

HALLOIN, JOHN M^{1*}. and CARL A. ELLIGER². ARS, USDA, ¹Sugarbeet and Bean Research Unit, Department of Botany and Plant Pathology, Michigan State University, East Lansing, MI 48824, and ²WRRC, Plant Development-Productivity Research, 800 Buchanan St., Albany, CA 94710. Characterization, localization and biological activity of phytoalexins associated with *Rhizoctonia* root rot lesions.

The phenolic phytoalexins betagarin and betavulgarin occur in association with foliar lesions of sugarbeets (*Beta vulgaris* L.) caused by *Cercospora beticola*. We studied phytoalexins associated with disease lesions caused by *Rhizoctonia solani* (AG 2-2) on crowns and roots of sugarbeets. Freeze-dried tissues were extracted with methanol, and the phytoalexins were purified by HPLC. A phytoalexin localized within healthy tissues surrounding disease lesions, that forms colored nitroso derivatives upon reaction with dilute nitrous acid, was not extracted by methanol, apparently due to cross linking with other plant constituents. Infected tissues and surrounding, non rotted tissues contained betagarin and betavulgarin, as well as two new compounds that are a glucoside and a xyloside of betavulgarin. Only trace amounts of these compounds were isolated from healthy tissues away from disease lesions. Growth of *R. solani* on agar media containing these phytoalexins revealed that only betavulgarin caused inhibition of radial growth of the fungus. Chemical assays showed that agar medium containing betavulgarin, on which the fungus had grown, contained non inhibitory betavulgarin glycosides, demonstrating that the fungus detoxifies the phytoalexin via glycosylation. Diseased tissues fail to accumulate betavulgarin at concentrations that are highly inhibitory to the fungus, apparently due to this detoxification.