ONLINE ISSN : 1349-0923
PRINT ISSN : 1348-589X

Journal of Pesticide Science
Vol. 32 (2007) , No. 3 pp.249-254

Action of fentrazamide on protein metabolism and cell division in plants

Sung Jin Lim[1)], Yukari Sunohara[1)] and Hiroshi Matsumoto[1)]

1) Doctoral Program in Life Sciences and Bioengineering, Graduate School of Life and Environmental Sciences, University of Tsukuba

(Received: March 5, 2007)
(Accepted for publication: May 7, 2007)

Abstract:
Fentrazamide [4-(2-chlorophenyl)-*N*-cyclohexyl-*N*-ethyl-4,5-dihydro-5-oxo-1*H*-tetrazole-1-carboxamide] is a new tetrazolinone class herbicide. Fentrazamide at and above 1 μM showed marked phytotoxic activity on the growth of early watergrass 15 days after treatment (95% reduction in the total dry weight at 100 μM), but showed less toxicity to rice. Dry weight of early watergrass and rice was reduced by 50% with 1.8 μM and 95.1 μM of fentrazamide, respectively. The pattern of soluble amino acid composition in early watergrass treated with fentrazamide was more similar to that treated with cafenstrole (an inhibitor of fatty acid elongation) than that with mefenacet (an inhibitor of cell division). The inhibition of fatty acid elongation in microsomal fractions of early watergrass by fentrazamide was comparable to that by cafenstrole, but inhibition by fentrazamide was 28–38% even at the highest concentration (2 μM). The cell division of leek roots was not affected by 100 μM of fentrazamide. Cycloheximide (an inhibitor of protein biosynthesis) at 10 μM showed a marked inhibitory effect on the incorporation of ^{14}C-leucine into protein, but fentrazamide showed less inhibitory effect even at 100 μM; however, fentrazamide at and above 10 μM markedly reduced the soluble protein content in early watergrass by 84%, which was much greater than that in rice. These results suggest that fentrazamide has a mode of action which leads to the degradation of protein.

Keywords:
fentrazamide, amino acid, very long chain fatty acids (VLCFAs), soluble protein, cell

division

To cite this article:

Sung Jin Lim, Yukari Sunohara and Hiroshi Matsumoto, “Action of fentrazamide on protein metabolism and cell division in plants”. *J. Pestic. Sci.* Vol. **32**, pp.249-254 (2007) .

doi:10.1584/jpestics.G07-07

JOI JST.JSTAGE/jpestics/G07-07