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Anti-Radical Potentiality of The Extract Methanolique of The Bark of a Plant Used in Tradtional Medicine in Cote D'ivoire : *FICUS EXASPERATA* (MORACEAE)

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ABSTRACT

The purpose of the present study is to highlight the antioxidant character of the barks of Ficus exasperata (MORACEAE) what could justify in party its utility in traditional medicine. In addition to that the antioxidizing potentiality was proved by the test to the DPPH. The CCM which ensues from this test showed the existance of antioxidizing molecules. In the mixture of solvent dichloromethane/ethyl acetate/methanol (75/10/20), five compound made up of R_f equal to 0,17, 0,28, 0,50, 0,70 and 0,77 would be molecules with anti-free radical potentiality.

Keywords : antoxydant. CCM. Ficus exasperata. DPPH

INTRODUCTION

Cote d'Ivoire flora establishes an important source regarding traditional pharmacopoeia. Professor Ake Assi learns us that more than five thousand species were inventoried [1]. Healing plants always had an important place(square) in the therapeutic arsenal of the humanity. According to the World Health Organization (WHO), approximately 80 % of the world population in developing countries, because of the poverty and of the lack of access to the western medicine, depend essentially on traditional healing plants for their care of primary health.

In a specific way, among plants used in traditional medicine in Ivory Coast, Those who are used against certain diseases as the diabetes, the blood pressure, cancers, cysts, etc. seem particularly interesting.

Indeed, the presence of anti-free radical molecules in the extracts of a plant could be at the origin of the efficiency of this one against the quoted diseases higher [2]. In this work a plant used in traditional medicine against several disease will be studied. It is about Ficus exasperata (MORACEAE).

After the phytochemical screening, the antioxidant character of the extract méthanolique of the bark of annoying *Ficus* will be highlighted by making it react with the 1,1-diphenyl-2,2-picrylhydrazine (DPPH). Because in the body the excess of free radicals having a very harmful effect, the anti-free radical molecules can contribute to regulate their presence in human cells.

BIBLIOGRAPHICAL STUDY

FICUS EXAPERATA

The genre *Ficus* includes until about 1000 species in all the hot tropical and moderate regions with the biggest diversity in South-East Asia, tropical South America and Australia. The very rough leaves of *Ficus exasperata* are used to polish the wooden objects [3]. In quotation of Cote d'Ivoire we know it in several local regions where from its naming: Mfachi to Attié; Asakué to Ebrié; Yenglé to Baoulé; Gnahin to Oubi; Niénié to Dioula; Gnahonhin to guéré [4].

Ficus exasperata is a dirty tropical rough, shrub which increases in approximately 20 m height, with oval leaves, are distiches. Alternate, ovals in elliptic, apex shortly acuminé, for sharp basis in obtuse, very rough superior surface, making look like some sandpaper. Side nervures; 3-5 pairs, the basal branched out pair by affecting the margin or over the environment of the blade (Figure 1). Petiole; 0,5-4 cm of length and stipulate are from 0,2 to 0,5 m of length. The bark is smooth, the plant grows generally well in the evergreen forests and the borders of forests, also in the secondary forest and in the waterside vegetation. it is spread in tropical Africa [5,6].



Figure 1: Foliage of the species *Ficus exasperata* [7]

Previous studies

Certain studies demonstrated that *Ficus exasperata* generates secondary métabolites which have proved effective in the significant inhibition of the uterine contractions. This metabolites is thus a potential source of new agents for the facilitation of the work [8,9]. The toxicity and the potential mutagène of most of the plants of Africa implied(involved) in the management of the cancer were not studied. The leaves of *Ficus exasperata*, showed a not toxic activity for these tests. The resul justified the use of the leaves of this plants in the treatment of the cancer, On the other hand to our knowledge there is no scientific study on the barks of Ficuse exasperata one of the basic criteria expressed by the WHO for the use of herbs as medicine

MATERIALS AND METHODS

MATERIAL

Plant material

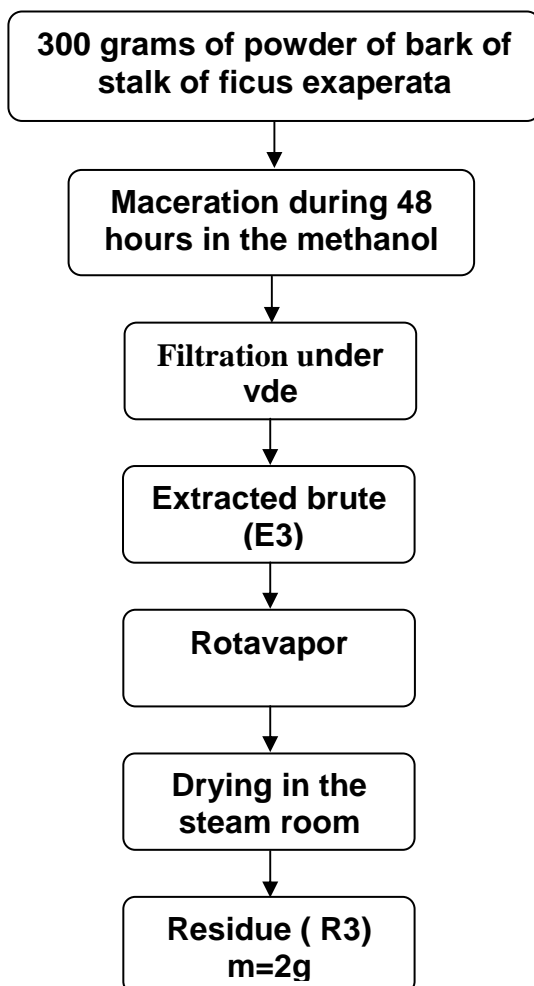
The plant material is constituted by bark of *Ficus exasperata* collected in November 2013 to Bingerville in Cote d'Ivoire, in the botanical garden. The organs was washed under a continuous

stream during approximately 5 minutes, dried in 25°C during two weeks, then pulverized by means of a crusher.

METHODS

Maceration

The extraction in the solvent consists in removing constituents of a solid or liquid phase by a solvent. The solvent used for the maceration of the powder of the bark *Ficus exasperata* in the methanol (Schema 1).



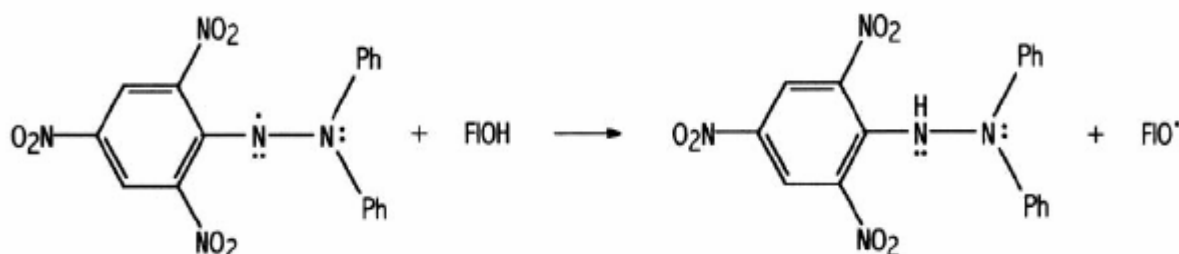
Schema 1: Synoptic plan of the extraction of bark *Ficus exasperata*

Methods of detection of the antioxidant power of the in vitro tests

The test DPPH

The method is based on the degradation of the radical DPPH[•]. An antioxidant will have the capacity to give a singlet electron to the synthetic radical DPPH[•] (Schema 2) of purple coloring to stabilize it in DPPH of yellow coloring. The measure of the diminution of tint purple in time allows to determine the EC₅₀, time at the end of which 50 % of tint is lost. Generally interpreted on the basis of the quantity of a necessary antioxidant to make decrease in 50 % the initial quantity of DPPH (EC₅₀), comparisons of EC₅₀ are realized. The profit is dependent on the concentration in initial DPPH. By adding a known reference, we could standardize the method, by returning for example

the result to an equivalent Trolox (a reference molecule, a structural analogue [10]. The method gives a global measure of the antioxidizing capacity.



Phytochemical screening

The analytical techniques of phytochemical screening are widely described in the literature.

Several author gives detail them on the methods [11,12].

RESULTS AND DISCUSSION

Mass of obtained extract

From 300 g of powder of barks, it was collected that 2 g of the crude oil in the methanol what makes a 0,63 % yield. Efficiency calculated from the relation of the figure 3.

$$\% = \frac{\text{Extracted mass}}{\text{Initial}} * 100$$

Figure 3: Formula of calculation of the yield on extraction

Phytochemical screening

The results of the phytochemical sorting realized on the methanol extract of the barks of the stalk of *Ficus exasperata* is in the tableau 1 below:

EXTRACTS	POLYPHENOLS	FLAVONOIDS	COUMARINES	STEROLS and POLYTERPENES	SAPONINES TRITERPENES
EF	+	+	-	-	-

EXTRACTS	PROTEINATE	COMPOUNDS REDUCERS	CARDIOTONIC GLYCOSIDES	TANNINS	GALLIC TANNINS
EF	-	-	+/-	-	-

- : absence, + : presence, +/- : Track

Table 1: Result of the phytochemical sorting of the barks of *Ficus exasperata* (EF)

We meet in the extract in the methanol of polyphenols, flavonoids, quinone and more or less cardiotoxic glycosides (Tableau 1). There is an absence of tannins, of make up compounds reducers, of proteins, coumarines, stérols and polyterpènes. Our results join the conclusions of

certain authors as Ayinde [13] who describes the presence of polyphenols and flavonoids in the leaves of *Ficus exasperata*. It connects the cardiostensive activity to these families of chemical compounds.

On barks, there are very few scientific studies. Nevertheless, ethnobotanic works show that the barks of *Ficus exasperata* would be effective against the arterial hypertension. It could be of for the presence of flavonoids and polyphenols [14].

Test in the DPPH on CCM

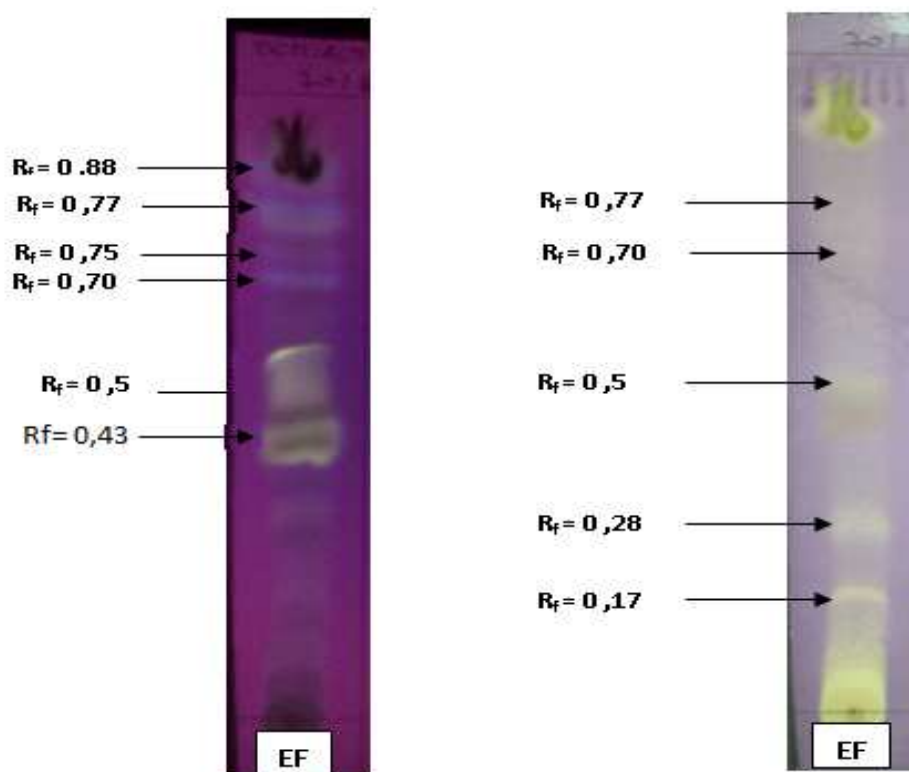


Figure 2: Test in the DPPH on CCM

The éluant used for this experiment is the mixture dichloromethane / ethyl acetate / methanol (75/10/20). In the patch to the right, the CCM was exposed to the ultraviolet radiation (UV at 366 nm). On the patch to the left, the CCM was pulverized in the DPPH and observed in the visible. This manipulation is very meaning Because it demonstrates the character antioxidants of our raw products and compounds having an antioxidizing potentiality. Besides after spraying in the DPPH, we remark three points.

In the first place, certain tasks observed in the ultraviolet radiation (UV at 366 nm) showed themselves in the DPPH with a yellow coloring belong products to $R_f = 0,5$; $R_f = 0,70$; $R_f = 0,77$. Secondly, other tasks which we did not see in the ultraviolet brilliance it are revealed after spraying of the purple solution of DPPH. They are the tasks in; $R_f = 0,17$, $R_f = 0,28$. Thirdly, a spot which was visible in the UV was not colored in yellow what means that this compound would not be in antioxidant. We can notice it for the spot with $R_f = 0,43$ (CCM to the left) (Figure 2).

This profit on CCM with finally a double importance not only products of our extracts for the methanol were separated, it is about five compounds in; $R_f = 0,17$; $R_f = 0,28$; $R_f = 0,5$; $R_f = 0,7$ and $R_f = 0,77$. The coloring of tasks in yellow blade after pulverizing in the DPPH shows that the crude oil methanolic barks of *Ficus exasperata* would contain products having an anti-radical activity.

CONCLUSION

The phytochemical sorting revealed that the barks of *Ficus exasperata* are sources of polyphenols, flavonoids, of cardiotoxic glycosides and quinones. The presence of polyphenols and flavonoids could be at the origin of their use in traditional medicine against the high blood pressure and the diabetes. It is nevertheless necessary to notice an absence of coumarins, sterols, polyterpene, proteins, compound reducers, saponins and tannins. The methanolic extract submitted to our study showed anti-free radical properties because the test in the DPPH was positive. What shows that the barks of this plant contain products having antioxidant properties. These results confirm the conclusions of the phytochemical screening, for the presence of polyphenols and flavonoids.

Indeed, in the mixture of solvent dichloromethane/ethylacetate/methanol (75/10/20), the CCM sprayed with a solution of DPPH revealed that at first the tasks to $R_f = 0,17$; $R_f = 0,28$; $R_f = 0,5$; $R_f = 0,7$ and $R_f = 0,77$ of the extract of the bark of stalk of *Ficus exasperata* contains products which have an antioxidant character.

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