Evaluation of antifungal capacity of essential oils from *Baccharis dracunlifolia* and *Lippia sidoides* on *Aspergillus flavus* growth and production of aflatoxin B1 and B2

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The objective of this research was to evaluate the antifungal capacity of essential oils from leaves of *Baccharis dracunculifolia*, *Lippia sidoides* and their blend (50%). The growth of *Aspergillus flavus* (CCT 7638) fungus and its production of aflatoxin B1 and B2 were evaluated when different concentrations of essential oils or their blend were present. The *in vitro* evaluation was carried out on microplates (1) with visual determination of Minimal Inhibitory Concentration (MIC), and also by measurement of fungal radial growth (2). Five different concentrations were checked: 31.25, 62.5, 125.0, 250.0 and 500.0 ppm. The aflatoxin B1 and B2 production was evaluated by High Performance Liquid Chromatography (HPLC) only in the treatment that showed the best efficiency in reducing fungal growth. Also, the *in vivo* trial was evaluated only with the best oil observed during the *in vitro* evaluation. *In vivo* trials were carried out using maize with and without sterilization (both with *A. flavus* inoculums) as substrate for fungal growth in independent trials. Two doses of essential oil were evaluated in the *in vivo* trial, 500 and 800 ppm, and as control there were two treatments; one of them was sprayed pure acetone (as acetone was used as solvent for essential oil spraying), and the other was sprayed nothing. The treated maize grains (50 g) from same treatment were poured in 12 beckers of 100 mL capacity and, they were put into a plastic box where the atmosphere was in equilibrium at 89% of relative humid. The plastic boxes were stored at 28 ± 2 ^{o}C without light exposure during 15 days. After that the boxes were opened and 6 beckers were used for mould count and other 6 for aflatoxin measurement. In the *in vitro* trial the *L. sidoides* oil showed the best results for both methodologies with an observed MIC of 200 and 500 ppm, respectively for microplate and radial growth methodology. For *B. dracunculifolia* and the oil blend was not possible to observe the MIC among tested concentrations. Aflatoxin production follows an indirect dose dependent relationship with essential oil concentrations evaluated. In the *in vivo* trial was observed a decrease of mould count for both concentrations checked when was used sterilized maize but, when not sterilized maize was used only the highest dose (800 ppm) was able to decrease it. The aflatoxin B1 production was decreased as the oil dose was increased when maize sterilized was checked but, aflatoxin B2 production was higher in 800 ppm than in 500 ppm dose. When not sterilized maize was used none dose was able to decrease aflatoxins production and they may has stimulated it.

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