Qualitative determination of flavonoids in alcoholic extract of the bark of *Plathymenia reticulata*

https://doi.org/10.56238/homeIIsevenhealth-120

Leandro Yúri Silva Souza
Isabelle Beatriz
Alessandro Campos
Luiza Ricarda
Lizia Lenza Campos
Maria Amélia Albergaria Estrela
Alberto de Andrade Reis Mota

1 INTRODUCTION

Ethnopharmacological investigations can be carried out based on reports from a given community in order to bring to the scientific sphere, with laboratory research, beneficial therapeutic claims of several plant species that are part of the great biodiversity of Brazil. From this knowledge, phytochemical and pharmacological analyzes can be carried out in order to prove or not such benefits. In this scenario, there are studies that point to a possible anti-inflammatory activity of the extract of *Plathymenia reticulata,* a plant of the Fabaceae family, found mainly in the Brazilian Cerrado, in addition to the presence of flavonoids and tannins (FERNANDES, 2002).

In view of this possible effect, it is undeniable the interest in studying and classifying the substances present in the plant, which is used in this region through "garrafadas" obtained from its bark seeking the relief of symptoms caused by inflammation in some diseases, such as osteoarthritis.

2 OBJECTIVE

In view of the above, the present work, still in progress, has as its objective to carry out qualitative tests to verify which types of flavonoids are present in the alcoholic extract of *Plathymenia reticulata,* through the Shinoda reaction, which different colorations obtained during the test indicate different types of flavonoids, With this, this work also aims to compare if different types of flavonoids are found in the hot alcoholic extraction with the cold alcoholic extraction but in a longer period of time, which would be more similar to the preparation of "garrafadas".

3 METHODOLOGY

1g of the powdered bark of *Plathymenia reticulata* was weighed, then 25 ml of ethyl alcohol was added and boiled on a hotplate for 5 minutes. After this time, the extract was filtered using cotton and placed in a test tube. Then about 200 mg of magnesium metal was weighed and added to the tube. Then 1 ml of concentrated hydrochloric acid was gradually added through the wall of the tube to observe the reaction.

For comparison, 20 g of plant powder was weighed and placed in 500 mL of ethyl alcohol, maintaining the same proportion as the Shinoda test. This preparation was left to stand for seven days (1 week) and then filtered for the test, which followed the same procedures as above after the heating step.

4 DEVELOPMENT

Flavonoids are a group of secondary metabolites found in a wide variety of plants, being found in various organs such as fruit, bark, flowers, roots, etc. They are synthesized from the shikimic acid pathway and the acetate pathway and can be found in the form of aglycones (without the presence of sugar molecules) or in the form of glycosides, a characteristic that modifies their physicochemical properties such as solubility in certain solvents (COUTINHO et al., 2007.).

The structural modifications of the flavonoid fundamental skeleton generate different types of this metabolite and are linked to the degree of unsaturation of the main ring.

In the plants in which they are found, they are used for various functions such as protectors against UV rays, favoring pollination, antioxidants, protection against insects, bacteria, fungi and viruses (SIMÕES, 2017).

Flavonoids are economically interesting for use as pigments, to add nutritional value to some foods also have some properties of pharmacological interest, such as anti-inflammatory, antiviral, antioxidant, antitumor action, among others (SIMÕES, 2017).

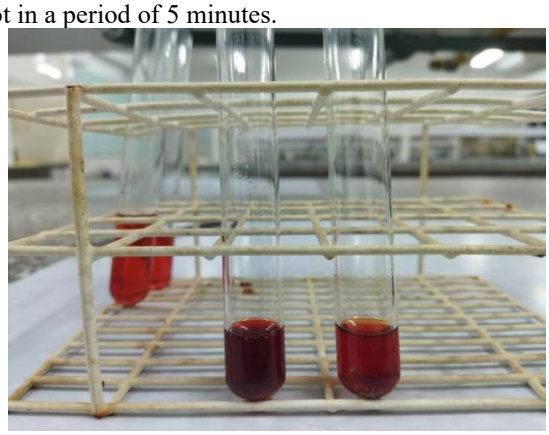
The staining generated by the Shinoda test for the presence of flavonoids follows the following order for positive reactions:

- -Flavone - yellow to red
- -Flavonol - red to blood red
- -Dihydroflavonol - red to blood red
- -Flavanone - red to violet
- -Anthocyanic derivatives - red to pink

It is observed that all the results are variations that are close to the red color in a spectrum of colors. This generates a great difficulty in classifying which flavonoids are present in the extracts of

Plathymenia reticulata, since the coloration of the bark of this plant is also red and there is influence of this color in the extracts. It can be seen from the difference in color between the extract obtained cold with the plant in contact with the solvent for a longer time, (Figure 1) that there is a clear presence of Flavonol, indicated by the red to blood red color, while the coloration of the extract obtained by hot alcoholic extraction for 5 minutes, the presence of flavones (or a lower concentration of flavonol) is observed.

Figure 1. a-alcoholic extract of *Plathymenia reticulata* obtained cold in a period of 7 days (Left) a-alcoholic extract of *Plathymenia reticulata* obtained hot in a period of 5 minutes.



5 FINAL CONSIDERATIONS

Flavonoids are secondary metabolites present in several plants, which perform important biological functions and possess properties of pharmacological interest. The Shinoda test is used to identify the presence of flavonoids in plant extracts, however, the interpretation of the results can be difficult due to the similarity of colors between the different types of flavonoids. The presence of flavonoids in Plathymenia reticulata extracts was observed through different colorations obtained in extraction tests. These compounds have a great potential for use in several areas, such as in the food and pharmaceutical industry. The understanding of the different types of flavonoids and their detection in plant extracts can contribute to the development of new products and treatments based on natural compounds.

REFERENCES

COUTINHO, Marcela; et al. Flavonoides: Potenciais Agentes Terapêuticos para o Processo Inflamatório. **Revista Virtual de Química.** v. 1, n. 3, p. 241-256, jun., 2009. Disponível em: https://rvq-sub.sbq.org.br/index.php/rvq/article/view/51/98. Acesso em: 20 abr. 2023.

FERNANDES, Alik Teixeira. Atividade farmacológica dos extratos obtidos da Plathymenia reticulata Benth.(Leguminosae). 2002

SIMÕES, Cláudia M O.; SCHENKEL, Eloir P.; MELLO, João C P.; et al. **Farmacognosia.** [Porto Alegre]: Grupo A, 2017. *E-book*. ISBN 9788582713655. Disponível em: https://integrada.minhabiblioteca.com.br/#/books/9788582713655/. Acesso em: 20 abr. 2023.

MACHADO, H.; NAGEM, T. J.; PETERS, V. M.; FONSECA, C. S.; OLIVEIRA, T. T. Flavonóides e seu potencial terapêutico. **Boletim do Centro de Biologia da Reprodução**, Juiz de Fora, v. 27, n. 1/2, p. 33-39, 2008. Disponível em: https://periodicos.ufjf.br/index.php/boletimcbr/article/view/17024. Acesso em: 20 abr. 2023.