

Potential effect of the volatile oil from pennyroyal (*Mentha pulegium* L.) collected in different seasons on angiogenesis and embryotoxicity.

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Mentha pulegium L. (Lamiaceae), known as “pennyroyal” or “poejo” has a variety of traditional medicinal uses in Brazil, being applied in pain, fever, colic, diarrhea, cough and cold conditions. It has been also used as food additive. Therefore, the Brazilian Health Regulatory Agency (ANVISA) has included it in the RENISUS list (1), as a plant of interest to be better studied. Besides that, adverse effects have motivated toxicity (2) approaches that indicate some terpene constituents as responsible for them. Concerning its volatile oil, different biological activities such as: antioxidant, antiprotozoal, antimicrobial and insecticidal/pesticidal (3,4) were confirmed, but little is still known about its toxicity. This work aimed to analyze the effects of the oil from plant collected in four annual seasons over the angiogenesis (5) and the embryotoxicity (6) in *Gallus domesticus* eggs. The plants were collected in an agronomic culture field in São Paulo, SP, during the four seasons. The aerial parts were extracted by hydrodistillation using the Clevenger-type apparatus for 2 hours and after the GC/MS analyses carried out by a Shimadzu® QP5050A system, its seasonal composition was evaluated comparatively. Two dozen embryonated eggs were inoculated, in triplicate, with the volatile oil (VO) and the pulegone (p) (one of its terpenes) diluted in albumin. The volatile oil dilutions from the four seasons were injected (100 µL/egg) at: 3.6 mg/mL (winter), 3.4 mg/mL (spring), 3 mg/mL (summer) and 3.1 mg/mL (autumn), while those of pulegone were at: 16.7 mg/mL, 1.67 mg/mL and 0.17 mg/mL. Only the albumin was injected in the control eggs. The results were recorded after 6 days of incubation, at 37°C and with 55 % of humidity. Pulegone (p) (16.7 mg/mL) inhibited completely the embryo development, (p) 1.67 mg/mL inhibited partially their development, and (p) 0.17 mg/mL showed a slight delay in development compared to that of the controls. Comparatively, (VO) induced homogeneous effects but less intense when analyzing those of (p) 0.17 mg/mL. The embryos that remained viable and continued to develop after 6 days of exposition to (p), have formed the chorioallantoic membrane and presented a hypovascular vitelline sac, showing an effect on the embryogenesis. Therefore, in the eggs treated with (VO), anti-angiogenic and embryotoxic effects occurred at the tested concentrations, and showed a little variation related to seasonality. Many embryos did not develop the chorioallantoic membrane or showed an early interruption of development. These effects were in accordance with those observed in (p). However, the effects of (VO) and (p) should be evaluated in lower concentrations and with different exposure times. The preliminary results confirmed the oil toxicity, stimulating further investigation.

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