

GL-containing plants in biofumigation: new perspectives

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The use in plant defence of natural compounds with a high biological activity presents several environmental (renewability, biodegradability) and technological advantages of great interest for conventional and organic agriculture. In particular, in these last years, some interesting perspectives had been provided by the enzymatic hydrolysis derived products of glucosinolates (GLs), typical defensive system of the Brassicaceae and other minor families. The high biocidal activity of these compounds, in fact, was observed *in vitro* on several soil-borne pathogenic fungi and nematodes, thus providing a natural and practical alternative to chemical fumigants for controlling some soil borne pathogen and pests with a lower environmental impact. The presence in all Brassicaceae plant organs of a good GLs amount and of a myrosinase activity sufficient to catalyze their hydrolysis, has suggested the practical possibility of amending soil with these biocidal compounds by cultivation and green manure of some new ecotypes recently selected in our Institute for their GL content. Some of these new selections (*Rapistrum rugosum* sel. ISCI18, *Brassica juncea* sel. ISCI20, ISCI99 and ISCI61, *Eruca sativa* cv. Nemat) showed good results in controlling some soil borne fungi (*viz.* *Pythium* spp. and *Sclerotinia minor*) or a clear nematocidal activity on *Heterodera schachtii*, the sugar beet cyst nematode, and on *Meloidogyne incognita*, the root knot nematode. In addition, in these last years it was even studied the possibility of drying some of these selections to produce biocidal pellets, to use them as organic treatments in addition or in alternative to biocidal green manure. These new materials maintain a good residual GL content and the enzyme myrosinase not denatured; in this way, dried plant pellets are able to produce the biocidal compounds in soil when watered by irrigation. Some results on this experience are reported and discussed.