In Vitro Antioxidant study of Amalaki (Emblica officinalis)

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Abstract

**Background:** Amalaki (Emblica officinalis) which is used to cure a number of ailments & considered as Amrutphala (life giving fruit). Amalaki is best potent herb rich with antioxidant.

**Objective:** The present study to assess the antioxidant assays, by 2-diphenyl-1-picrylhydrazyl (DPPH) standard protocol method.

**Materials and Methods:**

**Study Setting:** ACRL SJGAMC&H Koppal. Amalaki (Emblica officinalis) was procured from SJG Ayurveda Medical College Pharmacy Koppal, Karnataka, India, and was subjected to Antioxidant study by DPPH standard protocol method.

**Results:** It was observed that Amalaki indicated excellent antioxidant activity when compared to standard Ascorbic acid with the IC50 value of 77.52 and 64.5 respectively.

**Conclusion:** These results clearly indicate the antioxidant potentials of Amalaki proving its medicinal efficacy.

**Keywords:** Amalaki (Emblica officinalis) Antioxidant, 2-diphenyl-1-picrylhydrazyl

**Study & Article History:** Sample Received at 20/06/2022 study conducted in ACRL published in Avishkara Vol 1, Issue 2, July 2022.

Introduction:

Amalaki or Indian gooseberry (Emblica officinalis) is known for its medicinal and therapeutic properties from the ancient time in India and considered as a wonder fruit for health conscious population. Owing to its significant medicinal and nutritive value, it finds a prominent place in ancient Indian mythological literatures like Vedas, Shivpuran, Askandhpuran, Padmapuran, Ramayana, Kadambari, Charak Samhita, Sushrut Samhita etc. and considered as Amrit Phal (life giving fruit). Amalaki is having prime position amongst the...
Anti-aging drugs. It is the best tissue rejuvenating herb. It is a potent herb rich with Anti-oxidant, Vitamin-C, Tannin and Gallic acid. Amalaki possesses key properties like Rasayana (Adaptogenic), Ajara (Anti-ageing), Ayushprada (prolonged cell life), Sandhaniya (Improves cell migration and cell binding). It promotes, protects and extends youthful state and thus, curtailing Ageing process. Amalaki fruit has a special characteristic features which makes it a nurturing herb that is credited with a number of health benefits. In Ayurvedic tradition, the fruit forms an integral part of medicinal preparations that are used to support wellness and healthy Ageing. Charaka Samhita mentioned Amalaki is one of the most potent and nutritious drug and also a best rejuvenating herb (AmalakiVayasthapnanamSreshtham). Amalaki has low molecular weight hydrolysable Tannins, thereby it is considered as one of the more strong antioxidant herb in Ayurveda.

Free radicals are natural byproducts of our own metabolism. Apart from supplementing nutrition Amalaki gets rid of these free radicals which enhance cell ageing due to high amount of vitamin-C and flavonoids in it. Natural phenolics play a key role in antioxidative defense mechanism in biological system. Antioxidant Amalaki fruit is a rich source of vitamin C and low molecular weight hydrolysable tannins. Because of these content Amalaki becomes a good source of antioxidant. Tannins like embelicanin-A (37%), emblicanin-b (33%), punigluconin and pedunculagin conjointly give protection against Oxygen radical enclosed hemolysis of rat peripheral blood erythrocytes, hence a study undertaken to assess the antioxidant activity of Amalaki.

**Materials & Methods:**

**Sample preparation:**
Amalaki was obtained from SJG Ayurveda Medical College Pharmacy Koppal, Karnataka, India.

**Study Setting:** ACRL SJGAMC&H Koppal Antioxidant studies, namely 2-diphenyl-1-picrylhydrazyl (DPPH) free-radical scavenging activity, assay, were conducted by standard procedures.

**DPPH radical scavenging assay**
DPPH radical reacts with an antioxidant compound that can donate hydrogen and get reduced. DPPH, when acted by an antioxidant, is converted into diphenylpicryl hydrazine. This can be identified by the conversion of purple to light yellow color. DPPH radical scavenging assay of test sample Emblicaofficinale. In brief, 0.004% DPPH was prepared in methanol. The different concentrations of test samples and standard were taken as shown in Table no 1 in the concentration of 1mg/ml, and the total volume was made to 3ml, and then 1ml DPPH was added to the mixture. The reaction mixture was mixed throughly and kept for incubation in dark for 30 min. The absorbance of the mixture was measured at 517 nm. The ascorbic acid was used as the reference standard. The ability of plant extract to scavenge DPPH radical and control was calculated from the following formula:

\[
\% \text{ DPPH inhibition} = \left[ \frac{\text{abs of control} - \text{abs of sample}}{\text{abs of control}} \right] \times 100
\]

**Fig 1:** The DPPH Radical scavenging assay results of Amalaki sample and control.
Results:

The antioxidant radical scavenging activity of amalaki showed IC50 value of about 77.52.

<table>
<thead>
<tr>
<th>Concentration (µg/ml)</th>
<th>Methanol in µl</th>
<th>DPPH in ml</th>
<th>Control absorbance</th>
<th>Sample</th>
<th>%RSA</th>
<th>IC50</th>
</tr>
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<tbody>
<tr>
<td>20</td>
<td>2980</td>
<td>1</td>
<td>0.30 34</td>
<td>0.24 54</td>
<td>19.11</td>
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</tr>
<tr>
<td>40</td>
<td>2960</td>
<td>1</td>
<td>0.30 34</td>
<td>0.20 56</td>
<td>32.2</td>
<td>77.52</td>
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<tr>
<td>60</td>
<td>2940</td>
<td>1</td>
<td>0.30 34</td>
<td>0.17 54</td>
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<tr>
<td>80</td>
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<td>1</td>
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<tr>
<td>100</td>
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<td>1</td>
<td>0.30 34</td>
<td>0.11 214</td>
<td>59.98</td>
<td></td>
</tr>
</tbody>
</table>

Table 1: Showing DPPH Radical Scavenging activities of Amalaki

<table>
<thead>
<tr>
<th>Concentration (µg)</th>
<th>Amalaki</th>
<th>Ascorbic acid</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>19.11</td>
<td>20</td>
</tr>
<tr>
<td>40</td>
<td>32.2</td>
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<tr>
<td>100</td>
<td>59.98</td>
<td>70</td>
</tr>
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</table>

Table 2: Showing %RSA of Amalaki and Ascorbic Acid

Conclusion:

In this study, the antioxidant activity of amalaki was determined using the DPPH assay, the degree of discoloration of the DPPH solution determined the scavenging potential of the extract. 50% inhibition concentration (IC₅₀) was calculated as away to assess different concentration of extract, antioxidant properties in comparison with a known standard, that is Ascorbic acid. The results showed that high DPPH Scavenging activity of the extract has the value of IC₅₀ of 77.52 comparing this activity with standard ascorbic acid with IC₅₀ value of 64.5 reveals that the antioxidant power of the sample is more than...
that of the standard. This may be due to the presence of flavonoids phenols, the presence of phenols in amalaki were confirmed by phytochemical screening. The results indicates that amalaki has good antioxidant activities which could be contributing factors to the medicinal roles.

Reference