Fighting malnutrition with a 'stronger' chickpea

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Micronutrient malnutrition affects more than 2 billion people. Researchers working at the Crop Development Centre at the University of Saskatchewan are seeking long term solutions to help to alleviate the increasing micronutrient malnutrition problem by enriching food grains with essential micronutrients through breeding and appropriate management practices, collectively known as biofortification.

Chickpea (*Cicer arietinum L.*) is considered an excellent whole food as source of dietary proteins, carbohydrates, micronutrients and vitamins. It is the world's second most important pulse crop after common bean, and historically is an important daily staple in the diet of millions of people, especially in developing countries. Chickpea is the subject of a new study published today in the journal *Genome*.

Dr. Bunyamin Tar'an, one of the authors of the study explains, "To increase micronutrient contents in grains, a clear understanding of mechanisms of micronutrient mobilization, absorption, translocation and retranslocation in the seed-soil-plant-seed- human/animal chain is essential. This research is a step further gearing toward this understanding."

The researchers employed a genome-wide association analysis approach using single nucleotide variations (SNPs) and a set of diverse chickpea genotypes consisting of landraces, elite cultivars, and advanced breeding lines from the Crop Development Centre at the University of Saskatchewan to study the genic factors associated with iron and zinc

concentration in chickpea seeds.

"Our study indicated that there is substantial variability present in chickpea germplasm for seed iron and zinc concentration. These findings encourage the effective use of genetic resources and open the possibility for development of a molecular breeding strategy for increasing iron and zinc levels in chickpea cultivars."

Dr. Tar'an and his colleagues plan to further examine the genes involved in iron and zinc absorption, translocation and deposition in chickpea seeds. In the meantime the germplasm lines that consistently showed high iron and zinc concentrations are already being used in breeding program to develop varieties with enhanced micronutrient content.

More information: "Diversity and Association Mapping of Iron and Zinc Concentration in Chickpea (Cicer arietinum L.)" *Genome*, DOI: 10.1139/gen-2014-0108

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