6TH BCNP
Brazilian Conference
On Natural Products
XXXII RESEM

Federal University of Espirito Santo
Vitória – ES/Brazil
November 05-08/2017

Chemical Composition and Anti-Inflammatory Activity of the Essential Oil from the Leaves of Male and Female Specimens of *Baccharis punctulata* DC.

de Oliveira, M.S. [1], Ascari, J.[1], Nunes, D.S.[2], Granato, D.[2], Scharf, D.R[3], Simionatto, E.L[3], Heiden, G.[4] Soley, B.S.[5], Otuki, M.F.[5]

[1]Universidade Tecnológica Federal do Paraná, Campus Santa Helena, UTFPR, PR, Brasil; [2]Universidade Estadual de Ponta Grossa, UEPG, PR, Brasil; [3]Universidade Regional de Blumenau, FURB, SC, Brasil; [4] Embrapa Clima Temperado, RS, Brasil; [5]Universidade Federal do Paraná, UFPR, PR, Brasil;
murilo_tinelli@hotmail.com

Species of the genus *Baccharis* are used in traditional medicine in the control and treatment of various diseases, in addition to their economic and environmental importance. Increasingly, studies on its chemical composition and biological activities confirm the uses in traditional medicine associated with the pharmacological actions of species of this genus, especially as anti-inflammatories and agents of gastric protection[1]. *Baccharis punctulata* DC. is a species that occurs spontaneously, with distribution in the southern and southeastern regions of Brazil. Although there is no use in traditional Brazilian medicine, the leaves are used by the rural communities of the Province of Bustillo in Bolivia for the treatment of asthma, dislocations and contusions[2]. The objective of this work was to analyze the chemical composition and the anti-inflammatory activity of the essential oils of the leaves, using a model of skin inflammation in mice. Male (BPM) and female (BPF) specimens of *B. punctulata* were collected in the western part of the state of Paraná. The essential oils were obtained by hydrodistillation in a modified Clevenger apparatus for 3 h. The yield of BPF samples was 1.62% (w/w) and BPM 0.87% (w/w). The chemical analysis was performed by GC-MS-FID and showed the occurrence of sesquiterpenes found in greater proportion in BPM, being: δ-elemene (14.29%), germacrene D (11.29%) and bicyclogermacrene (10.90%) and in BPF, bicyclogermacrene (42.44%), germacrene D (21.18%) and β-caryophyllene (14.06%). The most commonly used *in vivo* animal model to study the cutaneous inflammatory process is the induction of edema in the ear of mice[3]. Topical application of phorbol esters, such as TPA, induces inflammation and hyperproliferative responses in animals. The treatments with BPM and BPF, as well as dexamethasone (DEXA, positive control), were performed topically shortly after the application of the phlogistic agent. The activity of the myeloperoxidase (MPO) enzyme used as an indication of the presence of polymorphonuclear leukocytes in the inflamed tissue was also evaluated for the aforementioned samples, as well as the histological analysis. Topical administration of the essential oils BPM and BPF was able to reduce the formation of the edema induced by TPA in the treated groups. These inhibitions were equal to 25.37 ± 5.32% (0.1 mg/ear), 43.13 ± 13.87% (0.3 mg/ear) and 43.13 ± 14.86% (1 mg/ear), when we consider BPF sample. The BPM was able to revert the formation of ear edema in 37.09 ± 18.25% (0.1 mg/ear), 30.97 ± 16.75% (0.3 mg/ear) and 47.68 ± 12.74% (1 mg/ear). While DEXA promoted inhibition equal to 84.86 ± 15.22% (0.1 mg/ear). The administration of TPA promoted an increase in MPO activity, as well as the inhibition of the increase in MPO activity when the animals were treated with GMP at concentrations of 0.1 mg (13.69 ± 0.20%), 0.3 mg (22.35 ± 0.11%) and 1 mg / ear (44.98 ± 0.27%). Topical treatment with BPM was able to inhibit the MPO enzyme activity at 22.40 ± 0.29% (0.1 mg/ear), 36.49 ± 0.07% (0.3 mg/ear) and 52.19 ± 0.28%. The DEXA (0.1 mg/ear) was able to reverse the increase of the enzymatic activity of MPO in 65.16 ± 0.003%. Histological analysis corroborated with the results expressed above. Based on the results of the chemical analysis it is observed that there is statistical difference ($p<0.05$) between the BPM and BPF essential oils. The essential oil samples showed promising anti-inflammatory activity in the model tested.

1 Campos, F. R. et al., Chem Biodivers. 2016, 13, 1.
2 Fernandez, E.C.; Sandi, Y.E.; Kokoska, L. Fitoterapia. 2003, 74, 407.
3 Gabor, M., 2003. Methods in Molecular Biology. 2003, 225, 129-137.