

Pharmacognostic, phytochemical screening study and anthelmintic activity of nerium oleander leaves

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Abstract

The purpose of this research was to research the pharmacognostic, preliminary phytochemical screening and in-vitro anthelmintic activity of Nerium oleander methanolic extract at two separate concentrations (20.50mg/ ml). The extract was taken against Indian earthworm *PheretimaPosthuma* for anthelmintic activity. The tests were expressed in terms of time necessary for *PheritimaPhosthuma*'s paralysis and death. Albendazole is used as a standard control group. Nerium oleander, as related to a standard control group (Albendazole), displays greater activity at higher levels. In conclusion, the use of Nerium oleander leaves as an anthelmintic has been verified and further research to isolate the active principles responsible for the behavior is suggested.

Keywords: Nerium oleander, PheretimePosthuma, Albendazole, Methanolic extract, Anthelmintic, Phytochemical screening.

Introduction

Plants serve as a constant medicinal source for the treatment of a variety of diseases [1]. Phytochemicals occur naturally in medicinal plants, leaves, roots, rhizomes and vegetables which have defense mechanisms and protect people from various diseases such as diabetes, cancer, atherosclerosis, etc. Plants' medicinal value lies in certain chemical substances that produce a definite physiological action on the human body [2]. Intestinal parasite infections are one of the key human health problems, particularly in children. The majority of helminth-caused diseases are of a chronic, debilitating nature; they are likely to cause more morbidity and greater human economic and social poverty. Helminthics are medicines that may function locally and kill GIT worms [3]. Plants provide all food, clothes, shelter, medications, etc. needs. Most helminthics give rise to side effects including abdominal pain, nausea, vomiting, and diarrhea [4]. In developing countries, 80% of the world's population uses plants as the primary source of improved health [5]. Infections of parasites affect both human beings and animals. Medicinal plants are the backbone of traditional medicine, which routinely uses medicinal plants on more than 3.3 billion people in less

developed countries [6]. This research brings with it preliminary phytochemical screening and anthelmintic action. Nerium oleander is an oxidic shrub or small tree in all its parts in the dogbane family Apocynaceae. This is currently the only species classified into the genus Nerium. From its superficial similarity to the unrelated Olive Olea it is most commonly known as Nerium or oleander. Oleander grows to a height of 2–6 m (6.6–19.7 ft), with erect stems which splay outward as they mature. The leaves are in pairs or whorls of three, dense and leathery, dark-green, narrowly lanceolate, 5–21 cm (2.0–8.3 in) long and 1–3.5 cm (0.39–1.38 in) wide, and with a complete margin filled with minute reticulate venation web typical of Eudicots. When young, leaves are light green and very shiny, before maturing to a dull dark green/greenish-gray. Nerium oleander has many effects, such as cardiogenic, diaphoretic, diuretic, anticancer, antibacterial, anti-fungal and expectorant [7].

Materials and Methods

Collection of plant and authentication

Nerium oleander leaves were collected in July 2016 from Narsapur district of Telangana, India and the plant was authenticated by D.Venkateshwara Rao, Deputy Director, AP Forest Academy, dulapally, Hyderabad, after collecting the fresh leaves, extracting all earthly matter and washing and shading dried and powdered by a pulverizer.

Collection of worms

The anthelmintic assay was performed on Indian earthy worm *PheritimaPosthuma* due to easy availability. The Indian earthworm (*PheretimaPosthuma*) were collected from the soil's water-logged areas and removes all earthly matter with water.

Chemicals and Drugs used

Methanol, Albendazole, Carboxymethylcellulose (CMC), Normal saline.

Preparation of plant extract

The Nerium oleander was dried under shade and crushed to form coarse powder in an electric blender and subjected to

soxhlet extraction using 72hrs of methanol as a solvent after completion of the extraction, the extracts were cooled at room temperature and filtered and evaporated to dryness using rotary evaporation.

Preliminary phytochemical investigation

The extract was subject to preliminary phytochemical screening to classify the Phyto-components using normal methodologies such as carbohydrates, sterols, amino acids, proteins, saponins, flavonoids, tannins, resins [8, 9].

Preparation of concentrations

Nerium oleander methanolic extract was made in different concentrations (25mg / ml, 50mg / ml, 75mg / ml, and 100mg / ml) by dissolving in normal saline solution, and Albendazole was prepared using 0.5 percent w / v of CMC (Carboxy Methyl Cellulose) as a suspending agent. For the respective concentrations, the volume is taken up to 10ml.

Evaluation of anthelmintic activity

The anthelmintic activity was conducted by standard procedure [10]. On adult Indian Earthworm *PheretimaPosthuma* as it resembles the intestinal roundworm parasite of humans anatomically and physiologically. *PheretimaPosthuma* was placed in a petri dish containing different concentrations of methanol extract of *Nerium oleander* leaves and standard compound Albendazole was inserted in the Petri dish. Every Petri dish was placed with two worms and examined for paralysis or death. Mean paralysis period was noted when no movement of any kind could be detected, except when the worm was shaken vigorously, the period of worm death was reported after it was found that worms did not move either when shaken or when external stimuli were given. The test result was compared to samples treated with reference compound Albendazole.

Results and Discussion

Nerium oleander's preliminary phytochemical screening shows that carbohydrates, alkaloids, tannins, sterols, proteins, glycosides, flavonoids, and amino acids are present. Methanol extract from plant *Nerium oleander* has an important influence on the *PheretimaPosthuma*. It would take less time to both paralyze and die. From our findings, higher paralytic effects of the extract were produced much earlier and the time taken for death was shorter. *Nerium oleander* methanolic extract demonstrated dose-dependent anthelmintic activity, showing optimum efficacy at a concentration of 50mg / ml. our plant extract showed more potent activity against *PheretimaPosthuma* at a concentration between 40 and 50mg / ml than the regular drug Albendazole. The other test concentrations of extract displayed a marked degree of anthelmintic activity. From the above findings, we can determine that the anthelmintic activity of the extract was compared with the standard drug Albendazole (Table 2) that *Nerium oleander* exhibited substantial anthelmintic activity, so

further research must be carried out so that the general public can benefit from this essential medicinal plant.

Table 1: preliminary phytochemical screening of *Nerium oleander*.

Test	Methanolic extract
Test for steroid	-
Test for steroidal glycoside	+
Test for tannins and phenols	+
Test for flavanoids	-
Test for carbohydrates	+
Test for cardiac glycosides	+
Test for Tri-terpenoids	-
Test for alkaloids	+
Test for proteins	-
Test for saponins	-

Table 2: The result of the anthelmintic activity of *Nerium oleander* (methanolic extract) and standard drug.

Extract	Concentrations(mg/ml)	Pheretimaposthuma	
		Paralysis(min)	Death(min)
Methanolic extract	25(mg/ml)	30±1.32	37 ±0.17
	50(mg/ml)	23±0.94	34± 0.62
	75(mg/ml)	19±0.9	25±0.56
	100(mg/ml)	18±0.67	24 ±0.99
albendazole	25(mg/ml)	40±0.41	43 ±1.38
	50(mg/ml)	35 ±0.60	39± 0.57
	75(mg/ml)	31± 0.84	30± 1.38
	100(mg/ml)	21 ±1.4	23± 0.94

A: 25 mg/mlB: 50mg/ml, **B:** 50 mg/mlB: 75mg/ml, **C:** 75mg/mlD: 100mg/ml.



Conclusion

In the current phytochemical screening was carried out for different chemical constituents. Phytochemical analysis of various extracts revealed the presence of alkaloids, steroidal glycosides, carbohydrates, tannins, and carbohydrates, etc. The result of this analysis suggested that the methanolic extract of *Nerium oleander* shows stronger anthelmintic activity against *Pheretima Posthuma*, an Indian earthworm.

References

1. Chopra RN, Nayer SL, Chopra IC. Glossary of Indian Medicinal Plants Council of Scientific and Industrial Research. 3rd Edn. New Delhi(India); 156:7-246.
2. Amin Mir M, Sawhney SS, Jassal MMS. Qualitative and quantitative analysis of phytochemicals.
3. Mohammed AAER, Ismail MAN, Mohammed AO, Moustafa FM (1999) Cytotoxic effects of Albendazole, Antiparasitic drug, Egyptian Journal of Biology 1:16-29.
4. Devi K, Indumathy S, Rathinambal V, Uma S, Kavimani S, Balu V, et al (2009) Anthelmintic activity of *Astachurna*. International Journal of Health Research 2:101-104.
5. Davidso-Hunt I (2000) Ecological ethnobotany: Stumbling toward new practices and paradigms MASA J; 16:1-13.
6. Jabbar A, Raza MA, Iqbal Z, Khan MN(2006) An inventory of the ethnobotanicals used as anthelmintics in southern Punjab (Pakistan) Journal of Ethnopharmacology; 108:152-154.
7. Bingtao Li, Antony J. M. Leeuwenberg, and D. J. Middleton (2009) "*Nerium oleander* L. ", Flora of China. Harvard University. Retrieved on -07-27.
8. Yarnalkar S (2004) practical pharmacognosy, Techniques and experiments, NiraliPrakashan, Pune,.
9. Ghosh T, Maity TK, Bose A, Dash GK (2009) Indian J Nat product; 16-19.