

# GENOTOXIC EFFECT ASSESSMENT AFTER 24 HOURS OF EXPOSURE TO NICOTINE AND TOBACCO-SPECIFIC NITROSAMINES FOUND IN CURED TOBACCO LEAVES

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**INTRODUCTION:** Tobacco farming is one of the most economically significant agricultural activities in Brazil. However, it is associated with occupational exposure to toxic compounds present in the tobacco plant, such as nicotine and tobacco-specific nitrosamines (TSNAs), especially NNK and NNN, which are known for their genotoxic potential. Exposure to these substances may lead to DNA damage, particularly in workers from this sector, highlighting the need for experimental studies that investigate such effects. **OBJECTIVE:** To evaluate DNA damage in peripheral blood cells of mice exposed to nicotine, NNK, NNN, and cured tobacco leaf extract, both individually and in combination, 24 hours after substance administration. **MATERIAL AND METHODS:** Swiss mice were used and distributed into eight experimental groups: G1: control; G2: nicotine 2.64 mg/kg; G3: NNK 0.39 µg/kg; G4: NNN 0.42 µg/kg; G5, G6, and G7: tobacco leaf extract at doses of 100, 200, and 400 mg/kg, respectively; and G8: combination of nicotine (2.64 mg/kg), NNK (0.39 µg/kg), and NNN (0.42 µg/kg). Substances were administered via oral gavage. After 24 hours, the animals were euthanized by decapitation, and peripheral blood was collected directly from the body for the comet assay to evaluate DNA damage. The variable analyzed was Tail Intensity, expressed as a percentage. Data were statistically analyzed using one-way ANOVA followed by Tukey's post hoc test, with a significance level set at  $p < 0.05$ . **RESULTS AND CONCLUSION:** Results showed a statistically significant increase in Tail Intensity in groups treated with NNK and NNN individually, all three doses of tobacco leaf extract, and the combination of nicotine, NNK, and NNN, when compared to the control group. Groups treated with the highest doses of tobacco leaf extract (200 mg/kg and 400 mg/kg) and the combination of NNK, NNN, and nicotine presented a markedly higher Tail Intensity than the group treated with nicotine alone. These findings emphasize the genotoxic effects of nitrosamines and the need for greater attention to occupational exposure in tobacco farming, given the severity of the associated health risks.