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Phytochemistry of Nerium Oleander L. Root

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ABSTRACT

The present study revealed that, In *Nerium Oleander L.* plant roots are present bioactive phytoconstituents. In Apocyanace family of plant majority contains alkaloids and terepenoids. Extraction of phytoconstituents done by hot extraction method using soxhlet apparatus. The methanol extract have 18.20 % extractive value after successive extraction in n-hexane, chloroform, ethyl acetate extractive value 4.01 %, 6.12% and 9.35% respectively. The Brown colored root contains other minor phytoconstituents are stereoid, saponins, polar glycosides, carbohydrates and phenolic compounds. The phytochemical tests are performed for to finding bioactive secondary metabolic compounds. Plant have been reported many pharmaceutical activities such as antibacterial, antifungal, cytotoxic, antitumor activity.

Keywords : *Nerium Oleander L.*, alkaloids, trerepenoid.

I. INTRODUCTION

Current day's herbal medicines are best remedies for various indigenous diseases. Traditional drugs are a big part of pharmaceutical science. India is a native place of ayurveda. According to WHO 80 -85% of the word population use traditional medicine for various types of disease. In ayurveda *Nerium Oleander L.* plant is mentioned for it's therapeutically uses. The height of plant is two to six meter, linear stem, firstly stem have a glaucous bloom after mature stem have a grayish black. The green colored leaves have in pairs, thick and narrow lanceolae, 5 to 2o cm length, 1 to 3.4 broad. The inflorescence grows in cluster at the end of every branch with white, pink and red colored with 2 to 5 cm diameter. The fruit is a long narrow pair of follicles 5 to 23 cm long, which splits open at maturity to spread numbers of downy seeds.

Nerium oleander L. is native to a from Mauritania, Morocco and Portugal. It occurs in river valley, tolerate long seasons of droughts and inundation from winter rains. It is cultivated in many tropical and subtropical region. In India plants are planted in midterm region of national highway for pollution control. *Oleander* roots are poisonous. It contains toxins hence it is can not feed to caterpillars but in low dose it is non toxic. In Mediterranean climate oleander can be florescence from April to October.

The reported phytochemicals are below:

Table 1. Reported phytochemicals in *Nerium Oleander L.* Plant[1]

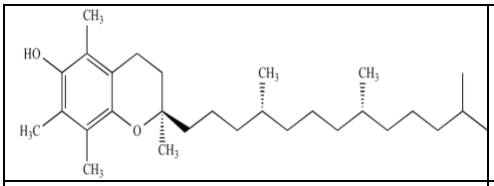
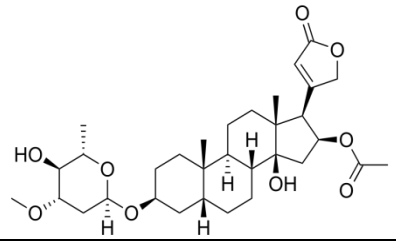
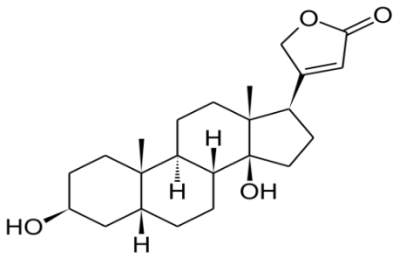
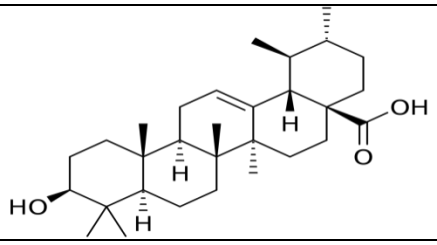
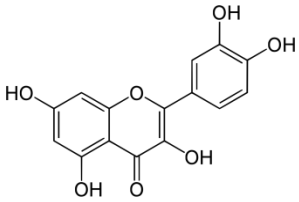
	**α-tocopherol**
	**Oleandrin**
	**Digitoxigenin**
	**Ursolic Acid**
	**Quercetin**

Figure 1. *Nerium Oleander L.* Plant

II. METHODS AND MATERIAL

1.1: Collection of Plant material:

The Nerium oleander L. roots were collected from western region of sahydri ghat, Maharashtra. The Coordinates of sahydri ghat is 10°10'N 77°04'E.

1.2: Preparation of herbarium and its authentication:

The plant leaf, inflorescence was authenticated by **Dr. M.S. Khyade of department of botany, S. N. Arts, D.J.M.Commerce and B.N.S.Science college, Sangamner. Taxonomic nomenclature done of plant is Nerium Oleander L.**

1.3: Drying and grinding of material:

Nerium Oleander L. roots were washing with tap water and then distilled water. The material was chopped into small cuts then grinding to small size powder and store in cool condition for further use.

1.4: Extraction:

Powder material was extracted by two methods.

1.4.1: Maceration:

Weigh 10 gm sample using calibrating balance with least count 0.001mg. The root powder was soaked in ethanol for 8 days with occasional shaking. After 8 days mixture was filtered by whatmann no.41 filter paper. Naturally solvent evaporated and extract stored in deep freezer for further study.

1.4.2: Hot extraction:

Weigh 100 gm plant root powder fill in the thimble of soxhlet. Soxhlet was run in ethanol solvent for 72 hrs. Thereafter root suspension was filtered and solvent evaporated using rotavapour with chiller. Extract obtained stored in cooler for further successive fractionation and preliminary phytochemicals study.

1.4.3: Successive extraction:

The extract was fractionating with non polar solvent to polar solvent. The n-hexane, chloroform, ethyl acetate extractive value calculated as NOH, NOC, NOE 1.25%, 1.83% and 2.66% respectively (w/w %).

1.5: Preliminary Phytochemicals screening test[6]

1.5.1: Test for alkaloids

a) Wagner's test: Take 4mg of extract add HCl and few drops of Wagner's reagent. Observed yellow colour.

b) Mayer's test: Take 6mg of extract add the Mayer's reagent. Observed yellow ppt.

1.5.2: Test for Carbohydrates

a) Fehling's test: Take 3mg of extract was shaken with 10ml of water, filtered and the filtrate was concentrated. Add 2 ml mixture of equal parts of Fehling's solution A and B were added and boiled for few minutes. Formation of red or brick red colored precipitate indicates the presence of reducing sugar.

b) Molisch's test: Take 2mg of extract was shaken with 5ml of water, filtered and the filtrate was concentrated. To this 4 drops of freshly prepared 15% alcoholic solution of α- naphthol was added. 4 ml of conc. H_2SO_4 was added so as to form a layer below the mixture. Red violet ring appear, indicating the presence of carbohydrates which disappear on the addition of excess of alkali.

1.5.3: Test for Flavonoids

Shinoda's test: Take 5 mg of extract was dissolved in 4ml of ethanol and to this 8drops of dilute Hcl followed by a small piece of mg metal were added. Formation of pink, reddish or brown colour indicates the presence of Flavonoids.

1.5.4: Test for Phenols

Nitric acid test: Take 2 mg extract, add conc. HNO_3 shake well, red colour indicates phenol present.

1.5.5: Test for Triterpenoids

Liebermann - Burchard's test: 5mg of dry extract was dissolved in acetic anhydride, heated to boiling, cooled and then 2 ml of concentrated H_2SO_4 was added along the sides of the test tube. Formation of a pink colour indicates the presence of trerepenoid.

1.5.6: Test for stereoids

Salkowski reaction: 4 mg of dry extract was shaken with chloroform, to the chloroform layer sulphuric acid was added slowly by the sides of test tube. Formation of red colour indicated the presence of steroids.

III. RESULTS AND DISCUSSION

The detailed report of the phytoconstituents tests carried out of root parts of Nerium Oleander L. are presented in Table 1. In this study the phytochemicals test reveals that the presence of the triterpenoids and steroids in n-hexane fraction, flavonoids in ethyl acetate extract. The alkaloids, carbohydrates, glycosides, are present in the ethanol extract.

Table 1. Phytochemical screening of root parts of *Nerium Oleander L.*

Phytoconstituents	***NOH***	***NOC***	***NOE_A***	***NOE***
Alkaloids	-	-	++	+
	-	-	++	+
Carbohydrates	-	-	-	+
	-	-	-	+
Flavonoids	-	-	+	-
Triterpenoids	+	-	-	-
stereoids	+	-	-	-

NOH- hexane fraction, NOC- chloroform fraction, NOEA - ethyl acetate fraction, NOE- ethanol extract. (+ = present - = absent)

IV. CONCLUSION

The present study revealed that plant contains bioactive phytoconstituents as a class of alkaloids, triterepenoids, carbohydrates, phenolic compounds and stereoids. Due to this secondary metabolic compound plant have therapeutic and pharmaceuticals properties.

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