VETIVERIM

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Office of the Royal Development Projects Board (ORDPB)
2012 Arun Amarin 36,
Bang Yi Khan, Bang Phlat,
Bangkok 10700, Thailand
Tel.: (66-2) 447 8500
Fax: (66-2) 447 8543
E-mails: vetiver@rdpb.go.th;
Foreign_rdpb@yahoo.com
Homepage: http://prvn.rdpb.go.th
Editor's E-mail: narongchc@au.edu

Editorial

Vetiver Fights Back

Communities at Nong Nae Sub-district, Phanom Sarakham District, Chachoengsao Province, Thailand has suffered from illegal dumping of industrial wastewater containing high phenol for more than two years. Phenol migrates from the dumping sites causing contamination of shallow-well groundwater as well as Tat Noi Creek, the main creek of the villagers. All of the villagers there utilize shallow-well groundwater as their sole drinking water source. It is therefore obligatory to reduce the phenol content in the creek and underground water in order to protect community's health.

A group of researchers from the Faculty of Engineering, Naresuan University in Phitsanulok Province, under the leadership of Dr. Tanapon Phenrat, has conducted an experiment by growing vetiver on a floating platform. They found that phenol concentration during the period of 15 days remained unchanged. However, it was rapidly decreased soon after that initial period, down to the level that meets the effluent standard (1 mg/L) within only six weeks. After the experiments, phenol was extracted from leaf, trunk and root of the vetiver grass and found very small amount of phenol remaining in the vetiver parts. This suggests that vetiver degraded phenol by enzyme-assisted degradation and not just removal by absorption. This successful laboratory evaluation gives confidence and insight necessary for conducting a pilot-scaled treatment of illegal-dumped wastewater contaminated with phenol at Nong Nae Sub-district in the near future.

In other system of phytoremediation, vetiver roots grown hydroponically could absorb organic and inorganic contaminants in the water. This is not what happens to phenol. Vetiver roots, although not being suffered by the presence of high concentration of phenol, did not absorb it into its structure during the first 15 days. Soon after that, it *fights back* by producing the enzyme (peroxidase) to degrade phenol to the extent that it was down to 1 mg/L, the safe effluent standard.

It can be concluded that vetiver is a marvelous plant that it is able to *fight back* its aggressor by degrading them with the enzyme induced by the presence of the aggressor, i.e. phenol. It remains to be seen that vetiver can do the same job when planted along the rim of the waterway loaded with phenol compound from the site of its dumping.