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Phytochemical and Antifungal Activity of Nigeria Jatropha Multifudia Latex.

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Abstract: *Jatropha multifudia is an ornamental plant which is employed to cure various infections in traditional medicine. The phytochemical analysis of the latex in mg/100g revealed the presence of secondary metabolites with phenols having the greatest quantity of 14.32 ± 0.18, followed by tannins 8.16 ± 0.18, oxalates 6.03 ± 0.12 and phytates having least of 0.21 ± 0.10. Latex of this plant was analysed and screened against fungi (Trichoderma rubrum and Seleretion rolfsii). The latex displayed potent antifungi activity against mentioned fungi, giving minimum inhibitory concentration as low as 0.5ml and this increases with maximum inhibitory concentration as high as 0.2ml. The latex extract shows significant zone of inhibition in dose dependent manner and the results are comparable with bentate (control). From this study, we conclude that the latex extract possess potent antifungal effects which may be further developed as alternative treatments for some fungicides.*

Keywords**:** *Jatropha multifundia, latex, phytochemicals, antifungal, Trichoderm rubrum Seleretion rolfisii.*

I. Introduction

Plants are nature's remedy to ailments in our world. This realization is the basis of studying the chemical constituents of various plants. Traditional and folklore medicine play an important role in health care services around the globe. Plants are known to synthesize a wide range of chemical substances, many of which have been and can be of tremendous value in treatment and prevention of diseases [1].

Patients are often unaware that about 25% of modern pharmaceutical drugs have botanical origins, such as digoxin, from foxglove, morphine from poppies, aspirin from willow bark and tamoxifen from the pacific yaw tree [2]. The occurrences of secondary metabolites such as alkaloids, anthraquinones, tannins, glycosides, flavonoids, terpenoids and components of volatile oils vary in medicinal plants as they react to changing environmental conditions [3]. It is those secondary metabolites that have biological actions and which can be modified to produce drugs [4];[5].

Jatropha multifudia, commonly called coral brush is a tree or shrub belonging to the family *Euphorbiaceae* and referred to in Yoruba as "Ogege". It is a tropical woody perennial with milky sap that is used as a natural, flexible bandage. In Africa this plant is known as "Miodine" which literally means "tree of iodine" because of its antiseptic sap. In West Africa, especially in Nigeria the leaves are used in the treatment of oral thrush, constipation and fever [6]. Although traditionally, *J. multifudia* has been considered non-toxic and is most commonly used as a mouthwash, still the potentiality of the toxicity of *J. multifudia* has not been recognized by the general public or by professional groups of traditional medicine [7].The present study is therefore designed to observe the constituents of *J. multifudia* to be able to ascertain its toxicant level and therapeutic effects.

II. Materials And Method

Latex of *Jatropha multifudia* was collected into sterilized specimen bottles from Oke-ba, Ikirun in Ifelodun Local government area of the State of Osun.Phytochemical screening: Phytochemical tests were carried out on the sample using standard procedures, to identify the constituents as described by Sofowora (2008), Trease and Evans (2002) and Harborne (1973). The method of choice used for investigation was evaluation of antifungal properties: the techniques for poisoned food. 0.5, 0.1 and 2.0(ml) of the sample were thoroughly mixed with 1.5ml of Potato Dextrose Agar (PDA) in sterile sample bottles separately before pour plating. For control, 1 ml of distill water was used instead of the sample as negative control and 0.1ml Bentate was used as positive control (commercial fungicides). The poured plates were inoculated aseptically with a 6mm fungal disc of the

test organisms at 27^{o}C for 72hours. The mycelia growth were measured with the aid of digital vernier caliper and recorded appropriately. Percentage mycelia growth inhibition was calculated by the following formula,

$$\% \text{ mycelia growth} = \frac{NTR-TR}{NTR} \times 100$$

Where NTR = Average diameter of fungal coloning in negative control sets (without treatment)
TR = Average diameter of fungal colony in treatment sets.

III. Results And Discussion

Table 1: Phytochemical screening test

Sample Concentration	Trichoderum rubrum	Seleretion rolfsii
0.5ml	12	20
1.0ml	20	25
2.0ml	40	55
0.1ml Bentate	90	82

Table 2: Antinutrient Analysis (mg/g)

S/N	Parameter	Observations
1	Saponins	++
2	Flavonoids	_ _
3	Tannins	++
4	Alkaloids	++
5	Cardiac glycosides	++

Key: ++ = Present; - - = Absent

Table 3: Mycelial Growth Inhibition (%)

S/N	Parameter	Results ± S.D
1	Phytates	0.21 ± 0.10
2	Oxalates	6.03± 0.12
3	Tannins	8.16 ± 0.18
4	Phenols	14.32 ± 0.18

S.D - Standard deviation
n = 3(triplicates)

IV. Discussion

Phytochemical screening of the plant material revealed that alkaloids, tannins, cardiac glycosides and saponins are present while flavonoids is the only one that is absent. Saponins have been found to be potentially useful for the treatment of hyperglycaemia and as a blood cleanser. The presence of alkaloids with saponins could be the reason why *J. multifudia* is used to reduce blood pressure and cholesterol level in blood [8].
Saponins are reported to be effective in the treatment of syphilis, rheumatism and certain skin disease: treatment of abscesses and other swellings, ulcer and septic wounds [9]; management of inflammation [10]. The absence of flavonoids in the leaves will not enable its use as an antioxidant.Antinutrient analysis was recorded in Table 2. Antinutrient analysis revealed phenols as having the highest value of 14.32 ± 0.18mg/g and phytates being the lowest at 0.21± 0.10mg/g. The toxicant levels ascertain the non-toxicity of the sap.

Latex extract showed inhibition activity against both *Trichoderum rubrum* and *Seleretion rolfsii* with the antifungal efficiency dependent on the concentration of the extraction. Using the Bentate as reference drug or standard, inhibitory activity was better pronounced in the sample against Seleretion *rolfsii* while the reference is more pronounced in the *Trichoderum rubrum.* Inhibition is however concentration or dose dependent. This is illustrated in Figure 1 below.

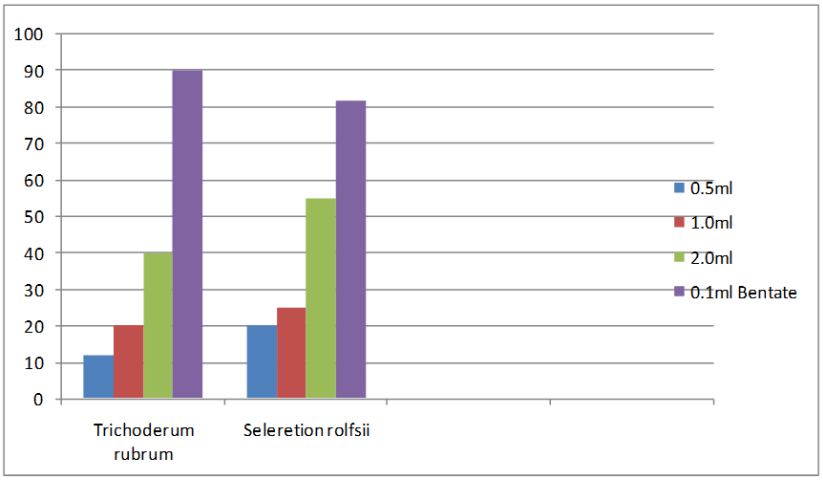

Fig 1: Illustration of the % mycelial growth inhibition on *Trichoderum rubrum* and *Seleretion rolfsii*

The result of this preliminary screening justify the use of *J.multifudia* latex as a mouth cleanser, it is however important to note that the sap need to be purified further to isolate and identify further the compounds responsible for its antifungal activities.

V. Conclusion

The results obtained in this study suggest that the identified phytochemicals may be the bioactive constituents responsible for the efficacy of *Jatropha multifudia* against fungi.
Jatropha multifudia is in agreement with the belief of users of this plant for oral thrust. Based on this, it is suggested that the traditional use of *Jatropha multifudia* be continued while the scientific evaluation of its active constituents using different solvent for extraction be given serious attention.

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