

EFFECT OF ENVIRONMENTAL FACTORS ON ACCUMULATION OF ISOFLAVONOIDS AND OTHER PHENOLIC COMPOUNDS IN *LOTUS JAPONICUS* AND *LOTUS CORNICULATUS*

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Effect of environmental factors on the accumulation of isoflavonoids and other phenolic compounds in *Lotus japonicus* and *Lotus corniculatus* from the family *Fabaceae* are evolutionarily related species and belong to plants with a high tolerance to abiotic stress. Flavonoids especially kaempferol and quercetin glycosides are the most abundant phenolics in *Lotus japonicus* and *Lotus corniculatus*, but isoflavonoids such as vestitol, which play an important role in stress-defence can also be produced in considerable amount. We focused on the effect of UV-B radiation on *L. japonicus* and *L. corniculatus* plants and its influence on the accumulation of flavonoids. The amount of kaempferol and quercetin glycosides remained almost unchanged compared to the control conditions, while the concentrations of isoflavonoids, in particular isoquiritigenin and vestitol, significantly increased in stress conditions in both *L. corniculatus* and *L. japonicus*. Vestitol, although is not a very effective UV-B absorbent, but it has significant antioxidant properties and its accumulation appear to be related to increased amount of reactive oxygen species (ROS) induced by UV-B radiation. In isoflavonoid biosynthesis pathway, we have observed the induction of gene expression for isoflavone synthase, a key branching enzyme in isoflavonoid biosynthesis, as well as pterocarpan reductase, an enzyme that synthesizes vestitol.

Despite of the fact that *Lotus japonicus* and *Lotus corniculatus* are morphologically almost identical and closely related species, they can form slightly different phenolic substances and accumulate them in different amounts. Due to these reasons, we need to understand the different biosynthesis pathways of these secondary metabolites and their regulations by the methods of molecular biology.

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