



PRODUCT DOCUMENTATION

HUMATE PRODUCTS

CYTOSAN, CYTOSAN FOMENTUM, CYTOSAN INOVUM, BALNEOL





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Introduction to the topic

Peloids and their historical and current use

Peat and bog earth are natural healing soils which are scientifically called peloids. They are formed by gradual long-term chemical and biological degradation, particularly of plant and partly animal organisms – i.e. by humification processes involving numerous microorganisms, and in the long-term influenced by geological factors. In addition to the high content of active ingredients, remarkable physical properties offer another huge benefit in terms of therapeutic applications. Due to the high sorption properties, peloids are able to maintain a constant temperature over long time-spans and are an extraordinarily suitable natural material for medicinal wraps, baths and packs. Recently, much attention has been paid also to the internal application of peat extracts, which have a wide range of positive therapeutic effects and significantly influence detoxification of the entire body. The effects of humic substances have begun to be used widely in both human and veterinary medicine, as well as in agrochemistry, applied ecology and civil engineering. Peloids enjoy much scientific attention also due to their environmental potential, which may be availed of in agriculture, heating and, particularly, in toxic product decontamination of the environment.

On the history of balneotherapy

The beneficial effects of peat baths and mud wraps were used for medicinal purposes not only in ancient Greece and Rome, but as early as in ancient Egypt,

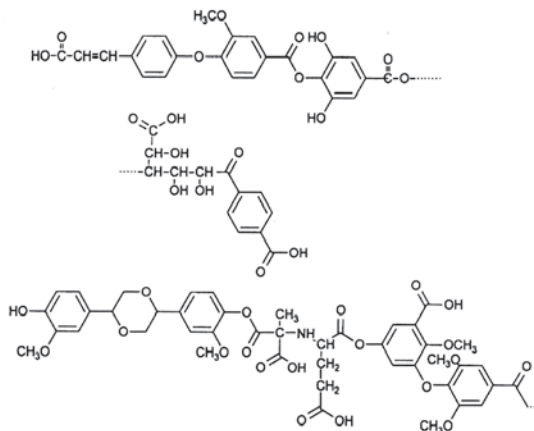
which has been evidenced by the discoveries of papyri the oldest of which dates back to the 19th century B.C. Nevertheless, it may be assumed that the use of peat for its therapeutic properties is as old as mankind, as the medicinal properties of peat pools are sought also by animals.

In the Central European region, the use of these natural substances started only in the 16th century and the first spa resort were Piešťany in Slovakia. The first reports speaking of the application of therapeutic mud that come from the Czech Lands appeared only in the early 1800s. Currently the effects of these substances are utilised not only in balneology, but also in dermatology, cosmetics, and healthcare.

Chemical composition of humic substances

Peloids derive their broad therapeutic potential from the high content of organic substances which are commonly called **humic substances**. These are chemically and biologically active organic carbon compounds, naturally present especially in sediments, soils, peat, brown coal and lignite (so called caustobioliths). These substances are formed by the gradual and long-term chemical and microbiological processes (exceeding 40,000 years). The richest source of humic substances is peat, which contains 80% of them; rich in humins, however, are also brown coal and lignite, where the proportion of humic substances represents tens of content per cent (20–30 %).

The typical representatives of humic substances are considered to be humic acids (brown in colour),



fulvic acids (yellow in colour), humin and salts of the above-mentioned acids – humates.

Humic substances are structurally much complex high-molecular (humic acids) and low-molecular (fulvic acids) organic molecules whose exact description is currently unknown, although they have been subject to research for 100 years. It is because methods commonly used for the research of organic compound structure cannot be used to study the structure of humic substances as colloids, and because humic substances are, under suitable conditions, capable of altering their structure, which is an important part of soil-forming processes and a reason why no strict boundary may be drawn between humic and fulvic acids. Humic substances have a huge range of molecular masses (2,000–200,000 g/mol), they are formed by three-dimensional cross-linked

molecules, whose centre is formed by an aromatic nucleus or by oxygen or nitrogen heterocycles. This nucleus is linked to aliphatic hydrocarbon chains, rich in various functional groups. These are predominantly carboxyl (–COOH) and hydroxyl (–OH) groups, as well as many others: methoxyl (–OCH₃), ketone (=CO), quinoid (=O) and amidic (–NH₂, –NH– ; =N–) groups as well as –SO₃H; –PO₃H₂ groups. The highly complex molecular structure may have a number of alternatives and differs by the origin of the raw material. The varied and complex structure of humic substances is the cause of a number of interesting physico-chemical properties, of which the most prominent are spectral, colloid, electrochemical, ion exchange and sorption properties.

Typical practical application is the utilisation of the ability of humic substances to chemically bind heavy metals, ions and gases with free electron pairs through various binding mechanisms – ion, covalent, as well as coordinate-covalent bonds, and a large amount of very weak bonds (hydrogen bridges) which are effectively much potent due to their high numbers. The activity of chemical forces is determined by the properties of functional groups which behave in a similar manner as ion exchangers called catexes.

In addition to their ability to chemically bind molecules and ions, humic substances are also capable of binding many substances through physical forces. These are the very physical abilities which ensure their remarkable sorption properties, as humic substances have a large internal surface whose cavities are interlinked with

ducts where not only ions but entire molecules may be captured. Here they are bound by electrostatic Van der Waals forces. Due to the size and segmentation of the molecule, the sorption capacity of humic substances is powerful. Sorption properties of humic substances also allow creating, besides other, highly stable aggregates with clays, which is an effect used when innovating Cytosan to Cytosan Inovum.

Humic substances are capable of surface binding not only of substances of inorganic origin (such as heavy metals), but also organic compounds of biological origin which is the principle of their antibacterial activity.

Specific features of binding mechanisms of humic substances

Polyionic activity

In order to explain the therapeutic effect of these organic substances, it is important to bear in mind that these complex molecules exhibit so called “polyionic nature”, which means that they are able to bind ions of various substances (through chemical and physical mechanisms), particularly at several sites of the molecule at one time, hence significantly increasing their efficacy. Humic substances are the carriers of ion-bound cations of valuable mineral substances which are exchanged for toxic ions upon contact with the latter. Humic substances hence work as so called ion exchangers.

Reduction potential

An important finding is the fact that humic substances exhibit reduction activity, which explains their huge

antioxidative potential and an important ability to reduce oxidative stress in the body, which is not only the cause of ageing, but also the cause of a number of civilisation diseases. The reduction capacity of humic acids has been proven by laboratory testing in e.g. some organic pigments.

Bounds with foreign substances

Humic substances are, furthermore, rich in so called quinoid structures (or 2-methyl naphthoquinone), which are especially important for direct formation of chemical covalent bounds of humic substances with foreign substances (possibly dangerous), without the need for any enzymatic catalysis. The presence of quinoid groups explains the ability of humic substances to bind amino acids. Humic substances are hence able to permanently fixate a number of toxic and mutagenic compounds of organic origin, foreign organisms (bacteria, viruses and fungi) and to excrete them from the body in stool without the risk of any damage to the organism.

Chelate bound

This is the most important type of binding interaction which has been described for humic substances. It is a special type of coordinate-covalent bound resulting in the formation of a complex which is usually called a “chelate”. The formation of chelate bounds allows for stable binding of e.g. heavy metals and other ionic compounds and for eliminating them from the body.

Mechanism of transfer of humic substances to cells and their activity

The mechanism of transfer of humic substance molecules into cells was elaborated by Kristian de Duve (1964) as a process based upon intracellular transformation of large molecules and particles.

The theory of this type of transfer does not allow for direct contact of humic substance molecules with the binding sites of cells. Large molecules are received as a result of endocytosis and thereafter they are transformed in digestive vacuoles formed when endocytotic vesicles fuse with lysosomes. All of the basic classes of biopolymers which enter the “peripheral part” of humic substance molecules or which are bound by them non-covalently (proteins, polysaccharides, nucleic acids, lipids), are broken down by ferments contained in the lysosomes.

As a result of fermentative hydrolysis, amino acids, sugars and nucleotides, which diffuse into cytoplasm and become involved in metabolic processes, are formed. Rejected residues of humic substances (the “nucleus”) are secreted from the cell during exocytosis.

The biological effects of humic substances upon live organisms are based upon the localisation of intact molecules of humic substances and high-molecular residues of their intracellular transformation in cellular walls or in the outer layer where they directly fuse with the cytoplasmatic membrane. This is how an active filter analogue, able to fulfil the following functions, is formed on the surface of a live cell:

- To fuse with heavy metal ions and to transform them into stable chelate-type complexes;
- To fuse with xenobiotic molecules (bacteria, viruses, fungi);
- To destroy free radicals forming in the plasmatic membrane as a result of lipid oxidation.

The general outcome of the above-mentioned humic substance effects upon live cells is the release of energy which, instead of being wasted for the compensation of negative impacts of the outer environment, may be utilised by the cell for its growth and multiplication.

Properties of humic substances from biomedical perspective

Anti-inflammatory and pain relieving effects

The list of medicinal effects of humic substances is very broad. In addition to antiviral, antibacterial, and antifungal activity, their analgesic (pain relieving) effects have been also evidenced. They reduce the risk of adhesions. Much pronounced, however, is their anti-inflammatory activity.

The effect of humic substances upon the stimulation of neutrophil granulocyte activity has been evidenced in a study; this has a direct impact upon combating bacterial infection due to the increase in the phagocytotic ability of white blood cells. The ability of humic substances to prevent growth of the following microorganism strains has been experimentally evidenced: Streptococcus, Staphylococcus, Enterobacter, Enterococcus, Candida albicans.

Anti-tumour activity

Research has demonstrated that humic substances effectively slow down the development of some types of tumour diseases. The protective and preventive effects are obvious particularly in the case of colon and rectal cancer. The anti-carcinogenic effect may be associated with high oxidative and anti-inflammatory activity of humic substances, including effects upon surface properties of cellular membranes.

Research has evidenced the ability to influence, in particular, cellular proliferation, i.e. multiple division or rapid growth of a group of cells. An in vitro study has shown anti-tumour effects of humic substances in leukemic cells and their role in the cessation of pathological multiplication due to the induction of apoptosis.

Current medical research is aimed, in particular, at the sphere of relations between humates and intestinal mucosa and at intestinal barrier issues.

Immunostimulation

Humic substances have an extraordinary impact on the increase of natural non-specific immunity due to the effective elimination of toxic substances from the colon. Immunity is increased also as a result of the above-mentioned ability to stimulate the activity of white blood cells.

Protection from radiation

Humic substances protect cells from various types of radiation, including radioactive and UV radiation.

Upon their contact with the complex molecule the rays induce the excitation of the electrons into higher levels, which means that the radiation energy is safely used and when the original status of the electron is resumed, the energy is irradiated in the form of harmless thermal energy.

Detoxification

Humic substances are much involved in the detoxification of the body. They are valued for their ability to bind free radicals and heavy metals (lead, cadmium, mercury) in the form of chelates, which are excreted from the body. The detoxifying process involves the entire body, as humic substance molecules, despite their size, penetrate in the most through digestive tract walls to blood. They neutralise free radicals, hence preventing cell damage, genetic information disruption, the development of infections, civilisation and tumour diseases and helping to stabilise the hormonal system.

Prevention of cardiovascular diseases

Humic substances enhance the oxygenation of cells due to their beneficial effects upon the vascular system. They are suitable as the prevention of myocardial infarction and stroke. They help to accelerate the dissolution of thrombi, blood hematomas.

Stimulation of the metabolism

Humic substances are known to catalyse enzymatic reactions, thus stimulating metabolism. This effect is

given by the following: humic substances are able to bind heavy metals and eliminate them from the body; equally though, they are capable of transporting into the body mineral substances which often act as co-factors or co-enzymes of a number of important enzymes.

Electrochemical balance

Humic substances help to stabilise cellular membranes, maintain electrochemical balance and they are involved in cellular regeneration.

Locomotive system

Due to their ability to reduce the toxic burden and due to their antioxidising activity in tissues and joints, humic substances exhibit positive effects on the diseases of the entire locomotive system including the spine, and on arthrosis, arthritis and other degenerative bone and joint conditions.

The positive effects of external use of humates on increased quality of life of patients suffering from chronic conditions affecting the locomotive system have been described in many a study. The application of humic substances has analgesic and anti-inflammatory effects and modifies metabolic processes. Concomitant internal use of humic substances may be expected to result in an increased therapeutic effect.

Humate and lignohumate in Energy products

product documentation – humate products

Energy products whose effect is based upon humic substance activity contain two different types of humates from various sources:

- 1) **humate obtained from peat – potassium humate**
- 2) **humate obtained from lignosulphonate – lignohumate**

These differ particularly in the nature of their original source from which they are obtained. While peat humate is obtained from peat – a natural geological resource mined in Northern Bohemia, lignohumate is a by-product of cellulose processing, i.e. it is a result of an artificial process of organic mass destruction. Chemically, peat humate contains a potassium salt of humic and fulvic acids; lignohumate is actually an approx. 1:1 mixture of humic and fulvic acids alone. Due to this combination, Energy humic products contain a very broad range of humic substances, which much enhance their efficacy and range of application.

Energy humate products composition

Cytosan

500mg mixture in hard gelatinous capsule

Active substances:

Lignohumate	448 mg
Silymarine	50 mg
Succinic acid	2 mg

Excipients: gelatine (capsule material)

Approval of the Czech Ministry of Health: HEM-350-29.6.01/18220

Cytosan Inovum

500mg mixture in hard gelatinous capsule

Active substances:

Lignohumate	358,4 mg
Potassium humate	50 mg
Green clay	50 mg
Silymarine	40 mg
Succinic acid	1,6 mg

Excipients: gelatine (capsule material)

Approval of the Czech Ministry of Health: OVZ-350-13.5.2008-26700

Cytosan Fomentum

100g finely divided mixture

Lignohumate	62,7 g
Potassium humate	26,9 g
Silymarine	10 g
Succinic acid	0,4 g

Balneol humate bath

110 ml

Water	73,3 ml
Potassium humate	22 ml
Glycerine	7,7 ml
Castor oil	2,2 ml
Combination of essential oils	2,2 ml
EDTA	1,65 ml
Phenonip	0,77 ml
Xanthan gum	0,16 ml

Energy humate products dosage and storage

product documentation – humate products

Cytosan a Cytosan Inovum

Dosage:

Adults and children from 12 years of age: 1 capsule per day, max. 3 capsules per day.

Children aged 6–12 years: 1 capsule per day, max. 2 capsules per day.

Children aged 3–6 years: ½ capsule per day.

Do not exceed the recommended daily dose.

After 2–4 weeks of usage the product should be discontinued for one week.

Warning:

Black discoloration of stool is a natural side-effect of humate products usage.

Cytosan definitely should not be used at the time of chemotherapy; the optimum time interval between the use of chemotherapeutic medicines and Cytosan is two days. On the contrary, Cytosan should be used during the interval between individual doses of chemotherapy.

The use of Cytosan or Cytosan Inovum during radiotherapy is beneficial and safe, as it protects the body from damage caused by ionising radiation.

Cytosan Fomentum

Dosage:

Dissolve 1 teaspoon of dry Cytosan Fomentum mixture in the necessary amount of water to obtain a thick paste. Apply to the desired sites on the skin and leave to work. After the end of the application wash thoroughly with water.

Not intended for internal use!

Balneol humate bath

Dosage:

This is a highly concentrated bath additive; the sufficient quantity for a therapeutic bath in a regular bathtub is 5ml (1/2 cap) of the product dissolved in warm water.

Storage of all humate products

Store at 10–25°C in a dry and dark place; do not freeze. To ensure long-term product life it is recommended to store the products in their original paper packaging. Any exposure to strong sources of light unnecessarily reduces the efficacy of the products.

Description of effects of individual components

POTASSIUM HUMATE AND LIGNOHUMATE

Overview of humic substance effects:

- They detoxify the body.
- They stimulate metabolism and support the immune system.
- A generally pronounced anti-inflammatory effect, particularly on the mucosa of the digestive tract.
- They clean the entire digestive tract.
- They dispose of pathogenic microorganisms (bacteria, viruses and fungi).
- They enhance enzymatic activity.
- They protect cells from damage caused by toxic substances and UV radiation.
- They have a protective effect on RNA and DNA molecules and their stability.
- They reduce the acidity of the internal environment.
- They are a valuable source of minerals.
- They enhance transport of minerals and their incorporation into cells.
- They enhance the efficacy of all subsequently used dietary supplements, herbal teas and extracts.
- They support healthy cell growth.
- They help to maintain electrochemical balance.
- They enhance the utilisation of energy in cells.

SILYMARINE

- a complex of active substances from milk thistle seeds.

Milk thistle – *Silybum marianum* L.
(syn.: *Carduus marianus* L.)

This is a frequently grown, vigorous, annual thistle with red-violet blossoms and rigid, white-spotted prickly leaves. It is a native of the warm Mediterranean region. It blossoms from June to August. The seeds, which are the source of Silymarine, are collected in late summer, just prior to complete ripening. The fruit (achenes) contain 20–30% of oil, 0.6% of sterols (beta-sitosterol, stigmasterol, campesterol, flavonoids – taxifolin, quercetin) and flavonolignans (silybin, silydianin and silichristin), coniferyl alcohol, 0.04% of tocopherols, amines (thyramine, histamine) and as much as 30% of proteins.

The mixture of silybin, silydianin and silichristin (flavonolignans) is called Silymarine and has been known under this denomination as the main component of a number of medicinal products. The major therapeutic effects of Silymarine include the positive impact upon the protection of liver and its enhanced function, enhanced liver regeneration, and enhanced gall bladder activity. Furthermore, they improve digestion and reduce fat (triacylglycerol) and cholesterol blood levels.

Protection from toxic burden

Silymarine exhibits antioxidative activity when destroying harmful radicals. Silymarine active substances have hepatoprotective effects (they protect liver cells). This is why Silymarine is

Description of effects of individual components

recommended for acute as well as chronic forms of hepatitis, liver cirrhosis, liver damaged by alcohol or medicines, or as a prevention of toxic effects of substances on the liver. The principal role of liver is to destroy unneeded, harmful or foreign substances in the body (chemical food additives, medicines, alcohol and other toxic substances – fungi, venoms, etc.), harmful infection-induced metabolites, steroid hormone metabolites, etc. Silymarine is an excellent supportive product for the liver, as it provides the liver with efficient protection from damage caused by chemical toxins. Silymarine in general protects and detoxifies the liver and stimulates their regeneration.

Anti-inflammatory and regenerative activity

Silymarine also inhibits prostaglandin production, which reduces the inflammation in the affected tissue; it stimulates proteosynthesis – the rate of ribonucleic acid synthesis, which enhances regeneration of damaged cells and of the body in general.

Harmonisation of fat metabolism

Active substances contained in Silymarine complex also help to optimise lipid (fat) and cholesterol blood levels. One of the Silymarine components – silybin – reduces fat oxidation. The usage of products containing Silymarine results in increasing levels of the “good” HDL cholesterol to the detriment of the “bad” LDL cholesterol levels, which act as preventive protection of vessels and the heart from atherosclerosis.

Silymarine is a suitable dietary supplement for people caring for their physical and mental health who are exposed to stress, work under extreme loads, and live a hectic lifestyle and people jeopardised by various kinds of infections. The use of Silymarine is recommended for patients with chronic liver conditions. It also provides much help during recovery from illnesses.

SUCCINIC ACID

Latin name: Acidum succinicum

English name: amber acid, succinic acid

Chemical systematic name: butanedionic acid

Chemical formula: $\text{COOH-CH}_2\text{-CH}_2\text{-COOH}$

Succinic acid is an organic acid which, together with its salts, forms an essential part of all live organisms. It looks like white crystalline powder with the taste of citric acid. Succinic acid is produced in the citrate or Krebs cycle active in mitochondria. Here, through a number of reactions, (aerobe saccharide, lipid and protein oxidation) ATP building stones, molecules which are the major energy source for cells, are formed. The citrate cycle plays a key role also in other metabolic processes, such as gluconeogenesis (the synthesis of glucose), transamination, deamination or lipogenesis (the synthesis of fatty acids). Succinic acid is hence produced by the body itself, as its requirement in cells is rather high and its adequate amounts are responsible for the energy balance of the cell. Succinic acid deficiency may be caused

by extreme physical, mental or emotional stress, i.e. situations occurring nowadays truly often, and it therefore seems to be very good for one's health to take succinic acid also as a dietary supplement. Succinic acid may be also obtained by dry distillation from amber (a fossilised resin of Tertiary conifers, 25–50 million years old, deposited in Tertiary sand and slate layers). In small quantities it is formed as a by-product of turbulent wine fermentation, through alcoholic sugar fermentation by the activity of microorganisms. In food industry, it is used to control acidity (it modifies pH), as a flavouring, flavour enhancer in beverages and meat products.

The therapeutic effects of succinic acid, or amber, have been known to people since times immemorial. As early as in Ancient Egypt and then in Ancient Greece and Rome people considered amber to have mystical and magic properties; in many a culture it was used as a talisman and medicinal tool. Succinic acid is a typical natural biostimulator; its regulatory activity increases the immunity of the human body and harmonises metabolism. The body responds to succinic acid quite naturally and tolerates it very well even in the form of a preparation; the acid is absolutely non-toxic, it does not accumulate in the human body, it is not addictive. It generally optimises energy balance and improves immunity. The use of succinic acid makes people more resistant to the effects of stress and increases their adaptability. It may be said

that succinic acid is an effective, harmless natural substance, which prolongs active life to the old age.

Liver and gall bladder protection

The anti-inflammatory effect of succinic acid was observed both in hepatitis (inflammation of the liver) and liver cirrhosis. It also effectively helps combat gallstones by reducing the excretion of salt and by dissolving tiny gallstones.

Protection from alcohol

The properties of succinic acid increase cellular ventilation activity, hence enabling to enhance the protection of the body from alcoholic intoxication. Succinic acid increases the ability to work and speeds up alcohol “burning” process, with rapid onset of effects combating “hangover”. These effects, however, manifest only in significantly higher than preventive doses.

Kidney protection

Succinic acid has been successfully used for the stimulation of kidneys even on cellular level. The anti-inflammatory effect of succinic acid has been evidenced in the treatment of the inflammation of the kidney pelvis (pyelonephritis). In addition, succinic acid helps to eliminate kidney stones.

Protection of the female organism

Inflammatory conditions are the most frequent obstetric problem. The treatment of such conditions

Description of effects of individual components

composes of the treatment of the cause proper of the inflammation, and of supporting the innate protective functions of the body.

Tumours

Succinic acid is also suitable as the prevention of undesirable adverse effects of chemotherapy or radiotherapy employed for the treatment of cancer. It accelerates healing by supporting the metabolism of the affected site, which improves blood circulation, brings oxygen to tissues, and toxic metabolites are more quickly eliminated.

Pregnancy

Succinic acid facilitates hormonal alterations in the organism of the mother during pregnancy and helps to cover an increased energy requirement. It balances the activity of the immune system, protects the body from various toxins, and reduces the risk of complications during pregnancy, so the foetus develops under optimal conditions, being supplied with sufficient amounts of oxygen as well as nutrients. Following delivery, succinic acid speeds up the mother's recovery and increases the production of breast milk.

Children

Many a scientific research has evidenced the positive effects of succinic acid upon the treatment of various paediatric conditions, from common inflammations to bronchial asthma. Succinic acid is therefore

suitable as a prevention of paediatric inflammatory conditions affecting the airways, and may be given also to infants. Its preventive use is recommended at the time of flu epidemics, cold weather, for children attending collective facilities etc.

GREEN CLAY

The greenish ground mineral, called green or French clay (for its frequent occurrence in France) is a pure natural bioactive substance with a broad range of applications. Green clay is formed by metallic oxides and a number of minerals essential for the human body. Its therapeutic and cleansing properties were used by people as early as in the ancient times. Green clay absorbs toxic substances, absorbs pathogenic spores, eliminates the consequences of excessive irradiation (radiotherapy), relieves excessive muscle strain and pain, has anti-inflammatory effects, heals burns and provides the body with essential minerals (significant effects in the treatment of fractures, arthrosis, rheumatism, metabolic disorders).

The more it is exposed to sun, air and rainwater, the more effective it is. It allows clay to employ all of its absorption abilities and to maintain the energy of the sun.

Green clay as a dietary supplement

In the digestive tract, clay is not absorbed and it is naturally excreted from the body. Its effect is thus

isolated and covers the entire digestive tube from the mouth through stomach and intestines to the anus, which is rather a lot. It has beneficial effects on excessive stomach acidity, flatulence, diarrhoea, it binds toxic substances and harmful microorganisms in the intestines, and if used in the long term (max.

1 year), the body is totally detoxified, the intestines and the digestive tract thoroughly cleansed, mucous membranes protected, and trace elements gradually supplied, which has an effect on subsequent cleansing of the skin.

Due to its neutralising capacity it much helps to optimise the pH of the stomach content. Its large areal surface allows it, through a physical mechanism, to take in gases and liquids, to soak up and absorb harmful substances and to eliminate them from the body. It thoroughly as well as gently cleanses the digestive tract from toxins, bacteria, gases and anything that distorts digestive tract mucosa. It helps during fatigue, stress, exhaustion, nervous weakens, and during regeneration processes in the body. It contains a number of mineral substances and trace elements, such as silicon (Si), aluminium (Al), calcium (Ca), iron (Fe) ions, potassium (K), magnesium (Mg), sodium (Na), manganese (Mn), phosphorus (P), copper (Cu), cobalt (Co), lithium (Li) as well as molybdenum (Mo) and others.

Experiments have shown green clay to have the ability to absorb radioactive radiation. This may be taken advantage of during therapies following

exposure of the body to radioactive irradiation. Due to the application of green clay after radiotherapy the entire therapeutic process is more tolerable and potential skin damage caused by radiation heals more rapidly.

If the principles of use are not observed, the adsorption capacity of clay may turn against useful intestinal microflora, as it has already uptaken the “bad” one. With respect to the above-mentioned, it is suitable to employ phased treatment, such as two, three or four (not more than six) weeks followed by a certain period over which the product is discontinued.

Green clay in tablets has the same effects as finely divided clay.

During targeted therapy employing clay the regular, time-specific usage should not be interrupted, as clay works continuously, by concatenating consecutive effects. If treatment is discontinued prematurely, the desirable effects are not achieved. At the start of treatment, the condition may worsen, which is caused by the current cleansing of the impaired site. It is advisable to use clay concurrently with a cleansing diet and increased intake of fluids. Potential worsening of the condition at the initial phase of the therapy does not signal jeopardy; on the contrary it is a sign of the functional activity of clay.

Humate products for internal use – Cytosan and Cytosan Inovum

The composition of Cytosan Inovum differs from the original Cytosan in the content of both types of humates (in addition to lignohumate it also contains a small quantity of peat potassium humate) and in the newly added French green clay complement, while Cytosan only contains lignohumate. The content of Silymarine and succinic acid is slightly higher in the original Cytosan (please refer to composition). The effects of these two products are similar, but their combination or, on the other hand, a targeted choice of one of them, may be much beneficial in certain cases.

Cytosan contains humic substances whose molecules are rather small and hence pass through the wall of the small intestine to blood very easily. For this reason Cytosan is much suitable for detoxifying the internal environment of cells, blood and any organ in the body. Its cleansing effect on the intestine is somewhat limited, though obvious. Cytosan Inovum is, on the contrary, highly targeted upon the precise elimination of any undesirable substances from the entire digestive tract and especially from the places between the intestinal villi, which are difficult to reach. The green clay complement furthermore enhances the detoxifying and anti-inflammatory effects of Cytosan Inovum due to the strong affinity of green clay to inflammatory sites.

In addition to lignohumate, Cytosan Inovum contains also a small amount of humate obtained from peat. As the source of this humate has been naturally biologically degraded, it may be expected to contain

rare metals and trace elements in quantities much exceeding those in a lignohumate prepared by special technologies.

Cytosan Inovum should be chosen where the digestive tract is burdened with toxic metabolic products, in the case of unhealthy diet and unhealthy lifestyle, suspected acute or chronic poisoning and where a risk of colon cancer exists. Due to green clay, Cytosan Inovum is also likely to have a larger potential to absorb intestinal gases and to have a more rapid effect in the treatment of diarrhoeal conditions and inflammatory processes in the digestive tract.

Cytosan should be selected as a sufficiently effective product for regular preventive as well as therapeutic cleansing of the body and to initiate detoxification before starting to use Cytosan Inovum, which in some cases might be over-effective, causing users problems like very frequent passage of stool. The inclusion of regeneration breaks in the use of Cytosan Inovum is necessary. A long-term continuous use could result in the elimination of positive intestinal microflora (please refer to Suitable combinations of other Energy products).

Mechanism of action of internally used Cytosan and Cytosan Inovum

The gelatinous capsule passes through the oesophagus to the stomach, where it is dissolved by gastric acids and the content of the capsule is mechanically mixed with the content of the stomach.

In this very moment the active ingredients of these products begin to act. If it is, for any reason, necessary for the product to begin to work as early as in the buccal cavity, it is possible to dissolve it in a small amount of water. In the stomach, the soluble substances contained in the product dissolve in a solution, they optimise pH, have anti-inflammatory and healing effects and humic substance molecules absorb any foreign substances of organic and inorganic origin which may be present. If improper food has been ingested, the timely use of ideally Cytosan Inovum is the best way to prevent digestive problems, and, in the case of heartburn and reflux, to prevent oesophageal mucosa damage. The components of the product which are soluble in water (succinic acid, Silymarine, and low molecular mass humic substances) are absorbed in blood circulation through the walls of the small intestine. Nevertheless, part of the content of the capsule remains in the small intestine (high molecular mass humic substances and green clay), they move to the colon and on the way they absorb metabolic waste products, heavy metals, gases and foreign substances. Cations of vital minerals and trace elements are also absorbed in the small and large intestines. Due to the presence of these substances, the surface of the intestine is protected, mucosa is kept clean, its function is stimulated and it is optimally covered by the protective layer of mucus. Humic substances together with green clay are much involved in so called mucous barrier which is one of the essential defence

mechanisms of the immune system. Substances passing through the intestinal wall, richly supplied with blood, to bloodstream are transported by so called portal circulation directly to the liver. Silymarine contained in Cytosan and Cytosan Inovum can immediately regenerate liver cells and support their detoxifying function and elimination of waste products by supporting the production of bile. Subsequently, blood with all of the active ingredients of the product then flows from the liver to all organs and tissues. Humic substances help eliminate metabolic waste products from tissues and succinic acid provides cells with energy and helps their regeneration. The effects of Cytosan and Cytosan Inovum are reflected in all body structures and are involved in detoxification and regeneration of the organism, which is a significant contribution to maintaining good health.

Suitable combinations with other Energy products

The internal use of Cytosan or Cytosan Inovum should precede the use of any other herbal products and dietary supplements. With regard to the thorough cleansing of the intestinal surface and elimination of toxic substances from the internal environment, the subsequent use of harmonising herbal concentrates may be expected to be much more effective and efficient. Moreover, the body's capacity to absorb vitamins and minerals contained in many other Energy products will be improved.

Humate products for internal use – Cytosan and Cytosan Inovum

The combination of Cytosan and Regalen enhances its detoxifying products due to simultaneous support of the liver function, as well as the combination with Renol or Fytomineral which concurrently supports the function of the kidneys. It is necessary to bear in mind that that concurrent regeneration of detoxification organs supports their correct function without which any effort to cleanse the organism is wasted!

Following a detoxification treatment with Cytosan or Cytosan Inovum exceeding one month, it is suitable to begin to take Probiosan which will ensure sufficient healthy colonisation of the intestinal surface with symbiotic bacteria. Nevertheless, in some cases (with proper diet) the use of prebiotic Chlorella which will create suitable environment in the intestines for correct natural colonisation is sufficient.

Other methods of internal use of Cytosan and Cytosan Inovum

Generally speaking, the easiest way to use both Cytosan and Cytosan Inovum is swallowing the gelatinous capsules with sufficient amounts of still water. There are, however, cases when swallowing capsules is difficult or even totally impossible or where it is necessary to use the protective effect of humic substances on the buccal cavity and oesophagus. In these cases it is possible to simply disconnect the humate capsule and dissolve in larger amounts of still water (0.5dl – 1 litre). This will give a dark brown drink neutral in flavour and aroma.

When dissolving Cytosan Inovum, a clay sediment will appear on the bottom which is not soluble. Drinking the sediment is essential for the optimum function of the product.

Drinking the Cytosan beverage provides an advantage in terms of a more gradual, slower, and therefore more thorough but gentler effect. The beverage represents also a suitable way of use for children. In this case it is particularly essential to make sure the water used for the drink is of high quality.

A number of studies have evidenced the positive impact of the internal use of humic substances upon the quality of life of livestock, the support of their reproduction, increased viability of offsprings, improved quality of meat, increased egg yield, and overall improvement in the resistance of the breed. The utilisation of the properties of humic substances for crops also seems to have a huge potential. In addition to increased yields, influence upon better pest resistance has been also observed.

Indications for internal use of Cytosan and Cytosan Inovum humate products

- Bacterial and viral infections and fungi (herpes virus, cytomegalovirus, Helicobacter pylori, Candida albicans etc.)
- Inflammatory conditions of the mucosa of the buccal cavity, pharynx, stomach and diarrhoeal conditions, as well as inflammatory conditions of

the small and large intestines (Crohn's disease, ulcerative colitis – Cytosan only in this case)

- Gastric and duodenal ulcers
- Regeneration of the liver following or during a liver infection (hepatitis, mononucleosis, etc.)
- Protection of the liver from liver toxins and regeneration of previously damaged liver cells (cirrhosis, steatosis, etc.)
- Rheumatoid joint conditions, arthrosis, arthritis, spinal pain, etc.
- Psoriasis, eczema, rash, acne, and itchy skin infections
- Prevention of cardiovascular diseases and positive effects on secondary diabetic consequences
- Hormonal disorders, irregular period, climacteric problems
- Prevention of osteoporosis (especially Cytosan Inovum)
- Chronic fatigue syndrome and lack of energy
- Oncologic conditions, radiotherapy (preventing recurrence)
- Paradentosis and increased formation of dental caries
- Protection from free radicals and cell ageing
- Deep detoxification of the body
- Regeneration and protection of cells from the effects of heavy metals, poisons and toxic substances (chemicals, smog, dust, and smoke from the environment and long-term use of medicines and hormones), prevention of excessive chlorine burden in professional swimmers

- General stabilisation of the organism and anti-stress activity
- Decelerated body ageing due to the antioxidative activity

Auto-intoxication – the intestines as the home of good health

Human diet is not free from residues, and not much healthy, either, and definitely not balanced at all. Most of the stuff we eat has to be excreted through our digestive system from the body. Waste products from food together with metabolic by-products from food processing may cause much damage in the body, if they are not excreted from it or if they remain inside for too long. Auto-intoxication is an epiphenomenon to all health problems which seemingly have nothing in common with the quality of the intestines. And yet the intestines are the very organ which is responsible for the elimination of anything that has no longer its place in the body, anything that is no longer needed. This “human waste” is more or less toxic, full of products from decay and fermentation processes which take place in the intestines. Stool often comprises not only of gases and digested food, acids and alcohols, but also of pronouncedly toxic substances such as methanol, propanol, butanol, indican, putrescine and cadaverine, whose toxicity is very high. Where the intestinal mucosa is impaired, these so called decay toxins enter blood circulation, causing the above-mentioned auto-intoxication which in itself may be the cause of the following health symptoms:

Humate products for internal use – Cytosan and Cytosan Inovum

- General worsening of health
- Unpleasant body and mouth odour and strong sweating
- Worsened mood, irritation, depression and sleep disorders
- Headache, joint pain and backache
- Cardiac and vascular problems
- Tumours
- Exhaustion, weariness and absolute lack of stamina

This has to be considered together with the impact of toxic substances received from the outer environment (water and air), food additives and preservatives, medicines and all unnecessary chemical substances which are part of a number of food supplements and medicinal products.

The insufficient ability of the intestine to carry out its function or its overload results in shifting the excretory function to other body organs, which are burdened by this activity that may be, ultimately, the cause of their worsened condition. Waste products are then excreted from the body by urine, skin and mucosa, all of this under an increased liver and kidney activity. If waste products are not excreted from the body, they begin to accumulate, causing further health problems, from acne through cellulitis to rheumatic disorders, atherosclerosis, gallstones and kidney stones, cataract, etc. Toxic substances are also much deposited in the brain and are the cause of mood and behaviour swings. Regular cleansing of the digestive tract is a must also

for those who truly attempt to live a healthy lifestyle as they cannot avoid the by-products of their own metabolism, either.

The internal use of Cytosan and Cytosan Inovum enables to take care of the health of the intestines whose quality is the underlying prerequisite for maintaining good health, youthfulness and beauty.

Humate products for external use – Cytosan Fomentum and Balneol as well as Cytosan and Cytosan Inovum

product documentation – humate products

Practically all Energy humate products may be applied on the skin both for therapeutic and cosmetic purposes. Each, however, has its own specifics and scope of suitable application.

Cytosan Fomentum is intended primarily for the application of dressings and wraps by simply mixing the finely divided mixture with a small amount of water. It supports the detoxifying capacity of the skin and skin regeneration and has pronounced anti-inflammatory effects also on deeper tissue structures. Cytosan Fomentum dressings may hence be used for inflammatory conditions of the viscera (such as liver, kidney, lungs, spleen, pancreas) and for any health problems of the locomotive system (bruises, fractures, inflammatory and degenerative joint conditions, pain, strained muscles). It may be successfully combined with the entire Pentagram® of creams or with Drags Imun, which further target the sphere of application of the wrap. A Cytosan Fomentum wrap or dressing may be also used for various reproductive organ disorders, painful or excessive period, chronic inflammations of the womb, or female genital yeast conditions. External application also helps combat toothache, dental sac inflammation, gum inflammation and oedema. Cytosan Fomentum may be dissolved in water and used in the form of baths, especially sitz baths, for obstetric and urological problems. The bath improves the quality of the skin, relieves from itching associated with rash and skin conditions,

has anti-inflammatory effects and helps to regenerate the skin and mucosa.

Balneol is intended primarily for baths, but it may be also used as a dressing, by applying the liquid onto a swab, and applying the swab onto the affected area. Balneol should be used in the form of a dressing where it is desirable to provide a sufficient supply of blood to the affected area (side effect of ethereal oils). On the contrary, concentrated Balneol should not be applied on damaged skin and open wounds.

Cytosan and Cytosan Inovum may be also used externally either to wash surface wounds, rashes or chronic open wounds (venous ulcers) or as a highly efficient cosmetic product in the form of skin masks (face, neck and cleavage). In this case it is also ideal to supplement the effects of succinic acid and humic substances with the effects of herbal creams. Adding a specific cream will create a mask tailored to the specific skin type. Cytosan as well as Cytosan Inovum may be mixed with water and afterwards with the Biotermal roughly ground salt, which gives a highly efficient natural peeling.

Targeted combinations of Cytosan and Pentagram® creams:

- Cytovital + Cytosan – mature dry skin, wrinkles
- Protektin + Cytosan – youthful, problematic skin, pigment spots
- Artrin + Cytosan – skin cleansing, treatment of face sinus inflammations and toothache

Humate products for external use – Cytosan Fomentum and Balneol as well as Cytosan and Cytosan Inovum

- Droserin + Cytosan – refreshing and toning the skin, suitable during rhinitis and cough
- Ruticelit + Cytosan – anti-inflammatory effect on the skin as well as internal tissues and organs

The mechanism of action of externally used Cytosan and Cytosan Fomentum

Humic substances contained in Energy humate products have the ability to intensify detoxification of the body through the skin, employing the principle of osmotic pressure gradient. This effect is achieved due to the high content of ions bound in humic substance molecules. This allows for influencing also inflammatory processes under the skin surface, in more internal layers of tissue structures via external application of humate products in the form of wraps or baths. Skin surface proper is also cleansed, supplied with blood, healed and regenerated, also due to the beneficial combination with succinic acid. Humic substances have astringent (constricting) effect on the surface of the skin and exhibit pronounced anti-inflammatory effects. Skin is an important detoxifying organ of the body. Together with the colon and lungs it is involved in the elimination of waste products from the internal environment. Lungs, colon and skin are the major organs of non-specific immunity. Their surface is the place not only of displacement of undesirable waste products, but also of interaction with pathogenic organisms and combating thereof. If these organs are too busy with the excretory function, their

immune function is logically impaired and pathogens can easily penetrate into the body. Compared to the intestines and lungs, skin has a much smaller area (approx. 2m²) and helps the body to get rid of those waste products which, for any reason, have not been eliminated through the intestinal way. Skin cleanliness hence often reflects the condition of the colon and vice versa. Supporting the excretory capacity of the skin may significantly help the general detoxification of the internal environment of the body. Skin, however, is not a merely excretory organ; substances are exchanged between the skin (or mucosa) and the dressing or bath – biologically active substances are resorbed and waste products together with sweat leave the body. The skin is capable of resorbing in particular valuable minerals and trace elements, as well as some humic substances of lower molecular mass. The absorbed substances improve the quality of the skin and mucosa, have anti-inflammatory effects and enhance healing processes in the skin and mucosa. Important is the effect of humic substances on vaginal mucosa where the resorption process is much more extensive than on the skin. A humate bath also normalises pH, thus supporting natural microbial colonisation of the vaginal mucosa.

Effects of humate products on the locomotive system

As humates are involved in detoxification processes, and have provable antioxidative and strong anti-

inflammatory effects, it is suitable to avail of their effects in the treatment of inflammatory joint diseases, such as arthritis, rheumatoid arthritis, and gout. Furthermore, humates have a provable positive impact on joint regeneration and they enhance the mobility of the entire locomotive system, including the spine.

Baths

Baths in general

Bath is an external application during which the entire body or part of it is submerged in an environment which influences the skin. It may be a liquid (most often water), a peloid (peat or mud), light, heat, air (containing various gases or essential oils), sand or combination thereof. The effects of baths are based on thermo-physical, physico-chemical and biochemical activity. An optimal skin care is not necessarily complicated or expensive. Nature provides a huge range of gentle and well tolerated substances which may be used for body care. Baths with various active substances help attain good health, inner harmony, fresh and youthful feel. For thousands of years, mankind considered water, the sun, herbal extracts, peat and mud the potion of health and beauty.

The temperature of the bath usually ranges from 35 to 40° C. In general it may be said that colder

baths have rather excitant, stimulating effects, while warmer baths calming and relaxing effects. Application of baths is generally recommended in the evening hours. Baths are never to be applied directly after meals or on full stomach. The duration of baths is approx. 5–30 minutes, depending on the temperature, type of bath, kind of problems, conditions and age of the bather. After a bath it is good to shower the body with clean water, let it dry spontaneously and treat the skin with body milk. Its is also recommended to take a dry wrap in a sheet, to cover the body with a light blanket and rest in the bed for half an hour – this increases the potency of effects of the bath even more.

Effects of peat baths

The ideal temperature of a peat bath is 35–37°C. Humic substances remove harmful deposits from the body by which the natural function of the skin is restored. Proper skin function plays a major role in healthy blood circulation and blood circulation influences the proper function of the entire body. It should be borne in mind that the skin is our natural protection from infections and diseases, and it therefore deserves to receive more attention. Humic substances alleviate the signs of irritated and itching skin, and enhance the protective acidic layer due to which the body better fights diseases, and nonspecific immunity of the body is increased. Peat baths are a well-established tool especially in the treatment of obstetric and skin problems,

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and locomotive system conditions. Their effects, however, are also reflected in improved blood circulation, enhanced immune system, alleviation of inflammatory processes within the body and supported detoxification of the body. Humate baths have also stabilising and relaxing effects on mental health and generally enhance regeneration of the organism.

If you wish to make a humate bath of a very powerful effect, it is advisable to use Cytosan Fomentum. Balneol humate bath has, due to the content of castor oil, lower capacity to enhance the exchange of substances between the bath and the internal environment of the body. It is therefore advisable to apply Balneol with a view to the content of essential oils, which boast remarkable aroma-therapeutic properties and have beneficial effects particularly on the nervous and respiratory systems.

Content of ethereal oils in Balneol

LAUREL: supports the stomach, helps combat dandruff and hair loss, helps in muscle pain and rheumatism.

GRAPEFRUIT: it has anti-depressive, disinfecting, refreshing and stimulating effects.

WHITE CEDAR: it destroys bacteria and fungi, helps combat inflammations of the upper airways and arthritis.

JUNIPER: it is remarkable for its cleansing capacity, it helps combat urinary tract diseases, and has

antiseptic effects on the respiratory system, it is effective in muscle and rheumatic pain, it mitigates sweating and has calming effects on mental processes.

CAMPHOR: it has antiseptic effects and helps combat colds, flu and rheumatism; it has sedative effects and enhances the digestive tract.

LITSEA: it has anti-depressive effects and it is suitable as prevention of infection diseases, it cleanses the air, combats fatigue, and improves concentration.

STYRAX BENZOE: it has anti-inflammatory, healing and soothing effects.

Cytosan Fomentum

This product is much suitable for the preparation of a therapeutic humate bath – 1 teaspoon of the product for a bathtub. The duration of this bath should not exceed 20 minutes and after the bath it is good to reserve time for rest, as it is natural to feel rather tired after a detoxification bath. It is also advisable to treat the whole body with a selected Pentagram® cream or Caralotion body milk to enhance the regeneration of the organism.

The advantages of Cytosan Fomentum compared to typical mud baths

1. Compared to traditional mud baths, a Cytosan Fomentum bath does not present a heavy burden for the cardiovascular system. The high viscosity

of normal peat baths results in hydrostatic pressure which causes the blood to move from the periphery and abdomen to the chest which may cause complications in higher-risk individuals.

2. Cytosan Fomentum has a high content of the organic component which forms a colloid solution of a high sorption capacity. The chemical effect of a mud bath has been reported to increase with the reduced proportion of solid substances in the bath, like in the “black water” used in balneology.

Indications for Cytosan Fomentum humate bath

- Chronic inflammatory degenerative diseases of the locomotive system
- Posttraumatic and painful conditions of the muscles, bones and joints
- Postoperative regeneration
- Primary and secondary osteoporosis
- Nerve and muscular conditions and muscle cramps
- Post-stroke conditions
- Sterility and infertility, ovary impairments
- Chronic inflammatory obstetric conditions
- Conditions following obstetric surgeries
- Chronic as well as acute inflammatory diseases of the urinary tract
- Diabetes
- Enhanced peripheral blood supply
- Skin diseases, acne, eczema, and rash
- Fungal diseases
- Mental problems (neurasthenia, tension, stress)
- Respiratory system conditions, asthma

Conclusion

The need for regular detoxification of the body is indisputable. Even if one leads the most disciplined lifestyle, the human body does wear off and waste products accumulate within. This toxic burden is the natural cause of ageing, inclination to diseases, and ultimately, also the cause of a natural death. Just as it is necessary to regularly clean up the household, to be able to live there, it is equally necessary to “tidy up” the body.

Formerly, cleansing rituals were a regular part of people’s life, which was based upon nature cycles. Nowadays, unfortunately, uniformity rules both our lifestyle and diet, which for most people remains practically the same throughout the year. The general environmental pollution together with unfit dietary patterns, lack of sleep and exercise, and excessive stress much contribute to the accumulation of toxic and waste substances in the body and to the generally lower capacity of the body to eliminate these substances.

It is therefore suitable to pay attention to the detoxification of the body and to the support of its excretory functions at least twice a year, by means of a detoxification treatment (e.g. Cytosan in the spring, Cytosan Inovum in the autumn) or, even better, support the detoxification capacity of the body continuously. Ideal products for continuous detoxification are humate baths combined with the Biotermal salt, as they have no contraindications,

they are readily available also for home application, and they have the benefit of concurrent internal detoxification. The skin and colon are mutually interconnected organ systems, so if we facilitate the activity of one, the other will be relieved as well. It is ideal to combine both approaches and to support the cleansing of the body via skin as well as the elimination of waste products via the digestive and excretory system. Cytosan and Cytosan Inovum are highly suitable for this purpose; they are much effective and adequately gentle. In combination with the Pentagonam herbal concentrates® or herbal creams® they have detoxifying and regenerative effect on the entire system of the body and they help resolve individual problems.

When detoxifying, it is necessary to pay much attention especially to adequate and sufficient intake of fluids. If the body is not sufficiently hydrated, it is incapable of excreting and eliminating waste products. An average person needs (depending on the body weight) a daily intake of approx. 1.5–2.5 litres of pure still water in addition to that received in food. Unnecessarily high fluid intake may be to the detriment and present an inappropriate burden for the kidneys. It is necessary to drink larger amounts of fluid by 3 p.m., which is particularly important for persons with cardiac, vascular and kidney risks.

The quality of water is very important. In general, it may be said that the best water is spring water,

obtained directly from the natural resource. Where such water is not available, water from the municipal source which has been left to stand for some time or boiled, is sufficient and is often a better alternative than bottled water whose storage conditions are never sure. An interesting and simple way to treat drinking water is freezing, which enhances the quality of the water.

Mgr. Tereza Viktorová

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