Change in acceptability of barley plants to aphids after exposure to allelochemicals from couch-grass (*Elytrigia repens*)

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The response of the bird-cherry-oat aphid, *Rhopalosiphum padi*, to barley plants was investigated following exposure of the plants to root allelochemicals from the aggressive weed couch-grass, *Elytrigia* (*Agropyron*) *repens.* Plants were treated either with root exudates from living couch-grass plants, or with the previously identified [1,2] couch-grass root compounds 5-hydroxyindole-3-acetic acid, DL-5-hydroxytryptophan, L-5-hydroxytryptophan hydrate and 6-hydroxy-1,2,3,4-tetrahydro-β-carboline-3-carboxylic acid (carboline), either separately or in mixtures. In choice and no-choice settling tests, aphid acceptance of barley plants was significantly reduced following treatment with root exudates, and the carboline when tested alone or in combination with the other compounds. In contrast, the other compounds without the carboline were less active in reducing aphid acceptance. In a probing bioassay, individual substances were either neutral or stimulatory to aphids, indicating that the reduced settling was probably not due to direct effects on the aphids, but rather due to effects on the plant. This was confirmed in olfactometer assays, in which aphids were repelled by odours from barley plants following treatment with a mixture containing all four chemicals. The responses of aphids to barley plants exposed to *E. repens* allelochemicals are similar to those reported after exposure of barley plants to volatiles of other barley plants [3].

[1] Hagin, R.D. (1989) Isolation and identification of 5-hydroxyindoleacetic acid and 5-hydroxytryptophan, major allelopathic aglycons in quackgrass (*Agropyron repens*, L. Beauv.). J. Agric. Food Chem., **37**: 11-43

[2] Hagin, R.D. and Bobnick, S.J. (1991) Isolation and indentification of a slug-specific molluscicide from quackgrass (*Agropyron repens*, L. Beauv.). J. Agric. Food. Chem., **39**: 192-196

[3] Pettersson, J., Ninkovic, V. and Ahmed, A. (1999) . Volatiles from different barley cultivars affect aphid acceptance of neighbouring plants. Acta. Agric. Scand. B. Soil and Plant Sci., **49**: 152-157