INTRODUCTION: Medicinal plants are the richest bio-resources for the discovery of modern drugs. These medicinal plants possess certain phytochemical compounds which act as a ailments for the infective diseases like bacterial, fungal, viral and cancer disorders. Aerva lanata Linn. belongs to the family Amaranthaceae, is a herbaceous perennial weed growing in the hot region of India at the altitude of 3000m. Commonly it is called as ‘Chaya’ in hindi, ‘Bhadram’ in Sanskrit and ‘Pulai’ in Tamil. Traditionally the plant is used for the treatment of Diuretic, Antiparasitic, Antihelminthic 1, Antidiabetic, Expectorant 2, Antimicrobial, Cytotoxicity 3, Urothitiasis, Anti-inflammatory activity 4, Nephroprotective 5, Anti-hyperglycemic 6. A partially purified fraction of Aerva lanata was found to be protection against liver damage by acting as an antioxidant agent 7.

Canthin-6-one and beta carboline alkaloids were isolated from Aerva lanata leaves 8. The leaves of Aerva lanata are used as sap for eye complaints, an infusion is given to cure diarrhoea and kidney stone and the root is used in the snake bite.

The aim of this study was to investigate the phytochemical compounds and antioxidant activity. Phytochemicals are the bioactive compounds which is responsible for the physiological action of the human body. The most significant phytochemicals includes alkaloids, flavonoids, tannins, phenols, quinines, terpenoids, coumarins etc. These phytochemicals act as a anti infective agents 9. Further the extracts was analysed for antioxidant activity. Antioxidants are the compounds which help to delay or inhibit the oxidation of lipids and other molecules through the inhibition of either initiation or propagation of oxidative chain reactions 10.

MATERIALS AND METHODS:
Collection of Plants: Plants for this study were collected from Chinnapaliyampattu, Tiruvannamalai district and was authenticated by Dr.
Rathna kumar, Department of plant biotechnology, Presidency college, Chennai-05.

**Preparation of Extracts:** Collected plants were dried at room temperature and ground to make fine powder. 20gm of plant powder was well dissolved in 100ml of solvents (Hexane, Ethyl acetate and Ethanol) (ratio 1:5). The suspension was filtered by using Filter paper of pore size 0.2µm. The filtrate was then air dried and extracts were collected in sterile vials for further use.

**Phytochemical tests:**

The phytochemical test of these extracts was performed using the method adopted by Harborne\textsuperscript{11} and Sofowora\textsuperscript{12}.

**Test for carbohydrates (Molisch’s test):**

To 2ml of plant extract, 1ml of Molisch’s reagent and a few drops of concentrated sulfuric acid were added. Presence of purple or reddish color indicates the presence of carbohydrates.

**Test for tannins (Ferric chloride test):**

To 1ml of plant extract, 2ml of 5% ferric chloride was added. Formation of dark blue or greenish black indicates the presence of tannins.

**Test for saponins (Frothe’s test):**

To 2ml of plant extract, 2ml of distilled water was added and shaken in a graduated cylinder for 15minutes lengthwise. Formation of a 1cm layer of foam indicates the presence of saponins.

**Test for flavonoids (Shinoda test):**

To 2ml of plant extract, 1ml of 2N sodium hydroxide was added. Presence of yellow color indicates the presence of flavonoids.

**Test for alkaloids (Mayer’s test):**

To 2ml of plant extract, 2ml of concentrated hydrochloric acid was added. Then a few drops of Mayer’s reagent were added. The presence of green color or white precipitate indicates the presence of alkaloids.

**Test for quinines:**

To 1ml of extract, 1ml of concentrated sulfuric acid was added. Formation of red color indicates presence of Quinones.

**Test for glycosides (Molisch’s test):**

To 2ml of plant extract, 3ml of chloroforms and 10% ammonia solution was added. Formation of pink color indicates presence of glycosides.

**Test for cardiac glycosides (Keller – Kiliani test):**

To 0.5ml of extract, 2ml of glacial acetic acid and a few drops of 5% ferric chloride were added. This was under layered with 1 ml of concentrated sulfuric acid. The formation of brown ring at the interface indicates presence of cardiac glycosides.

**Test for terpenoids (Salkowski test):**

To 0.5ml of extract, 2ml of chloroform was added and concentrated sulfuric acid is added carefully. Formation of red brown color at the interface indicates presence of terpenoids.

**Test for triterpenoids:**

To 1.5ml of extract, 1ml of Libemann –Buchard Reagent (aceticanhydride+ concentrated sulfuric acid) was added. Formation of blue green color indicates presence of triterpenoids.

**Test for phenols (Ferric chloride test):**

To 1ml of the extract, 2ml of distilled water followed by a few drops of 10% ferric chloride was added. Formation of blue or green color indicates presence of phenols.

**Test for coumarins:**

To 1 ml of extract, 1ml of 10% NaOH was added. Formation of yellow color indicates presence of coumarins.

**Steroids and phytosteroids (Libermann- Buchard test):**

To 1ml of plant extract equal volume of chloroform is added and subjected with a few drops of concentrated sulfuric acid appearance of brown ring indicates the presence of steroids and appearance of the bluish brown ring indicates the presence of phytosteroids.

**Phlobatannins:**

To 1ml of plant extract few drops of 2% HCL was added appearance of red color precipitate indicates the presence of phlobatannins.
Anthraquinones (Borntrager’s test):  
To 1ml of plant extract few drops of 10% ammonia solution were added, appearance pink color precipitate indicates the presence of anthraquinones.

Antioxidant activity:  
The antioxidant activity of Plant extracts was determined by, the DPPH(1,1-diphenyl-2-picryl-hydrozyl) in vitro method.

DPPH free radical scavenging activity:  
The antioxidant activity of Hexane, Ethyl acetate and Ethanolic extracts of Aerva lanata and the standard compound BHT was measured in terms of hydrogen donating radical scavenging ability using the stable DPPH method. 1ml of extract was added to 3.7mL of methanol solution. After centrifugation, the supernatant is collected 200μml of DPPH solution is added. Kept in the dark for 45 min and the resulting decrease in absorbance at 517 nm were recorded against blank using a UV-Vis Spectrophotometer.

The radical scavenging activity on DPPH was expressed as, % DPPH radical-scavenging = [(Absorbance of control - Absorbance of test Sample) / (Absorbance Of control)] x 100.

RESULTS:  
The preliminary phytochemical screening of Aerva lanata showed the presence of plant components such as carbohydrates, tannins, flavonoids, cardiac glycosides, terpenoids, phenols and coumarins in hexane extract, carbohydrates, tannins, flavonoids, cardiac glycosides and phenols in ethyl acetate extract and carbohydrates, tannins, flavonoids, quinones, cardiac glycosides, phenols and coumarins in ethanol extract. (Table 1).

TABLE 1: PHYTOCHEMICAL ANALYSIS OF AERVA LANATA

<table>
<thead>
<tr>
<th>S.No</th>
<th>Phytochemical Tests</th>
<th>Test performed</th>
<th>Hexane</th>
<th>Ethyl Acetate</th>
<th>Ethanol</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Carbohydrates</td>
<td>Molisch’s test</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>2.</td>
<td>Tannin</td>
<td>Ferric chloride test</td>
<td>-</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>3.</td>
<td>Saponin</td>
<td>Frothe’s test</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>4.</td>
<td>Flavonoids</td>
<td>Shinoda test</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>5.</td>
<td>Alkaloids</td>
<td>Mayer’s test</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>6.</td>
<td>Quinones</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>7.</td>
<td>Glycosides</td>
<td>Molisch’s test</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>8.</td>
<td>Cardiac glycosides</td>
<td>Keller – Kiliani test</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>9.</td>
<td>Terpenoids</td>
<td>Salkowski test</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>10.</td>
<td>Phenols</td>
<td>Ferric chloride test</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>11.</td>
<td>Coumarins</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>12.</td>
<td>Steroids</td>
<td>Libermann – Buchard test</td>
<td></td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>13.</td>
<td>Phytofuranoids</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>14.</td>
<td>Anthraquinones</td>
<td>Borntrager’s test</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Free radical scavenging activity:  
The stable free radical scavenging activity by the DPPH method is an easy, rapid and sensitive way to survey the antioxidant activity of a specific plant extracts. Fig. 2 indicates the percentage of free radicals scavenging activity in various extractions with different concentrations 25µg, 50µg and 75µg of Aerva lanata. In this study percentage inhibition of free radicals was carried out with different extractions of selected plants. Ethanol extract with 75µg concentration gives higher percentage (59.40%), Ethyl acetate extract showed moderate activity of 47.57% and Hexane extract showed least activity of 36.64% of free radical scavenging activity. The free radical scavenging activity increases with increase in concentration (Table 2, Fig.1). The percentage inhibition of control was found to be 81.68% which showed higher activity than the extract.

TABLE 2: DPPH ASSAY OF AERVA LANATA AGAINST DIFFERENT EXTRACTS

<table>
<thead>
<tr>
<th>Concentrations (µg)</th>
<th>Control</th>
<th>% of Inhibition</th>
<th>Hexane</th>
<th>Ethyl acetate</th>
<th>Ethanol</th>
<th>BHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>0.9593</td>
<td></td>
<td>28.83±0.93</td>
<td>38.03±1.44</td>
<td>16.12±0.52</td>
<td>72.36±1.64</td>
</tr>
<tr>
<td>50</td>
<td>0.9593</td>
<td></td>
<td>31.48±0.75</td>
<td>43.26±0.53</td>
<td>21.51±0.45</td>
<td>76.23±0.85</td>
</tr>
<tr>
<td>75</td>
<td>0.9593</td>
<td></td>
<td>36.64±0.56</td>
<td>47.57±0.40</td>
<td>59.40±0.93</td>
<td>81.68±0.61</td>
</tr>
</tbody>
</table>
**DISCUSSIONS:** The results of the present study reveals that the ethanolic extract of *Aerva lanata* showed maximum number of components such as Carbohydrate, tannin is used for the treatment of skin eruption and bowel condition, flavonoids possess wound healing activity due to the astringent, antioxidant and antimicrobial properties which appear to be responsible for wound contraction and elevated rate of epithelisation \(^{14}\), Quinones, Cardiac glycosides, phenols was found to be toxic to the growth and development of pathogens and Coumarins in the ethanolic extract when compared to other solvents. Previous study reported that presence of Flavonoids, Tannins, Anthraquinones from the stem extract of *Aerva lanata* \(^{15, 16}\). The present work also correlates with the aforesaid studies. The ethanolic extract showed maximum antioxidant activity when compared to other solvents. Hence the ethanolic extract can act as a maximum scavenging activity and can protect the cells from the free radicals.

**CONCLUSION:** The present study suggests that the *Aerva lanata* have maximum number of bioactive components and higher amount of antioxidant potential in the ethanolic extract, therefore the ethanolic extract may act as a significant activity and can be further analysed for many pathogenic disorders as well as may be helpful in future for preventing or slowing the progress of diseases involved. However it is obvious that fewer information was available further in order to explore this plant more researchers should be carried out.

**REFERENCES:**