

Summary of scientific research



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Welcome to the world's leading Fulvic acid and Humic substance medical research center

Since 1996, Fulvica BioScience has continually searched the world over for valid human clinical medical studies relating to Humic substances, particularly Fulvic acid. We also perform our own studies, and are affiliated with a network of scientists from all around the world.

As a non-profit foundation we feel it is our most urgent responsibility to inform the public and the medical community alike about the important discoveries that we have unearthed that pertain to world health. We have discovered that there is a missing link in the human food chain, with immediately deadly consequences. World health now hangs in the balance.

Medical and agricultural research continues to conclusively point to one fact: Fulvic acid holds the keys to healing and preventing the world's diseases

- Nearly every pharmaceutical drug, herbal extract, health supplement, or therapeutic substance from nature, can somehow be traced to the functions and actual makeup of fulvic acid.
- The DNA of every living or extinct species of organism on Earth, whether plant, animal, or microbe, has eventually become a highly refined component of fulvic acid.
- The original life giving, protective, and healing components from plants (phytochemicals) do not disintegrate during nature's fulvic acid production process, but become highly concentrated.
- Fulvic acid often exhibits remarkably similar characteristics to the bioactive sub-

stances it originated from, and exhibits comparatively similar beneficial results that are often significantly magnified and enhanced.

- Many species of plants, particularly microscopic plants, are involved in the fulvic acid production process.
- Fulvic acid production is, in essence, nature's perfect recycling process, where the end product, fulvic acid, provides a steady increase in health to subsequent generations of living organisms.
- Modern waste disposal and agricultural practices have completely broken nature's recycling process, resulting in progressively deteriorating health.
- In a more perfect world, fulvic acid can reverse the steady cycle of health deterioration, and start a new cycle of progressive health improvement.

Fulvic acid is a Humic substance or extract. Fulvic acid is the end product of nature's Humification process, which is involved in the ultimate breakdown and recycling of all once-living matter, especially plants.

Fulvic acid contains ALL of the phytochemical protective substances, amino acid peptides, nucleic acids, etc., from the original plant matter, highly concentrated, refined, transformed, and enhanced by the actions of innumerable microscopic plants, such as fungi. The Humification processes prevents the original phytochemical protective components from completely breaking down and turning back into basic mineral elements. Even small strands of RNA, DNA, and plant photosynthetic materials still remain intact. Many of the original components become complex enzymes, which have seemingly miraculous function.

Because fulvic acid is so highly refined, it consists of extremely complex but

small molecules, easily penetrating cells. For this reason it is highly reactive and bioactive, and is the most rare and valuable of all humic substances. Because of Fulvic acid's very small size (low molecular weight), it readily penetrates human tissues and cells, and interacts on the cellular level providing innumerable functions. The results are simply phenomenal.

Nature meant for small amounts of fulvic acid to participate at every level and link along the food chain. It contains latent solar energy, remnants of plant photosynthesis. Fulvic acid even bridges the gap between inert minerals and living matter, and it participates in the spark of life.

Fulvic acid is simply nature's most important form of protection and defense for plants, animals, and man. It is tied very closely with immune system functions and has powerful antioxidant qualities. Because fulvic acid is so small and complex, it has been entirely misunderstood and overlooked by most of medicine and science.

For a good preliminary understanding of the many important health related implications, we highly recommend that you read our online **Health ALERT**. The online version is constantly evolving and updated daily. Prior to our taking the journal online in January 2001, we published and sold over 20,000 hard copy issues of *Health ALERT 2000*. A limited number of those 24 page newspaper issues are still available, and can be purchased for \$7.50 each.

We continue to spend many thousands of dollars on acquisition and translation of valuable Fulvic acid and Humic substance related medical documents. We appreciate your help in spreading the word to others, and also welcome contributions of related and worthwhile clinical studies. Financial support through donations or grants is sincerely appreciated.

Thank you for visiting our site. We hope that your visit will be informative and enjoyable.

Exposing the untold truths behind our perplexing global health crisis....An Urgent Wake-Up Call To All Consumers

Some of the most unthinkable tragedies in history are taking place at a tremendous expense to your health. Millions of people are in jeopardy, and many are suffering and dying needlessly. The time has come to expose these deadly injustices, and provide you with immediate and concrete solutions. Anyone willing to carefully read, study, and ponder the facts presented throughout this research database, will awaken to the terrible state of our situation and realize that our health has been put on a perilous course headed for immediate disaster.

Astonishing parallels exist that point to interrelated common causes, most of which will become obvious even to the casual reader. The answers are relatively simple, yet a valiant new breed of advocate will be required to champion the cause because once-trusted conventional institutions and agencies have become seriously corrupted by greed and power. As one of science's greatest unconventional thinkers so aptly admonished:

“Serious problems cannot be dealt with at the level of thinking that created them.” --Albert Einstein

Public betrayed by medicine says medical authority

Dr. Joseph D. Beasley, M.D., a former Harvard University Administrator and Dean of the School of Public Health at Tulane University, exposed the current medical system as seriously flawed. According to Dr. Beasley, the wonder drugs of the last century haven't worked as well as was thought. Medical science has undeservedly taken credit for the health improvements of the last 100 years, when in fact, it was improved

quality of life that was responsible.

The general public has never been told by pharmaceutical companies about the actual inexpensive and common sources of their drugs. Pharmaceutical companies have obscured the background science behind the simple natural lifesaving microbial and herbal components common to both plants and soil. Researchers for drug companies are constantly discovering wonderful natural substances, but little does the general public know that the original plant and soil sources worked far better and more effectively than the isolated synthetic counterparts patented by pharmaceutical companies.

According to Dr. Beasley, money and greed have tainted medicine and kept consumers from being told the truth. In many cases, it is the medical establishment that is responsible for the betrayal of our health.

JD Beasley, MD; *The Betrayal of Health*; 1991; Times Books.

Unforeseen parallels indicate common causes for disease

Forward thinking scientists, medical doctors, and researchers worldwide are quickly discovering increases in human disease directly proportionate to the decline in certain micronutrients in our diets. These parallels are consistent with an especially serious decline in phytochemical (phyto means plant) nutrients and enzymes in agricultural soils, crops, livestock feeds, and the human diet.

Billions of beneficial microbes (microscopic plants) once common to fertile soils are no longer found there because the nutrients they feed upon are not supplied to the soil, and they are killed by repeated applications of chemical fertilizers, pesticides, and herbicides. Missing is the immense array of phytochemicals and enzymes they release into the soil which travel up the food chain, being added to, and built upon, by each successive host. New advances in soil science are proving that many phy-

tochemicals and other valuable micronutrients actually originate in the soil, and are not produced nearly so abundantly in higher food plants as was earlier thought. Phytochemicals include plant hormones, plant antibiotics, anti-viral and anti-fungal compounds, plant antioxidants, and a vast arsenal of other highly protective substances, most of which have not yet been discovered.

Anderson, M; Jensen, Dr. Bernard; *Empty Harvest*; 1993.

Incurable deadly diseases are fast becoming epidemic

Numerous incurable strains of deadly diseases are showing up in most countries of the world and have even infiltrated most states in the USA. Reports coming from global conferences of the World Health Organization (WHO) and Center for Disease Control (CDC) continue to alert medical authorities to the serious risks. It has been reported that large segments of the population have already been exposed, and that it is only a matter of time before many people will develop the diseases.

Hospital studies show that patients with normally incurable epidemic Hemorrhagic Fever were able to be successfully treated with humic extracts, which stopped bleeding, restored circulation, removed clots, was anti-viral, and significantly bolstered and regulated the immune system. Yinzhong Cui, *Humic Acid*, 1 (1991)

Why some people come down with the deadly diseases, while others have immune systems that are resistant, still baffles medical researchers. Yet most worrisome is that immunity of the general population is rapidly diminishing. Some diseases have become resistant to antibiotics which makes them incurable, while other diseases never have had a cure. Some of the lethal and incurable forms of disease cited in reports include: tuberculosis, hepatitis, various forms of hemorrhagic fever including the ebola virus and hantavirus, and Aids which is caused by the HIV virus.

Missing link in food chain creates deadly imbalance

Our current health dilemma is comparable to a three-legged stool, with the well-known and familiar vitamins and minerals being two of the legs. Without the third leg, plant phytochemicals, this three-legged stool will not stand, upsetting nature's fragile balance. Phytochemicals stimulate the immune and hormonal systems, and are the missing link upsetting the entire food chain, which is manifest by serious and diverse health problems.

The inconceivable tragedy is that for many years the pharmaceutical companies have been knowingly substituting the "third leg" in the form of very expensive synthetic drugs, versions of otherwise naturally occurring phytochemicals created both by microscopic soil-based plants (microbes) and higher plants. Similarly, the huge agricultural chemical companies substitute chemical pesticides to resolve farmers' out-of-balance crop problems. This all comes at a huge cost to consumers, both monetarily and in steadily failing health and upset to nature's balance.

Cancer fighting nutrients become deadly when combined with chlorinated tap water

Some of nature's most valuable and essential anti-cancer and anti-disease phytochemical nutrients which are commonly found in food have been discovered to form deadly cancer causing substances when consumed or combined with chlorinated tap water. This discovery includes familiar foods including soy, fruits, vegetables, tea, many health products, and even some vitamins. Research has proven that these essential nutrients are the exact same families of compounds, that even in infinitesimal amounts have been tormenting the water treatment and chlorine industries for years.

Recently, a joint study was undertaken in Japan by research scientists at

the National Institute of Health Sciences and Shizuoka Prefectural University. They determined that natural organic substances originating from foods, including fruits, soy, and green or black tea, react when tap water is chlorinated, forming dangerous cancer causing compounds. These deadly compounds have been named MX, which stands for "unknown mutagen", and are similar to the already well-known and more easily detected cancer causing THMs (trihalomethanes).

The Japanese scientists specifically mentioned that their studies showed that MX is created by the reaction of chlorine with natural organic plant phytochemicals such as catechins, which are contained in tea, and flavonoids which are found in fruit. Since Japan has an extremely high consumption of tea, fruits, and soy products, it is easy to see how high amounts of residues from these foods would end up in their wastewater treatment and water recycling systems.

Earlier studies by scientists in Finland in 1997 determined that MX is 170 times more deadly than other known toxic byproducts of chlorination, and was shown in laboratory studies to damage the thyroid gland as well as cause cancerous tumors.

THMs are known to be created by the reaction of chlorine with humic and fulvic acids, which are the final breakdown products of vegetation, including decayed leaves and organic matter. Humic substances are the same as soil humus, of which the fulvic fraction is water soluble and readily transported into streams and waterways, as well as utilized nutritionally by plants.

Very recent scientific discoveries have identified and clarified the composition of fulvic and humic acids as containing a significant amount of nutritional phytochemical groups including hormones, sterols, fatty acids, polyphenols, and ketones, which subgroups include but are not limited to: flavins, flavonoids, flavones, tannins, catechins, quinones, isoflavones, tocopherols, etc.

These compounds are some of the most valuable and promising anti-cancer nutrients found in our foods and health supplements. Coenzyme Q10 is a quinone, vitamin B-2 is a flavin, vitamin E is a tocopherol, citrus bioflavonoids including hesperidin, quercetin, and rutin are all flavonoids, green tea contains catechins, phenols, tannins, and isoflavones. Potentially all of these substances, and many more, are implicated by chlorination.

Amazingly, it has been discovered that these phytochemicals remain intact, concentrated, and intricately combined within humic substances; which are valuable remnants of nature's protective substances contained within fruits, flowers, pollen, nuts and seeds, as well as vegetative parts including roots, stems, bark, and leaves. Even the plant nucleic acids, RNA and DNA remain intact.

To comply with EPA rulings, water treatment plants have had to develop special techniques to scrub the seemingly dubious organic residues from water prior to treatment with chlorine. There is nothing wrong with the organic substances themselves, it is chlorine that is at fault for turning them into the deadly THM and MX cancer cocktail. Reality is that the organic substances have been shown to be highly beneficial combined with pure drinking water in trace amounts.

The bottom line is this: when water treatment facilities remove these substances, they are throwing the precious baby out with the bath water, and the remnants that remain are turned into cancer causing agents by chlorination. To make things worse, it is certain that the fresh plant foods we eat similarly react with the chlorinated tap water we drink with our meals, creating toxins. This means that fresh fruits and vegetables, green salads, green tea, black tea, herb teas, soy products, vitamin pills and various health supplements, and even some pharmaceutical drugs, all can be implicated in combination with chlorinated water.

The deadly cancer causing agents

which are produced are extremely toxic in infinitesimal amounts, so small and obscure that they are extremely difficult to detect. Very little chlorine is required. When the concentrations of phytochemicals are high, such as in concentrated health supplements, or even fruits and vegetables coming from more fertile soils, the deadly combination with chlorination intensifies.

It has been known by the water treatment and chemical industries for many years that chlorine reacts negatively with natural organic compounds. These industries call these compounds DBPs (disinfection by-products) which are known to cause cancer in populations whose drinking water contains them. THM, the most commonly known DBP, is known to cause a high incidence of bladder cancer and also to cause spontaneous abortion of fetuses.

The Environmental Protection Agency has continually tightened their restrictions on THMs in drinking water, and even tighter restrictions are just around the bend. Yet it is interesting to note that the many government agencies and chlorine industries have conveniently neglected to take a serious look at food, health supplement, and pharmaceutical drug consumption, preparation, and production relating to use of chlorinated tap water.

There is good reason for the public to seriously examine and question this entire issue. Many years ago laws were passed making chlorination of water mandatory. Now, the chlorine industry and government agencies must continue their existing policies, because if sudden or drastic changes are made, the legal liabilities would be staggering. Certainly some government or industry personnel have known or theorized about these problems and have been covering them up for many years. However, if anyone were to admit to it, the consequences could be disastrous. This predicament could make the tobacco industry scandal seem insignificant in comparison.

Another area needing thorough scrutiny relates to pharmaceutical drug safety

studies normally performed on animals in the laboratory. It would be reasonable to surmise that good laboratory practices and procedures would require that such studies be performed using highly purified drinking water for animals. It would be reasonable to believe that drug companies would not take the chance of jeopardizing clinical studies using chlorinated tap water. Of course chlorinated tap water is a common denominator within the human environment. Educating people to the dangers of chlorine would be admitting to knowledge of the problem, which could invalidate past studies and certainly raise serious legal problems.

This whole chlorine issue should come as no real surprise to any biochemist. During the last century, chlorine has been combined with many other normally safe organic substances to form some of the most powerful deadly toxins known, such as dioxin, DDT, PCBs, etc. The bottom line is that the real culprit is chlorine, not the substances with which it reacts.

Although chlorine has essentially eliminated the risks of waterborne diseases such as typhoid fever, cholera and dysentery, there are many pathogens that are not controlled by chlorine. Other and better methods of water treatment exist. Many alternatives are already used throughout the world. Ever tightening EPA regulations have forced the water supply industry in the USA to look into alternative methods for disinfecting water.

For years, environmentalists have battled the water treatment industry and large chemical companies in an effort to ban the use of chlorine in drinking water. This ongoing battle has been a big source of revenue for both sides. As word of the problem spreads to the general public, something might actually be done about it.

As this message spreads, it will no doubt shake the very foundations of the chlorine and water treatment industries, let alone the government agencies that are implicated along with them. There certainly should be cause for serious

alarm within the nutritional supplement and food industries, as well as those segments of the medical industry that might awaken to the dilemma.

This message is of utmost importance to the general public, because chlorine will one day, in the near future, be exposed as a major cause and contributor to cancer and degenerative disease. Chlorine will also be found to be responsible for damaging the body's immune and hormonal systems by mutating the food-based plant estrogens and phytochemicals that support those systems. A healthy immune system should be your first and best line of defense against waterborne disease.

Recer, P; Water chlorine byproduct may be cancer risk; June 18, 1997; Associated Press

Christman, RF; Kronberg, K; Singh, R; Ball, LM; Johnson, DJ; *Report 259: Identification of Mutagenic By-products from Aquatic Humic Chlorination*; North Carolina State University

Rhomberg, L Ph.D.; *Risk In Perspective: Are Chemicals In the Environment Disrupting Hormonal Control Of Growth and Development?* April 1, 1996; Harvard Center for Risk Analysis

Japanese data related to MX and the Shizuoka Prefectural University has been extracted from various abstracts published by the American Water Works Association (AWWA), and the National Institute of Health (NIH).

Plant phytochemicals and nutrient groups can be determined from information within the Organic Chemical Tables; Chemical Abstracts Service (CAS), a division of the American Chemical Society.

Undiagnosed low thyroid epidemic affects possible 70% of population, causing serious health problems

A new study by Dr. E. Chester Ridgway, the University of Colorado's chief endocrinologist, says that an estimated 13 million Americans may have undiagnosed thyroid problems, up from previous estimates. He says that even mild thyroid problems might cause serious consequences. Pregnant women with underactive thyroid are in jeopardy of having children with lower IQs. Research shows that low thyroid levels

can raise cholesterol levels, thus raising the threat of a heart attack. In his April 10, 2000 news release, Dr. Ridgway said that people don't realize what a big problem this is and how important it is to get the word out.

Low thyroid symptoms · Depression, Anxiety, Seizures · ADD and ADHD · Lack of Concentration · Mental Confusion · Memory Loss · Serious Mental Illness · Low Resistance to Colds, Flu · Respiratory Infections · Cold Hands and Feet · Low Body Temperature · Constipation, Hair Loss · Low Blood Pressure · Low Energy, Chronic Fatigue · Overweight, Hypoglycemia · Difficult Weight Loss · Headaches, Migraines · Skin Problems, Acne · Low Blood Sugar · High Cholesterol · Heart Disease · Cancers, Tumors of Many Kinds · Arthritis, Osteoporosis · Diabetes (often misdiagnosed) · Female Estrogen Problems: Breast Cancer, Tumors · PMS, Infertility · Uterine Fibroids, Cramps · Excessive Monthly Bleeding · Endometriosis, Cysts, etc. **...and many other symptoms**

Very few medical doctors understand the undiagnosed thyroid problem or know that this situation has been getting progressively worse for many years. Many people have very real and serious symptoms, yet their physicians are unable to truly determine the cause, often treating them for the wrong ailment. Patients are often told that their symptoms are psychosomatic or "all in their head", and they may be sent to psychiatrists.

Common and often undiagnosed symptoms and dangerous consequences of low thyroid include: serious mental problems, depression, anxiety, seizures, ADD and ADHD (low thyroid is a problem even in young children), poor concentration, mental confusion, memory loss, cold hands and feet, low energy levels, difficult weight loss, migraine headaches, acne, low blood sugar, high cholesterol levels, heart disease,

cancer, arthritis, diabetes including misdiagnosis and complications, susceptibility to tuberculosis, lung cancer, emphysema, constipation resulting in colon cancer, susceptibility to infections due to low immunity, all female problems (due to high amounts of dangerous forms of estrogen), including: tumors, fibroids, ovarian cysts, PMS, endometriosis, breast cancer, miscarriage, heavy periods and cramps, etc.

A number of years ago, Dr. Broda Barnes, M.D., did extensive studies showing at that time that low thyroid (hypothyroidism) affected 40% of the population. These studies were extensive and performed upon very large segments of the population. Other doctors that since have followed his work are noticing that the problem is rapidly increasing, and they are now seeing the problem in as high as 70% of the population.

Dioxin, a dangerous chlorine related compound found throughout the food chain, is one cause of low thyroid. Another is likely related to toxic substances which are produced when drinking water is chlorinated, and later when chlorinated drinking water mixes with plant phytochemicals in food. Rather than feeding the body's endocrine glands as nature intended, the many hormone-like plant micronutrients found in food are altered by chlorine, and turned into mutagens that do permanent damage to the glands. Also, serious deficiency of valuable phytochemicals in modern-day diets may be responsible for undernourished hormonal functions in those with otherwise healthy glands.

Dr. Barnes developed a self test based on body temperature, using an ordinary thermometer, that anyone can use to detect a problem. Dr. Barnes' method used underarm temperature, but since that time most doctors treating these special thyroid problems now suggest taking oral temperature and pulse.

Immediately upon awakening in the morning, while still in bed, normal temperature should range

between 97.8 to 98.2 degrees. Dr. Barnes and others believe that anything less than 97.8 indicates low thyroid or hypothyroidism. Anything above 98.2 could indicate hyperthyroidism or over-active thyroid. Also, at the same time, pulse rates should be checked and should range between 65-75. With many thyroid deficiencies, pulse rates will be lower, along with a body temperature that is one or two degrees lower. This condition certainly requires attention.

Daytime average body temperature should be 98.6 degrees, and daytime resting pulse should be 84, which is best to be checked about 10 AM and also about 30-60 minutes after lunch. Many studies show that people without heart disease have a daytime pulse rate of 85 beats per minute. Other studies show that the smartest high school students have a pulse rate of 85 versus 70. Other studies with patients that have pacemakers, where heart rate can be controlled, showed improved memory and mental function at a pulse of 85 verses 72.

Conventional medicine has failed miserably with treatment of thyroid problems. Their procedure uses THS blood screening to lab test for low thyroid levels, which is often very inaccurate because it only identifies part of the picture. It does not show if the thyroid hormones are actually working correctly in the body. Many people that exhibit the common symptoms don't receive proper treatment because their blood levels appear normal.

There are important factors involved in getting proper treatment. You must find a doctor that understands the proper tests and treatments described by Dr. Barnes, Dr. Balch, and others, and is willing to use natural desiccated thyroid. If your doctor does not understand these methods, insisting on blood work alone and prescribing synthetic thyroid drugs, find a doctor who does. It is possible to self diagnose and self treat thyroid problems, and natural hormones are available without prescription, but hard to find in suitable quality. It is very important that proper guidelines be very carefully followed for self treat-

ment.

Pharmaceutical companies produce synthetic levothyroxine versions of “inactive” thyroid that very often don’t work. These products have T4 thyroid which depends on the liver to do the conversion to T3, which is the most active form of the hormone. In many cases the synthetic versions don’t convert properly, even though blood tests look normal. Patients treated with synthetics often experience adverse symptoms and feel much better when given the natural desiccated thyroid, containing T4, T3, T2, and T1 hormones.

Most physicians have been so badly indoctrinated by the major drug companies that they haven’t a clue as to the serious and potentially deadly health implications that still exist in their patients, especially those patients with less noticeable sub-clinical problems. Recently, the drug company manufacturing the synthetic thyroid known as Synthroid has been undergoing lawsuits for inconsistency and quality problems, but sadly even those legal actions don’t address the real issues, and let them off the hook for more serious legal issues. Studies show that Synthroid and related synthetics can deplete the body’s bone mass by as much as 13%.

The cause and cure of thyroid disorders correlate with the subjects of many articles in this publication. The ultimate solution is prevention with proper diet and nutrition, and then hormone therapy if necessary. When a thyroid problem is identified, proper therapy can sometimes restore the organ, otherwise lifetime thyroid supplementation may be necessary. This can be done naturally, safely, and quite easily, just as you would use any other nutritional supplement. Please don’t delay with implementing prevention, testing yourself, and obtaining help as required.

Barnes, BO; Galton, L; *Hypothyroidism: the unsuspected illness*; 1976; Harper & Row Publishers; New York, NY.

Langer, S; Scheer, J; *Solved: The Riddle of Illness*; 1984; New Canaan, Ct; Keats.

Barnes, BO; Barnes, CW; *Heart attack rareness in thyroid treated patients*; 1972; Charles C. Thomas; Springfield, IL.

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Barnes, BO; *Etiology and treatment of lowered resistance to upper respiratory infections*; Federation Proceedings 1942;69:808

Barnes, BO; *The treatment of menstrual disorders in general practice*; Arizona Medicine 1949;6:33

Barnes, BO; Ratzenhofer, M; *One factor in increase in bronchial carcinoma*; JAMA 1960;174:2229

Loeser, AA; *A new Therapy For Prevention of Post-Operative Recurrences in Genital and Breast Cancer, A Six-Years Study of Prophylactic Thyroid Treatment*; Brit. Med. Jour., v. 6, 1954, pp. 1380-83.

Balch, James F., MD, and Phyllis A; *Prescription for Nutritional Healing*; second edition, 1997; Avery Publishing Group.

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 hypothyroidism (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, fluorine, 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 (phenylketonuria), 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 thyroid 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. Thyroid 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 (and throughout our *Health ALERT* publication), will provide the best and safest treatment possible.

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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 mag-

nificantly powerful spectrum of natural micronutrients, phytochemicals, antiviral 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.” --Profes-

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

Please refer to companion article: [Humic and Fulvic soil substances hold Tuberculosis solutions](#)

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 CON-

gressman

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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Humic substances are nature’s own best medicines, a hidden treasure trove unearthed

It seems beyond belief that anything as simple as a lowly soil substance could clean up the Earth’s environment, neutralize radiation and deadly toxins, heal the agricultural lands, fuel the spark of life in living organisms, disarm and kill infectious pathogens, destroy the deadliest viruses, prevent most, if not all diseases, and even cure and restore diseased and damaged tissues and organs in plants, animals, and man.

Sound too good to be true? All of those claims are legitimate and proven by scientists, medical doctors, and pharmacologists from all around the world. Tragically, the politics of greed have repressed the message, which as it

expands to the public, will shake the very foundations of conventional science, medicine, and agriculture.

It doesn't take a rocket scientist to see and understand the power and potential of humic substances. Common sense and reason are all that are needed. As the never before all-assembled pieces of this magnificent puzzle come together, the whole picture becomes crystal clear.

What are humic substances? They are the sum total of all once living organisms, mostly plants, disassembled by nature's brilliant decomposition and recycling processes, then highly refined by millions of species of beneficial soil-based microorganisms. Ultimately, microscopic plants such as yeast, algae, mold, fungi, etc., finish up the process. These tiny beneficial plants refine, purify, combine, and re-refine, until tons of once-living matter are converted to pounds and ounces.

Yet miraculously, when it is all said and done, the end product is not inert basic "dead" mineral elements, but is transformed into the world's most complex and ultra-compact molecules. Even the nucleic acids, RNA and DNA, of the earlier life-forms remains intact. The molecules are ultra-condensed and highly functional, rolled up into tight little balls that are supercharged biochemical and phytochemical powerplants, similar to storage batteries or fuel cells.

Where did this supercharged power come from? It is sunshine light energy captured during plant photosynthesis, and through decomposition it is converted and stored within the interior of the world's most refined and complex molecules.

Buckminster Fuller, one of America's best known thinkers of the 20th century, helps us to understand plant energy accumulation from photosynthesis. Visualize if you will, a log burning in the fireplace. When asked "what is fire" Buckminster explained, in a rather lengthy discourse, that fire is the Sun's radiation unwinding, each growth-ring of the tree's log representing a year.

He explained that many years of the Sun's flame winding through the sky, absorbed by the tree through photosynthesis, is now unwinding in the burning log.

With a log of firewood, lump of coal, oil, natural gas, or gasoline, all of which are remnants of once living plants, it is easy to see and understand solar energy storage and release. With the humic substances, it is not so clear to see because they don't readily burn.

"It so often happens that our vision of search is toward the horizon, little realizing that what we are seeking lies at our own feet" Dr. D. Bastra, M.D.
Royal College of Surgeons

Humic substances are found in rich humus soil in trace amounts. They are also found in massive ancient plant deposits, never truly fossilized, still remaining completely organic. What makes their stored solar energy so different? The key is found in nature's decomposition and refining process. The energy is converted into a different form.

Coal, oil, tar, natural gas, and uranium deposits, all are "dead" inorganic remnants of ancient plants. Uranium mines, just like coal mines and tar pits, also have fossilized trees, leaves, and dinosaur bones, all remnants of ancient life turned to rock.

Uranium ore is rock, and doesn't burn, or does it? Ponder how a few pounds of seemingly inert refined uranium ore has the power to fuel the reactor in a nuclear power plant, or become an atomic bomb. Where is all of that energy stored? The power is deep within complex molecules, and is released through nuclear fission, the splitting of the atom's nucleus.

Could there be a similarity to the seemingly inert humic substances? Humic substances are not radioactive, but quickly and effectively neutralize radiation. This is well established and extensively documented. Where does that nuclear energy go? Could it be that controlled nuclear fusion is taking place,

the joining of atoms' nuclei?

It is certain that a different form of equally intense latent solar light energy is found deep within the humic substance molecules. The many rare earth superconductor elements that humic substances contain may provide some clues.

Humic substances have the amazing power to molecularly bond with, and transform, other molecules and substances, liquefying them, making them smaller, more condensed, and energizing them. A tremendous, well controlled fusion or fusing power certainly exists.

Recent advances in new laboratory instruments and testing procedures has given us Nuclear Magnetic Resonance (NMR) analysis. With NMR, scientists can, in a sense, see and untangle complex organic molecules, categorizing similar portions of the highly complex molecules into Functional Groups, which relate to more commonly known substances. This allows us to discover the many valuable components hidden in the complex humic molecular structures.

The varieties of smaller, more recognizable, molecules found within the highly complex humic molecules, read like the "who's who" of the many pharmaceutical and nutritional breakthroughs of the last century. Many of the substances are the current focus of the most promising ongoing medical and health research studies.

In a nutshell, humic substances consist of an immense arsenal and array of powerful phytochemicals, biochemicals, supercharged antioxidants, free-radical scavengers, super oxide dismutases, nutrients, enzymes, hormones, amino acids, antibiotics, antivirals, antifungals, etc.

Many of the substances that make up humic matter have yet to be discovered and catalogued among the known and documented organic chemicals. The diagram below begins to tell the story, and shows but only the tip of the iceberg.

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Epidemic diseases coincide with little known fulvic and humic antioxidant medical data

Headlines coming from Johns Hopkins, Reuters, the Associated Press, and other medical news services, continually discuss serious concern over the widespread and rapid increase of incurable infectious diseases, degenerative diseases, autoimmune and mental disorders.

The incidence of heart disease, cancer, diabetes, arthritis, osteoporosis, multiple sclerosis, Parkinson's disease, asthma, AIDS, Alzheimer's, depression, anxiety, ADHD, and a host of other illnesses are reported to be advancing in epidemic proportions.

Promising parallels exist to medical research surfacing from scientists, doctors, and pharmacologists from around the world, showing that specialized humic extracts, particularly fulvic acid, can prevent, treat, and often even cure many diseases, even some that are otherwise incurable.

40 million in the US have Arthritis related autoimmune diseases including Lupus, Fibromyalgia, and Rheumatoid Arthritis; Humic substances offer hope

An estimated 40 million Americans have some form of arthritis or other rheumatic condition. That number is

expected to climb to 59.4 million, or 18.2 percent of the population, by the year 2020.

In a recent issue of *Annals of Rheumatic Diseases*, doctors found that people with rheumatoid arthritis have lower levels of common antioxidants in their blood in the years before the disorder is diagnosed. A new study suggests that the same may be true for another autoimmune disease, systemic lupus erythematosus. It is not certain if the lower level of antioxidants is a cause or the effect of the diseases, or indirectly related to the disorders.

According to Dr. George Comstock, of the Training Center for Public Health Research in Hagerstown, Maryland, antioxidants in the blood are possibly being used to mop up damaging free radicals, byproducts of inflammation related to the diseases. "Or perhaps low antioxidant status, whether because of decreased intake, absorption, or transport, increases the potential for oxidative damage," he wrote.

Humic extracts, especially fulvic acids, when administered both topically and orally are proven to regulate the immune system as powerful immunomodulators, and to work as potent antioxidants and antiinflammatory agents.

In studies with hospital patients with rheumatoid arthritis, an autoimmune disorder, humic extract bath therapy treatment had a 92% success rate. Several hundred similar studies have been performed in China showing that fulvic acid and humic extracts are proven highly successful. Yuan, Shenyuan; *Fulvic Acid*, 4 1988; in *Application of Fulvic acid and its derivatives in the fields of agriculture and medicine*;

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Rheumatoid arthritis is more prevalent in women than in men and generally strikes between the ages of 20 to 40. It is believed to be caused by an abnormal immune reaction in which the lining of the joints are attacked and destroyed, leading to pain, inflammation, swelling, and eventually deformity of the joints

and disability.

Approximately 1 percent of U.S. adults have definite rheumatoid arthritis, an autoimmune disease occurs more frequently in women than in men. The prevalence of rheumatoid arthritis is approximately 2.1 million people: 600,000 men and 1.5 million women.

The estimated U.S. prevalence of juvenile rheumatoid arthritis (JRA), which occurs in children ages 16 and younger, is between 30,000 and 50,000.

For the new study, Dr. Comstock and colleagues looked at thousands of blood samples donated in 1974, and specifically tested those from 21 people who were diagnosed with rheumatoid arthritis 2 to 15 years after giving blood. They also identified another six people who developed systemic lupus erythematosus 3 to 13 years after giving blood.

Lupus is also thought to be due to an abnormal immune reaction in which the body attacks connective tissue and numerous organs. The disease is 10 times as common in women as men, and most often occurs between ages 13 and 45. Comstock mentioned in the article that the trend does match that of an earlier small study which suggests that low concentrations of antioxidants may in some way be related to the development of rheumatoid arthritis, either directly or as associates of another disease-causing factor. "Although the number of cases is too small to allow definitive statements about the association of serum antioxidants with systemic lupus erythematosus, it is hoped that this report will stimulate others to see if our results can be replicated," he wrote.

Systemic lupus erythematosus (SLE or lupus) is a chronic autoimmune disease in which the body harms its own tissues and can lead to inflammation and damage to joints, skin, kidneys, heart, lungs, blood vessels, and the brain. Reports estimate SLE to affect at least 239,000 Americans: 4,000 white males, 41,000 white females, 31,000 black males, and 163,000 black females.

The autoimmune disorder, Fibromyalgia, affects an estimated 3.7 million Americans age 18 and older. Prevalence is much lower in men than in women. A chronic condition, fibromyalgia is characterized by widespread pain, greater sensitivity to pain, sleep disturbances, fatigue, and multiple tender points.

Johns Hopkins News Services; A report published as a collaborative effort between the National Institutes of Health (NIH), the Centers for Disease Control and Prevention (CDC), the Arthritis Foundation, and the American College of Rheumatology; May, 1998.

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Fulvic acid and Humic extract topical use and bath therapies show amazing clinical results

Fulvic acid and humic extract water solutions can safely be applied as skin treatments. Directly applied or as bath therapies, fulvic and humic extracts are safe in amounts as high as 10 percent weight-by-volume. Medical doctors have found that extended saturation of the skin by direct application, or use as a bath therapy can be highly successful in treating many external and internal conditions. Clinical studies show that ulcerous skin problems and various skin diseases can be eliminated. Studies by a U.S. doctor have shown that fulvic acid or humic extract bath treatments can cure the common cold or flu in just one or two session, stopping them dead in their tracks.

Hospital patients with skin ulcers had 92.2% success rate when treated with fulvic acid and humic extract baths. Yuan, Shenyan; Fulvic Acid, 4 1988; in *Application of Fulvic acid and its derivatives in the fields of agriculture and medicine*; First Edition: June 1993

Medical doctors in Europe, China, and even the United States, have discovered that clinical bath treatments using specially prepared humic and fulvic extracts have unparalleled healing power with many serious diseases. Patients with

severe rheumatoid arthritis and other bone, joint, tendon, and muscle autoimmune disorders, exhibit healing effects that are unrivaled. Often after a few weeks of daily bath sessions, patients are significantly relieved of pain and inflammation, and are restored to health.

Medical test results indicate that humic extracts enhance the human immune system, which results in the cure of viral diseases. Jingrong Chen et al, *Jiangxi humic acid*, 2 (1984)

Literally hundreds of well documented clinical studies exist from hospitals, medical schools, and doctors from around the world. Internal use of fulvic acid also works well for many of these same conditions including the various rheumatoid and autoimmune disorders.

Bath treatments, or lengthy periods of moist localized saturation, are extremely potent therapies for many conditions. Such treatments are remarkable effective. Extensive clinical studies support the exceptional safety of both topical and bath therapies.

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, Shenyan; 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 metalloenzymes 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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Incurable HIV or Aids virus is destroyed by humic extracts, epidemic now
16

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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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 inflamma-

tion, coughing, sputum and asthma, were also much better alleviated. Jin-grong 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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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 pancreatic 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 clin-

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

For centuries traditional medical doc-

tors 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 asso-

ciated 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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Application of fulvic acid and its derivatives in the fields of agriculture and medicine; First Edition: June 1993, China.

Medicinal value of the Humic extract known as Fulvic acid is astounding and very well-documented

Many reports on the beneficial use of humic substances, especially fulvic acid, for human health and medicine have been published. These include reports documented in the Chinese *Materia Medica* pharmacological compendium, dating back to the 15th century Ming Dynasty. During that period, a very famous medical doctor, Li Shi Zhen, used "Wujinsan", meaning "golden medicine", containing humic and fulvic acids as the active ingredient in the treatment of infectious ulcerous growth and female hemorrhage diseases. These studies showed humic and fulvic acids to be efficient anti-inflammatory and blood coagulating agents.

Hospital eye clinic patients with ulcerous cornea infection had 94.2% success rate when treated with fulvic acid eye drops and injections. 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

In China, prior to 1978, humic and fulvic acids had been used in hospitals and among the general population for the treating of a wide range of diseases with success. Up to that point there was very little research conducted on the pharmacology of its therapeutic mechanism. Because of lack of clinical data, doubt and misconceptions remained as to therapeutic use.

Hospital patients treated for chronic ulcerous colon infections had 92.6% success rate when treated with fulvic acid enema. Yuan, Shenyuan; *Fulvic Acid*, 4 1988; in *Application of Fulvic acid and its derivatives in the fields of agriculture and medicine*; First Edi-

tion: June 1993

Since that time, many medical schools and hospitals in China have engaged in extensive studies on the toxicology and pathological aspects of humic and fulvic acids and their clinical applications. Hundreds of research papers have now been published nationally in China, and some have appeared in international journals and have been presented at various meetings outside of China.

Hospital patients with acute upper gastroenterological bleeding had 95.6% success rate when treated with fulvic acid oral medicine and injections. 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

Pharmaceutical companies in Da Tong, Shanxi, in Gongxian, Henan and in Kunming, Yunnan are manufacturing humic acid medicines which are approved by the Chinese Drug Administration. Because of their non-toxicity, the humic extract fulvic acid is approved for internal as well as external use.

Clinical medical studies using humic and fulvic acids were performed on thousands of hemorrhoid patients, which were so successful that the Chinese government had a special pharmaceutical preparation developed for treatment of this condition. 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

Chinese doctors now use fulvic related medicines to reduce inflammation, increase circulation and control bleeding, to regulate the immune system and hormone systems, to heal digestive tract disorders, and as an anti-cancer and anti-tumor therapy.

German companies have a number of humic and fulvic based products. These include the following healing bath additives: Moorbad Saar N, Humopin N, Leukona Sulfomoor-Bad N, Salhumin Rheuma-Bad, Salhumin Sitbad N, Salhumin Teilbad N, Contrheuma-Bad L, mostly for the relief of rheumatism and arthritis. Huminit is used internally for the treatment of stomach hyperacidity

and other gastric disturbances, gastric ulcers and gastroenteritis in humans. Veterinary medicines include, Kalumin, Sulumin, Salhumin and Kalumat for the therapy and prevention of diarrhea and enteritis.

Studies of patients with gastric and duodenal ulcers showed that 91.1% had condition improve when treated with fulvic acid. Treatment showed no side effects, substantially diminished pain, with few relapses, with 61.1% of patients being completely cured. Xinsheng Zhu, *Fulvic Acid*, 9 (1991)

Studies show that humic, and especially fulvic acids do occur naturally in the human diet. Waters from streams and rivers running through forested land contain dissolved humic and fulvic acids. Humic and fulvic acids occur in living plants grown in organic humus containing soils, and humic and fulvic acids have been isolated from live plants. Humic and fulvic acids have been found in the gastrointestinal tract of humans and animals and are absorbed. They circulate with the blood and are metabolized in the liver.

In 1988, Dr. S. A. Visser reviewed the medicinal value of humic substances in an article entitled: "Effects of humic substances on higher animals and man; the possible use of humic compounds in medical treatments", which was presented at the International Humic Substance Society meeting in Sevilla, Spain. His findings showed that the medicinal applications of humic and fulvic acids can be external as well as internal.

Hospital studies in China show that elderly patients, ages 60-90, when treated with fulvic acid, regained appetite, slept better, and became more energetic. Other hospital studies coming from India show that fulvic acids are considered to be a powerful anti-aging therapy that also able to help with symptoms of dementia. Erchuan Wang et al, *Humic acid*, 3 (1991)

Dr. Visser stated that external applications of humic and fulvic acids are based on their use as antiphlogistic (anti-in-

flammatory), analgesic (pain relieving), hyperemic (blood flow increasing), anti-rheumatic, anti-microbial, anti-fungal, antiviral and anti-cancer agents. Humic and fulvic acids have also been used externally in the treatment of hematoma (localized accumulation of blood), phlebitis (inflammation of veins), desmorrhhexis (rupture of a ligament), and myogelosis (hardening of a muscle), as well as for the treatment of patients with contusions, distortions, cervical (neck) complaints, lumbago (pain in the lower back), ischias (pelvic pain in the hip joint), arthrosis (non-inflammatory arthritis), polyarthritits (arthritis of multiple joints), osteoarthritis (arthrosis deformans), and with osteochondrosis (ossification of cartilage).

With respect to internal use, humic and fulvic acids have been shown to be particularly useful in the prophylaxis (prevention), therapy and metaphylaxis (after-care) of a variety of stomach and intestinal troubles such as, hyper-acidity, diarrhea, gastric ulcers, dysentery, gastroenteritis and colitis. They can also act as a detoxifying agent, and have been used against bacterial and viral infections. They have been found to be useful in the treatment of anemia (deficiency of red blood cells, hemoglobin or total blood volume) and as a stimulator of the body's immune system and of detoxifying liver functions. By counteracting certain kinds of cancerous growth, humic acids may also have a potential as an anti-carcinogen.

Many of these effects can be attributed to the activity of humic and fulvic acids by themselves, and are the result of their surface activity, chelating properties, power of absorption, their poly-acidic nature, their polyphenolic structure, their interaction with other organic molecules including polysaccharides, proteins, enzymes and lipids, as well as of their redox properties and free radical content. No unfavorable side effects have so far been noticed with the administration of humic or fulvic acids.

Dr. G. Davies summarized the effects of humic acids in the Nucleus, Feb. 1996, in a monograph titled "Properties and

functions of humic acids." He stated that oral doses of humic acids reduce heavy metal absorption in animals and also decrease pesticide toxicity. Humic acids can be administered preventatively and therapeutically in animals, including pregnant animals, without apparent risk. Some humic acids control uterine cancer in rats and humic acids markedly reduce the mutagenic effect of benzopyrene, 3-aminoanthracene, 2-nitrofluorene and 1-nitropyrene. The anti-mutagenic effect depends upon the adsorption of these dangerous chemicals onto the humic acid surface. Since fulvic acid is humic acid, the bioactive component, all data applies to fulvic acid as well.

Recent research articles by Dr. Senesi and Dr. Miano clearly link humic and fulvic acid properties with human health.

Hospital patients with rheumatoid arthritis had 92% success rate when treated with humic extract baths. 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

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High quality humic and fulvic acid preparations proven very safe for human internal and external uses

Extensive medical studies show that the toxicity of naturally-occurring humic and fulvic acids is remarkably low. Dietary supplements, and oral or injectable medications prepared from humic and fulvic acids isolated from naturally-occurring soil materials are neither carcinogenic nor mutagenic.

Prenatal embryotoxic or teratogenic (fetus developmental malformation) effects are also not observed with humic or fulvic preparations at daily dose levels from 5-50 milligrams per kilogram body weight or embryo weight.

Topical humic preparations are exceptionally safe and are tolerated remarkably well. Skin treatments can safely be applied in water solutions in amounts as high as 10 percent weight-by-volume.

Pharmaceutical companies and private researchers in many nations have done considerable work in the area of safety testing of humic and fulvic acid for human medical use. Numerous products have been developed which have been approved by their respective coun-

try's drug administration for oral as well as external use. Extensive clinical studies have shown that properly prepared humic/fulvic extracts are effective, safe, and non-toxic.

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Humates are the guarantee of fertility and environmental safety of agricultural products

by Dr. Boris V. Levinsky, Russia

For over 200 years, soil science has used the term "humus". Humus has been defined as decomposed organic

matter, which has steadier decomposition than initial biomass. There are many hypotheses how humus is formed, but as yet no satisfactory explanation has been presented. We are still trying to discover why that relentless process of decomposition of organic mass in soil (it happens only in soils) does not go to the end, to final carbonic gas and water, but only stops at the stage where simple products of decomposition: amino acids, carbohydrates and phenols, turn into very complex products - Humic Acids.

The property of these remarkable combinations are so unique that even if we joined the efforts of all chemists of the world we could not manage to synthesize anything similar. Humic acids have been presented to us by Mother Nature and they link the evolution of living and lifeless matter.

Humic acids are compounds of a complex structure, which are insoluble with exception of a small part named Fulvic Acids. But treatment with alkaline turns them into soluble salts such as potassium humate, sodium humate, ammonium humate, etc. Correctly solublized humates possess physiological activity, which was first proven by Professor Khristeva (Ukraine), more than 50 years ago. Her discovery could have played a significant role in the world's agriculture, but unfortunately it did not meet support of communist party leaders and officials of the former USSR. Practical usage of humates in the former USSR was mainly experimental, in permitted and selected forms, but without wider usage. Information was published and discussed only among scientific circles, which were virtually unknown to the public.

Over the last 50 years, interest in humates comes and goes, but what I can state, is that there is always a demand for humates, because their use is the best way to increase yields, reduce fertilizer consumption and improve soil structure. Usage of humates in other countries: Slovenia, Italy, United States, and Australia was developing very slowly, despite the efforts of very well known specialists,

Drs. Faust, Lee, Bartlett, Senn, Obreza and others. Other reasons for that, were the absence of an efficient production technology of humate related products, and supply to the market with low quality products.

An efficient technology was created, and a production line set up in 1993 in Irkutsk, Russia. At the same time Australian and Russian scientists worked out modern methods of analyses of humate structure, based on interpretation of functional groups, NMR (Nuclear Magnetic Resonance) spectrogroups, which correlate with the physiological activity of humic acids. It gives hope for these remarkable products and their derivatives to be used internationally for everyone's benefit.

Humic acids are defined as complex aggregates of brown to dark colored amorphous high molecular weight substances, united by general principle of structure, but have some distinctions, which depend on raw material. As chemical functions they are aromatic carboxyl acids, with aromatic nucleuses of low degree of condensation which are incorporated by parts of non aromatic character. Presence of aromatic nucleuses with mobile p-type electrons and various functional groups at a nucleus and in lateral circuits and also paramagnetic centers cause their ability to ionic exchange, complex formation, tautomeria, and oxidizing-reduction reactions.

Thus it is necessary to understand, that the nature of the humic acid molecule is neutral, atoms of hydrogen of carboxyl, hydroxyl and phenol groups are partially substituted by ions of iron, aluminum, calcium, magnesium. In this condition the molecule is not biologically active, it is braided (in analogy with protein) in a roll and insoluble. Mainly because of that, the natural humus is not washed out into the world's oceans, keeping fertility in the soils. Only under the influence and action of alkalines on ions of sodium, potassium, or ammonia, substitute hydrogen and other metals in carboxyl and phenol groups dissociate, resulting in the whole length of the vast molecule distributing a nega-

tive charge, causing mutual repulsion of its fragments. The molecular roll turns into a straight chain of molecules of humate, and becomes soluble and ready to carry out its biological reaction.

Polyhedral influence of humates is caused by their simultaneous influence on all compositions of future harvest: water, soil and plant. Penetrating the water, humates change its structure, so that it becomes more organized and arranged like fragments of ice structure. As a result the water gets the well known properties of "melted water", improving plant nutrition. Penetrating the soil, humates restore its structure; convert soluble forms of lead, mercury, cadmium and other harmful and radioactive elements, including industrial remains of poisons, and environmentally dangerous chemicals, into insoluble forms. But besides that, humates form complexes with phosphorus and micro elements which are easily assimilated by plants, and sharply increase efficiency of mineral fertilizers. Penetrating a plant, and acting to a plant on a cellular level, humates improve germination of seeds, speed up plant development, stimulate enzyme formation, increase resistance to droughts, frost and radiation, increase cell energy, promoting formation of chlorophyll, vitamin C, sugar and amino acids and other important components. Humates regulate plant metabolism in such a way that prevents accumulation of nitrates, selectively improving penetration of cell membranes for ions of potassium.

Demonstrable results of the use of humates, are overall, a direct increase of harvest of all agricultural products. Practical experience of humate usage in Russia and other former USSR republics has confirmed the following significance of harvest increase: wheat 13-25%, barley 15-17%, buckwheat and millet 25-50%, corn 30% with biomass 6-20%, potato, carrot, beet, radish 25-40%, cotton 10-30%, cucumbers 34-38%, tomatoes 20-30%, cabbage 25-35%, apples 8-20%, grape 25-30%, all citrus 30-60%, pasture up to 100%. Flower growing companies are supplying information that shows increases in the quantity of roses and lilies 30-100%,

increased rooting, and a reduction in time until blossoming of 10-15 days.

It has been proven that humates increase not only the quantity, but the quality of agricultural products, they accumulate more nutritious elements. For instance, humates allow increased content of vitamin C: in beets up to 100%, in radish up to 30%; Carotene: in beets up to 100%, in cabbage up to 25%; Riboflavin: in the same vegetables 8-14%, Niacin: in beets up to 79%, in cabbage up to 42%, in radish 50%. Leaves of beets and cabbage increased content of protein 16-18%, phosphorus 26-28%. Potatoes have a higher content of starch, flax got better quality of fiber and higher quantity of oil in seeds. Also remarkable, is that humic substances sharply increased content of nuclear acids in cotton, content of oil in sunflower seeds, content of sugar and vitamin C in tomatoes up to 45%. So, we can make a conclusion that stimulation of biochemical processes in the cell, which is connected with intensification of energetic exchange, provides high quality products with high content of nutritious elements.

Growing levels of ionic radiation and the pollution of the environment by pesticides, metal compounds and other toxic elements, being characterized as having mutational and carcinogenic abilities, are very dangerous for all living organisms. That's why the protection function of humates has serious significance. This protection function has a wide sphere of action: protection from drought, frost, radiation, industrial toxic wastes, and agricultural pesticides. The protection action of humates is a result of a coordination with plant cells which improves general resistance. This phenomenon was discovered by Professor Khristeva and her students. Siberian and Ukraine harvests were saved many times from droughts and frosts. She proved the fact that plants treated with humates gain resistance to radiation. It was also proved that spraying and watering of all types of vegetation with 0.01% solution of humate, sharply activated soils, activated microorganisms, and improved adaptation of plants to industrial pollution. Humates speed

up water exchange, physiological and oxidizing processes, promoting better nutrition and feed exchange, especially when the condition of healthy nutrition is worse than the norm and polluted by industrial wastes.

Cultivation of different agricultural products, such as: corn, potato, cucumbers, lettuce, etc., require use of high quantities of nitrogen fertilizer, but after treatment with humates, an average 50% reduction in the requirement of nitrogen addition was noted. It was proven in the United States that humate usage fully prevents and helps to cure the plant disease, chlorosis.

One of the major problems of agriculture is the effective assimilation of mineral fertilizers. The problem is, high soluble potassium and nitrogen base fertilizers are easily washed out from the soil, but phosphate fertilizers, vice versa, attach themselves to ions of potassium, magnesium, aluminum, iron turning into inert insoluble forms unavailable for plants. But in presence of humates, efficiency of fertilizer's assimilation is much higher. Assimilation of nitrogen and potassium fertilizers is increased by 100 times, because of increase of membrane penetration. The combination of humates with mineral fertilizers guarantees their full assimilation.

Humates play an important role in transportation of micro elements. Humic acids are natural complex formers (chelators). Thousands of years ago they were accumulating important micro elements in nature, in available plant forms. Treatment of vegetating plants with humates provides constant nutrition of the plants with micro elements.

Fertility of soils was always connected with presence of humus. Humic substances take part in regulation of practically all soil properties. First, humates stimulate development of all kinds of microorganisms in the soil, which speed up soil cleaning and restoration, and speed up humus accumulation. Second, humates form color and consequently thermal conditions, which is very important for "cool" clay soils, they even get "warmer". Third, long time treatment of

soils with humates improves soil structure. The formed humate potassium and magnesium become mineral bridges, structuring soil. We can form the conclusion that humates help a plant produce necessary enzymes, which allow it to form resistance and grow stronger at every stage of development.

Professor Khristeva has used results of her observations, and formulated the idea that the same processes should proceed with all living organisms. Humates were tested as an addition to chicken feed. It was discovered that it activates synthesis of protein exchange, resulting in increase of chicken weight on average 10%, and survival on average 14%. Important practical results appeared in cattle and fish breeding. Humic products facilitate a calf's birth, and increase calf weight on average 13%. Humates act as preventive and medicinal remedies.

Humates are more effective in the early stage of plant and animal development, and the best result of treatment or usage is achieved in unfavorable environments. For instance, the harvest of corn and potatoes treated with humates had been saved when the July temperature in Siberia had dropped to -12° Celsius (10° Fahrenheit). In another case, 42% of chickens were saved when one of the Irkutsk poultry farms had a shortage of food. Moreover, biomass of chickens was increased by up to 20%. During that experiment antibiotics and vitamins were excluded from the diet.

The above mentioned information is true only to high quality humic products. Unfortunately, not all the products offered to the market under the name "humic" are of a high quality. I strongly believe that, after we checked different sources of humate supply, I came to the conclusion that humates can be divided into four groups.

First group offered to the market, is a group (in raw form) without the special processing of lignite. It is fossilized brown oxidized lignite or Leonardite. This product has 30-40% humic acid content, 30-40% of mineral part - ash, and the balance is presented

by unknown ballast substances. Recommended application norms of these products are very high and I doubt they perform with good results, because first, humic acids in them are insoluble and are not in an active form. Second, mineral content of these products have metals which bind to humic acids. Third, long time usage of these products pollute the soil.

Second group is represented by humates produced in the common method of treatment of lignites with concentrated alkalines. The content of humic acids of these products is within the level of 20-30%. Humates here are in active form, but still they have a high content of ballast and ash, which causes above mentioned problems.

Third group of humates is represented by soluble humates produced in the way of treatment of brown lignite or Leonardite with alkaline solutions. These humates are high quality products, because they are free from ballast, but they are very expensive and difficult to transport and handle. Moreover the production process leaves a lot of waste.

Fourth group are humates produced from a high quality tested lignites, with over 70% humic acid content, less than 12% mineral ash part and 18% organic ballast. These soluble products are in powder form with 75-85% humic acids.

The quality of humate products can be defined from their content of soluble humic (or fulvic) acids. We should bear in mind the fact, that tests should examine important characteristics of humic acids such as: Quinone, Carboxyl, Phenol, and Amino Groups and condensed Aromatic nucleuses. There are several methods to define those characteristics, but the more complete information regarding humate content, gives interpretation of functional groups NMR (Nuclear Magnetic

Resonance). All molecule fragments of humic acid were divided by Australian scientists (T. V. Verheyen, 1982) into 5 classes, which give exact signals in different areas of the spectrum:

Class A - Ketone, Carbonyls, Carboxyls and Quinone

Class B - Phenol Carboxyls and Nitrogen substituted atoms of Carbon

Class C - Aromatics and Heterocyclic

Class D - Aromatic protonized atoms of Carbon

Class E - Methyl and Methylene groups

The higher the predominance of classes A - D, the higher the activity of humates. Groups of class E are ballasts. It is quite obvious that the content of groups A - D depend on the degree of the oxidation of humate. This testing method was improved in Irkutsk State University, which has allowed us to test more humate products manufactured in Russia, Ukraine, the US and other places.

The data of this article shows that effective usage of humates, in every particular case, depends on various factors. The main factors are the condition of soils and necessary norm of nutrition elements. That is why we see the importance in development of complex preparations, like mineral fertilizers with humate coating, and micro fertilizers, including necessary micro-elements and humates. I am confident these complex compounds are the future of agriculture.

In conclusion, I want to formulate directions for scientific research and practical usage of humates in agriculture.

Create a group or team of scientists in the chemical, agronomy, soil research, microbiological fields for studying of humates' influence on plants, and test all humate products offered to the world market.

Prepare full and exact recommendations and technology of usage of humates for different types of crops.

Develop production of high quality humates, using best high-tech technologies and know-how.

This article was written exclusively for Fulvica BioScience's Health ALERT, by Dr. Boris Levinsky. Original was translated from Russian into English by Dr. Andrei U. Ageev, Russia, and Graeme McRae, New Zealand. Additional translation and editing was completed by Brent R. Stucki, U.S.A.

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The application of Fulvic acid in Chinese agricultural fields

by Dr. Li Yuzhong

In China, a high content of fulvic acid was found in certain humates by the Chemistry Department of Zhengzhou University in 1975. Since then, several other institutions started studies on its extraction techniques, chemical and physical characteristics, and finally a simple and highly efficient technique was formed.

Fulvic acid became commercial available in China in 1978. Since then, some institutions have carried out studies of fulvic acid in agriculture. Xu (1979) found fulvic acid could reduce crop stomas opening, reducing water transpiration, and raise crop drought resistance.

The Agrometeorology Institute, Chinese Academy of Agricultural Sciences, listed fulvic acid as one of their research undertakings in a national seventy-five-year planned project, known as "Technologies for increasing yields of dry land". Also, fulvic acid is a research undertaking of that institute's drought mitigation project.

The ministry of Agriculture, Chinese Academy of Sciences, and the Ministry of Chemistry, Chinese Academy of Agricultural Sciences paid a lot of attention to the extension work and agri-

cultural production related to this fulvic acid product. Its effects in agriculture could be summarized by the following research by Zheng Ping, *et al*, in 1993:

1. Fulvic acid was effective at drought mitigation, it reduced water transpiration of crops, promoted root system development and activity.
2. Fulvic acid raised plant enzyme activity and chlorophyll content, strengthened plant photosynthesis, increased crop immunity, raised crop yield and quality.
3. Fulvic acid could be mixed with pesticides, increasing the pesticide effect, reducing the amount of pesticide used.
4. Fulvic acid could complex trace elements, promoting the ability of transportation and absorption in plant cells.

Many studies carried out on vegetables, fruits, and various crops such as corn, wheat, rice, sweet potato, tobacco etc., showed that fulvic acid could increase crop yield from 8-15% under normal conditions, and 10-30% under extreme conditions.

Other successful fulvic acid studies have been carried out showing plant disease resistance, frost resistance, as well as increased quality of fruits, vegetables, and other crops. Now the study and use of fulvic acid has extended to 2,000,000 hectares, just by the Agrometeorology Institute, CAAS, alone since 1978.

There is a book available which gives some examples of fulvic acid use in medical areas. It mentions that Li Shizheng, the famous ancient Chinese doctor, used a medicine which mainly contained fulvic acid to cure women's uterine bleeding and skin ulcers in the year 1500 AD.

In recent years, there are several hospitals and medical universities that have carried out fulvic acid studies in many areas. These include reducing inflammation, invigorating the circulation of blood, stoppage of bleeding, cure of digestive system ulcers, regulation of

immunity and endocrine system, and cure of tumors, eye disease, arthritis etc.

"If fulvic acid has some official approval as human medicine, its market in the medical field will be very great." –Dr. Li Yuzhong

This article was written exclusively for Fulvica BioScience's Health ALERT, by Dr. Li Yuzhong, one of China's leading agricultural humic substance research scientists. Original article, including correspondence notes were compiled and edited by Brent R. Stucki, USA. Dr. Yuzhong was born in 1964. His education and experience include: 1982-1989, Biology Dept, Inner Mongolia University, Majors: Botany, Plant Ecology, Bachelors and Master Degrees. 1989-1993, Worked for Chinese Academy of Agricultural Science. 1993-1996, Northeast Normal University, Major: Ecology, Ph.D. Degree. Currently working for Agrometeorology Institute, CAAS, on drought mitigation project.

Cellular regeneration attributed to Fulvic acid electrolyte

Living cells are single bipolar mechanisms, meaning they have a positive and negative composition, and work similar to batteries. Cells are made up of a positively charged acidic central core or nucleus, which is surrounded by the negatively charged alkaline cytoplasm. The components are separated by semi-permeable membranes. Each cell is a single structural unit that functions as a member of the total living organism. Once a cell dies, and eventually in the natural scheme of things, comes into contact with the appropriate soil microbes, it will ultimately break down and turn into a humic substance.

Over 50% of hospital patients noticed that they were able to sleep more relaxed when treated with fulvic acid, a humic extract. Improved sleep came as an added benefit since the patients were already being treated with the fulvic acid for various chronic diseases.

Bingwen Su, Jiangxi Humic Acid, 3 (1985)

Research has shown that two very important components of humic substances are nucleic acids and amino acids, which are remnants from the nucleus, cytoplasm, and protein building blocks of once-living cells. Nucleic

and amino acids are absolutely essential to all living things.

There are potentially thousands of individual nucleic and amino acids in humic substances. These nucleic and amino acids are preserved intact within humic substances, where they are believed to remain stable indefinitely. The nucleic acids consist of negatively charged DNA from the breakdown of the nucleus of cells, and positively charged RNA from the cytoplasm of cells, which also remain stable in humic substances.

Of interest here, are the nucleic acids and amino acids which are major constituents of the fulvic acid fraction of humic substances. Since fulvic acids are of low molecular weight, and water soluble on both sides of the pH scale, they are readily absorbed through semi-permeable membranes, and function actively in association with living cells.

Complexed into the fulvic, nucleic, and amino acid team, are innumerable essential minerals and rare earth elements. Fulvic acid contains literally hundreds of complex minerals which include traces of virtually every element listed in the Periodic Table. Together, all of these components function in unison, as fulvates (salts of fulvic acid), making fulvic acid an extremely powerful electrolyte.

Hospital studies show that patients with normally incurable epidemic Hemorrhagic Fever were able to be successfully treated with humic extracts, which stopped bleeding, restored circulation, removed clots, was anti-viral, and significantly bolstered and regulated the immune system. Yinzhang Cui, Humic Acid, 1 (1991)

Because of its many nutritional components and electrolytic power, fulvic acid has instant cellular revitalizing, replenishing, and nourishing characteristics unlike anything else. Fulvic acid's electrolytic value also has been shown to increase permeability of bio-membranes, which means that it can sensitize cell membranes for better absorption or assimilation of other things in its presence.

It is essential that the electrical potential of all cells remain balanced and "charged". A high quality electrolyte is essential for proper cellular function. An electrolyte is a substance that dissolves in water or other suitable medium, that will conduct electrical current. An electrolyte is essential to cells because in molecular processes it permits electrons to be set loose, transferring electrical current, by allowing the flow of ions. Fulvic acid is a polyelectrolyte which means "much electric."

The value of an electrolyte can be shown by an experiment that was done by researchers on a giant amoeba, which is a microscopic single cell animal. Under a microscope the electrolytic potential of the amoeba, which is normally 20 millivolts, was depressed to zero. The researchers then noticed astonishing changes as the amoeba become dysfunctional, the outer membrane then ruptured in several places, and internal components began to flow out into the surrounding fluid. At that point researchers visually concluded that the form and structure of the amoeba had disintegrated and it was for all purposes dead. Upon increasing the electrolytic charge, the form of the amoeba reconstructed and became active and healthy again. This same test was repeated many times with the same results.

"The cell is immortal. It is merely the fluid in which it floats which degenerates. Renew this fluid at intervals, give the cells what they require for nutrition and, as far as we know, the pulsation of life may go on forever."

--Dr. Alexis Carrel, Nobel Prize in Medicine

Although plant and animal cells have slightly different makeup, leading scientists agree that their metabolic functions, components, and requirements are exactly the same. For instance; in plants there are chlorophyll molecules which are the light receptors responsible for the photosynthesis process. These chlorophyll molecules are very similar in structure to the heme molecule of human red blood cells (hemoglobin).

Extensive hospital eye clinic studies using humic extracts showed 100% success in curing eye diseases caused by virus, bacteria, or fungus, also healing ulcerous wounds, relieving inflammation, and stopping hemorrhaging, without side effects. Guofan, Tang, Jiangxi Humic Acid, 3 (1984)

The physical health of all organisms, both plant and animal, can be expressed in terms of electrical potential. It is essential that the electrolytic potential of all organisms be maintained at optimum levels, otherwise weakness, degenerative disease, and eventual death will result.

Fulvic acid has been proven to be one of nature's most perfect and powerful organic polyelectrolytes. Because many of fulvic acid's constituents were once involved in photosynthesis, the fulvic retains that latent energy potential stored inside its solar charged molecular structure, which can balance cell life on the molecular level, providing regulated positive and negative charges as needed, acting as both a donor or acceptor. Within the complexities of fulvic acids, the individual molecules are similar but not identical. This variation in makeup allows a variety of possible reactions, positive or negative, or in some cases alternating, to assist the balance.

Because of its unique polyelectrolytic properties, fulvic acid can influence the formation or transmutation of new species of metal ions. This means fulvic acid can convert existing minerals into new minerals.

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Humic substances promote exceptional health in livestock

Dr. Charles S. Hansen, D.V.M., conducted controlled studies with livestock animals in the state of California from the early 1960's through 1967 on an experimental basis. Dr. Hansen's tests involved supplementation with a blend of fulvic and humic acids as a feed additive. He also used fulvic acid alone as a treatment for specific ailments in livestock. The result of supplementation and treatment in comparison to untreated animals was outstanding.

Studies on dairy cows showed that after two months on the supplements no bacterial or viral infections occurred. A herd of over 300 dairy cows had a 15% increase in butterfat production after 3 months of supplementation. Another group of dairy cows on the supplement were cut back on high protein rations with no decrease in milk production. It was noticed that all cows on the supplement experienced more complete digestion.

In other studies, untreated dairy cows that developed mastitis, a serious bacterial infection of the udder, were treated with one pint of fulvic acid solution and

recovered to full production in 12 to 24 hours. Similarly, untreated cows with mastitis that were treated with the usual antibiotics had only 50%-70% recovery after 2-3 weeks.

Studies on hogs revealed that the animals on the supplement experienced better and more complete digestion. The supplement completely eliminated Necro, a bloody diarrhea in hogs. It was also found that when fed the supplement free choice for 36 hours, it acted as an excellent vermifuge, or de-worming agent.

Studies on mink showed elimination of most diseases common to mink herds. Those mink on the supplement were less vicious, more docile. Studies showed that all mink on the supplement experienced more complete digestion, and ceased fur chewing which is a common problem.

Studies on poultry showed that pullets (young hens) on the supplement produced eggs of superior shell hardness and quality. Pullets given the supplement were free of most diseases. Pullets on the supplement experienced more complete digestion of the various feeds in their diet. The supplement also acted as a vermifuge, or de-worming agent.

A similar study currently underway at a European university has shown that Dr. Hansen's results are consistent with the latest studies. These clinical studies on dairy cows and pigs shows that a humic acid concentrate, high in fulvic acids, promotes increase in beneficial intestinal flora resulting in better feed digestion. The humic supplement has a medicinal effect on the entire digestive system, eliminates toxins and infections, acts as an antibiotic and antiviral which eliminates pathogens in the bloodstream, reduces inflammation (credit for this was given to humic acid's flavonoid structure), bolsters immune system, increases milk and cream production, prevents mastitis, increases overall health.

The results of these studies show that humic substances, especially their fulvic

acid component, play an important role in the health management of livestock. This holds especially true for those animals maintained on commercial feeds derived from conventional agricultural practices.

This latest university study shows that humic and fulvic acids are the better alternative to antibiotic livestock feed additives, which were just recently banned in Europe.

Hansen, Dr. Charles S; Private and unpublished research studies; Courtesy of Kenneth Westwood, a humic substance researcher.

Faust, Dr. Robert H; Private ongoing research studies currently taking place at the University of Leipzig; Translation courtesy of Bennie Tomasson, Holland.

Those humic sea minerals

by Dr. Robert H. Faust

Humic sea-mineral was discovered around the turn of the century near the town of Panaca, Nevada, on what was once the coastal area of a giant inland sea that existed millions of years ago. The Great Salt Lake is a remnant of this sea. Mule skinnners working for the railroad discovered one of their mules missing. They located it at the deposit eating the mineral.

The mineral has been mislabeled montmorillonite, a common clay found throughout the region. It is actually a humic substance comprised of interbedded lake silt with high humus lignitic silts. The strata averages 1 inch to 4 inches thick. The organic matter is very fibrous and the pattern of kelp-like vegetation can be seen.

The material tests out around 38% humus, along with high levels of potassium and iron. The material is found to a maximum height of 75 to 100 feet from the valley and is exposed due to an uplift. The area was once a vast inshore swamp and marsh abounding in the massive fern-like plants common in that period.

At one time, giant reptiles roamed the warm swamps. These animals were large yet had very small mouths. It is

calculated that feeding on vegetation available in today's swamps, they would not be able to sustain themselves even if they ate constantly. Therefore, the food of the dinosaurs had to be of a food value unknown today.

This once ultra-rich vegetation helped form a super concentrated compost layer many feet thick that was compressed into a layer only inches thick over millions of years. The swamps of this area had high levels of nutrients raining down from the volcanoes of central Utah. Later in geologic history the climate dried, and with it the swamps. During this time hundreds of feet of sediments built up. Later, as faulting occurred, the strata was inundated with geothermal fluids that mineralized the humus, then it was acted upon by unknown but beneficial fungi and bacteria.

Cultures from the dry mineral were sent to the Communicable Disease Center in Atlanta, Georgia in 1978. The organism could not be identified, but it was non-pathogenic when tested. The mined product contains about 38% humus, 17% soluble silica, 5% potash, and 9% calcium. It contains nearly all trace elements.

The benefits of the end product to agriculture are many. In general, when the material is fed to animals (including man) the digestion of food is increased and the absorption of food nutrients is increased. In plants, increased levels of trace minerals are noted. The humic acids and silica can increase phosphate uptake. Silica can increase resistance to both insects and disease.

Dr. Melchior Dikkers, Ph.D., a distinguished biochemist and mineral authority, wrote in his book *The Trace Mineral Story*, that the Panaca mineral deposit was brought to his attention in 1931, when he was professor of bio and organic chemistry at Loyola University. Dr. Dikkers wrote that "The properties were so amazing and unique that I became deeply involved in a research program that was to take me into many years of painstaking analysis and findings." Dr. Dikkers contended that deficiency disease comes about not only

because of the insufficiency of a certain element, but also "As the result of an imbalance or disequilibrium between various mineral elements". He found that only a deposit such as the one in Nevada provided the needed proper balance of minerals and trace elements.

The humic mineral is a valuable feed supplement for ruminants and non-ruminants, and for fish as well. It has proven to be both economical as well as useful as a feed supplement. As a fertilizer and soil conditioner it has many benefits. It can be used pre-plant, side-dressed or with the seed at planting.

Many people have discovered or learned about the benefits of this geologically formed product in the many years since Dr. Dikkers did his work in 1931. The lesson is clear that trace minerals in an organic form (humic acids) are much more available and useful as trace element and major mineral nutrition sources. The principle of balance and new knowledge about the interactions of trace minerals again reinforces the concept of using a natural humic product with natural balance built in.

Humic acids or humus can be defined as the end product of the decomposition of organic matter by aerobic organisms. Humic acids serve many complex purposes in the soil.

Humic substances are a colloid and coat soil particles, acting as a cushion and an interface between the dead mineral of the soil and the living plant root. Without this coating the soil can become a gummy mass. With it, the soil becomes friable and granular in structure.

These humic substances possess a high cation exchange capacity, which means that it helps hold the essential cation elements, ammonium, potassium, calcium, et cetera. In the absence of the clay or humic colloid, the cations are either lost by fixation or leaching, and thereby they are lost to the plant root.

Humic substances are very complex,

and are different depending on conditions and minerals available. Due to an inundation of geothermal fluids into this bed of humus, this product is unique, as it has high levels of attached cations, such as nearly 5% potassium.

In addition to the cations, the deposit contains very high levels of trace minerals in an organic form. That may be one of the keys to its beneficial properties. Plants and animals can absorb these elements readily in this humic form because it has already been assimilated and chelated by the microorganism which utilized parent organic matter eons ago. Trace elements are required in only minute amounts in this form. I know of no other natural product that has this mineral-organic makeup. That is what makes humic bio-mineral fertilizers and feed supplements so unique.

This article was published in 1986 in ACRES USA. Dr. Robert H. Faust, USA. Doctorate, Agroecology and Biotechnology President, Hawaii Bio-Organic Growers Association Experience, research works and interests: Leading expert in agroecology, humates and product development, biological pest control and product development, worldwide crop consultant, humic and fulvic acids their use and production, organic farmer, bioremediation, mushroom culture, VOCA volunteer.