ANTIOXIDANT ACTIVITY OF CHLOROXYLON SWIETENIA DC. LEAVES

1Jyotishkha Agrawal, 2Ravi Upadhayay, 3Shailbala Sanghi
1Research scholar of Barkatullah University Bhopal (M.P.), INDIA.
2Professor of Botany Department, Govt. P.G. College Pipariya, Hoshangabad (M.P.), INDIA.
3Assistant Professor of Botany Department, M.L.B. College Bhopal (M.P.), INDIA.

Abstract: Natural product, especially plants, have been used for the treatment of various diseases in different type of medicinal system in thousands years. Present study indicate that Chloroxylon sweitenia methanolic extract (20 to 100μg/ml) found in antioxidant activity compared with standard antioxidant (ascorbic acid). IC50 value for standard ascorbic acid and methanolic extract was respectively found to be (40.38 μg/ml, 69.45 μg/ml). The antioxidant activity of methanolic extract was found to be less than that of standard ascorbic acid.

Index Terms - Antioxidant activity, DPPH, Chloroxylon sweitenia DC., phytochemicals.

INTRODUCTION

Plants provide various types of natural products; plants with healing properties are used in traditional medicine since time immemorial by human beings, they are also known as, ‘Medicinal plants’. These medicinal plants are used for curing various diseases from the prehistoric times (Sumner & Judith 2000; Arsdall & Anne V. 2002; Atanasov et.al.2015;Smith –Hall 2012). These medicinal plants synthesize various compounds these synthesized chemical compounds of medicinal value are known as, ‘Phytochemicals’ (Newman, D. J. & Cragg G. M. 2012; Brown, D.E.& Walton, N. J.1999). Phytochemicals are responsible for medicinal activity in the plants, these bioactive compounds are alkaloids, flavonoid and phenolic compounds (Venkataswam et. al. 2010; Gupta et. al. 2010; Kiran SR & Devi PS 2007). Basically Phytochemicals are the product of primary or secondary metabolism of plants and provides specific color, flavor and fragrance to the plants. These Phytochemicals are non-essential nutrients which provide immunity against various diseases to the human (Meskin & Mark S. 2002). The DPPH method was introduced by Marsden Blois (1958). The modified method introduced by Brand-Williams et al. (1995) has been extensively used (Gomez-Alonso et al. 2003; Ypez et al. 2002). EC50 (efficient concentration) term used by (Brand-Williams et al. 1995; Bondet et al. 1997) for the interpretation of the results from DPPH method. This is defined as the concentration of substrate that causes 50% reduction in the DPPH colour (Sagar B. Kedare & R. P. Singh 2011).

Chloroxylon sweitenia is known as ‘Bherul’ in Sanskrit and ‘East Indian Satinwood’ in English. It is a medium sized tree, prefers moist tropical area with a temperature range of 30 – 40 °C, the average rain fall of 1000 – 1500 mm and soil pH of between 5 – 7. C. sweitenia is a member of family Rutaceae. This is a moderate size tree of 9-15 meters in height and 1.0-1.2 meter in girth, with short straight, clear bole up to 3 meter, and spreading crown, common in dry deciduous forests throughout peninsular India (Jyoti et.al. 2017). C. sweitenia is fund in central and southern India, Sri Lanka, Nigeria and Madagascar. This plant is basically the source of timber used for the home decoration and packing boxes, heavy construction, agriculture and fuelwood. The heartwood of C. sweitenia is cream or golden yellow in color and possesses aromatic compounds, which protects them from insects and variety of microbes including fungus (Farmer R.H.1972; Mujumdar et al. 1977).
Identify and collection of plant-

The plant was collected from forest of Hoshangabad in the month of July 2016. This plant was subsequently identified from local flora and herbarium as Chloroxylon swietenia DC and the Vaucher specimen was deposited in the Herbarium of Botany department Govt. P.G. College Pipariya, Hoshangabad. Fresh leaves, bark and other material were collected from forest of nearby Hoshangabad.

Preparation of plant extract-

Leaves were washed thoroughly 2-3 times with running tap water and dried in room temp. After one week dried plant material was blended to make homogenous powder and used for successive soxhlet extraction (Anupam B. et. al. 2011; Mandeep S. & Sharma E. 2013; Chaturvedi S. et.al. 2011) 65 g of the powder was filled in the thimble and extracted successively with various solvents like Pet. Ether, Chloform, Ethyl acetate, Methanol, and Aqueous (in the ratio of 1:2). Soxhlet was kept running for 72 hours at 30-40 C, until the solvent color appears in the collection tube.

DPPH radical scavenging activity-

1. Experimental:

DPPH scavenging activity was measured by the spectrophotometer. Stock solution (1.5 mg/ml in methanol) was prepared such that 75 µl of it in 3 ml of methanol gave an initial absorbance of 0.349. Decrease in the absorbance in presence of sample extract
at different concentration was noted after 15 minutes.

1.1 Preparation of stock solution of test sample:

10mg of the extract was dissolved in 10 ml of methanol to get 100 µg/ml solution.

2.1.1. Dilution of test solution:

20, 40, 60, 80 and 100 µg/ml solution of the test samples were prepared from stock solution.

2.1.2. Preparation of DPPH solution:

15 mg of DPPH was dissolved in 10 ml of methanol. The final solution was covered with aluminum foil to protect from light.

2.2 Estimation of DPPH radical scavenging activity:

75µl of DPPH solution was taken and volume made till 3 ml with methanol, absorbance was taken immediately at 517 nm for control reading. 75 µl of DPPH and 50 µl of the test sample of different concentration were put in a series of volumetric flasks and final volume was adjusted to 3 ml with methanol. Three test samples were taken and each processed similarly. Finally the mean was taken. Absorbance at zero time was taken for each concentration. Final decrease in absorbance was noted of DPPH with the sample at different concentration after 15 minutes at 517 nm.

Calculation of % Reduction = \frac{\text{Control absorbance - Test absorbance}}{\text{Control Absorbance}} \times 100

RESULTS AND DISCUSSION

Standard (ascorbic acid)-

Table 1 Showing on absorbance and % inhibition in different concentration of ascorbic acid.

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Concentration µg/ml</th>
<th>Absorbance (517nm)</th>
<th>% Inhibition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Control</td>
<td>0.349</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>20</td>
<td>0.268</td>
<td>23.20917</td>
</tr>
<tr>
<td>3</td>
<td>40</td>
<td>0.251</td>
<td>28.08023</td>
</tr>
<tr>
<td>4</td>
<td>60</td>
<td>0.212</td>
<td>39.25501</td>
</tr>
<tr>
<td>5</td>
<td>80</td>
<td>0.145</td>
<td>58.45272</td>
</tr>
<tr>
<td>6</td>
<td>100</td>
<td>0.111</td>
<td>68.48138</td>
</tr>
<tr>
<td></td>
<td>IC 50</td>
<td></td>
<td>40.38146</td>
</tr>
</tbody>
</table>

Methanolic extract-

Table 2 Showing on absorbance and % inhibition in different concentration of methanolic extract.

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Concentration µg/ml</th>
<th>Absorbance (517nm)</th>
<th>% Inhibition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Control</td>
<td>0.349</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>20</td>
<td>0.162</td>
<td>53.58166</td>
</tr>
<tr>
<td>3</td>
<td>40</td>
<td>0.148</td>
<td>57.59312</td>
</tr>
<tr>
<td>4</td>
<td>60</td>
<td>0.111</td>
<td>68.19484</td>
</tr>
<tr>
<td>5</td>
<td>80</td>
<td>0.072</td>
<td>79.36963</td>
</tr>
<tr>
<td>6</td>
<td>100</td>
<td>0.044</td>
<td>87.39255</td>
</tr>
<tr>
<td></td>
<td>IC 50</td>
<td></td>
<td>69.45682</td>
</tr>
</tbody>
</table>
IC$_{50}$ for standard Ascorbic acid was found to be 40.38µg/ml and for methanolic extract was found to be 69.45µg/ml. Thus the anti-oxidant activity of sample was less than that of standard ascorbic acid.
CONCLUSION

As the free radicals are harmful for organism and they cause different type of diseases. The Methanolic extract of *Chloroxylon swietenia DC* possesses antioxidant activity as compared to ascorbic acid. The reported IC$_{50}$ value for the standard Ascorbic acid and Methanolic extract *Chloroxylon swietenia DC* were 40.38μg/ml and 69.45μg/ml respectively. The reported antioxidant activity of the Methanolic extract of *Chloroxylon swietenia DC* could be very helpful for the further research and also a cost effective way to cure many diseases.

ACKNOWLEDGEMENT

Author would like to acknowledge Mr. Prabhat Jain, Scan Laboratory and Prabhat Soni for their moral and technical support.

REFERENCES

32. Thymol (CID=6989). NIH. Retrieved 26 February 2017. THYMOL is a phenol obtained from thyme oil or other volatile oils used as a stabilizer in pharmaceutical preparations, and as an antiseptic (antibacterial or antifungal) agent. It was formerly used as a vermifuge.