ABSTRACT

*Nerium oleander* is an evergreen shrub or small tree in the dogbane family Apocynaceae. It is commonly known as oleander but has many other names like *Nerium indicum* mill. and *Nerium odorum* soland. The present study was carried out for pharmacognostic evaluation, physical evaluation, and phytochemical evaluation according to standard procedures. The flowers of *Nerium oleander* were collected, shade dried and extraction was done by simple maceration method. The preliminary morphological studies, macroscopic as well as microscopic evaluation, physical evaluation and preliminary phytochemical screening for the presence of alkaloids, flavonoids, carbohydrates, glycosides, tannins, terpenoids, phenolics, steroids and saponins for petroleum ether, chloroform, methanol and aqueous extracts of *Nerium oleander* flowers were carried out. The physical evaluation was carried out for the determination of petroleum ether soluble extractive value, methanol soluble extractive value, water soluble extractive value; ash value includes total ash, acid insoluble ash and water soluble ash, moisture content, volatile oil content for the flowers of *Nerium oleander*.

**Keywords:** *Nerium oleander*, Phytochemical, Pharmacognostic, ash values, extractive values

INTRODUCTION

*Nerium oleander* is an evergreen shrub or small tree in the dogbane family Apocynaceae. It is commonly known as oleander but has many other names like *Nerium indicum* mill. and *Nerium odorum* soland. The white and red flowered variety is equated with *Nerium indicum*. *N. oleander* is distributed in Mediterranean region and Subtropical Asia, is indigenous to India–Pakistan subcontinent. Distributed in the Himalayas from Nepal westwards to Kashmir up to 1950 m, extending to Baluchistan, Afghanistan and found throughout India in gardens. The white and red flowered variety is equated with *Nerium indicum*.

Leaves, roots, root bark is used to treat various ailments. Charka prescribed the leaves of white flowered variety externally in chronic and obstinate skin diseases of serious nature including leprosy. Sushruta used karavira in medicinal paste for application in alopecia. Root powdered with water was applied to alleviate venereal diseases. The powder of leaves was used as a snuff for treating epilepsy. All parts of plant especially roots were known to be highly poisonous when taken internally. Tincture of flowers exhibited cardiotonic, root CNS-active and spasmylytic activity. Externally, root exhibited healing properties for haemorrhoids and ulcers. Oil of root bark gave good results in leprosy. In Homoeopathy, tincture of *Nerium oleander* (red laurel) leaves is used in diseases of nervous system, hemiplegia and paralytic conditions under strict medical supervision.

Experimental Section

MATERIALS & METHODS

Collection and authentification of plant material

Plant Material – The flowers of *Nerium oleander* were collected from the local regions of Naya Nangal in August 2013. They were identified by sending it to Director, NISCAIR New Delhi. The collected parts were dried under shade at room temperature and powdered to coarse material in grind mill. The powder was passed through 40# mesh particle size and stored in airtight container at room temperature.

Macroscopic studies

The flowers were taken and studied for their various parameters.

Physical appearance

Microscopic studies

Powder studies – Fine powder # 60 of the dried flowers was taken for the observation of powder microscopic characters. The powder was treated separately with glycerine, phosphogluconol HCl, iodine, and Potassium iodide solution and was observed under compound microscope. Microscopic cells like parenchymatous cells, vessels, unicellular trichomes, starch grains were observed in powder.

Physical evaluation

*Author for Correspondence*
Table 1: Physical Test of Crude drug Nerium oleander
<table>
<thead>
<tr>
<th>Nature</th>
<th>Colour</th>
<th>Odour</th>
<th>Taste</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coarse powder</td>
<td>White</td>
<td>Faint</td>
<td>Slightly bitter</td>
</tr>
</tbody>
</table>
Table 5: Phytochemical Screening

<table>
<thead>
<tr>
<th>Test</th>
<th>Pet ether extract</th>
<th>Chloroform extract</th>
<th>Methanolic extract</th>
<th>Aqueous extract</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test for Steroids</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Test for steroidal glycosides</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Test for tannins and phenols</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Test for Flavonoids</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Test for Carbohydrates</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Test for Cardiac Glycosides</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Test for Triterpenoids</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Test for Alkaloids</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Test for Proteins</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Test for Saponins</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>

**Test for Carbohydrates**

*Molish test* - to about 2 ml of an alcoholic extract few drops of *p*-naphthol (20% in ethyl alcohol) was added. Then about 1 ml of Conc. Sulphuric acid was added along the sides of the test tube. Reddish violet ring at the junction of two layers separated in the presence of carbohydrates.

*Fehling’s solution test* - the extract was heated with dilute HCl to hydrolyse polysaccharides. The reaction mixture is neutralized by adding NaOH solution and then Fehling solution 1 and 2 were added. A red ppt. formed in cases of reducing sugars/carbohydrates.

**Test for Steroids**

*Salkowski test* - when few drops of conc. Sulphuric acid is added to the test solution in chloroform, shaken and allowed to stand, produces red color in the Chloroform layer.

**Libermann - Burchard’s test** - the test solution in Chloroform is treated with few drops of acetic anhydride, Conc. H₂SO₄ is added from the side of the test tube. It shows a brown ring at the junction of the two layers and the upper layer turns green.

**Test for Glycosides**

The extract is tested for free sugars. After complete removal of sugar, the extract is hydrolysed with dilute mineral acid and then tested for the glycone and aglycone moieties.

**Test for Cardiac Glycosides**

*Liberman - Burchard’s test*

*Keller- Kiliani test*

*Raymonds test*

*Baljet test*

**Test for Cyanogenetic glycosides**

To one gram of powdered drug moistened previously in a test tube suspend a piece of sodium picrate paper above the drug by trapping the top edge between the cork and the tube wall. Allow standing for 30 minutes. The evolution of hydrocyanic and turns paper brick red (sodium isopurparerate)

**Test for Anthraquinone glycosides**

Bontrages test - powdered drug is boiled with dilute sulphuric acid and filtered. The filtrate is gently shaken with organic solvents, Separate the organic layer, to that add ammonia solution. Pink color appears.

**Test for Flavonoids**

Shinoda test (Mg - HCl reduction test) To the alcoholic solution add few fragments of magnesium ribbon, add HCl acid dropwise, pink to red crimson red color appears after few minutes.

Zn- HCl reduction test - to the test solution add a mixture of Zinc dust and Conc HCl gives a red color.

Ferric chloride test - to the test solution with Ferric chloride bluish green to black color in produced.

**Test for Phenols and Tannins**

*With gelatin solution* - treat the test solution with 1% gelatin solution containing sodium chloride white ppt. appears.

*With ferric chloride solution* - treat the solution with few drops of freshly prepared neutral ferric chloride solution separately, bluish black colour appears.

**Lead acetate test** - to the test solution add few drops of 10% lead acetate, yellow ppt. appears.

**Alcoholic HCl acid test** - to the test solution gently add alcoholic hydrochloric acid, red colour appears.

**Test for Saponins**

**Froth test** - Dilute aqueous extracts with distilled water separately to 20 ml and shake in a graduated cylinder for 15 minutes formation of 1 cm layer of foam which is stable for 15 minutes take place

**Haemolysis test** - sample is dissolved in physiological salt solution. To this 4% buffered equilibrated blood (pH 7.40) in added. Haemolysis of red blood cells occurs and can be noticed in the microscope.

**CONCLUSION**

In the present study ash values, extractive values were determined and phytochemical screening for various chemical constituents was carried out. The phytochemical screening of various extracts showed the presence of alkaloids, steroidal glycosides, carbohydrates, tannins and carbohydrates etc. It should be noted that steroidal compounds are of important interest in Pharmacy and so the extracts can be further studied for various pharmacological activities and provide future for the research in this field

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