue and accelerate the degenerative tissue phase of the healing process.

The bradykinase enzyme blocks the inflammatory reactions which are a response to an external necrotic attack and which stimulate the immune defenses.

Barbaloin and aloetic acid carry out an antibiotic and antibacterial action.

Isobarbaloin and ester of cinnamic acid and salycilic acid carry out an analgesic action. Acemannan speeds up the repair of tissues, intervening in the stimulation of macrophages and an increase in the production of fibroblasts and collagen. A remedy for both being scalded by heat and accidentally exposed to radioactive sources is the application of Aloe juice and honey.

In conjunction with this topical solution, drink 4 tablespoons of 100% pure Aloe juice. This will ensure pain relief and a rapid reabsorption of burned tissues.

4.9 The visual system

4.9.1 Cataracts

This disease consists of the obfuscation of the crystalline layer of the eye. It mainly occurs in old age. The causes can be found in lifestyle and eating habits which remain unbalanced over long periods of time. In this disease, the optic nerve becomes weak and lax, making vision unclear and obfuscated, and worsening the eyesight as a direct result of the cataract's presence. Aloe is rich in calcium, zinc, vitamin A, and beta-carotene – nutrients which strengthen the optic nerve and its nerve endings through to the eye bulb, creating a condition whereby the individual is regaining eyesight. Used internally, in the quantities of 2 tablespoons (25ml) of 100% pure Aloe juice each day, this remedy is a valid aid in preventing this degenerative disease in anyone over the age of 40.

4.9.2 Keratitis

Keratitis is an inflammation of the cornea, the transparent part of the sclera inside the eye. This pathological state can occur after strong exposure of the eyes to the sun, especially at high altitudes or in solariums. Prodromes, one symptom of keratitis, are strong eye irritations or heavy lacrimation. Another characteristic symptom is extreme sensitivity to light, persisting over time.

Aloe's considerable quantities of beta-carotene, together with its significant doses of zinc and calcium, and its sedative and analgesic properties, make its use in treating this problem understandable. We recommend 4 tablespoons (50ml) of 100% pure Aloe juice per day, diluted in a glass of carrot juice, as it also contains vitamin A. Associate with this eye packs moistened in warm water and Aloe juice. Follow this procedure morning and night, keeping the packs in place with a band for at least 20 minutes.

4.9.3 Conjunctivitis

Conjunctivitis is the inflammation of the conjunctiva, the mucosa of the eye, which connects the inside of the eye to the eyelids and the sclera. The causes of conjunctivitis are linked to prolonged exposure to dust, causing the eyes to become irritated, with the accompanying unpleasant sensation of grittiness, burning, and eyelids stuck shut upon

awakening. Immediate relief can be gained with eye packs of 100% pure Aloe juice, as described by Sebastian Kneipp, the Swiss abbott. In this way, inflammation is reduced and the burning disappears.

See *Keratitis*.

4.9.4 Night blindness (Keratomalacia)

This vision disturbance, characterized by difficulty in adapting vision at night, is caused by a vitamin A deficiency. Low intake or reduced absorption (from the gastro-intestinal tract) of this important nutritive element prevent its complete bio-availability. Another cause of night blindness is lowered concentrations of purpurine, a protein which is highly specific to the management of the visual process. Long-term and extreme vitamin deficiencies can also bring about night vision problems. As with most eye pathologies, 100% pure Aloe juice can be a relieving and restorative eyewash as well as a nutrient-filled vitamin supplement. The most important vitamin in this particular case is vitamin A, but we strongly recommend a consultation with an eye specialist for proper diagnosis.

4.9.5 Glaucoma

This term indicates a disease state of prolonged and great pressure on the internal ocular bulb. Glaucoma attacks bring about strong migraines, accompanied by nausea and vomiting. Migraine sufferers see colors and lights more pronouncedly, while the remainder of external reality appears as if through thick white fog. Aloe juice intervenes on the biological processes, for improved control of inner-ocular pressure, re-establishing normal pressure and health. This is due to the generous amounts of potassium ions, which regulate many electrical biochemical processes, as well as the digestive enzymes that favor proper food breakdown. This helps to eliminate the metabolic overloads which translate into higher arterial pressure, with vital effects. Polyunsaturated fatty acids and phospholipids like inositol are also important for maintaining arterial pressure under control and at the proper levels. We recommend a therapy with 100% pure Aloe juice, 4 tablespoons (50ml) per day for the first three weeks, and then 2 tablespoons (25ml) every day for 2 months. Sodium, coffee, and tobacco are to be exclu-

ded from the daily diet, with increased intake of fruit and vegetables for their vitamin and mineral content, and an emphasis on foods rich in potassium.

4.9.6 Styte (Hordeolum)

When a sebaceous gland becomes obstructed and its waste material remains stagnant and not eliminated for a prolonged period, inflammation occurs. This type of inflammation at the eyelid borders is called a styte. Irritating and painful swelling is quickly produced, due to increased pressure on the ocular bulb. Under these circumstances, the normal visual function of opening and closing the eyelids is obstructed. It is important to act quickly, with a soaked eye pack made of 100% pure Aloe juice, keeping this eye pack in place for 20 minutes and changing it frequently over a one hour time span. This procedure is useful in sedating the pain and discomfort, as well as the inflammation. Following this initial course of therapy, proceed to make eye packs soaked in an Aloe juice and chamomile tea mix. This further helps to stop the inflammation. Continue the treatments at least three times a day, until the problem disappears completely.

4.10 Immune system

4.10.1 Rheumatoid arthritis

As already described in the section entitled Arthritis, the medical term "arthritis" indicates an inflammation of the joints that help to support the body and its movement, as well as its displacement. This disease is due to several factors, often connected to an irregular diet, uncoordinated lifestyle habits, and a deficiency of minerals, especially copper. These factors facilitate the breakdown of muscles, joints, and cartilage.

Rheumatoid arthritis is a major disease. It affects the large joints involved in muscular movement. This inflammation has an erosive character and can bring about serious anatomical and functional damages, as well as strong pain, owed to digestive processes and the absorption of proteins, resulting in deficiencies for the really important organic requirements. The antigen-antibody complexes, part of the immune defense system, remain trapped inside the joints,

creating swelling and pain. This is the reason why fasting has been considered important in these cases, and is intermittently practiced by patients affected by this problem to reduce the devastating effects of arthritic pain.

Aloe use, in these cases, is recommended for a prolonged period of at least several months before there are any significant results. Take 4 tablespoons (50ml) of 100% pure Aloe juice, morning and night before bed, preferably diluted in a glass of water or fruit juice. The juice can also be used topically in moments of strong neuralgia.

4.10.2 Vaginal candidiasis (Thrush)

Aloe gel is miraculous for stopping the irritating itching that is created by the pathogen, *Candida Albicans*, which afflicts many women. Extensive research on the effects of Aloe for this problem has been carried out in Russia, with positive results in all cases, proving its sedative and resolute ability. Topical Aloe gel use is recommended as the primary recourse, though internal use is also important. In addition to topical use, take 2 tablespoons (25ml) of 100% pure Aloe juice three times a day before meals, until resolved.

4.10.3 Herpes

This cutaneous affection has a viral origin and is very widespread throughout the world, especially in conjunction with gastro-intestinal disturbances, febrile states, or menstrual problems. Once the virus makes contact with the body, especially during periods of intense stress that compromise immune function, it can attack easily, making its re-occurrence possible.

Herpes is characterized by the formation of tiny aqueous vesicles grouped together in a cluster formation, that tend to become inflamed and create pus, and can spread to the surrounding area. These herpetic formations tend to become unsightly and itchy and can degenerate into very real infections of the skin. There are different types of herpes. The most known is herpes simplex, located on the borders of lips, narices of the nose, and on the genitals.

The well-known properties of Aloe, including its astringent, antibacterial, anti-inflammatory and immunomodulating properties, produce immediate and excellent results in these cases.

Apply 100% pure Aloe juice to the affected parts a few times a day. To improve the internal health stimulus, take the product as a food in the quantity of 2 tablespoons (25ml) three times a day for two weeks.

4.10.4 Herpes tonsurata

Another common type of herpes is one which is widespread in the male population and concerns the area of skin between the cheeks and the chin where the beard grows. This facial zone, which gives life to the hair bulb, is where the tiny itchy pustules appear, interfering with facial hair growth.

When the vesicles disappear, they leave a residual yellowish crust that can break and infect during shaving, leaving unsightly scars.

At the first appearance of symptoms, rub the area with 100% pure Aloe juice, massaging it in circular motions, a few times a day until complete recovery.

4.10.5 Herpes Zoster

This pathology is widespread in the human population, though not as high in incidence as herpes simplex.

The characteristic which distinguishes this type of herpes from the others is its presence and ability to spread on the body.

Colored striations appear on the body, generally red, along the canals of the nerve branches that are connected to the bone marrow, provoking evident and extreme pain.

We recommend applications of 100% pure Aloe juice with a very light massage on the affected areas two to three times a day, depending on the condition's extent and severity, proceeding for at least a week until the disappearance of the disease.

4.10.6 Post-chemotherapy weakness

The potentially destructive nature of the drugs used in chemical anti-cancer therapy greatly burdens and affects the human body that has to endure this treatment, both physically and emotionally. On a physical level, this potent modern instrument aimed at the tumoral cells creates imbalances

in the immune system.

Aloe juice can be safely used in conjunction with this type of therapy. In fact, as described throughout the course of this book on Aloe, there are many molecules that work together to create this plant's amazing properties and, in this particular case, especially its immunostimulating and immunomodulating effects. The body's defenses are stimulated and are, at the same time, modulated for the full expression of their potential. Acemannan, in particular, stimulates the maximum expression of these properties.

We recommend taking 4 tablespoons (50ml) of 100% pure Aloe juice every day, shortly before main meals, together with fruit juice, preferably freshly-squeezed. Continue this treatment for at least one month.

4.10.7 Psoriasis

Psoriasis is a chronic skin disease characterized by skin desquamation localized mainly on the knees and elbows. Its origins are psychosomatic or due to nutritional imbalances, or a combination of both factors.

Official medicine provides no specific cure for psoriasis. Instead, studies conducted by the illustrious scientist Bill Coats demonstrated that Aloe juice taken daily can help to contain and even heal this type of disease. Recent publications of the European Academy of Dermatology (1995) declared that among Aloe's varied properties, there is one which inhibits the psoric squama, and is therefore able to arrest the proliferation and the tissue differentiation of the epidermis. Treatment ought to include internal as well as external use.

Apply Aloe gel to the affected areas morning and night, remembering to use a moisturizing cream, because Aloe's strong astringent action is also quite drying. In very severe cases, we recommend the use of a moisturizing cream with added Aloe. For internal use, drink 4 tablespoons (50ml) of 100% pure Aloe juice twice a day just before meals.

Continue this treatment for one month. Repeat these procedures during the change of seasons.

4.10.8 X-Rays: burns and weakness

See *Burns or scalding from heat and radiation*.

4.10.9 Allergic reactions

See *Allergies and itching*.

4.10.10 Scleroderma

Aloe juice works amazingly well in yet another skin disease with its origins in immunity: scleroderma. The medical community is not yet clear on the mechanisms that cause this type of affliction. Its symptoms are characterized by a hardening of the tissues, with sclerosis and muscular retraction. We recommend taking 4 tablespoons (50ml) of 100% pure Aloe juice, divided into doses taken at the three main meals of the day.

4.10.11 Multiple Sclerosis

Positive effects have been demonstrated in recent Russian studies on patients affected with this disease, the causes of which are ignored even today. Only hypotheses exist, one being that the triggering factor is merely an elevated level of stress, especially in people predisposed to nervous disorders.

The main symptom distinguishing this degenerative disease of the fascia, central, and peripheral nervous systems, is the hardening and subsequent loss of tissue elasticity, including muscular elasticity. These symptoms underlie the difficulty in movement with the associated paralytic tremor of the hands and eyes, or even severe depression. The B group vitamins, especially B1, and the essential and non-essential amino acids, with healthy doses of phospholipids and anti-inflammatory agents, make Aloe an effective botanical remedy for a blocked muscular metabolism, providing effective improvement for this clinical condition. We suggest taking 2 tablespoons (25ml) of 100% pure Aloe juice three times a day.

**Veterinary uses of Aloe:
pioneer studies and new discoveries**

5. Veterinary uses of Aloe: pioneer studies and new discoveries

Aloe's therapeutic use now has a part in the veterinary repertoire of remedies.

Veterinary studies have attributed a thousand uses to the elegant Aloe plant, which is able to resolve numerous pathologies in humans and has been given its rightful place among the remedies used to treat our friends in the animal kingdom.

More and more breeders and veterinarians are looking to the therapeutic properties of Aloe.

5.1 Horses

Throughout history, horses have been our faithful companions in travels, in battle, and in work.

An enduring symbol of strength and power, horses today are mainly present in sports, from horse riding to trotting races, from polo to horseracing, and to potentially unexplored areas.

The symptomatic problems and pathologies of the horse have modified over time, with greater emphasis on the digestive and neuro-vegetative aspects of this animal.

5.1.1 Nervous system problems in the horse

The horse is an animal that is very sensitive and easily irritated, almost childlike in spirit.

Aloe has been demonstrated to be a useful aid in calming overly impetuous and nervous horses.

The reason for such impressive results is the quality of the minerals contained in Aloe, such as magnesium and zinc, which constitute parts of the principal neurotransmitters, together with the B group vitamins, which improve metabolism and the brain's encephalus.

California breeder and trainer, I. Peal, uses 100ml of Aloe juice in his yearlings' fodder.

According to Mr. Peal, the results are surprising, to say the least.

5.1.2 Cuts, contusions and wounds to the legs.

As in humans, the problems that affect the cutaneous layers of horses are also helped by the use of Aloe, because it contains analgesic, sedative, and regenerative properties. Apply Aloe gel to the affected areas of the hoofs and legs, 4 times a day.

For deep cuts, insert gauze moistened with Aloe gel and bandage the wound for three days. If necessary, repeat the treatment.

5.1.3 Lesions in the hoofs

The hoofs represent the corneal layer of the leg, a horse's nail.

Applying Aloe-based gel to the hoofs is useful in improving the production of the hoof's keratin layer, bringing about faster healing, and allowing the horse renewed ease of mobility. Apply the gel daily, after thorough cleaning, and top with a bandage.

5.1.4 Distortions, strains, and swellings in joints

Aloe has been found to be useful in all pathologies of the osteo-articular system (joints).

The acemannan in Aloe promotes regeneration and lubrication of the joint tissues, which often suffer from prolonged wear and tear.

Apply the affected area with an Aloe-based cream, bandage it, and repeat the procedure daily.

If using bandages on the affected area presents a problem, simply rub the unguent into the affected area until it is completely absorbed.

For the acute inflammation that can occur in competitions and other strenuous situations, another procedure can be employed with equally valid results. Place pure Aloe juice in the freezer and, once frozen, crush the larger pieces into smaller, more manageable pieces.

Apply the frozen Aloe juice to the animal's painful and inflamed area. This procedure is to be repeated four to six times a day. 100% pure Aloe juice may also be used internally to act in conjunction with the topical use. We recommend 2 to 4 ounces of juice, morning and night, depending on the weight of the animal and the severity of the case.

5.1.5 Coughs and throat inflammation

Aloe's immunostimulant and sedative properties make it useful in easing respiratory problems.

For this purpose, we recommend the use of 2 ounces of juice three to four times a day as an anti-inflammatory, antibiotic, and a natural analgesic.

If there is mucus present, or if the inflammation is internal, it may be useful to spray the juice (with a vaporizer) into the congested narices and throat three to four times a day.

5.1.6 Laminitis

This pathology is also known as podophlegmatitis, an inflammation of the keratinous tissue of the foot, with a painful deformation of the hoof.

It is caused by food or medicine intoxication or, alternatively, the ingestion of too much grass, which can provoke muscular weakening in the animal and subsequent limping.

These toxins are not easily eliminated and the horse becomes increasingly weaker over time.

Aloe's intervention on collagen and keratinous material indicate its use in the treatment of this painful equine affliction.

Aloe helps to stimulate the horse's ability to eat food that will help reverse this condition.

In cases of widespread inflammation and severe conditions, Aloe may be administered in 1 quart infusions, two or three times a day, until the horse shows the first signs of re-stabilization and improvement.

5.1.7 Leucopenia (Post-viral fatigue syndrome)

The great English veterinarian, Peter Green, treated many of his horses affected by this pathology.

In this disease, the white blood cell count can drop by up to 80%, severely compromising the horse's health.

Dr. Green's recommendation is to add 7 ounces of Aloe juice to the horse's normal diet for three to four weeks.

5.2 Dogs and Cats

For these two close and faithful friends of man, we propose to provide remedies that are useful and valid for both species.

This is possible because many of the pathologies that occur in dogs also occur in cats, making it possible to use the identical remedies.

For many years now, veterinarians have begun to use natural remedies in the treatment of animal diseases. These remedies do not normally produce side-effects, being less potent than their synthetic counterparts, such as pharmaceutical therapies.

In several veterinary studies, Aloe was found to be a valid tool in treating a variety of pathologies, while at the same time providing a gentler and more versatile approach.

In the following paragraphs, we will address the main problems that afflict our canine and feline friends.

5.2.1 Arthritis

Arthritis is a disease which mainly afflicts older animals. It can be caused by many factors, among which the most pronounced is vitamin and mineral deficiencies, causing a thinning of the cartilage in joints.

Acemannan, the complex chained sugar present in Aloe, restores the production of collagen.

Aloe's minerals help restore the bone and cartilage tissues.

The irritating symptoms of arthritis are greatly relieved by Aloe's natural analgesic properties, through isobarbaloin, cinnamic acid, and salicylic acid, giving cats and dogs a chance to live a relatively pain-free life.

For cats, we recommend 2 tablespoons (25ml) of 100% pure Aloe juice added to meals at lunch and dinner.

For dogs, 4 tablespoons (50ml) of 100% pure Aloe juice to be taken twice a day at mealtime until the symptoms disappear.

It would be useful to continue with half the dose for the several weeks following this treatment.

Aloe-based lotions also provide great relief when topically applied to the painfully affected joints.

5.2.2 Cystitis and urinary infections

To overcome bacterial infections in the genito-urinary system of small animals, the combined actions of acemannan, the saponins, and the salicylic acid contained in 100% pure Aloe juice promote Aloe's immunostimulant, antimycotic, anti-inflammatory, and analgesic actions.

Plenty of water is recommended for this condition. An interesting note is that cats are more frequently affected by these infections than dogs.

For cats, use 4 tablespoons (50ml) of 100% pure Aloe juice twice a day during meals; for dogs, double the dosage. Continue the treatment until resolution. Successively, continue with a half dose, weekly, for the following two weeks.

5.2.3 Ear infections

This type of infection is quite frequent in both dogs and cats. If noticed in time, these infections are easily treated with Aloe juice, topically applied to the cleaned affected ear. The vast range of vitamins and minerals in Aloe, together with its bradykinase enzyme, salicylic acid, and acemannan, are a versatile tool in providing easy and immediate analgesic, antibacterial, immunostimulating, and pain relieving effects.

We recommend the topical application of an Aloe-based cream or Aloe juice, to be spread outside and inside the ear morning and night until the problem disappears.

5.2.4 Hysteria

When faced with dogs that are irascible or hyperactive, Aloe juice can be a reasonable solution.

Its wealth of magnesium and zinc, together with the B group vitamins, provides great nutritional value and helps re-establish the afflicted dog's neurological equilibrium.

The acemannan found in Aloe greatly protects the nerve's linings, present in the entire body, and aids in increasing efficiency in electrical connections of the nervous system. All of this translates into a solution that serves to sedate the agitated animal and create a sense of well-being, so that he/she is quickly pacified.

We recommend adding 5 to 10 tablespoons of 100% pure Aloe juice to the dog's drinking water. The dose depends

on the animal's body weight.

To further promote well-being in highly agitated dogs, it is helpful to administer extracts of chamomile or valerian, and promote a diet excluding canned or packaged foods. These processed products, full of preservatives, additives, and colorings, can be damaging to a body already in a state of neurological weakness.

This state of discomfort usually doesn't affect cats, but, should it be necessary, follow the indications given for dogs, halving the doses.

5.2.5 Fur balls

This discomfort is common to our feline friends, who are always carefully grooming their fur, which gets caught on the tongue and swallowed in great quantities. These hairs eventually amass in the stomach in the form of balls.

Depending on the amount of fur ingested and number of balls in the stomach, symptoms may include vomiting, coughing, and even intestinal blockage. The anthraquinones in Aloe have a laxative action, useful for the elimination of fur balls in a "natural" way – through the feces.

For this laxative effect, 2 tablespoons (25ml) of 100% pure Aloe juice is to be taken with food three times a day. Repeat this for three or four days until normal digestive and excretory functions are restored.

5.2.6 Digestive problems

The innate "wisdom" of the substances contained in Aloe juice help to eliminate digestive problems in both dogs and cats. The consequences of poor digestion can lead to a range of symptoms, from decreased appetite to constipation, and from vomiting to depleted vitality – all of which tend to compromise the animal's state of health.

Aloe contains a vast range of digestive enzymes that help to integrate the body's existing ones, promoting the improved breakdown of ingested foods and, as a result, improved absorption of the nutrients in the intestine.

The various analgesic substances, like salicylic acid and isobarbaloin, help to eliminate abdominal pain.

Anthraquinones promote the elimination of toxins formed by the fermenting processes in the intestine, by increasing

the peristaltic action and ensuring hydrated, solid stools.

For cats, we recommend 4 tablespoons (50ml) of 100% pure Aloe juice, taken in the form of 2 tablespoons in the morning and 2 tablespoons with food for one week.

For dogs, a doubled daily dose is required. Continue this treatment in both cats and dogs for another week, at half the dose for the week following the initial treatment.

5.2.7 Fleas

These parasites infest cats and dogs very frequently and carry diseases, including infectious ones.

The marketplace has many products for fleas, ranging from sprays and lotions to collars and shampoos. Resorting to these products does not always prove effective. Although some of these commercial products contain strong anti-parasitics, the problem often continues to exist. Potent doses of poisons have a powerful effect against these fleas and parasites, but they also cause secondary problems for the animal, particularly problems of the nervous and immune systems, compromising its internal health.

Fortunately for cats and dogs, fleas detest Aloe juice, just as they abhor citrus fruit.

In fact, these two botanical species contain a bitter principle with a pH slightly higher than skin, which repels fleas very rapidly.

Additionally, the analgesic substances in Aloe, like salicylic acid and ester of cinnamic acid, help to relieve itching associated with flea infestation.

We suggest that the animal be washed once a day with a shampoo based on Aloe and jojoba, massaging it well into the fur, together with 100% pure Aloe juice. Support this topical treatment with Aloe taken internally – 2 tablespoons (25ml) for cats, and 4 tablespoons (50ml) for dogs – twice daily. Proceed with this internal treatment for two weeks. If the symptoms persist, we suggest the consultation of a veterinarian.

5.2.8 Scabies

This is a disease, found mainly in dogs, caused by a sand mite which can also invade humans. The infection manifests itself as widespread blotches on the animal's body

which are very itchy, particularly at night. This condition can also cause loss of fur and induce much stress to the animal.

We recommend 100% pure Aloe juice with its bitter principles, anti-parasitic qualities, and a particular pH, to determine the death and disappearance of these infective mites. The use of a shampoo, combined with concentrated Aloe juice taken internally and externally through the topical solution, is the best way to obtain a rapid and efficient solution to the problem.

Wash the dog with an Aloe-based shampoo daily and, after rinsing, massage 100% pure Aloe juice into the skin and fur. Do this twice daily until the problem disappears.

Add 4 tablespoons (50ml) of 100% pure Aloe juice to each of the two main meals.

At the first signs of improvement (made evident by fur re-growth) and the healing of the skin irritations, use the preventive measure of rubbing the Aloe juice on the animal, once a day, for at least one more week and add the dose of 2 tablespoons (25ml) to its 2 main meals of the day.

5.2.9 Seborrhea

This problem affects the scalp of every animal with fur.

If it appears in the form of desquamation and dryness of the epidermis, it is called dry seborrhea. If the epidermis shows high production of a thin greasy film, then it represents wet seborrhea.

The causes are to be found in gastro-intestinal or liver dysfunction, usually as the result of a poor diet that alters the skin's pH and the normal secretions of the hair bulb.

Aloe juice has a pH equal to 6, weakly acid, and very similar to that of skin, which has a pH equal to 5.5. Aloe's pH level helps it to deeply penetrate the scalp, along with its nutrients, to revitalize the hair bulb, strengthening and feeding it for re-growth and renewed function.

The acemannan in Aloe also invigorates the collagen portion in the derma of the epidermis.

The plant hormones stimulate cellular reproduction, thus promoting the re-growth of healthy cells.

The various digestive enzymes carry out a superb role in restoring lost liver function as well as gastro-intestinal efficiency. We recommend that an Aloe-based shampoo be

used once a day for one week.

The skin of the affected area should also be treated with Aloe by adding 4 tablespoons (50ml) of 100% pure Aloe juice to the pet's drinking water or to its two main meals of the day.

5.2.10 Tinea

Cats can easily catch this fungal disease, also known as trichofizia, which is infective and easily transmitted to dogs and children.

It is characterized by hair loss and the appearance of red ring-shaped blotches on the skin, which are itchy and have a tendency to spread throughout the body.

Aloe, in the case of Tinea, provides its chrysophanic acid, cinnamic acid, and barbaloin, for a natural antimycotic and antibiotic action.

The most effective treatment is obtained by combining the shampoo and topical treatment with an internal one.

It is best to isolate the infected animal from children and other animals, to prevent the easy spread of this fungus.

Wash the affected parts of the animal daily with an Aloe-based shampoo, and apply 100% pure Aloe juice to the irritated blotches and surrounding area.

Add Aloe juice to the animal's food twice a day: 2 tablespoons (25ml) for cats and 4 tablespoons (50ml) for dogs. Repeat the treatments until the symptoms disappear, and then administer half the dose for a further four weeks. This should guarantee a complete healing of this problem.

Appendices

A) Multi-botanical preparations

Aloe today has truly found its rightful place as one of the most widely used plants in the world, but it is also just as true that numerous manufacturers and companies are applying themselves to the production of juices made from the precious synergy of combining several varieties of Aloe.

This tendency, which, at first, may seem economically counterproductive, (having more varieties but proportionately less of the Vera juice) demonstrates considerably more advantages in terms of practicality and therapeutic value.

In fact, a pulp composed of a carefully balanced mix of four varieties of Aloe – for example, *arborescens* Miller, *barbadensis* Miller, *chinensis*, and *ferox* – can guarantee a resulting final effect which is decidedly superior to the best pulps produced from only *Aloe barbadensis* Miller. The potential for this formula lies in the combination of the well-known effects of high quality Aloe Vera, with the synergistic blend of specific stimulants coming from each botanical variety chosen which, like a balanced symphony, can lead our body towards the fulfilling attainment of health and well-being.

B) Padre Romano Zago's Aloe, honey, and alcohol recipe

In the 1980's, Padre Romano Zago, a Catholic monk, posted to do parish service in Rio Grande, Brazil, came to discover a folk remedy for cancer. In fact, in the slum area where he lived, a thought crossed his mind – here, one could die of hunger and poverty, but survive cancer! In the many years of work in that city, Padre Zago assisted numerous cures derived from the use of *Aloe barbadensis* Miller, honey and alcohol, and he began in this way to advise in the use of this preparation. As Padre Zago explains in the many interviews he has given around the world, the potential and the success of this particular formula comes from its unique ability to make Aloe's many nutrient, purifying, and curative constituents readily available to the body. The alcohol works as a very light vasodilator which carries the extraor-

dinary nutritive principles of the honey and the Aloe into the most hidden meanderings and “nooks and crannies” throughout the body.

This recipe, ancient as humans of the world themselves, has been made available to the world by Padre Zago’s precise instructions, which foresee the use of Aloe leaves of a five-year-old plant of the *arborescens* variety. It must be harvested and treated in the dark, away from sunlight. The leaves must be cleaned with a light cloth, and the head, tail, and thorny borders removed – the remaining leaf is then sliced. The recipe includes a blend of 350g of the cleaned leaf, together with 40-50ml of grappa or brandy, and 500g of honey. This blend is then kept refrigerated and away from light, and taken in varying doses according to the different pathologies.

C) Aloe and AIDS

The immune system is that remarkable instrument that our body has at its disposal, ready for combating external attacks from pathogenic agents like bacteria and virus.

When, for various reasons, it is lost or partially compromised, we enter into a state of disease. When our delicate psycho-physical equilibrium is placed under stress, or subjected to a bad or unbalanced diet, fast-paced lifestyle, and too little attention is paid to everyday signals given by the body, then we can become prone to infective viruses and bacteria of various kinds. When, or if, all of these possible sources of disease unite, they can result in a hard knock to the immune system.

Solutions to this problem can come from a healthier lifestyle, including healthy balanced dietary habits, physical exercise, daily meditation, and the re-balancing of any nutritional compromises by the intake of vitamins, minerals, and nutrients of various kinds, until the body has the necessary strength to restore its own defenses.

According to recent medical studies, a remedy for increasing compromised immune defenses comes from a group of active principles contained in Aloe juice called “acemannan”. Acemannan is a mucopolysaccharide: that is, a complex sugar that has the extraordinary property of directly acting on the various cells that are in charge of immunological activity in the body.

Acemannan is a molecule that was isolated for the first time at the beginning of the 1980s, by Bill McAnnaly, a researcher at the Carrington Laboratories of Texas, U.S.A. McAnnaly noticed that this type of molecule interacted with the defense (immune) systems in laboratory trials given a daily dose of carriesin, also known as acemannan. The first in-depth study of the effects of mucopolysaccharides on the HIV virus was successfully carried out in Brussels in 1988, by Hermans and Clumeck. These two scientists were the first to discover acemannan’s remarkable properties as an antiviral and immunomodulator, which refers to its ability to regulate the body’s immune defenses according to the actual needs of the body.

The two researchers found matching results for the increased activity of macrophages, T lymphocytes, and the beta cells of the pancreas. Another finding, according to the studies they carried out, was that acemannan also limited the damage caused by the use of anti-retrovirus drugs like AZT. Even the very delicate spine marrow, which is easily damaged, sometimes irreparably, by potent drugs like AZT, benefited from acemannan’s anti-viral and organ-protecting actions. All the patients treated exhibited improvement in their clinical condition – so much so, that some of the patients were able to return to work. In the last ten years, several immunologists have carried out further scientific research on carriesin, and all of them have been amazed at the results.

Successive studies by McDaniel, a pathologist, confirmed the potent anti-inflammatory activity of acemannan on patients affected by AIDS, with the added bonus of not producing any of the side effects which normally occur with drug therapy. Other sources come from studies conducted on terminal patients of Acquired Immune Deficiency Syndrome by the well-known immunologist Dr. John Pittman, who obtained such satisfactory results with acemannan that he became a firm supporter, unequaled in the history of clinical proof on Aloe. Acemannan has the ability to increase the blood’s purifying actions and thus give the body a greater capacity to combat diseases and rediscover its way to healing. Many scientific researchers continue to doubt the therapeutic value of acemannan, and it is for this reason that they limit their work to mere experiments. Fortunately, an increasing number of doctors are combining allopathic

medicine with nutrition and targeted supplementation.

Dr. Joan Priestly, as an example of this new approach to therapies, uses the traditional drug therapies with her patients affected by AIDS and HIV, as well as using the synergy produced by nutritional integration with different nutrients, including Aloe, together with a psychosomatic evaluation of the disease. In this way, the patient is given the opportunity to consciously expand to a new and broader concept of health. The ensuing results are inexorably more immediate and stable long-term, owed to the newfound ability of the unconfined mind to experience its infinite powers.

D) Aloe and Cancer

In Oriental medical science, the use of Aloe for the prevention and cure of cancer is currently in its early stages because the experiments that have been carried out so far have involved only animals and laboratory trials.

We should point out here that the medical protocols on the evaluation of a drug or an active principle are very long and elaborate. Several years are needed in order to progress from the verification stage, through in vitro and animal trials, to the stage where trials are carried out on people. Only after having achieved and overcome these two phases can the world's government health agencies grant pharmaceutical companies the authority to produce drugs and preparations aimed at treating the disease that is studied here.

Within the realm of research protocols, ethnopharmacology is still in its earliest stage. The data obtained so far, and presently available to us, is very encouraging. In fact, it clearly demonstrates the inhibition of cancerous masses present in animals when subjected to Aloe therapy. Evaluations of cellular behavior, in vitro, have also given the same results. Experiments foreseeing the use of Aloe are being carried out throughout the world today. Yet, it is interesting to note that, in Russia, at the early part of the last century, people with cancer were being cured with subcutaneous injections of Aloe extract. This therapy also placed great importance on diet during convalescence, which had to be rich in fresh foods, like fruit and vegetables, particularly cherries, black currants, and beets. All of these measures were very important for detoxifying the body and rendering it more responsive to fighting pathogens. Ongoing experiments begun in

Japan in the late seventies, studying the use of a vaccine against cancer known as Maruyama, indicate, among other things, the use of dry extract of Aloe. Results are showing very satisfactory results in containing various types of tumors and, in less severe cases, some encouraging results in actually curing this deadly disease. But, outside the rigid scientific protocols, there are numerous quantities of data and testimonies relative to this plant. We are referring to the hundreds and thousands of testimonies which have reached the convent in Jerusalem where Padre Romano Zago, inventor of the famous formula that carries his name, is serving his current parish. He foresees the use of a particular mixture composed of a juice blend of Aloe leaves with honey and grappa or brandy. This potion is portentous in carrying out a real change in cellular activity and re-establishing lost immunological function. In several interviews granted to journalists throughout the world, Padre Romano Zago still seems amazed whenever he is informed of first improvements in a patient. He is, on a deeper level, acting as an instrument, simply sharing a recipe for healing that originates in ancient traditional Brazilian folklore. Still other results come from Great Britain, specifically from London. A middle-aged man, Mr. Mistry, was diagnosed with a lung tumor and given only six months to live. The only solution offered was surgery, offering a 50% chance of success. Feeling that he had no recourse to alternatives, he thought to get in touch with an old acquaintance, J. Winter, who had been cured of his brain cancer with only the use of Aloe. This was how Mistry began to religiously take daily doses of the potent Aloe juice sent to him from the United States. After one year, the tumor began to regress and the clinical condition began to show an improvement. From these brief summaries of experiences, we can see that the use of Aloe is becoming more widespread. The fact that a growing number of people are becoming aware of the true benefits that this plant has to offer is of extreme importance, despite the fact that there is still a waiting period for the necessary permits to release it for its medically accepted targeted use.

Bibliography

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1. Lawless J., Allan J.: "Aloe Vera. The therapeutic properties of a versatile and efficient plant" *Techniche Nuove*. London, England. 2000.
2. Beringer A.: "AloeVera, belli e sani in modo naturale con l'estratto puro di aloe vera" Macro Edizioni. Monaco, 1997.
3. Romiti R.: "Aloe: la ricetta brasiliana detta "di Padre Romano Zago" Blu International Studio (BIS). Turin, Italy, 1999.
4. Padre Zago R. O.F.M.: "Di cancro si può guarire" ADLE Edizioni. Padova, Italy. 1998.
5. Pedretti M.: "Chimica e farmacologia delle piante medicinali" Studio Edizioni. Milan, Italy.
6. Il nuovo Zingarelli: "Dictionary of the Italian language" XII edition, Zanichelli
7. Richterich R.: "Chimica clinica – teoria e pratica" Bulzoni Editore. Rome, Italy. 1968.
8. Guareschi I.: "Chimica" VI, 2, p. 623-624. Turin, Italy. 1922.
9. Fiore G.: "L'aloe immunostimolante naturale. Natura e benessere" March – May, 2001.
10. Gentile, Cignetti.: "Fitofarmaci" Piccin. Padua, Italy. 1987.
11. Monti L.: "16 monographie di piante medicinali eccellenti" Studio edizioni. Siena, Italy. 2000.
12. Kneipp S.: "La cura Kneipp" La casa verde. Verona, Italy. 1996.
13. AA.VV.: "Corso di erboristeria applicata" Bottega Verde. Siena, Italy.
14. Kousmine C.: "Salvate il vostro corpo!" *Techniche Nuove*. Milano, Italy, 1992, 1998.
15. Cooper K.: "Il potere curativo degli integratori alimentari" Red edizioni. Como, Italy, 1999.
16. Silvani F.: "Ayurveda - Scienza della vita" I nuovi delfini Gruppo futura. 1998.
17. Sannia A.: "Fitoterapia moderna" Vol.I. *Techniche Nuove*. Milan, Italy. 1998.
18. AA.VV.: *Guide pratiche per l'automedicazione responsabile* Bayer.
19. Picciola G.: "Introduzione alla chimica organica" Hoepli Editore. Milano, Italy. 1987.
20. Valitutti G.: "Chimica organica" Edizioni Atlas. Bergamo, Italy. 1984.
21. AA.VV.: "Curarsi con i cibi" BIT. Rimini, Italy. 1998.
22. Murray M.: "Il potere curativo dei cibi" Red edizioni. Como, Italy. 1996.
23. Boninfante A., Mascolo N., Mucci E.: "Prontuario di fitoterapia" Studio Edizioni. Italy. 1997.
24. Hendler S.: "Enciclopedia delle vitamine e dei minerali" *Techniche Nuove*. Milano, Italy. 1994.
25. Cappelletti C. & F.: "Dalle erbe la salute" Publilux. Trento, Italy. 1992.
26. Treben M.: "La salute dalla Farmacia del Signore" Ennsthaler. Athesia. Bolzano, 1987.

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Plant steroids**Enzymes***Amylases**Bradykinases**Carboxypeptase**Catalases**Cellulase**Creatine phosphokinase**Phosphatases**Lipases**Proteases**Transaminases**SGOT/SGPT***Lignins****Saponins****Amino Acids***Essential amino acids*

Phenylalanine Phe

Isoleucine Ile

Leucine Leu

Lysine Lys

Methionine Met

Threonine Thr

Valine Val

*Non-essential amino acids**Aspartic acid Asp**Glutamic acid Glu**Alanine Ala**L-Arginine Arg**Glycine Gly**Glutamine Gln**Hydroxyproline Hyp**Histidine His**Proline Pro**Serine Ser**Semi-essential amino acids**Cysteine Cys**Tyrosine Tyr***Vegetable hormones**

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