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Elimination of Heavy Metals

Extensive Testing of Humic Substances in Hungary

(Humic/Fulvic Acid) has the capability of transferring metals to and from metallo-proteins in vivo. These proteins play a role in metal storage and sequester excess metal ions, preventing toxicity. Metallo-protein concentrations are the highest in the liver where metals accumulate in the metallo-thionein portions of this organ. Metallo-proteins can be found in many other human tissues, including small amounts in the blood plasma, which suggests that these proteins play a role in the transport of metals as well.

When the free metal binding capacity of (Humic/Fulvic Acid) gets saturated, or contains a high concentration of a metal humate (attachment of metal to humic/fulvic acid), then (Humic/Fulvic Acid) will transfer this metal to the protein-type molecules that are able to bind and utilise it. On the other hand, if the free metal binding capacity is high, then (Humic/Fulvic Acid) will form complexes with metals that are free or attached to metallo-proteins, helping in the excretion of these metals (i.e. in the case of toxic heavy metals like cadmium). Therefore, it may be concluded that (Humic/Fulvic Acid) may act somewhat like metallo-proteins due to its chelating activity and ion exchange capacity. When metals are a part of a metallo-protein, they can modulate its biochemical reactions.

Primarily, investigations have focused on the ability of a (product), containing standardised (Humic/Fulvic Acid), to deliver essential minerals while also eliminating toxic heavy metals like lead, cadmium, and mercury. Oral consumption of (Humic/Fulvic Acid) administered daily for six weeks significantly decreased blood cadmium levels and increased urine cadmium in 31 adult workers continuously exposed to occupational cadmium. In the majority of subjects, initial abnormally low serum iron levels increased, and markers of kidney and liver function improved.

Research indicates that absorption of cadmium from the

gastrointestinal tract and its toxicity are influenced by the supply of element such as Zn, Cu, Fe, Se, Ca, and Vitamin C. The ability of (Humic/Fulvic Acid), as an ion exchanger, may free its trace elements bound in chelate form for uptake into the tissues and bind other elements that are readily available, such as cadmium. At the same time, a number of essential elements are provided that may decrease the ability of cadmium uptake and absorption in the gastrointestinal tract. The improvement of liver and kidney enzymes could be attributed to the effect of the preparation on the micro-element status and balance in the body, which would then play a role in the functioning of these enzymes. (Humic/Fulvic Acid) was studied for its effect on the metabolism of trace elements in 51 healthy adult volunteers. Following two-weeks of oral administration of (Humic/Fulvic Acid), blood lead and cadmium levels decreased significantly. Furthermore, (Humic/Fulvic Acid) decreased absorption of cadmium and lead from food or environmental exposure based on urine measures of these metals. (Humic/Fulvic Acid) had no significant effect on blood parameters studied (i.e. haematocrit, haemoglobin, leukocyte count; SGOT, GGT, ALP; and, Na, K, Ca, and P).

Further pieces of evidence of the beneficial effects of (Humic/Fulvic Acid) have been documented in clinical trials evaluating occupational and environmental heavy metal exposure. In a three-week clinical observation with subjects screened for routine occupational health check-ups, 21 subjects were found to have higher than usual Pb levels (exceeding 1.0 micromol/l, the health risk limit being 1.5 micromol/l) and 26 subjects had Cd levels exceeding the accepted health limit (0.08 micromol/l). Subjects given (Humic/Fulvic Acid) showed a significant decrease in their blood Pb and Cd levels following the daily oral intake of (Humic/Fulvic Acid). No significant or pathological changes were observed in the blood chemistry of these subjects. Additionally, (Humic/Fulvic Acid) was administered orally to six adult subjects with moderately elevated lead levels that did not require penicillamine. (Humic/Fulvic Acid) was administered to each subject for three weeks. Four of these six subjects (66%) had significantly lower blood lead levels following three weeks of daily administration. The rate of decrease in lead levels in the subjects was similar to that reported for penicillamine. Two patients in the (Humic/Fulvic Acid) group reported mild side effects and therapy was discontinued. The results from these clinical observations indicate that reducing toxic levels of heavy metals in humans is apparently influenced by treatment with the (Humic/Fulvic Acid product) following its administration.

Two open clinical trials examining the effects of (Humic/Fulvic Acid)

in volunteers exposed to lead have provided further documentation of the beneficial effects of (Humic/Fulvic Acid). Twenty individuals with high occupational lead exposure were given 20 ml per day of (Humic/Fulvic Acid) for six weeks. Blood levels of lead decreased markedly and significantly from the beginning of the study when compared to the control group. None of the clinical or haematological parameters changed during the course of the treatment. Two subjects reported mild and transitory diarrhoea, which normalized without stopping treatment. Four subjects reported moderate nausea and one a transitory headache. Another open clinical trial in 60 subjects has demonstrated a similar but not as profound outcome. At the end of a 12-week administration period, the change in serum lead parameters became significant compared to pre-administration values. The results of this trial are not as profound as the six-week administration of the (Humic/Fulvic Acid) in volunteers exposed to lead. Although the reduction in blood lead levels was significant, a longer treatment time was needed due to the smaller dosage of (Humic/Fulvic Acid) that was administered to the individuals. The examined laboratory parameters (i.e. serum blood, routine laboratory tests, liver and kidney function, and urine examination) exhibited no significant changes, which supported the safety of (Humic/Fulvic Acid) in the recommended dosage. Data from the two former studies indicate that the higher the serum or blood lead level, the more significant reduction in this parameter can be observed. Furthermore, doses of 20 ml per day of (Humic/Fulvic Acid) appear more effective in the treatment of occupational lead exposure.

Studies in animals have confirmed the beneficial effects of (Humic/Fulvic Acid) on heavy metal chelation. Some studies using isolated humic acid have demonstrated that it does affect cadmium speciation in the intestine and thus absorption and distribution of this heavy metal. Additional studies using (Humic/Fulvic Acid) in animals provide support for the ability of (Humic/Fulvic Acid) to chelate heavy metals. Adult pigs were fed varying doses of (Humic/Fulvic Acid) or a control supplement and the excretion of a mercury radioisotope previously administered, was examined. Those animals that were fed (Humic/Fulvic Acid) excreted more of the mercury isotope, than did the control animals. Although the data was not significant, due to the small number of animals, this study warrants further research to document the efficacy of (Humic/Fulvic Acid) in alleviating mercury accumulation.

The effect of (Humic/Fulvic Acid) on the absorption and incorporation of isotope-labelled strontium chloride has also been documented. Not only did (Humic/Fulvic Acid) slow the strontium absorption and its incorporation, it also affected the urinary excretion

of this toxic element. The urinary excretion of strontium was less intensive in the animals fed with (Humic/Fulvic Acid). The authors concluded that a lower amount of the toxic element complex was absorbed when (Humic/Fulvic Acid) was present. This same effect has been documented in humans exposed to cadmium and lead. Based on urine measures of these metals, (Humic/Fulvic Acid) decreased the absorption of cadmium and lead from food or environmental exposure. Further data indicate that cadmium and lead urinary excretion increased in humans during the administration of (Humic/Fulvic Acid), indicating the removal of this toxic element. Although it is premature to state the exact mechanism of action occurring in these animals and humans exposed to various heavy metals, it is safe to presume that the absorption and urinary excretion of heavy metals is affected by (Humic/Fulvic Acid).

Evidence for the protective effect of (Humic/Fulvic Acid) bound with microelements against environmental exposure to irradiation has also been provided in the literature. The radio-protective effect of standardised (Humic/Fulvic Acid) was tested in female Wistar rats. (Humic/Fulvic Acid) was given in one dose of 240 mg/animal (960 mg/kg body weight) and the rats were subjected to whole body irradiation. Baseline and outcome data (white blood cell, erythrocyte, platelet counts, and total serum iron binding capacity) were taken to substantiate claims of efficacy of the (Humic/Fulvic Acid) treatment. The results showed improvements in platelet counts (leukocytes and thrombocytes) which had markedly decreased after irradiation. Platelet counts began to normalise in the control group one week earlier than in the untreated control group of rats with just one dose of the (Humic/Fulvic Acid) formula. No side effects or toxicities were noted while administering (Humic/Fulvic Acid) to this group of animals.

As indicated by the previous data, the standardised (Humic/Fulvic Acid) appears to be an effective chelator of offending heavy metals. Furthermore, it shows a protective effect against radiation in vivo. Its benefits could be utilised in the prevention of heavy metal contamination in workers in hazardous occupations, by decreasing the absorption and increasing the elimination of toxic heavy metals like cadmium. Furthermore, this standardised (Humic/Fulvic Acid) would be beneficial in eliminating heavy metals that can be accumulated throughout a lifetime of environmental exposure, and alleviating the physiological consequences that occur with irradiation. Animal studies show a similar mechanism of action when comparing them with the studies in humans. Both indicate that (Humic/Fulvic Acid) may work to decrease the absorption of these heavy metals as indicated by its effects on the excretion of these toxic elements in the urine.

***HumicHealth.info EDITOR'S NOTE:**
In keeping with this website's intention to educate without promoting or endorsing any Humic Acid product, we have substituted the terms (Humic/Fulvic Acid) and (the product) when reference to a brand name or formulation is made in the above text.

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