# Anaerobic Biodegradation of Alachlor, Butachlor and Metolachlor by Earthwarm Intestinal Microflora

You-Jin Yim[1], Kwang-Hee Shin[1], and Hor-Gil Hur[1]

Department of Environmental Science and Engineering, Gwangju Institute of Science and Technology, Gwangju, Korea[1]

TEL : +82-62-970-2455, FAX : +82-62-970-2434

Chloroacetoanilides are used for control of annual grasses and broadleaf weeds.[1)] Their extensive uses give reason for concern about potential to cause cancer and endocrine disruption. Anaerobic biodegradation of 3 chloroacetanilides(alachlor, butachlor and metolachlor) was tested by earthworm(*Eisenia fetida*) intestinal microflora to remove them from the environment. The microflora were incubated with 0.5mM each chloroacetanilide in the postgate's medium C under anaerobic condition(100% $N_2$ or 80% $N_2$ and 20% $H_2$) for 7 days, and extracted with ethyl acetate. Gas chromatograph equipped with FID and ECD detector was used for the identification of their metabolites. Almost complete degradation was observed after 7 days incubation, resulting in the formation of mercapto-substituted derivative of alachlor, butachlor and metolachlor. This study suggests that earthworm intestinal microflora has a potential ability to detoxify chloroacetoanilides in soil environment. Further study is being performed to determine the microbial community structure of microflora capable of degrading chlorocaetanilides through a denaturing gradient gel electrophoresis(DGGE) and 16s rRNA gene sequencing.

## Reference

1. Junghans M, Backhaus T, Faust M, Scholze M, Grimme LH, Predictability of combined effects of eight chloroacetanilide herbicides on algal reproduction(2003), Pest Manag Sci., 59(10):1101-10.