# BLK Water: Fulvic Acid

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## Background

BLK water includes fulvic minerals/acid. This acid is a type of organic molecule that can be found in soil and water. When it is present in soil it is typically a mixture of fulvic acid, humic acid, and humin. This mixture is, also, known as humic substances or geopolymers. Geopolymers are not categorized into any one biological molecule since they are a combination of many biological molecules. [1]. Humic substances can be isolated from sources such as lignite, peat, and compost [2]. Compost includes decaying plants and animals.

## Chemistry

Fulvic acid contains multiple functional groups. Using the structure of fulvic acid provided by BLK water there are carboxyl, hydroxyl, amino, and sulfhydryl groups present. The majority of groups present are the carboxyl and hydroxyl groups which is where the hydrogens come from that make it an acid. Normally, when an acid is introduced to a base or a less acidic acid it will give up/donate its hydrogens. Fulvic acid is a polyelectrolyte which simply means that it will completely dissociate in water. Unlike the other humic substances, fulvic acid is soluble in low and high pH levels including natural waters. [1]. Another characteristic of this acid is that it is polar.

It is important to understand the characteristics of the other humic substances since they are initially found all together. Humin is not soluble in acids or bases while humic acid is soluble in only basic solutions [1]. Because of this I would assume to be able to isolate only fulvic acid to add into BLK water, they must dissolve humic substances into an acidic solution. Once fulvic acid is isolated then they can add it to a basic solution to remove the acidity leaving you with fulvic minerals. I could not find any specific information on why BLK water adds an acid to water and why they alkalize it. The only thing I could think of is so they can isolate fulvic minerals.

## BLK Claims

One claim made by BLK that I evaluated was that fulvic minerals/acid helps the human body effectively breakdown, absorb, and transport key bioavailable nutrients. As I mentioned before, fulvic acid is soluble in low and high pH levels [1] which allows it to dissolve in natural waters. Because of this, plants have direct access to fulvic acid. A study done showed a that fulvic acid dissolved in water helps plants to absorb nutrients faster [2]. There was another study done on aquatic species and the effect of fulvic acid. Specifically, the presence of fulvic acid in loaches showed an increase in weight and growth rate [3]. These effects were observed in plants

and loaches, so it does not directly correlate with the claim made by BLK; however, there is an indication that fulvic acid can help with absorption and possibly the breakdown of nutrients. Fulvic acid can form complexes with metal ions that can promote the transport of nutrients [1]. Ultimately, there seems to be evidence supporting BLK's claim that fulvic acid can help with absorption, breakdown, and transport of nutrients. However, most of the information that I found did not include studies in humans.

Another claim that was made by BLK was that there are no side effects from fulvic acid. As I mentioned before, most of the information that I found was focused on plants or non-human animals. Because of this I could not find any information stating that there are absolutely no side effects to consuming fulvic acid. I was able to find one unreliable source that explained that fulvic acid can be used for treating allergies, but fulvic acid can lead to complications to autoimmune disorders since it can stimulate the immune system [4]. This statement contradicts itself. If fulvic acid stimulates the immune system, then allergies would become more severe. Obviously, there are claims that fulvic acid can help an individual, but I was unable to find any information stating that there are no side effects to consuming fulvic acid.

## Conclusion

Overall, the claims made by BLK about fulvic acid have some evidence to support them. The most supported claim was that it can help absorb, breakdown, and transport nutrients. This claim is support by studies done on plants and loaches indicating an increase in absorption, weight gain, and growth rate (this could be a result of an increase in absorption, breakdown, and/or transport of nutrients). The basic chemistry of fulvic acid supports this claim as well. Since fulvic acid can form complexes with metal ions it can increase the transport of these metal ions within our bodies.

However, I was not able to find evidence that supported the claim made by BLK stating that there are no side effects from fulvic acid. The source that I did find was not reliable and stated that fulvic acid could cause complication to those that suffer from autoimmune disorders. This is concerning because BLK is promoting to customers that there are no side effects. Ultimately, more detailed research on fulvic acid is needed before BLK can come out and say that there are absolutely no side effects to consuming it.

# References

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