Bio-chemical researches concerning *Aloe arborescens* and *Aloe barbadensis* (A. vera) plants, cultivated with organic protocols from Azienda Agricola G. Dester.

These researches developed in the last years in a collaboration between Dester Gardens and several national and international research institutions.
Our most relevant partners are:
Università Cattolica del Sacro Cuore of Piacenza (Agricultural and Enviroinmental Chemistry Institute), Mendel University of Brno (Czech Republic) and Agricultural Technic Institute G. Pastori of Brescia).

Aloe plants belong to the ***Aloe*** genere which comprehends over 160 different species, some not yet identifyed.

The two species we know and use the most for their beneficial healing properties are

Aloe barbadensis and Aloe arborescens

Aloe barbadensis

Aloe arborescens

Aloe barbadensis and *Aloe arborescens* leaves contain many bioactive molecules, beneficial both for humans and animals.

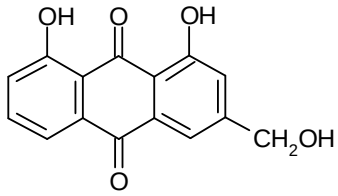
1. Several antioxidants concentrated in the leaf's surface
2. Polysaccharides found mostly in the gel inside the leaf

In addiction, a high presence of **mineral salts** and **essential amino acids** has been proved.

The most relevant **antioxidants** present in Aloe plants are **aloin** and some other less known molecules (alosone, aloesina, aloeresina ed aloenina), all with similar effects:

- ANTIOXIDANTS

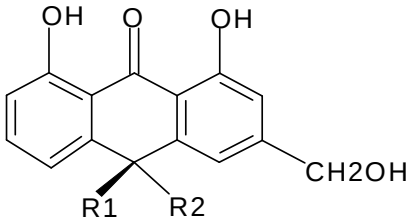
preventing free radicals formation, slowing agening, countering the development of degenerative diseases and other kinds of mutations.

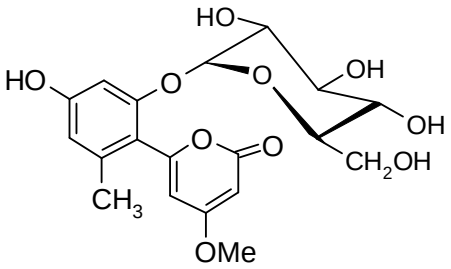


- ANTIBIOTIC AND ANTIVIRAL

Countering the growth of pathogenic microorganisms.

- DETOXIFYING

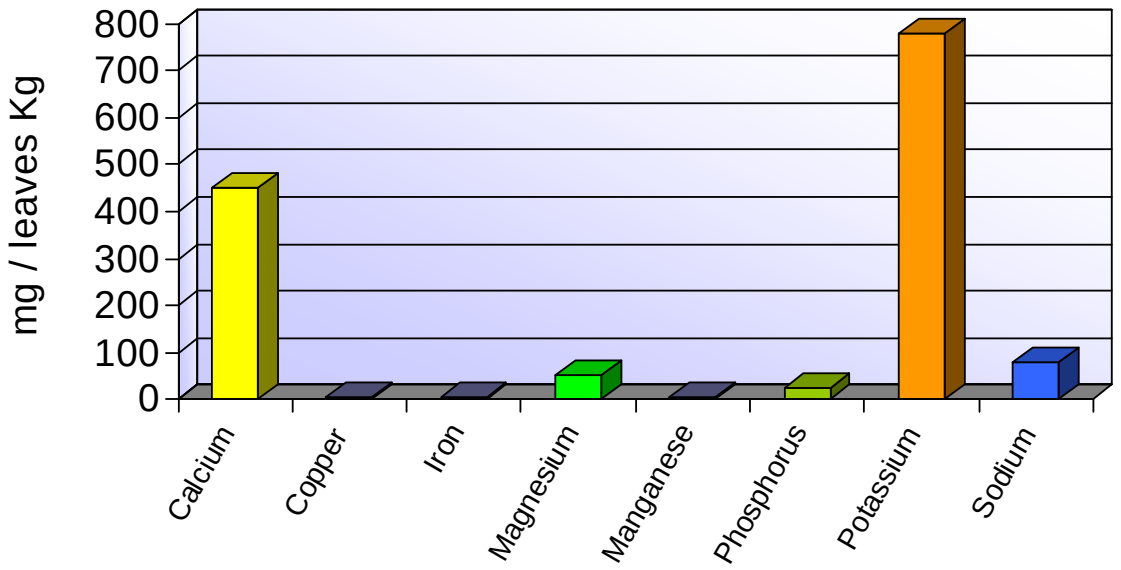




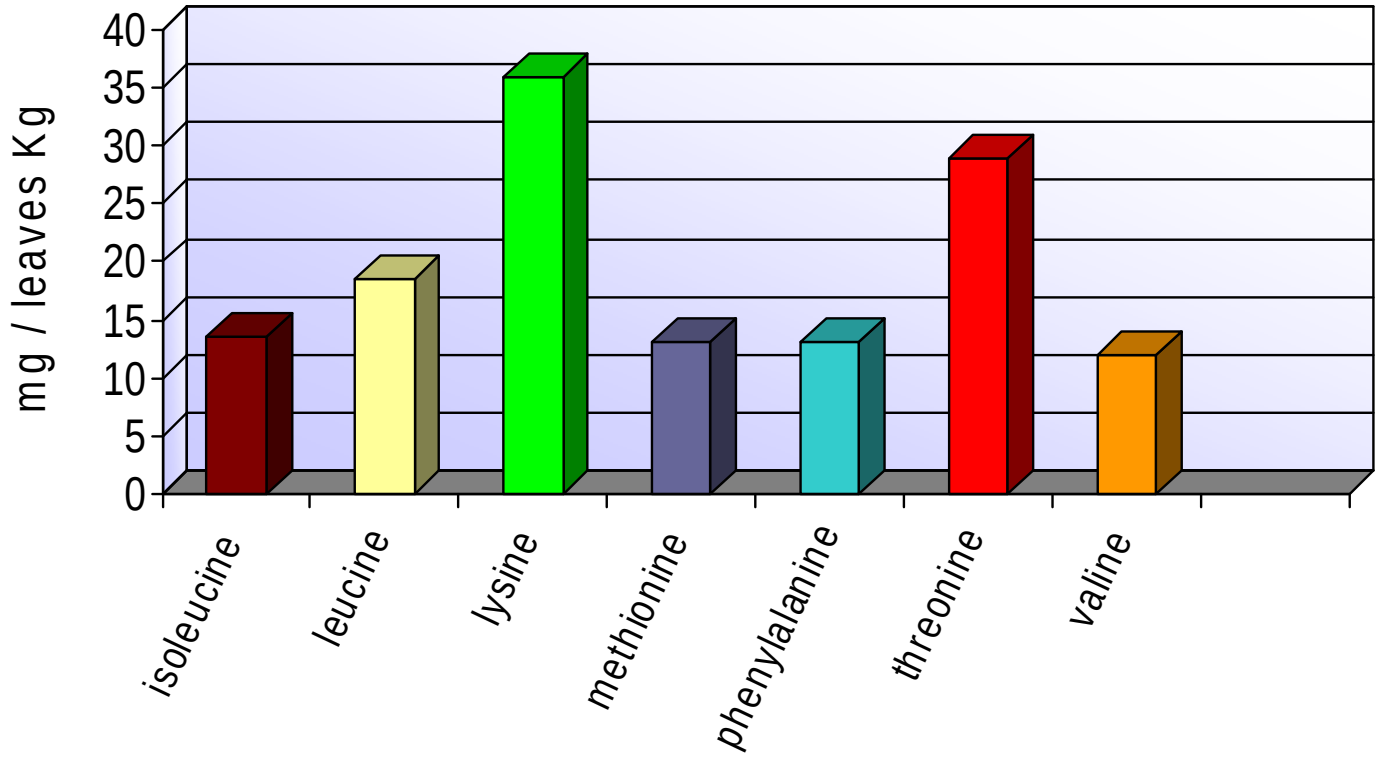
Also **polysaccharides** known as aloe-mannans have several beneficial properties:

- ANTIOXIDANT
- ANTIBIOTIC
- PREBIOTIC (improves the growth of beneficial bacteria)
- CICATRICIAL (improves injured tissues regeneration)
- IMMUNOSTIMULANT (enhances immune defences)
- ANTINFLAMMATORY
- ANTIDIABETIC

Calcium and **Potassium** are the highly present mineral salts in *Aloe barbadensis* plants.

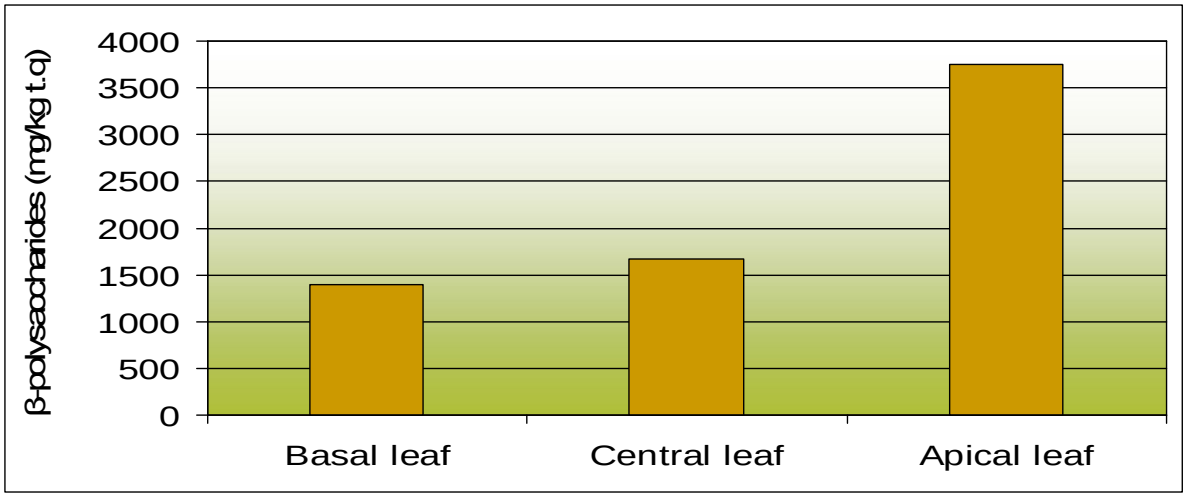


Aloe plants also have high levels of **essential amino acids** (which humans and animals cannot auto-produce and must take by eating)



Content in bioactive molecules (aloin and polysaccharides) in Aloe plants considering different species and ages.

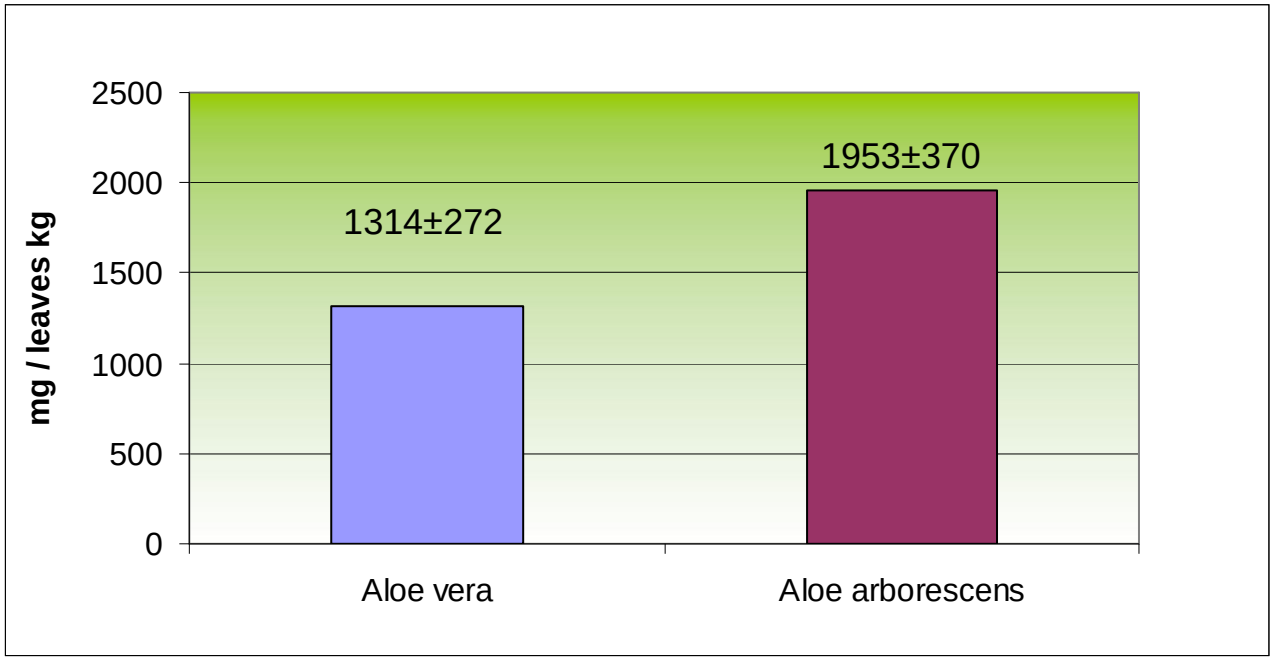
- Younger leaves (3 years) show higher content of aloin and polysaccharides than the older ones.



- The side branches of *Aloe arborescens* have more aloin than the main one.

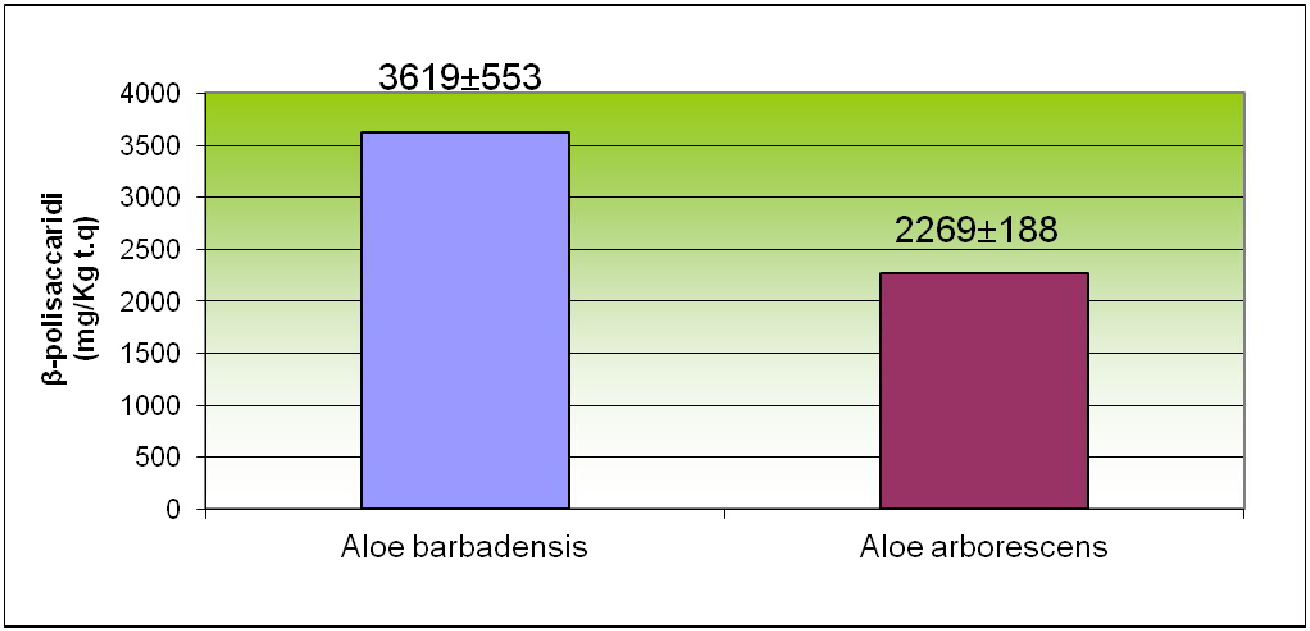
Aloe plants can be used for alimentary/therapeutic purposes from the **third year** of life.

- *Aloe arborescens plants have more* aloin than *Aloe barbadensis ones.*



Aloe arborescens *species is more suitable for Aloe-based alimentary integrators production.*

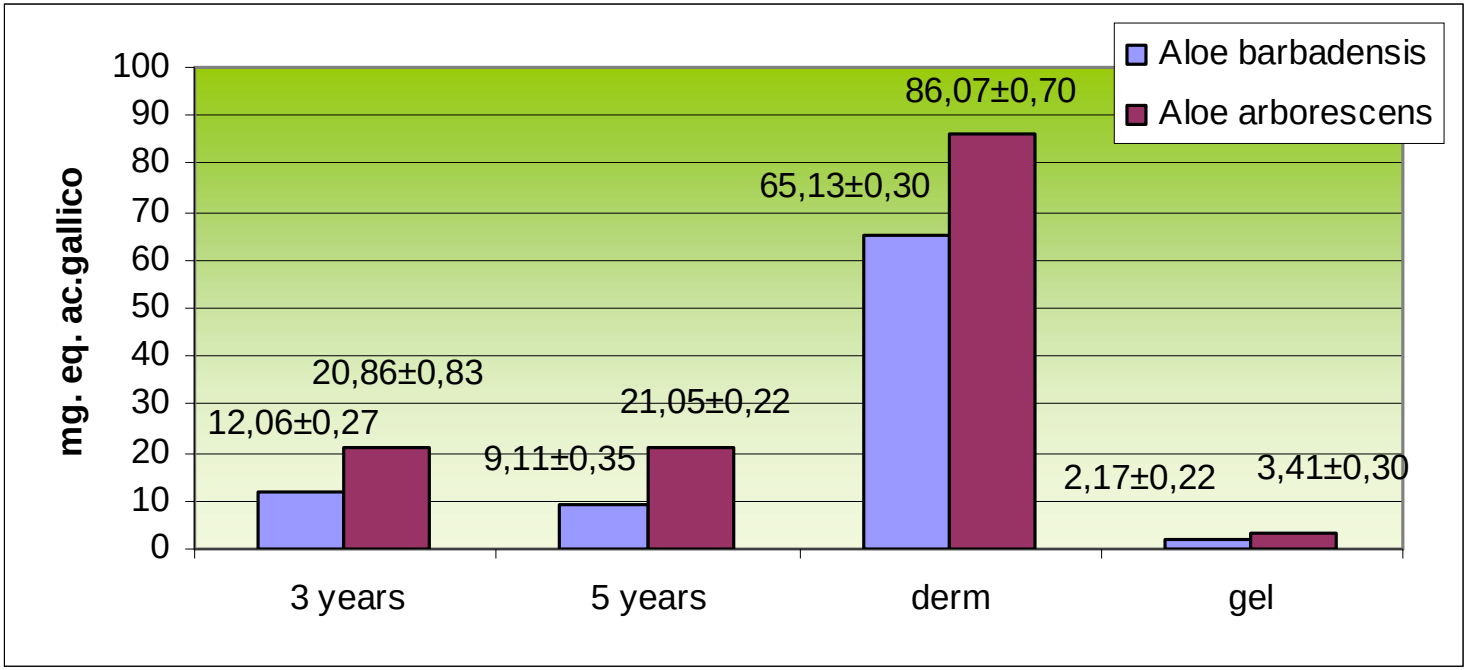
- *Aloe barbadensis plants have more* polysaccharides than *Aloe arborescens ones.*



Aloe barbadensis *species is more suitable for Aloe gel-based cosmetics production.*

Researches concerning the anti-radical activity of Aloe plants

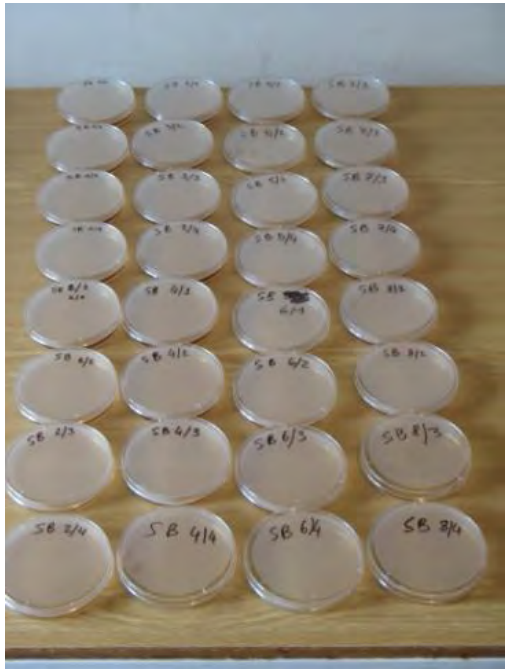
Antioxidants are situated in the leaves surface (external peel) and are abundant in *Aloe arborescens* species



<u>Whole Aloe leaf juices</u> show intermediate antioxidant properties values, compared to pore gel and pore derm juices.

Researches concerning antibiotic activity of different Aloe leaf juices

(from Mendel University of Brno researches)



Different Aloe extracts have been tested for some pathogenic microorganisms presence (*Escherichia coli, Bacillus cereus, Bacillus licheniformis*).
The antibiotic properties of the Aloe juice have been confirmed, showing extremely low growth rates of microorganisms.

Researches concerning prebiotic activity of different Aloe leaf juices

(from Mendel University of Brno researches)

Different Aloe extracts have been tested upon probiotic lactic bacteria (*Lactobacillus delbrueckii and L. acidophilus*) showing the positive PREBIOTIC effect of whole leaves Aloe juice on their growth rate.

Researches concerning some commercial, Aloe-based products stability

Colour and biomolecular stability of several commercial Aloe-based products have been tested.

The researches showed evidence of the fast degradation of active properties in long-term conservation products.

On the contrary, fresh products like Dester Aloe juice produced following Father Zago’s recipe, showed high resistance to the deterioration of the active molecules.

Use of Aloe-based juices as natural anti-inflammatories to prevent milk cow’s diseases.

Project funded from: Ministry of Agriculture and Forestry
Organic Farming Office (Rome)
Institute of Animal-Plant Chemistry Faculty of Agriculture (Piacenza)

Whole leaf Aloe juices of at least 3 years old Aloe arborescens plants, produced from Dester Gardens, were given to milk cows to estimate the antiinflammatory effects and reduce antibiotics somministration.

Aloe-treated cows showed:

1. Absence of health-related and production-related issues.
2. Enhancement in milk production.

There was also evidence of how calves fed with milk from the Aloe-treated cows, had a higher growth rate and general improved well-being.


CONCLUSIONS

The researchers involved in these studies agree by saying how the several therapeutic and pharmacological effects of Aloe

purifying-detoxifying

nourishing

cicatricial

antiradical

antiviral-antibiotic-antihistaminic-prebiotic

anti inflammatory - painkiller

Immune stimulant

Are based upon the SINERGY between the different bioactive molecules and nourishing components concentrated in Aloe leaves.

For further scientific information about this subject, please consult the PhD thesis of

dr. Agronomist Marco Pellizzoni,

Researcher of the Agricultural and Environmental Chemistry Faculty of the Università Cattolica del Sacro Cuore, Piacenza