

OPUNTIA FICUS-INDICA

Process Values



THE INTEGRITY OF THE PHYTOCOMPLEX



In the dietary supplement market, dehydrated *Opuntia ficus-indica* is widely used for weight management, metabolic support and gastrointestinal well-being.

However, the systemic effectiveness of these products is closely linked to the dehydration technique. Our “Low-Temp” process at 45° does more than dehydrate the cladode: it preserves the integrity of the native phytocomplex in all its parts.

Comparable products on the market use destructive methods that, for processing reasons, exclude many parts of the plant, making the phytocomplex incomplete and therefore only partially effective.

In other cases, poor management of dehydration time and temperature results in a degraded product and consequently reduced effectiveness.

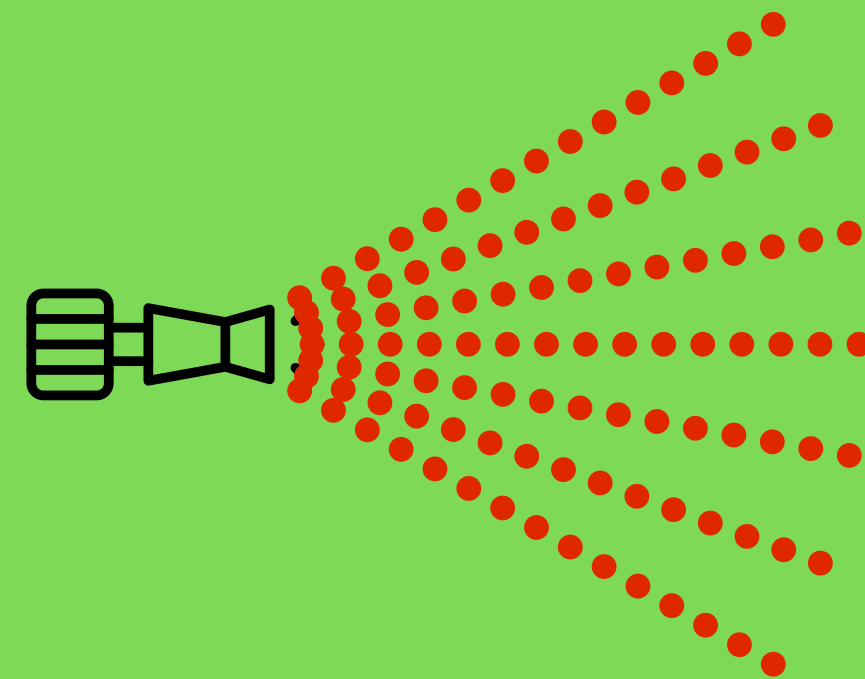
Our technology uses a proprietary process designed around the plant’s physiology, yielding a fully intact, biologically active nutritional ingredient and maximizing absorption and clinical effectiveness.

DEHYDRATED OPUNTIA IN CONVENTIONAL PRODUCTION PROCESSES

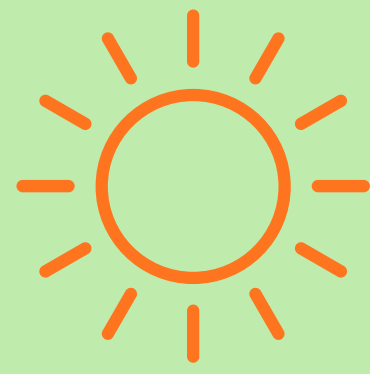
Conventional processes mainly follow two routes:



Sun-drying



Spray-drying



SUN-DRYING

Open-air drying processes, known as sun-drying or passive solar drying, are the oldest, cheapest and most rudimentary methods, and the least effective at preserving quality because of:

1. Photochemical degradation (UV damage)

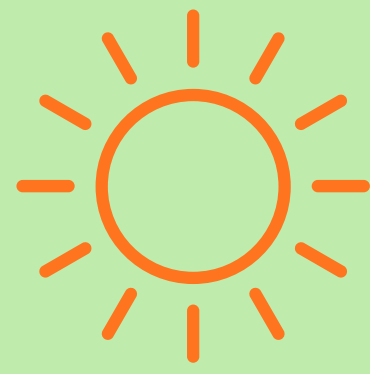
Direct exposure to sunlight is damaging to delicate phytocomplexes. UV rays rapidly destroy Vitamin C, flavonoids and betalains (the antioxidant pigments in Opuntia). A cladode dried in the sun loses almost all of its antioxidant potential, becoming little more than “inert fibre.”

2. Microbiological risk and fermentation

Fresh cladodes are made up of approximately 90–92% water and are rich in sugars (mucilages). Open-air drying is a very slow process that can take weeks or months. During this prolonged period, high humidity combined with ambient heat creates ideal conditions for mould, yeast and bacterial growth, triggering fermentation before the plant has fully dried.

3. Oxidation and browning (enzymatic browning)

Without any control over atmospheric conditions, prolonged contact with oxygen and the action of natural enzymes such as polyphenol oxidase cause severe browning. The dehydrated product loses its vivid, healthy green colour, taking on a brownish-grey colour and an unpleasant smell—visible signs of degradation.

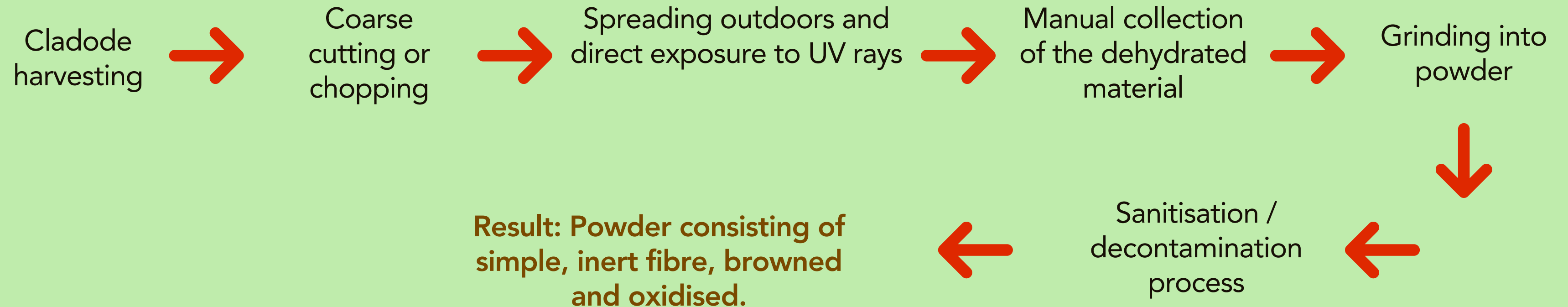


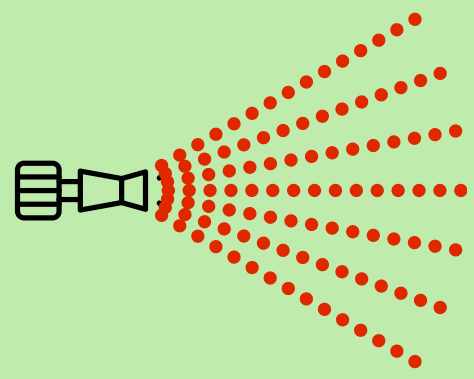
SUN-DRYING

4. Environmental contamination (lack of GMP standards)

Open-air drying exposes the product to fine dust, pollution, insects, larvae, and the droppings of birds and insects. This makes it absolutely impossible to guarantee the hygiene and health standards (HACCP and GMP) required by pharmaceutical/nutraceutical companies when purchasing raw materials.

Typical sun-drying process





SPRAY-DRYING

Spray drying (atomisation) is the most widely used industrial method for turning liquids into powder. However, when applied to complex botanical matrices rich in sugars and mucilages, such as Opuntia, it proves highly destructive because it involves several processing stages.

Initial cooking/blanching:

Used to soften the fibres and stop enzymatic oxidation, this stage subjects the plant to its first severe thermal shock, already beginning to denature the mucilages and degrade Vitamin C.

Aggressive chopping and blending:

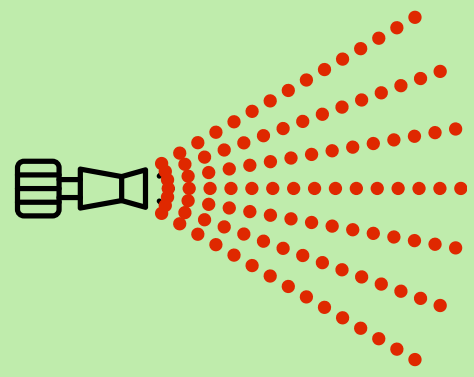
The plant is blended whole. This violent mechanical stress (high shear) breaks the molecular bonds of the gel.

Centrifugation and intensive filtration:

To prevent the fibres or the gel's natural viscosity from clogging the spray dryer nozzles, the blend must be ultrafiltered. At this stage, much of the solid phytocomplex is discarded and the gel's three-dimensional structure is broken down, turning it into a simple, inert sugary "broth" without its original protective function.

Pumping to the nozzles:

The liquid is forced at very high pressure through a microscopic nozzle. This mechanical force, combined with heat, physically destroys the gel's three-dimensional architecture.

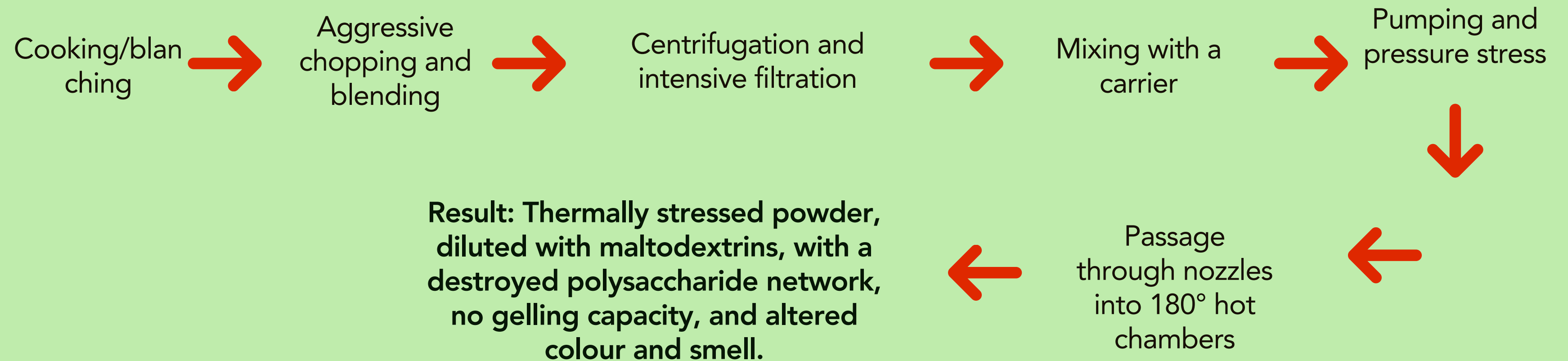


SPRAY-DRYING

The need to use "carriers" (loss of purity)

Opuntia is rich in natural sugars. If spray-dried in its pure form in a 180°C chamber, it melts and sticks to the walls of the equipment (the "glass effect"). To prevent this, manufacturers are forced to add large quantities of supporting excipients, known as carriers, such as maltodextrins. The final product is never 100% pure.

Typical spray-drying process



DEHYDRATED OPUNTIA IN OPUNTIA ITALIA'S PROPRIETARY PROCESSES

The dehydration processes developed by Opuntia Italia stem from observing the plant's physiological mechanisms. They use a biomimetic approach intended to work with—and naturally overcome—the defence mechanisms of a plant that is extremely reluctant to release the water inside it.

Opuntia can “heal” the cut, exposed surface, immediately stopping evaporation. This defence mechanism, developed over centuries of evolution, makes low-temperature dehydration almost impossible for a plant that contains 92% water.



“Our dehydrated product is the perfect bridge between the effectiveness of the fresh plant and the supplement industry's need for a highly effective product that maximizes the value of its formulations.”



All the machinery used in the dehydration process is entirely designed and built in-house at Opuntia Italia.



Using a biomimetic approach, the machinery prepares and guides the plant through a natural, stress-free dehydration process in just 24 hours at a temperature of 45°C.



Our dehydration process does not exclude any part of the plant. The product is completely whole. We are the only company in the world to offer the whole-cube format, demonstrating the integrity of the dehydrated product.



100% Opuntia, intact phytocomplex and maximum clinical effectiveness

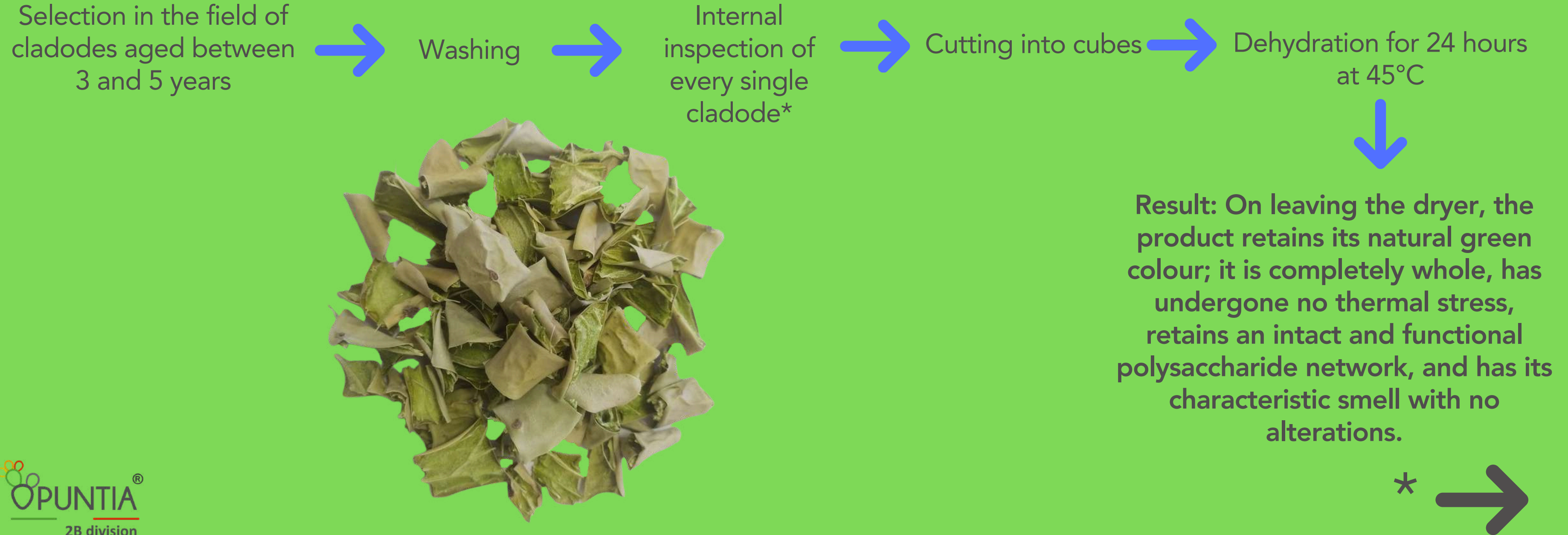


No excipients, zero foreign chemicals

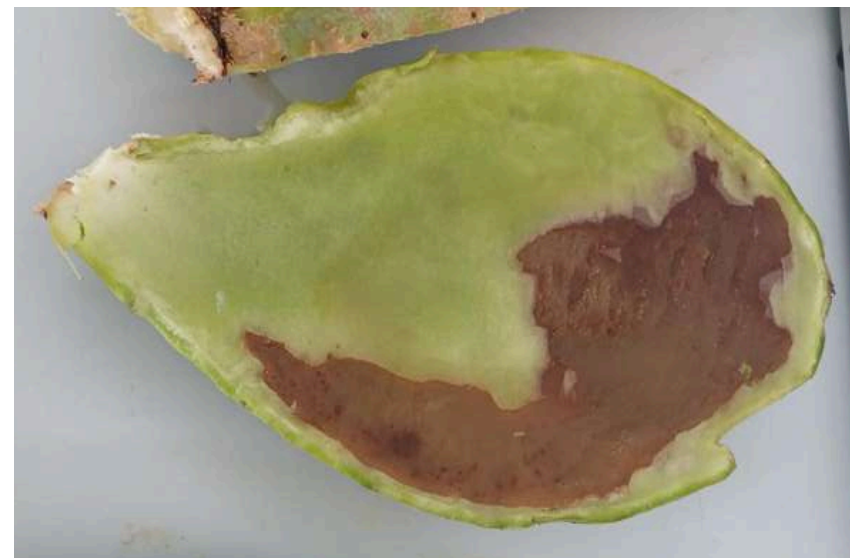


The dehydration process takes place in the dark inside the dryers.
ZERO photo-oxidation: the colour remains the cladode's natural green.

Typical OPUNTIA ITALIA process



*Each cladode is individually checked by hand to verify that there is no internal rot. Cladodes can be affected by environmental stress, causing micro-lesions that allow bacteria such as *Pseudomonas* and *Erwinia* to enter. These bacteria produce enzymes capable of degrading the internal cell wall, creating rot that can compromise the purity of the dehydrated product.



Photos of cladodes that are perfectly intact on the outside but rotten inside.

FORMATS AND CUTS OF DEHYDRATED OPUNTIA



**WHOLE
CUBE**



TEA CUT



POWDER

Only in the San Cono district, a few kilometres from our facility, there are more than 2,500 hectares of prickly pear orchards.

This means that raw materials are available in virtually unlimited quantities.



Image of the cladode inspection stage

SYSTEMIC BENEFITS OF OPUNTIA GEL AND THE ADVANTAGE OF AN INTACT STRUCTURE

The nutritional value of Opuntia lies mainly in its mucilages (soluble fibres) and its pool of antioxidants. Aggressive extraction processes break the polysaccharide chains and deactivate heat-sensitive molecules. Our physiological method ensures three fundamental therapeutic actions:



1. Gastrointestinal protection and prebiotic effect: Cold-extracted mucilages retain their high molecular weight. Once ingested, they form a viscous gel that adheres to and soothes the gastric mucosa (anti-ulcer and anti-reflux action). Destructive processes break down these fibres, eliminating their ability to form a protective gel.
2. Metabolic modulation (blood glucose and lipids): The intact network of our gel physically slows the absorption of sugars and fats in the intestine, helping to modulate blood-glucose spikes and cholesterol. An extract whose fibres have been denatured by heat or aggressive chopping loses almost all of this trapping capacity.
3. Maximum antioxidant bioavailability: Opuntia is a valuable source of compounds that are highly sensitive to heat and oxidation. Cold extraction protects these compounds, ensuring systemic anti-inflammatory action and helping counter oxidative stress—benefits that common extracts processed using high temperatures or centrifugation cannot provide.

MAIN CHALLENGES IN EXTRACTING GEL FROM THE PRICKLY PEAR CLADODE

Unlike the more widely used Aloe plant, whose gel is immediately accessible inside the leaf, the situation in Opuntia is considerably more complex.

Inside the cladode, the gel is enclosed in tiny cellulose sacs that form a honeycomb-like structure.

This cellulose structure makes gel extraction extremely difficult when the main objective is to preserve the three-dimensionality of the molecular structure.

If the cladode were chopped to break open the cellulose sacs, the released gel would mix with the fibres, cuticle and cellulose, forming a green amalgam. Any attempt to separate these components would damage the gel and its viscoelastic properties.

Opuntia Italia's processes use biomimetic methods to separate the gel gently at an early stage, greatly reducing its mixing with the rest of the cladode.

This process preserves the three-dimensionality of the molecular structure and, consequently, its clinical effectiveness.





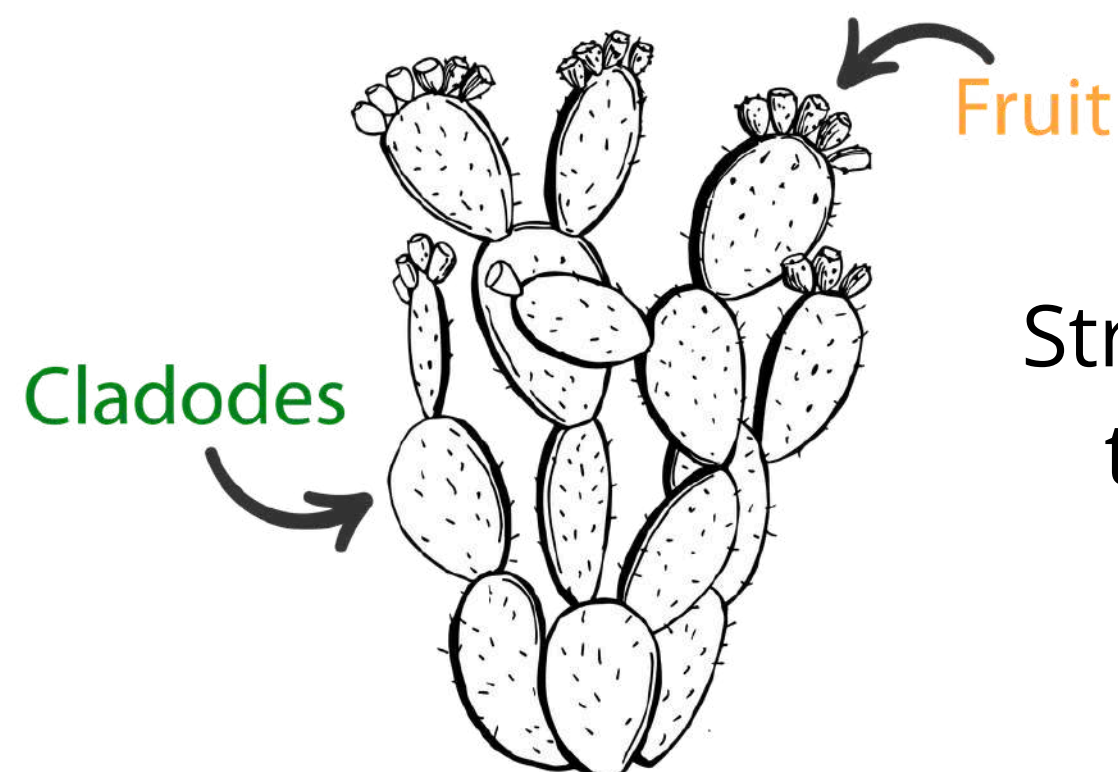
All raw materials are selected exclusively from certified organic farms.



All products derived from prickly pear cladodes contain no heavy metals.



Freshly extracted
Opuntia gel



Structure and parts of
the *Opuntia ficus-*
indica plant



YOUR
Sicily

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Production facility: C/da Piano Bugiades - Licata AG

Cultivation areas: San Cono - Sicily - Italy

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