



# EVALUATION OF ANTIOXIDANT ACTIVITY OF DIFFERENT SOLVENT EXTRACTS OF *MENTHA PIPERITA*

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## Abstract

Peppermint (*Mentha piperita*) has been reported to possess variety of physiological activities. The present study includes extraction of phytochemicals in two different solvents namely water and ethanol. Qualitative antioxidant activity was done by DPPH solution and quantitative estimation of antioxidant activity was carried out Colorimetrically. Both the solvent extracts showed moderate to good antioxidant activity. IC<sub>50</sub> values have also been recorded.

**Keywords:** *Mentha Piperita*, Antioxidant Activity, IC<sub>50</sub>

## Introduction

Peppermint (*Mentha piperita*, also known as *Mentha balsamea* wild) is hybrid mint, a cross between water mint and spearmint. Indigenous to Europe and the Middle East, the plant is now widely spread and cultivated in many regions of the world. It is occasionally found in the wild with its parent species. Peppermint (*Mentha piperita*) is an aromatic perennial plant that grows to a height perennial plant that grows to a height of about 3ft (1m.) It has light purple flowers and green leaves with serrated edges.<sup>1</sup>

Peppermint belongs to the lamiaceae family and grows throughout North America, Asia, and Europe, and there are more than 25 species of true mint grown throughout the world.<sup>2</sup>

Peppermint is a cooling, relaxing herb that contains properties that help ease inflamed tissues, calm muscle spasms or cramps, and inhibit bacteria and microorganisms. It also has pain relieving and infection-preventing qualities. Peppermint is one of the most popular flavoring agents.<sup>3-6</sup> The present study includes the evaluation of antioxidant activity of extracts of leaves of Peppermint.

## Material and method

The leaves of peppermint (*Mentha piperita L.*) Were purchased from a local market in Akola, Maharashtra.

### Solvent extraction

#### A] Preparation of aqueous extract of peppermint

50 g of peppermint leaves were poured in 70 ml of water and contents were allowed to stand for 18 hours. The extract was decanted into another beaker and used for study of antioxidant activity.

#### B] Preparation of ethanolic extract of peppermint

50 g of peppermint leaves were poured into 70 ml of ethanol and contents were allowed to stand for 2-3 hours. The extract was decanted into another beaker used for study of antioxidant activity.

#### Study of qualitative antioxidant activity of *Mentha piperita*:

0.02% of DPPH solution in ethanol was prepared. Single spot of each extract of *Mentha piperita* were taken on TLC plates and after drying the spot, TLC plates were dipped in DPPH solution and tested for antioxidant activity.

Ten different solutions of each extract of *Mentha piperita* were prepared as 0.01 mg/ml, 0.02 mg/ml, 0.03 mg/ml, 0.04 mg/ml, 0.05 mg/ml, 0.06 mg/ml, 0.07 mg/ml, 0.08 mg/ml, 0.09 mg/ml and 0.1 mg/ml respectively.

0.02% of DPPH was prepared in ethanol. 2 ml of this solution was mixed with 2 ml of 0.01 mg/ml solution of peppermint extract, and optical density was measured at 54 nm using colorimeter. Analogously optical density for all solutions of different concentrations of peppermint extract were recorded. A blank reading of DPPH was also recorded. The optical density was recorded and % antioxidant activity was calculated using formula giving below.

$$\text{Percent inhibition of DPPH (\%AA)} = \frac{A-B}{A} \times 100$$

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.

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

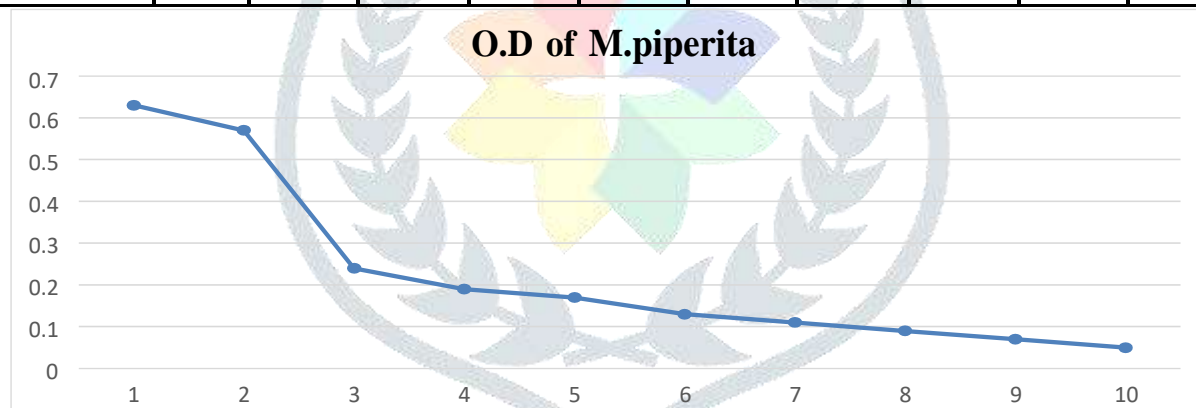
### RESULT AND DISCUSSION

Optical density of each of the solution of the sample was recorded by Cholorimeter and the results obtained are reported in following tables. IC<sub>50</sub> values have been determined for each extract.

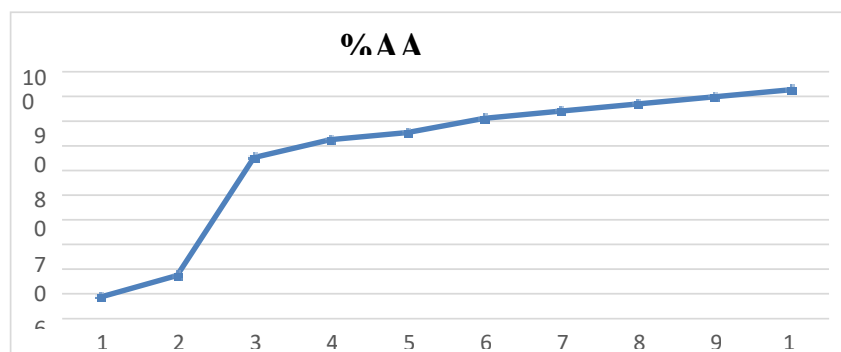
**Table 1.1**

**Optical density and percent antioxidant activity of aqueous extract of *Menthapiperita***

CONC.mg/ml	0.01	0.02	0.03	0.04	0.04	0.06	0.07	0.08	0.09	0.1
O.D of <i>M. piperita</i>	0.63	0.57	0.24	0.19	0.17	0.13	0.11	0.09	0.07	0.05
%AA	8.69	17.39	65.21	72.46	75.36	81.15	84.05	86.95	89.85	92.75



**Concentration of M. Piperita vs Optical Density**



**Concentration of M. Piperita vs %AA**

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

$$= 92.75 - \frac{1}{2} (92.75 - 8.69)$$

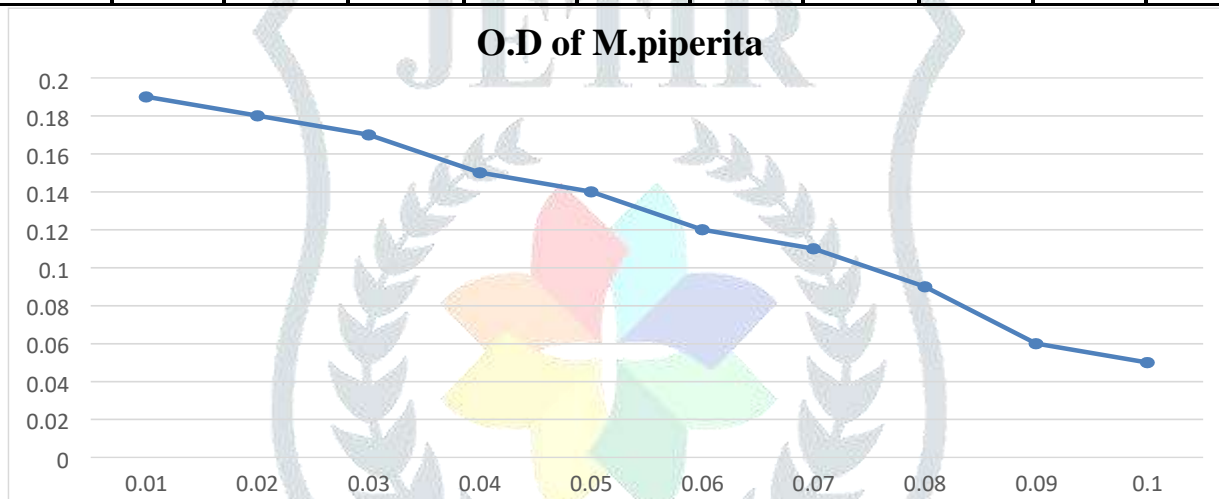
$$= 50.75$$

$$IC_{50} = 50.75 \text{ mg/ml}$$

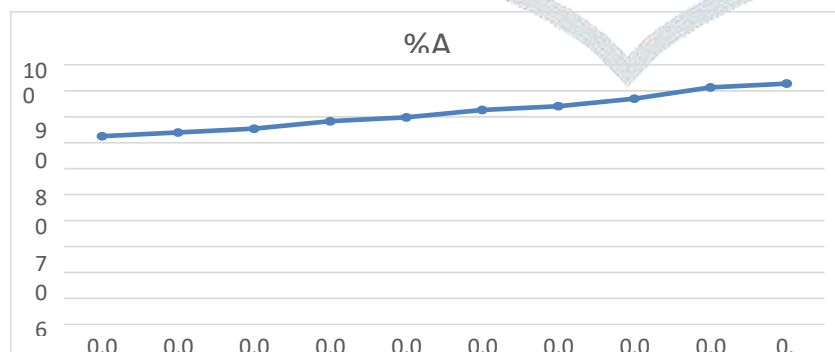
**Table 1.2**

**Optical density and percent antioxidant activity of ethanolic extract of *Mentha piperita***

CONC.mg/ml	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.1
O.D of <i>M. piperita</i>	0.19	0.18	0.17	0.15	0.14	0.12	0.11	0.09	0.06	0.05
%AA	72.46	73.91	75.36	78.26	79.71	82.60	84.05	86.95	91.30	92.75



**Concentration of *M. Piperita* vs Optical Density**



**Concentration of *M. Piperita* vs %AA**

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

$$= 92.75 - \frac{1}{2} (92.75 - 72.46)$$

$$= 82.61$$

$$IC_{50} = 82.61$$

Remarkable decrease in O.D and increase in %A.A was observed in water as well as ethanol extracts of *Mentha piperita*

### IC<sub>50</sub> Values of *M. Piperita* extracts.

Sr. No.	Extracts	IC <sub>50</sub>
1	Aqueous extract of <i>M. Piperita</i>	50.75 mg/ml
2	Ethanol extract of <i>M. Piperita</i>	82.61 mg/ml

### CONCLUSION

From above study it is concluded that aqueous & ethoanolic extracts of *M. Piperita* has good antioxidant activity. The IC<sub>50</sub> values for water and ethanol extracts have been from to be 50.75 mg/ml and 82.61 mg/ml respectively.

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