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The chemical forms of Fe used as *in vivo* substrate in uptake process of chloroplast

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Iron is an essential micronutrient required for several fundamental metabolic processes such as photosynthesis. Consequently, chloroplasts are the major iron sinks in the aerial plant tissues containing 80-90% of the iron taken up by plant cells. Chloroplasts take up iron from the cytoplasm of the mesophyll cells. Thus the amount and the chemical form of iron in the cytoplasm are important for the iron availability for chloroplasts. In plants iron is complexed by organic compounds since free ferrous ions can catalyze Fenton reaction and thus cause oxidative damages. Although some of the metal-binding ligands, such as nicotianamine and citrate were indicated so far that may complex iron ion *in vivo*, the complexed form of iron in the cytoplasm has not been detected yet. Despite some iron uptake related chloroplast envelope membrane transporters and enzymes were identified in the last decade, we are in a lack of information, what is the natural source of iron complexes of this uptake machinery.

To elucidate the chemical forms of Fe used as *in vivo* substrate in uptake process of chloroplast, intact chloroplasts of oilseed rape (*Brassica napus* cv. DK Exquisite) were isolated and the iron uptake capacity of chloroplasts were tested in the presence of natural iron complexes: Fe(III)-NA, Fe(II)-NA and Fe(III)-citrate. Iron uptake was followed spectrophotometrically by measuring the iron content of chloroplasts in the form of ferrous-bathophenanthroline disulphonate complex after solubilising the chloroplasts under reducing conditions. Chloroplasts clearly prefer to use Fe(III)-citrate compared to Fe(III)-NA. complexes in their iron uptake. The iron uptake capacity of chloroplasts from Fe(III)-NA or Fe(II)-NA was significantly lower than that of from Fe(III)-citrate.

Biography

Ahmad Moieni received a PhD in Plant Cell and Molecular Biology from INP-ENSAT, Toulouse, France in 1997. He is Associate Professor in Department of Plant Breeding, Faculty of Agriculture, Tarbiat Modares University, Tehran, Iran. His research interests include: haploid plants production by anther culture and isolated microspores culture, colchicine-induced polyploidy, micropropagation, and *in vitro* production of plant secondary metabolites via cell culture and hairy roots culture.

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