

Natural Ingredients

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It was obvious from the many seminars given at In-Cosmetics 2016 that the “natural” trend is as active as ever although the claims that the materials being described are natural were occasionally rather ambitious! This feature is about materials that have a strong claim to be being of natural origin with proven cosmetic benefits.

There can be no doubt that *Limnanthes alba* (meadowfoam) seed oil is natural. It has a unique molecular structure not found in any other naturally occurring substance while its high content of long-chain fatty acids offers extraordinary oxidative stability due to a combination of natural antioxidants and lack of conjugated double bonds. **Elementis** crushes the seed to obtain the oil, which is then treated to yield useful cosmetic actives such as Meadowderm [INCI: Meadowfoam delta-lactone] that has antiaging benefits. In-vitro skin biomarker analysis showed distinct changes in expression of relevant genes upon treatment with Meadowderm. In-vivo trials confirmed a reduction of total wrinkle surface area, which can also be seen by eye and in silicone replicas.

Consumer concern in the control of body malodours using natural materials instead of triclosan or aluminium-based antiperspirants has led to the introduction of some interesting materials. Citrofol AI from **Jungbunzlauer** is triethyl citrate of natural origin. It works as a deodorant by inhibiting the enzymatic decomposition of sweat. Sinodor {INCI: Citronellyl methylcrotonate} from **Givauden**, is effective at neutralising body odours while having no discernible odour itself. UsNeo from **Lipoid Kosmetik AG** is a natural bactericide based on *Usnea barbata* (lichen) extract in plant derived propanediol. UsNeo has an excellent antibacterial profile against Gram positive bacteria, in particular those known to cause body odour, while preserving normal skin flora.

Tegodeo CW90 from **Evonik** is a deodorant based on a zinc salt of ricinoleic acid. It does not inhibit natural transpiration and has no bactericidal or fungicidal properties and therefore does not interfere with the natural flora of the skin. Polyfix ZRC 25 GP [INCI: Zinc ricinoleate, aqua, tetrasodium glutamate diacetate, propanediol] from **Schill+Seilacher** deodorises by absorbing and building stable complexes with odour molecules thereby removing them from the environment. It is compatible with non-ionic and anionic surfactant system and is readily biodegradable.

Propanediol was one of the components of Polyfix ZRC and this is a material available in its pure form from **Zemea**. It is obtained as a fermentation product of glucose and it is a moisturiser claimed to have unique solubility properties and to boost preservative efficacy. It can be used at about 60% by weight to produce clear sodium stearate-based deodorant sticks that are effective without the need for antimicrobial agents like triclosan. Various combinations of ethylhexyl glycerin and caprylyl glycol also find use in less aggressive deodorant products.

Excessive exposure of the skin to UV and IR rays leads to the formation of free radicals, inflammation and the degradation of the proteins of the skin's extracellular matrix. These are the main causes of premature skin aging including short-term effects like sunburn, dryness and erythema and long-term consequences such as dark spots, photoaging and skin cancers.

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According to **Greentech**, protection against UV radiation alone is not sufficient to prevent deleterious skin consequences as approximately 50% of free radicals formed in the skin by solar radiation originate from visible and infrared rays. Soliberine [INCI: Buddleja officinalis flower extract] from **Greentech** is an extract of buddleia which is protective against a wide range of incident light wavelengths including blue light and infra-red. Soliberine maintains normal skin physiology by reducing the level of infrared-induced MMP1 release and by significantly reducing the production of ROS induced by blue light. It also has high antioxidant capacity and is highly efficient for scavenging free radicals.

Artonox from **Sabinsa** is obtained from the dried heartwood of *Artocarpus lakoocha*. It is described as a natural skin lightening ingredient standardised for a minimum of 95% oxyresveratrol, which is a polyphenolic compound that inhibits L-tyrosine oxidation by tyrosinase. Tests by **Sabinsa** demonstrated its inhibition of melanogenesis, its ability to reduce UV-B induced cytotoxicity and its antioxidant properties. In summary it acts on some of the major targets that cause undesirable pigmentation, age spots, freckles and other related skin conditions. Also from **Sabinsa** is pTeroWhite [INCI: Pterocarpus marsupium bark extract] that comprises 90% pterostilbene. It helps lighten skin tone and hyperpigmentation, has good UV-B protection potential and shows anti-inflammatory activity to protect skin from possible irritation.

SpecAWK Plus from **Spec Chem Industry Inc.** is an example of the multi-component approach traditionally used in Chinese medicine and in-vitro and in-vivo tests show it to have anti-wrinkle, anti-aging, skin lightening and whitening, antioxidant, anti-inflammatory and moisturising effects. It is prepared from ten traditional Chinese edible herbs: Panax ginseng, Poria cocos, Panax notoginseng, Gastrodia elata, Glycyrrhiza uralensis, Carthamus tinctorius, Salvia miltiorrhiz, Paeonia suffruticosa, Scutellaria baicalensis and Lycium and it won the China Personal & Cosmetic Technology Innovation Award, 2016.

The problems caused by environmental pollution were a feature at In-Cosmetics. Puricare from BASF was an anti-pollutant featured in **HAIR CARE 2016**. **Algues & Mer (A&M)** launched a new ingredient it named Invincity extracted from the brown seaweed, *Ascophyllum nodosum*. The A&M factory and laboratory are located on Ouessant Island, at the western tip of France, far from any source of industrial or agricultural pollution, and the seaweed is harvested by hand. Aryl hydrocarbon Receptors (AhR) are receptors to polycyclic aromatic hydrocarbons and some heavy metals. They are found in keratinocytes, melanocytes, fibroblasts and Langerhans cells. When activated by a pollutant, they trigger the expression of genes controlling reactions like oxidative stress, inflammation and melanogenesis. Invincity is shown to decrease AhR expression by 73% compared to placebo and it increases barrier reinforcement and skin firmness. It also claims to reduce TEWL, dark spots and skin redness.

Magnesium is one of the most important minerals of the human metabolism, involved in more than 300 cellular biochemical reactions as an enzyme co-factor. It is particularly indispensable in all of the body's natural self-cleansing and detoxification responses and is mostly assimilated by the human body as the chloride.

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Nigari salt is obtained from purified sea water and is mainly composed of natural magnesium chloride. Detoxium [INCI: Aqua, sea salt extract, propanediol, phospholipids, stearyl inulin] from **Lucas Meyer** consists of Nigari salt encapsulated in an Ionosome system. It is said to enhance the skin's defence system against oxidative species and to increase the cells capacity to excrete wastes more efficiently.

A classical liposome is too sensitive to resist the high ionic strength of the salt whereas Ionosome resists electrolytes. It is a new vectorisation system developed by **Lucas Meyer** comprising biomimetic phospholipids enriched in phosphatidylcholine. Ionosomes make the encapsulation of some destabilising molecules possible and increases the diffusion of the entrapped molecules through the skin.

Stress comes in many forms: according to **Sinerga** everyday life is often the cause of chronic stress. As a result, the body undergoes fight-or-flight reactions that cause persistent muscle contraction resulting in wrinkles, crow's feet and fine lines. Acetylcholine is the chemical mediator that makes the muscle contract and acetylcholinesterase enzyme deactivates acetylcholine after the nervous signal to restore muscle basal conditions. Dolcévia [INCI: Stevioside] is extracted from dry leaves of *Stevia rebaudiana* and has a proved de-contracting effect on involuntary muscle by enhancing the activity of acetylcholinesterase so that the acetylcholine contracting action is reduced and skin remains smoother.

How do you agitate a snail? Apparently when snails are agitated they excrete a thick fluid as a means to protect themselves. The slime that is excreted contains nutrients like hyaluronic acid, glycoprotein enzymes, antimicrobial and copper peptides, and proteoglycans. Research suggests that snail slime will stimulate the production of elastin and collagen, increase fibronectin production and generally encourage the proliferation of fibroblasts. An alternative source to agitated snails from **CR&D** research laboratories is Glycosnail Veg. that shows all the healing and cosmetic properties of snail slime, but with a complete respect of vegan claims.

Glycosnail Veg is an enriched mucopolysaccharides complex [INCI: Aqua, glycoprotein, glycerin, sodium hyaluronate, hydrolyzed glycosaminoglycans, copper gluconate, sodium PCA] that has a double function when applied to human skin. It is claimed to stimulate the formation of collagen, elastin and dermal components that repair the signs of photoaging and it is also claimed to minimise the damage generated by free radicals that are responsible for premature skin aging.

Despite their natural origins petrochemicals are not afforded natural status and various materials from botanical sources are offered as substitutes. Petrolatum is a major cosmetic ingredient that serves as the benchmark for occlusive film on the skin. **Bionat Consult** offers Polyna R [INCI : Olea europea (olive) fruit oil, Oryza sativa (rice) bran wax, stearic acid, olive oil polyglyceryl-3 ester], as a possible alternative to petrolatum. It forms a lipophilic film on the skin that will prevent TEWL and help maintain active ingredients in skin contact. Using innovative technologies based on olive oil **Bionat Consult** also produces an alternative to lanolin called Polyte Extra, an alternative to light silicones called Polyssan O and an alternative to squalane trade named Polyssan OL.

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Bassol C from **AAK** is an oxidation-resistant emollient that provides an alternative to unstable vegetable oils, mineral oils and synthetic emollients. It is made from rapeseed by mild and efficient processing using less energy and other resources compared to mineral oils and synthetic emollients. Bassol C may be INCI ingredient listed as either olus oil or canola oil and is a clear, medium viscosity oil, with a highly lubricating character, making the skin soft and smooth.

Developed to match the viscosity of dimethicone grades, giving similar sensorial characteristics with an enhanced solubility profile, the Pelemol SR range from **Cornelius** offers a plant derived alternative to dimethicone. The range features 100% vegetable ester/polyester blends and currently four are available to match dimethicones with viscosities ranging from 20CS to 1000CS. The lightest is a mixture of coco-caprylate/caprate and trioctyl dodecyl citrate while the other three are all mixtures comprising different proportions of coco-caprylate/caprate and dimer dilinoleyl dimer dilinoleate.

Natural alternatives to volatile silicones are the claims made for two Emogreen products from **Seppic**. Both materials are bio-sourced emollients based on high purity C15-19 alkane and are non-polar and biodegradable. Emogreen L19 gives a fresh and gliding touch with a soft after feel. Emogreen L15 gives a lightweight and non-greasy skin feel with a powdery finish.

Enhancing skin radiance is the claim made for three multifunctional actives from **IBR Ltd.** that emit blue or green fluorescent light when activated by UV illumination. This fluorescence compensates the yellow and red tones of the skin and results in a brighter, lighter and more radiant skin appearance when exposed to sun light. IBR-Dragon [INCI name: *Hylocereus undatus* fruit extract] emits blue fluorescence and has moisturising properties. It is claimed to maintain youthful skin and provide better protection against UV radiation.

IBR Phyto(flu)ene Colorless Carotenoids are natural carotenoids produced and extracted from carotenogenic algae and plants that fluoresce green light. They also exhibit unique anti-oxidation capability against hydroxyl radicals, have anti-inflammatory activity and inhibit collagenase formation. They are to be found in IBR-CLC [INCI: *Dunaliella salina* extract] and IBR-TCLC [INCI: *Solanum lycopersicum* (tomato) fruit extract]. Both extracts are available in either vegetable squalane or squalane with *Simmondsia chinensis* (jojoba) seed oil.

Camaderm by **Solabia** is a fresh organic black crowberry (*Empetrum nigrum*) juice high in flavonoids and anthocyanins, obtained by cold pressing and stabilised by organic vegetal glycerin. In-vitro studies show it to protect dermal fibres by inhibiting elastase activity and MMP-1-collagenase release. Clinical studies showed it to improve skin tone and firmness, microcirculation and peripheral vascularisation. In-vitro studies on collagen lattice of healthy fibroblasts or from red stretch marks also showed that 0.1% Camaderm decreases the tensile strength developed by fibroblasts from stretch marks, bringing them back to their normal level.

Aromtech uses supercritical carbon dioxide extraction to extract oils and bioactive compounds from plants. Summer Vita Strawberry Seed Oil contains linoleic, alpha-linolenic

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and oleic acid and strawberry seed antioxidants in a concentrated form. It is said to invigorate stressed skin and recent research suggests that it can be used as a moisturising and skin-softening agent in rinse-off products.

Vin-upLift from **Mibelle Biochemistry** is a unique tightening ingredient based on Swiss ice wine that is made from grapes that have been left to freeze naturally on the vine. Compared to classic wines, ice wine is characterised by significantly higher concentrations of juice ingredients that are also only partially fermented and this delivers astringent properties to the skin. To create Vin-upLift Swiss ice wine is spray-dried onto a carrier polysaccharide from *Caesalpinia spinosa* (tara) gum and the ice wine actives are fused to the water-binding skeleton of this polysaccharide. Clinical studies show that Vin-upLift can instantly and significantly smooth crow's feet wrinkles in a dose-dependent way. Vin-upLift also moisturises the skin on a long-term basis and it makes the skin appear both youthful and refreshed.

Fruit juices and waters are increasingly popular for replacing some or even all the water content of skin care products making natural claims. Botanykem from **Berkem** is a range of botanical extracts and floral waters from exotic and traditional French plants. Berkem uses an extraction process developed to minimise the environmental impact and preserve the integrity of active compounds found in these plants. They are a natural source of active molecules and due to its phytochemical composition, each botanical extract and floral water offers natural and essential benefits for the face, body and hair.

Botanica has developed an interesting range of water distillates for boosting formulas with botanical waters such as coconut water distillate and green tea water distillate. **Phenbiox** produces Active Juice from freshly centrifuged fruits and vegetables on-demand to guarantee the best preservation of the active molecules. **Brasca** produces Cytofruit Waters from organically certified fruits from the Mediterranean, including kiwi, bergamot, clementine and other citrus fruits.

Finally, it could be argued that the natural trend commenced with the ready availability of herbal extracts and **A&E Connock** continue to be a forerunner in this with its signature brand of Cosflor liquid botanical extracts and now incorporating Apicos bee-related and Dairycos dairy-based extracts. These provide the formulator with an extensive palette of natural additives and **A&E Connock** offers a bespoke development facility to ensure formula compatibility and to meet key marketing objectives. The service also extends to the development of customised extracts and blends, tailored to the customer's individual requirements.

The cosmetic benefits of the majority of materials mentioned are backed by extensive in-vitro and/or in-vivo testing and they also have COSMOS and/or Ecocert approval. Those interested are urged to contact the supplier for further information.

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