

# Proximate Analysis and Antifungal Activity of Moringa Oleifera Flower Oil Against Candida Albicans

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Received: July 19, 2024; Accepted: July 27, 2024; Published: August 05, 2024

## ABSTRACT

Medicinal plants rather than curing a disease aim at returning the body back to its natural state of health. Moringa oleifera plant has nutritional content which are diseases preventing and it has been used from ancient age in the prevention of diseases. Moringa oleifera plant is a small size tree approximately 5-10m height. It is cultivated all over the world due to its multiple utility. Every part of Moringa is used to certain nutritional and or medicinal purpose. Besides being a good source of protein, vitamin oil, micro-macro minerals, fatty acids. The flower shows a good presence of saponins, flavonoids, anthracene, tannin, steroid, phenols. Its Proximate Analysis indicates it contains protein 12.39, fats 10.31, fibre 5.02, ash 6.60, moisture 12.52. it has minimal effect against Candida albicans and therefore is not suitable for the treatment of Candidiasis.

## Introduction

For a long time, plants have been an important source of natural products for human health. The antimicrobial properties of plants have been investigated by a number of studies worldwide and many of them have been used as therapeutic alternatives because of their antimicrobial properties [1]. Plants have many antimicrobial properties as secondary metabolites such as alkaloids and phenol compounds. The practice of complementary and alternative medicine is now on the increase in developing countries in response to world health organization directives culminating in several preclinical and clinical studies that have provided the scientific basis for the efficiency of many plants used in folk medicine to treat infections. Despite the existence of potent antibiotics, the Antifungal agents resistant or multi resistant strains are continuously appearing imposing the need for a permanent search and development of new drugs [2].

It is therefore necessary that the search for newer antimicrobial sources could be a continuous process. Plants are the cheapest and safest sources of antimicrobials [1]. Moringa oleifera Lam is native to the sub-Himalayan tract of India, Pakistan, Bangladesh and Afghanistan which is widely used for treating bacterial infection, fungal infection, anti-inflammation, sexually transmitted diseases, diarrhea, and malnutrition [3].

Moringa species have long been recognized by folk medicine practitioners as having value in the treatment of tumors.

It has been used as a regular component of conventional eatables for nearly 5000 years [4].

## Materials and Methods

### Sample Collection and Preparation

Fresh flowers of Moringa oleifera was collected and 400g of the flower was shed dried for 14 days and ground into powder.

### Extraction of Moringa Oleifera Oil

70g of powdered flower were separately placed in 1000ml bottles with 800ml of distilled water, 500ml of 80% Ethanol and 500ml of 80% Methanol. The bottles were shaken for 2hours and allowed to stand for 7days with agitation. The different extracts were separately filtered using whatman no 1 filter paper. The different filterates were then concentrated and evaporated in a water bath. The oil concentrates were then stored in sterile bijou bottles and stored in a refrigerator [5].

### Phytochemical Screening of Moringa Flower Oil

Preliminary phytochemical screening of Moringa oleifera oil was carried out according to the method described by [6].

### Sterilization of Materials

All the materials used were properly washed sterilized in an autoclave at 121 degrees Celsius for 15mins before use. Work was carried out under aseptic conditions. The work bench was sterilized using 70% ethanol. All media used were prepared using manufacturer's instructions.

The media used were Sabouroid Dextrose Agar, Mueller Hinton Agar, Nutrient Agar, and Nutrient Broth.

### Collection of Test Organisms

Pure culture of test organisms were collected from university of Abuja teaching hospital microbiology laboratory and subcultured in Sabouroid dextrose agar. The culture was incubated at 37 degrees Celsius for 5 days.

### Sensitivity Test (Disc diffusion method)

The sensitivity test was carried out according to the method described by [7]. The media used was Mueller Hinton agar. The concentration of extract used was 20mg/ml, 50mg/ml, 100mg/ml, 200mg/ml, 400mg/ml. This was repeated for the three extracts.

### Proximate Analysis of Moringa oleifera Flower

The Proximate Analysis was carried out according to the method described by [8].

### Results

**Table 1: Results of Phytochemical screening of Moringa oleifera Flower oil extract**

Constituents	Extracts		
	Aqueous	Ethanol	Methanol
Saponins	+	+	+
Flavonoids	+	+	+
Anthracene	+	+	+
Tannin	+	+	+
Steroid	+	+	+
Terpenoid	-	-	-
Cardiac glycosides	-	+	-
Alkaloids	-	+	-
Phenols	+	+	+
Phlobatannins	-	+	-

**Table 2: Results of Antifungal Test of Moringa Oleifera Flower Oil Extract Against Candida Albicans**

Extracts	Concentration of Extracts mg/ml				
		25	50	100	200
Aqueous	-	-	-	03	04
Ethanol	-	03	05	07	09
Methanol	-	02	03	05	06
Control (Fluconazole)	10	12	14	17	20

**Table 3: Nutritional constituents/Proximate Analysis of Moringa oleifera Flower**

Nutrients	Composition
Protein	12.39 ±0.03
Fats	10.31 ±0.02
Fibre	5.02 ±0.02
Ash	6.60 ±0.00
Moisture	12.52 ±0.02
Carbohydrates	53.17 ±0.03

### Discussions

Table 1 shows that the flower contains saponins, flavonoids, anthracene, Phenols, tannin and steroid in all the three extracts, while terpenoid, Cardiac glycosides, and alkaloids are absent on both aqueous and methanol extract but present in ethanol extract.

Table 2 sensitivity test of Moringa oleifera Flower oil against Candida albicans shows that the extracts has negligible action against Candida albicans and agrees with the work of [9]. Ethanol extract produced 9mm zone of inhibition at 400mg/ml concentration stated that Candida albicans and Pseudomonas spp are resistant to Moringa oleifera. Methanol and aqueous extract show lesser zone of inhibition with 6mm and 4mm respectively. The standard drug used was fluconazole, it showed effectiveness against the test organism with 20mm zone of inhibition.

In Table 3, the Proximate Analysis of Moringa oleifera Flower oil contains 12.39 ± 0.03 Protein, 10.32 ± 0.02 Fats, 5.02 ± 0.02 Fibre, 6.60 ± 0.0 Ash, 12.52 ± 0.02 Moisture, 53.17 ± 0.03 Carbohydrates.

### Conclusion

Although Moringa oleifera is said to possess many nutritional and health benefits like anti-inflammation, antipyretic, antimicrobial, analgesic, asthmatic and other benefits, it has minimal antifungal activity against Candida albicans. It also showed absence of some bioactive metabolites. The findings in this study agree with earlier studies which stated that not all phytochemicals are present in all plant parts and that those present different according to type of extracting solvent used [9].

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