

Natural Ingredients

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John Woodruff

The movement towards sourcing and using cosmetic ingredients from natural sources continues with suppliers very active in promoting materials and actives of natural origin. Many suppliers also associate natural with sustainable sourcing, green processing and fair trade. It is not only the material suppliers that are looking towards sustainable sourcing; in April this year **Unilever** announced that it intends to source 100% of its materials sustainably by 2020 and was already sourcing 36% in this manner. Also in April **P&G** declared that it now achieves zero manufacturing waste to landfill in 45 of its world-wide facilities. This article features some recent introductions of natural-based ingredients, of those from sustainable sources and those using green processes

In-Cosmetics remains the principal exhibition for suppliers of ingredients to the cosmetic industry and in keeping with the trend towards minimising environmental impact its pre-event publicity announced that In-Cosmetics is working to provide event management that wherever practicable, minimises the negative and maximises the positive environmental, social and economic impacts of the show. It promoted various ideas to reduce the carbon footprint of delegates and suggested they each planted a tree to neutralise this effect.

It was at In-Cosmetics that **Brasca** introduced its new line of non-hydrogenated Specifeel NH Butters. Claiming they were the result of a patented technology, they were described as the perfect synergy between Nature's benefits and cosmetic needs. Brasca's stated aim is to protect the value of nature and people in product manufacturing and to care about its environmental impact by adopting eco-sustainable processes and to optimise sustainability from the entire product life cycle perspective. The **Brasca** NH butters are based on maracuja, baobab, argan, avocado, apricot, coffee, rose and black cumin oils with the INCI name of the source material followed by palmitic/stearic triglyceride where the triglyceride has been sourced from olive oil. According to **Lucas Meyer Cosmetics** vegetable butters are widely used in cosmetic products for their nourishing and softening properties and to provide a richness and comfortable sensation when applied. However, they can present a grainy aspect and leave a greasy sensation and a tacky after-feel on the skin. **Lucas Meyer** exhibited a number of vegetable butters created by emulsifying vegetable oils with rheology modifiers. An example was So'Sweet Whipped Butter that was created by emulsifying 15% shea butter with Lecigel [Sodium acrylates copolymer, lecithin].

In 2011 **Sophim** was presented with the Prix Pierre Potier Award for Green Chemistry and Sustainable development. It supplies a wide range of vegetable butters, oils and waxes including an alternative to petrolatum based on hydrogenated castor oil called Vegeline. Two variants are available that differ in melting point and they are claimed to have similar texturing effects to petrolatum but improved properties for cosmetic use. They improve skin moisture by inhibiting transepidermal water loss (TEWL) and their sensorial properties and smooth after-feel is like that of vegetable butters.

A wax newly introduced to the cosmetic industry is Cire de Sumac or sumac wax [Rhus succedanea fruit wax] from **Baerlocher France**. It has emollient and skin smoothing properties and is suggested as a beeswax alternative. **Strahl and Pitsch** suggests Vegerites as natural alternatives to ozokerite from the petroleum industry

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that can be used to gel vegetable oils. These products are blends of vegetable based ingredients developed to offer functional and effective non-petroleum alternatives to traditional ozokerite. Vegerite waxes are designed to approximate the physical properties, while also demonstrating the structure forming qualities, viscosity modifying and gelling characteristics of their original petroleum derived products.

Dr. Straetmans suggests Dermofeel Viscolid [Hydrogenated rapeseed oil] for cold processing of water-in-oil emulsions and it can be used to gel mineral oils, vegetable oils and essential oils. Sucragels from **Alfa Chemicals** are a range of oil-gelling agents and cold process emulsifiers based on sucrose esters.

Lubrajels from **Guardian laboratories** are well known as additives for skin moisturising products. There is now a natural version called, surprisingly enough, Lubrajel Natural. Its principal constituents are aqua, glycerin, beta-glucan, algin and xanthan gum and it can be utilised as a natural moisturiser, sensory improver, and emulsion stabiliser. It is thermally stable and its viscosity is little affected by pH. The addition of 8% glycolic acid to create an exfoliating gel provides a product that is clear at pH 3.5 and has a Brookfield viscosity of 87,000cps at 25°C.

Avocados are a rich source of lipids, proteins and vitamins and **Laboratories Expanscience** has based its new anti-ageing active, Effipulp [Hydrolyzed avocado protein, maltodextrin] on this fruit. The avocado peptide preserves the moisture content of the skin by stimulating the production and release of hyaluronic acid from the keratinocytes throughout the stratum corneum, epidermis and dermis. This provides improved skin density and a restoration of lost volume and it rejuvenates by restoring firmness and elasticity.

Water in various applications ranging from waste water treatment to increasing the water content of skin was a highlight of In-Cosmetics. **Follow the H2O Trail** was billed as an exclusive walkthrough staging 20+ innovative projects presented by exhibitors and described as a unique opportunity to discover new ingredients, new product concepts and technologies, uncovering ideas on how to improve water management in the name of beauty! It was sponsored by **Chimex** that demonstrated its waste water treatment process designed to return clear, clean water to the environment.

Claimed to have an air quality so pure that it is the benchmark against which the air quality of the rest of the world is measured is the rugged west coast of Tasmania. It is home to pristine rainforests, wind swept beaches, sheer cliffs prevailing winds that carry with them pure rainwater from over the Southern Ocean and Antarctica. With the nearest landmass over 10,000 kilometres away, the rainwater that is carried over the great Southern Ocean is untouched in every sense of the word. According to Kreglinger his is selectively harvested in north-west Tasmania under ideal conditions to ensure that Tasmanian 9 Rainwater is the purest obtainable. Kreglinger also supplies wines from its own estates in Tasmania.

Algae AS introduced AlgaeEsthe as a key ingredient obtained from a brown algae harvested from the sea of Arctic Norway. It survives the frigid sea in winter and the continuous sun of summer, it is said to gather natural elements such as vitamins, minerals and sea oligoelements. It is available as a powder or in cream form and is recommended for face and body treatments such as scrubs, soaps and muds.

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Aromtech offers a family of ingredients based on plants harvested from within the Arctic Circle to provide glycerin-water based extracts of plants used as ingredient in Northern naturopathy. **Indena** offers Mirtoselect as an extract from *Vaccinium myrtillus* (bilberry) that has been harvested in Lapland to provide a material rich in polyphenols and anthocyanins

Still on the H2O trail **Cargill** offered to add texture to the water phase of cosmetics by building viscosity to provide body and sensorial benefits. Well known as a supplier of starch-based ingredients to the food industry **Cargill** promoted the use of an agglomerated grade of cold-water swellable starch coded HiForm A12747. Also offering to add structure to water **The Innovation Company** featured water-in-water emulsifying technology as a way of optimising skin care benefits to cosmetic products.

Brasca exhibited its range of Cytofruit Waters and invited delegates to see a selection of coloured serums based on them. Fresh fruit is pressed under vacuum at 85°C to extract water to form juice concentrates as part of foodstuff manufacture. The water that is removed still contains many constituents of the original fruit and these are separated and concentrated by distillation and reverse osmosis to provide fruit waters with Ecocert organic approval. **Gattefosse** placed its Original Extracts vegetal waters on the H2O Trail and showed its two new ones from cranberries and from cherries. They are 100% fruit waters with COSMOS approval and can be substituted for the water content of cosmetic formulations.

Dermohydrine cellular active is the newest addition to the **ROVI** [now owned by **Air Products**] cosmetic active ingredient portfolio. Dermohydrine cellular active utilises natural extracts to enhance the moisture retention levels of the skin. According to ROVI in-vivo panel tests demonstrated excellent improvement in the hydration level of the skin. Epidermist 4.0 from **Codif** is an exopolysaccharide extracted from a marine organism that provides the skin with a soft and unique skin feel effect. It is a mixture of galactose and N-acetyl-glucosamine and is described as rebooting the skin hydra-memory function to help the skin to maintain its optimum hydration level.

Lipotec's contributions to the H2O trail were two new additions to its Lipomoist series. Diffuporine contains a hexapeptide [Acetyl hexapeptide-3] that enhances the expression of aquaporin 3, improving the water gradient from the basal layer of the epidermis to the stratum corneum. The other material was trade named Hyadisine and is an exopolysaccharide obtained by bio-fermentation from a marine bacterium found in Brittany. The water retaining profile of Hyadisine provides innovative anti-aging formulations with excellent long-lasting moisturizing and immediate anti-wrinkles properties, claimed **Lipotec**.

Synovea DOI [Isosorbide dicaprylate] from **Syntheon Ltd.** is a new molecule with very green chemistry derived from corn. Lipophilic in nature, Synovea DOI offers long-term hydration by regulating Aquaporine-3 responsible for skin hydration and skin homeostasis. Loss of skin moisture causes flaking, tight uncomfortable skin and fine lines and irritation so restoring skin homeostasis and hydration has a positive effect on sensitive skin. It also stimulates the production of key proteins to improve the overall skin architecture.

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Aquaxyl [Xylitylglucoside, anhydroxylitol, xylitol] from **Seppic** is a combination of materials of vegetable origin created to moisturise and restructure the skin by improving the flow of water and glycerin through the aquaporins. It is said to boost synthesis of hyaluronic acid, ceramides and intercellular cholesterol. It is water-soluble, preservative-free and can be cold-processed. A second material of vegetable origin from **Seppic** is Simulgreen [Hydroxystearyl alcohol, hydroxystearyl glucoside], which is an emulsifier with moisturising properties. It is shown to be compatible with a wide range of vegetable oils, silicone oils, mineral oil and various esters and is able to form stable emulsions with 20% oil when used at 3% plus 0.5% of a stabilising polymer.

Berkem is a French company with 40 years experience in extracting active agents from plants and at In-Cosmetics it released details of its latest offerings including Fresh'ka extracted from strawberry plant leaves for brightening the complexion and smoothing skin texture and Origa'light from oregano leaves that has skin lightening and antioxidant properties. There was also Polynektar Myrti'lla, which is a bilberry extract [Vaccinium myrtillus leaf extract] that helps fight against the unsightly appearance of redness and signs of cutaneous aging. It improves microcirculation and the skin's oxygen and nutrient absorption to provide a fresh complexion, free of redness.

Skin lightening remains a challenge for cosmetic formulators with those materials proven to work such as hydroquinone and arbutin having serious side-effects and many of the suggested alternatives difficult to stabilise in finished compositions. Now **Kalichem** has introduced Kalilight as a skin lightening compound based on a synthetic version of hydroxyapatite, a naturally mineral found in human bones and teeth. It is possible to calibrate the physical and chemical properties of synthetic hydroxyapatite for specific applications. Its characteristic as a slow-release source of phosphate and calcium ions to the skin cells suggests its use as an anti-aging ingredient for aged skin. Kalilight is a stable skin lightening material in which cysteine and glutathione molecules are bound by electrostatic and Van der Waals forces to the hydroxyapatite substrate and are slowly released into the skin to provide a synergistic skin lightening effect.

Sweetone from **Expanscience** modulates melanogenesis by reducing the quantity of melanin produced and the density of melanocytes. Sweetone [Saccharide hydrolysate, maltodextrin] is a concentrate of active molecules derived from Schizandra berries. The Schizandra sphenanthera berries used to make Sweetone are from Shaanxi Province, in the central region of China and are used in traditional Chinese medicine to reduce stress and fatigue and to increase vitality and endurance. They are wild grown and manually harvested in accordance with good farming practice, before being left to dry in the sun. Sweetone is a concentrate of active molecules that result from the enzymatic hydrolysis of the dried and defatted berries. After freeze-drying, a stabilised powder composition of peptides, sugars and hydroxy-acids on an organic maltodextrin carrier, free of preservatives is obtained. As well as modulating melanogenesis it modulates inflammation and slows the proliferation of endothelial cells, helping to reduce skin imperfections such as redness.

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Melissa was used by the Ancient Greeks for its soothing and healing properties, a practice that has continued to this day. Investigation into its properties shows that they are due to its concentration of rosmarinic acid, which has anti-inflammatory and antioxidant properties. Using a green chemistry process **Induchem** has converted rosmarinic acid into rosmarinyl glucoside, which is a more stable and more water-soluble form of the acid. When applied to the skin natural enzymes break down the molecule to slow release rosmarinic acid into the epidermis where it has an anti-inflammatory and soothing effect. It also inhibits metalloproteinases from degrading collagen so has an anti-ageing effect. Defensil Plus from **Rhan** soothes various forms of skin irritation and relieves dry, itchy, allergy-prone skin. It is a multi-component mixture that includes *Rosmarinus officinalis* (Rosemary) leaf extract]

Concerns and controversy over existing preservatives continues and the demand for more natural systems is very evident. Although prominent in the supply of “approved” preservatives **Shulke & Mayr GmbH** now also supply Sensiva PA 30 to meet this demand. Described as half-natural, half nature-identical, Sensiva PA 30 is a synergistic blend that combines the antimicrobial activity of two nature-identical fragrance ingredients, phenethyl alcohol and undecyl alcohol, with naturally derived propanediol. The moisturising properties of propanediol improve the skin feel of formulations while enhancing the efficacy of the antimicrobial components to effectively stabilise cosmetic formulations against typical microbiological contamination.

Inolex suggests Lexgard Natural [Glyceryl caprylate, glyceryl undecylenate] as an all-natural multi-functional ingredient system for preservative-free and self-preserving cosmetics. It is 100% vegetable derived. Dermosoft 1388 Eco [Aqua, glycerin, sodium levulinate, sodium anisate] is a natural preservative suitable for oral care from **Dr Straetmans**. Also from Dr. Straetmans Dermosoft Decalact [Sodium caproyl/lauroyl lactyl lactate] is a natural antimicrobial agent derived from sugar beet. It is effective against gram positive bacteria and yeasts with efficacy against *Melassezia Furfa*, dandruff; *Trichophyton*, athlete’s foot; *Candida Albicans*, thrush, and *P.acnes*, acne. The third antimicrobial material from Dr Straetmans is Dermosoft MCA Variante [Caprylyl glycol, dipropylene glycol, glyceryl caprylate] offering broad-spectrum protection to perfume-free products.

Although not a preservative Teflose [Propanediol, aqua, rhamnose, glucose, glucuronic acid] from **Solabia** inhibits pathogenic organisms adhering to the skin’s surface This makes it of interest for deodorant products and also for shaving compositions as it also modulates the inflammatory response and reduces itching and irritation. Another material with soothing and anti-inflammatory properties from **Solabia** is Fucogel. It is an anionic polysaccharide [Biosaccharide gum-1] obtained by fermentation and it also has a slow release hydrating effect and when topically applied at 5% it stimulates the release of sirtuins-1, which reduces the depth of wrinkles.

Niniderm from **Solabia** is a grape juice extract enriched in polyphenols by enzymatic biocatalysis. It has strong antioxidant properties to protect the skin from the effects of UV radiation. Also claimed to protect the skin from UV radiation is Uvaxine [Glycerin, polydatin glucoside] from **Induchem**. It is obtained by enzymatic

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glycosylation of a natural plant stilbene and it is a natural UV absorber and is said to enhance the skin's natural defence against UVA and to protect its DNA.

Following its acquisition of **Libragen Induchem** has added many materials originating from sugar chemistry to its portfolio of cosmetic actives. Inoveol CAFA [Caffeyl glucoside] is obtained by enzymatic processing of caffeic acid in green coffee extract. It has photo-protective properties and inhibits the release of metalloproteinase 9 thereby protecting collagen from enzymatic degradation. Caffeyl glucoside is one of the actives in Endothelyol from Induchem, which also includes rosmarinyl glucoside and gallyl glucoside. Endothelyol is obtained from plants using a proprietary biotechnology process and is claimed to regulate inflammation and to improve rosacea in 28 days. Caffeyl glucoside with disodium acetyl glucosamine phosphate are the active constituents of Erasyal that is claimed to repair and enhance skin.

Still with **Induchem**, disodium acetyl glucosamine phosphate is the active constituent of Novhyal, which is claimed to stimulate the skin's synthesis of hyaluronic acid. Gallic acid is the active principal of Inoveal Gala, which has antioxidant and anti-inflammatory properties. Sveltam is a mix of four synergistic actives: 7-methyl-xanthine, paraxanthine, theobromine and caffeine targeted at lipolysis stimulation and lipogenesis inhibition and recommended for slimming products. Inoveal Oleu is oleuropeinyl glucoside from olive oil that also reduces the inflammatory response and inhibits the release of interleukin 8, which is partly responsible for skin ageing.

Oléoactifs from **Oléos** are natural cosmetic ingredients based on Oléos' lipid-eco-extraction patented green technology. Developing synergies between the properties of natural ingredients of vegetable oil and the bio-molecules naturally present in plants, Oléoactifs are oily complexes of synergistic molecules which effectively reduce cellular oxidative stress, a major factor of skin ageing. There are currently six Oleoactifs with organic certification, including oils from pomegranate, epilobium and propolis. Oleos also produces Oleo'sense, aromatic materials based on a mixture of vegetable oils, butters and waxes with essential oils including those of myrrh, vanilla and cinnamon.

Many natural materials and the active ingredients extracted from them have a history of use in folklore and it is surprising how often these empirical beliefs can be substantiated in efficacy testing. One such material is BioPhyx AC from **N-Active EIRL** of Chile. It is an extract of leaves from *Aristolelia chilensis* or Maqui, a plant that grows at up to 2,500m above sea level in Chile. The native population use infusions to heal wounds and treat stomach complaints and tests show that they have anti-inflammatory, analgesic and anti-oxidant effects. The leaves are collected in an environmentally responsible manner and processed to provide BioPhyx® Ac as a protector and repairer of skin against oxidative stress due to its content of phenolic compounds, mainly tannins and flavonoids.

Another material sourced from the high plateaux of South America is Skinergium from **Laboratories Expanscience**. Maca [*Lepidium meyenii* walpers] is a taproot plant from the Brassicacea family that has been grown as a food crop and for its medicinal properties since the Neolithic era in the High Andes in Peru, at an altitude of 3,500 to 4,200 metres. The maca is ground into flour that is treated with a specific

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enzyme mix, in order to obtain a hydrolysate containing peptides and sugars. It is shown to stimulate the proliferation of aged fibroblasts, so can compensate for the age-related decrease in the dermal cell population and thereby counter intrinsic cutaneous ageing. It also improves complexion radiance and skin luminosity.

As part of the trend towards green processing, the provision of cosmetic bases that can be turned into completed products with the minimum of energy is gaining momentum. Sucrabase is a range of oily gel bases from **Alfa Chemicals** based on its Sucragel cold process emulsifiers that can be used to create a variety of different products by incorporating suitable additives. Up to 5% additional oil can be added to a Sucrabase without loss of viscosity. Up to 4% water may be added to form a thick cream or 8% for a lotion, however if more water is to be added the product may be thickened with carbomer or other rheological modifier. Sucrabase seems particularly suited for preparing exfoliating scrubs including sugar scrubs and face masks and to prepare bath milks, which bloom on addition to the bath water.

Dermofeel Easymuls [Sunflower seed oil polyglyceryl-3 esters citrate] is a o/w, natural emulsifier from **Dr. Straetmans** that is easy to use and can be processed cold to produce light emulsions and is especially suitable for lotions, milks and sprayable formulations. **Stearinerie Dubois** offers DUB Base Expert+ [Glyceryl stearate citrate, sucrose stearate, polyglyceryl-4 cocoate, cetyl alcohol, sodium ricinoleate]. It is self-emulsifying base which can be used to produce innovative o/w emulsions that offer a silky and non-greasy application. It is also recommended for adding to shower gels to create a rich and creamy moisturising body wash.

The Blanova Muls materials from **Azelis** are a range of PEG-free emulsifiers of natural origin. Blanova Muls GMSC is glyceryl stearate citrate, which can emulsify high levels of oil to form o/w emulsions and is suitable for cold processing. This material is common to the range; Blanova Muls Eco 77 has an addition of glyceryl stearate and Blanova Muls Eco 2277 also contains stearyl alcohol and sodium stearyl lactylate. If processing instructions are followed they result in liquid crystal structures offering superior moisturising properties. All Blanova Muls emulsifiers can be used to form sprayable o/w emulsions and Blanova Muls Eco 2277 latter forms the basis of two emulsion concentrates.

Polyethylene beads have long been a favourite material for cleansing and gentle exfoliating products and for use as a filling and binding agent in pressed powder products. However, its persistence in the environment and in particular its presence as a pollutant in the oceans is driving the search for alternatives. Whilst there are many from natural sources such as ground nut kernels for use as scrub agents most do not have the binding properties necessary for decorative cosmetics. Ecosoft products from **Micro Powders Inc.** are finely micronised biodegradable powders from renewable resources. They are designed for use as binders in pressed powder formulations and to provide increased slip and to enhance the texture of cosmetic and personal care formulations. Ecosoft 608 and Ecosoft 608XF are produced from 100% polylactic acid. Ecosoft 611 is a combination of polylactic acid and prime yellow carnauba wax, which are melted together then micronised in order to provide a homogeneous blend that has Ecocert approval. Scrub agents based on polylactic acid polymer are also available.

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Although skin care has been the prime focus for natural cosmetics there are materials meeting “natural” standards available for hair treatments. From **BASF Care Creations** comes Plantaquat NC [Cetearyl alcohol, lecithin, sodium cetearyl sulfate, olus oil], which is suggested as the principal conditioning aid to replace quaternary ammonium salts and silicone compounds in hair conditioners. Extensive efficacy test reports show that it works particularly well in association with Cetiol C5 [Cococaprylate] or Myritol 312 [Caprylic/capric triglyceride].

Formulating all-natural leave-in hair conditioners are more challenging and dependant on whether aqueous or oil based formulations. Making natural conditioning oils substantive to hair in aqueous formulations is a method of avoiding cationic surfactants as conditioning aids. Conditioning polymers such N-Hance SP-100 and N-Hance 4572 from **Ashland Laboratories** may be used at very low levels to dramatically improve the deposition of natural oils, such as meadowfoam and jojoba. Using as little as 0.25% N-Hance SP-100 conditioning polymer leaves up to 1,300 ppm of meadowfoam oil on the hair. This polymer has a much better ecotoxic profile when compared to traditional cationic surfactants. Additionally, naturally-derived thickeners may be used to maintain natural oil on hair fibres. Natrosol Plus 330 HEC thickener, based on cellulose, has efficient thickening properties as well as contributing to the overall conditioning effect.

At one time hair styling lacquers were based on naturally occurring shellac, from which lacquers got their name. Shellac is a resin secreted by the female lac beetle, *kerria lacca*, on trees in the forests of India and Thailand, which was dissolved in ethanol to provide an effective styling aid. However the film formed was very brittle and the solutions have a limited shelf-life so synthetic polymers displaced shellac from most compositions.

An attempt to merge sustainable maltodextrin with synthetic vinyl pyrrolidone has resulted in Biostyle GGP Polymer from **AkzoNobel**. Biostyle GGP Polymer [Maltodextrin/VP Copolymer] is a newly developed hair fixative polymer designed especially for use in styling products including clear hair gels, spray gels, creams, lotions and mousses. It provides clarity and the preferred rheology normally associated with synthetic fixative polymers, yet contains more than 50% renewable content. According to **AkzoNobel** Biostyle GGP Polymer represents a new way for formulators to create more natural and sustainable styling products without any sacrifice of performance properties.

AkzoNobel also supply a completely natural styling polymer called Amaze XT [Dehydroxanthan gum] described as a multi-functional styling polymer with thickening and suspending capabilities. Extensive salon testing results illustrate its curl retention properties in highly humid conditions and show that its wet and dry hair feel and combability are comparable with synthetic polymers.

Procondition 22 [Brassicamidopropyl dimethylamine] from **Inolex** is an amido-amine derived from brassicacea oil that provides good conditioning properties and a rich creamy viscosity when incorporated in formulations at 1 – 2% and neutralised with aspartic or glutamic acid. Brassicao oil is 34 – 40% stearic acid, 51-57% behenic acid and about 8% glycerin plus trace phytochemicals, all of which are incorporated in Procondition 22. Tests illustrate that Procondition 22 has better conditioning

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properties compared with the amido-amine of either fatty acid alone and against behentrimonium chloride and it has a good eco-toxicological profile.

It is now generally recognised that the C22 – behenic carbon chain is the optimum for providing hair conditioning. Beracare BBA Organic [Pentaclethra macroloba seed oil] from **Beraca** is a natural conditioner agent derived from Pentaclethra macroloba (Pracaxi) fruit. Pentaclethra macroloba is widely distributed in South America from north-eastern Venezuela through the Guiana's and into Amazonia. It improves wet combability and hair brightness, softness, shine and dry combing properties and helps to promote viscosity in emulsions.

Even when not claiming “natural” many ingredient supply companies are looking at ways of reducing environmental impact. This may be achieved by less energy demanding processing, by reducing waste or by improving the efficacy of existing materials. It is this last method that inspired **Ashland** to launch a new functional polymer that allows formulators of anhydrous antiperspirants to significantly reduce aluminum salts in stick and roll-on product forms without compromising antiperspirant activity. Trade named APShield AP this PVM/MA decadiene copolymer has high adhesion properties and tests show that it is possible to reduce the aluminium salt content from 20% to as little as 5% without loss of efficacy over time.

Nor are shower and bath products ignored when seeking to provide a degree of naturalness to a formulation: Lamesoft OD [Coco-caprylate, lauryl glucoside, glycerin, polyglyceryl-2 dipolyhydroxystearate, polyglyceryl-3 diisostearate] from **BASF** is a microemulsion that is able to form clear solutions in surfactant systems. When used at 4% in a body wash tests show that it remains on the skin to provide smoothness, hydration and improved skin feel. All ingredients are derived from renewable sources and it is shown to add perceived mildness, skin feel and moisture through deposition from surfactant products.

Kelisema offers KeliOat [Hydrolysed oat protein] to add mildness and skin benefits to body wash compositions. It is a water soluble oat protein hydrolysate obtained from non-genetically modified oat flour by an enzymatic process which yields peptides with optimum molecular weight. KeliOat is also naturally rich in hydrosoluble polysaccharides which are very delicate on the skin and can help the skin to remain smooth and soft.

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