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ACTIVITY ANTIFONGIC OF *AERVA LANATA* (AMARANTHACÉE) A MEDICINAL PLANT OF THE FLORA OF THE CÔTE D'IVOIRE

Doffou Doffou Jean-Paul[1]*, Soumahoro-Thès Péhie M.[2], N'guessan Jean David[1] and Djaman Allico Joseph[2]

[1]Pharmacodynamics Biochemical Laboratory UFR Biosciences University of Felix-Houphouët –Boigny, Abidjan Cote d'Ivoire.

[2]Department of Clinical and Fundamental Biochemistry, Pasteur Institute of Côte d'ivoire, 01 BP 490 Abidjan 01.

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***Corresponding Author**
Doffou Doffou Jean-Paul
Pharmacodynamics Biochemical Laboratory UFR Biosciences University of Felix-Houphouët – Boigny, Abidjan Cote d'Ivoire.

ABSTRACT

This survey was achieved in contribution to the eradication of the opportunist mycosiss through the assessment of the activity antifongic of *Aerva lanata* (amarantacées) on the in vitro growth of *Candida tropicalis* and *Cryptococcus neoformans*. The results of the tests antifongic show that the tested fungal stumps are himself revealed sensitive to the plant excerpt with clean and efficient inhibitions of 100% to different concentrations, according to a measure out-answer relation. With in sight of the values of the parameters antifongics (CMI, CI50), he/it appears that the excerpt hydroalcoolic of *Aerva lanata* is 2 times more active on *Cryptococcus neoformans* (CMI = 25mg/mL; CI50 = 1,44 mg/mL) by report to *Candida tropicalis* (CMI = 50 mg/mL, and CI50 =3,05 mg/mL.).

KEYWORDS: Amaranthacées, activity antifongic, excerpt hydroalcoolic, mycosiss, opportunists, parameters antifongic.

INTRODUCTION

Although one has medicines antifungals, the treatment of the mycosis difficult rest, on the one hand because of the number limited of really efficient active principles, of the more and more elevated costs of the modern medicines and on the other hand by the emergence of stumps resistant to some usual antimycosic **(Guédé-Guina, 1975; Rex *et al.*, 1995)**. The abusive use of the plants exposes the populations to various accidents. Indeed, in addition to

the active principles, the traditionals medicines contain other molecules of which some have adverse effects very pronounced toxic or even **(Yayé *et al.*, 2011)**. So, this survey initiated in the goal to search for new bioactive molecules facing the resistance and to contribute to the resolution of the infection problem developed by the fungal microorganism *Aerva lanata* is an amaranthacée, used in traditional environment to take care of the stomach aches of the women and to warn the miscarriages. She/it also serves to treat the cough, the headaches and the urinary lithiase **(Rajesh *et al.*, 2010)**. She/it is also used like diuretic and against the arterial hypertension, the diabetes, the asthma, the catalepsy **(Gupta & Neeraj, 2004)**.

The present survey consists in valuing the activity antifongique of the excerpt hydroalcoolic of *Aerva lanata* by tests of in vitro sensitivity on stumps of *Cryptococcus neoformans* and *Candida tropicalis*. Finally, to determine the antifungals parameters: the inhibitory minimal concentration (CMI) and the concentration for 50% of inhibition (CI50).

II - MATERIAL AND METHODS

II-1 - biologic Material

II-1-1 - plant Material

The plant material is constituted of stems, flowers and leaves of *Aerva lanata*.

II-1-2 - tested Germs

The fungal support has been constituted of stumps of *Cryptococcus neoformans* and *Candida tropicalis*. These stumps have been provided by the Laboratory of Mycology of the UFR of the Medical Sciences of Abidjan. They have been isolated of the patients coming from the service of the infectious illnesses of him FALLEN from Treichville (**Thès, 2001**).

II-2 - METHODS

II-2-1 - Method of extraction

The hydroalcoolic excerpt has been prepared according to the method of **Zirihi *et al.*, 2003**. According to this method, 100 g of powder of *Aerva lanata* has been extracted with one liter of solvent mixture ethanol/eau 70/30 (v/v) by homogenization in a mixer. The gotten homogenate has first been wrung with the help of a cloth white and clean poplin. Then, filtered three times successively on absorbent cotton and once on paper filters Whatman. The filtrate evaporated at the steamroom in 50 °C to give the alcoholic total excerpt 70%.

II-2-2 - Incorporation of the excerpt to the agar

The incorporation of the plant excerpt to the agar has been made according to the method of the double dilution in tilted tubes **(Ajello *et al*., 1963; Holt, 1975)**. This set included 12 tubes to tests for every tested germ of which, 10 tubes tests and 2 tubes witness. The incorporation of the plant excerpt has been made while homogenizing, first in the tube n°1; 2 g of raw excerpt of *Aerva lanata* in 20 ml of Sabouraud middle contained in this tube. Then, the half of the volume of this mixture is transferred in 10 ml of agar of the tube n°2 and is homogenized to the vortex. This operation is taken for the tube n°3 and so forth until the tube n°10. The range of concentrations gotten of the tubes tests varies from 100 to 0,2 mg/mL with a geometric link of reason 1/2. All tubes have been sterilized to the autoclave to 121°C during 15 minutes and then tilted with small cheek to the temperature of the room to permit their cooling and the solidification of the agar **(Thès, 2001; Zirihi *et al*., 2003; Kporou, 2004; Ouattara, 2004; Acka, 2004)**.

II-2-3 - Preparation of the inoculum

The inoculum has been prepared while homogenizing one respectively at two colonies of young cultures of mushrooms aged of 2 days for *Candida tropicalis* and 3 days for *Cryptococcus neoformans* appropriated on the slope of the agar. The inoculum 100 says standard inoculum valued to 106 cells/mL is prepared while homogenizing a œse of germs (appropriated with the help of a shackle) in 10 ml of distilled water sterilized. From this inoculum, some decimal dilutions are achieved. **(Kra, 2001)**.

II-2-4 - Culture of the germs in presence of the plant excerpt

For each of the tubes to test of every set, the sowing has been made by display of 10 µL of the inoculum 10-1 by streak valued to sowed 1000 cells. The thus achieved cultures are hatched to 30°C in a simple incubator of Memmert type, during 2 to 5 days for *Candida tropicalis* and *Cryptococcus neoformans*.

III - RESULTS

The results of the sensitivity tests indicate for all fungal stumps a progressive reduction of the number of colonies of *Cryptococcus neoformans* and *Candida tropicalis* as the concentrations of the plant excerpt increase in the experimental tubes.

The number of colonies of *Candida tropicalis* decreases from the concentration 0,2 mg/mL and the clean inhibition is gotten to the concentration of 50 mg/mL. This germ is therefore

sensitive to the action of the excerpt hydroalcoolic of the aerial organs of *Aerva lanata* with a CMI = 50 mg/mL, and a CI50 = 3,05 mg/mL. (**Figure 1**).

Cryptococcus neoformans is sensitive to the action of the excerpt hydroalcoolic of *Aerva lanata* with a CMI = 25 mg/mL, and a CI50 = 1,44 mg/mL. The number of colonies decreases from the concentration 0,2 mg/mL and the clean inhibition is gotten to the concentration of 25 mg/mL. (**Figure 2**).

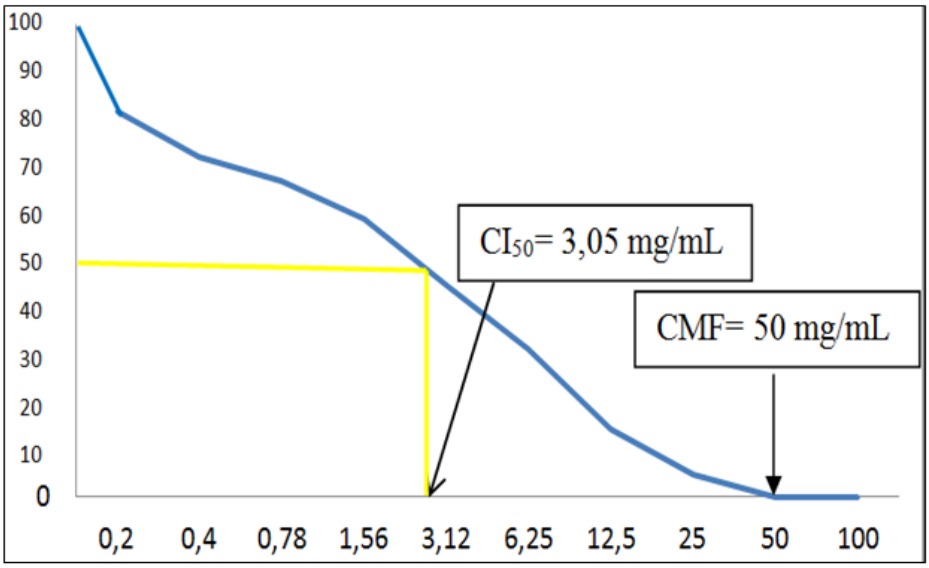

Figure 1: Curve of sensitivity of *Candida tropicalis* opposite the excerpt hydroalcoolic of *Aerva lanata*.

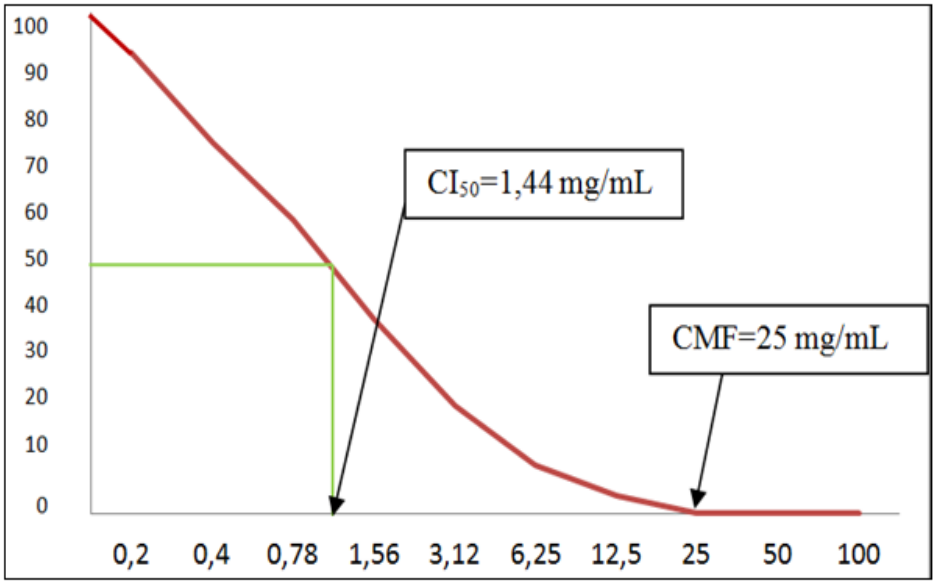

Figure 2: Curve of sensitivity of *Cryptococcus neoformans* opposite the excerpt hydroalcoolic of *Aerva lanata*.

IV - DISCUSSION

The results of this survey show that the excerpt hydroalcoolic of *Aerva lanata* is active and inhibit the in vitro growth of the fungal germs studied according to a measure out-answer relation. Compared to the witnesses of growth, we observes a progressive reduction of the number of colonies according to the increase of the concentration of the plant excerpt of *Aerva lanata*. In all sets, clean and efficient inhibitions of 100% have been observed. The inhibitory minimal concentrations (CMI) of the stumps of *Cryptococcus neoformans* and *Candida tropicalis* is respectively of; 25 mg/Ml and 50 mg/mL with in sight of these results, it appears that *Cryptococcus neoformans* is the most sensitive stump with a CMI of 25 mg/mL. Whereas, *Candida tropicalis* is the least sensitive stumps with active CMI of 50 mg/mL. The raised CI50 are respectively of 3,05 mg/mL and 1,44 mg/mL for the stumps of *Candida tropicalis* and *Cryptococcus neoformans*. It is evident from these results that this excerpt is more active in the inhibition of *Cryptococcus neoformans* compared to *Candida tropicalis* more resistant. The report of efficiency gives: CMI (*Candida tropicalis*) / CMI (*Cryptococcus neoformans*) is equal to 8. It indicates that the hydroalcoolic excerpt of *Aerva lanata* is 2 times more active on *Cryptococcus neoformans* in relation to *Candida tropicalis*.

CONCLUSION

To the term of this survey, he/it comes out again that the excerpt hydroalcoolique of *Aerva lanata* has an activity efficient antifongic. on the yeasts and mildews. The tested mushrooms are sensitive to the plant excerpt of way measures out dependent. The stump of *Cryptococcus neoformans* appears as being the most sensitive stump and *Candida tropicalis* most resistant. This action shows that the hydroalcoolic excerpt of *Aerva lanata* contains the active principles having an inhibitory activity efficient in vitro to various degrees. The gotten profile antifongic is interesting and could be improved.

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