

Biology research paper sample

[Environment](#), [Plants](#)



(Author)

Genetically Modified Organisms

Introduction

Genetically modified organisms (GMOs) are those organisms in which genetic material is changed with the help of genetic engineering and other advanced techniques in laboratory. In GMOs, genomes are precisely changed at the molecular level with the help of techniques such as recombinant genetic technologies. In these organisms, genes from unrelated organisms are added to produce required characteristics, which are not easy to produce through traditional ways of selective breeding. Scientists have successfully modified many organisms including bacteria, yeasts, insects, plants, and mammals. Plants are among those GMOs that have faced much controversy.

Importance of GMOs. GMOs are helpful in the production of genetically improved foods, and are also helpful in scientific research. They can also be used in the production of materials other than foods such as pharmaceutical products and biofuels. Crop plants, soil bacteria, and farm animals are among the most prominent examples that are produced by genetic engineering. However, genetically modified agricultural plants are the most commonly cited examples of GMOs. These plants are modified to produce more food at faster rate with more nutrition and quality at low cost. These plants are also modified to have resistance against pests and diseases. First GM foods were herbicide-resistant soybeans that were introduced to the market in the mid-1990s (World Health Organization, WHO. int). According to the reports, over 840 million people in the world are undernourished chronically. Over 1.3 billion people are living on less than one dollar per day.

Moreover, estimates are showing that the population of the world will increase by two times over the next 40 years in which more than 95% of people are estimated to be born in the developing countries of the world. In these situations, it has been estimated that at least 40% increase in food production could help, and GM plant technologies are considered among the best solutions to overcome these problems (Key, Ma, and Drake 291-292).

Main concerns of GMOs

Transfer of genes can result in some unknown outcomes as these transfers of genes can result in changes in different processes in the organisms such as changes of metabolism, growth rate, and/or response to factors from environment. These processes not only affect the organism but also the surrounding environment that can indirectly produce health related issues. Important concerns for humans. GM foods are produced from different organisms having different kinds of genes administered in different ways. Therefore, GM foods have a number of issues that are important to consider for human health. These issues may include allergic reaction to humans, gene transfer from foods to human body, and outcrossing of GM crops and traditional crops. GM foods have the potential to generate allergic reactions as a result of transfer of genes from allergenic organisms to some non-allergenic organisms unless the protein products from those genes are not allergenic. According to World Health Organization (WHO), currently there is no such GM food in the market that can generate allergic reaction in the body. GM foods have also the potential of transfer of genes from foods to cells of the body or to useful bacteria in the body. This transfer of genes could have harmful effects on the health as for example in the case of the

transfer of antibiotic resistance genes from GM foods to the human body. This problem can be decreased by reducing the use of gene transfer technology for transfer of antibiotic resistance genes. However, it has been reported that there are low chances of transfer of genes between GMOs and other organisms. Outcrossing refers to the transfer of genes from GM crops to traditional crops (Sterner, and Coria 489) that can affect the food safety that is why they can affect human health. Several reports are there in which GM crops approved for animals' use or industrial use were mixed into GM crops for human use. This problem can be reduced by clear distinction between different fields of various GM crops and conventional crops. Issues of mixing of GM plants with conventional plants can be resolved by using built-in identification factors as for example pigmentation that can help in easy checking and separation of GM plants. Some other factors such as separate growing seasons and geographic isolation can also be used. Considering all these things, it is important to know that a general statement on the safety of all GM foods obtained from different plants in different situations cannot be made and these crops have to be assessed individually for their safe use (World Health Organization, WHO. int).

Unintended effects of GMOs on nontarget species. One famous example of the affect of GM plants on other species is the case of Bt corn. Bt corn has the ability to produce toxic compound that acts as pesticide. Scientists enhance the expression of protein by corn plants that are helpful in reduction of the use of insecticide by farmers. In a study conducted in 1999, it was found that monarch larvae are largely affected by their natural food supply, i. e. milkweed that was covered in pollen from transgenic corn as

compared to monarch larvae that were given milkweed covered in pollens from regular corn. This finding resulted in a debate about the use of GM plants as it affected other non-targeted organisms. However, later studies showed that high concentration of pollen used in the study cannot occur in reality. Moreover, migratory patterns of monarchs do not occur during the time of pollination of corn. Further studies confirmed the safety of Bt corns, therefore the U. S. Environmental Protection Agency approved the use of Bt corn (Phillips nature. com).

Concluding remarks

GMOs are among the most debated things in scientific community and public. Studies both in favor of GMOs and against its use are present. This debate shows that GMOs need further investigations by the scientific community (Domingo, and Jordi 741). Many experts are of opinion that proper research in the field of GMOs can help in safe commercialization of GM plants. Many experimental variations are present to express and/or control engineered genes, and the knowledge of these variations can help in further development.

GMOs can be of great advantage to mankind in providing food and medical care, thereby removing hunger and disease in the world. They can also help in the development of cleaner environment. Their wise use can help in improvement of economy. However, further investigations are required to get optimal use of GMOs. Overall, it has to be considered that GMOs are among the most complicated biodiversity issues requiring the combined work of scholars from around the world, so that ongoing debate on the efficacy of GMO could be solved.

Works Cited

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