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Secondary metabolites of methanolic extracts from chilca (*Baccharis glutinosa*) roots against phytopathogenic fungi

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Baccharis glutinosa has been used in Mexico in anti-fungal activity on maize phytopathogenic fungi; the aerial parts have been tested producing a fungistatic effect against *Aspergillus flavus*, *A. parasiticus* and a fungicidal effect on *F. verticillioides*. Also, it suggest that the antifungal fractions act producing a defective cell wall, the fractions act as competitive inhibitor of the enzyme β-1,3 glucanase. In this study, we investigated the inhibitory effect of methanol extract obtained by the crude extract of roots, on two major fungal pathogens of agricultural impact. The antifungal activity was evaluated by minimum inhibitory concentration and minimum fungicidal concentration methods against *Aspergillus ochraceus* Wilhelm and *Fusarium moniliforme* J. Shield, using different concentrations of methanolic extract: 0.09, 0.16, 0.26, 0.43, 0.73, 1.21, 2, 3.4, 5.6, 8, 10, 12 and more that 15 mg.mL-1. Ketoconazole (1 mg.mL-1) was used as control. The treatments were applied in triplicate. These results demonstrate that the use of methanolic extracts chilca have an effect on the sporulation inhibition of *Aspergillus ochraceus* Wilhelm and *Fusarium moniliforme* J. Shield with increasing concentrations of study. The methanolic extracts had inhibitory effect on the fungal *Aspergillus ochraceus* Wilhelm and *Fusarium moniliforme* J. Shield. Preliminary studies in GC-MS analysis of methanolic extracts of chilca revealed the presence of furfural compounds and organic acids. To our knowledge, this is the first study reporting of phytochemical composition and biological activity of *Baccharis glutinosa* roots that could be used as natural alternative to biological control of pathogenic fungi.

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Natural nanostructures (lipoproteids of blood plasma) play an important role in the development of pathological states

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Low density lipoproteins (LDL) of blood plasma are natural lipid-transporting nanoparticles. LDL peroxidation leads to the accumulation of primary (hydroperoxides) and secondary (dicarbonyls) products. This is accompanied by a modification of the LDL particles structure, as a result of which they acquire the ability to be captured by scavenger receptors of cells and induce of atherogenic damage in vessel wall during cardiovascular diseases and in diabetes. It has been shown that the co-oxidation of LDL lipids and glucose causes intensification of free radical processes and the glucose oxidation product-methylglyoxal produces a superoxide radical anion in the process of interaction with amine compounds. It was established that in patients with diabetes mellitus, the oxidation of LDL is significantly higher than in patients with atherosclerosis. Nevertheless, the particle of high atherogenic lipoproteins subject to free radical oxidation to a much lesser degree than LDL particles but becomes susceptible to oxidation after modification with low molecular weight dicarbonyls. LDL modified with glyoxal and methylglyoxal are quite slowly eliminated from the blood flow of primates (rhesus monkey), whereas malonyldialdehyde-modified LDL disappears from the bloodstream very quickly.

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