



# ANTIOXIDENT PROPERTY OF THREE VARIETIES OF THE BETEL LEAVES

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## Abstract:

Betel (Piper betel) is widely grown in many parts of the Indian sub-continent and is used in several common household remedies. The betel (Piper betel) is a species of flowering plant in the pepper family piperaceae native to southeast Asia. Antioxidants both are natural and man-made substance that protects our cell from free radical. In present investigation we try to find out the antioxidant property of water extract of Piper betel by using DPPH as a free radical scavenger and Spectrophotometer. For that 3 varieties of betel leaves were collected from the market. From this study we found that the bangala piper betel variety has best antioxidant property than the other two varieties.

**Key word: - piper betel, antioxidant property, DPPH**

## I. INTRODUCTION

Betel leaf (Piper betel L.) is a heart-shaped deep green leaf associated with the Piperaceae family with more than 2000 species. Betel leaf is a perennial creeper and produced leaves with glossy nature along with white catkin inflorescence. In catkin of betel leaf, the male plant has dense and cylindrical spikes, where the female plant has pendulous spikes. The plant is attached to the host tree or support by root, which arises from each node. The cultivation is widely distributed in subtropical and tropical areas of the world.

## Material and method

The leaves of betel (Piper betel) were purchased from a local market of akola Maharashtra

### Preparation of leaves extract

The leaves were extracted in distilled water by using Solvant extraction method

#### A. Preparation of aqueous extract of Piper betel.

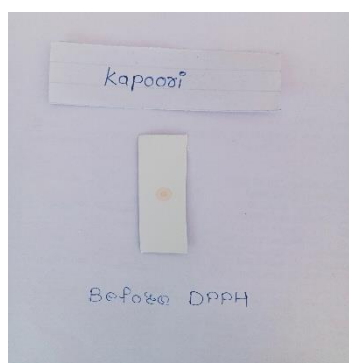
Pour 5 gm of Piper betel dried powders sample was taken in a beaker 25 ml of solvent was added the mixture was heated for 30 min at 60°C. the mixture was allowed to cool and filter. The filtrate obtained was used as a sample and different concentrations of solutions like 0.1mg/ml, 0.2mg/ml, 0.3 mg/ml, 0.4mg/ml, 0.5mg/ml were prepared.

#### 1. Study of qualitative antioxidant activity of Piper betel

The study of antioxidant activity by DPPH method by following procedure. 0.002% of DPPH was prepared in methanol and 3ml of these solutions were kept in dark for 30 min and optical density was measured at 517 nm using visible spectra photometer.

Qualitative antioxidant activity shown by aqueous extract of Piper betel.

**Kapoori variety**

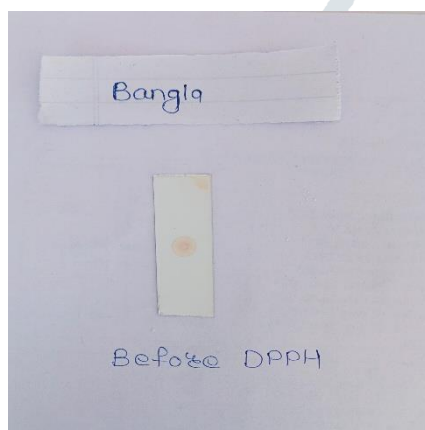


Before applying DPPH.

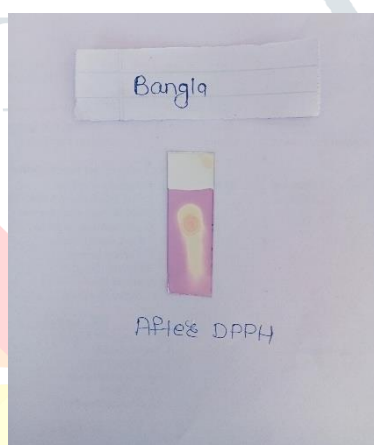


After applying DPPH.

**Bangala variety**

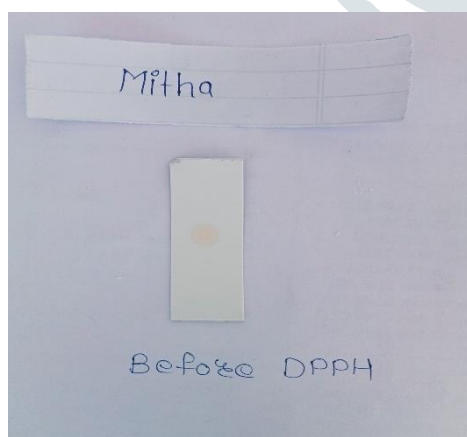


Before applying DPPH



After applying DPPH

**Meetha Variety**



Before applying DPPH



after applying DPPH

The piper betel extract of water showed prominent bleaching of purple colour of DPPH indicating that these all have good antioxidant property .

Ethanol (3ml)with the 3 ml of 0.002% DPPH solution was used as blank the optical density (OD) was recovered and %antioxidant activity was calculated using formula given below

$$\% \text{ Inhibition of DPPH (\% AA)} = (A - B) / A$$

Where, A= blank O.D of DPPH

B = O.D of sample solution

From this we can calculate IC<sub>50</sub> value of each sample

$$\text{IC}_{50} \text{ Max (\% AA)} = 50\%(\text{Max} - \text{Min \% AA})$$

#### IV. RESULTS AND DISCUSSION

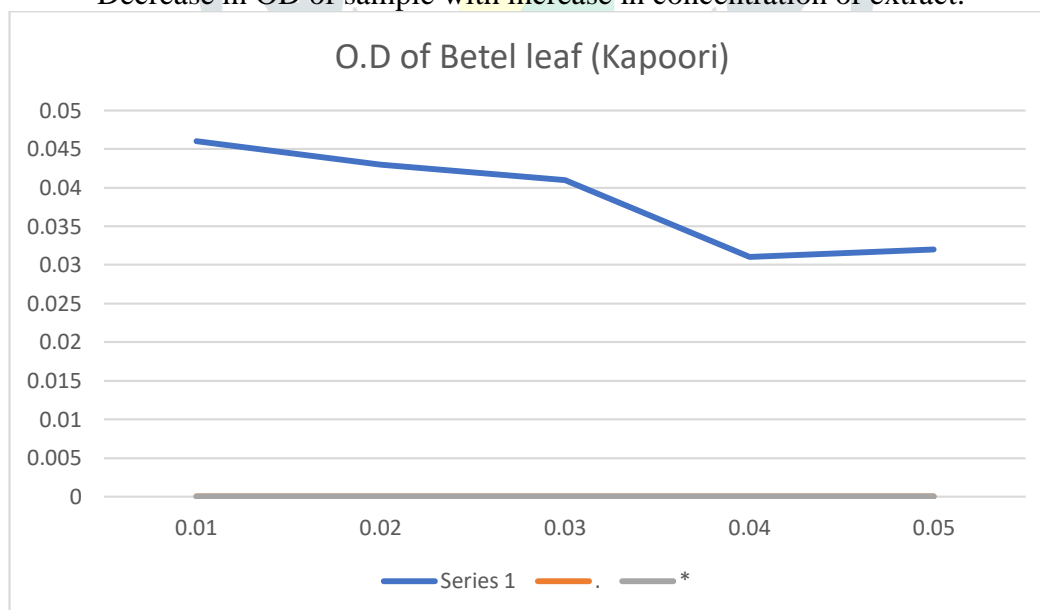
Five different solution of each solvent extract where prepared having different concentrations. 2ml of each of this solution was mixed with 2ml of 0.02 in DPPH solution and resulting solution was used as sample . optical density of the sample was recorded by colorimeter and the result obtained are reported in following table and IC<sub>50</sub> values have been determined for each extract.

**Table 1.1**

Optical activity and percent antioxidant activity of aqueous extract of Piper betel (Kapoori pan)

Concentration mg/ml	0.01	0.02	0.03	0.04	0.05
O.D of sample	0.046	0.043	0.041	0.31	0.032
% AA Betel leaf	0.345	0.69	1.035	1.38	1.725

Decrease in OD of sample with increase in concentration of extract.



Increase in percent antioxidant activity with increase in concentration of extract.

Calculation of IC<sub>50</sub> value for piper betel water extract = max- ½(max-min)

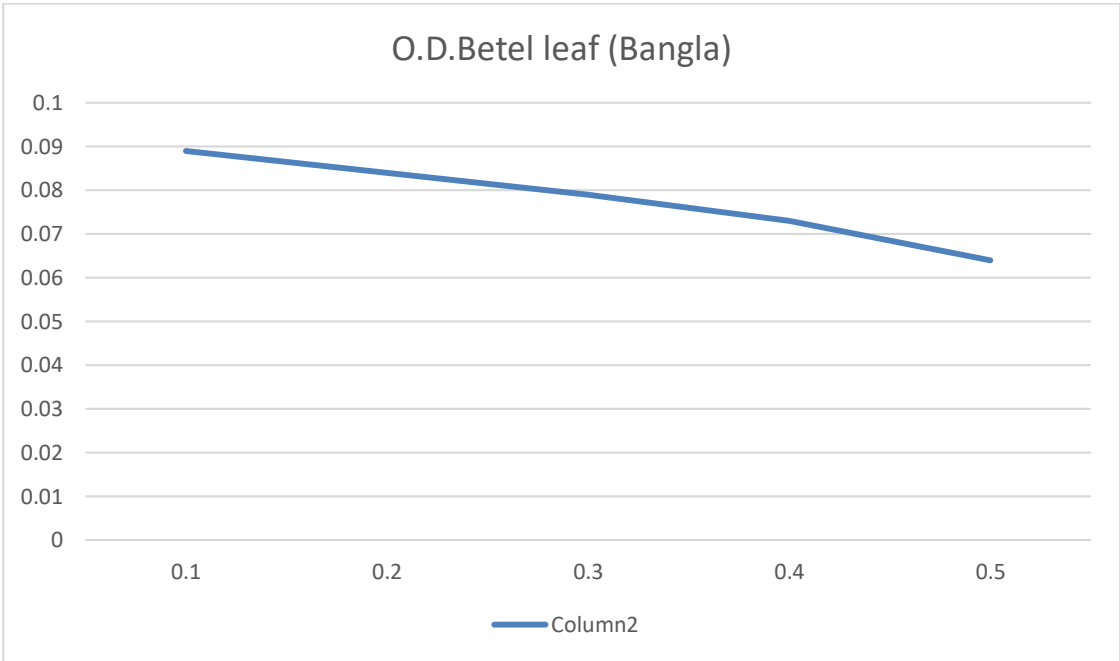
$$= 1.725 - 1/2(1.725 - 0.345)$$

$$= 0.5175$$

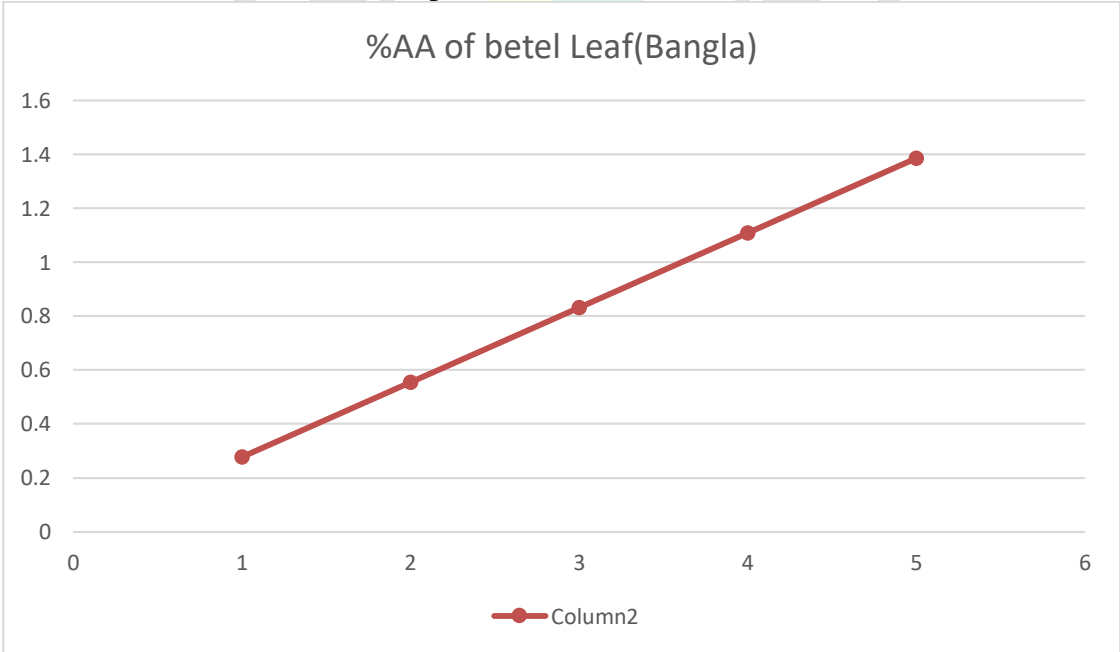
Table 1.2

Optical activity and percent antioxidant activity of aqueous extract of Piper betel (Bangla)

Concentration mg/ml	0.01	0.02	0.03	0.04	0.05
O.D of sample	0.089	0.084	0.079	0.073	0.064
% AA Betel leaf	0.277	0.554	0.831	1.108	1.385



Decrease in OD of sample with increase in concentration of extract

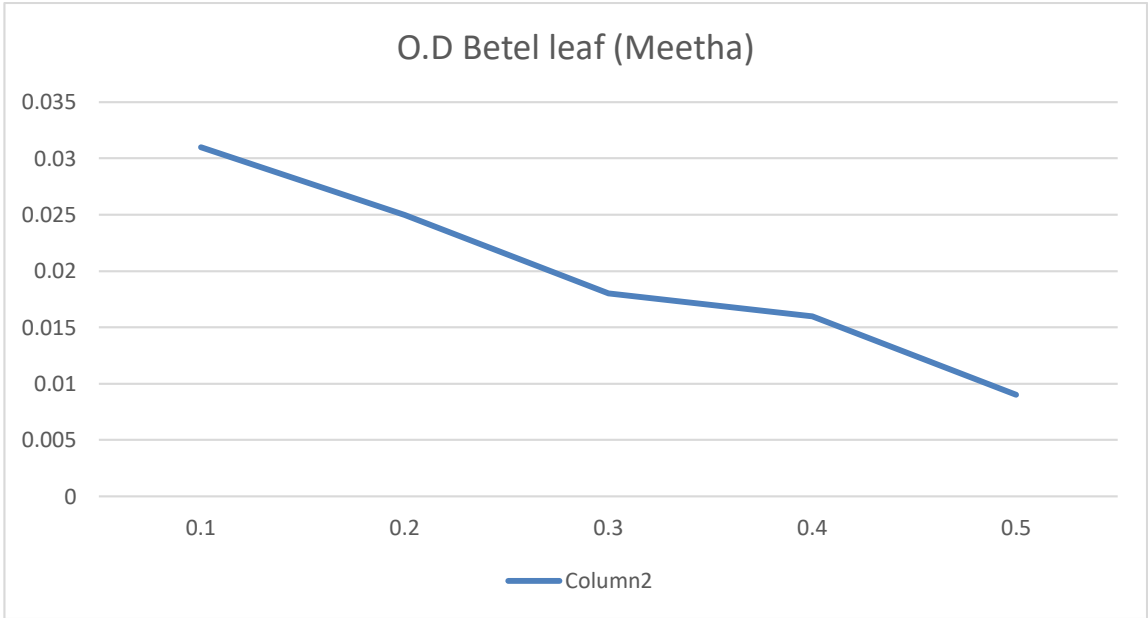


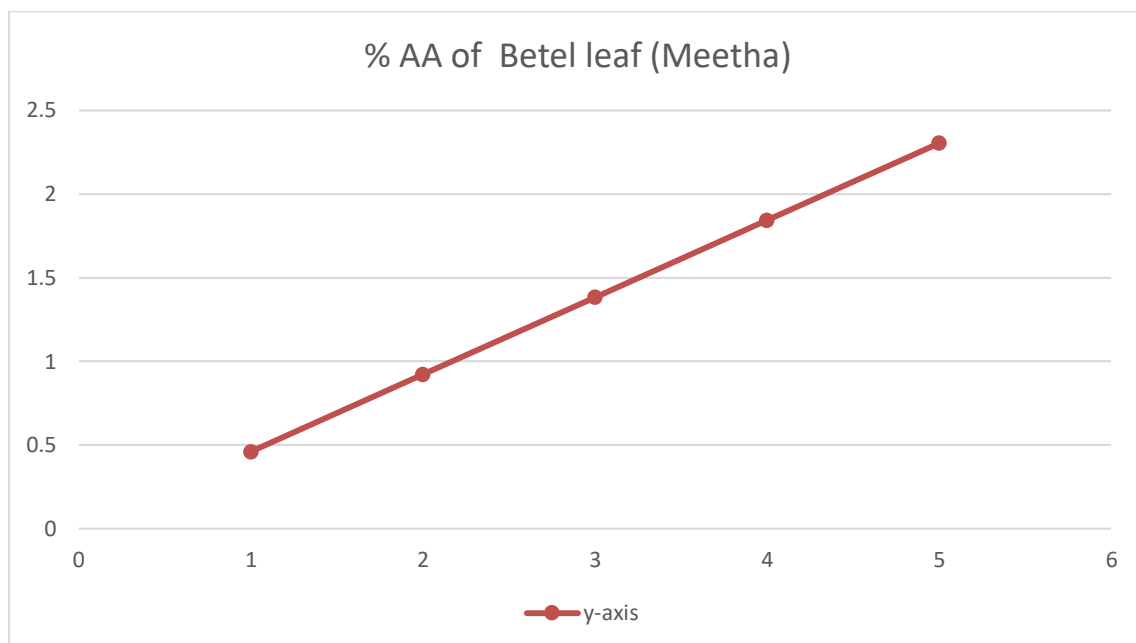
Increase in percent antioxidant activity with increase in concentration of extract.  
Calculation of IC<sub>50</sub> value for piper betel water extract =  $\text{max} - \frac{1}{2}(\text{max} - \text{min})$   
 $= 1.385 - \frac{1}{2}(1.385 - 0.277)$   
 $= 0.4155$

Table 1.3  
Optical activity and percent antioxidant activity of aqueous extract of Piper betel (Meetha variety)

Con (mg/ml)	0.01	0.02	0.03	0.04	0.05
O.d of B.leaf	0.031	0.025	0.018	0.018	0.009
%AA of B.leaf (Meetha)	0.461	0.922	1.383	1.844	2.305

Decrease in OD of sample with increase in concentration of extract





$$\begin{aligned} \text{Calculation of IC}_{50} \text{ value for piper betel water extract} &= \max - \frac{1}{2}(\max - \min) \\ &= 2.305 - \frac{1}{2}(2.305 - 0.461) \\ &= 0.6915 \end{aligned}$$

Remarkable decrease in O.D and increase in %AA was observed in water extract of piper betel.

The extract of piper betel show more capability of scavenging the DPPH and decrease in O.D than aqueous extract, which showed that of piper betel has more antioxidant activity than aqueous extract.

#### Comparison of IC<sub>50</sub> value of three sample of betel leaves given in table

Sr. No.	Extract	IC <sub>50</sub>
1	Aqueous extract of piper betal (Kapoori variety)	0.5175
2	Aqueous extract of piper betal (Bangla variety)	0.4155
3	Aqueous extract of piper betal (Meethavariety)	0.6915

#### Conclusion

From above study it is concluded that aqueous extracts of Piper betel has good antioxidant activity. The IC<sub>50</sub> for each extract have been found to 0.5175mg/ml , 0.4155mg/ml, and 0.6915mg/ml respectively. But out of the three variety the bangala leaves has less value of IC<sub>50</sub> it shows good antioxi-deant property than other two varieties.

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