

## DNA PROTECTIVE EFFECT OF ANTIOXIDANT APPLE EXTRACT

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### **Abstract:**

The main destination to the Apple (*Malus domestica*) Brazilian production is the fresh market; however new alternatives are being sought since the fresh consumption has not been increased in the last few decades. The alternatives to develop new apple products pass through the food, pharmaceutical and cosmetic industries. Apples have a series of bioactive compounds, also called phytochemicals, which can prevent chronic non-communicable diseases. The objective of this research is to increase the knowledge about an antioxidant apple extract produced with Brazilian apples, regarding to its cytotoxic, genotoxic and DNA protection capacity. Three experiments were conducted using Human fibroblasts (Clonetics, Cambrex/Lonza, USA) grown in a humid chamber at 37°C with 5% CO<sub>2</sub>, using specific culture medium. To determine the *in vitro* cytotoxic potential of the apple extract, the MTT (3-(4,5 dimethyl thiazole-2-yl)-2,5 diphenyl tetrazolium bromide) technique was used. The genotoxic effect was assessed by the comet assay. The evaluation of the protective activity exerted by the apple extract on the DNA was assessed using the crystal violet technique. According to the results, the apple extract is safe for use in cell cultures in the concentration range from 0.003 to 0.0002% (w/v). Cell cultures treated with apple extract had a reduction on the comet formation when compared to the control group. The apple extract has no capacity to cause DNA damage, since it maintained the integrity of the human fibroblasts genetic material and, it is therefore considered non-genotoxic. The apple extract has the potential to exert a protective effect against stimuli that cause damage to cellular DNA. Using apple extract in a concentration of 0.0015% increases DNA protection about 27% compared to control. In conclusion, the results show that the apple extract has significant DNA protective activity, since it maintained the integrity of the genetic material of human fibroblasts.