

TITLE: Proteomic and metabolomic studies in Fe deficient Strategy I plants.

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ABSTRACT: Iron (Fe) deficiency induced chlorosis is a major nutritional disorder for crops growing in calcareous soils, and chlorosis causes decreases in vegetative growth as well as marked yield and quality losses. With the advances in mass spectrometry techniques, a substantial body of knowledge has arisen focused on the changes on protein and metabolite profiles in different plant parts and compartments as a result of Fe deficiency. Changes in the protein profile of thylakoids from several species have been investigated, as have root proteome changes in tomato (*Solanum lycopersicum*), sugar beet (*Beta vulgaris*), cucumber (*Cucumis sativus*) and *Medicago truncatula*. High throughput proteomic studies have also been published using Fe deficient *Arabidopsis thaliana* roots. In sugar beet roots, not only the protein but also the metabolite profile changes induced by Fe deficiency have been studied. Metabolite profiles have been studied in leaf extracts and xylem sap of several plant species. This communication tries to summarize in a comprehensive manner the major conclusions derived from these two “-omic” approaches. A better understanding of the mechanisms involved in root Fe homeostasis from a holistic point of view may strengthen our ability to enhance Fe-efficiency responses in plants of agronomic interest.

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