



## Antimicrobial and Phytochemical Screening of Cinnamon Extract

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**Abstract:** Study on antimicrobial and phytochemical screening of cinnamon extract was conducted; the plant was extracted and analyzed for bioactive compounds as well as antibacterial effect on selected bacteria (*Klebsiella pneumonia*, *E. coli* and *pseudomonas aeruginosa*). At concentrations between 100 – 200mg/ml with zone of inhibition between 9 – 14 mm. Results obtained showed activity against all the isolate while bioactive compounds present include alkaloids, carbohydrates, terpenoids, flavonoids, amino acids and saponins.

**Keywords:** Bacteria, Antimicrobial, Bioactive compound, Extract

### Introduction

Cinnamon is native to India and Syrilanka. It is now cultivated in may tropical countries. This plant has been used in Ayurvedic (Indian traditional medicine) and other medicine traditions in Asia. In the American continent, most of the original uses over still prevalent, mainly as a treatment for diarrhea, stomach upset, against respiratory ailment and externally as a skin antiseptic (Aguilar,1999” Gonzalez 1998” linaves *et al*, 1994). Plant and used as medicine therapy because they contain several components which are believed to cure various infection diseases. The biodiversity of plant provides an important source of chemical component, which have many therapeutic application such as antiviral, antibacterial antifungal and anticancer activities (Pereira *et al* 2004 ).Aromatic and medicinal plants herbs acquired particular attention in the field of intensive research on the natural antimicrobial and or antifungal properties (Alzareky and Nakahara, 2003).

Cinnamon is one of the herb plants commonly used as spices in food preparation and as traditional medicine. Nowadays, cinnamon is also used as raw material functional foods and drinks. The part from cinnamon plant usually used, is the stem. The skin of the cinnamon stem contain essential oil with major components are cinnamal delyde and eugenol, cinnamon has been reported to inhibit the growth of several antibiotic resistance strains of bacterial and antibacterial activity of commercial and wild cinnamon species has been seen (Ashish *et al*,2011).cinnamon in concentration as low as 0.02% inhibited mold growth and aflatoxin production in yeast extract sucrose broth (Bullerman *et al*, 1977).

### Sample Collection

The sample were bought from Maiduguri Monday market, was then grinded in to a fine powder using pestle and mortar immediately the sample was taking to the laboratory and was extracted using Soxhlet extractor and methanol as solvent

### **Determination of Antimicrobial Activity**

A disc of blotting 6mm paper is impregnated with a known volume cinnamon extract and placed on a plate of sensitivity testing agar uniformly inoculated with the test organisms, and placed in an incubator 24 hours. The extract diffuse from the disc in to the medium and the growth of the test organism is inhibited at distance from the disc that is related (among other factor) to the sensitivity of the organisms. Organisms sensitive to the extract are inhibited at a distance from the disc where as resistant strains have small zones of in habitations or grow up to edge of the disc (Monica, 2004)

### **Phytochemical Analysis of Cinnamon Extract**

Phytochemical analysis of cinnamon extract was performed using Joshi and Wagh (2018); Singh and Kumar (2017), Wagner's test Foam test for Alkaloids, Molish test for Carbohydrates Chloroform test for Terpenoids, Alkaline reagent test for Flavonoids, Ninhydrin test for Amino acids and Foam test for Saponins,

### **Result Presentation**

Antimicrobial activity of methanolic extract of cinnamon against some selected micro organisms.

Table 1; minimum inhibitory concentration

Organisms	zone of inhibition(mm)	Concentration of extract (mg/ml)
<i>Klebsiella</i>	13	100
<i>E. coli</i>	9	200
<i>P. aeruginosa</i>	14	100

Table2; Phytochemical Analysis of Bioactive Compounds in the Cinnamon Extract

S/ No	Bioactive Compounds	Status of Bioactive Compounds
1	Alkaloids	+
2	Carbohydrates	+
3	Terpenoids	+
4	Flavonoids	+
5	Amino acids	+
6	Saponins	+

### **Discussion of the Result**

This study report the antimicrobial activity of five (5) concentrations of cinnamon extract against *Klebsiella pneumoniae*, *Pseudomonas aeruginosa*, , *Escherichia coli*, the result of antimicrobial activity of the investigated extract are shown in table 1. In this study, the extract showed activity against *Klebsiella pneumonia*, *E. coli* and *pseudomonas aeruginosa* with an inhibition zone of 13mm, 9mm and 14mm respectively at 100mg/ml to 200mg/ml. the above

results is to the one obtained by Shivendau Ranjan *et al*,(2012). Some of the bioactive compounds obtained include alkaloids, carbohydrates, terpenoids, flavonoids, amino acids and saponins.

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