# Using Phytoaccumulation to End Mineral Deficiencies: Increasing the Iron Content in Brassica juncea

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Iron is extremely important when it comes to how our bodies function. Although it is considered a trace mineral, a lack of iron can lead to severe cases of anemia, which is the most common blood disorder in the United States. Iron along with many other minerals is able to be easily absorbed in hyperaccumulators such as Brassica juncea through phytoaccumulation. This project was an experiment of the ability of Brassica juncea to absorb and accumulate a substantial amount of iron, which would naturally fortify the plant leaves with this mineral. Samples of Brassica juncea were grown hydroponically in concentrations of 0 (control), 25, 50, 100, 500, 1,000, and 2,000 ppm of $FeSO_4$ . The plant samples in concentrations of 2,000, 1,000, and 500 ppm succumbed to extreme toxicity after two days of exposure and were disposed. The rest of the samples (0, 25, 50, and 100 ppm) were monitored for three weeks. After this time period, all of the plant samples were harvested, dehydrated, and tested for iron content using a procedure that involved a reaction with KSCN and a colorimeter. It was found that the samples growing in the highest concentrations of $FeSO_4$ (50 and 100 ppm) accumulated enough iron to be well over the RDA when consumed in an amount equivalent to an average serving size of the plant leaves. However, the plant samples growing in a 25 ppm concentration would, when consumed at the average serving size, meet the RDA of iron almost exactly. In conclusion, this method of naturally fortifying plants with essential minerals could be used to help end mineral deficiencies.

**Awards Won:**