

The antitumour mechanism of an Amazonian plant in human cancer cells is deciphered

September 28 2018



The plant *Vismia baccifera* produces a toxic response in tumour cells. Credit: Daniel A. Monsalve Ortiz

Research conducted by the Free Radicals and Oxidative Stress Group at the UPV/EHU's Faculty of Medicine and Nursing has deciphered the antitumour mechanism exerted by the plant *Vismia baccifera*, originally from the Amazonian region of Colombia, in human liver cancer cells. The journal *Heliyon* has published the results of the study in which the plant was found to induce oxidative stress in cells, which eventually leads to cell death.

Products derived from plants are receiving increasing attention from the scientific community owing to their anti-oxidant, anti-inflammatory and antitumour activity. "Right now, there is huge interest in identifying compounds derived from [plants](#) that could be used as chemotherapeutic agents with the capacity to prevent tumours from growing, or to treat metastasis, for example," explained Dr. Jenifer Trepiana, one of the authors of the study.

For its research, the group chose the plant *Vismia baccifera* from the Amazonian region of Colombia. "Indigenous populations use it for its anti-inflammatory properties or for urinary tract disorders or skin diseases, but we chose it because in previous studies, we had seen that it is the one with the greatest antitumour capability in [liver cancer cells](#) that we have used," said the researcher.

The study was conducted in vitro using a model of human liver tumour cells treated with an aqueous extract of *Vismia baccifera* leaves prepared as an infusion, just as it is used in traditional indigenous medicine. Healthy human hepatic cells were also treated with this same extract "to see whether or not healthy cells are also affected," said Dr. Trepiana.

Toxicity for tumour cells but not for healthy ones

The researchers confirmed that the extract of *Vismia baccifera* produces a toxic response in tumour cells. It produces an increase in [free radicals](#)

and hydrogen peroxide, causing the death of the [tumour](#) cells. Among the effects caused by the increase in hydrogen peroxide, "the blocking of the cell cycle (in which the cells stop dividing), damage to genetic material, and the activation of a [cell death](#) process known as apoptosis were observed," specified the researcher.

When comparing the cytotoxic action of *Vismia baccifera* in [tumour cells](#) and healthy cells, they saw that "only the cancer cells were affected. We found that these effects do not take place in healthy human liver cells and, previously, in rat cells," she said. "This is of huge interest, because the most important thing is that [healthy cells](#) should remain unaffected."

The researcher regards these results as "tremendously positive. The ideal thing would be to take the research further and move toward in vivo studies using animal models, to go on passing milestones until it can be used as a therapy against cancer. Although we are well aware that it will be a very long road," she concluded.

More information: Jenifer Trepiana et al. Unraveling the in vitro antitumor activity of *Vismia baccifera* against HepG2: role of hydrogen peroxide, *Heliyon* (2018). [DOI: 10.1016/j.heliyon.2018.e00675](https://doi.org/10.1016/j.heliyon.2018.e00675)

Provided by University of the Basque Country

Citation: The antitumour mechanism of an Amazonian plant in human cancer cells is deciphered (2018, September 28) retrieved 1 May 2024 from <https://medicalxpress.com/news/2018-09-antitumour-mechanism-amazonian-human-cancer.html>

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