

## GemmoNova<sup>®</sup>

### When Bud Nest<sup>®</sup> technology enhances Beauty

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Nowadays people are more and more looking for a natural and safe treatment for their ailments. Gemmotherapy (“therapy with buds”), as an alternative to modern medicine, is a possible answer to this request. This trend is more and more observed in the cosmetic industry as well, where people looks for more natural products. In the mean time, Nature is endangered by Human every day. This directly affects our daily life but also our cultivation’s areas and possibilities. Then, the need of pollution-free facility cultivation seems obvious. One technology offers the ideal environment for plant cultivation: the Bud Nest<sup>®</sup> technology.

GemmoNova<sup>®</sup> is the first cosmetic ingredient benefiting from both the ancient knowledge linked to Gemmotherapy and the modern Bud Nest<sup>®</sup> technology. It is obtained from safflower buds grown in a contamination free environment, and it reveals powerful anti-ageing properties

#### The interest of safflower buds

Why are buds, or new born plants, so attractive? Simply because they constitute the embryonic part of the plant, where cellular turnover is intense. Buds contain much more nucleic acid than any other part of the plant, and concentrate the potential biological energies and all the power of the future plant. When spring arrives, buds become the plant’s memory and revive the plant. Scientific studies in Gemmotherapy have demonstrated that buds can concentrate more active ingredients than adult plants, or can even combine the specific activities of 2 parts of an adult plant. Pharmacological or cosmetic activities can therefore be expected to be much higher in bud extracts than in common plant extracts.

Safflower seeds and flowers (photos 1-a and -b) have been used and studied since ancient time. Safflower is one of humanity’s oldest crops. Chemical analysis of ancient Egyptian textiles identified dyes made from safflower. But, the crop was traditionally used for colouring and flavouring foods, and making red and yellow dyes out of the flowers and grown for its seeds, and the oil extracted from them. [1] Other traditional uses are more specific to East Asia: safflower seeds have been used for osteoporosis, arthritis and cardiovascular diseases.

But recent studies on safflower buds (photo 1-c) let predicted about a new cosmetic interest for anti-ageing. Analysis shown that they contain plenty of active compounds and nutrients and are even richer in phenolic compounds (8'-hydroxyarctigenin), amino acids (proline) and  $\alpha$ -tocopherol than safflower seeds. [2]



Photos 1: a- safflower flower; b- safflower seeds; c- safflower bud

## Bud Nest<sup>®</sup>, a new protected cultivation technology

Pollution induces many harmful effects directly or indirectly to human health. Soil contaminants have deleterious results for the environment. There are hazardous chemicals in contaminated soil. Water pollution affects plants and organisms living in water. And, air pollution causes harm to humans and living organisms. It affects the human respiratory system and cardiovascular system. The chemicals are contained in primary food chain, which in turn affect consumer species. They become more concentrated for each consuming rung of the food chain. It damages and changes the whole ecosystem

In the end, upon a cultivator's eye, pollutants in the soil, in the water or in the air, alter plant metabolism and affect crop growth and yield. It is difficult to harvest completely pollution-free crop at present. The need of pollution-free facility becomes obvious for anyone who likes to secure a renewable plant source.

Bud Nest<sup>®</sup> technology offers the ideal environment for plant cultivation dedicated to the cosmetic industry. This is a special facility which cultivates plants under a controlled environment. Bud Nest<sup>®</sup> makes possible to harvest plants which are pesticides-free, fresh and rich in nutrients in a short period, and that are also free from diseases and insects. Regardless of natural disasters (drought, flood, cyclones...), cultivation remains possible all year round. And, since the plants do not be affected by the weather or the soil, they can maintain the same quality crop after crop and thus maintain as well similar compounds content in plants.



Photos 2: Bud Nest<sup>®</sup>, the best environment for cultivation

## GemmoNova<sup>®</sup>

GemmoNova<sup>®</sup> is the result of the alliance between Gemmotherapy and Bud Nest<sup>®</sup> technology. Safflower buds are grown in a contamination-free environment thanks to Bud Nest<sup>®</sup>. The extract made out of this is standardized in a liquid form with a blend of water and propanediol and is commercially available as GemmoNova<sup>®</sup> (PD).

Screening in-vitro tests have first been conducted on GemmoNova<sup>®</sup> to validate its potential as antioxidant, anti-allergic and more interestingly for the anti-ageing properties. Effect on pro-collagen type I was particularly promising.

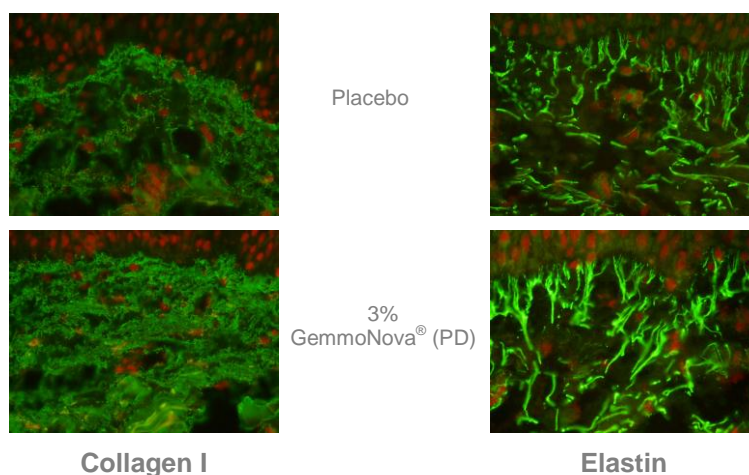
## Skin replenishment effects

An ex-vivo study has been performed on full human skin (dermis + epidermis). Skin explants have been treated every 2 days during 10 days with a placebo cream and a cream containing 3% of GemmoNova<sup>®</sup> (PD). Afterwards,

an immunolabelling with 2 antibodies (human anti-collagen I and anti-elastin) has been done. Image analysis by microscope enables to quantify the density of collagen I and elastin fibres in the dermis.

For both fibres, we clearly observed a positive effect of GemmoNova<sup>®</sup> (PD) on the area occupied by the labelling in the full dermis for collagen I and in the papillar dermis for elastin (Photos 3). 3% GemmoNova<sup>®</sup> (PD) cream increases significantly the collagen I density by 73% compared to the control. Immunolabelling of elastin is particularly visible on oxytalans and elaunins fibres in the papillar dermis. After 10 days treatment, 3% GemmoNova<sup>®</sup> (PD) induces a significant increase of 31% of the elastin density compared to the control.

Those test results confirmed our predictions on the benefits of GemmoNova<sup>®</sup> as anti-ageing active and its effects on the firmness and elasticity of the skin.



*Photos 3: Ex-vivo human skin, after 10 days, treated every 2 days, observed by immuno-histochemistry.*

As a complement, a clinical study has been run to evaluate the anti-wrinkle and firming effects of a 2% GemmoNova<sup>®</sup> (PD) cream. We selected a panel of 32 mature and deeply wrinkled women, aged from 45 to 60. They applied the product twice daily on their face during 56 days. Afterwards, evaluation was made by using 2 different techniques.

On first instance, we measured the skin mechanical properties before and after treatment on the cheeks. For this purpose, ballistometry appeared as the best technique to substantiate the skin rebound. On average, we observed that GemmoNova<sup>®</sup> (PD) significantly increased by 28% the skin elasticity and firmness. (Fig.2). The best result even shows an improvement of 68% for one volunteer.

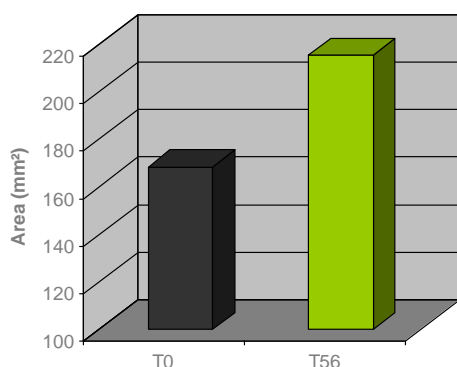
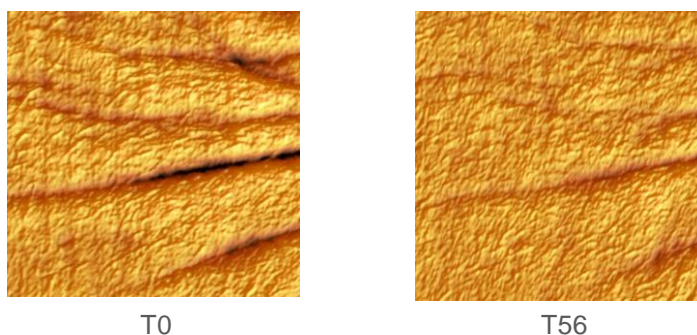


Figure 1: Skin elasticity and firmness measured by ballistometry, before and after 56 days treatment with 2% GemmoNova<sup>®</sup> (PD) cream.

Secondly, we substantiated the effect on deep crow's feet wrinkles. For this purpose, we used fringe projection technique. On average, we observed that GemmoNova<sup>®</sup> (PD) significantly reduced the skin rugosity (-9% of the maximum amplitude of the relief). The roughness due to ageing can be reduced up to 41% and the wrinkle amplitude up to 19% (Photos 4). Wrinkle area and volume are respectively decreased by 12% and 20% on average. One volunteer even shows an improvement of 52% on the wrinkle area and 79% on the wrinkle volume.



Photos 4: Crow's feet area, observed by fringe projection, before and after 56 days treatment with 2% GemmoNova<sup>®</sup> (PD) cream.

## Conclusion

The alliance between Gemmotherapy and Bud Nest<sup>®</sup> technology lead to the creation of GemmoNova<sup>®</sup>. Safflower buds, containing all the power of the future plants in a concentrated form, are grown in a contamination-free environment thanks to Bud Nest<sup>®</sup>. This plant selection was done because active compounds identified in safflower buds such as proline or 8'-hydroxyarctigenin were predicting about the potential anti-ageing properties. The different steps in our efficacy evaluation of GemmoNova<sup>®</sup> successively demonstrated the impact on elastin fibres, collagen I fibres and their precursors, and the final benefits on the skin firmness and elasticity, as well as the anti-wrinkle effect. GemmoNova<sup>®</sup> can provide a full replenishment to mature women suffering of skin sagging.

## References

- (1) Daniel Zohary and Maria Hopf, Domestication of plants in the Old World, third edition (Oxford: University Press, 2000), p.211

- (2) Kim Eun-Ok, Analysis of Functional Compositions and Bone Proliferative Effects of Germinated-Safflower Seeds, Department of Food Science and Nutrition, Graduate School, Catholic University of Daegu, 2008, p.19-24

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**EXTREME LIFT (REF. 12067-3)**

PHASE	INGREDIENTS (TRADE NAMES)	INGREDIENTS (INCI NAMES)	SUPPLIERS	% W/W
A	WATER	Water	-	77,30
	SODIUM GLUCONATE	Sodium Gluconate	JUNGBUNZLAUER	0,20
B	ZEMEA	Propanediol	DUPONT TATE & LYLE	3,00
	NEOFECT 304	Benzyl Alcohol, Caprylyl Glycol	JAN DEKKER	1,00
C	GLYCERIN	Glycerin	-	2,00
	XANTHAN GUM XG FFCSP-PC	Xanthan Gum	JUNGBUNZLAUER	0,50
D	NIKKOL LECINOL S-GF	Hydrogenated Lecithin	NIKKO CHEMICALS	3,00
	MACADAMIA NUT OIL	Macadamia Ternifolia Seed Oil	JAN DEKKER	10,00
	SHEA BUTTER RBD ORG	Butyrospermum Parkii (Shea Butter)	JAN DEKKER	1,00
E	GEMMONOVA® (PD)	Carthamus Tinctorius (Safflower) Bud Extract, Water, Propanediol	JAN DEKKER	2,00
F	LACTIC ACID (10% AQ. SOL)	Water, Lactic Acid	JUNGBUNZLAUER	QSP pH 7
<b>PROCEDURE</b>				
<ol style="list-style-type: none"> <li>Mix phase D and heat it to 85°C,</li> <li>Mix separately phase B, then add it to phase A and heat A+B at 80°C,</li> <li>Mix separately phase C, then add it to phase A+B under stirring,</li> <li>Add phase D gradually under strong stirring to emulsify (1000-1500 rpm),</li> <li>Let the mixture cooling down and add phase E under gentle stirring,</li> <li>Adjust the pH with phase F</li> </ol>				
<b>APPEARANCE AND CHARACTERISTICS</b>				
<ul style="list-style-type: none"> <li>Slightly beige milky serum,</li> <li>Nikkol Lecinol S-GF, a hydrogenated lecithin derived from non-GMO soybeans, reduces irritations and brings moisturization to the skin,</li> <li>This action is also enhanced by the Shea Butter RBD Org,</li> <li>Skin beauty enhancement is provided thanks to GemmoNova® (PD), the new active ingredient based on safflower bud extract and obtained via the "Bud Nest" technology.</li> </ul>				
<b>PH</b>	<b>CENTRIFUGATION</b>	<b>VISCOSITY</b>	<b>STABILITY</b>	
6,8	5000 rpm. / 4 min → No phase separation	2300 cPs (Viscostar Plus, Spindle 6, Speed 20 rpm, 20°C, 1min)	Nothing to report after 3 months at room temperature and 42°C, and after 1 month at 50°C	



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ENERGY OF LIFE (REF. 11287-2)

PHASE	INGREDIENTS (TRADE NAMES)	INGREDIENTS (INCI NAMES)	SUPPLIERS	% W/W
A	WATER	WATER	-	68,35
	GLYCERIN	GLYCERIN	COOPER	1,00
	EDETA BD	DISODIUM EDTA	BASF	0,05
	CARBOPOL ULTREZ 21	ACRYLATES/C10-30 ALKYL ACRYLATE CROSSPOLYMER	LUBRIZOL	0,30
B	NIKKOL NIKKOMULESE 41	POLYGLYCERYL-10 PENTASTEARATE, BEHENYL ALCOHOL, SODIUM STEAROYL LACTATE	NIKKO CHEMICALS	4,00
	DEKANEX™ 2004 FG	HYDROGENATED POLYDECENE	JAN DEKKER	18,00
C	NIKKOL PEN-4630PN	PPG-6-DECYLTETRADECETH-30	NIKKO CHEMICALS	1,00
	NEOFECT 304	BENZYL ALCOHOL, CAPRYLYL GLYCOL	JAN DEKKER	1,00
D	FRAGRANCE YELENA	FRAGRANCE	ROBERTET	0,25
E	GEMMONOVA® (PD)	CARTHAMUS TINCTORIUS (SAFFLOWER) BUD EXTRACT, WATER, PROPANEDIOL	JAN DEKKER	3,00
F	WATER	WATER	-	2,00
	ALOE CON UP 200 (ORG-FT)	ALOE BARBADENSIS LEAF JUICE POWDER	FLORIDA FOOD	0,05
G	SODIUM HYDROXIDE (AQ. SOL. 10%)	WATER, SODIUM HYDROXIDE	MERCK	1,00

PROCEDURE

1. Heat separately phases A and B at 80°C,
2. Add slowly phase B to A under strong stirring (1000 rpm), and then cool down A+B to 50°C,
3. Prepare and heat phase C at 50°C, then add it to A+B,
4. Cool down A+B+C to room temperature then add phases D, E, F and G, and homogenize well.

APPEARANCE AND CHARACTERISTICS

- White O/W cream,
- Long lasting moisturizing and emolliency effects thanks to Nikkol Nikkomulese 41 and Dekanex™ 2004 FG,
- Skin beauty enhancement thanks to GemmoNova® (PD), the new active ingredient based on safflower bud extract and obtained via the "Bud Nest" technology (new auto controlled cultivation environment).

PH	CENTRIFUGATION	VISCOSITY	STABILITY
6-6.3	5000 rpm. / 4 min ⇒ No phase separation	11000 cPs (Viscostar Plus, Spindle 6, Speed 20 rpm, 20°C, 1min)	Nothing to report after 3 months at room temperature and 42°C, and after 1 month at 50°C



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