

The substrate preference of the iron acquisition system of chloroplasts in *Brassica napus*

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Iron is required for essential plant cell functions and several metabolic processes especially photosynthesis. Consequently chloroplasts are the major Fe sinks that contain 80-90% of Fe taken up by mesophyll cells. In plants Fe is complexed by organic compounds since free ferrous ions can catalyse Fenton reaction. Although some metal-binding ligands, such as nicotianamine and citrate were indicated so far that may complex Fe ion *in vivo*, the complexed form of Fe in the cytoplasm has not been identified yet.

To elucidate the chemical forms of Fe present in the cytoplasm of mesophyll cells *in vivo*, intact chloroplasts of oilseed rape (*Brassica napus*) were isolated and their Fe uptake was tested in the presence of natural and synthetic Fe complexes such as ferric-carboxylic acid and ferric-amino-carboxylic acid complexes. Fe uptake was followed by a bathophenanthroline- (BPDS-) based method. Chloroplasts clearly prefer to use Fe(III)-citrate compared to Fe(II)-citrate and Fe(III)-malate, furthermore, chloroplast Fe uptake from Fe(III)-NA and Fe(II)-NA was significantly lower than that of from Fe(III)-citrate. Similarly, uptake capacity of chloroplasts for Fe(III)-EDTA and Fe(III)-EDDHA was negligible. Fe deficiency has a strong impact on chloroplasts Fe uptake since a significant decrease was observed in the presence of Fe(III)-citrate. However the Fe uptake rate was not affected in the excess of Fe.

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