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A review Paper on Biotechnology and its Applications

Sunil Kumar,
Shri Krishan Chander Government Degree College Poonch,
Poonch, Jammu and Kashmir, India

Abstract – This paper aims to explore biotechnology in terms of its application. Large areas of applications identified in the literature are environment, medicine, agriculture, food processing and industry. It was noted that the areas and scope of application of biotechnology will increase with respect to scientific advances. It was concluded that as the use of biotechnology is expanded, research activities should focus on the risks and challenges identified, particularly in agricultural applications.

Keywords: Biotechnology application, environment, medicine, agriculture, food processing and industry.

I. Introduction

The alteration of natural leftover into useful bio sources is possible through biotechnological processes using microorganisms. The natural waste resources being processed are plants, agricultural waste and municipal waste. These plant-derived wastes include lignin, cellulose and hemicellulose. For example, the conversion of natural waste into nutritive biomass involves the conversion of cellulose into high-calorie foods or feeds using cellulolytic bacteria. Also, the conversion of waste into biological energy such as bio fuel involves the use of bacteria such as fungi. Natural bioremediation is the process of reducing or eliminating pollution in the environment through biotechnology in the form of biotreatment. According to Gavrilescu 2010, biotreatment / bioremediation methods are used to remove, degrade or detoxify natural resources such as water, soil, air, and waste. Bacteria such as yeast, fungi, protozoa, unicellular plants, rotifers and bacteria are used in the bioremediation process because most of them have the potential to reduce the most dangerous recalcitrant and chemical pollution in the environment. Environmental protection can be achieved through the use of natural biotechnology. For example, reductions in carbon dioxide such as the return of CO2 emitted from industrial gases or the CO2 conversion on site by bioprocess using cyanobacteria have been reported in literature (Hitoshi et. Al., 2010). The removal or reduction of CO2 from atmospheric or gaseous pollutants is necessary to prevent

global warming and this trend is being achieved through the use of biotechnology. In addition, emitted CO2 can be converted into perishable plastics as part of petroleum-based plastics monitoring the environment is possible through the use of sensors in biotechnology. Biosensors can be used to measure pollution levels and can detect pollutants such as heavy metals, herbicides, pesticides and organic compounds as described in Gavrilescu (2010).

II. Applications of Biotechnology in Medicine

Biotechnology is actively used in area of medicine

Biotechnology is effectively used in medicine: such as drug production and treatment, genetically modified organism, genetic analysis of genes, genetic mutation, etc.

Applications of Biotechnology in Agriculture

Biotechnology shows application in agriculture areas like crop growth, improved crop protection, improved food processing, nutritional development, better taste, etc.,

Applications of Biotechnology in Food Processing

In food processing like fermentation bioprocess, the use of food additives and processing equipments are used in food dispensation. Such products as enzymes, amino acids, vitamins, organic acids, certain carbohydrates and flavor agents are produced using genetically modified micro-organism

Application of Biotechnology in Industry

The bio process of plants and other products that can be used for food are applicable for industrial use. Bio processes include industrial fermentation, the use of cells or micro-organisms or enzymes to produce useful industrial products such as chemicals, feeds, detergents, paper, bio-plastics etc.

III. Conclusions

Biotechnology is effective in the case of its variety of applications. Studies reveal that it can applies in environment, medicine, agriculture, food processing and industry. Biotechnology further flourishes for the advancement of science and technology. It ispredicted that biotechnology research activities should focus on the risks and challenges identified, particularly in agricultural applications.

IV. References

1. Biotechonweb (2018): Application of Biotechnology. Available on-line athttp://www.biotechonweb.com/Applications-of-Biotech.html

2. Boyer, H. (2016): Biotechnology: Principles and Processes.National Council of Educational Research and Training, New Delhi. Available on-line @ncert.nic.in/ncerts/l/lebo111.pdf

3. Bull, A.T., Holt, G. and Lilly, M.D. (1982): Biotechnology: International Trends and Perspectives. Organization for Economic Co-operation and Development. Available on-line @ www.oecd.org/sti/biotech/2097562.pdf
FAO. (2010). Current Status and Options for Biotechnologies in food Processing and in Food safety in developing Countries. FAO International Conference, Guadalajara, Mexico. 349–351.

4. Gavrilescu M. (2010). Environmental Biotechnology: Achievement s, Opportunities and Challenges. Dynamic Biochemistry, Process Biotechnology and Molecular Biology 4(1), 1-36. Global Science Books.

5. Hitoshi, M., Hiroshi, O., Satoshi, T., Takuo, O., and Hideo, A. (2013): Polyhydroxyalkanoate (PHA) Production from Carbon Dioxide by Recombinant Cyanobacteria. In Environmental Biotechnology - New Approaches and Prospective Applications. In Tech, Crotia. Available on-line @ www.intechopen.com

6. Jasia N., Tehmeena, A., Fiza, N. and Rehana, S. (2017): Application of Biotechnology in Food Technology. International Journal of Engineering Technology Science and Research Vol 4(12), December, 2017. Available on-line @ www.ijetsr.com

7. Marian P. and Violetra P. (2013) Environmental Biotechnology for Bioconversion of Agricultural Forestry Wastes into Nutritive Biomass. In Environmental Biotechnology - New Approaches and Prospective Applications. In Tech, Crotia. Available on-line @ www.intechopen.com

8. Mohammad, Z., and Narasu, M.I. (2013) A reviewer article: Biotechnology Applications in Medicine. International Research Journal of Applied and Basic Science Explorer Publication. Available on-line @ www.irjabs.com

9. Sukumaran Nair MP (2006) Environmental biotechnology for sustainable chemical processing, wfeo 27. On line at: http://www.wfeo-cee.org/news/v27n10pg2.htm

10. Wieczorek A. (2013): Use of Biotechnology in Agriculture – Benefits and Risks. Biotechnology BIO-3. College of Tropical Agriculture and Human Resources (CTAHR), Hawaii. Available on-line @ www.ctahr.hawaii.edu
Wikipedia (2018): Biotechnology. Wikimedia Foundation, Inc. Available on-line at: https://en.wikipedia.org/wiki/Biotechnology.