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The interactive effects of nitrogen and sulfur on glucosinolate patterns and their breakdown products in vegetable crops

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Glucosinolates (GSLs) are amino acid derived secondary metabolites naturally occurring in the order of Brassicales. They represent an important class of phytochemicals involved in plant–microbe, plant–insect, plant–animal and plant–human interactions. In Brassica vegetables GS are known as the bioactive compounds giving the typical flavor and odor, being involved in natural pest control. Still, in high doses GSL remain highly toxic. Even though the GS content in Brassica species is genetically fixed, breeding programs already aimed for reducing the GS content, with the engineering of 00-varieties of rapeseed (*Brassica napus*) being the most prominent example. Contrary to their negative effects, GSLs are also discussed to have beneficial nutritional and health effects. But it is more their breakdown products, particularly isothiocyanates (ITCs) and nitriles, formed after hydrolysis within the glucosinolate-myrosinase-system, which the health-promoting effects can be ascribed to when taken up in low doses. Besides genetic approaches to influence GSL content and pattern and their breakdown products, little is yet known about how agronomic and particularly plant nutritional factors can alter the GSL content and pattern of their different hydrolysis products in the context of improving food quality. Therefore, the influence of the sulfur (S) supply on GSLs, ITCs and nitriles in various Brassica species, such as Indian mustard (*Brassica juncea*), kohlrabi (*Brassica oleracea*), and Chinese cabbage (*Brassica rapa spp. pekinensis*), are exemplarily discussed in relation to nitrogen nutrition.

Literatur

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