C-N Metabolite Profiling in Shoots and Roots of Cabbage Plant Affected by B and Mo Deficiency

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Micronutirents are elements that are essential for plant growth but are required in much smaller amounts, and closely involved in all metabolic and cellular functions. Boron (B) is involved in numerous important processes, including protein synthesis, transport of sugars, carbohydrate metabolism and the metabolism of plant hormones. Molybdenum (Mo) is also linked to protein metabolism, including nitrogen assimilation, sulfur metabolism and phytohormone biosynthesis. Here, we are focused on depicting B- or Mo-specific variations in primary metabolism. B deficiency led to noticeable changes in metabolite concentration with depending on organs. An interesting finding was a significant decrease in soluble sugars and secondary metabolism intermediates like sinappic and ferulic acids in both organs, and these could be an evidence to explain the reason that carbohydrate metabolism and cell wall synthesis are strongly restricted under B deficiency. Mo also negatively affected econdary metabolism intermediates, and, moreover, it was observed a marked reduction in glycolysis and TCA intermediates and acidic amino acids, glutamate and aspartate in shoots.

Keywords: Chinese cabbage, B, Mo, Nutrient deficiency, Metabolite
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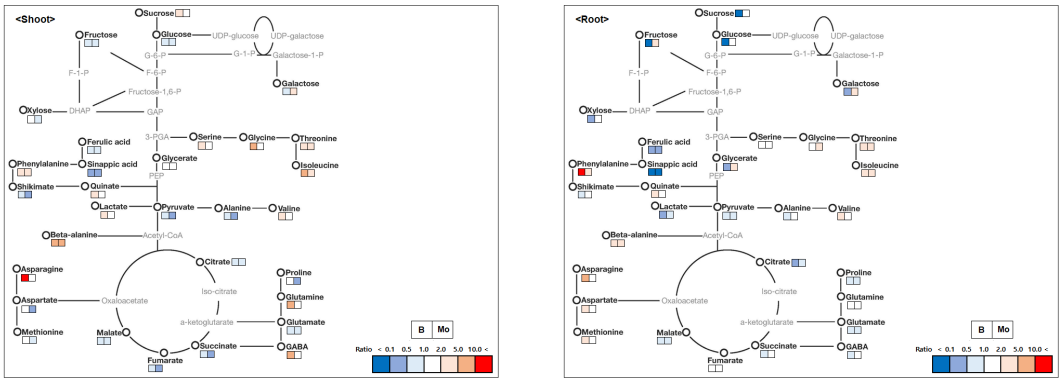

Fig. 1. Changes in primary metabolism under B and Mo deficiencies. Seedlings of Chinese cabbage were subjected to B or Mo-free nutritent condition for 15 days. Polar metabolites were measured and profiled by GC-TOFMS after MeOH:H_2O:chloroform extraction.