Clinical and histological evaluation of a herbal product (GAHV) used as repair and analgesic in a murine model.

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Abstract

In Mexico there are more than 300 records of medications that contain the active substance called paracetamol and 68% of the Mexican population that self-medicates, does so with NSAID´s. Theoretically, eliminating the use of NSAID´s from the patient treatment should reduce the discomfort, but other medications are regularly needed to accelerate the healing process. The use of histamine-2 antagonists, proton pump inhibitors and others that allow the generation of a protective barrier for the tissue is used. As 80% of the population admits having presented symptoms such as inflammation and abdominal distension, gastric acidity, bad breath and in some cases reflux at some point of their lives. These symptoms may be indicative of diseases such as gallstones, celiac disease, Chron disease or erosion of the digestive tract that can lead to ulceration and subsequent bleeding. The use of drugs based on inhibitors of the proton pump can lead to the complication of these cases, so we propose the use of an GAHV herbal product whose obtaining is fast, easy and economical . The purpose of this study was to evaluate the effect of an herbal product in erosion's of the upper digestive tract in a murine model.

Methodology: The extraction of secondary metabolites from the plant species was carried out by maceration in methanol [0.1g/L] FTIR, optical absorption analysis and HPLC screening were carried out in order to characterize the extract. Phytochemical analysis of the ethanolic extract was carried out according to the protocol designed by Dominguez, 1973.

The effect of the extract was evaluated in 30 male rats of the Wistar strain weighing between 250-290 g from the Bioterio of the Medicine Faculty, UNAM. The rats were divided in four groups (6 each/group) as follow: Control group, GAHV Treatment, Eroding agent+GAHV, and GAHV. The oral administration of the eroding agent lasted 14 days at a concentration of 0.2mg/mL/rat/day. After, the plant extract re suspended in physiological solution (0.9% w/v) at a concentration of 100g/L was administered. Subjects were sacrificed, blood was recovered for blood count and blood chemistry analysis. The dissection of esophagus, stomach and small intestine was executed for histological analysis with HE technique. Behavioral tests, such as the open field test and forced swimming, were carried out in all the groups to assess the effect that the herbal extract has on the system.

Results

The FTIR analysis showed the presence of specific functional groups: (1) 1000 - 1200 cm^{-1} (C-O–C of glycoside structures); (2) 1600-1730 cm^{-1} (C=O carbonyl); (3) 2850 - 2930 cm^{-1} (–CH3, -CH2-, =CH-); (4) 338-3920 cm^{-1} (OH free alcohol type).

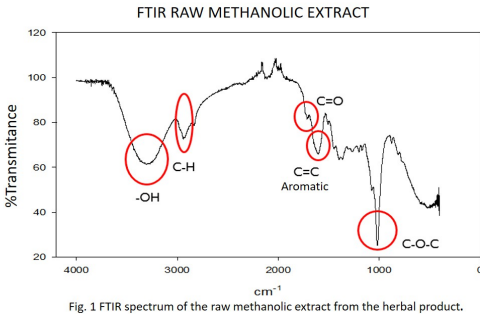


Fig. 1 FTIR spectrum of the raw methanolic extract from the herbal product.

The phytochemical screening revealed the presence of the following groups of molecules: catechins, sesquiterpenlactones, naphthaquinones and anthraquinones.

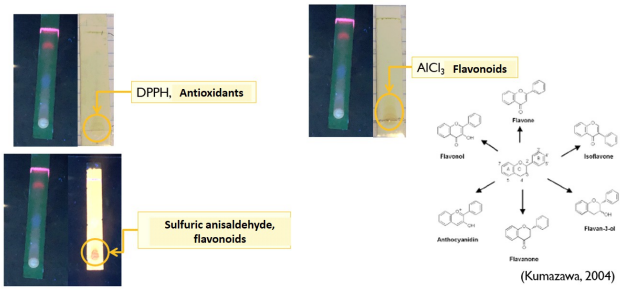


Fig. 3 Characterization of herbal extract by TLC.

The administration of the erosive agent caused the destruction of the gastric mucosa allowing the release of red blood cells to the lumen of the organs studied, promoting the migration of leukocytes to the área. Homeostasis was lost in the body since there were high levels of platelets, leukocytes and enzymes that allow liver function (alkaline phosphatase, GGT, GOT / AST, GPT / ALT), renal (Creatinine) and cardiac (creatine phosphokinase) ; when compared with the values obtained in the subjects of the control group.

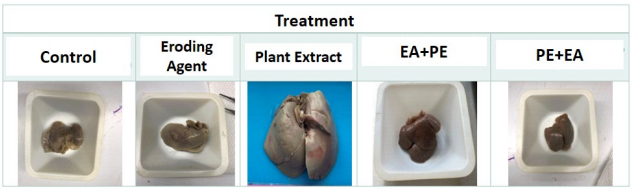


Fig. 4 Macroscopic effect of the different treatments on the liver.

The GAHV increases significantly the platelet levels in blood, improving the coagulation process. When administering the GAHV, the gastric mucosa morphology, esophagus, mucous membrane of stomach and intestinal villi showed normal morphology characteristics after treatment GAHV

The use of GAHV as a repair agent against damage previous was evident and we can said that fulfilled the expectations since, despite having been administered the erosive agent for 14 days at a dose of 0.2 mg / mL / rat / day, the histological analysis showed the preservation of the normal morphology of the tissue.

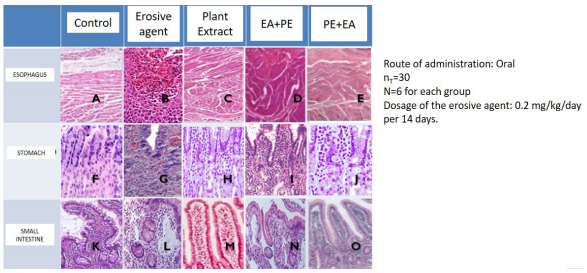


Fig. 2 Micrography of sagittal cuts of the esophagus, stomach and small intestine dyed with eosine-hematoxyline. 10X

Behavioral tests showed that the administration of the erosive agent caused anxiety in the subjects and those treated with the GAHV tended to a calm probably by less pain.

Recent publications.

1. Bernhoft, A. **(2010)**. *Bioactive compounds in plants- benefits and risks for man and animals*. ISBN 978-82-7099-583-7.
2. Munnangi, S. Sonnenberg, A. **(2015)**. *Time trends of physician visits and treatment patterns of Peptic Ulcer Disease in the United States*. Arch Intern Med. 2015; 157:1489-1494.
3. Gustafson, J. Wellin, D. **(2010)**. *"No acid, no ulcer"- 100 years later: A review of the history of Peptic Ulcer Disease*. doi:10.1016/j.jamcollsurg.2009.08.014
4. Möller, R., Vazquez, N. **(2011)**. *Anatomy of the Liver in Wistar Rat (Rattus norvegicus)*. Int. J. Morphol. vol.29 no.1 Temuco mar. 2011 http://dx.doi.org/10.4067/S0717-95022011000100012
5. Taraj, K., Ciko, L., Malollari, I. **(2018)**. *Eco-extraction of essential oil from Albanian Hypericum perforatum L. and characterization by spectroscopy techniques*. Journal of environmental protection and ecology 20(1):188-

Biography



Verónica E. Gallegos-Hernández is a biotechnological engineer from the Instituto Politécnico Nacional who has worked in the remediation of soils contaminated with fossil fuels to improve the wellbeing of her conational. For her Master's degree, her research is focused on the field of gastric diseases, specifically in the erosions of the digestive tract caused by environmental factors.

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