

Can glucosinolates act as plant elicitors? Use of kale (*Brassica oleracea* var. *acephala*) green manure for the activation of systemic plant defenses in bell pepper

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Abstract:

In the search for new alternatives to avoid the problems associated with the use of chemical fungicides in agriculture, the use of green manure (GM) could help to combat fungal diseases of crops, such as those produced by the necrotrophic pathogen *Rhizoctonia solani*. In the case of the use of brassica-tissues as GM, could have an elicitor capacity of systemic plant resistance related to the presence in these tissues of defense metabolites called glucosinolates (GSLs). Kale-leaves were used as GM and their GSLs content was removed by autoclaving, and applied to pepper plants infected with *R. solani*. Autoclaving removed part of the glucobrassicin (GBS) (85%) and sinigrin (19%) content of the kale-tissues. Application of intact kale-tissues to roots of pepper plants produced a systemic activation of foliar defenses via the salicylic acid (SA) and ethylene (ET) pathways, significantly reducing pathogen damage. In addition, this systemic response led to the accumulation of secondary defense metabolites in leaves, such as pipercolinic acid, hydroxycoumarin or gluconic acid, among others. Therefore, GBS-rich GM kale-tissues is able to activate systemic defenses in bell pepper against foliar pathogens through SA/ET hormonal pathways, accumulating secondary defense metabolites.

Keywords: glucosinolates; salicylic acid; ethylene; glucobrassicin; elicitors.

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