

МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ
СУМСЬКИЙ ДЕРЖАВНИЙ УНІВЕРСИТЕТ
КАФЕДРА ІНОЗЕМНИХ МОВ
ЛІНГВІСТИЧНИЙ НАВЧАЛЬНО-МЕТОДИЧНИЙ ЦЕНТР

МАТЕРІАЛИ ІХ МІЖВУЗІВСЬКОЇ
НАУКОВО-ПРАКТИЧНОЇ КОНФЕРЕНЦІЇ
ЛІНГВІСТИЧНОГО НАВЧАЛЬНО-МЕТОДИЧНОГО ЦЕНТРУ
КАФЕДРИ ІНОЗЕМНИХ МОВ

“TO MAKE THE WORLD SMARTER AND SAFER”

(Суми, 26 березня 2015 року)
The ninth scientific practical student`s, postgraduate`s and teacher`s
LSNC conference

ENVIRONMENTAL BIOTECHNOLOGY

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Environmental biotechnology is the application of biotechnology in the natural environment. It could sustain the environment by using eco-friendly biological processes. Some of these processes could be used to solve the most demanding environmental problems like controlling air emissions and water pollution. Developing countries in Asia and elsewhere have high levels of atmospheric pollution. Besides, they are coupled with their growth in population, that creates enormous sewage and waste disposal problems.

Converting the leaves and stalks of maize, algae and cellulose into bio fuels can greatly reduce green house gas emissions, comparatively in terms of fuel obtained from fossil sources. And it costs less to make biofuel in terms of energy requirements too. This is one way how biotechnology can be used to lower carbon dioxide emission levels.

Improper disposal of solid and hazardous waste not only damages the environment but causes the maximum health problems. Incineration was earlier considered the best way of disposing solid wastes, especially domestic wastes. Although it is still being done in developing economies, the situation is quite different in the developed world. And biotechnological processes are responsible for that. Today using the process of anaerobic digestion, bio-degradable solid wastes can be converted to bio-gas and usable organic material. Furthermore, anaerobic digestion is progressing to a stage, that in future it may not be necessary to separate bio-degradable solid waste from the total solid waste, before starting anaerobic digestion to make bio gas and so on.

In the treatment of sewage water, biotechnological techniques can be used to introduce especially cultured aerobic, anerobic or facultative bacteria, which also happen to be inexpensive. These micro organisms along with their enzyme systems can effectively carry out bacterial reduction of organic matter in waste water of

sewages. Not only that, when anaerobic bacteria are used in sewage water treatment, biogas can be produced. So at one level, cleaning up hazardous waste in the environment is an application of environmental biotechnology. The same technology when applied to waste systems of other industries produces important byproducts. For example, in penicillin manufacture, the fungal biomass that remains after making penicillin can be converted to animal feed using advanced biotechnology techniques.

Biotechnology helps assist in environmental monitoring. For example there are products that can help detect harmful and toxic soil pollutants (portable biotech products are available, so contamination can be assessed onsite). Plant and bacteria are used to remove soil pollutants using a process called bioremediation. The process is to add nutrients to the soil to activate the bacteria already present or by adding newer bacteria to the soil. In both cases these bacteria consume and convert toxic materials to harmless compounds.

One of the practical applications of bioremediation is to use a combination of bacteria and plants to reconfigure any piece of land and make it free of toxic substances. For example, this technology can also help redevelop erstwhile industrial land into land that is suitable for human habitation, by removing contaminants in the soil and water. Bioremediation process not only handles soil impurities, but also impurities in the groundwater and surface water as well.

The environment in a farm is usually messy and requires constant physical labor in keeping the place clean and hygienic. But biotechnology products are now helping to keep the farm environment spick and span. For example, in livestock farms, biotechnology helps maintain farm environment by degrading livestock manure, and in eliminating foul smelling gases like hydrogen sulfide. Not just that, but with specific reference to where the livestock is kept, it helps keep a probiotic environment. These biotechnology products are usually a combination of potent waste digesting enzymes and selected strains of bacteria.

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