



## A REVIEW STUDY OF KARVIRA

<sup>1</sup>Dr. Madan Mohan Sharma, <sup>2\*</sup>Dr. Lokesh Singh Bhati and <sup>3</sup>Dr. Ujwala hivale

<sup>1</sup>Professor, Dept. of Kriya Sharir, Kunwar Shekhar Vijendra Ayurved medical college, Saharanpur, U.P.

<sup>2</sup>Assistant Professor, Dept. of Agadtantra Evum Vidhi Vaidayak, M.J.F. Ayurved Mahavidyalaya, Jaipur.

<sup>3</sup>Assistant Professor, Dept. of Panchkarma, M.J.F. Ayurved Mahavidyalaya, Jaipur.

**\*Corresponding Author: Dr. Lokesh Singh Bhati**

Assistant Professor, Dept. of Agadtantra Evum Vidhi Vaidayak, M.J.F. Ayurved Mahavidyalaya, Jaipur.

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### ABSTRACT

*Karvira* know as Indian oleander, It is most potentially cardiac poison. *Karvira* have been used in Ayurveda Science. In Indian medicine *Karvira* is comes under *Sthavaravisha* and *Upavishas*. It is more in tropical regions. It is an evergreen shrub seen in the gardens with white, pink and yellow coloured flowers. All parts of the plant are toxic and contain a variety of cardiac glycosides. *Karvira* is one *Visha* but having rich therapeutic values. The *Karvira* is botanically known as *Nerium odorum* having in white or red flowers variation. Another plant *Thevetia nerifolia* is later considered pita. In this article the all information related to *Karvira* has been compiled.

**KEYWORDS:** *Karvira*, *Nerium*, *Cerbera*, *Oleander*.

### INTRODUCTION

In Ayurveda, *Visha* is defined as *Visham hi deham samprapya pragdushyati shonitam // Kaphapittanilanschanu samdoshan shhashayan | Tato harudyamaasthay dehocheday kalpate //* the substance that enters the body vitiates the blood first, next the kapha, pitta and vata along with their respective seats, then it invades the heart and leads to the death.<sup>[1]</sup> *Susrutaacharya*, *Charakaacharya* mentioned the Kaner (*Nerium odorum*) as *sthavara visha (moolvisha)*. All parts of Sweta and Rakta karvira are poisonous. Its root is used for Suicide, murder and abortion. Its flowers are offered to Lord Shiva. Karavira rootbark and leaves are used as medicine. Pitakarvira's seeds are very poisonous. Its seeds is used for suicide, murder, abortion. It is commonly grown in gardens, parks and house premises including temples and religious campus in the plain as well as hills. Plant occur throughout neotropics. It is wild in South and Uttar Pradesh. It is more in tropical regions. It is a tribal of America but now spread everywhere in India.

### Kinds and Varieties

- ❖ Bhavaprakash- Sweta, Rakta
- ❖ Dhanvantri Nighantu- Sweta, Rakta
- ❖ Raj Nighantu- Sweta, Rakta, Pita, Krishna

According to modern medicine-Sweta, Rakta, Pita Karvira's internal usage is very less but external use is done more. It uses its internal in stone and abdominal disease.<sup>[2]</sup>

**Gana-** Tiktaskandha, Kusthaghna (Charak Samhita), Laksadi, Shirovirechana (Susruta Samhita)

### Raspanchak (Pharmacodynamics)

Rasa- Katu, tikta  
Guna- Laghu, ruksa, tiksna  
Virya- Usna  
Vipaka- Katu  
Dosakarma- Kaphavatasamaka

**Karmukatva-** Hrudya, raktasodhaka, svasaghna, kusthaghna, svedajanana, kandughna, jvaraghna, visamajvarapratibandhaka, vranasodhana-ropana, sothahara, dipan, vidahi, bhedana.

**Therapeutic uses-** Vrana-dustvrana-nadivrana, palitya, indralupta, upadansa-phirang, Ashmari-sarkara, netrabhisyanda-netrakopa, hrudroga-raktavikara, svasarog, udararoga-agnimandya-vibandha, jvara-visamajvara, tvakdosha, ksudraroga, kandu-pamakikkisa-kacchu, bhagandar.

Parts used - Root, root-bark, leaves.

Dose- Powder (30-125) mg.

**Formulations-** Karviradya taila, Karavira yoga, Svetakarviradya taila, Svetakarvira pallavadya tail.<sup>[3]</sup>

**Karvira (Sweta and Rakta)****Vernacular names**

Latin name-	Narium odorum
Hindi-	Kaner, kanhal, karvira
Bangali-	Karabi, karvi
Gujrati-	Kaner, karen
Marathi-	Kanher
English-	Sweet scented oleander, rooseberry spurge, Indian oleander
Family-	Apocynaceae

**Synonyms**

Sweta Karvira-	Swetapushp, shatkumbh, ashvamarak
Rakta Karvira-	Raktapushp, chandat, lagud. <sup>[4]</sup>

**Botanical Description**

An evergreen shrub with silvery-grey bark. Leaves usually in whorls of 3,4,6 by 5. 1 inch, linear-lanceolate or oblong, thickly coriaceous, acuminate, smooth, dark-green and shining above, rough and dotted beneath, midrib stout, lateral nerves numerous, parallel and transverse; petiole short. Flowers 1.5 inch. diametre, red, white or rose-coloured generally sweet-scented, double under cultivation, in large terminal racemose cymes. Sepals broad-subulate. Corolla funnel-shaped, lobes spreading, overlapping to the right. Corona-appendages lacinate into numerous irregular segments. Stamens near the top of the stigma, cells with long twisted appendages. Fruit 6-7 by 3-4 inch, rigid. Seeds linear, ribbed, villous with and having a coma of greyish-brown hairs. It is a plant seen in the gardens with white, pink or red colored flowers. All parts of the plant are poisonous. Nectar is also poisonous. An antibiotic Oleandomycin has been isolated from this plant. Research is still going to extract medicines for cancer treatment but without much success.

**Flowering and fruiting time-** Flowering often throughout the year. Fruiting during cold season.<sup>[5]</sup>

**Active principles**

1. Nerin consisting of three glycosides-neriodorin, neriodorein, and karabin.
2. Oleandrin.
3. Odorin.

**Mode of Action**

Nerin, Oleandrin and odorin are glycosides which have digitalis like action.

**Signs and Symptoms**

**GIT-** On consumption there will be nausea, vomiting, dysphagia, frothy salivation, abdominal pain and diarrhoea.

**CVS-** There may be atrial and ventricular fibrillations and AV block. The blood pressure will fall and pulse will be irregular and weak. It has digitalis like action on the heart.

**CNS-** Dizziness and ataxia. Pupils will be dilated, muscular twitching, tetanic convulsions lock-jaw, drowsiness, coma and labored respiration. Death usually occurs due to cardiac failure and may also due to respiratory failure.

**Fatal Dose-** 8 to 10 seeds, 15 to 20 gm of root and 5 to 10 leaves.

**Fatal Period-** 20 to 36 hrs.

**Treatment**

1. Stomach wash with 1% potassium permanganate or warm water.
2. Sodium molar lactate solution, atropine and Propranolol 1mg I.V.
3. Atropine 1mg., adrenaline 2 c.c. and 2 mg noradrenaline in 5% glucose as I.V. drip.
4. Symptomatic management.
5. Digoxin immune Fab (Ovine) is the specific antidote.

**Postmortem appearances**

All the internal organs appear congested. Lungs may be congested and edematous. Stomach may be inflamed and mucosa may have hemorrhages.

**Circumstances of poisoning**

1. Its roots, leaves or fruits are used for suicidal purpose by making it as a paste or decoction.
2. Homicides are rare.
3. Accidental poisoning can occur while treatment for venereal diseases or cancer or to procure abortion by local quacks.
4. Its juice is used as an abortifacient by quacks.
5. The juice is used as a cattle poison by soaking a cloth in the juice and inserting it in the anus of the animal.<sup>[6]</sup>

**Karvira (pita)****Varnacular names**

Latin name-	Cerbera Thevetia /Thevetia Neriifolia
Hindi-	Pita kaner
Bangali-	Kalkeful, kolkaful
Gujrati-	Pili karen
Marathi-	Pivali Kanher

English- Yellow oleander, Exile tree, Lucky nut.  
Family- Apocynaceae.<sup>[7]</sup>



### Botanical Description

It is called yellow oleander. It has lanceolate leaves and bellshaped yellow flowers. It may grow up to a small tree. All parts of the plant are poisonous. When incised a white juice is extruded. The fruit contain a single nut which is triangular in shape with 4 chambers each enclosing a pale-yellow seed. The toxins are more concentrated in the seeds. The seed is taken ground with sugar and taken. Shrubs or small trees up to 7 meters high. Leaves linear, up to 15cm. long, revolute, dark-green above, polar beneath. Flowers pure yellow or suffused with red, in sub-terminal, few flowered cymes. Sepals long-acuminate, spreading. Corolla funnel-shaped, lobes overlapping to left. Stamens 5, inserted in the corolla throat. Another incumbent on the stigma. Fruit and indehiscent fleshy drupe, angular, broader than long.

**Flowering and fruiting time-** April, June or Summer season.<sup>[8]</sup>

### Active principles

1. Thevetin- a glycoside which is a cardio-toxin and digitalis like action.
2. Theotoxin - also a cardiac glycoside and less toxic.
3. Nerifolin- a cardiac glycoside less toxic than Thevetin.
4. Cerberine- a glycoside which is a neurotoxin, acting on CNS and produces tetanic convulsions.
5. Peruvocide, Ruvocide also cardiac glycosides.

### Signs and Symptoms

**GIT-** The seeds are ingested usually. There will be burning pain in the mouth, drying in the throat, tingling and numbness of the tongue. This is followed by nausea, vomiting, diarrhoea and headache.

**CVS -** Pulse may be rapid weak and irregular. There will be arrhythmias and varying degrees of heart block on E.C.G. Death usually takes place from peripheral circulatory failure.

**CNS:** There may be vertigo, dilated pupils, loss of muscular power fainting, tetanic convulsions and coma precede death.

**Fatal Dose:** 8-10 seeds.

**Fatal Period:** 4-5 hrs.

### Treatment

1. Wash out the stomach with warm water or 1:10000 solution of  $\text{KMnO}_4$ .
2. Molar lactate solution I.V. to combat acidosis on one hand and 5% glucose solution containing, 1mg atropine, 2 cc. adrenalin (1 in 1000 ml) and 2 mg noradrenalin I.V.drip.
3. Activated charcoal.
4. Antiarrhythmic drugs are indicated in the presence of arrhythmias.
5. Digoxin immune Fab (Ovine)- It is the antidote given in digitalis overdose. This is very effective in poisoning with glycosides which are having digitaloid action like *digitalis purpurea*, *cerbera thevetia*, *cerbera odollam*, *nerium odorum* etc. It is prepared from the immunoglobulin fragments from sheep already immunized with a digoxin derivative called Digoxin-dicarboxy-methoxilamine (DDMA). It is available in the trade name Digibind 38 mg. Fab is available in each vial and is used immediately after dissolving in 4ml of sterile water and given as I.V. 10 to 20 vials can be given through a membrane filter I.V. in acute poisoning.
6. Symptomatic treatment.
7. E.E.G. monitoring.<sup>[9]</sup>

**According to Ayurveda-** Buffalo milk curd with sugar or Arak-tvak powder with water.<sup>[10]</sup>

### Postmortem appearances

All the internal organs are congested. Brain may be congested and edematous. Subendocardial hemorrhages may be seen. Stomach mucosa will be congested. Seed particles may be seen sticking to the stomach mucosa.

### Medicolegal importance

1. Suicidal poisoning with the seeds is common. Kernels are taken and after grinding, it is mixed with honey or sugar and ingested.
2. Accidental poisoning can occur in children or when used as a purgative.
3. Homicidal poisoning is rare. Sometimes powdered kernel is added to alcohol and given.
4. Used as an abortifacient by quacks.
5. Cattle poison (horse).

### Test to detect yellow oleander

Add HCl to the suspected extract which will give blue color. To the solution if  $\text{KMnO}_4$  is added the color will disappear.

### Cerbera Odollam

This is a small tree which belongs to the family of oleanders. The leaves are large and lanceolate. The fruit resembles mango and are dark green. The flowers are white like those of jasmine. Fruit is fibrous when dry and contains a single seed. Milky juice exudes from all parts of the plant which also contains active principles.

**Active Principles** -They are mainly glycosides which are cardiotoxins-Cerberin, Cerberocide, Odollin, Odolotoxin.



### Signs and Symptoms

**GIT** - On ingestion the symptoms appear within 1 hour. There will be bitter taste in the mouth, gastrointestinal irritation, nausea, vomiting, abdominal pain and diarrhoea.

**CNS**- The patient may have general weakness, blurring of vision and respiratory distress.

**CVS** - Hyperkalemia and depression of transaminase activity are the chief biochemical changes that occur. Hyperkalemia affects the Cardiovascular system. ECG changes appear 4 hrs after ingestion. The usual findings in the ECG are Ventricular arrhythmias, sinus bradycardia AV block, SA block, combination of SA and AV block, atrial fibrillation and atrial tachycardia. Death may be due to cardiac failure.

**Fatal Dose**- Kernel of one fruit.

**Fatal Period**- 1 to 2 days.

### Treatment

1. Stomach wash with 1% potassium permanganate.
2. Atropine 0.5 mg I.V. every 15 to 30 minutes to keep the heart rate above 50 per minute.
3. Propranolol 1 mg can be given I.V.
4. Hyperkalaemia should be corrected.
5. Digoxin immune Fab is the specific antidote.

**Postmortem appearances** -All the internal organs will be congested. The lungs will be congested and edematous. Subpleural, subendocardial, and subepicardial hemorrhages may be seen. Stomach mucosa will be congested and sometimes seed particles may be seen on the stomach mucosa.

### Circumstances of poisoning

1. Suicides with this poison is common. Kernel of the seeds are consumed after grinding with honey or sugar and made into a paste.
2. Homicide may be by powdered seeds is added to alcohol.
3. Accidental poisoning may occur in children by cutting the fruit mistaking it for unripe mango.
4. Poisoning can also occur during treatment as a purgative.<sup>[11]</sup>

### DISCUSSION AND CONCLUSION

The plant drug Karvira is poisonous to fatal extent if consumed in excess or overdose which most adversely affects heart and respiration resulting into death. Hence, the drug is advised to be used medicinally within strict posological consideration specially for oral use.

The drug belongs to Upavisha varga which normally requires purification (sodhana) and other precautions before clinical use of the drug Karvira (*Nerium odorum*) with white and red flowered varieties (Sweta and Rakta Karvira).

Besides the cardiotoxic effects, the drug Karvira is anthelmintic, antipyretic and antiseptic. It is used in cardiac asthma, circulatory disorders, fever, leprosy, respiratory disorders, skin diseases and worms. The drug Karvira is medicinally useful in various diseases by administering different parts of the plant both externally and internally. Karvira has been recommended in various ailments in classical texts of indigenous medicine. The oil cooked with root of Karvira and aconite along with cow's urine destroys charmadala, siddhma, pidika, krimi and kitibha belonging to group of Ksudraroga. The oil cooked with Karvira should be applied to pama. Karavira and Dugdika are pounded together with milk and this paste is applied overhead (skull) in the condition of grey hairs (palitya) after removing grey hairs. The juice of Karvira is recommended for external application in baldness (Indralupta). Oil (cooking leaves) is applied on skin affections.

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