

A REVIEW ON *KARAVEERA* AND ITS THERAPEUTIC UTILITY

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ABSTRACT

Upavisha are the group of drugs which on consumption or administration are relatively less toxic in nature and not as lethal as *Mahavisha* but produce certain toxic symptoms in the body. *Karaveera* (*Nerium oleander* L.) is reported as *Upavisha Dravya* in classical Ayurvedic pharmacopeias. Four varieties of *Karaveera* are mentioned according to the text *Raja Nighantu* but three of them are widely seen all over the world.

Though it is a known Cardio-toxic plant (on internal Administration) and all parts of the plant are toxic (particularly seeds and root), it can be used as a therapeutic agent if used after proper *Shodhana* (purification/processing) both internally and externally. *Karaveera* being a '*Upavisha*', has been successfully used in different classical Ayurvedic formulations and indicated in various ailments especially in Skin diseases, *Indraluptha* (Alopecia areata) etc. In this review an attempt is made to include the overall information about the poisonous plant *Karaveera*, its Toxicological aspects, Medico-legal aspect and Therapeutic uses.

Keywords : *Karaveera*, *Nerium oleander* L., *Upavisha*, Cardio toxic, Medico-legal aspect, Therapeutic uses.

INTRODUCTION: In ancient days, the preparation of medicaments was very dependent on green plants in the surroundings. When a plant is used for medicinal preparation, it is useful as a drug or therapeutic agent or an active ingredient. There is an increasing interest in herbal products as a self-medication in recent years. Some plant extracts either turn into drugs over time or which are consumed directly without treatment. One of these plants is *Nerium oleander* L., which has cardiac glycosides, since it is a potentially lethal plant.

Acharya Charaka denotes that "Even an acute poison can act as an excellent drug if we administered it in a proper combination (*Yoga*) and dose. On the other hand, even a drug well-known for its efficacy may

prove fatal as poison if administered improperly"^[1]and the drug *Karaveera* is not an exception for this as the overdose of which is most adversely effects heart and respiration resulting into death.^[2] Even though the drug is a *Visha* (Poison), it is medicinally useful in various diseases. Different parts of the plant are administered both externally and internally, the need for *Shodhana* (purification) of the drug is essential for reducing the side effects of medicine and to make the drug more effective. In the classical texts, *Acharyas* warned to take cautious attention while using toxic drugs in medicinal preparations. The drug *Karaveera* has been recommended in various ailments in classical texts both internally and externally but can be used only after proper *Shodhana Samskaras* (purification).

AIMS AND OBJECTIVES

1. To review the botanical, pharmacological and toxicity profiles of the drug *Karaveera*
2. To review the therapeutic utility of *Karaveera* from Ayurveda, Modern and folklore systems

MATERIAL AND METHODS

BOTANICAL PROFILE

Karaveera (Oleander) belong to the Family Apocynaceae. It is cultivated as Ornamental shrub and commonly grown in gardens, parks and house premises including temples and religious campus in the plain as well as hills. Its flowers are used in God worship. A large glabrous erect shrub with milky juice, about 5m high. Leaves are linear- lanceolate, dark green and shining above with stout mid-ribs. The flowers are red, rose- coloured, white or yellow and sweet scented. Fruits are cylindrical, straight, with hard follicles, 15-23 cm long and rigid. Seeds are 1.2cm long and are tipped with a coma of light brown hairs. Flowering and fruiting is almost throughout the year; chiefly during April-June^[3].

Vernacular Names^[4]:

Sanskrit	- <i>Karaveera</i>
Hindi	- Kaner.
Kannada	- Vakana linge, Kangana linge
Arabic	- SumSuul-himar, Sammul-himar.
English	- Indian oleander, Yellow oleander.
Latin	- <i>Nerium oleander</i> .
Malayalam	- Manja arali, Kanaveeram, Karaveera

Varieties: *Karaveera* has more than 400 varieties including Cultivars and Dwarf Vars. which are grown in the gardens for its attractive flowers (Red, Yellow, and White etc.). According to the Text *Raja Nighantu*, 4 varieties have been mentioned^[5] Yellow, Red (Pink), White and Black among which the Black Var. is not clearly identified or unavailable presently. The botanical source plants for the available varieties of *Karaveera* are-

- *Shweta & Rakta Karaveera* [White Oleander & Red/Pink Oleander] – *Nerium oleander* L
- *Peeta Karaveera* [Yellow Oleander] – *Thevetia oleander*/ *T.nerifolia* / *Cerbera thevetia* L^[6].

VARIETIES OF OLEANDER




White Oleander	Yellow Oleander	Red/Pink Oleander
		
Fig(I)	Fig(II)	Fig(III)
<i>Shweta Karaveera</i>	<i>Peeta Karaveera</i>	<i>Rakta Karaveera</i>

TABLE NO (I): *Rasa Panchaka*^[6]:-

<i>Rasa</i>	<i>Guna</i>	<i>Veerya</i>	<i>Vipaka</i>	<i>Prabhava</i>	<i>Dosha karma</i>
<i>Katu</i> (pungent), <i>Tiktha</i> (bitter), <i>Kashaya</i> (astringent)	<i>Laghu</i> (light), <i>Ruksha</i> (non unctous), <i>Teekshna</i> (penetrating)	<i>Ushna</i> (hot)	<i>Katu</i>	<i>Hridya</i> – promoting cheerfulness[in overdoses it is <i>Hridayaavasadaka</i> – Discomfort to the heart]	<i>Kapha-Vata hara</i> (mitigates <i>Kapha –vata doshas</i>)

TABLE NO (II): Major Chemical Constituents of Oleander^[7]: -

White and Red variety (<i>Nerium oleander</i> L.)	Yellow variety (<i>Thevetia nerifolia</i>)
<ul style="list-style-type: none"> • Neriodorin • Neriodorein • Karabin • Neriin (identical with Digitalis) • Rosaginine (strychnine like action) 	<ul style="list-style-type: none"> • Thevetin (similar in action to Digitalis) • Thevitoxin (similar in action to Digitalis) • Nerifolin • Peruvoside • Ruvoside • Cerbrin.

PHARMACOLOGICAL PROFILE

Antinociceptive activity: - The extracts of *Nerium Oleander* leaves (aqueous and ethanol) possess significant antinociceptive activity, but ethanolic extract was more pronounced.

However extract were shown to induce gastric, ulcerogenicity with mice. Other reported activities of oleander are Anti-inflammatory; Antimicrobial; Locomotor activity; Anticancer activity; Diuretic effect; Anti-leukemic effects and Immunomodulating activity. [8]

TABLE NO (III): TOXICITY PROFILE ^{[9], [10]}

Toxicity Profile	White and Red variety	Yellow variety
Fatal dose	About 5 to 15 leaves. About 15 grams of root.	About 8-10 seeds; About 15 to 20gms of root.
	The <i>Oleander</i> is also known to hold its toxicity even after drying. 10-20 <i>Oleander</i> leaves consumed by an adult may cause an adverse reaction, and a single leaf could be lethal to an infant or a child.	
Fatal period	10 to 20 minutes of ingestion	Within 10 to 20 minutes of ingestion.
Detection	Oleander- derived cardiac glycosides are cross reactive with the frequently used radio- immunoassays for digoxin, an elevated level may help confirm suspicion of oleander poisoning. Oleander glycosides can also be identified by Thin-layer chromatography and fluorescence spectrophotometry. Reverse-phase HPLC and HPLC/MS are more specific.	
Medico Legal Importance	<ul style="list-style-type: none"> ➤ Commonly used as suicidal poison. Ingestion of Yellow Oleander seeds has become a popular methods of suicide in Sri Lanka and other countries in Asia^[10] ➤ The root is commonly used as abortifacient (used Int. & Externally) ➤ Accidental poisoning is sometimes met with, when any part of the plant is used both internally and externally in any therapy. ➤ Cattle poison ➤ Powdered kernel of the fruit mixed with alcohol used for homicide 	

Signs and Symptoms of Karaveera (Oleander) Poisoning

Ayurvedic view

Karaveera is one among the 8 *Moola Vishas* mentioned in *Susrutha Kalpasthana* ^[11]. *Rasatharangini* quoted it among *Upavishas* ^[12]. All parts of the plant are poisonous.

1. Burning sensation in *Koshta* [GIT],

2. Painful *Vamana* (Vomitting) and *Virechana* (Diarrhoea),
3. *Akshepaka Vatha* (Convulsions).
4. *Avasada* (Fatigue),
5. *Nadi dourbalya* (Nervous weakness/weak pulse),
6. *Hridaya avarodha* (AV - Block)
7. *Swasa avarodha* (Difficulty in breathing)and leading to death^[13].

TABLE NO (IV): Modern View ^[14]

White and Red variety (<i>Neriumoleander</i> L.)	Yellow variety (<i>Thevetia nerifolia</i>)
<ul style="list-style-type: none"> • Locally - Contact Dermatitis • Inhalation- Headache Dizziness Respiratory difficulty Nausea • Ingestion - Vomiting Pain in the abdomen Frothy salivation Difficulty in swallowing & articulation Restlessness Muscular twitching 	<ul style="list-style-type: none"> • Locally – Sap of the plant may cause Inflammation. • Ingestion - Tingling & Burning sensation in the mouth & tongue. Dryness of throat Vomiting Diarrhea Headache

<p>Tetanic spasm Lock jaw Slow & weak pulse Rapid respirations BP falls Ventricular fibrillations AV block Drowsiness Coma Respiratory paralysis Death</p>	<p>Dizziness Dilated pupils Drowsiness Loss of muscular power Weak, rapid & irregular pulse BP falls Heart block Collapse Death</p>
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Therapeutic Uses of *Karaveera*

1. Skin diseases

• *Karaveera* is mentioned among the drugs used for external cleansing like ointment etc., especially for Skin diseases [15].

• In Ringworm, Pruritus, Keloids, Papular eruptions and Pamphigus- Powder of *Kushta* (*Saussurea lappa*), *Kantakateri* (*Berberis aristata*), *Kasisa* (Green vitriol), *Kampillaka* (*Mallotus philippensis*), bark of *Karaveera* etc- is dusted over the body smeared with oil [15].

• *Manashila* (Arsenic disulphide), Root of *Karaveera* etc. should be prepared in powder form mixed up with *Thushodaka* (fermented husk gruel). The *Darvilepa* (Semi-solid in consistency) ointment made of One *Karsha* (12gm) Powder of each of the above, mixed up with an *Adhaka* (2.56 litres) of the juice extracted by burning the *Palasha* (*Butea monosperma*) is said to be the most useful in eradicating obstinate skin diseases including the Leprosy [15].

• One among the drugs in *Kushtaghna gana* [16].

• Rubbing with the brush made of the stems of *Karaveera* in *Kushta* (Leprosy) with numb and absolutely anesthetic patches with absence of perspiration and itching [17].

• Paste of the seeds of *Prapunnada* (*Cassia tora* L), *Saindhava* (Rock salt), *Rasanjana* (*Berberis aristata*), and Root of

Swetha Karaveera etc. along with the tender leaves of *Jathi* (*Jasminum grandiflorum*) should be applied in *Kushta* (Leprosy) [17].

• Oil prepared of drugs *Kushta* (*Saussurea lappa*), *Arka* (*Calotropis gigantea*), *Karaveera*, *Kasisa* (Green Vitriol) etc., cures *Kushtaroga* (Leprosy) which can be used as *Alepa* (paste), *Udvarthana* (body massage), *Pragharshana* (rubbing) & *Avachurnana* (dusting) [17].

• *Karaveera* used for *Snana* (bath), *Pana* (drink) & *Lepa* (paste) in *Krimi* (Worm infection) & *Kushta* (Leprosy) [17].

• *Lepa* (paste) of *Karaveera* etc. cures *Kaphaja Visarpa* (Herpes zoster) [18].

2. **Visha Chikitsa** : If there is visual impairment due to *Visha- Anjana* (collyrium) prepared of *Devadaru* (*Cedrus deodara*), *Trikatu* (*Zingiber officinale*; *Piper longum*; *P.nigrum*), *Karaveera* etc by triturating with goat's urine [19].

3. **Vrana (Wound)**: Decoction of *Karaveera* is useful for healing ulcers. [20].

4. **Shiro roga (Disease of head)**: *Khalithya* (hair loss), *Palithya* (Grey hair), *Vali* (Wrinkles in face), *Hari-loma* (Tawny hair) – *Nasya* (Nasal drops) & application of *Lepa* (paste) over the head, face [21]. *Karaveera taila* is indicated in *Indraluptha* (Alopecia areata). [22]

5. **KshudraRoga (Minor diseases)**: In *Apachi* (Cervical lymphadenitis),

Karaveera taila is used as in the form of *Shirovirechana* (Nasal instillation) [23].

6. Arbuda (Tumor): In *Kaphaja Arbuda* (Tumor) decoction of *Karaveera* leaves for wound cleansing [24]. *Pana* (drink), *Abhyanga* (oil massage) & *Nasya of Karaveera etc.*, *Taila* (oil) – *Kushta* (Leprosy), *Dushta vrana* (Non-healing ulcers), *Nadi vrana* (Pilonidal sinus), *Apachi* (Cervical lymphadenitis) [25].

7. Udara (Ascites): Wine mixed with paste of roots of *Karaveera* etc. used in *Sannipatahaja Udara* [26]

8. Swayathu (Edema): *Ekanga sopha* (Swelling), ext. application (*Lepa*) of *Karaveera* etc [27].

9. Bhagandhara (Anal fistula): application of *taila* of *Karaveera* etc [28].

10. Paste of root of *Karaveera* is indicated in *Upadamsha* (Vulnerable disease) and the water prepared out of

Karaveera dala is beneficial in controlling watery secretions from eyes in *Abhishyanda* (Conjunctivitis) [29].

OTHER USES

- All parts of plant *Nerium odorum* are poisonous. Root and the root bark are powerful diuretic and cardio tonic like *Strophanthus* and *Digitalin*. An infusion is given in cardiac systole as well as in dropsy [30].

- Milky juice of *Thevetia nerifolia* is highly poisonous and kernel is a powerful acro-narcotic poison. Oil from seeds is emetic and purgative. In Gold coast, seeds are chewed as a purgative. In Guiana, the seed is used as a purgative in Rheumatism and dropsy. It is also considered a good alexiteric and is prescribed with run [31].

- Karaveera* twig is used as tooth brush [32].

TABLE NO (V): CLASSICAL FORMULATIONS OF KARAVEERA [33]

Sl.No	Formulations including Karaveera	Indication	References
1.	<i>Sarvakarmika Agada</i>	<i>Vyanthara dashta chikitsa</i>	Ashtangahridayam (Ah.U.36/70-71)
2.	<i>Palitha Rogahara Lepam</i>	<i>Shiroroga prathishedham</i>	Ashtangahridayam (U.24/38)
3.	<i>Swetha Karaveeradi Lepam</i>	<i>Kandu</i> (pruritus), <i>Kikkisa</i> (striae gravidarum)	Ashtangahridayam (U.24/38-39)
4.	<i>Swetha Karaveera pallavadi Tailam</i>	<i>Kushta</i> (leprosy) <i>Chikitsa</i>	Charaka.chi.7/105
5.	<i>Kanakaksheeri thaila</i>	<i>Kushta</i> (leprosy) <i>Chikitsa</i>	Ch.chi.7/114
6.	<i>Karaveera Kashaya</i>	<i>Dvivraneeya Chikitsa</i>	Ch.chi. 25/86
7.	<i>Karveera Kshara</i>	<i>Ashmari</i> (urinary calculi) <i>chikitsa</i>	Su.chi. 7/23
8.	<i>Vajraka taila</i>	<i>Kushta</i> (leprosy) <i>chikitsa</i>	Su.chi. 9/54
9.	<i>Karaveera Thaila</i>	<i>Bhagandhara</i> (anal fistula) <i>prathishedham</i>	Ah.U.28/34
10.	<i>Ekanga Sophahara Lepam</i>	<i>Swayathu</i> (edema) <i>chikitsa</i>	Ah.chi.17/25
11.	<i>Musthadi Churna</i>	<i>Kushta</i> (leprosy) <i>chikitsa</i>	Ah.chi.19/67
12.	<i>Vishaharanjana</i>	<i>Visha</i> (poison) <i>chikitsa</i>	Ch.chi. 23/68
13.	<i>Karaveeradi Taila</i>	<i>Bhagandharadhikara</i> (anal fistula)	BhavaPrakasha.50/32
14.	<i>Brhat Kaseesadi Taila</i>	<i>Arshoadhikara</i> (in haemorrhoids)	BP. 5/60-62
15.	<i>Karaveeradi Taila</i>	<i>Bhagandhara</i> (anal fistula) <i>chikitsa</i>	Chakradatta 46/24
16.	<i>Karaveera Taila</i>	<i>Kushta</i> (leprosy) <i>chikitsa</i>	Chakradatta 50/49
17.	<i>Karaveera Rasa Aschothana</i>	<i>Netra Roga</i> (eye disease) <i>Chikitsa</i>	Chakradatta 59/8

18.	<i>Karaveera Lepa</i>	<i>Shiroroga Prathishedham</i> <i>Indraluptha(alopecia areata) chikitsa</i>	-	Ah.U.24/29
19.	<i>Karaveera Lepa</i>	<i>Shiroroga Prathishedham</i> <i>Palitha(grey hair)Chikitsa</i>	-	Ah.U.24/38

FOLKLORE USES

- Administration of *Choorna* (powder) of root bark of *Nerium oleander* cures Bronchitis, Bronchiectasis, Emphysema etc. [34].
- The seed oil is applied externally to treat Skin infections.
- Toxic bites – External application of *Nerium odorum* [35].
- Dermatitis- Macerated leaves of oleander have been applied.
- Macerated leaves of *Karaveera* - Also used in superficial Tumor, Syphilis, Loss of hair.
- Gingivitis: - Decoction of Oleander leaves have been used [36].

DISCUSSION: *Karaveera* (*Nerium oleander* L.) is a highly toxic drug (dried or green) grouped under the category of ‘*Upavisha*’ by Ayurveda pharmacopeia with mainly 4 varieties. The use of *Karaveera* in therapeutic dose is Cardiotonic, but its overdose is Cardiotoxic. Though all parts of *Karaveera* (*Nerium odorum*) is poisonous, root is mentioned as more poisonous in Ayurveda.

The signs and symptoms mentioned in *Karaveera* poisoning as per Ayurveda as *Nadidourbalya* (nervous weakness), *AkshepakaVaata* (Convulsion) may be due to Rosagenin present in *Oleander* bark reported to have strychnine-like effects on spinal cord. *Hrudayaavarodha* (blockage to heart) directly indicate the cardiotoxicity due to the most significant toxins oleandrin and neriin present in *Karaveera*. The drug *Karaveera* is used effectively by folklore, Ayurveda and modern-day medicinal systems in various ailments like

skin diseases of scaly nature, leprosy, eczema, scabies and allergies. Every system of medicine advice utmost precaution while using in therapeutics for its known cardiotoxicity. Along with which the Oleander may contain many other unknown compounds that may have unidentified effects both lethal as well as therapeutic. Hence the exploration of such contents are the need of the hour.

CONCLUSION: There is an increasing interest in herbal products as a self-medication in recent years. Some plant extracts either turn into drugs over time or which are consumed directly without treatment. One of these plants is *Nerium oleander* L., which has cardiac glycosides, since it is a potentially lethal plant. There is really no boundary between a medicine and a poison, for a medicine in a toxic dose is a poison and a poison in a small dose may be a medicine. Exploring the unidentified properties of *Karaveera* and standardizing the purification and setting the therapeutic dose may establish this drug as a new ray of hope in therapeutics.

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