Comparative Study of Anti-oxidant and Antibacterial Properties of Methanolic Extracts of *Murraya koenigii* and *Clitoria ternatea* Leaf Extracts from Chhattisgarh.

POKHRAJ SAHU1
CIF, Faculty of Pharmacy, Kalinga University, Raipur-492101, Chhattisgarh, INDIA.
Chhattisgarh, INDIA.

Abstract

Clitoria ternatea is a type of blooming plant, and *Murraya koenigii* is used to improve the smell of vegetables while they are cooking. Both plants are used for a variety of medical purposes. Several secondary metabolites, including alkaloids, flavonoids, carbohydrates, proteins, vitamins, and others, are present in both plants, which contribute to their high levels of antioxidant qualities.
By measuring the zone of inhibition of the bacterial strains *Escherichia coli* and *Staphylococcus aureus*, we were able to examine the antibacterial properties of the plants *Murraya koenigii* and *Clitoria ternatea.* The antioxidant capabilities of DPPH (2,2-Diphenyl-1-picrylhydrazyl) were also determined using standard ascorbic acid, and optical density (OD) was measured using ultraviolet spectroscopy at wavelengths of 515–520 nm.
Thus, *Murraya koenigii* ultimately performs better than *Clitoria ternatea* in a few chosen parameters.

Key words: *Escherichia coli (E.coli), Staphylococcus aureus (S.aureus),* DPPH, *Murraya koenigii* and *Clitoria ternatea* .

Introduction

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Carl Linnaeus originally described *M. koenigii*, a tree in the citrus family Rutaceae, in 1767. It is sometimes referred to as sweet neem, curry tree, or curry bush.
It is indigenous to mainland Southeast Asia, southern China, and the Indian subcontinent. It has also been brought to Australia and other parts of Southeast Asia. In Bangladesh, Sri Lanka, and India, its leaves are utilized in a variety of culinary preparations.
Plant height is 4–6 meters with a trunk up to 40 cm in diameter, it is a little tree. The pinnate fragrant leaves have 11–21 leaflets, each measuring 2-4 cm in length and 1-2 cm in width. The plant bears tiny white flowers that have the ability to self-pollinate, yielding tiny, glossy black drupes with a single, sizable, viable seed. The berry pulp has a sweet taste and can be eaten.
Curry leaves, another name for meetha neem, are a common component of Ayurvedic medicine and are used to cure a number of illnesses. It is well-known for having antimicrobial, anti-inflammatory, and anti-diabetic qualities. Common use include increasing hair development, assisting with digestion, regulating diabetes, and enhancing the condition of the skin and hair.

Fig 1.2 *Murraya koenigii* plant

Clitoria ternatea is a plant species that is indigenous to the Indonesian island of Ternate and is commonly referred to as Asian pigeonwings, bluebellvine, blue pea, butterfly pea, cordofan pea, or Darwin pea. It is a member of the Fabaceae family.It is usually referred to as Aparajita in Indian Ayurveda.In India, it is occasionally mistaken for Convolvulus prostratus (Convolvulus pluricaulis).

Memory-boosting, nootropic, antistress, anxiolytic, antidepressant, anticonvulsant, tranquillizing, and sedative capabilities are among the many attributes attributed to it in traditional Ayurveda treatment. The plant's resemblance to the female reproductive organ has led to its association with female libido in traditional Chinese medicine. Its extract has been demonstrated to lessen the severity of serotonin and acetylcholine-induced behavior in mice.

The perennial herbaceous plant *Clitoria ternatea* has elliptic, obtuse leaves. It thrives in damp, neutral soil and grows as a vine or creeper. Its flowers, which are solitary and have faint yellow patterns, are its most remarkable feature. They are a beautiful deep blue color. They measure roughly 4 cm in length and 3 cm in width. Some types have pink and white blooms.

Fig 1.2 *Clitoria ternatea* plant

DPPH Assay

These days, antioxidants are becoming more and more well-liked, especially as a means of preventing the destruction of free radicals during the digestion and storage of fatty foods, as well as their known detrimental effects on human metabolism. In both cases, natural antioxidants are preferred over synthetic ones. Tests for determining the effectiveness of antioxidants in human metabolism and food systems have therefore grown more popular.

The antioxidant impact can now be measured using a variety of bioanalytical methods. One of them, the 1, 1-diphenyl-2-picrylhydrazil (DPPH) elimination assay is the most likely, often employed, and well-liked method to evaluate antioxidant capacity.
The chemicals or herbal extracts are mixed with the DPPH solution in this experiment, and their absorbance is assessed after a predefined period of time.
Using our plant sample and ascorbic acid as a standard, we mixed them with DPPH solution and utilized UV spectroscopy to measure the optical density (OD) at specific wavelength range 515-520nm.

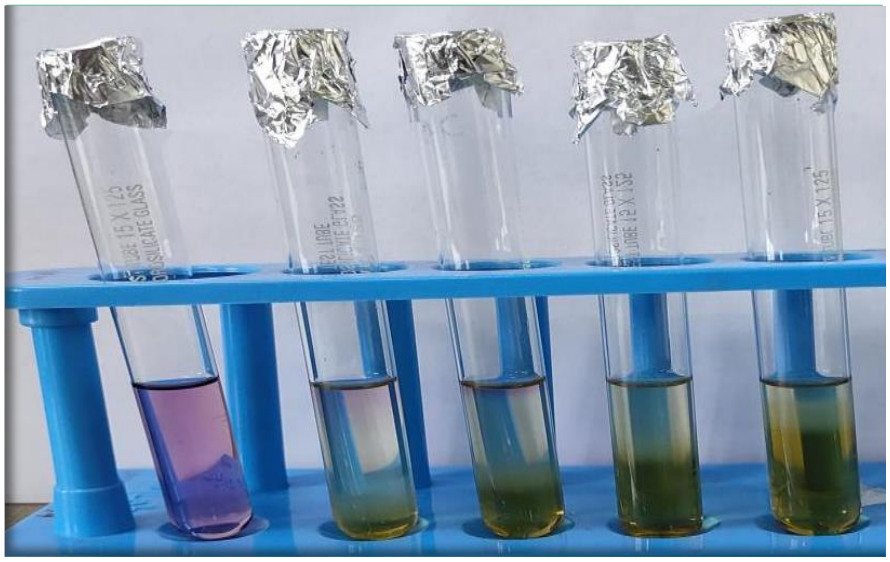


Fig 1.3 DPPH assay for plant sample *Murraya koenigii*

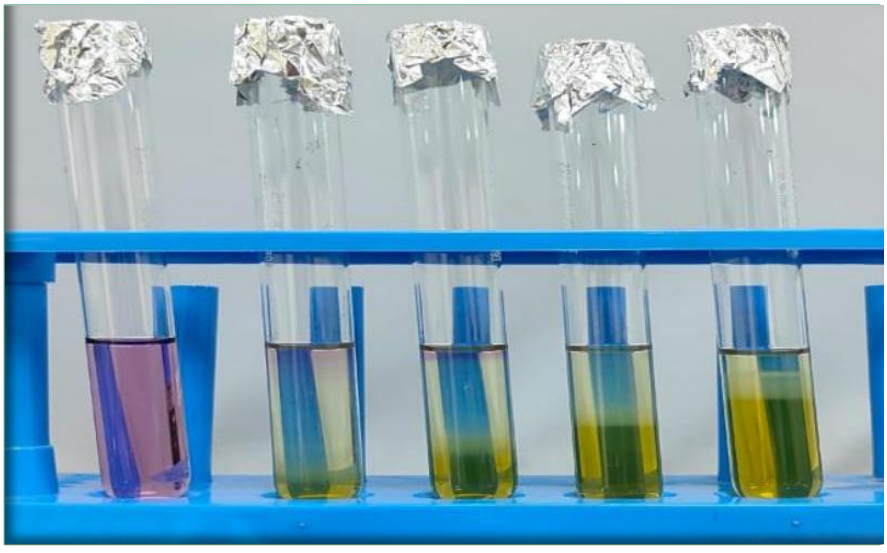


Fig 1.4 DPPH assay for plant sample *Clitoria ternatea*

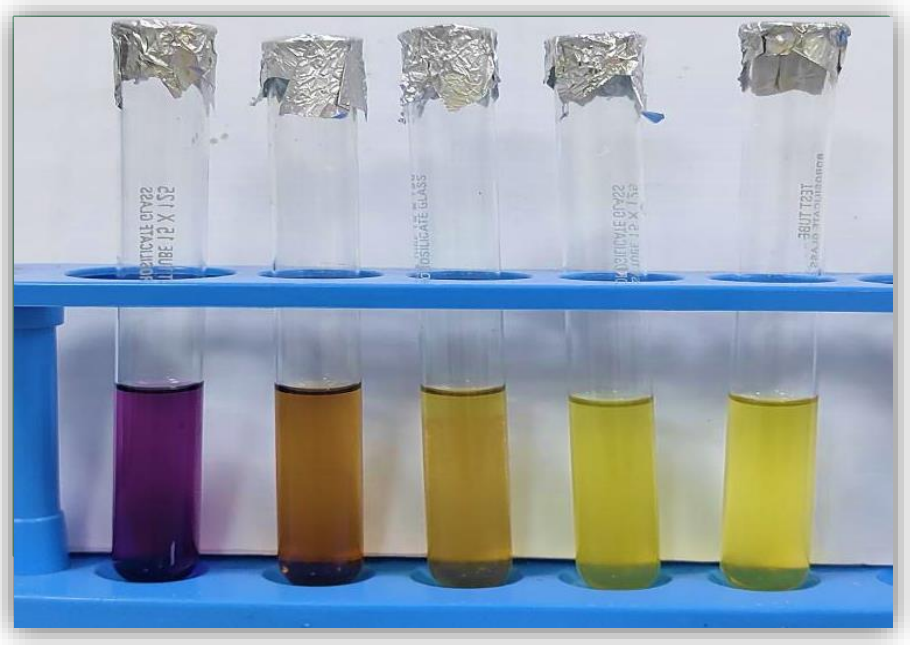


Fig 1.5 DPPH assay for Standard ascorbic acid

S.No.	Vol. of Extract (ml)	Optical Density (515-520 nm) of leaf extracts		
		Methanolic extract of *Murraya koenigii*	Methanolic extract of *Clitoria ternatea*	Methanolic extract of Ascorbic acid
1	20	0.26	0.23	0.34
2	40	0.24	0.19	0.31
3	60	0.22	0.15	0.28
4	80	0.20	0.13	0.23
5	100	0.09	0.07	0.10

Table 1.1 Comparative DPPH estimation through OD measurement through UV visible spectroscopy for Methanol extracts of *Murraya koenigii*,*Clitoria ternatea* and Ascorbic acid at 515-520 nm.

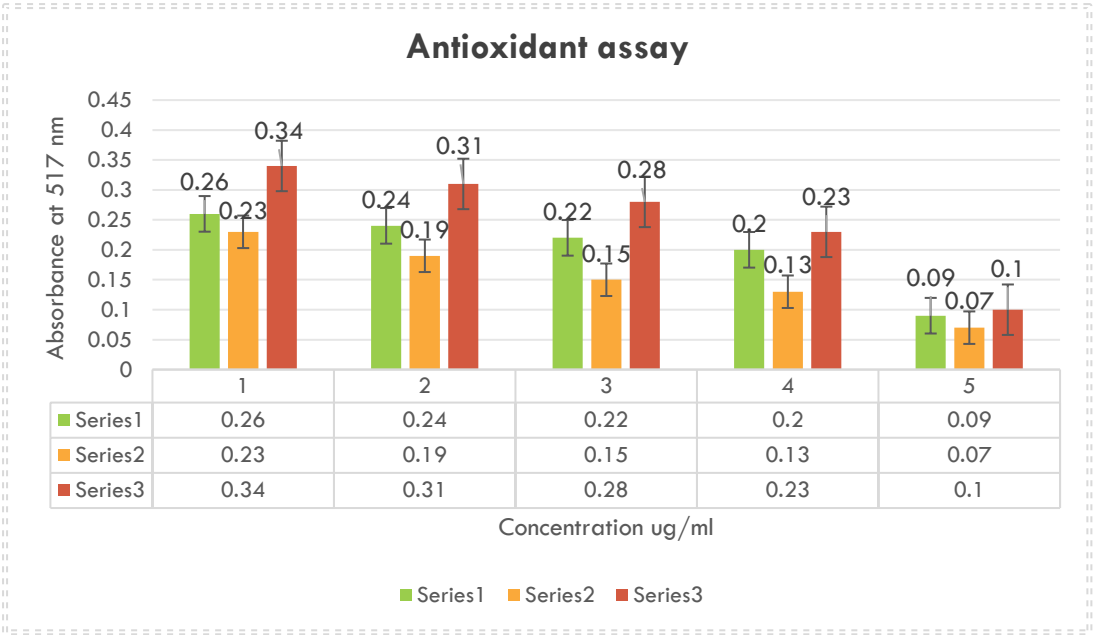
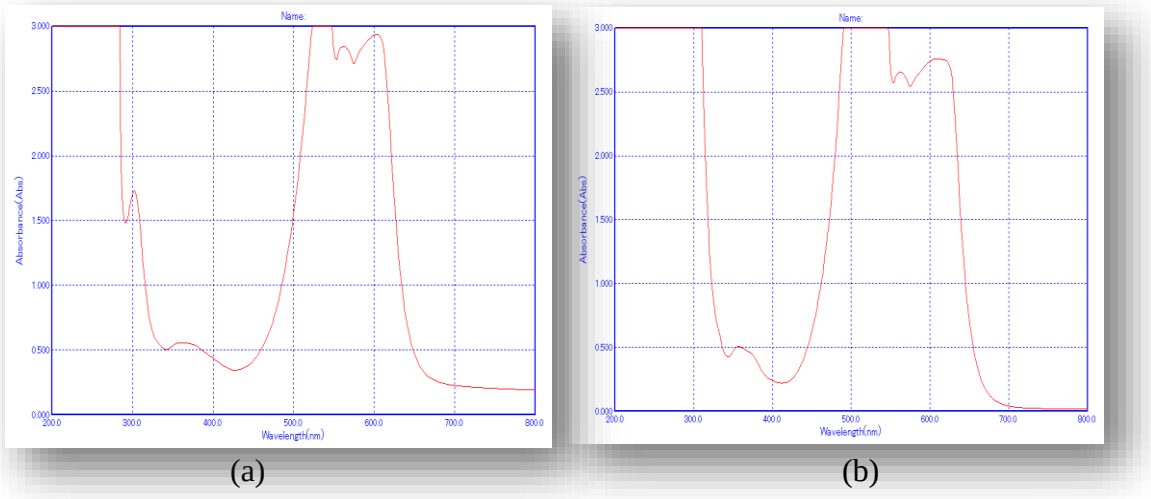
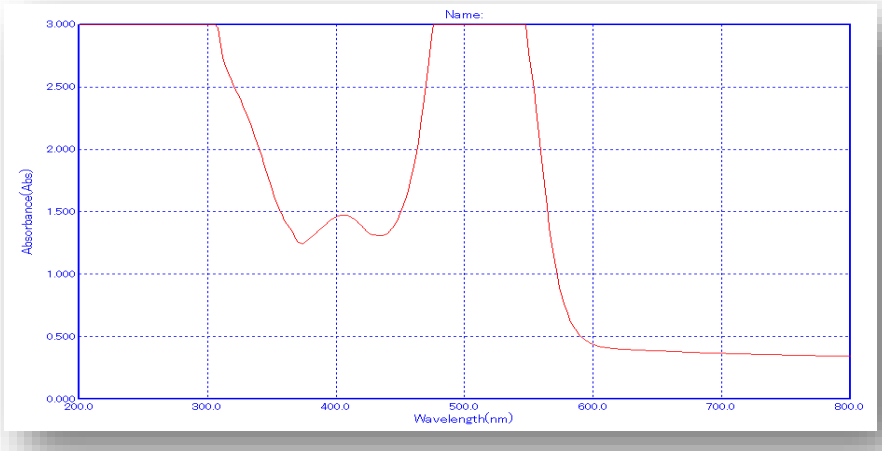


Fig 1.6 Showing graphical representation of DPPH assay where series one blue colour is representing plant sample *Murraya koenigii* ,series second orange colour is representing plant sample *Clitoria ternatea*,series three gray colour is representing standard sample ascorbic acid



(a) (b)



(c)

Fig1.7 UV spectroscopy analysis results for sample (a)*Murraya koenigii ,(b)Clitoria ternatea* and (c)standard ascorbic acid

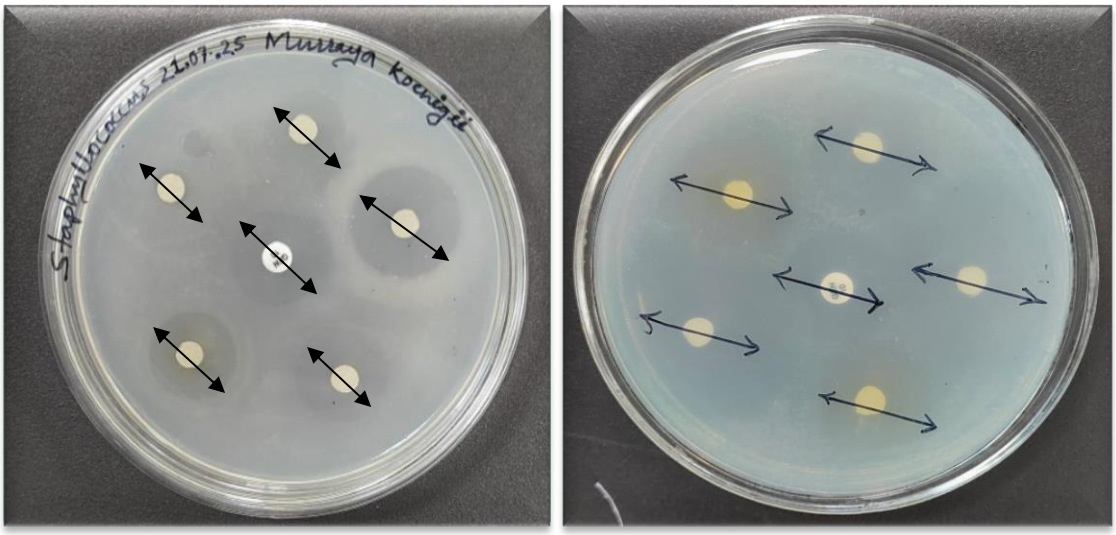
Antibiotic resistance assay

A class of substances known as antibacterial agents such as commercially available antibiotics, combats harmful microorganisms. Therefore, the harmful impact of bacteria in biological environments will be reduced by eliminating them or lowering their metabolic activity.

In our practical we used gentamicin (Gen), commercial available antibiotics to examine antibacterial resistance property against *E.coli* and *S.aureus* bacterial strains by using our both plant sample's methanolic extraction, by measuring zone of inhibition in mm.

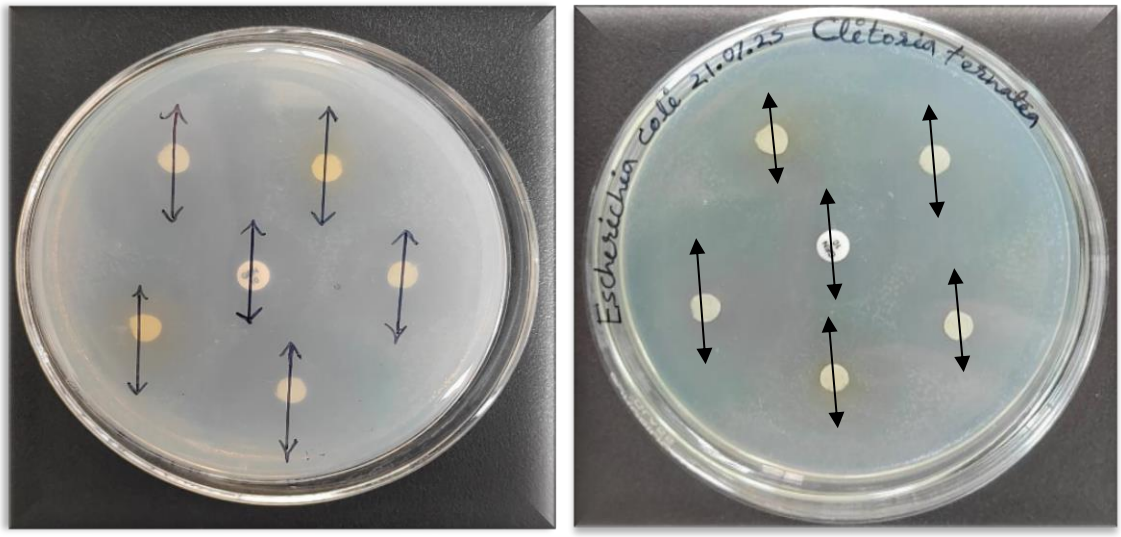
S.No.	Leaf extract with methanol solvent	Zone inhibition of leaf extract									
		Escherichia coli (E.coli) (mm)					*Staphylococcus aureus* (mm)				
		0.2	0.4	0.6	0.8	1.0	0.2	0.4	0.6	0.8	1.0
1	*Murraya koenigii*	3	4	7	9	11	4	6	7	9	12
2	*Clitoria ternatea*	2	3	5	8	10	3	5	7	9	11

Table 1.2 Showing zone of inhibition by using both plant sample's methanolic extraction against Gen antibiotic disc.



(a) S.aureus strain (b) *E.coli* strain

Fig 1.8 Showing zone of inhibition by using plant sample *Murraya koenigii* methanolic extraction disc against Gentamicin antibiotic disc by using disc diffusion method on *E.coli* and *S.aureus* strain



(a) S.aureus strain (b) *E.coli* strain

Fig 1.9 Showing zone of inhibition by using plant sample *Clitoria ternatea* methanolic extraction disc against Gentamicin antibiotic disc by using disc diffusion method on *E.coli* and *S.aureus* strain

Observation and Result

By using various method like disc diffusion method, uv spectroscopy analysis, OD detection, DPPH assay finally we found that the best result present in methanolic extract of plant sample *Murraya koenigii* as compared to plant sample *Clitoria ternatea*, it means that plant sample *M. koenigii* has more antioxidant more antibiotic resistance property and more scavenging property against free radicles formation as compared to another plant sample *Clitoria ternatea*.

Discussion

After all analysis we found ,by using this plant extraction we can develop plant based antibiotic and antioxidants which may be very useful for our health sectors without using any commercial antibiotics or chemicals.

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Discipline: Biotechnology

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