

# BEAUTY *from* WITHIN

SABINSA



**Emerging Trends in  
Health & Wellness**

# NUTRICOSMETICS

The latest trend in skin care is use of supplements and nutrients to get the cosmetic benefits. This approach in the skin care segment is called 'Nutricosmetics'. It is also known as 'beauty from within', 'oral cosmetics', 'beauty pills', or 'eat yourself beautiful' (1). Hence nutricosmetics are dietary ingredients and antioxidants that enhance the structure, function, and appearance of skin, nails, and hair (2).

**Nutricosmetics can be defined as dietary supplements in the form of tablets, capsules, granules, beverages, or foods that are formulated and marketed specifically for beauty purposes (1). It is an intersection between nutritional and personal care.**

Nutricosmetics are not only meant to provide beauty benefits from within but also to provide protection from various everyday external damages (e.g. environmental exposures, sun exposure, smoking and poor diet) as well as internal factors (e.g. premature skin aging and weaker antioxidant status). Hence these products provide necessary support to the common skin problems and may help in the management of overall skin health and vitality.

Nutricosmetic ingredients can be targeted to help improve the skin quality, formation of collagen, moisture balance, reduce the appearance of fine lines and wrinkles, and reduce visible signs of aging. Some of the nutricosmetics ingredients are Vitamin A, Coenzyme Q<sub>10</sub>, omega-3-fatty acids, lycopene, soya-isoflavones, lutein etc. (3).



## NUTRICOSMETIC MARKET: AN OVERVIEW

The consumption of nutricosmetics in consumers is multiplied in recent years due to the increased awareness of importance of these ingredients towards health and beauty. In general, the trend towards healthier lifestyles, including personal care, the growing concern for beauty and healthy aging in consumers also gained momentum in recent years. The nutricosmetic market worldwide is expected to increase at a 5.0% CAGR (compound annual growth rate) from 2017 to 2025 and is expected to become worth US\$7.93 bn by 2025 from US\$5.13 bn in 2017 (5). Out of this, US\$1.67 bn market share holds by Europe alone (6) and this is due to high penetration of supplements with increased awareness of the benefits among the consumers.

Japan is the biggest market for the nutricosmetic segment in the Asia Pacific region, and it continues

to lead innovation in this area. According to Transparency market research, Japan holds around 54.8% of the Asia Pacific nutricosmetics market in 2017.

Based on the product type, the nutricosmetic market is divided into supplements and beauty beverages. In 2025, supplement type segment is expected to be leading position with the market share of 54.1%. Similarly, among the supplements, tablets will be leading the market in forecast period. Based on the primary function, global nutricosmetic is divided into skin care, weight management, hair and nail care, and multifunctional. In this case, skin care leads the market till 2015. Sun care also expected to display the leading growth rate between 2017 to 2025 (3).

Glycation is a non-enzymatic chemical process in which human DNA, lipids and proteins are damaged by the attachment of reducing sugars such as glucose, ultimately leading to the formation of highly reactive Advanced Glycation End products (AGEs). This process has been associated with deleterious effects on the skin (4).

**Role in  
reducing  
AGE  
formation  
in aging**

## KEY BENEFITS OF NUTRICOSMETICS:

- ✓ Helps to get rid of dull skin flakes and boosts cell renewal which is the key to a vibrant, fresh complexion.
- ✓ Helps to prevent wrinkles, lines and age spots.
- ✓ Protects the skin from damage caused due to harmful UV radiations.

Sabinsa has a range of phyto-based nutrients that can be used as Nutricosmetics. These ingredients designed to deliver radiance and beauty benefits to the skin.

**They include Saberry<sup>®</sup>, Artonox<sup>®</sup>, Silbinol<sup>®</sup>, Curcumin C3 Reduct<sup>®</sup>, Cococin<sup>™</sup>, Ellagic acid and Rosemary Extract.**

# SABERRY®

Saberry® an ORAC Dense Phytonutrient™, obtained from the fruits of Amla or Indian gooseberry (*Emblica officinalis*).

Contains  $\beta$ -glucogallin (10%), the valid, more optimal and relevant biomarker which reflects the antioxidant potential of Amla more accurately than ascorbic acid (7). A leader among water-soluble phytonutrients in terms of broad-spectrum antioxidant activity, showing a combined ORAC value of 358,600  $\mu\text{mol TE}/100\text{g}^*$  (\*TE/g: Trolox

Equivalent/100g, Vit E/g: alpha-tocopherol Equivalent/100g, CAE/g: Caffeic Acid Equivalent/100g). The antioxidant properties find application in inhibition of melanin formation, treatment of UV radiation, skin damage and photo-aging by inhibition of MMP-1.

<b>ORAC<sub>hydro</sub></b> (H-ORAC) ( $\mu\text{mol TE}/100\text{g}$ )	<b>ORAC<sub>lipo</sub></b> (L-ORAC) ( $\mu\text{mol TE}/100\text{g}$ )	<b>ORAC<sub>total</sub></b> (H-ORAC + L-ORAC) ( $\mu\text{mol TE}/100\text{g}$ )	<b>HORAC</b> ( $\mu\text{mol CAE}/100\text{g}$ )	<b>NORAC</b> ( $\mu\text{mol TE}/100\text{g}$ )	<b>SORAC (SOD)</b> (kunitsSODeq/ 100 g)	<b>SOAC</b> ( $\mu\text{mol VitE}/100\text{g}$ )
<b>267,800</b>	<b>400</b>	<b>268,200</b>	<b>34,500</b>	<b>90,400</b>	<b>10,200</b>	<b>135,100</b>

**TE/100 g:** Trolox Equivalent/100 g    **VitE/100 g:** Alpha-tocopherol Equivalent/100 g    **CAE/100 g:** Caffeic Acid Equivalent/100 g

Broad spectrum antioxidant activity is based on the values of ORAC<sub>Total</sub> [hydrophilic (H-ORAC) and lipophilic (L-ORAC)-Peroxyl Radical Absorbance Capacity], HORAC (Hydroxyl Radical Absorbance Capacity), NORAC (Peroxynitrite Radical Absorbance Capacity), SOAC (Singlet Oxygen Absorbance Capacity), and SOD (Superoxide dismutase equivalent activity, corresponding to Superoxide Radical Absorbance Capacity).

# ARTONOX®

Artonox® is obtained from the dried heartwood of *Artocarpus lakoocha* and contains a minimum of 95% Oxyresveratrol. Oxyresveratrol is 32-fold stronger than kojic acid and 150-fold stronger than resveratrol with regards to skin lightening potential (8).

Laboratory studies have demonstrated that Artonox® produces superior antioxidant, tyrosinase inhibition, melanogenesis inhibition, and UV protection, thus playing a protective role to the skin (9). It is also known to reduce the formation of AGEs and cross-linking of collagen, thus improving skin tone (10).

<b><i>In vitro</i> study of Artonox® (9)</b>	<b>Assay</b>
Tyrosinase inhibition (IC <sub>50</sub> µg/ml)	0.049
Melanin inhibition (IC <sub>50</sub> µg/ml)	12
DPPH inhibition (IC <sub>50</sub> µg/ml)	2.7
ORAC (µmol trolox equivalents/g)	19,735
Elastase inhibition (IC <sub>50</sub> µg/ml)	120
Collagenase inhibition (IC <sub>50</sub> µg/ml)	92
UV protection (IC <sub>50</sub> µg/ml)	18

# SILBINOL®

**Silbinol® is obtained from dried heart wood of *Pterocarpus marsupium* (Indian Kino) and is standardized for minimum 90% Pterostilbene.** Pterostilbene, a structural analog of resveratrol, is more stable *in vivo* than resveratrol (11) and has comparable antioxidant and anti-inflammatory (anti-aging) support. It exhibits increased bioavailable than resveratrol due to the presence of two methoxy groups which cause it to exhibit increased lipophilic and oral absorption (12).

Pterostilbene effectively controls sugar levels in the blood stream by inducing  $\beta$ -cells of pancreas to release insulin (13). Controlled sugar levels have a direct influence on skin aging. Increased sugar levels bind to proteins by glycation to produce

AGEs which in turn damage collagen and elastin (14). Thus by controlling the sugar levels in the blood stream, the damage to collagen and elastin may be controlled to a great extent.



<i>In vitro</i> study (11)	Assay
Tyrosinase inhibition (IC <sub>50</sub> µg/ml)	7
Melanin inhibition (IC <sub>50</sub> µg/ml)	0.55
DPPH inhibition (IC <sub>50</sub> µg/ml)	4.9
ORAC (µmol trolox equivalents/g)	12,508
Elastase inhibition (IC <sub>50</sub> µg/ml)	50
Collagenase inhibition (IC <sub>50</sub> µg/ml)	125
UV protection (IC <sub>50</sub> µg/ml)	30

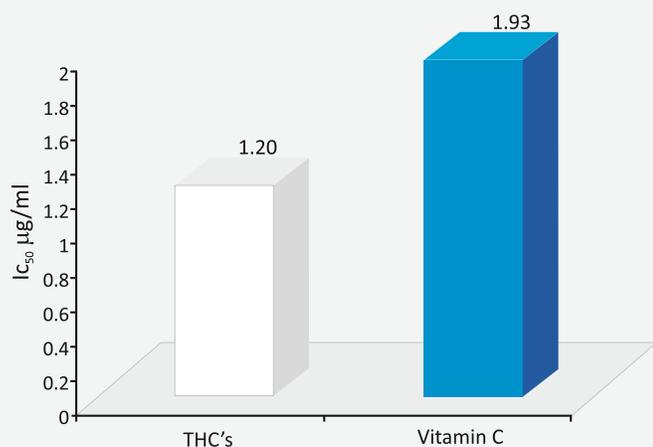
# CURCUMIN C3 REDUCT®

Curcumin C3 Reduct®, the cascading antioxidant from Sabinsa, redefines the bioavailability of Curcumin. Extracted from the rhizomes of *Curcuma longa*, it is standardized for minimum 95% Tetrahydrocurcuminoids. Tetrahydrocurcuminoids (THCs) are the colorless hydrogenated product derived from the yellow Curcuminoids. THCs include Tetrahydrocurcumin (THC), Tetrahydrodemethoxycurcumin (THDMC) and Tetrahydrobisdemethoxycurcumin (THBDMC).

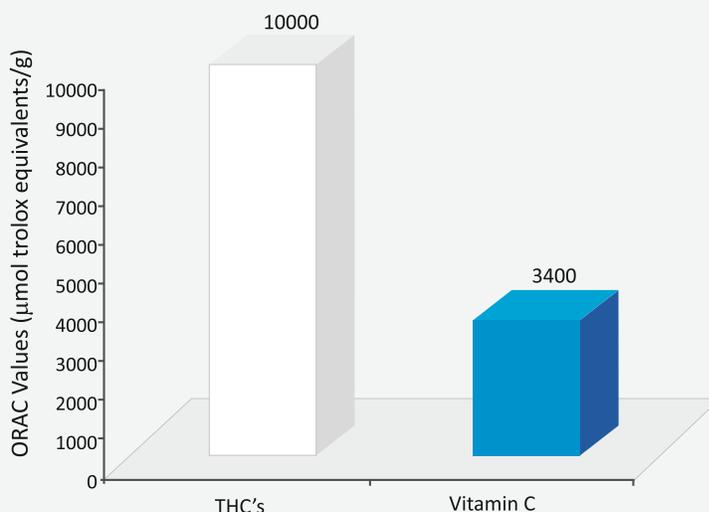
## Protection from UV radiation:

UV induced free radical damage to the skin causes loss of skin integrity. The studies reveal that the Curcumin C3 Reduct® was found to be a more potent antioxidant than the commonly used antioxidant, Vitamin C, thus playing a protective role to the skin (15).

THCs has shown potential as Antiglycation compound to reduce AGEs formation and cross-linking of collagen thus improving skin tone.



DPPH Method: Lower the IC<sub>50</sub> value, higher the antioxidant activity

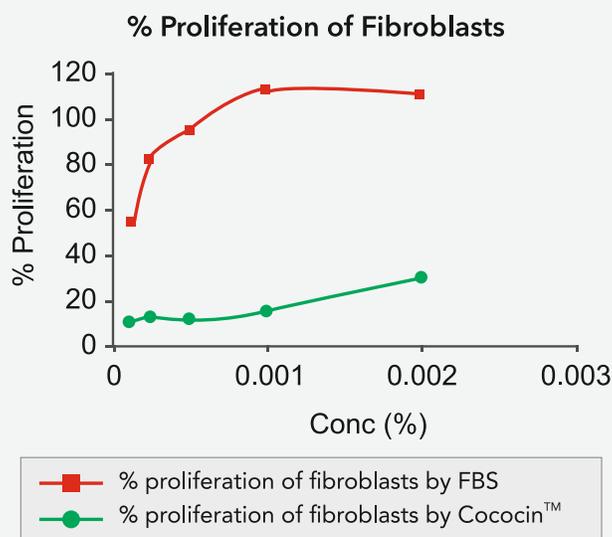


ORAC Method: Greater the ORAC value, greater the antioxidant activity

# COCOCIN™

Cococin™ is the freeze-dried tender coconut water available in a free flowing powder form. In view of its inherent nutritional significance it has been rightly trademarked by Sabinsa Corporation as "The Nourishment Factor®" that provides a valuable nutrient pool for enhancing food and beverage, as well as cosmetic product formulations. Green tender coconut water, is rich in phytohormones and proteins, amino acids, sugars, vitamins and minerals which are essential to promote tissue growth. Cococin™ has been shown to promote the proliferation of fibroblasts and hence can be inferred to have collagen boosting potential. ***Tender coconut water is rich in proteins, amino acids, sugars, vitamins, minerals and growth hormones essential to promote tissue growth and also promotes epidermal proliferation and in turn preventing loss of moisture.***

## Cell Proliferation enhancement by Cococin™ in Swiss 3T3 fibroblast cell line



# ELLAGIC ACID

Ellagic acid is a naturally occurring polyphenol found in many natural sources. It has been reported that Ellagic acid has a high affinity for copper at the active site of tyrosinase, and inhibits its activity by binding to the copper.

Pomogranate extract containing 90% of Ellagic acid inhibited tyrosinase activity in mushrooms, and inhibited pigmentation in a dose dependent manner in UV irradiated guinea pigs (16). It is also reported that ellagic acid riched pomegranate extract, effectively prevented collagen degradation in UV-B-exposed fibroblast by blocking matrix metalloproteinase production (17).

A double-blind, placebo controlled trial on the protective effect of Ellagic acid on UV irradiated skin has been carried out on 30 healthy female volunteers at doses of 100 mg/day and 200 mg/day ellagic acid. At the end of 4 weeks, a dose dependent inhibitory effect on pigmentation of UV irradiated skin was observed (18).



# ROSEMARY EXTRACT

Rosemary extract is a standardized extract from the dried leaves of Rosemary (*Rosmarinus officinalis*) and contains a minimum of 1.5% Ursolic acid, 6% Carnosic acid and 1% Rosmarinic acid.

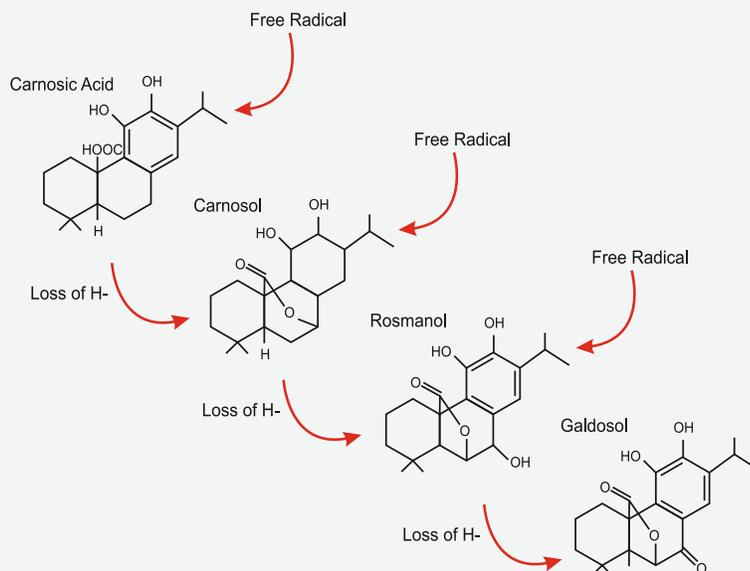
## Cascading antioxidant potential

Rosemary extract's unique cascading power revolves around carnosic acid. After this powerful molecule has extracted a free radical, it changes its structure and becomes carnosol. Carnosol also extracts a free radical to become rosmanol. Rosmanol continues the free radical scavenging until galdosol is created and further continues the scavenging process. All of this is accomplished beginning with just one powerful antioxidant molecule (19).

Carnosic acid cascades into a series of antioxidant molecules to provide sustained antioxidant benefits

Carnosic acid → Carnosol → Rosmanol → Galdosol

Studies show the vital role played by antioxidants in hair care and nourishment. They help absorb essential nutrients for the body and in turn promote hair growth. The quenching of free radicals also promotes a better immune system which may cause a reduction of hair loss. Antioxidants are also beneficial as they slow the aging process (20).



# CONCLUSION & REFERENCES

In conclusion, nutricosmetics is an emerging trend in the beauty segment. This is due to the increased awareness and importance of the dietary supplement towards health and beauty. These nutrients may help improve the skin quality, formation of collagen, moisture balance, reduce appearance of fine lines and wrinkles, and reduce visible signs of aging. Antioxidant rich nutrients quenches the free radicals, which promotes better immune system and may reduce hair loss.

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