

# GATULINE® RC



SOURCE OF YOUTH

With the fight against age, the primary quest is one of renewed youth.

Gattefossé looked at the very first days of the plant, seeking, in the heart of beech tree buds, a unique active.

Shedding light upon the natural potential of these buds, Gattefossé presents a pearl of youth,

# GATULINE<sup>®</sup> RC

**Anti-aging, Anti-wrinkle, Active**

**Gatuline<sup>®</sup> RC**, as a recognized trademark, was designed for use in cosmetic and dermatological products formulated to minimize the appearance of wrinkles and aging, and to give the skin a healthier look.

The Beech bud revealed all its abilities through the medical science of gemmotherapy. A particular environment-friendly harvest and a patented extraction technology made it possible to obtain this **unique active**.

The development of this product highlighted a targeted activity of **Gatuline<sup>®</sup> RC** at the epidermis level:

- Increase of the oxygen uptake and protein synthesis of keratinocytes
- Improvement of cutaneous moisturization
- Significant reduction of skin microrelief.

**Gatuline<sup>®</sup> RC** is a key natural active and an effective holistic response to cutaneous aging.

The latest active derived from Gattefossé's research, **Gatuline<sup>®</sup> RC BIO**, is a new reference with the same technology as **Gatuline<sup>®</sup> RC** and with organic certification.



## THE BEECH TREE...

This majestic variety of leafy tree, with a remarkably upright and smooth trunk, is able to reach a height of approximately 130 feet. The **Beech tree** (*Fagus sylvatica* L.) personifies the natural balance between power and grace. This tree matures after 60 years, and often lives to be 200-250 years old, which is the reason it is often called “**the ever-lasting youth tree**”.

## THE BEECH TREE BUD

“**Gemmotherapy**” is a medical science that originated in the sixties, and **Gatuline® RC** translates this therapy to cosmetics.

“Gemmotherapy” is derived from the latin word *gemma* (meaning bud, pearl) and is based on taking advantage of the **high potential actives hidden in the buds**. These are the embryos of plant life, and **contain highly energetic actives**: numerous hormones, flavonoids and peptides, such as phytostimulines, which stimulate cellular metabolism and results in the transformation from dormant stage to bloom.

## SYMBIOSIS WITH THE ENVIRONMENT

The buds are gathered in a wild, semi-mountainous region, far from urban and industrial areas (pollution), and also far from cultured gardens, fruit and grain areas (pesticides, weed killers).

Harvesting occurs at a precise stage of the development of the tree during a very short period, one or two weeks, when the tissues are particularly rich in phytostimulines. The buds are gathered from the lower branches, in order not to interfere with tree growth: **the natural balance** is thus **fully respected**.

A network of farmers has been specially trained to ensure a **fast qualitative harvest** with a botanist on hand to observe them. Adherence to these precautionary measures helps to ensure the supply and quality of the raw material.

Both **Gatuline® RC** and **RC BIO** result from an identical technology of extraction, patented by Gattefossé.

# EXTRACTION TECHNOLOGY: A UNIQUE EXTRACTION PROCESS

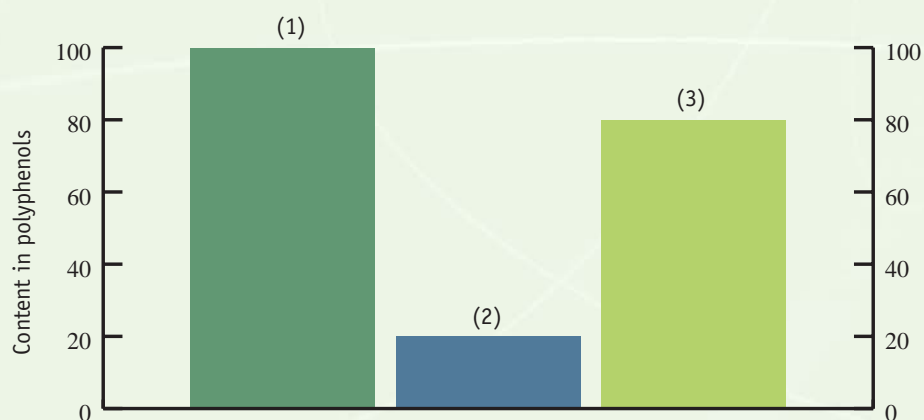
In order to optimize the extraction process and to guarantee that the composition of the final extract would be exactly the same as the fresh plant, Gattefossé developed a new process.

Indeed, living tissues tend to spontaneously deteriorate whenever their environmental balance is disturbed. If the enzymes naturally present in the tissue are still active during the extracting phase, they can cause damage to important parts of the extracts such as the actives.

**Gatuline® RC** is not subjected to enzymatic degradation because of a unique stabilization process derived from the technology of ultra high frequencies. **This process does not rely on the addition of other chemicals or solvents and has been patented by Gattefossé.**

The fresh buds are frozen soon after they are gathered to prevent any possibility of degradation during transportation to the manufacturing site. They are then thawed and rehydrated in order to recover the free water content they possessed prior to harvesting. This external rehydration allows the circulation between intracellular water and surface water. Under ultra high frequencies (UHF), the plant's internal temperature increases in just a few seconds to the specific experimentally derived and correlated stabilization temperature of the treated plant.

**Comparison between fresh (1), dried (2) and UHF stabilized buds (3).**





This process deactivates the enzymes in the plant's tissues and allows for the extraction of the active substances originally contained in the fresh plant.

**Ultra high frequency stabilization maintains the fresh plant's original characteristics.**

Following the initial stabilization step, **Gatuline® RC** goes through different stages of extraction to obtain the active fraction.

## IN VITRO SUBSTANTIATION

The benefits of **Gatuline® RC** were substantiated by a series of tests. A non-preserved version was used, in order to avoid the interactions of the preservative particularly on cell culture studies.

**Gatuline® RC's** innocuousness was demonstrated on human fibroblast and keratinocyte cell cultures:

- no cell proliferation,
- no cell morphology alteration.

An initial screening using oxygraphy techniques (at 20% concentration) proved that compared to a reference,

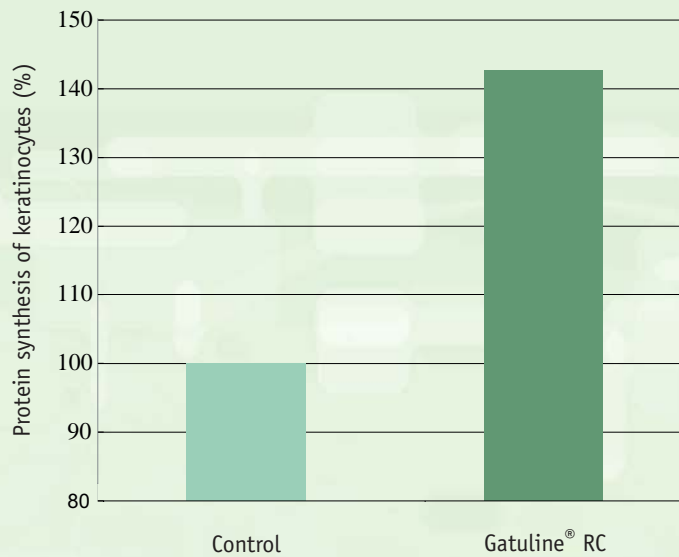
- **Gatuline® RC improves oxygen consumption by 71%.**

This result indicates an improvement in **cell metabolism dynamics** and an increase in the intracellular energy reserve.

It was important to better understand how cells would use this additional energy, therefore, **Gatuline® RC** was studied with a keratinocyte cell culture model.

Keratinocytes were chosen because they are the first skin cells to be in contact with **Gatuline® RC**. Protein synthesis was measured because it is essential to the biological balance of the skin.

Radio-labelled amino acids, added to the cell culture medium, were used to trace newly synthesized proteins.



- **0.4% GATULINE® RC increases keratinocyte protein synthesis by 42%, without any associated cell proliferation.**

The increased protein synthesis in the keratinocytes leads to the formation of various nutritional aids and regulating peptides (keratin, filaggrin,...). The presence of additional regulating peptides **strengthens the epidermal structure** which contributes to a smoother superficial cutaneous microrelief. Also, fillagrin and other proteins accumulated in the *stratum corneum* help to retain water in the corneal layer through an osmotic effect. This leads to a **moisturizing effect**.

## IN VIVO SUBSTANTIATION

Two parameters were selected for study: cutaneous microrelief and moisturization.

### Moisturization

Cutaneous moisturization was tested with a corneometer. After measuring initial moisturization from three areas of the internal forearm, twenty healthy volunteers applied twice daily for four weeks, on one forearm cream with 2% **Gatuline® RC**, on the other a placebo cream. Moisturization was measured twelve hours after the last application.



**Gatuline® RC was shown to improve skin moisturization by 30%.**

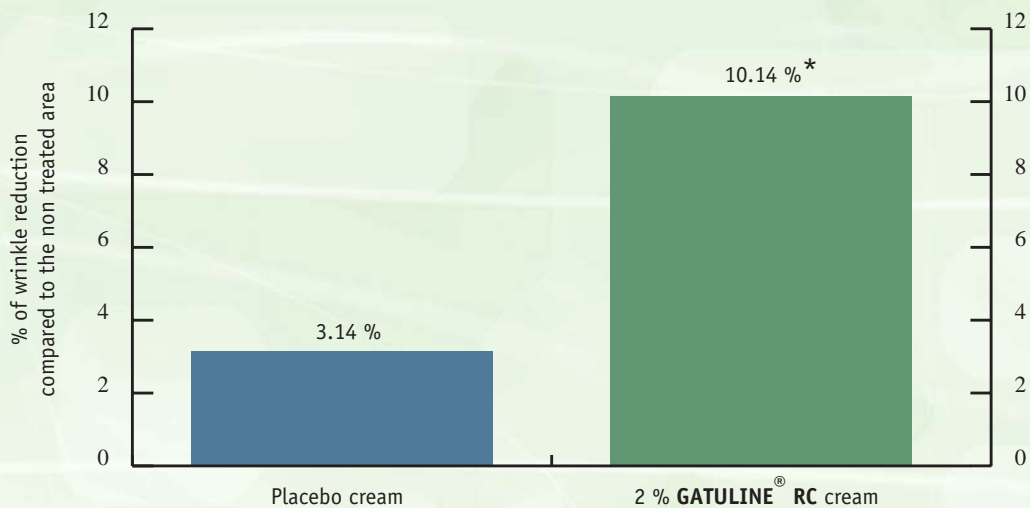


## Cutaneous microrelief

The cutaneous microrelief was analyzed using image analysis: skin prints - silica replicas - were obtained from the three tested areas of the internal forearm. After taking this first print, twenty healthy volunteers applied twice daily for four weeks, on one forearm cream with 2% **Gatuline® RC**, on the other a placebo cream.

New skin replicas were taken twelve hours after the last application.

### Reduction of wrinkle deepness (%)



\* : significant result ( $p < 0,05$ )

**Gatuline® RC was found to smooth cutaneous microrelief: a 10% wrinkle reduction was observed after only four weeks.**

# GATULINE® RC BIO

**An Organic label for an original active.**

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## Certified... Organic!

The symbiosis between cosmetic science and Nature is realised as Gattefossé presents an additional reference resulting from work with **Gatuline® RC**.

Resulting from many complex stages, **Gatuline® RC BIO** is born and represents **the very first substantiated natural active** with an **Organic label**.

The certification given by Ecocert, an independent organization, involves the application of criteria usually restricted to end-products.

**Gatuline® RC BIO**, an active ingredient aimed at the development of a certified end product, means that it falls precisely under the ECOLOGICAL AND ORGANIC COSMETICS Ecocert reference framework (production process, production waste...). It is free of all GM crop, glycol propylene and paraben.

The patented process of extraction, the same to that of **Gatuline® RC**, does not use any chemical or solvent.

This active ingredient brings the benefit of a certified ingredient to formulators aware of sustainable development issues, combined with the effectiveness of a complete **anti-age specific active**.

This active ingredient has the same properties as **Gatuline® RC**:

- increases cellular oxygen uptake
- boosts protein synthesis by keratinocytes
- improves cutaneous moisturization
- smoothes skin microrelief.

**Gatuline® RC BIO** represents the answer to the legitimate need for youth with an ecological and serene approach.

**Gatuline RC Bio – The Certified Organic Anti-Aging Active.**







## SPECIFICATIONS

	GATULINE® RC	GATULINE® RC BIO*
<b>Organoleptic characteristics:</b>		
Appearance	light brown-amber liquid	brown liquid
<b>Physico-chemical characteristics:</b>		
pH	5±0.5	3.5 to 5.5
Dry material	≥ 9 g/l	≥ 9 g/l
Mineral material	≥ 0.8 g/l	≥ 0.8 g/l
Total nitrogen	≥ 0.15 g/l	≥ 0.15 g/l
Solubilities	Soluble in water, insoluble in oils.	
Preservatives	Phenonip® 0.45%	Benzoic acid 0.2% Benzyl alcohol 3%
<b>Transport and storage conditions:</b>	Do not expose to light. Store at room temperature. A very slight sediment without any influence on the product's activity may be observed.	
<b>Packing:</b>		
Industrial standard pack (plastic containers)	1 and 5 kg	5 kg
Samples	50 g	50 g
<b>Regulatory:</b>		
INCI name	Water (and) Fagus Sylvatica Extract	
CAS n°	7732-18-5/85251-65-6	
EINECS n°	231-791-2/286-477-8	
Approbation for cosmetic use in Japan and Australia	approved	approved
<b>Toxicology:</b>		
Acute toxicity by oral route (25%)	non toxic	non toxic
Ocular irritation (25%)	non irritant	non irritant
Single epicutaneous Patch-test (25%)	non irritant	non irritant
Sensitization test (25%)	non sensitizing	non sensitizing

\*: "Ecological and Organic Cosmetic, certified by Ecocert sas - BP47 - F32600 L'ISLE JOURDAIN – FRANCE."

- 96,8% of natural ingredients on the total of ingredients
- 96,8% of organic certified ingredients on the total of ingredients.

## APPLICATIONS

This authentic beech bud extract was designed to offer a new, more reassuring and serene dimension to anti-aging and anti-wrinkle products.

**Gatuline® RC** is a unique ingredient: all substantiation, from *in vitro* evaluations to *in vivo* tests, leads to a logical explanation of its activity. Its performance will convince the cosmetologist and the end user as well.

Due to its smoothing effect and moisturization properties, **Gatuline® RC** is designed for **anti-aging and anti-wrinkle cosmetics** (skin care, eye contour, serum,...) and for **products that rejuvenate the body**.

**Gatuline® RC** can potentially be used in other applications in addition to skin care: hair care can also benefit from its advantages. It is suggested that any positive activity on keratin may enable the hair to grow stronger, therefore **Gatuline® RC** may be used in shampoos, lotions, capillary masks...

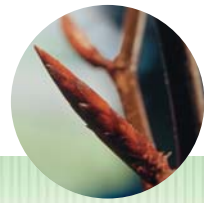
**Gatuline® RC's** recommended level of use is 2% to 5%, depending on the type of formulation being considered. It is best to add **Gatuline® RC** at room temperature at the end of the manufacturing process. Protein reducing and precipitating agents, and strong alcoholic solutions should be avoided.

The new reference **Gatuline® RC BIO**, used also between 2% and 5%, will be appropriate for anti-age and anti-wrinkle ranges with the added value resulting from the organic label. This new and original substantiated active will closely relate to the consumer's strong desire for ecological expectations and claims.

## FORMULATIONS

ANTI-WRINKLE EYE CONTOUR GEL		MM 4493 BIS
INCI name	Trade name	%
I DEMINERALIZED WATER		77.70
PERFUME, PRESERVATIVE		0.50
GLYCERIN		10.00
CARBOMER 940		0.60
II SODIUM HYDROXIDE (10% SOL.)		1.20
III WATER (and) FAGUS SILVATICA EXTRACT	<b>GATULINE® RC</b>	5.00
PROPYLENE GLYCOL (and) WATER (and) GINKGO EXTRACT	<b>VEGETOL® GINKGO BILOBA LC416 HYDRO</b>	5.00
		100.00

Disperse carbomer into I and let stand. Add the other components in their order in the formula.



## ANTI-AGE CREAM

MM 7442

INCI name	Trade name	%
<b>I</b> DEMINERALIZED WATER		48.02
CARBOMER	CARBOPOL® ULTREZ 10	0.25
XANTHAN GUM (SOL. 2%)		10.00
AMINOMETHYL PROPANOL (SOL. 50%)		0.06
<b>II</b> DIMETHICONE		4.00
OCTYL METHOXYCINNAMATE		5.00
BENZOPHENONE-3		1.00
ETHOXYDIGLYCOL OLEATE	SOFTCUTOL® O	6.00
TOCOPHERYL ACETATE		0.50
CETYL ALCOHOL		2.50
STEARYL ALCOHOL		2.50
PROPYLENE GLYCOL LAURATE (and) ETHYLCELLULOSE (and) PROPYLENE GLYCOL ISOSTEARATE	EMULFREE® P	6.00
<b>III</b> ALUMINIUM STARCH OCTENYL SUCCINATE		4.00
GLYCERIN		2.00
BUTYLENE GLYCOL		2.00
<b>IV</b> DIMETHICONE (and) DIMETHICONOL		2.00
<b>V</b> <i>PERFUME</i>		0.15
CI 15985 (SOL. 0.5%)		0.40
<i>PRESERVATIVE</i>		0.40
WATER (and) FAGUS SYLVATICA EXTRACT	GATULINE® RC	3.00
<b>VI</b> AMINOMETHYL PROPANOL		0.22
		100.00

Sprinkle Carbopol® Ultrez 10 over water. Leave to stand. Prepare xanthan gum solution and add to rest of I. Under vacuum and rapid mixing (rotor stator, 3000 rpm), add II heated to 75°C to I heated to 75°C. Continue rapid mixing for 3-5 min. Cool under planetary stirring. At 50°C, add III and IV. At 35°C, add V and VI. Continue stirring for about 15 min.

## REGENERATIVE CREAM

MM 8036/B

INCI name	Trade name	%
<b>I</b> POLYGLYCERYL-6 DISTEARATE	PLUROL® STEARIQUE WL 1009	5.00
CETYL ALCOHOL		2.00
GLYCERYL STEARATE	GELEOL	0.50
PUMPKIN (CUCURBITA PEPO) SEED OIL		2.00
SQUALANE		6.00
CAPRYLIC/CAPRIC TRIGLYCERIDE	LABRAFAC™ CC	6.00
TOCOPHERYL ACETATE		0.50
<i>PRESERVATIVE</i>		0.50
<b>II</b> DEMINERALIZED WATER		70.70
GLYCERIN		2.00
<b>III</b> POTATO STARCH MODIFIED		1.50
XANTHAN GUM		0.20
<b>IV</b> FAGUS SYLVATICA EXTRACT	GATULINE® RC BIO	3.00
<b>V</b> <i>PERFUME</i>		0.10
		100.00

Under rapid mixing, disperse III into II heated to 80°C, for about 20 min. Heat I to 75°C. Under rapid mixing (rotor stator 3000 rd/min), pour III + II heated to 80°C into I heated to 75°C, maintain rapid mixing, for about 10 min. Cool under planetary stirring and at about 35°C, add IV and V. Complete cooling.



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## WORLDWIDE POSITION



GATTEFOSSÉ is an independent, multinational company headquartered in France which creates, manufactures and distributes specialty products used as ingredients by the cosmetic and pharmaceutical industries.

Present in almost 50 countries worldwide, GATTEFOSSÉ enjoys a strong know-how and position in lipochemistry, biology and extraction from natural sources.

GATTEFOSSÉ offers the cosmetic industry a variety of high performance products classified as:

- **BASES & ADDITIVES:** emulsifiers, coemulsifiers, emollients, dispersers, solubilizers, thickeners...
- **TRADITIONAL PLANT EXTRACTS**
- **SUBSTANTIATED ACTIVE INGREDIENTS** from vegetable and marine origins.