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Genotoxic Evaluation of Gryllus Bimaculatus in 3 Sets of Mutagenesis Test

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Cricket (Gryllus bimacutus) is mass-bred in 6 cycles per one year in insect farms. They are used as dry or live foods for animals, tropical fish, reptile and amphibians. Therefore, it is necessary to study the genotoxicity of whole bodies of G. bimaculatus. The aim of this present study was to evaluate the genotoxicity of the G. bimaculatus extract with three methods, Ames test, chromosome aberration test in Chinese hamster ovary cells in vitro and micronucleus (MN) test in vivo which involve the different test systems (bacteria, mammalian cells and mice nuclei).

Ames test was performed essentially according to the procedure described by Maron and Ames. In this salmonella typhimurium assay, G. bimaculatus did not show any mutagenic response in the absence or presence of S9 mix with TA98, TA100, TA1535, and TA1537. For chromosome aberration test, CHO (Chinese hamster ovary) Cultures were initiated by seeding approximately 1×10^4 cells per 24 well into 1 ml of medium. For both assays (initial and confirmatory) without metabolic activation, 1 day after culture initiation, the cells were incubated at approximately 37 °C with the test article, vehicle control (water and DMSO) and positive control (mitomycin C) at predetermined a concentrations for 24 h. For trials conducted with metabolic activation, S9 was added for the incubation 24h period and a benzo(a)pyrene was used positive control. In this test, G. bimaculatus did not show any significant effect on Chinese Hamster Ovary (CHO) cells compared with control.

In mouse micronucleus test, no significant increase in occurrence of micronucleated polychromatic erythrocytes was observed in ICR male mice intraperitonealy administered with G. bimaculatus at a dose of 15, 30, 150, 300 and 1500 mg/kg.

These results indicate that G. bimaculatus has no mutagenic potential in these in vitro and in vivo systems.

Keyword : Gryllus bimacutus, genotoxicity test