PLANT BIOASSAYS TO SCREEN GENOTOXIC EFFECTS OF ENVIRONMENTAL POLLUTANTS AND CLIMATE CHANGE

By Sema Tülay Hekimbaşı

Global climate changes may cause environmental stress on organisms and human being. Monitoring possible damage on DNA under environmental stresses such as UV radiation, high temperatures and acid pH caused by ongoing global climate change is a global concern nowadays. Potential phyto-cyto and genotoxicity of other environmental pollutants such as heavy metals, PAHs, Disinfection by-products (DBPs), pollutants of soil, air and wastewater, silver and titanium dioxide (TiO_2) nanoparticles have screened using animal, bacterial and plant model organisms up to date. In vitro and in vivo studies are both conducted for these observations. Higher plants have been frequently used in ecotoxicological and genotoxic assessment procedures. They are ideal indicators of cytotoxic and genotoxic effects of environmental chemicals. They are preferred for easy handling and have some advantages over other short-term tests that need longer procedures. Their cost-effectiveness, reliability and sensitivity make them ideal for screening and identifying DNA reactive environmental compounds. Mitotic index and some nuclear abnormality observations are used to evaluate the potential cytotoxicity. Micronucleus tests and chromosome aberrations are used to analyze the potential mutagenicity of pollutants. Germination rate and seedling growth length are applied to detect the potential phytotoxicity. Besides these, some molecular methods were developed to monitor mutagenicity at both the chromosomal and DNA level. The FISH method provides a detailed detection and analysis of possible chromosomal rearrangements. TUNEL test and Comet assay is used to estimate possible DNA fragmentations. Model plants mostly prefered to be used in bioassay systems are Allium cepa, Tradescantia,

Arabidopsis thaliana, Vicia faba, Hordeum vulgare, Zea mays and Brassica campestris.

PLANT BIOASSAYS TO SCREEN GENOTOXIC EFFECTS OF ENVIRONMENTAL POLLUTANTS AND CLIMATE CHANGE

ORIGINALITY REPORT

0%
SIMILARITY INDEX

PRIMARY SOURCES

EXCLUDE QUOTES ON

EXCLUDE BIBLIOGRAPHY ON

EXCLUDE MATCHES OFF