

Radioprotective Effect of the Extract from *Cichorium intybus* in B16 cells

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Cichorium intybus is a perennial herb of the Compositae Family, native of Europe, west and central Asia, north of Africa and South America. The plant grows to a height of about 50-150 cm. The flowering time of it is from July to September. The flower is lingulate and blue. The basal leaves and the stems of the *C. intybus*, when they are very tender, are edible. The root, dry and toasted, can be used as a substitute of coffee. Its tuberous roots store inulin as a reserve carbohydrate, which consists of a chain of fructose molecules with a terminal glucose molecule. It may be classified as a fructoligosaccharide, and can be found in more than 30,000 vegetal products. Amongst these vegetables, the chicory roots are outlined for the production of inulin on an industrial scale due to the root's stability in the production of long chains of GF_n and constant growth, even in moderate climates. From then on, inulin was used as an ingredient in foods with reduced or no sugar and fat, such as chocolates, ice creams and yoghurts, among others. Its use in products with low calories and reduced fat levels, in Europe, the United States and Canada, is already quite widespread. The present experiment was carried out to indicate that *C. intybus* contains both prooxidant and antioxidant compounds which can act in either chemical or biological systems. Ionizing radiation is a well-established carcinogen due to the resulting oxidative damage, and the molecule most often reported to be damaged by this physical agent is DNA. About 60-70% of cellular DNA damage produced by ionizing radiation is caused by OH, formed from the radiolysis of water. Oxidative stress occurs when there is an excessive free radical production and/or low antioxidant defense, and results in the chemical alterations of biomolecules causing structural and functional modifications.

In the *in vitro* comet assays for the genotoxicity in the B16 melanoma cells, the control group showed that more DNA breakage occurred in the irradiation group than in the extract-treated group. The tail extent moment and olive tail moment of the irradiation control group and ascorbic acid-treated group were 20.49±0.006, 9.09±0.12, 20.87±0.00 and 9.31±0.233, respectively. In the case of irradiation group

pretreated with the extract from C. intybus, the tail extent moment and olive tail moment were 9.15 ± 1.410 and 4.40 ± 0.547 , respectively. The group pretreated with the extract from C. intybus exhibited lower damage than the irradiation control and vit C pretreated groups. These results have revealed that the extracts of C. intybus have an excellent ability to reduce radicals and thus can act as radioprotector.