



MISTLETOE FRUIT EXTRACT AS DEATH INDUCTOR IN BREAST CANCER CELL CULTURES

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Key words: mistletoe, cancer, partial characterization.

Introduction. Mistletoe is a tree parasitic plant, so its impact is rather negative causing great tree mortality and economic losses in all the country. *Cladocolea loniceroides* seed, a Mexican endemic mistletoe, has not been studied up to now and it represents a serious pest in Mexico City.

The use of plants as complementary treatment in some diseases is increasing. Mistletoe *Viscum album* species is used in European clinics to treat cancer because of its capability of apoptosis inductor in some kind of cancers (1).

Previously, the authors found that aqueous fruit extract of *C. loniceroides* shows antioxidant activity and cell death induction in cancer cultures. The aim of this research was to characterize partially the extract composition and identify if this extract causes cell death in various breast cancer cultures.

Methods. Proteins were extracted according to its solubility (2). Then, a qualitative phytochemistry analysis was carried out to determine presence of some compounds. Condensed tannins and alkaloids were quantified (3).

ZR75-1, MCF7 and MDA-MB-231 cell lines culture were performed. Doses-response curves were built for each cell line using different concentrations of fruit aqueous extract (gallic acid equivalents).

Results. Total protein concentration extracted was 7.17mg/g, albumins were the main fraction (5.9 ± 0.2 mg/g), followed by prolamins (1.4±0.03 mg/g), glutelins were not found. Among the phytochemicals analysed, phenolic hydroxides, leucoantocianidins, tannins, flavonoids and alkaloids were found in the aqueous extract.

Concentration of condensed tannins was 20.2±1.3 mg eq. catequina/g in liophilized aqueous extract whereas alkaloids concentration was 69.3±0.9 mg/g in the same extract.

Viscum album specie shows biological activity because of the presence of proteins such as lectins (mistletoe lectin I, II y III) and viscotoxins (4). However, *C. loniceroides*, shows a low protein concentration extracted by solubility method proposed by Padhye and Salunke (2). Cytotoxic effect of fruit aqueous extract may be possible because of the presence of phytochemicals like polyphenols, flavonoids, tannins and alkaloids.

Table 1 shows 50% lethal doses for the three cell lines studied until now. MDA-MB-231 is significantly more sensitive ($p < 0.05$) ($LD_{50} = 72.8 \mu\text{g eq. gallic acid / mL}$), than the other cell lines. This cell line corresponds to a metastatic culture and is, roughly, 50% more sensitive than MCF7.

Table 1. 50% lethal concentration comparison among different breast cancer cell lines.

| Cell line | Breast cancer tissue | LD ₅₀ (μg eq. gallic acid/mL) |
|------------|----------------------|--|
| ZR75-1 | Ductal carcinoma | 91 |
| MCF7 | Adenocarcinoma | 177 |
| MDA-MB-231 | Adenocarcinoma | 72.8 |

Conclusions. *C. loniceroides* aqueous fruit extract induces cell death in breast cancer cultures. The metastatic culture is the most sensitive and this effect may be ascribed to the presence of some phytochemicals in the plant.

Acknowledgements. To Nanotechnology Laboratory from Universidad Autonoma Metropolitana, Iztapalapa for the support during cell culture.

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