Influence of seasonality in chemical composition of the essential oil of *Copaifera duckei* and evaluation of toxicity against *Arthemia salina*

Inaê F. Pinto[1], Daiane S. Rodrigues[1], Dárlison F. C. de Andrade[2], Elaine C. P. de Oliveira[1]

[1] Universidade Federal do Oeste do Pará - Pará, Brazil
[2] Instituto Chico Mendes de Conservação da Biodiversidade (ICMBio) – Pará, Brazil
inaeferreira.siq@gmail.com

Keywords: *Copaifera duckei*, essential oil, seasonality

Copaifera duckei, known popularly as “copaiba”, produces “copaiba” oil or balm. This oil have been used since colonial period being used in folk medicine. Essential oil (EO) of copaíba showed anti-inflammatory, healing and antiseptic action potential. Studies related to chemical composition of essential oil to establish a standard of quality are important for commercialization. It is probable that a cause of this variation is seasonality. However, the few data releases of seasonal influence to *C. duckei* led to this study. A method used to evaluate the toxicity of compounds is through bioassay with *Arthemia salina* (1).This study proposed to evaluate the influence of seasonality on chemical composition and evaluation of toxicity in EO of *C. duckei* against *A. salina*. The oilresin was collected in the Tapajós National Forest for two periods (summer and winter), and then 40 mL of oil resin was subjected to hydrodistillation in apparatus distillation column for 6 hours obtaining a volatile fraction. The volatile fraction was analysed by gas chromatography coupled to mass spectrometry (GC-MS) to identify the variation in the percentage of chemical compounds. The volatiles fractions of *C. duckei* presented the major constituents: β-bisabolene (summer period 34.29%; winter period 28.17%), β-caryophyllene (summer period 23.49%; winter period 15.92%), β-selinene (summer period 7.15%; winter period 11.39%) and α-humulene (summer period 1.03%; winter period 1.28%), respectively. The cysts of *A. salina* were placed in artificial saline for 24 hours under lighting. After ten larvae were transferred to test tubes containing saline solution and samples of EO in concentrations: 1, 10, 100 and 1000 $\mu L.mL^{-1}$. The bioassay was performed in triplicate. The count of the larvae was performed after 24 hours. The mortality rate was determined by dividing the number of larvae killed by total number of individuals and multiplying the result by 100. The degree of toxicity was classified according to mortality: 0-9% = not toxic (NT); 10-49% = slightly toxic (ST); 50-89% = toxic (T); 90-100% = highly toxic (HT). At concentrations of 10, 100 and 1000 $\mu L.mL^{-1}$ OE in summer period the mortality rate was 100% (AT), with the exception of 1 $\mu l.ml^{-1}$, which showed a mortality rate of 13.3%. OE in winter period, only concentrations of 1000 and 100 $\mu l.mL^{-1}$ presented 100% mortality rate, the concentration of 10 $\mu L.mL^{-1}$ presented in the rate of 53.3% larvae dead and 1 $\mu L.mL^{-1}$ concentration only 23.3% in the mortality rate. According to the methodology of Harwig and Scott (2), the EO of *C. duckei* presents toxic, with the highest mortality rate in the dry period, where the concentration of compounds is larger than in the rainy season. Preliminary results with *A. salina* demonstrate that EO of *C. duckei* presents toxicity, suggesting sequential studies.

1. Meyer, B.N. et al. Journal of Medical Plant Research, 1982, **45**, 31-34.
2. Harwig J., Scott P. Appl Environ Microbiol, 1971. **21**,1011-1016.

Acknowledgements: UFOPA, Laboratório de Pesquisa e Desenvolvimento de Produtos Naturais Bioativos (PDBio), FAPESPA, ICMBIO, CoomFlona.

ISBN: 978-85-66836-11-0