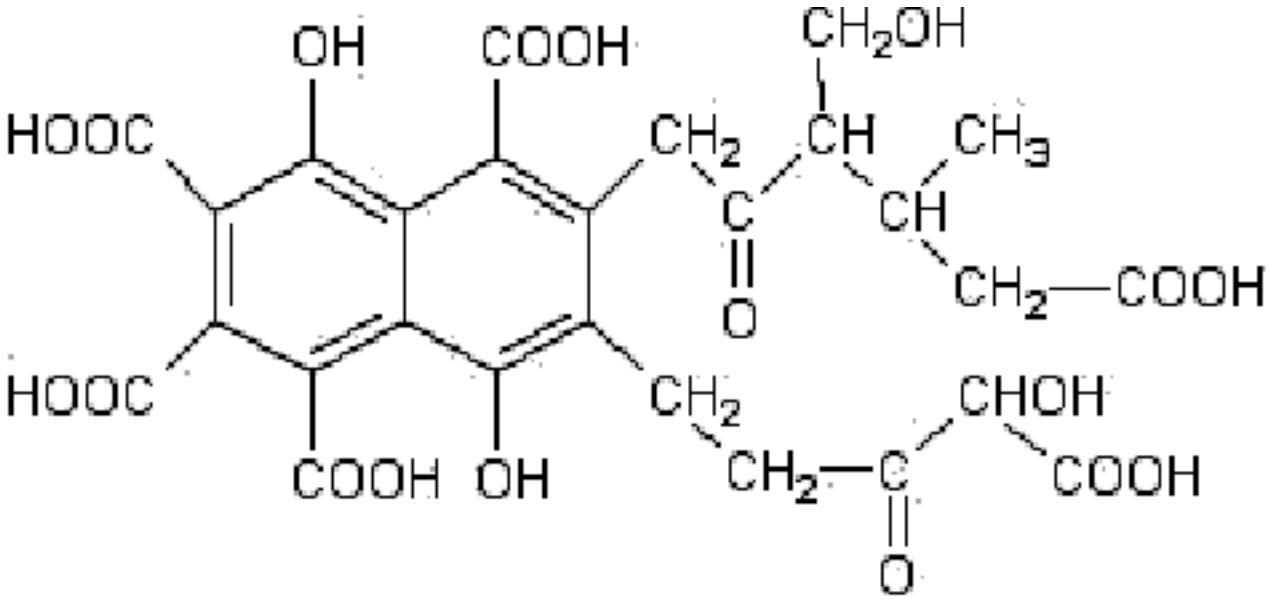
Fulvic Acid

&

Humate

Natures Miracle Substance



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Section 1

If you are currently supplementing with minerals labeled ionic or colloidal, the discovery and understanding of fulvic acid should excite you.

Nature has provided us with every nutrient that we need to live a long, healthy, and active life. Unfortunately, we're no longer able to enjoy all of the earth's goodness because of the way we process our already fragile foods to death. It doesn't help that our soils have been ravaged and that the animals we eat are regularly given steroids to artificially stimulate their growth.

Plants, the Soil, and Your Health

You may wonder why we can't receive the same nutritional value from the plants that we eat as we can from plant-derived minerals in a liquid form. The primary reason is that the soils that are used to grow our fruits and vegetables today have been depleted of their natural resources. Soil no longer has the abundant vitamins, minerals, and other nutrients that it once did.

Today, farmers are pressed for time and force their fields to produce crops that yield high quantities of vegetables and fruits – with very little regard to the nutritional content of the foods that are grown. So that growth can be hurried along, we've begun to 'supplement' our farmlands with high amounts of nitrogen, phosphorus, and potassium (N-P-K), but very little else.

It is a widely known fact that when high amounts of nitrates are present, plant protein formation is increased. Such an excess of nitrates can also cause an overabundance of amino acids. If the amino acids aren't used by the plants, they can attract insects. Of course some organic farms are a bit better, but the quantity of nutrients still pale in comparison to a good liquid, plant-derived mineral product.

A second reason that our plants fail to nourish us properly is because the soil has been depleted of beneficial microbes. These microbes are necessary for plants to convert inorganic substances to organic. Without this conversion the plants become deficient in minerals. This means that those who eat the plants can also become deficient.

Doctors have known for years that everyone needs at least 90 nutrients to maintain their health. These nutrients include a minimum of 70 minerals, 18 amino acids, and three essential fatty acids. To obtain these nutrients we are admonished to eat at least 57 different sources of food each week. For most people this admonition is much less than practical and sometimes completely impossible. The monetary budget required to obtain such a diverse list of foods would be enormous. Even discounting the monetary aspect, almost no one has a large enough selection of foods at their disposal to satisfy these requirements.

Even if it were possible to eat a 'balanced' diet which consisted of the proper portions of carbohydrates, proteins, fats, etc., you would still be nutritionally deficient. Why? It is due to the fact that the foods that we eat are heavily processed (canning, cooking, microwaving, etc.) and nutritionally bankrupt.

The only alternative that we have is to supplement our diets with good, high-quality nutritive substances such as antioxidants, vitamins, and plant-derived minerals.

One of the most popular ways to increase your intake of minerals is through the use of liquid minerals (sometimes known as ionic or colloidal). This type of mineral supplement has special properties that no others do. However, before you run out and grab a bottle, you should be aware that not all colloidal minerals are the same.

In today's highly competitive marketplace, many manufacturers would have you believe that one colloidal or ionic mineral supplement is just as good as another, it simply isn't true. Most liquid, plant-derived minerals are a unique and superb source for over 70 different minerals. Since almost everyone, regardless of their social or economic status, is horribly mineral deficient, mineral supplementation is a logical place to start. While this form of supplementation doesn't fulfill all of your nutritional needs, it may help reduce the possibility of developing several disorders. Osteoporosis, cardiovascular disorders, arthritis and others are all disorders that have been directly linked to a lack of minerals.

The Role of Fulvic Acid and Plant Nutrition

By definition, fulvic acid is "a water-soluble, natural organic substance of low molecular weight which is derived from humus, often found in surface water." – Water Quality Association

Sources of true, plant-derived minerals are called humate deposits. These deposits, if they contain water-soluble, bioavailable elements, will also contain high amounts of humic acids. Fulvic acid is one of several subclasses of humic acids.

Humic acids are composed of a complex mixture of partially decomposed organic materials. These acids are endowed with the ability to chelate positively charged ions, such as elemental minerals, that are absorbed by plants. This natural chelation allows plants to store both vitamins and minerals and helps to increase their overall bioavailability.

Fulvic Acid and Organic Transmutation

The absorption factor of ionic minerals greatly exceeds traditional tablet supplements. This is one of their strongest advantages. However, those who take plant-derived colloidal minerals are often concerned by the fact that, when the manufacturers list the contents of the supplement, the names of heavy metals appear on the label. While this alarms many people, it shouldn't. The fact is that true organic, plant-derived minerals do not contain heavy metals.

Organic, plant-derived minerals are able to be safely used by your body because of the fact that nature has acted upon them and transformed them into organic material rather than allowing them to remain in their elemental form. This is called organic transmutation.

A driving force behind this miraculous transformation is fulvic acid. The reason that labels list 'heavy metals' is that even once elemental minerals are transformed and stored within plants, they retain their original chemical names. Again, once an elemental mineral is reacted on by fulvic acid and photosynthesis, it is changed from inorganic to organic. This process is often called transmutation. As we read in 'Biological Transmutations,' fulvic acid can actually transmutate magnesium and vegetal silica into a form of calcium that can be used by humans.

Fulvic acid is present in every true plant-derived, organic mineral. The same cannot be said for elemental minerals which are derived from rocks, shells, and certain clays. While elemental mineral supplements may claim to have a wide range of minerals, they cannot compare to the safety and availability of plant-derived substances. It should be noted that fulvic acid itself can contain as many as 60 different mineral compounds – this is above and beyond any other source of minerals with which it is joined.

As is discussed in "The Value of Organic, Plant-Derived Minerals" (Issue #205), when positively charged minerals are absorbed by plants, their bioelectrical polarity is changed to a

negative charge. Whenever normally toxic minerals, such as iodine, are absorbed and transformed by plants, they become non-toxic. It may be the chelation factor that accounts for the ability of fulvic acid to neutralize the toxicity of heavy metals such as lead. The actual mechanism that fulvic acid uses to chelate minerals has yet to be ascertained. Although we know that this neutralization happens, the mechanics of the process are still one of nature's secrets – a secret that we benefit from.

Fulvic Acid Increases Bioavailability

Despite the important role that fulvic acid plays in the production of ionic minerals, it is also renowned for its ability to make vitamins and minerals absorbable to plants. It accomplishes this by complexing elemental minerals into organic forms that are easily transported into and through the roots and membranes of plants.

Plants absorb minerals and vitamins through root 'hairs' – one ion at a time. Interaction between fulvic acid and the elemental mineral must take place before this absorption can happen.

Whenever minerals come into contact with fulvic acid, in a water medium, they are naturally dissolved into an ionic form. These minerals literally become part of the fulvic acid itself. Once the minerals meld into the fulvic acid complex, they become bioactive, bioavailable, and organic. Thus, when elemental minerals are transformed into an organic state, through a natural chemical process involving fulvic acid and photosynthesis, they are safe to be used by both humans and animals.

The presence of fulvic acid also acts as an important protective agent whenever toxins are used to reduce the insect population that often besiege non-organically grown crops. According to A. Szalay, fulvic acid has the ability to dramatically detoxify herbicides, pesticides, and other poisons that it interacts with – this includes many radioactive elements. This detoxification process may extend to animals and humans, since we are the end-users of these plants.

As previously stated, the soil from which our food is grown is severely depleted of vitamins and minerals. For plants to remain beneficial to us, it is imperative that they absorb the greatest possible amount of these substances. For this reason, nature provided fulvic acid. The very presence of fulvic acid enables plants to maximize their uptake of vitamins and minerals.

This means that whenever you eat plants that have been in the presence of fulvic acid, your body can assimilate more of nature's building blocks with which to build and maintain your body. Another benefit of fulvic acid is that it actually potentiates the availability of essential nutrients. Potentiation is a term that describes how long an ingredient can remain active.

Nature's Protective Force

The more you study organic substances, such as fulvic acid, the more you will be impressed by nature.

The phytochemicals (plant chemicals) found in nature provide us with an astounding array of benefits and protection. For instance, soy provides us protection against certain cancers and acts as an adaptogen, antimutagen, and is full of active enzymes – if it comes from soy sprouts and not the processed bean. Fulvic acid also acts as a source of protection from environmentally induced oxidation.

Anyone interested in maintaining their health should note that free-radical damage (oxidation) has been implicated in over 60 disorders.

For years we've known that antioxidants are extremely beneficial in our fight against disease. As such, the scientific community has focused a major portion of their attention towards well-known antioxidant substances. This research has shed light on many extremely powerful free-radical fighting nutrients such as proanthocyanidins .

If a healthy body is your goal, then you must take action to protect against free-radical attacks. If you are taking colloidal minerals that contain fulvic acid, you're on the right path. Fulvic acid is a very powerful antioxidant.

According to N. Senesi, Y. Chen, and M. Schnitzer, fulvic acid has the ability to dramatically reduce the oxidative effects of free-radicals. This means that fulvic acid could potentially help your body ward-off disorders such as cancer, premature aging, wrinkling of the skin and arthritis – all of which are thought to be hastened by oxidation.

Enzymes are Activated by Fulvic Acid

Whenever we eat, our body sets into motion a complex series of actions designed to break down the foods that we've eaten. It then converts these digested foods into energy and building materials. The actions that take place on the foods that we ingest would not be possible if it were not for enzymes.

Without enzyme activation, food would simply rot in our stomach, elimination could not take place, thought would cease, and we would die. Enzymes are the 'life-force' behind vitamins and minerals.

Obviously, anything that we can do to strengthen and protect these enzymes will further our hopes of maintaining a healthy and active lifestyle.

Since you have only a finite number of enzymes that are available to your body, supplementing them from outside sources (such as with raw fruits and vegetables and enzyme supplements) is an absolute necessity [for more information on enzymes, see Issue #200 – Enzymes and Your Health].

The good news is that the presence of fulvic acid actually increases the activity of several enzymes, including: transaminase, invertase, and alkaline phosphates.

Speaking of the potentiation of certain substances, fulvic acid may also have a positive effect on RNA and DNA. According to several researchers, the actual content of DNA in cells and the synthesis of RNA is enhanced by the presence of fulvic acid. Furthermore, if you supplement with traditional vitamins and minerals, their bioavailability may be enhanced by the addition of fulvic acid.

Fulvic Acid and Organic Tissue Growth

A modern day medical wonder is our ability to actually remove damaged tissues and bones from the human body and replace them with healthy bones and tissues. Unfortunately, such transplantation is also very risky. Transplants of this type are sometimes rejected.

To lower the incidence of rejection the most desirable donor tissues come from alternate sites of the same body. Unfortunately, this requires a separate surgery. Extra incisions mean more discomfort and a longer period of healing. The only other alternative is finding a donor from other sources. In one experiment, patients who required the replacement or transplantation of bone were treated at the University Hospital in Freiburg, Germany using fulvic acid as part of the

therapy. Due to the lack of human donor tissues, animal bone in the form of bovine calcium hydroxyapatite, an inorganic calcium compound, was used. Two problems with such a procedure is that neither animal bones or inorganic calcium are readily absorbed by the human body. However, these problems were circumvented with the use of fulvic acid. When fulvic acid was inserted into the animal bone before replacement, the patients experienced dramatically improved regeneration of the transplanted bones.

The fulvic acid was so readily accepted and used by the patients that their bodies became highly osteoconductive. This means that new bone tissue began to form at an accelerated pace, thereby enhancing growth and healing. The inorganic calcium was also absorbed by the body due to the fact that the fulvic acid had transformed it into an organic compound. At the end of the experiment it was noted that, without the introduction of fulvic acid into the bone tissues, healing was not accelerated and regeneration did not take place.

Cell Wall Permeability and Absorption

As with any product or nutritive supplement, the only way that your body can benefit from it is after it has been absorbed. The same is true of plants. Before a plant can properly process minerals, vitamins, and other nutrients, they must be incorporated into their structure. Fulvic acid actually enhances this absorption process. Prior to elemental minerals being converted and stored by a plant as plant tissue, fulvic acids begin to ionize them. Without fulvic acid, the substances that surround plants would not be able to be absorbed since the root 'hairs' are single ion chambers that pull nutrients into them ion by ion.

However, when fulvic acid acts upon a substance its molecular size and weight is altered. This enables it to pass through cell membranes – including the semi-permeable membranes that line your intestines.

When searching for organic, plant-derived minerals, make certain that they contain fulvic acid. This will ensure that you get the highest quality available.

Fulvic Acid

(Humic Extract)

At last... from Mother Nature, her most precious and best kept secret!

Called the "missing link" to optimum health and nutrition by leading scientists throughout the world.

A health miracle so wonderful that medical studies show that it has the ability to significantly change your life for the better.

So safe, powerful and effective that medical doctors around the world have used it for thousands of years with amazing results.

Scientists have discovered a missing link in our food chain, and can see that rapidly increasing degenerative diseases worldwide may be directly related to absence of this substance in the human diet. Now experts know that more than vitamins and minerals are required for health, this third nutritional element is equally important. This breakthrough discovery is supported by little-known and even secret medical research coming from top institutions around the world; medical schools, hospitals, clinics, and pharmaceutical labs.

Most of the world doesn't yet know about this medical discovery for some very good reasons

- Until recent, they just didn't know it existed, couldn't detect it, and when they did identify this substance it was so complex that they couldn't understand it. It has been discovered to be the most complex substance in the world.
- Some of the medical institutions doing the research are in the business of making enormous profits from developing synthetic patented drugs, and they would prefer that you not know about inexpensive and natural solutions.
- Pharmaceutical companies have been rushing to patent synthetic versions of this natural substance, and dozens of patents have been approved. Yet Mother Nature has them all beat, they'll never be able to match her handiwork because this substance is far too complex!
- An estimated 80% of pharmaceutical drugs are tiny isolated synthetic fractions of this WHOLE and COMPLETE "missing link" from Mother Nature.

Human medical studies are exposed

While products we recommend are nutritional supplements, and can't make claims of treatment or prevention of disease, human clinical medical studies from around the world show amazing results with nearly every imaginable health condition when specialized pharmaceutical preparations are used. These medical studies have been uncovered, translated, researched, and now are unveiled for all of the world to see. The studies show that proper internal and external medical use of specialized extracts can be extremely effective for many health concerns. The majority of studies show success rates as high as 90% or more. Please understand that we aren't making these claims for our nutritional supplements, we are just reporting that this valid medical research exists.

Diseases, cures, medical treatments, and testimonials presented here or elsewhere are mentioned for educational purposes only. Their purpose is to show parallels pointing to conditions of nutrient deficiency only.

We will be the first to tell you that the product we recommend is not a quick fix that will solve all of your problems. However, it will give your body some much needed tools, that through long term supplementation can have remarkable results.

Once all of the research data is assembled, analysed, and understood, it points to a profound pattern of serious dietary deficiency worldwide

Massive volumes of agricultural studies point to a pattern of serious deficiency of this substance in commercial crops and livestock. When the deficiency is alleviated, phenomenal results are achieved, including plant resistance to disease and insects, remarkable growth, fruiting, and general health.

Similarly, human dietary supplementation and topical use with our product is bringing about life changing results for so many! The fact that we have thousands of customers that depend on this supplement, attests to the fact that something really marvellous is happening for many of them. Amazing health testimonials are pouring in from excited users everywhere.

Here is what you might notice and possibly even expect from a consistent long-term plan of dietary supplementation and topical use

- Supercharges your immune system
- Promotes exceptional health of the thymus gland
- May help balance the thyroid system due to helping stabilize the immune system.
- Reduces cravings and helps with over-eating
- Promote renewed energy and motivation
- Feel blood sugar become more balanced
- Over time restores your body to its optimum potential
- Helps purge parasites, pathogens, and viruses from your body
- Cleanses, neutralizes, and removes toxins
- Acts as a powerful natural anti-inflammatory agent and antioxidant
- Surrounds the body with a protective shield of defence
- You may start feeling better almost immediately
- You may see health concerns improve
- Experience increased resistance to colds and flu
- See aches and pains alleviated
- Notice that you become sick less often
- You may feel relief from common and seasonal allergies
- Gain improved resistance to infections and disease
- Feel increased energy and endurance
- Notice improved skin, nails, and more youthful complexion
- Feel improved digestion and bowel function
- See absolutely amazing healing of burns, cuts, and bruises
- Experience increased circulation and oxygenation
- Feel better and more alert mentally

- Experience improved memory and brain function
- Revitalize sexual functions and desire
- Notice improvement of aging symptoms in the elderly
- Notice that other supplements and medications work better when taken at the same time
- And an ongoing list of miracles too numerous to list

Hundreds, even thousands of years of traditional medical research, and now even modern medical research, points directly to all of the above mentioned benefits.

So what exactly is this miraculous substance?

It is called **Fulvic acid** (not to be confused with folic acid, an unrelated vitamin). Fulvic acid has been most appropriately referred to by some scientists as Mother Nature's "milk". It not only nourishes, it transmits immunity and a shield of protection to all living things.

This "milk" has been devised by Mother Nature with the purpose of easily penetrating, nourishing, and reacting with every living cell, human, plant, animal, and even microscopic organisms, both good and bad selectively. Hundreds of advanced studies coming from scientists all around the world proclaim the benefits of Fulvic acid to be "incredible", "amazing", "miraculous", "magical", "phenomenal"!

"If the creator... felt it necessary to design something to solve multiple problems and if this creator wanted to show us... the magic and miracle of pulling 'rabbits from a hat,' then an outstanding job was done with the design of fulvic acid! --Dr. William R. Jackson, PhD.

ONE OF MANY REASONS for these exclamations of excitement involve the effects Fulvic acid has when dissolved in water (or combined with body fluids). Fulvic acid is the smallest, most complex, most highly refined naturally occurring water soluble substance on Earth. Tiny amounts remarkably transform the molecular structure of water, making it intensely more active and penetrable. Fulvic acid then assists water in its job of dissolving and transporting. It helps carry nutrients into the cell and waste products away from the cell, while also helping to neutralize toxins and invaders.

An example of the penetrability of Fulvic acid is its dramatic ability to EVEN PENETRATE deadly ultramicroscopic viruses.

Viruses are super small, and live deep inside the cells of plants, animals, and humans. Viruses even live inside other microscopic disease causing organisms, where they hitch-a-ride. Viruses encapsulate themselves within an impenetrable protein barrier where defense mechanisms cannot get to them. Fulvic acid helps dissolve their barriers, penetrating their strongholds, helping to neutralize viruses and their poisons. Fulvic acid also helps make the viruses vulnerable to attack by the immune system. Yet this is only the beginning. Fulvic acid also has the amazing ability to alert the immune system to the virus or disease invader AND to regulate and give strength to the immune system!

Being the most HIGHLY REFINED NATURAL water soluble substance on Earth, Fulvic acid is produced by the action of billions upon billions of microscopic plants, such as

yeasts, algae, and fungi, all participating in the process of decomposition of once living matter. Every living organism on Earth, plant, animal, or man, experiences a lifelong battle against viruses, infections, and disease. This intense battle for survival continues and even becomes more intense among soil-based microscopic plants during decomposition. Billions upon billions of defense mechanisms are produced, passed down, and recycled at every stage of life and through many stages of decomposition. As these substances are recycled, they continually become smaller and smaller and more refined (naturally). At very last they become water soluble, turning into Fulvic acid.

The plant defense mechanisms that ultimately become Fulvic acid are nearly immortal.

Because those defense mechanisms are so highly protective, they remain intact and do not break down during decomposition, nor do they get used up, they just become more highly refined and take on unusual properties. These protective substances are tiny fragments of DNA, the building blocks of Fulvic acid. They have imparted health and longevity to every generation of living organism along their path of existence, and continue to pass it on.

When Fulvic acid is dissolved and combined with water, the water is transformed. Its molecular structure is changed and becomes more organized. Scientists have noticed that the water becomes energized and is able to transmit unusual biological "messages" to living organisms. Scientists even go as far as to describe this fulvic water phenomenon as "memory". A nursing mother's first breast milk (colostrum) carries an unknown substance that scientists call *transfer factor* (not to be confused with commercial products of similar name), which carries "messages" to alert the immune system of her offspring to known disease invaders. Fulvic acid similarly carries with it a message of warning, a "memory" of past battles with disease invaders. The battle scars are indelibly etched within the Fulvic acid's refined molecular structure, which is made up of tiny fragments of DNA, even including remnants of DNA from past invaders.

Fulvic acid appears to be "alive" with nature's own energy, and is intimately tied to the very spark of life. Fulvic acid is the World's most complex enzyme, and enzymes are described by scientists to be like living entities, having function and life-like qualities. Yet fulvic acid is more than just an enzyme, it is in essence the "milk" from Mother Nature... meant for giving life, energy, health, **immunity**, and renewal to the entire Earth, humans, plants, animals, and living organisms.

It also cleanses the entire surface of the Earth of pollution, pesticides, and toxins of all kinds. Thousands of scientific studies exist to prove it. Russian scientists used it to clean up the Chernobyl Nuclear Disaster, including the soil, animals, and people exposed to the radiation. According to Dr. William R. Jackson, fulvic acid annihilates radiation! Truly amazing stuff!

Fulvic acid and related humic substances are seriously depleted from agricultural soils, crops, fruits and vegetables, dairy products, meats, and foods of all kinds, COMPLETELY lacking in the modern human diet.

This "milk" from Mother Nature is likely the most important health and medical discovery ever in history. Nearly every plant, animal, and human disease can in some way be linked to the deficiency of this "milk"!

Pharmaceutical industry connections

The microscopic plants involved in the decomposition processes resulting in Fulvic acid, are the very same microscopic plants used by the pharmaceutical industry to develop their new drugs. An estimated 80% or more of our modern-day pharmaceutical drug miracle cures, including antibiotics, are isolated and concentrated synthetic versions of the highly complex components found in Fulvic acid.

Research shows that Fulvic acid naturally supplies a massive broad spectrum of powerful antibiotic and anti-viral medications equal or even superior to those known and produced by the pharmaceutical industry today. The Fulvic medications are not found in high single component concentrations like the drugs, but contain tiny amounts including billions that have yet to be discovered or may never be discovered!

Little-known United States Government studies show that substances in this "milk" even rival or exceed the power of today's leading antibiotics produced by the drug companies. Yet unlike the drug company antibiotics, Mother Nature has designed things so that disease pathogens will never become resistant to her naturally occurring "milk". Recently, when European governments banned antibiotics in animal feed, THIS SUBSTANCE WAS FOUND TO WORK BETTER. Yet all that we tell you here is still only the very tip of the iceberg!

Scientists have determined that it takes over 3 tons of living plant matter for Mother Nature to produce just one quart of her "milk" in the concentration that Fountain of Minerals provides! We have gone to great lengths to determine that Fulvic Acid is producing the safest, most effective, and most powerful "milk" from Mother Nature that currently exists in the industry. Clinical studies show that **negative side effects are virtually non-existent** when using Fulvic acid at the recommended dosage (one ounce per day). No problems or negative side effects have ever been reported by any of the scientific literature or by any of our customers. Extensive laboratory, pharmaceutical, and clinical testing has proven absolute SAFETY for human internal and external use.

Absorption and Fulvic acid's rare-earth functionality

Fulvic acids are nature's bridge between "dead" mineral elements and living organic matter. True fulvic acids are extremely absorbable (approaching 100%). Fulvic acids not only contain rare-earth mineral elements in organic form, fulvic acids are enzymes and have a life-like functional quality. Being "organic" means the minerals are not "dead" mineral elements, but actually powerful bio-active life-like enzymes made up from very complex combinations of powerful phytochemicals. Research shows that these complex substances have amazing fountain-of-youth-like health properties. Historical medical use is ongoing and dates back hundreds and even thousands of years in remote regions of the Himalayas, China, and Russia, where people today still have the longest recorded life-spans.

Fulvic acid, origin and overview

In the beginning

In the beginning the Earth was blessed with optimum organic growing conditions. The soil had a wealth of minerals, trace elements, and rich humus soil teaming with microbes. The Earth's minerals had not yet leached and eroded into the seas, and because of that, the soil was exceptionally fertile. The vegetation was very lush and abundant, as is evidenced by ancient remains that we know were formed into coal and oil deposits.

Humic deposits

But there have been found other most unusual remains that geologists call humic deposits They also came from that ancient lush vegetation. These humic deposits never did turn into oil or coal. They are quite rare and can be found in various areas of the world. Some of these deposits are exceedingly rich in a little known substance called fulvic acid.

Fulvic acid

Fulvic acid has been discovered to be one of the most important miracles of life itself. Fulvic acid is a part of the humic structure in rich composting soil. It is an acid created in extremely small amounts by the action of millions of beneficial microbes, working on decaying plant matter in a soil environment with adequate oxygen. It is of low molecular weight and is biologically very active. Because of its low molecular weight, it has the necessity and ability to readily bond minerals and elements into its molecular structure causing them to dissolve and become mobilized fulvic complexes. Fulvic acid usually carries 70 or more minerals and trace elements as part of its molecular complexes. These are then in ideal natural form to be absorbed by plant roots and interact with living cells. Plants readily absorb high amounts of fulvic acid, and maintain it in their structure. In fact it has been discovered that these fulvic acid complexes are absolutely essential for plants to be healthy, and the same is true of animals and man.

Microbial action

We know that ancient plant life had ample fulvic acid as is evidenced by the exceedingly rich and unusual deposits that are located in various areas of the world. This fulvic acid in these deposits came from massive amounts of vegetation and its further decomposition by microbes. Fulvic acid is then a naturally occurring organic substance that comes entirely from microbial action on decomposing plants, plants themselves, or ancient deposits of plant origin.

Fulvic acid is lacking in food crops

It seems obvious that most of the plants and food crops of today would also contain adequate amounts or at least some of the miracle fulvic acid and its related mineral complexes, but few do. As human beings it would be reasonable to assume that we should be consuming fulvic acid complexes in the plants we eat, and consequently have fulvic acid in our systems. It is

obvious that this is the way nature intended it. But this is not the case, nor has it been for a long time.

Our soils are sick from poor agricultural practices, pesticides, chemical fertilizers, erosion, and mineral depletion, as well as sterile conditions that prohibit microbial activity. Because of this our plants are sick, containing very little nutrition, especially minerals. For generations adequate fulvic acid that should have been contained in the plants we eat has been missing from our diets, yet it is essential for our cell metabolism. Scientists have found that nutritionally we need 90 different nutrients in our diets. Over 60 of these are minerals and trace elements. We are simply not getting them today from the plants we eat.

Re-mineralization of soils would be of little benefit without microbes, the fulvic acid they produce, and return to better farming practices. Re-mineralization of our bodies without the fulvic acid that should be contained in the plants we eat, has proven just as useless. People are sick with degenerative and deficiency related diseases now more than ever. With fulvic acid supplementation and return to proper diet and farming practices these situations have the potential to be remedied.

Fulvic acid in science and medicine

Fulvic acid is still not well known or understood by most of the scientific or medical community. Fulvic acids have not been able to be synthesized by chemists, and are unable to be clearly defined because of their extremely complex nature. This perplexity warrants little opportunity for science or medicine to exploit fulvic acid, or profit from new patents. Historically, traditional medical claims of encouraging health benefits have been simply remarkable. Many of these health assertions have also shown that fulvic acid is disease preventative in nature and may dramatically increase longevity. The health benefits seen to this point demonstrate that fulvic acid potentially poses a substantial threat to the future of pharmaceutical companies, medical doctors, and health professionals. Until recent, fulvic acid has been entirely overlooked or misunderstood.

Benefits of Fulvic acid

Some scientists have recently been studying fulvic acid, and have come up some amazing facts. They tell us that fulvic acid is the finest electrolyte known to man. It is assists with human enzyme production, hormone structures, and is necessary for the utilization of vitamins. It has been found to be essential to living cells in carrying on metabolic processes. It maintains the ideal environment for dissolved mineral complexes, elements, and cells to bio-react electrically with one another causing electron transfer, catalytic reactions, and transmutations into new minerals. It is also the most powerful anti-oxidant and free radical scavenger known. It has the unique ability to react with both negatively and positively charged unpaired electrons and render free radicals harmless. It can either alter them into new useable compounds or eliminate them as waste. Fulvic acid can similarly scavenge heavy metals and detoxify pollutants. Fulvic acid helps to correct cell imbalances.

Fulvic acid, a hidden treasure

A water solution can contain much higher mineral concentration when dissolved into fulvic acid than it could otherwise hold. It is most important to realize that fulvic acid is natures own

perfect vehicle for transport of minerals to living cells. This is because fulvic acid bonds with minerals and other molecules and transforms them.

Since fulvic acids are formed by decomposition of once living matter, fulvic acid contains hidden treasures of the past, in the perfect plant form, in nature's own recycling process. Mineral, metal, and trace element complexes with fulvic acid become an additional bonus to the miracle of fulvic acid. These fulvic complexes are hundreds of times smaller than living cells, and are amazingly absorbable by them. It is most important to know that fulvic acid has the unique ability to enhance, potentiate, and increase absorption of many other compounds such as vitamins, herbs, minerals, tinctures, and foods with which it is combined. Fulvic acid is one of natures miracles of unparalleled proportion.

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Major attributes of Fulvic acid

World's finest electrolyte

Fulvic acid is an organic natural electrolyte that can balance and energize biological properties that come into contact with it. An electrolyte is a substance that is soluble in water or other appropriate medium that is capable of conducting electrical current.

The power of an electrolyte has been shown in repeated tests on animal cells (giant amoeba), to be able to restore life in what researchers termed "a beautiful demonstration" and "astonishing". When the electrolyte potential was taken away, during the test, the cell ruptured and disintegrated into the surrounding fluid causing death. Upon reintroducing electrical potential the cell reconstructed and became active and healthy.

It was also determined in studies, that similar results could be expected of the progressive weakness among humans that results from unchecked hemorrhage, overwhelming emotions, uncontrolled infections, unbalanced diet, prolonged loss of sleep, and surgical shock. These examples are all accompanied by a steady decrease in electrical potential that eventually is reduced to zero at death. These studies show convincingly that that the physical well being of plants, animals, and humans is determined by proper electrical potential.

Fulvic acid has proven to be a powerful organic electrolyte, serving to balance cell life. If the individual cell is restored to its normal chemical balance and thereby, in turn, its electrical potential, we have given life where death and disintegration would normally occur within plant and animal cells.

Promotes electrochemical balance as both donor and receptor

Fulvic acid is available at times as a donor and at other times as an acceptor, based on the cell's requirements for balance. One of the reactions that occurs is always an oxidation reaction in which the chemical species loses electrons as a donor. The other reaction is a reduction in which the active species gains electrons as an acceptor. Trace mineral enzymes in the fulvic acid electrolyte may serve as electrodes.

Most powerful natural free-radical scavenger and antioxidant known

Free radicals of fulvic acid behave as electron donors or acceptors, depending upon the need for balance in the situation. Fulvic acid can in the same way take part in oxidation-reduction reactions with transition metals.

Complexes and dissolves minerals and trace elements
Enhances nutrients
Transports nutrients
Catalyzes enzyme reactions
Fulvic acid has close association with enzymes
Increases assimilation
Stimulates metabolism
Detoxifies pollutants

An important aspect of humic substances, including fulvic acids, is related to their sorptive interaction with environmental chemicals, either before or after they reach concentrations toxic to living organisms. The toxic herbicide known as Paraquat is rapidly detoxified by humic substances.

Dissolves silica
Synthesizes or transmutates minerals
Enhances cell division and elongation
Enhances the permeability of cell membranes
Increases metabolism of proteins
Catalyzes vitamins within the cell
Chelates all monovalent and divalent elements that it is exposed to

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Properties of humic substances

Humic acids - the fraction of humic substances that is not soluble in water under acidic conditions (pH < 2) but is soluble at higher pH values. They can be extracted from soil by various reagents and which is insoluble in dilute acid. Humic acids are the major extractable component of soil humic substances. They are dark brown to black in color.

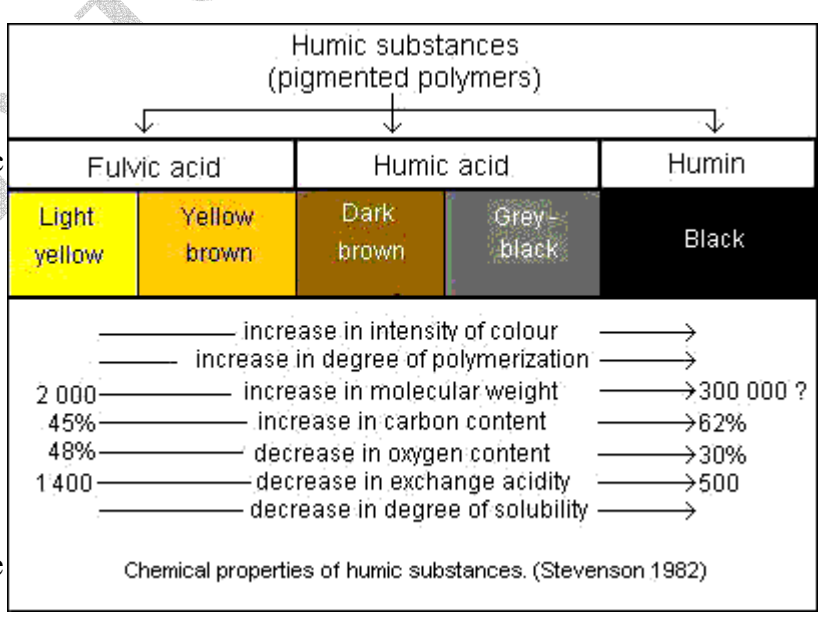
Fulvic acids - the fraction of humic substances that is soluble in water under all pH conditions. They remains in solution after removal of humic acid by acidification. Fulvic acids are light yellow to yellow-brown in color.

Humin - the fraction of humic substances that is not soluble in water at any pH value and in alkali. Humins are black in color.

Many investigators now belive that all dark colored humic substances are part of a system of closely related, but not completely identical, high - molecular - weight polymers. According to this concept, diferences between humic acids and fulvic acids, can be explained by variations in molecular weight, numbers of functional groups (carboxyl, phenolic OH) and extent of polymerization.

The postulated relationships are depicted in figure , in which it can be seen that carbon and oxygen contents, acidity and degree of polymerization all change systematically with increasing molecular weight.

The low - molecular - weight fulvic acids have higher oxygen but lower carbon contents than the high - molecular - weight humic acids. Fulvic acids contain more functional groups of an acidic nature, particulary COOH. The total acidities of fulvic acids (900 - 1400 meq/100g) are considerably higher than for humic acids (400 - 870 meq/100g).

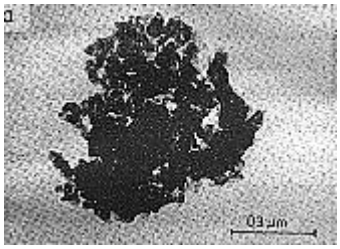
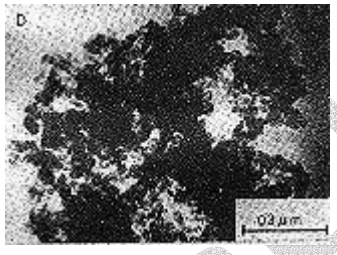
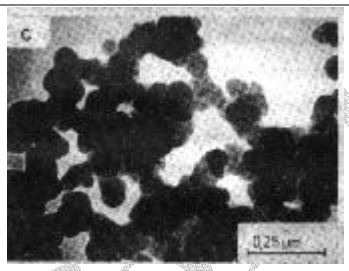
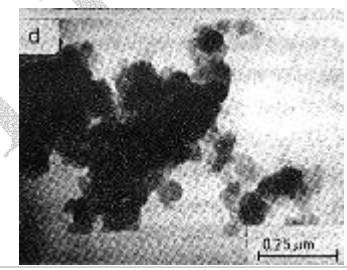
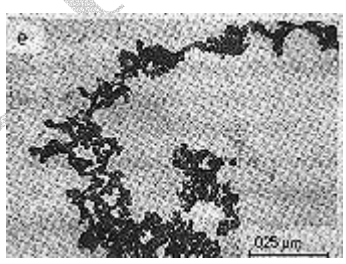
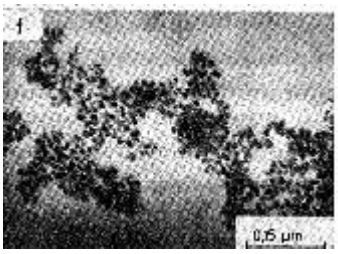


Chemical properties of humic substances. (Stevenson 1982)

Another important difference is that while the oxygen in fulvic acids can be accounted for largely in known functional groups (COOH, OH, C=O), a high portion of the oxygen in humic acids seems to occur as a structural component of the nucleus.

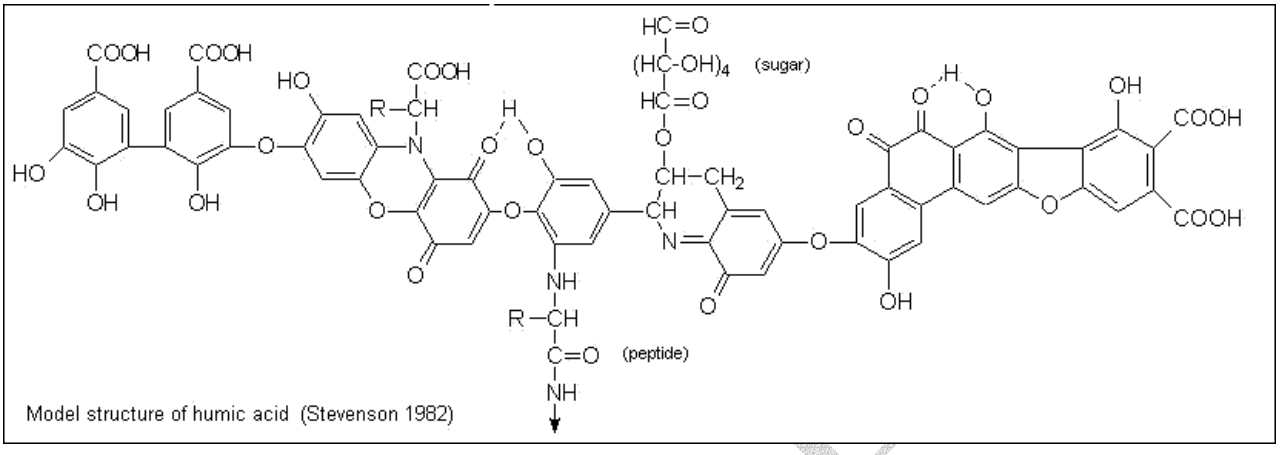
Electron microscope observations revealed the humic acids of different soils to have polymeric structure, appearing in form of rings, chains, and clusters. The sizes of their macromolecules can range from 60 - 500 A, what is mainly decided of by the occuring humification process, which also exerts an influence on their spatial sructure. Compared to other taxonomic units, the polymers of podsol- earth soils showed to most loose structure.

Electron microscope observations of humic acids (Drozd 1978)

Humic acids of peaty sandy hydro earth soil	Humic acids of haplic phaeozems	Humic acids of podzolic soil
 	 	 

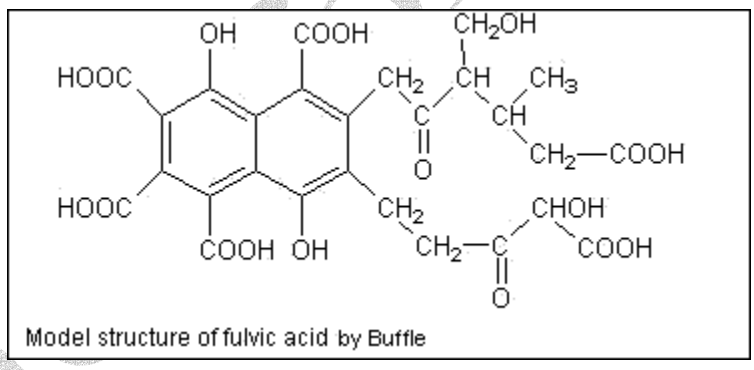
Is apparent that humic substances consist of a heterogeneous mixture of compounds for which no single structural formula will suffice.

Humic acids are thought to be complex aromatic macromolecules with amino acids, amino sugars, peptides, aliphatic compounds involved in linkages between the aromatic groups. The hypothetical structure for humic acid, shown in figure, contains free and bound phenolic OH groups, quinone structures, nitrogen and oxygen as bridge units and COOH groups variously placed on aromatic rings. (See illustration 1)



Model structure of humic acid (Stevenson 1982)

The hypothetical model structure of fulvic acid (Buffle's model) contains both aromatic and aliphatic structures, both extensively substituted with oxygen - containing functional groups.



Model structure of fulvic acid by Buffle

Elemental composition of humic substances and several plant material (by Kononova)

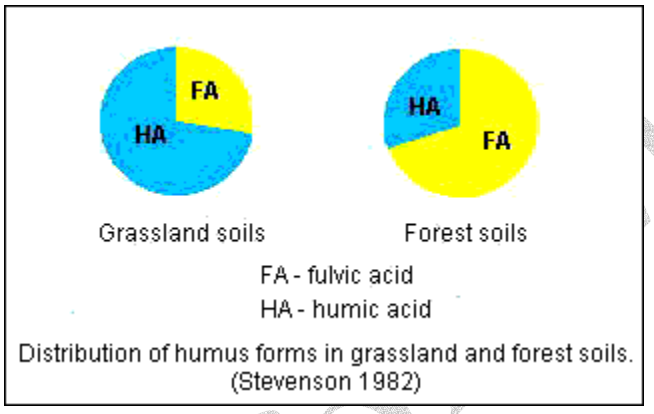
Substances	% dry ash-free basis			
	C	H	O	N
Fulvic acids	44 - 49	3,5 - 5,0	44 - 49	2,0 - 4,0
Humic acids	52 - 62	3,0 - 5,5	30 - 33	3,5 - 5,0
Proteins	50 - 55	6,5 - 7,3	19 - 24	15,0 - 19,0
Lignin	62 - 69	5,0 - 6,5	26 - 33	-

The humic acid / fulvic acid ratio

The percentage of the humus which occurs in the various humic fractions varies considerably from one soil type to another.

The humus of forest soils is characterized by a high content of fulvic acids while the humus of peat and grassland soils is high in humic acids.(see figure)

The humic acid / fulvic acid ratio usually, but not always, decreases with increasing depth.



Distribution of humus forms in grassland and forest soils. (Stevenson 1982)

Humic acid / fulvic acid ratios of some surface soils (by Kononova)

Soil	Humic acid/ Fulvic acid ratio	Soil	Humic acid/ Fulvic acid ratio
Chernozem ordinary	2.0 - 2.5	Gray forest	1.0
Chernozem deep	1.7	Sod podzolic	0.8
Chestnut dark	1.5 - 1.7	Tundra	0.3

Fulvic acids defined

Fulvic acids: What are they? Where do they come from? What can they do? Why do we need them?

Though virtually unknown to the layman, there is perhaps no substance more vital to life, (with the possible exception of oxygen and water) than the biologically derived compounds known as Humic and Fulvic acids. Fulvic acids enter into all life processes within plants and animals and wear many hats. When necessary; they act as free-radical scavengers, supply vital electrolytes, enhance and transport nutrients, make water wetter, catalyze enzyme reactions, increase assimilation, stimulate metabolism, chelate essential major and trace elements making them organic, and demonstrate amazing capacity for electrochemical balance.

Unknown Fulvic

Despite the fact that scientists world wide have published thousands of papers relative to fulvic acids and their effect on living matter, they have received limited public exposure because of the inability to produce and commercialize these substances. Researchers consider water extracts of 30 parts per million (ppm) as being a high concentration. For obvious reasons the knowledge of fulvic acids have been confined primarily to the scientific community.

How Are They Formed?

Fulvic acid is a derivative of microbial degradation of humic substances. Microorganisms are essential to the process. Each gram of healthy top soil has in excess of four billion microorganisms that participate in manufacturing bio-chemicals essential to healthy plants and animals. If they were to fail our lives would cease. A better perspective of their importance can be gained by looking at the work they do. Microorganism activity in preparing one acre of top soil, expends the equivalent energy of 10,000 people doing the same amount of work in the same amount of time.

What Humic Substances Do in the Soil

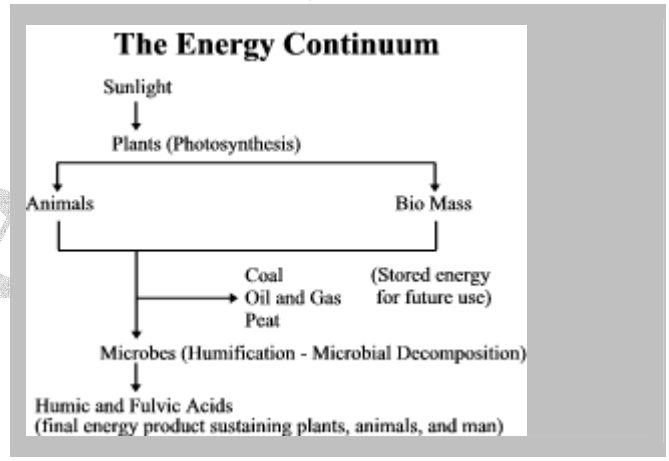
Scientists claim organic substances stimulate plant cellular growth and division, including auxin type reactions. They enhance plant circulatory systems and promote optimum plant respiration and transportation systems. They decrease plant stress and premature deterioration. They dramatically improve seed germination and promote greater fibrous root growth. They increase the size and numbers of legume root nodules and increase resistance to drought and insect infestation.

High molecular weight humic substances serve as food stock for microorganisms. . .which in turn break them down into smaller units of high energy substances called fulvic acid. Humic substances of high molecular weight, including humic acids, alter the physical characteristics of the soil while low molecular weight fulvic acids are involved in biochemical reactions that influence the plant's metabolic process. Both are indispensable.

The Fulvic Miracle

In addition to duplicating many of the positive functions of humic acid, fulvic acid will:

- Stimulate metabolism
- Give positive effect on RNA & DNA
- Act as a catalyst in respiration
- Increase metabolism of proteins
- Increase activity of multiple enzymes
- Enhances the permeability of cell membranes
- Enhance cell division and cell elongation
- Aid chlorophyll synthesis
- Increase drought tolerance, and prevent wilting
- Increase crop yields
- Assist denitrification by microbes
- Buffer soil pH
- Contribute electrochemical balance as a donor or an acceptor
- Synthesize new minerals
- Chemically weather inorganic substances
- Decompose silica to release essential mineral nutrients
- Detoxify various pollutants (pesticides, herbicides, etc.)



The two major life functions which cannot be duplicated by man are Photosynthesis and Humification

Who and What are you?

Biologically you consist of varying amounts of the following major and minor elements;

Calcium
Carbon
Chlorine
Hydrogen
Iron
Iodine
Magnesium
Sulfur
Oxygen
Phosphorus
Potassium
plus traces of aluminum, bromine, cobalt, copper, fluorine, manganese, nickel, silicon, sodium, zinc, and all the additional (as yet) undiscovered trace elements being added to the list as our knowledge increases.

The Body Cellular

The elements you are composed of (plus or minus a few billion) are components of approximately 60 trillion cells. An average cell contains about 1 quadrillion molecules, which is about 10,000 times as many molecules as the milky way has stars. Individual cells when properly nourished, are capable of producing many of their own amino acids, enzymes, and other factors necessary for all metabolic processes. Each cell, in addition to other processes, burns its own energy, maintains itself, manufactures its own enzymes, creates its own proteins, and duplicates itself. It is essential to understand that the total metabolism of the body is the sum of the metabolic operations carried on in each individual cell.

Growth & Maintenance Nutrients

Scientist have identified at least 90 growth and maintenance nutrients which must be continuously supplied to the body to sustain healthful life. These growth and maintenance nutrients include amino acids, major and trace minerals, vitamins and other nutritional factors. When these factors are supplied to our cells, the cells then create the building blocks for the total metabolic machinery of our life process. The building blocks present in the metabolic machinery of human beings are (in the great majority of cases) the same as the building blocks contained in the metabolic machinery of other organisms of extremely different types.

Organisms vary in their capacity to produce some of these building blocks internally. Some organisms are capable of producing all amino acids within their cells. Humans can produce all but eight. Some organisms can produce many of the vitamins within their cells. We can only produce one. The very complex processes of all metabolic functions are carried on within the cell. If we fail to supply the cell with the essential growth and maintenance nutrients we will experience a breakdown of these functions. When this breakdown is substantial we have the onset of disease or the manifestation of some related defect.

Nutritional Deficiencies

Total deficiencies in one or more of the growth and maintenance nutrients which human cells need for healthful metabolism is now a rare occurrence, but substantial deficiencies in the growth and maintenance nutrients is a common factor to every degenerative disease we experience.

Sick Soils, Sick Plants, Sick People

All naturally fertile soils contain adequate amounts of humic and fulvic acids produced by resident microbes within the soil. Humic and fulvic acids assist the plant in obtaining its complete nutrition. Our modern agriculture aims (with few exceptions) at one goal which is market. Food quality is sacrificed for food quantity. Since the farmer is paid by the bushel, yield is paramount to nutritional content. The farmer in his frantic effort for yield, has succumbed to the Pied Pipers of agro-chemical companies with products to sell. He is further decoyed by bad advice from county agents and higher schools of learning that protect the "grant" status of moneys received from these same agro-chemical companies, who advocate the application of excessive amount of nitrate fertilizers to the soil. Such practices stun and destroy the indigenous microbial life within the soil. When microbial life is inhibited or destroyed, vital humic and fulvic acids are exhausted.

Gone Are The Minerals

When microbes are depleted from the soils, they are no longer present to convert inorganic minerals into organic minerals needed by plants. Excessive use of nitrate fertilizers inhibits the formation of normal plant proteins and stimulates an over-abundance of unused amino acids that attracts insects. Since pests were created to eat diseased plants this introduces the ideal environment for increased infestation because of increased insect food supply. The farmers reaction is more pesticides and fungicides to save his infested crop. This in turn inhibits or destroys even more vital microorganisms that are essential to mineral conversions to plant nutrients.

Unsafe Foods

These deficient, pesticide laden products are turned into "cash" which the farmer thinks is the bottom line. Lacking in organic trace elements and other nutritional factors, but long on chemical residues from pesticides, insecticides, herbicides, these nutritionally hollow products end up on the tables of America. Without taste, and deficient in organic minerals and nutrients, we peel, boil and overcook what remains and ask "why do I hurt?"

Can Good Foods Be found?

A very small percentage of the agricultural lands of America are fertile enough to produce nutritious and healthy foods. An honest effort in attempting to select a healthful diet from grocery shelves may be a nutritional disaster. Unless you are fortunate enough to organically grow your own foods, supplementation is a necessity.

The Vitamin Connection

In this century common vitamin deficiency diseases have been reduced dramatically due to our awareness of the role of vitamins in nutrition. New breakthroughs are just beginning to emerge in the use of increased dosages for treatment of some ailments. It should be noted however that vitamins cannot complete their function in the cell's metabolism without the presence of certain minerals. This may explain the fascinating effects of humic and fulvic acids at work in living organisms. Fulvic acid chelates and binds scores of minerals into a bio-available form use by cells as needed. These trace minerals serve as catalysts to vitamins within the cell. Additionally, fulvic acid is on to the most efficient transporters of vitamins into the cell.

The Enzyme Connection

An enzyme is a catalyst that does not enter into a reaction but speeds up or causes a reaction to take place. Enzymes are complex proteins. The burning of glucose in cells for instance, requires the action of several enzymes, each working on the substrate of the previous reaction. Each cell of the body (when properly nourished) is capable of producing the enzymes needed for complete metabolism. Research has shown that fulvic acid improves enzymatic reactions in cells and produces maximum stimulation of enzyme development. The fulvic acid molecule often contains within its structure coenzymes and important factors which the cells may utilize in stimulation the manufacturing of enzyme reactions and formation. Leading scientists, such as Roger J. Williams, recognize that:

"the building blocks present in the metabolic machinery of human beings are, in the great majority of cases, exactly the same as the building blocks contained in the metabolic machinery of other organism of extremely different types."

Fulvic acid will in all probability, be found to be one of the key factors of enzyme reactions with all living cells.

Free Radicals & Antioxidants

Free radicals are highly reactive molecules or fragments of molecules that contain one or more unpaired electrons. They circulate through the body causing great mischief in bonding to and injuring the tissues. In addition to destroying tissue, they magnify the probability that injured cells will become susceptible to a great many infections and diseases, or mutate and cause cancer.

Free Radical Scavengers

Our first line of defense against free radicals is a generous supply of free radical scavengers called antioxidants. Dramatic increases of free radicals in our air, food and water in recent years have put a tremendous strain on the body's natural defense mechanisms. When we exceed our capacity to resist, cell membranes and tissues are exposed to the devastating onslaught of free radicals which combine with the lipid portion of cell membranes to greatly lower their resistance to carcinogenic pathogens.

Super Antioxidants

In recent years frantic efforts have been make to locate and isolate compounds with extraordinary affinity for free radicals. Entire industries have evolved around such efforts, with nearly every vendor of health food products offering suitable solutions. Because of the limited public knowledge concerning the great contribution fulvic acid plays as a bi-directional super antioxidant, we need to consider certain facts.

Fulvic Acid and the Free Radical Connection

To gain knowledge of how antioxidants tie up free radicals we must understand their workings, and explode a general misconception. For antioxidant to bind a free radical the antioxidant molecule must have unpaired electrons of equal and opposite charge to that of the unpaired electrons of the free radical. In a sense the free radical scavenger is its self a free radical or it could not mate and neutralize the destructive effects of free radicals.

Who Wears the White Hat?

We have found that fulvic acid is a powerful, natural electrolyte that can act as an acceptor or as a donor in the creation of electrochemical balance. If it encounters free radicals with unpaired positive electrons it supplies an equal and opposite negative charge to neutralize the bad effects of the free radicals. Likewise, if the free radicals carry a negative charge, the fulvic acid molecule can supply positive unpaired electrons to nullify that charge.

Antioxidants and Beyond

Being a bio-available chelated molecule that can "also" chelate, fulvic acid wears the white hat. As a refiner and transporter of organic minerals and other cell nutrients, it has the ability to turn bad guys into good guys by chelating and humanizing free radicals. Depending upon the chemical makeup of the free radical, they can be incorporated into and become a part of life sustaining bio-available nutrients. They may become an asset instead of a liability. In the event that the chemical makeup of the free radical is of no particular benefit, it is chelated, mobilized, and carried out of the body as a waste product.

The Human Experience

Although being made prior to the discovery and naming of fulvic acid, the late Dr. Clyde Sandgrin publicly stated:

"If I had to chose between the liquid mineral and electricity, electricity would have to go."

Reported benefits are little short of astonishing. For internal use they are:

- Increased energy
- Alleviates anemia
- Chelates body toxins
- Reduces high blood pressure
- Potentizes vitamin & mineral supplements

- Magnifies the effect of herbal teas and tinctures
- Chelates all monovalent and divalent metals
- Is a powerful natural electrolyte
- Restores electrochemical balance
- Stimulates body enzyme systems
- Helps rebuild the immune system
- Reported external beneficial use in:
- Treating open wounds
- Healing burns with minimum pain or scarring
- Eliminating discoloration due to skin bruises
- Killing pathogens responsible for athletes foot
- Acting as a wide spectrum anti-microbial and fungicide
- Treating rashes and skin irritations
- Helping to heal cuts and abrasions
- Helping heal insect bites and spider bites
- neutralizing poison ivy and poison oak

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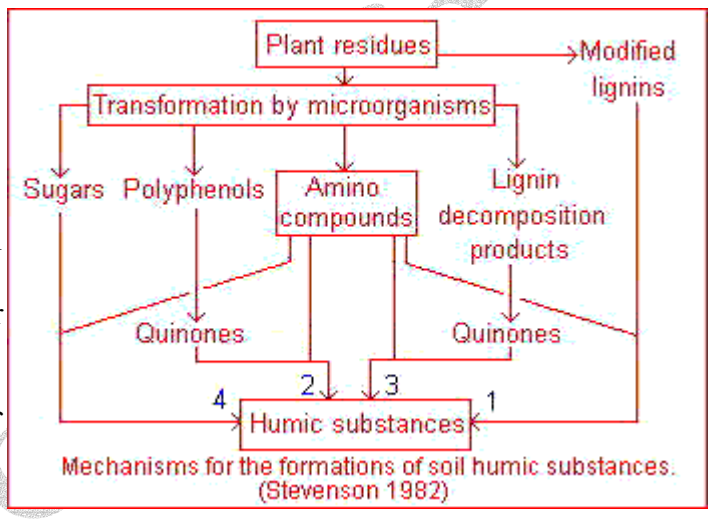
The formation of humic substances

The formation of humic substances is one of the least understood aspects of humus chemistry and one of the most intriguing. Studies on this subject are of long-standing and continued research can be justified on theoretical and practical grounds.

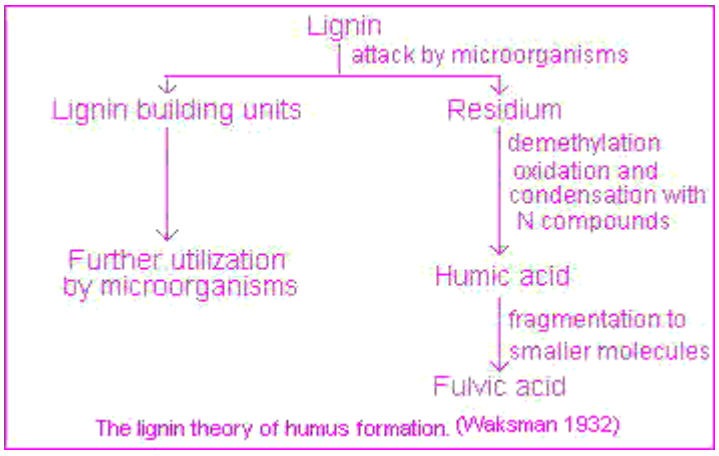
Several pathways exist for the formation of humic substances during the decay of plant and animal remains in soil, the main ones being shown in the picture:The classical theory, popularized by Waksman, is that humic substances represent modified lignins (pathway 1) but the majority of present-day investigators favor a mechanism involving quinones (pathway 2 and 3). In practice all four pathways must be considered as likely mechanisms for the synthesis of humic and fulvic acids in nature, including sugar-amine condensation (pathway 4).This four pathways may operate in all soils, but not to the same extent or in the same order of importance. A lignin pathway may predominate in poorly drained soils and wet sediments (swamps, etc.) whereas synthesis from polyphenols may be of considerable importance in certain forest soils. The frequent and sharp fluctuations in temperature, moisture and irradiation in terrestrial surface soils under a harsh continental climate may favor humus synthesis by sugar-amine condensation.



Mechanisms for the formations of soil humic substances. (Stevenson 1982)

Pathway 1 - The lignin theory

For many years it was thought that humic substances were derived from lignin (pathway 1). According to this theory, lignin is incompletely utilized by microorganism and the residuum becomes part of the soil humus. Modification in lignin include loss of methoxyl (OCH_3) groups with the generation of o-hydroxyphenols and oxidation of aliphatic side chains to form COOH groups. The modified material is subject to further unknown changes to yield first humic acids and then fulvic acids.This pathway, illustrated on the picture , is exemplified by Waksman's lignin-protein theory.



The lignin theory of humus formation. (Waksman 1932)

The following evidence was cited by Waksman in support of the lignin theory of humic acid formation:

1. Both lignin and humic acid are decomposed with considerable difficulty by the great majority of fungi and bacteria.
2. Both lignin and humic acid are partly soluble in alcohol and pyridine.
3. Both lignin and humic acid are soluble in alkali and precipitated by acids.
4. Both lignin and humic acid contain OCH_3 groups.
5. Both lignin and humic acid are acidic in nature.
6. When lignins are warmed with aqueous alkali, they are transformed into methoxyl-containing humic acids.
7. Humic acids have properties similar to oxidized lignins.

Although lignin is less easily attacked by microorganisms than other plant components, mechanisms exist in nature for its complete aerobic decomposition. Otherwise undecomposed plant remains would accumulate on the soil surface and the organic matter content of the soil would gradually increase until CO_2 was depleted from the atmosphere. The ability of soil organisms to degrade lignin has been understimated in some quarters and its contribution to humus has been exaggerated.

In normally aerobic soils lignin may be broken down into low-molecular-weight products prior to humus synthesis.On the other hand, the fungi that degrade lignin are not normally found in excessively wet sediments.Accordingly, it seems logical to assume that modified lignins may make a major contribution to the humus of peat, lake sediments, and poorly drained soils.

Pathway 2 and 3 - The polyphenol theory

In pathway 3 lignin still plays an important role in humus synthesis, but in a different way. In this case phenolic aldehydes and acids released from lignin during microbiological attack undergo enzymatic conversion to quinones, which polymerize in the presence or absence of amino compounds to form humiclike macromolecules.

Pathway 2 is somewhat similar to pathway 3 except that the polyphenols are synthesized by microorganisms from nonlignin C sources (e.g., celulose). The polyphenols are then enzymatically oxidized to quinones and converted to humic substances.As noted earlier, the classical theory of Waksman is now considered obsolete by many investigators. According to current concepts quinones of lignin origin, together with those synthesized by microorganisms, are the major building blocks from which humic substances are formed.

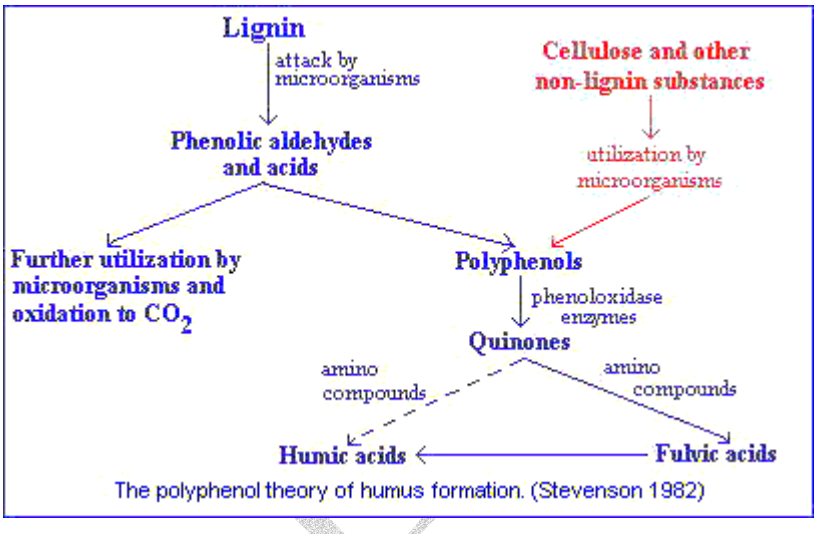
The formation of brown-colored substances by reactions involving quinones is not rare event, but is a well-known phenomenon that takes place in melanine formation, such as in the flesh of ripe fruits and vegetables following mechanical injury and during seed coat formation.

Possible sources of phenols for humus synthesis include lignin, microorganisms, uncombined phenols in plants and tannins.Of these, only the first two have received serious attention.

Flaig's concept of

humus formation is:

1. Lignin, freed of its linkage with cellulose during decomposition of plant residues, is subjected to oxidative splitting with the formation of primary structural units (derivatives of phenylpropane).
2. The side-chains of the lignin-building units are oxidized, demethylation occurs, and the resulting polyphenols are converted to quinones by polyphenoloxidase enzymes.
3. Quinones arising from the lignin (and from other sources) react with N-containing compounds to form dark-colored polymers.



The polyphenol theory of humus formation. (Stevenson 1982)

The role of microorganisms as sources of polyphenols has been emphasized by Kononova.She concluded that humic substances were being formed by cellulose-decomposing myxobacteria prior to lignin decomposition.

The stages leading to the formation of humic substances were postulated to be:

1. Fungi attack simple carbohydrates and parts of the protein and cellulose in the medullary rays, cambrium, and cortex of plants residues.

2. Cellulose of the xylem is decomposed by aerobic myxobacteria. Polyphenols synthesized by the myxobacteria are oxidized to quinones by polyphenoloxidase enzymes, and the quinones subsequently react with N compounds to form brown humic substances.

3. Lignin is decomposed. Phenols released during decay also serve as source materials for humus synthesis.

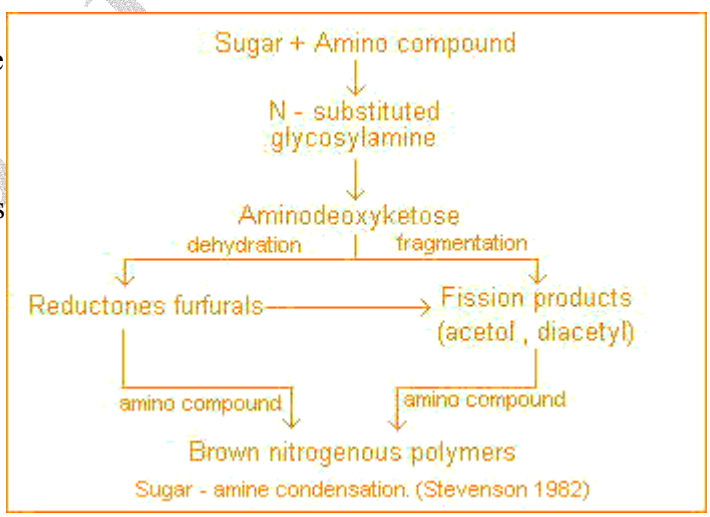
Pathway 4 - Sugar-amine condensation

The notion that humus is formed from sugars (pathway 4) dates back to the early days of humus chemistry. According to this concept reducing sugars and amino acids, formed as by-products of microbial metabolism, undergo nonenzymatic polymerization to form brown nitrogenous polymers of the type produced during dehydratation of certain food products at moderate temperatures.

A major objection to this theory is that the reaction proceeds rather slowly at the temperatures found under normal soil conditions. However, drastic and frequent changes in the soil environment (freezing and thawing, wetting and drying), together with the intermixing of reactants with mineral material having catalytic properties, may facilitate condensation. An attractive feature of the theory is that the reactants (sugars, amino acids etc.) are produced in abundance through the activities of microorganisms.

The initial reaction in sugar-amine condensation involves addition of the amine to the aldehyde group of the sugar to form the n-substituted glycosylamine. The glycosylamine subsequently undergoes to form the N-substituted-1-amino-deoxy-2-ketose. This is subject to: fragmentation and formation of 3-carbon chain aldehydes and ketones, such as acetol, diacetyl etc.; dehydration and formation reductones and hydroxymethyl furfurals.

All of these compounds are highly reactive and readily polymerize in the presence of amino compounds to form brown-colored products.



Sugar - amine condensation. (Stevenson 1982)

Section 2

Asthma and lung infections on the rise in all age groups

Asthma is a chronic inflammatory disease of the airways. When not diagnosed or properly treated, asthma can lead to a host of social and financial problems.

Hospital studies show that the common cold and related bronchial asthma and respiratory illnesses from infection, can be rapidly cured when patients are treated with fulvic acid. Especially pleasing to parents is the powerful and immediate effect this therapy has on young children.

Erchuan Wang et al, Humic acid, 3 (1991)

New research by Dr. David L. Hahn of Dean Medical Center, Madison, Wisconsin, shows that pneumonia related respiratory disease and acute bronchitis caused by chlamydia pneumoniae appear to be the cause of most asthma. His recent studies show that asthma patients have been found to have a high level of antibodies for chlamydia pneumoniae, which seems to be a common denominator among asthma sufferers. Dr. Hahn believes that chlamydia antibody detection can be an effective tool in diagnosing asthma.

In hospital studies, profuse otherwise unstoppable bleeding of the mucous membranes of the nose, mouth, throat, bronchial and lung areas, related to acute respiratory and viral infections in patients with tuberculosis, heart failure, leukemia, and other serious diseases, were successfully stopped with fulvic acid therapy.

Suchen Cao**,** Jiangxi Humic Acid, 3 (1993)

Extensive research of HMO studies conducted from 1967-1987 showed that "prevalence of asthma increased steadily and significantly...in both males and females in all age ranges." These findings were reported in the April 1998 issue of the American Journal of Respiratory and Critical Care Medicine. Although the data in those studies does not go beyond 1987, the researchers found that "more recent national data suggest that these increases are continuing." The weight of the evidence for an ongoing rise in asthma, they conclude, "is growing steadily."

Hospital studies showed that serious and acute cases of chronic bronchitis were better treated and cured with fulvic acid (96.77% cure rate) that worked significantly better than conventional drug therapy. Symptoms of inflammation, coughing, sputum and asthma, were also much better alleviated.

Jingrong Chen et al, jiangxi humic acid, 2 (1984)

Speaking for the American Academy of Allergy, Asthma and Immunology, Dr. Gary Rachelefsky said: "Despite the fact that we have a real understanding of the disease and medications to treat it, we still have increased asthma." About 7% of the children in the US have asthma. The prevalence has increased 40% between 1982 and 1993. It is the most common childhood disease and is the top reason for pediatric hospitalization, accounting for up to 300,000 admissions a year. Asthma is the cause of 10-30 missed school days per asthmatic child per year. Asthma effects over five million U.S. children and adolescents, and accounts for 28% of all direct medical expenses totaling nearly $5 billion in spending per year.

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Observations on the use of fulvic acid as a blood coagulant

Since February, 1979, Suchen Cao and associates, of the Medical University in Zhejiang Province, China, had begun using fulvic acid in treating bleeding diseases. Until August of that year they had treated 15 cases, all giving satisfactory results, although only a small number of patients were involved.

Source of Fulvic Acid, Types of Reagents, Methods of Usage

Source:

Fulvic acid was extracted from humic peat in the hospital preparation room in the Shaoxing area.

Types of reagents:

(a) Fulvic acid 0.2% injection solution, 5 ml per injection, used intravenously or intramuscularly.

(b) Fulvic acid in powder form, taken orally.

Methods of usage:

(a) Cotton swabs dipped in 0.2% fulvic acid solution were placed at the bleeding area in the mucous membrane.

(b) For treating patient coughing blood or hematuria patients (blood in urine), twice a day 5 ml of 0.2% fulvic acid solution injected intramuscularly, or once a day 40 ml of 0.2% fulvic acid solution added to glucose solution injected intravenously.

(c) Patients suffering from bleeding from mucous membrane, coughing blood or hematuria were given fulvic acid therapy when other treatments failed.

Clinical Data

Fifteen cases of bleeding and stoppage of bleeding:

Six had mucous membrane bleeding problem (4 with different degrees of severity of nasal membrane bleeding triggered by chronic kidney infection, uremia, pulmonary cardiac disease, leukemia, and cirrhosis; one had festered surface of the tongue caused by a lymph tumor; one had aplastic anemia causing gum bleeding); three hematuria patients (one each of acute bladder infection or cardiac hepatitis or leukemia); six patients coughing up blood (4 caused by bronchiectasis, one caused by tuberculosis, one caused by heart failure).

Bleeding mucous membrane:

1. Nasal bleed caused by uremia, pulmonary cardiac disease, leukemia, and cirrhosis. Four cases studied. Treatment as described above required one hour for blood coagulating. Treatment result was apparent cure with no relapse.

2. Festered surface of tongue caused by lymph tumor, brain membrane, leukemia. One case studied. Treatment as described above required wet cotton swab layering-over 2 or 3 times. Treatment result was apparent cure with no relapse.

3. Bleeding gum caused by aplastic anemia. One case studied. Treatment as described above required one hour for blood coagulating. Treatment result was apparent cure with no relapse.

Hematuria:

1. Acute bladder infection, one case studied. Treatment was as prescribed above. The following day no blood found in urine, routine urine testing negative. Treatment result was apparent cure with no relapse. 2. Leukemia, blood shot eye, and hematuria (red cell ++), one case studied. Treatment was as prescribed above.

Patient was getting better by the following day with no blood found in urine, no blood shot eye. Patient had relapse. 3. Cirrhosis, one case studied. Treatment was as prescribed above. Patient was getting better, with blood coagulating by the 4th day. Patient had relapse.

Coughing blood:

1. Bronchiectasis, four cases studied. Treatment was as prescribed above. Three cases were getting better with blood coagulating by the 5th day, with no relapse. In one of the four cases, treatment showed no effect.

2. Tuberculosis, one case studied. Treatment was as prescribed above. Patient was getting better, with blood coagulating by the 3rd day. Patient had relapse.

3. Heart failure, one case studied. Treatment was as prescribed above. Apparent cure by the 3rd day, with no relapse.

Treatment Results

Six patients suffering from mucous membrane bleeding all showed apparent positive results. Five of them received localized layering-over treatment once and one received the same treatment 2 ~ 3 times. No relapse was observed in any case.

Two out of three hematuria patients were found with no blood in their urine the day after the treatment. The routine urine test was negative. The treatment was effective with one patient and no relapse was observed. The other two patients had relapses. The routine urine test showed that the presence of red cells (++++) was reduced to (++). Continuing treatment did not show apparent improvement.

One out the six patients who coughed blood showed an apparent response to the treatment; one did not get better; the other four showed signs of improvement. Within 3 to 5 days treatment, five patients stopped coughing blood. One of them stopped coughing blood but later started again.

Discussion and Summary

From the above case study, it is clear that fulvic acid indeed can stop bleeding. Patients with more serious illness, for example, suffering from aplastic anemia, chronic kidney infection uremia, after receiving treatment, except for one, had their bleeding stopped to a certain degree.

Examples: In 4 cases of nasal bleeding the patients were initially treated with gauze containing Anluoxue and Vaseline and in one case of gum bleeding the patient after initially treated with gauze containing coagulate agent, Anluoxue, Zhixueming, vitamin K, did not show obvious results. However, following one treatment by layering a cotton swab dipped in fulvic acid solution over the bleeding area, bleeding stopped.

For one of the three cases of hematuria patients (caused by acute bladder infection), following 1 day treatment by intravenous injection, there was no blood in the urine on the following day.

Three out the four cases of bronchiectasis patients were obviously better. On the 5th day the coughing of blood was gradually reduced, however, traces of blood were still found in the sputum.

According to reports in the literature, the therapeutic feature of fulvic acid resembles Yunnan Baiyao. Experimental results indicated that 30 minutes following intravenous injection of dogs with 160 mg of fulvic acid, the dog thrombus elasticity diagram showed the reduction of the reaction time R and the coagulation time K. The blood clotting process was accelerated yielding advantageous blood coagulation.

When this medicine was taken orally, there were two incidents showing nausea and vomiting, a condition hard to bear. The remainder did not have any bad reaction.

Although we have not collected numerous data of the usage of this medication, the initial results show it to has the ability to stop bleeding.

Suchen Cao, Jiangxi Humic Acid, 3 (1993) In: Application of Fulvic acid and its derivatives in the fields of agriculture and medicine; Chapter 35; First Edition: June 1993.

Cancer is second leading cause of death in the US, humic extracts arrest cancer growth according to medical studies

According to the National Cancer Institute, about 1,228,600 new cancer cases were expected to be diagnosed in the year 2000. Since 1990, approximately 11 million new cancer cases have been diagnosed.

In the year 2000 about 564,800 Americans were expected to die of cancer, more than 1,500 people a day. Cancer is the second leading cause of death in the U.S., exceeded only by heart disease.

Patients with cancer causing tumors of the esophagus had 100% success rate in preventing tumor progression into the cancerous state when treated for two years with a humic extract solution.

Yuan, Shenyuan; Fulvic Acid, 4 1988; in Application of Fulvic acid and its derivatives in the fields of agriculture and medicine; First Edition: June 1993

One of every four deaths in the U.S. is from cancer. Since 1990, there have been approximately 5 million cancer deaths. Overall annual costs for cancer run $107 billion per year.

Breakthrough cancer research studies supported by the National Institute of Health clearly indicate that oxygen-containing molecules known as oxidants or free-radicals, play an important role in causing cancer, and that antioxidants or free-radical scavengers help suppress cancer.

In a surprising new development, the study shows that cancerous cells themselves are causing an overproduction of free-radicals. This alone can account for cancer's typical runaway cell growth.

Cancer cells have now been shown to produce oxidants that act as messenger molecules and send signals through protein pathways, bombarding surrounding cells uncontrollably with damaging free-radicals.

The study shows that certain super antioxidants work to obstruct the signaling protein pathways, neutralizing the spread of cancer and can potentially prevent it in the first place. Unique protein inhibiting antioxidants block the necessary signals that normally allow adjacent cells to become cancerous. Studies point to antioxidants as new anti-cancer treatment and prevention strategies.

Humic extracts (Fulvic acids) are nature's most powerful antioxidants. Pharmacological studies throughout the world have shown that various mechanisms within the humic molecular structure make it both a donor and acceptor free radical scavenger and antioxidant. Also noted are powerful superoxide dismutases (SODs) and metalloenymes of every conceivable kind.

While all humic extracts do not always destroy cancer cells, they generally halt their growth and spread. Sometimes tumors disappear almost immediately and spontaneously. Humic extracts are certainly cancer preventative, and it is certain that the higher the quality of humic extract, the better the ability to reverse and completely cure cancers.

Outpatient medical hospital studies on thyroid tumors, some cancerous, showed that injections with a special humic extract was 90% successful in stopping tumor growth and diminishing size of tumors, with 80% of patients having complete cures.

He, Shenyi, et al; Humic acid in Jiangxi Province, 1 (1982)

It has been found that naturally-occurring humic acid preparations can stimulate the production of cytokines, including interferon-gamma, interferon-alpha, interferon-beta, and tumor necrosis factor-alpha. What this means is that a valid mechanism has been discovered, proven, and documented, whereby humic extracts are able to work with the body to selectively seek out and destroy cancer cells.

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Blach-Olszewska, Z; Zaczynksa, E; Broniarek, E; Inglot, AD, Arch. Immunol. Ther. Exp. (Warsz), 1993, 41(1), 81-85).

Common Virus Shows Link To Brain Cancer In Children

Colon, penile, uterine, cervical, liver, and numerous other cancers are also caused by viruses

February 21, 2002

A new study appearing today in the Journal of the National Cancer Institute, shows that the JC Virus (JCV) which infects about 65% of children by age 14, likely plays a role in the development of the most common type of malignant brain tumor found in children. This finding is consistent with many other recent reports linking viruses to cancer.

The JC Virus is named after a patient, John Cunningham, from whom the virus was first isolated in the 1970's. According to the senior author of the study, Dr. Kamel Khalili, the JC Virus "is very common," and he went on to say that "sixty-five to 70 percent of human populations worldwide get infected with this virus by age 14, so we all basically have this virus in our bodies."

Twenty specimens of brain tumors taken from children showed evidence of the JC Virus. Dr. Khalili says that "the presence of the virus... is suggestive of a biological role for this virus in the development of these tumors." Khalili, who is a cancer researcher at Philadelphia's Temple University, said that earlier lab studies show that the JC Virus causes cancer in rats, mice, and brain tumors in certain monkeys.

The JC virus comes from a viral group called Neutropic Polyomaviruses. It usually infects the upper respiratory system by inhalation of airborne particles just like the common cold. Polyomavirus caused respiratory infections are very common in children. The virus causes no serious disease unless a person's immune system is weak. In patients with very weak or destroyed immune systems (such as AIDS patients, or those who are taking organ anti-rejection drugs), according to Dr. Khalili, the JC Virus can cause progressive Multifocal Leukoenchephalopathy (PML), a fatal brain disease. Dr. Khalili says that evidence suggests that JC Virus also plays a role in the development of the most common brain cancer in children, medulloblastoma. This type of cancer is diagnosed annually in about one out of every 200,000 children under the age of 15. It is a very aggressive cancer that is difficult to treat and often is fatal. Dr. Khalili says that if it can be conclusively proven that JC virus does play role in the brain cancer, then it may be possible to develop a vaccine that could help in treating the tumor or preventing its spread.

Studies by Dr. L. Laghi and associates have shown that JC Polyoma Virus also causes colon cancer. In other extensive research Dr. Richard C. Hunt, at the University of South Carolina, has documented many other viruses as the cause for colon, penile, uterine, cervical, liver, and numerous other cancers.

This information provides support for the idea that humic substances (fulvic acids) are a little-known and important missing link throughout the food chain. Modern agricultural practices have eliminated the humic substances from farm soil, which parallels increases in viral plant, animal, and human viral infections. Common to rich organic soil humus, fulvic acids have been shown to have unequalled value in defending plants, animals, and man against viruses of all kinds, and also in significantly increasing and balancing immunity. Of interest is also the fact that hospital studies in China showed that children with serious respiratory infections responded exceptionally well to humic - fulvic extracts when nothing else seemed to work.

Renowned longevity and health of isolated Himalayan cultures is linked to fulvic acid extracted from fossil-like humic substances

For centuries traditional medical doctors in remote areas of the Himalayas have claimed that "shilajit", a rare humic substance high in fulvic acid, can "arrest the aging process" and "induce revitalization". Historical documents testify to the amazing longevity and health of these people who often live well beyond 100 years of age. Now the physiological functions behind these claims are being substantiated by leading medical hospitals and pharmacologists around the world.

Fulvic acid extracts from the rare humic substances found on the high mountain slopes of the Himalayas, have been used for centuries by the isolated inhabitants of that region as a "rejuvenator, a class of drugs reputed to arrest the aging process and to induce revitalization", according to quotes from leading pharmacologists studying them. The traditional medical claims of "rehabilitation of muscles, bones and nerves", treatment of "geriatric complaints including arthritis, diabetes and allergic manifestations," dementia, etc., are now being proven, along with their mode of action, by pharmacologists and many other medical doctors and scientists.

The various pharmacological studies reveal that the fulvic acids exhibit results" sufficiently impressive", and "more effective" than several currently available immune system regulators. The fulvic acids "produced significant effects", as an anti-stress agent, in relieving stomach ulcers, preventing allergic reactions, and in activating the immune system against tumor cells. "The results support the use" of fulvic acids "as an adjuvant [assisting in the prevention, amelioration, or cure] in the therapy of diabetes", to quote leading pharmacologists.

In recent years, leading scientists, doctors, and pharmacologists from major hospitals and universities in India, Russia, and China have become more conscious of the purported anti-aging and health claims associated with the rare fulvic acids, and have been looking deeper into the assertions coming from traditional health practitioners of the region. The inhabitants and areas of the Himalayan belt that are mentioned in the many and growing number of scientific and medical studies documenting this research include: The Tibetans of the Tibet region of China, the Georgian Russians living in the Caucasus Mountains of Russia, the Hunzas of Pakistan and Afghanistan (Hindu Kush and Karakoram Mountains), the Sherpas in Nepal, the people of the Kashmir region, and the Indians living in the Kumaon, Himalayas, Vindhyas and Aravallis Mountains of India.

It is a well-known fact that a large number of individuals in the Himalayan belt live to well over 100 years of age, and often are reported to live to 120-140 years or more, maintaining excellent health throughout their entire lives. People of the region that use fulvic acid preparations made from the rare humic substance not only report significant health benefits for themselves, but for their animals as well, and most people lack the degenerative diseases common to other cultures today.

Scientists researching these matters determined that the prized shilajit health preparation esteemed for centuries throughout the region was indeed organic humic matter of ancient plant origin, and they spent time tracking down and checking the authenticity of the very best supplies. Rather than simply studying the people and their livestock, which had already shown significant health benefits historically, the scientists undertook extensive clinical, medical, pharmacological, and laboratory studies to identify the active constituents and analyze their physiological functions.

In a scientific world that as a whole still knows very little about humic substances, these researchers went far beyond. They accurately identified and quantified the water soluble fulvic acid fractions. This in itself is an amazing feat considering that fulvic acids, for the most part, are virtually unknown to medical science and undetectable through standard testing procedures. These scientists proved that the water soluble fulvic fraction was the primary active constituent. They even recognized that the fulvic, along with its associated organic metal ions, was made up of numerous other and even more obscure active constituents. They identified and isolated extremely valuable functional groups within the fulvic acid spectrum that were also shown responsible for the protective, regenerative, and healing responses of cells. They did this for the most part independent from the rest of the scientific world.

What the researches discovered is fascinating. From one clinical study to the next, scientists were able to prove not only that many of the medicinal remedies and health benefits are completely justified by scientific fact and medical results, but they also identified mechanisms responsible. Their studies opened up an entirely new picture into the amazing functions and values of fulvic acids in relation to man and medicine.

After years of scientific research, other pharmacologists determined that not all fulvic acids are the same, and that they vary in quality from one source to the other. These pharmacologists came up with methods for determining and quantifying the medicinal value. They perfected their extraction processes. The pharmacologists performed extensive chemical analysis, metal ion analysis, microbiological analysis, pathogen analysis, and mycotoxin analysis. They went to great lengths to identify the presence of any harmful substances, which were proven absent at any toxic level. The pharmacologists used extremely advanced pharmaceutical techniques to standardize the natural extract, to the quality of the finest pharmaceutical preparations in the world today, while retaining all of the natural organic principles in an unadulterated "herbal" form.

The pharmacologists recognized that although the rare humic substance was rock-like and seemed inert or fossilized, it had all of the organic characteristics of the natural botanicals they had been working with for years. In other words, although it was ancient and looked like dead rock, it was in actuality a natural organic herbal substance, and they used extreme care in preserving the fulvic extracts so that they would retain their organic form.

Traditional medicine throughout the Himalayan belt lists the indigenous humic substance and resultant fulvic acids as a "rasayana" or rejuvenator, a class of drugs reputed to arrest the aging process and induce revitalization of attenuated physiological functions. The special endurance attributed to the Sherpas, including their ability to survive extremely cold conditions and high altitudes has also been linked to these substances during the medical studies.

Clinical studies in pharmacology have shown significant value in treatment of diabetes mellitus (attenuates the development and progression), stomach ulcers (anti-ulcerogenic and anti-stress activity), allergies and anti-allergic action (mast cell protection), hormonal control and regulation of immunity (immunomodulatory functions), and tumor and cell growth factors relating to activated white blood cells and immune system (splenocytes and peritoneal macrophages).

Traditional medicine of the region prescribes the local rare fulvic acid extract in genito-urinary diseases, diabetes, jaundice, gallstones, enlarged spleen, digestive disorders, epilepsy, nervous diseases, elephantiasis, chronic bronchitis, dementia, arthritis, and anemia. The humic extract has been shown to accelerate the process of rehabilitation of

muscles, bones and nerves, and is used to treat many geriatric complaints including memory loss, and is believed to increase cerebral functions. It has also proven useful as an aphrodisiac, rejuvenator, alternative tonic, stimulant, internal antiseptic, diuretic, lithontriptic, and is used for treatment of respiratory problems, worms, piles, adiposity, renal and bladder stones, nervous diseases, amenorrhoea, dysmenorrhoea, menorrhagia, eczema, anorexia, and fracture of bones.

Historically, fulvic acids from the Himalayan region have been shown effective for treatment of cold stress, diabetes, tumors, skin diseases, rheumatic pain, kidney stones, heart ailments, leprosy, and many other ailments. Fulvic acids are also a panacea of oriental medicine, where they continue to be used extensively.

These discoveries are most significant, considering the fact that the various cultures of these remote Himalayan regions have used organic farming practices for centuries, which promote soil and crops already rich in natural humic/fulvic substances. Yet these people still find that additional fulvic acid supplementation and medication proves highly beneficial to their health, and alleviates disease problems when they arise. This shows that the ancient vegetation, which was the source for the rare fulvic acids, has exceptional properties that may even surpass those of vegetation found anywhere on Earth today.

The rare humic deposits of the region were exposed at the time of uplift of the Himalayas, and are normally found from about 5,000-15,000 feet of elevation. These humic deposits are exposed by landslides, excavation or road-cutting. It is important to note that similar high quality humic substances found in various other regions of the Earth show similar results. However, the fulvic acids from the shilajit humic have some most unusual characteristics.

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From notes by: D.B.A. Narayana, Ph.D., manager of research and development for Dabur Research foundation, and also member and past president of the Indian Pharmaceutical Association, and also is a member of the Research Advisory Council of CSIR.

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Global presence of Diabetes mellitus now epidemic, human clinical studies show Fulvic acids offer significant help

Diabetes mellitus responsible for enormous world economic burden

A December supplement to the British Diabetic Association journal, *Diabetic Medicine*, warned that the prevalence of diabetes worldwide is expected to nearly double in the next twelve years. Dr. Paul Zimmet and colleagues for the International Diabetes Institute and the World Health Organization report that diabetes mellitus "appears to be epidemic in many regions of the world" and will double and could even triple by the year 2010.

With fulvic acid, diabetes patients became more energetic and the tingling, painful feeling and numbness experienced in the nerve endings disappeared or were reduced.

Yuan, Shenyuan; et al; *Application of Fulvic acid and its derivatives in the fields of agriculture and medicine*; First Edition: June 1993

Related reports were quoted as saying that "The corresponding burden of complications and premature mortality resulting from diabetes will constitute a major public health problem for most countries." Dr. George Alberti, Vice Chair of the British Diabetic Association says, "In the short term, it is vital that attempts to change lifestyles are stepped up and that investment in finding a cure is increased. In the longer term, it is equally important that we ensure that we have the medical infrastructure in place to deal with the problem."

Scientists found that fulvic acids show significant success in preventing and combating free radical damage to pancratic islet B cells, which is the widely accepted cause for diabetes mellitus. What they discovered was that the Fulvic acid preparation significantly increases superoxide dismutase (SOD) activity. Their clinical studies show that fulvic acids diminish the development and progression of diabetes, and assisted in the treatment.

Bhattacharya, S.K. Activity of shilajit on alloxan-induced hyperglycemia in rats. Fitoterapia, Volume LXVI, No 4, 1995, pg. 328.

The American Diabetes Association (ADA) recently concluded that "The economic burden of diabetes mellitus in the US is enormous." In their February 1998 issue of *Diabetes Care*, the ADA estimated that total direct and indirect costs reached $98 billion in 1997, which is now about 8% of all healthcare costs. The ADA wrote in their report that the prevalence of diagnosed diabetes in the US is now about 3% of the population. This relates to $10,071 per capita in medical expenses for diabetics compared with $2,669 for non-diabetics. According to Dr. Richard Kahn and the Alexandria, Virginia, based ADA, any advances that can "delay the onset or slow the progression of diabetes" are needed to "mitigate the associated clinical and cost repercussions."

Diabetes mellitus stems from dietary deficiency of protective humic substances, especially fulvic acids

Most medical doctors and diabetes associations do not know that scientists in less conspicuous parts of the world are making significant inroads into the treatment and prevention of diabetes mellitus with fulvic acid humic extracts and herbs. In fact, Fulvica

BioScience's studies have identified a missing dietary link as likely a major cause for the disease. However, the valuable research may be entirely overlooked because the solution does not necessarily have the huge profit potential that is standard to the pharmaceutical industry.

For centuries people living in isolated villages in the Himalayas and adjoining regions have used preparations made from a rare fulvic acid containing humic substance known as Shilajit, to prevent and combat problems with diabetes. Diabetes is quite uncommon in the isolated mountain villages, yet a brisk trade in these rare fulvic acid containing preparations has expanded in recent years to the traditional doctors in surrounding regions.

Due to the historical and recent expanding success of the diabetes treatments in the Himalayan region, medical researchers have taken a more serious interest in determining if the claims have scientific merit. Dr. Salil K. Bhattacharya and scientists from the Neuropharmacology Laboratory, Department of Pharmacology, Institute of Medial Sciences, at Banaras Hindu University in India, undertook extensive clinical studies on the subject. What they proved was that it was the fulvic acid fraction in Shilajit, and other closely associated humic compounds, that were responsible for the anti-diabetic activity and long reputed historical success of that preparation.

Dr. Bhattacharya recognized that the fulvic acids showed significant success in preventing and combating free radical damage to pancratic islet B cells, which is the widely accepted cause for diabetes mellitus. What he discovered was that the fulvic acid significantly increases superoxide dismutase (SOD) activity. Dr. Bhattacharya's clinical studies showed that fulvic acids diminished the development and progression of diabetes, and assisted in the treatment.

Studies going on in other countries confirm the work of Dr. Bhattacharya regarding fulvic acid SOD activity and effectiveness of diabetes. Studies in China take the research even further.

Extensive human clinical studies carried out in various medical schools and hospitals in China have shown significant success in treatment of diabetes patients. Studies show that patients become more energetic. The tingling, painful feeling and numbness experienced in the nerve endings disappear or are reduced. In China, the pharmaceutical use of fulvic acids have now been approved for both internal and external use, because they have shown that they are both safe and effective.

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The therapeutic effect of Fulvic acid on keratitis and hemorrhagic eye disease

Keratitis is characterized by inflammation of the cornea of the eye, while a hemorrhagic eye condition is characterized by profuse bleeding caused by hemorrhage or burst of the blood vessels of the eye.

Fulvic acid is an anti-inflammatory agent. It is also a blood coagulating and analgesic agent, capable of healing open wounds. From 1977 to 1981, Guofan Tang and his coworkers performed extensive studies in the area of ophthalmology and presented many reports with summaries. From March, 1981 to the end of July, 1982, they used fulvic acid in the treatment of 60 patients with eye diseases (total number of diseased eyes: 64). Control studies were conducted using other drugs on 30 randomly selected patients with similar eye problems.

Fulvic acid treatment group:

This group was treated with fulvic acid extracted from humic peat in the People's Hospital preparation room in the Shaoxing area. Chemical analysis of the fulvic acid showed that the molecular weight was lower than 500, which fulfills the standard set by the National Fulvic Acid Symposium. It showed a stronger affinity toward the elemental mineral Beryllium, and was free of any radioactive material. Two forms of reagents were available: an eye drop containing 0.5% fulvic acid in 10 ml bottles and an intramuscular injection reagent containing 0.5% fulvic acid solution in 2 ml ampoule. The latter was also able to be injected underneath the conjunctiva of the eye; or when mixed in 10% glucose solution, could be used as an intravenous injection. For outer eye illness such as keratitis, 0.5% fulvic acid was used as an eye drop 4 times a day or every 2 hours; or, additionally, intramuscular injection using 2 ml of 0.5% fulvic acid twice a day.

For patients suffering from hemorrhagic eyes, intramuscular injection was performed with 2 ml of 0.5% fulvic acid, twice a day.

Whenever either the eyedrops or the injection containing fulvic acid was used, the dilator Atropine was applied. However, antiseptics and blood coagulating agents should be avoided.

The control group:

Patients with various ailments were selected at random. Multiple medications were used in order to speed up the healing and to relieve patients from pain. Eye drops containing Chloromycetin and ointments containing Tetracycline were used along with antibiotic injections. Some patients were also treated with intravenous injections of Chloromycetin and Tetracycline. Viral infections were given Anti-herpes eyedrops, Vitamin C and K, and Novacain, among other treatments and injections. For the hemorrhagic control group's conditions, intramuscular and intravenous injections were given using the common drugs for this purpose.

Eyesight examinations:

Prior to the treatment, patients in the fulvic acid and the control group were examined for their eyesight. Their eyes were examined externally and the back of their eyes were observed. When the treatment was in progress, examinations were conducted daily or every other day. Then results were compared and analyzed. Eyesight examinations were taken into consideration in the final analysis.

Case studies:

The keratitis group treated with fulvic acid consisted of a total of 26 cases. Four of the hypo-keratitis cases were treated with end result being 50% effective. Eleven keratitis cases were caused by external injury and had a 90.9% success rate. Three keratitis cases were caused by viral infection and had a success rate of 100%. One keratitis case was caused by fungal infection and had a 100% success rate. Six cases were considered to be simple forms of keratitis with an end success rate of 83.33%. One case was caused by bacillus bacteria and treatment was 100% effective. The combined success rate for all fulvic acid treated keratitis cases was 84.61%.

The hemorrhagic eye group treated with fulvic acid consisted of a total of 34 patients. Twenty had blood accumulated in the anterior chamber of the eye, six were caused by previous surgery and fourteen from external injury. Treatment for that group was 85% successful. Another ten patients had blood accumulated in the lens of the eye, two were from vein retinitis, two were caused by previous surgery, four from external injury, one was related to diabetes, one was related to high blood pressure. Total effectiveness for the second group was 60%. In the final group, four patients had hemorrhaged retina of the eye, with two caused by vein retinitis, one related to diabetes, and one from central venous thrombosis. Success rate for the last group was 75%. Total overall effectiveness of the fulvic acid treated hemorrhagic group was 76.5%.

The control group consisted of 30 patients with similar ailments that were selected at random. They were treated with a variety of all the best known drug therapies and antibiotics. The control keratitis group was rated at 83.33% total effectiveness, and the hemorrhagic group at 91.7%.

Analysis and discussion:

The above treatment shows that fulvic acid is an anti-inflammatory agent, and able to significantly enhance healing of ulcerous wounds and coagulate blood. Based on the treatment results of the two groups, together with data taken from extensive charts, literature, and vision tests, the final analysis and discussion are presented below:

Extensively documented and detailed results show that the control group, in general, uses medications consisting of more than 3 leading drugs, sometimes for a combination of treatments, for example: caused by localized burns, penetrating the anterior chamber, and antiseptics injected below conjunctiva. The final overall results are in no way better in comparison with the solitary treatment with fulvic acid.

From complex statistical studies, the therapeutic effectiveness of both groups shows no significant difference. Thus the therapeutic effectiveness of fulvic acid is not inferior in comparison with a combination of anti-bacteria and antibiotic treatments.

The effectiveness of the control group using more than 2 or 3 medications for treating hemorrhaged eye diseases is in no way better than those treated with fulvic acid as the only drug.

For patients with various ulcerous cornea ailments, the number of treatment days is equally effective for both fulvic acid and the control groups.

Summary:

The effectiveness of fulvic acid as an anti-inflammatory agent and as a coagulant is nowhere less efficient compared with various anti-bacterial agents, antibiotics, or other blood coagulants. In addition, contrary to other anti-inflammatory drugs, fulvic acid does not have any side effects and in many cases is actually superior in effectiveness. Further advantages are availability and low cost of fulvic acid. Economically, fulvic acid has a uniqueness with these characteristics, and fulvic acid warrants further study and observation.

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Fibromyalgia

Fibromyalgia is a syndrome rather than a specific disease. As such there are a complex of symptoms which may or may not be present in any particular clinical instance of fibromyalgia. The most common symptoms, however, can all be helped by fulvic acid complexes as fulvic acid has been shown to be effective in reducing muscle and joint pain, improving sleep, and decreasing fatigue. Generalized muscle stiffness should also be reduced.

Taking the liquid mineral/vitamin complex will be more effective if accompanied by the capsules (dietary supplement). Research also has shown the following to be of great assistance in reducing the effects of fibromyalgia:

[1] Light, ongoing aerobic exercise, such as a walking programme, coupled with stretching exercises.
[2] A raw vegetarian diet. This diet, in one study, produced great improvement of up to 70% reduction in symptoms in the people involved in the study over a seven week period.

A change in diet such as this, presuming that the person is not already on this diet, and the exercise programme would probably be best undertaken after the liquid mineral/vitamin supplement has been taken for at least a month and has produced some benefits. Any large change should also be performed cautiously and under advice from the patients chosen health professional.

Incurable HIV or Aids virus is destroyed by humic extracts, epidemic now has over 33 million people infected

According to the Joint United Nations Program on HIV/AIDS, the epidemic currently infects over 33.4 million people worldwide. An estimated 14 million people have died since the epidemic began.

An extensive number of studies show that Humic extracts, specifically Fulvic acids, effectively and safely kill the HIV/Aids virus. In fact, one pharmaceutical company has patented a humic based drug that purifies blood for transfusions, killing the HIV virus without damaging blood cells.

Humic extracts are the most effective natural treatment against viruses of all kinds. Comprehensive studies show that humic extracts are effective against common cold and flu viruses, including respiratory tract viruses, retroviruses, influenza viruses, herpes simplex viruses, just to name a few.

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Research on the development of the medicinal applications of Fulvic acid in China

In the 15th century during the Ming Dynasty, Li Shi Zhen, in the Materia Medica pharmacological compendium, recorded incidents of the use of "Wujinsan" (golden medicine) containing fulvic acid as the active ingredient in the treatment of infectious ulcerous growth and female hemorrhage diseases, implying fulvic acid to be an efficient anti-inflammatory and blood coagulating agent.

Prior to 1978, fulvic acid had been used in hospitals and among the general population for the treating of a wide range of diseases with success; however, there was very little research conducted on its therapeutic mechanism. Because of lack of clinical data, doubts and misconceptions remained regarding the therapeutic usage of fulvic acid.

Since then, a score of medical schools and hospitals in China have begun to engage in extensive studies on the toxicology and pathology of fulvic acid and its clinical applications. Over a hundred research papers have been published nationally in China and some appeared in international journals, in addition to some reports presented at various meetings outside of China. Pharmaceutical companies in Da Tong, Shanxi, in Gongxian, Henan and in Kunming, Yunnan manufactured fulvic acid which was then approved by the Chinese Drug Administration, because of its non-toxicity, for oral as well as external usages. The pharmaceutical usage of fulvic acid has been approved by the provincial drug administration to be used clinically for its effectiveness and safety, both internally and externally.

Pharmacological studies:

1. **As an anti-inflammatory agent:** The effectiveness of fulvic acid relative to hydrogenated cortisone varies with the location of its source and the method of extraction. (i) Fulvic acid inhibits an enzyme secreted from the infected area and (ii) Fulvic acid regulates the level of the trace elements Zinc and Copper and thus activates the super-oxide dismutase which is a Zinc and Copper containing enzyme. Free radicals generated in the infected region are dismutated, utilized, and eliminated by this agent. Applications have also been established in the area of veterinary medicine.

2. **Stimulates blood circulation and enhances blood coagulation:** Many diseases are caused by malfunction of the circulation in the capillary blood system. The therapeutic effect of fulvic acid is a result of its ability to restore and improve blood circulation in the capillary system. Fulvic acid, on the other hand, serves as well as a blood coagulant when there is bleeding or blood seeping from the vascular bed.

3. **Digestive tract ulcers:** The healing effects of various fulvic acids are a result of their ability to stimulate blood circulation in the stomach wall and its ability to inhibit the secretion of acid from the stomach wall. It stimulates as well the secretion of those glands in the stomach which have the ability to protect the stomach inner wall, preventing and healing stomach ulcers.

4. **Immunology:** There are indications that with injection of fulvic acid into the abdominal region, the size of thymus in experimental animals increases, together with indications of macrophage activation. A dosage of 5 mg/kg of fulvic acid when injected into the abdominal cavity is beneficial. However, larger dosages of 50 mg/kg showed adversary effect, i.e., the weight of the thymus reduced. Researchers became interested in carrying out research to investigate how fulvic acid regulates the immune system.

5. **Endocrinology:** Fulvic acid regulates abnormal thyroid hormone secretion as a result of its being able to regulate cyclic nucleotides at the cellular level.

6. **Anti-cancer:** In general, fulvic acid does not kill cancer cells. It serves as a regulating agent in the immune system and can be used in conjunction with other anti-cancer medicines.

Clinical Applications of Fulvic Acid:

1. **Anti-inflammatory and blood coagulant:** In many clinical cases infections were accompanied by blood seeping into the area, or bleeding caused ulcers. Fulvic acid moderates ulcerous conditions on the basis of its anti-inflammatory nature, its coagulating nature, and general healing ability.

2. **Ulcerous cornea infection:** 53 cases studied, treated with fulvic acid eye drops and intramuscular injections. Success rate 94.2%. Study performed at an eye clinic in a hospital in Shaoxin, Zhejiang Province, China.

3. **Blood shot eye:** 47 cases studied, treated with fulvic acid eye drop and intramuscular injection. Success rate 93.6%. Study performed at an eye clinic in a hospital in Shaoxin, Zhejiang Province, China.

4. **Colon infection, including chronic ulcerous colon infection:** 95 cases studied, treated with 30 dosages of fulvic acid enema. Success rate 92.6%. Studies performed at Haidian Hospital in Beijing, China.

5. **Acute upper gastroenterological bleeding:** 160 cases studied, treated with oral fulvic acid and injection. Success rate 95.6%. Studies performed at Internal Medicine, Tongren Hospital, Beijing, China.

6. **Skin ulcers:** 51 cases studied, treated with fulvic acid bath. Success rate 92.2%. %. Studies performed at Internal Medicine, Tongren Hospital, Beijing, China.

7. **Rheumatoid arthritis:** Large number of cases studied, treated with fulvic acid bath. Success rate 92%. Studies performed at Haidian Hospital in Beijing, China.

8. **Hemorrhoids:** Several thousand cases studied, treated with fulvic acid preparation. Success rate was so good that Chinese medical authorities developed an over-the-counter medicine for national distribution. Studies performed at Erlonglu Hospital in Beijing, China, and Kunming in Yunnan, China.

9. **Cancer of the esophagus, disease incubation period:** 27 cases studied, treated using fulvic acid water solution for two years. 100% successful in preventing tumor progression into the cancerous state. Studies performed by Hongji Xie, et al.

10. **Malnutrition in women:** 1800 cases studied, treated with fulvic acid. Success rate 96.0%. Studies performed by Professor Deqing Yao at Tongren Hospital in Beijing, China.

11. **Over-active thyroid:** 33 cases studied, treated for 6 months of fulvic acid treatment. Success rate 90.9%. Studies performed at Tongren Hospital in Beijing, China.

12. **Congenital regional neurological disease (deaf and dumb, mental retarded and seizure patients):** Three groups studied, with one year of fulvic acid treatment. Success rate

30.3%. Studies performed at Tongren Hospital in Beijing, China, and Epidemic Prevention Station in Changping, China.

In summary, as a result of the joint efforts contributed by both the basic science researchers and clinicians, the fulvic acid component derived from humic acid has proven to be an effective and a safe remedy for a wide range of diseases. This accomplishment has raised the curiosity and interests of scientists from abroad. As evidenced by "*The Recent Progress in Chinese Medicine*" published In Singapore and "*Fulvic Acid*" published in Germany.

Future research and development directions are:

1. Continuous collaboration among researchers in chemistry, pharmacology and medicine is needed to warrant provision of high quality and authentic products. This is a mandate for making the treatment effective and safe.

2. Expand the existing clinical application to benefit more patients.

3. Select meaningful areas and develop in-depth research methodologies.

4. Acquire advanced information from researchers abroad in order to gain a broader view and understanding of the fulvic acid applications in medicine.

Shenyuan Yuan, Fulvic Acid, 4 (1988). In: *Application of Fulvic acid and its derivatives in the fields of agriculture and medicine*; Chapter 34; First Edition: June 1993

Stimulate, nourish, and repair thyroid function with nature's remedies while relieving deadly symptoms; fulvic acid offers hope

Natural therapies can prevent and treat thyroid disease, including hypothyroidsim (underactive thyroid), hyperthyroidism (overactive thyroid), Graves Disease and Wilson's Syndrome, which are the underlying causes of many serious illnesses.

A prime objective for anyone with a thyroid problem is to eliminate intake of all toxins, while removing toxic buildup within the body. Thyroid malfunction, both overactive and underactive, is generally due to autoimmune response by the body. This is where the body's immune system produces antibodies which attack the gland because the tissues seem foreign to the body. Normal hormone production is upset. Generally, the cause is due to buildup of dangerous toxins, chlorinated substances, viruses, pathogens, infections, pesticides, altered enzymes or hormones, etc., in the tissues of the thyroid gland. Such conditions can also cause lumps, tumors, and cancer.

Outpatient medical hospital studies on overactive thyroid had 90.9% cure rate within a six month period when patients were treated with a fulvic acid medication.

Yuan, Shenyuan; Tongren Hospital, Beijing; Fulvic Acid, 4 (1988)

Your first line of defense is to start supplementation with an appropriate high quality fulvic acid preparation. Fulvic acid is a natural water soluble substance of plant origin. It contains many healing phytochemicals and enzymes which readily disperse throughout the body, even to the interior of cells. Clinical medical school and hospital studies show that specially prepared fulvic acid extracts regulate abnormal thyroid hormone secretion as a result of their ability to regulate RNA and DNA (cyclic nucleotides) at the cellular level. Similar studies also show that fulvic acids act as immunomodulators, regulating immune system function.

Fulvic acids are one of the safest and most powerful antiviral substances known. Although they are not antibiotics in the technical sense of the word, as prescription drugs are, their antibiotic-like effect is comparable to the power of penicillin in equally small amounts. Unlike antibiotics, fulvic acids may be used indefinitely without creating any antibiotic resistant strains of disease which are common problems with pharmaceutical drugs.

Humic extracts, especially fulvic acids, provide a natural chelation therapy. They detoxify the body, the liver, and the digestive tract, by attaching to toxic buildup, including heavy metals, chlorination byproducts, etc., where they disarm, neutralize, and remove them as waste products. Fulvic acids also work as nature's most powerful antioxidants, neutralizing dangerous free radicals, as well as supplying hormone stimulating micronutrients.

Outpatient medical hospital studies on thyroid tumors, using fulvic acid, had a 90% success rate, with 80% having complete cures.

He, Shenyi, et al; Humic acid in Jiangxi Province, 1 (1982)

The underactive thyroid gland requires sufficient organic iodine to function properly. Organic means that it must come from a plant source, as part of a carbon molecule. High quality, safe, and readily available iodine is found in fulvic acid. Another safe and effective supplemental source of iodine comes from kelp. A dose even as high as 2,000 to 3,000 mg of kelp daily is safe and effective.

Avoid chlorine and fluoride like the plague, including fluoride found in toothpaste and added to drinking water. The phosphoric acid used in soft drinks can also contain fluorine, which is equally implicated. Chlorine, flourine, and fluoride are chemically related to iodine, and compete with it, blocking iodine receptors in the thyroid gland.

Thyroid hormone is made from tyrosine, an amino acid that the body readily converts from phenylalanine, an essential amino acid. The body breaks down proteins, turning them into these and many other amino acids. Poor quality protein intake or conversion problems during digestion and metabolism can limit tyrosine intake. This is especially true with people that have PKU (phenylketoneuria), a condition where their body cannot properly convert phenylalanine to tyrosine. Low blood plasma levels of tyrosine have been associated with low thyroid. Tyrosine is best taken on an empty stomach, with purified water or fruit juice. Adult daily dosage for thyroid supplementation is about 1,000 mg, taken independent of milk or other protein foods, preferably an hour before meals.

It is a well-known fact that an excess of one mineral can cause a deficiency in another. A high amount of copper in the body is common to reduced thyroid function. Too much copper can inhibit the function of zinc, which is essential to the thryroid conversion process along with manganese, iodine, iron, and selenium. Fulvic acids in the diet assist with maintaining proper balance. They chelate and remove excess copper (or other minerals or heavy metals), and help to nourish by supplying safe natural organic plant forms of minerals in the proper balance as nature intended.

Studies have shown that guggulsterone extracts from the Indian herb Commiphora mukul can increase the concentration of thyroid hormones in the blood. The herb is especially effective in increasing the ratio of the active T3 form of thyroid (triiodothyronine) to T4 (thyroxine). A corresponding and significant decrease in normal liver damage by free radicals was noticed, which is most interesting considering the fact that the liver is the principal site where T4 thyroid is stored and T3 thyroid is generated. Due to the natural increase in thyroid hormone function, and possibly other factors, guggulsterones have been used to treat overweight patients. During those double-blind clinical studies, a significant fall in serum cholesterol was noticed. Thryroid hormone studies with forskolin extract of the Indian herb Commiphora mukul, have shown increased thyroid production.

Other studies on patients with low thyroid have shown that body DHEA levels are below normal. DHEA (Dehydroepiandrosterone), is a naturally occurring steroid secreted from the adrenal gland. Some researchers believe that supplementation with DHEA might assist in stimulating thyroid production and alleviating symptoms.

Another highly successful approach for underactive thyroid conditions, or hypothyroidism, is to supplement with a natural desiccated thyroid glandular. This is best obtained from a source other than pharmaceutical, because most thyroid replacement drug therapies are synthetic. The best natural glandulars come from livestock raised organically in New Zealand, where extremely careful control against animal diseases is maintained. Studies show that when used properly, these natural glandulars can help revive the body's thyroid function. With the use of natural glandulars, reduction, or even possible eventual elimination of the need for supplemental thyroid may be achieved.

Scientific and medical studies show that there is hope to naturally repair and restore proper thyroid function. When the body has been cleansed and has accumulated proper levels of nutrients, the thyroid has a chance to begin working again. In many cases, nutritional therapists have seen that thyroid function resumes after only a few months, evident as body temperature begins to rise. A careful and cautious nutritional approach, with low levels of

natural thyroid glandular supplements and the nutrients and procedures outlined in this article will provide the best and safest treatment possible.

Yuan, Shenyuan; et al; *Application of Fulvic acid and its derivatives in the fields of agriculture and medicine*; First Edition: June 1993

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Humic and Fulvic soil substances hold Tuberculosis solutions

Please refer to companion article:
Tuberculosis is declared a global epidemic with incurable strains spreading throughout the U.S.

An obscure and highly technical U.S. Government report shows that there is a direct correlation between natural soil substances (humus, humic, fulvic) and the absence of tuberculosis in humans. This report and many other studies reveal that certain humic extracts, particularly fulvic acids, contain a magnificently powerful spectrum of natural micronutrients, phytochemicals, anti-viral and antibiotic-like agents that directly inhibit and destroy disease pathogens, while fortifying and regulating the immune system, increasing overall health. In the report, these extracts, although undetermined at that time, are described as being as potent as penicillin in equally small amounts.

"The present form of agriculture, to which our biological agriculture is opposed, leads to the ruin of soil and health and will eventually bring about the death of humanity." -- Professor Louis Kervran

Professor Louis Kervran was Minister of Health for France and a member of the New York Academy of Sciences

This report, a U.S. Govt. Information Circular from the U.S. Dept. of Interior, Bureau of Mines, shows a direct correlation between exposure of coal miners to humic substances and their complete absence of tuberculosis. Ancient plant deposits that were buried but never turned into true coal still remain organic in form, and are commonly referred to as humic, humates, fulvates, lignite and leonardite, and are found in close proximity above coal. These humic compounds are identical to the black and brown humus found in the very richest soils.

This government report discusses the fact that these same anti-pathogenic substances have also been traced by biochemists into many plant species, and function the same as protective mechanisms found in various plant parts, especially the coats of seeds. Also of interest is the fact that scientists insist that the activity and function of humic matter in fresh humus soil works identically to that found in ancient humic deposits, although the ancient deposits contain substances that are much more highly concentrated.

Many scientists have shown that these various anti-pathogenic substances are produced by beneficial microbes common to rich humus soils. The microbes concentrate and convert higher plant matter forming soluble compounds (fulvic acids) that are readily transported to a new plant's roots and on into the entire plant, often accumulating in specific areas of the plant.

The government report discusses the curious fact that a high concentration of still-living microbes were discovered to be dispersed throughout the interior of all raw humic substances, with the ratios, types, and species consistent with the various types of humates. Many of the strains of microbes were identified to be from the very same families responsible for some of the pharmaceutical industry's most well known, latest, and highly respected drugs and antibiotics, which interestingly are all found in healthy topsoil.

Although the various studies in the government report showed that scientists knew and identified the different species and types of microbes and were familiar with the antibiotic substances they produce, the powerful anti-pathogenic substances they were successful in

isolating from humates could not themselves be identified. The speculation is that these substances encompass nature's entire spectrum of known and yet to be discovered antibiotics.

The extracts isolated from humic substance had an activity comparable to or better than that of penicillin at similar or even higher dilution rates. The various studies showed that besides preventing tuberculosis among miners, the unique and varied disease fighting substances were found to have activity against many other human disease pathogens, and activity against plant-pathogenic bacteria as well.

Recent scientific research is gradually unraveling the mystery, and is showing that one of the reasons why individual humic related antibiotic substances are hard to identify is because such an immense and diverse spectrum exists, which have all become combined together molecularly, and also modified and inter-linked with one another. One area of immense interest that has been identified is the quinoid groups, consisting of quinonoids, quinolones, quinones, etc. Pharmacologists are finding that these substances are some of the most powerful antibiotics ever, and also that some of them fortify and increase overall health by increasing resistance to disease. The quinoid groups are very common to high quality humic extracts, especially certain fulvic acids.

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Pay Dirt; Ingrid Wickelgren; Popular Science, March 1996

Tuberculosis is declared a global epidemic with incurable strains spreading throughout the U.S.

The World Health Organization has declared tuberculosis a global emergency and epidemic. One-third of the world population is now infected with tuberculosis. More people died worldwide last year from tuberculosis than in any other year in history. This year over 8 million people will contract tuberculosis, which kills 3 million people annually. Multi-drug-resistant strains of tuberculosis have now been identified in 42 states in the U.S. Large numbers of people are now infected without knowing it, and any of them could eventually develop the disease. Incurable drug-resistant strains are easily passed on, and currently 50 million people are at serious risk worldwide.

Drug resistant Tuberculosis found in 42 states of the USA

Reports from various Centers for Disease Control show that drug-resistant tuberculosis is showing up across the U.S., now in 42 states, according to William Bishai, M.D., Ph.D., a Johns Hopkins immunologist. Various CDCs report that this is a big increase over past years.

Dr. Lee Reichman, executive director of the New Jersey Medical School National Tuberculosis Center in Newark, says that the states with the most significant increases are not the 14 states where this epidemic started 10 years ago. It is not the states we would expect, he said, which would normally include New York, New Jersey, Texas and California. He said it is actually the Southern and Midwest states which are reporting multi-drug-resistant tuberculosis.

"there's a lot of people out there in 42 states infected"

Dr. Lee Reichman, National Tuberculosis Center

"The hidden thing there, is when you are looking at multi-drug-resistance (MDR), you are looking at actual cases of tuberculosis - but only 10% of people ever infected get to be a case," said Dr. Reichman, "So that means there's a lot of people out there in 42 states infected with MDR who haven't yet gotten TB - they may or may not (develop the disease)."

Dr. Reichman says that there are many serious medical concerns associated with treating TB. "These things are saying we've still got problems to solve and we better solve them. Otherwise, in three to four years people are going to be saying 'there's another TB epidemic, my God, we've got to do something about it,'" Reichman said.

An urgent call to action to reduce incurable TB strains

"Alarming" rates of multi-drug resistant strains of tuberculosis are appearing in every country, with some "hot zones" appearing where tuberculosis has become virtually incurable, according to Dr. Ariel Pablos-Mendez of New York City's Columbia College of Physicians and Surgeons, the lead author of a new study. He went on to say that people with resistant strains can pass an incurable infection on. Representatives from the Centers for Disease Control and Prevention in Atlanta, said that "the stage is being set for substantial increase in the incidence of drug-resistant tuberculosis in many countries.'' They also said that "the findings should be interpreted as a call to action to reduce this threat."

Global emergency: One Third world population TB infected

One-third of the world's population is infected with tuberculosis bacterium, with eight million people developing the disease every year. Tuberculosis is epidemic and has been declared a global emergency and major public health threat. According to World Health Organization official, Levon Arevshatian, "It is estimated that TB kills some three million people per year, representing more than five percent deaths globally."

New therapies needed against TB, the most lethal of all infectious diseases

Worried by the fact that tuberculosis has become epidemic, and kills more people each year than any previous year in history, the World Health Organization sent a warning to the international community to apply new therapies with greater rigor. They say that currently 50 million people are at risk of infection with drug-resistant strains, which raises the cost of the usual treatment from $2,000 to an average of $250,000 per patient. Tuberculosis is currently the most lethal of all infectious diseases for both children and adults. Between two and three million people die from tuberculosis each year.

TB report "indictment of our public health system" says congressman

A congressional report describes efforts to combat TB as being complicated because of the emergence of strains resistant to anti-TB drugs. In the report, congressional analysts describe how new cases of tuberculosis are increasing at an alarming rate. Representative Ed Towns, D-N.Y., chairman of the House Governmental Operations subcommittee on human resources, said: "This is a chilling report; it is an indictment of our public-health system."

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Report from Johns Hopkins University, Baltimore, October 13, 1997

The Journal of the American Medical Association, September, 1997, #278: pp. 833-837, 838-842, 843-846, 865-867

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Treating thyroid tumor with Fulvic acid

Report on ten case studies

Thyroid tumor, a commonly seen ailment, has been treated by thyroidectomy surgical procedure (thyroid gland removal).

From March 1977 to April 1980, Dr. Shenyi He and his coworkers treated 10 patients with fulvic acid. The results were successful. Follow up visits with the patients showed that in eight cases the tumor disappeared without relapse. Details are listed below:

Clinical data:

Number of patients: 3 cases male and 7 cases female patients

Age: 17 to 36

Size and location of the growth: 3-4 cm x 4-5 cm, next to the narrow band of the thyroid gland; 7 cases leaning left, three leaning right.

Time lapse between first detection of the tumor and when treatment began: 1 week to 10 years.

Treatment: 1 case study: fulvic acid syrup; 6 case studies: fulvic acid tablets and fulvic acid injections; 3 cases: fulvic acid tablets, fulvic acid injections, and fulvic acid injection applied into tumor growth.

Diagnosis:

The female patients with thyroid tumor were under 40 years of age. Tumors of all sizes and shaped round or oval were observed and had a firmer texture than the normal gland. Its shape was better defined and slow growing. There was no pain when pressure was applied. It went up and down when food was being swallowed. Patients rarely experience any discomfort and thyroid functions were all tested normal.

Standards for evaluation of the therapeutic effects:

Cured: After three courses of treatment, the tumor disappears; Effective: After three courses of treatment, most of or part of the tumor shrinks; Not cured: After three courses of treatment, the tumor remains the same size.

Methods of treatment:

1. The regimen consisted of 20 days of three times a day intake of 10 ml syrup containing 50% fulvic acid. The same regimen is repeated another two times.

2. The regimen consists of 20 days of intramuscular injection with a 2 ml dosage containing 0.20% fulvic acid twice daily.

3. One injection in the tumor region, 4 ml of 4% fulvic acid.

4. The regimen consists of 20 days of taking fulvic acid tablets (0.3 x 4#), three times a day.

Source of material:

The preparation room of the Humic acid purification factory at Ruichang School prepares the fulvic acid syrup. People's Hospital in Ruichang County manufactures fulvic acid tablets and the solutions for fulvic acid injections.

Analysis of Therapeutic effect:

Within this case study group: Two patients after one course of treatment found their tumor to have disappeared; four patients found their tumor to have disappeared after two courses of treatment; two found their tumor to have disappeared after three courses of treatment; one patient did not complete the treatment; one patient after one course of treatment found the size of the tumor reduced, it was followed by surgically removing the growth.

Summary:

The thyroid tumor is a follicular adenomas. It is shaped like a pocket with the inner wall as shrunken follicles, some appear solid, arranged randomly, partially fiber-like, possibly due to the action of fulvic acid. Complete cure: 80%; effective: 10%; no effect: 10% (The patient treated with surgical procedures was not included in these statistics.)

Case studies:

Case 1: Ms. Wang, 34 years old, is a married factory worker. In March 1977 she experienced soreness in her elbows and discomfort in her neck . A growth the size of a ping-pang ball was found in her neck. She was examined as a outpatient and diagnosed as having a thyroid tumor. After being treated with fulvic acid syrup for two months, the tumor shrank and eventually disappeared. Follow-up visits showed there was no recurrence.

Case 2: Ms. Zhou is a 36 year old peasant, married. In October 1978 she discovered a growth in the front of her neck. Examination showed that the tumor had a size of 4 x 5 cm, detectable near the left side of the narrow band. It was soft to the touch. It had a defined shape and did not hurt when pressure was applied. It went up and down when food was being swallowed. She was diagnosed as having thyroid tumor. After a month's treatment using fulvic acid injection together with fulvic acid tablets, the lump disappeared.

Case 3: Ms. Tan, 22 years old, is a teacher in a private school. In April 1977, a lump as big as an egg was found in her neck area. She felt inhibited when breathing. After three regimens with fulvic acid intramuscular injection, the lump was reduced in size. There has not since been a relapse.

Case 4: Mr. Liang, 17 years old, is a student. The growth in his neck was discovered 6 years ago. It was located in the center leaning towards to the right, its size 3 x 3 cm. Treatment started on April 2, 1979, consisting of fulvic acid injection together with fulvic acid tablets. One month later the lump began to shrink and two months later it disappeared. Follow-up visits showed there was no recurrence.

Case 5: Ms. Luo is a 30 year old married woman. For over a month she felt there was a lump in her neck and her throat felt itchy. A tumor with a size of 3 x 3 cm was detected upon examination, detectable near the left side of the narrow band. It had a medium firmness to the touch and when pressure was applied, it did not hurt. It moved up and down when food was being swallowed. After two regimens of fulvic acid treatment beginning on December 20, 1979, the lump disappeared.

Points of understanding:

1. All 10 cases were out-patient treatments. Before and after treatment, no other medicine was used. The disappearance of tumor is without doubt the results of using fulvic acid.

2. According to related reports, fulvic acid has a anti-viral effect. It heals cancer and allows the thyroid gland to be normal again.

3. The disappearance of the thyroid tumor may be related to the inhibition towards thyroid tumor cells, relating to the inhibition of its uncontrollable growth.

4. Patients feel fine during treatment, free of any discomfort.

5. The treatment is simple and the cost of medicine is low. The patients are freed of suffering from surgery and its related complications. Patients do not need to lose work time.

6. Based on limited case study, injections with syrup together with tablets give fast results.

7. To ensure best result, the patient is required to take the whole course of treatment without interruption.

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Shenyi He, et al; Humic acid in Jiangxi Province, 1 (1982). In: *Application of Fulvic acid and its derivatives in the fields of agriculture and medicine*; Chapter 34; First Edition: June 1993

Humic substances are nature's most powerful antiviral

New studies continue to show virus - cancer connection

The relationship of viruses to cancer is not too surprising, considering the mounting evidence that shows that there is a missing link in our food chain that is allowing viruses to run rampant in their attack
on humans, animals, and even our food crops. What may surprise you most is that drug companies have sponsored extensive secret studies for the purpose of profiting from this dire situation, when in fact inexpensive and effective natural solutions exist. This entire website documents the relationships.

Of immense interest is the fact that medical hospital studies show that difficult viral respiratory illnesses common in children are readily resolved with fulvic acid dietary supplementation. Fulvic acid is a humic extract common to rich organic humus soil and also certain ancient plant deposits. Many medical studies show that humic substances, especially fulvic acids, have the power to protect against cancer AND the related cancer causing viruses. Studies often show reversal of deadly cancers and tumors using special humic substance therapies. Many studies and extensive references exist, a few of which are referenced below.

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Against Human Immunodeficiency Virus Replication; Journal of Acquired Immune Deficiency Syndromes 1991, 4(7), pp. 677-685.
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Apendix

When choosing a product containing fulvic/humic substances make sure that only filtrated spring water is used in the production of the product. See warning below.

Dangers of chlorine in relation to humic substances

Chlorine reacts negatively when mixed with humic substances especially fulvic acid, causing the production of deadly carcinogenic THMs and MX. The water treatment industry has known about this for many years, and because of this they try to remove humic substances from culinary water before treating it with chlorine. This situation is very well documented. Chlorine is the deadly culprit, not the humic substances.

Many companies selling fulvic and humic based products do not know about this problem, and may be extracting their health supplements using chlorinated water. This presents a dangerous situation to public health. Furthermore, it is important that health supplements NOT be mixed or taken with culinary water that could be chlorinated, or with juices reconstituted with chlorinated water.

Chlorine is a deadly chemical, and has the same dangerous results when it comes into direct contact with many of the extremely valuable phytochemicals contained in fresh fruits, vegetables, and herbal extracts. It makes good common sense to avoid chlorine as much as possible.

Humic Acid Data Packet

As presented by the International Humic Substances Society

Note: The samples included here are a composite data packet for all standard and reference humic acids

Elemental Composition

C	H	O	N	S	P	H20	Ash	C-13	N-15
---------- % ---------				--------- % --------			---------- % ---------		
52.55	**4.40**	**42.53**	**1.19**	**0.58**	**0.03**	**10.0**	**3.1**	**-27.7**	**-1.41**

Amino Acids Composition

Acid Basic				S-Containing	Neutral Hydrophobic					Neutral Hydrophilic		
Asp	Glu	Arg	His	Met	Val	ITe	Leu	Tyr	Phe	Thr	Se	Gly
---------- nmol /~g ----------												
14	12	13	2.4	1.3	79	37	50	16	24	32	72	97

Carbohydrate Data

Glu	Gal	Man	Rham	Arab	Rib	Xyl	Fuc	Total
---------- nmol /~g ----------								
5.0	3.3	3.3	1.4	1.4	0.2	1.9	0.6	17

ESR Data

Free Radical Concentration spin / g (el 7)	Line width Gauss	g-value	RFI
12	6.7	2.0040	2.3

Listed here are some abstracts of works demonstrating the therapeutic benefits of humic acids in cancer treatment.

Dentifricees for controlling Helobacter pylori

Patent #	Kind Date	Date	Application
CN 1102979	A	1995 05 31	CN
1994-110886	19940321		
CN 1051223	B	2000 0412	

Abstract:
Dentifrices for controlling H.pylori (microorganism responsible for gastritis and gastric or diodenal ulcer) comprising humic acid Bi salt 0.001-0.12, metronidazole 0.001-0.23,Bi subcarbonate 0.001-0.2, Bi sub citrate 0.001-0.2, Bi subsaliceylate 0.001-0.2, and / or furaxone 0.001-0.2% with/without traditional Chinese medicines in addn. to base materials. A dentifrice containing metronidazole 0.5 sorbitol 10, glycerol 10, Na CM-cellulose 1, CaHPO4 50, SDS 3g, saccharin, flavours and water.

Injection for treating rheumatic arthritis, strain or other disease in veterinary medicine

Patent #	Kind Date	Date	Application
CN 1129110	A	19960821	CN
1995-120939	1995-12/25		
CN 1059555	B	20001220	

Abstract:
The title injection is composed of humic acid0.05-5.0, procaine-HCL 0.02-2, NaCl 0.1-1.0, and water for injection to 100%. The injection is prepd. by dissolving humic acid in injection water, centrifugating, mixing with prcaine HCL, NaCl and addnl. injection water, stirring at 60-80', adjusting with HCL or NaOH to pH 5.0-7.0, filtering filling into vials, and sterilizing at 100' for 30min.

Pharmacologic and toxicologic properties of humic acdis and their active profile for vet. medicine therapy

Kuhnert M; Fuchs V; Golbs S DTW. Deutsche Tierartztliche Wochenzeitschrift (1989 Jan)

Abstract:
Humic acids derive from a class of natural substances in humic substances. The chemical properties of certain defined humic acid products enable their application in diseases of the digestive system of mammals when combined with metabolic disorders, especially in rearing age. The simple administration (via feed), their exceptional safety and the absence of side effects (e.g. allergy, resistance) as well as no residue formation in animal derived products allow a broad application of these substances in veterinary medicine, even when regarding ecotoxicological aspects.

Possibility of applying humic acids in medicine (wound healing and cancer therapy)
Jurcsik, I. Lab Agrochem. Plant Physiology, Pecs, Hung.
Abstract:
Previous expts. proved that humic acids (HA, esp. hymatomolanic acid, HY) generate active oxygen of the presence of oxygen, water and radiation. Based on these expts., it was thought that this process accelerates wound healing and inhibits multiplication of malignant tumor cells. Hy can help meet the increased demand for oxygen during wound healing by producing active oxygen. Multiplication of tumor cells is restricted by the intercalation of HY mols. with DNA strands, causing hydrogen abstraction from DNA deoxyriboses (5). In addn., HY increases the respiration rate. As HA have a self-regulation mechanism for the amt. of active oxygen produced, lipid-peroxidn. was detected. Clin. tests (in the case of wound healing) and in-vitro expts. (carcinostatic lab tests) provided results that proved the above theory. In wound healing epts., 0.01%Hy shortened the healing time. HY (0.012%) reduced the reprodn. of tumor cells by 70% (HEp-2) while multiplication of HEF remains consts. DNA synthesis practically stops above a concentration of 0.004%HY. At the same time, HY had a restricting effect only above 0.2g/100ml concentration on group of cells.

Further evidence for the incompatible pharmacodynamic responses to colchicine of malignant and benign epidermal hyperplasia in skin-tumor resistant mice.
Setala, Kai. Univ. Helsinki, Naturwissenschaften (1965), 52(18) CAN64:222264 AN 1966:22264
Abstract:
Malignant and benign hyperplasia was provoked on the backs of mice. These and normal animals were exposed to an Me2CO soln. of colchicine (I), alone and in combination with phlorizin (II) or humic acid (III) prepn. The examination of the biopsies by cytologic, light-, polarization-, and electron microscopic methods, revealed that the combined exposure did not alter the effects of I (cf. preceding abstract). The addition of II or III to benign epidermal hyperplasia decreased the I effect. Normal epidermis responded in a similar manner. Neither II or III enhanced the effect of I on malignant hyperplasia. There was a qual. difference between the susceptibility of the receptors of malignant and non-malignant cells. Radiodynamic and pharmacodynamic responses cannot be used as reciprocal models of general reactivity nor as a common determinant in the evaluation of efficacy of a given anticancer measure.

Anti-tumor effect of humic acid and its pharmacological study.
Fu, Maiwu; Zhang, Lisheng, Lanpin et al Chinese Med. Sci. Peop. Rep. of China. YHTPAD ISSN:0512-7343 , CAN 96:79555 AN 1982:79555
Abstract:
The antitumor effect of 2 different humic acid preparations was studied. Both inhibited the growth of mouse S-180 sarcoma and hepatoma. One preparation inhibited mouse uterine cervical cancer U14, whereas the other was not effective. Neither preparation affected the phagocytic activity of the mouse reticuloendothelial system, but both markedly reduced spleen.wt. and the formation of splenic rosette cells and hemagglutinating antibodies. Neither preparation influenced the content and synthesis of DNA, but both markedly decreased the content and synthesis of RNA, in S-180 cells

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Oxihumic acids and its use in the tratment of various conditions.

Patent #	Kind Date	Date	Application
WO 2000016786	A2	20000330	WO
1999-IB1569	19990922		
WO 2000016786	A3	20000608	

Abstract:
A pharmaceutical compound comprising an oxihumic acid salt, ester or derivatives thereof as an active ingredient is disclosed. The compound. is preferably administered orally for stimulating lymphocytes in a human, animal or bird. It may be used in treating viral and bacterial infections, HIV infections, opportunistic diseases, inflammation, pain and fever, cancer growth and diseases associated with viral infection and a depressed immune system. A number of pharmacological examples were given including interleukin 10 production by oxihumate treated lymphocytes, increased antibody production against Newcastle disease in chickens treated with oxihumate, TNF production by oxihumate treated lymphocytes, and antiviral activity of oxihumate against HSV-1 and coxsackie virus type 1 in vitro.

Effects of sodium humate on the cells cycle and proliferation of mammalian cells.

Hofmanova J., Kozubik A., Hola J., et al Institude of Biophysics Acad. of Sciences Czech Republic.

Biochem. Metab. (1999) CODEN: KBMEFQ ISSN: 1210-7921

Abstract:

It was demonstrated that sodium humate (HUNa) prepared from natural humic acids, suppressed proliferation of four mammalian cell lines of different origin in vito in a concentration dependent manner without decreasing cell viability. Incubation with HUNa caused accumulation of cells in the G0/G1 phase of the cell cycle as determined by flow cytometry. Both these effects were found to be reversible. Similar results were obtained in vito using most lymphosarcoma cells growing as an ascit in the pertoneal cavity of mice treated with HUna. Moreover, pre-treatment of these cells with HUna significantly decreased their ability for form metastatic infiltration in the mouse liver after i.v. administration. The mechanism(s) of HUNa effects are discussed, which could be connected with its special chemical properties, such as great surface activities, redox properties, absorption ability and/or free radical content. These properties can all effect predominantly cell surface and thus the cell response to external signals. The author's findings can be important both from ecotoxicological and therapeutic points of view.

Synthetic humates in manufacture of a medicament for treatment of mucosal disease.

Patent #	Kind	Date	Application
EP 656208	A2	19950607	EP
1994-113498	19940830		

Kuehnert Manfred, Haase Anton F. , Kleffner Hans Werner Reutgerswerke AG, Germany

Abstract:

Synthetic humates, prepd. by oxidn. of polyhydric phenolic compds. are useful in manuf. of drug compounds for oral administration for treatment of irritation and inflammation of gastric, intestinal, respiratory and reproductive tract mucosa in human and veterinary medicine. Thus lavage of bovine uterus with 2L 4% Na humate solution prepared by oxidation of hydrquinone, 4 times at 12 h intervals after a difficult birth accelerated regeneration of the uterus.

Effect of orally administered humic acids on the nuclei acid metabolism of ascites tumor cells in mice.

Zsindley, A.; Hofmann R.; Klocking R. Biokem.Intez., Orvostud. EGY., Debrecen, Hung. Acta Biol. Debrecina (1973)

CODEN: ABIDAO CAN 81:114748

Abstract:

Humic acids (40mg) administered orally to mice bearing Crocker sarcoma 180 or Nemeth-Kellner ascites lymphoma for 5 days decreased the amount of ascites fluid and the tumor cell no. The acids also decreased the amount of DNA and RNA in tumor tissue and altered the amino acid compn. Thymine was increased and adenine was decreased in DNA, and adenine was increased in RNA

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