

Physiological and molecular facets of plant iron nutrition and interactions in global scenario

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Elucidation of physiological and molecular facets of iron (Fe) nutrition and interactions in plants is essential for development of sustainable agricultural practices under iron nutrition stress. Iron interactions with zinc, nitrogen, boron, aluminium and vanadium in important agricultural crops were encouraging. Subsequently, considerable progress were made towards the explanation of the roles of transport proteins in plant Fe homeostasis. Iron in symplast is reduced to Fe²⁺, mainly by the action of FRO proteins, whereas *FDR3* gene has an important role in transporting Fe. Likewise, Strategy I confirms that Fe³⁺ reduced by Ferric Reduction Oxidase 2 (FRO2) at plasma membrane before transport across the membrane by Iron-Regulated Transporter 1 (IRT1). The emerging physiological and molecular understandings of Fe uptake and translocation in grains also indicate accumulation of some toxic metals, which needs clarifications. Besides these, plant leaves are important sink tissue for iron in plastids and mitochondria for numerous enzymes and indispensable for photosynthesis and other cellular metabolic processes. Investigations exhibited that Fe deficiency inhibits symbiotic nitrogen fixation by affecting growth and survival of rhizobial species, nodule formation and nodule function, for Fe²⁺ being part of nitrogenase,

leghaemoglobin and ferredoxin regulated by nodulin-like genes. *Phaseolus vulgaris* revealed significant roles of Fe in host-rhizobium association. Amazing roles of 24-Epibrassinolide was recently evaluated in maintaining physiologically active iron besides seed loading, stored in vacuoles or in ferritin of many crop species. Under changing climate, greater insights needs to be derived for enhancing judicious use and efficiency of iron in plants through sensible researches at molecular levels.

Speaker Biography

Akhouri Hemantaranjan completed his PhD at the age of 26 years from Banaras Hindu University India. He is the Professor and Ex-Chairman of Plant Physiology Department, Institute of Agricultural Sciences, Banaras Hindu University, India. Currently, working as a Senior Professor with over 160 publications that have been cited over 1500 times, and his/her publication H-index is over 20 and has been serving as an editorial board member of reputed Journals besides Editor in Chief of the UGC Approved International Treatise Series on Advances in Plant Physiology published 18 volumes till date. Honoured with Agricultural Excellence Award, 2013 and Life Time Achievement Award, 2014; Reviewer of 16 international journals; delivering Guest Lectures/Keynote Address in many World Universities. He has forty years of research experience who guided 13 Ph.D; 30 years of post-graduate teaching experience; several years of administrative experience in elite Central University biggest in Asia. He elucidated several facts of underlying mechanisms for stress tolerance in crops. With his expertise in physiology of abiotic stresses and micronutrients, he commendably established doses of salicylic acid, zinc, brassinolide and paclobutrazol in stress mitigation.

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