Abstract

The wing Somatic Mutation and Recombination Test (SMART) in Drosophila melanogaster has been used to analyse five different promutagens for genotoxicity using the standard cross and the high bioactivation cross. Benz(a)anthracene and N-nitrosodiphenylamine were weakly positive in the standard cross both after 48 h and 72 h chronic feeding. However, the dose-response relationship showed a plateau. Of the two naphthlamines, the carcinogen 2-naphthylamine was also weakly positive in the standard cross at the highest concentration tested. The carcinogen N-nitrosopyrrolidine was tested in the standard cross using both 48 h and 72 h chronic feeding as well as 6 h acute feeding. It proved to be highly mutagenic and recombinagenic with a clear-cut dose-response. The genotoxicity of this promutagen can be enhanced by a factor of two to four when the high bioactivation cross is used or when the larvae are pretreated for 24 h with phenobarbital. These results demonstrate the sensitivity and versatility of the Drosophila wing spot test for the evaluation of genotoxic activity of promutagens and procarcinogens.

Keywords

genotoxicity, somatic cells, metabolic activation, Drosophila, benz(a)anthracene, 1-naphthylamine, 2-naphthylamine, N-nitrosodiphenylamine, N-nitrosopyrrolidine, phenobarbital.