

## Review Article

### A Review on Saptrangi (*Salacia oblonga* Wall): A Medicinal Herb

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#### ABSTRACT

*Salacia oblonga* Wall, a native shrub also known as Saptrangi and Ponkoranti, belongs to the family *Celastraceae*, is distributed across the world.

A large number of chemical constituents such as salacinol, kotalanol, neokotalanol, neosalacinol, and mangiferin are isolated from *S. oblonga* which show various pharmacological activities. *Salacia oblonga* Wall is being used in several herbal preparations for treating diabetes and obesity. It possess anti-inflammatory, antihyperlipidemic, antiperoxidative, antimicrobial, antimutagenic, nephroprotective and antimutagenic activities. This review focuses on the potential of *Salacia oblonga wall* in various human diseases and can be used as a promising herbal drug, for the benefit of mankind.

**Key-words:** *Salacia oblonga*, Salacinol, pharmacological activities, Anti-diabetic, Nephroprotective, Patent.

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## Introduction

Plants have the ability to synthesize a wide range of phytochemical compounds that possess significant biological functions.

Many of these compounds, used to treat various diseases and have beneficial effects on human health.<sup>1</sup> Medicinal plants are rich source of drugs of traditional systems of medicine, pharmaceutical intermediates and chemical existence for synthetic drug.<sup>2</sup>

Substances derived from plants have recently gained great interest because of its utilization

With increasing interest in the field of herbal medicines, ayurvedic dosage forms and research in the field of herbal formulations, it has become necessary to probe into area of systemic knowledge about herbal drugs. Active components are present in part of the plant like bark, leaves, flowers, roots, fruits, seeds *etc.*<sup>3</sup> Secondary products from the plants are responsible for its action or biological activity.

According to the World Health Organization, large population living in rural areas depends on medicinal herbs, as a primary healthcare system.

Medicinal herbs are commonly available and comparatively economical.

Herbal medicine is a great area of research hence it has become necessary to probe into the area of systemic investigation about them.

One of the important medicinal herb from genus *Salacia* is *Salacia oblonga*. It is also known as ponkoranti and saptrangi. *S. oblonga* has long tradition of use from ancient times as an Indian medicinal herb. The genus *Salacia* (Family: Celastraceae) comprises of various medicinally important species (*S. oblonga*, *S. chinensis*, *S. reticulata*, *etc.*).

Major pharmacological activity of *S. oblonga* is Anti-diabetic. Presence of various phytochemicals viz, salcinol, kotanol and mangiferin from *S. obloga* extracts gives various important biological activities. Salcinol and kotanol have shown antidiabetic activities. Mangiferin is one of the major active component.

*Salacia* species are well distributed in Sri Lanka, India, China and other Southeast Asian countries, and many plants from this genus (e.g., *S. reticulata*, *S. oblonga*, and *S. prinoides*) have been used for thousands of years in herbal medicine.

Apart from its main antidiabetic activity, different species of the genus, *Salacia oblonga* also exhibited hepatoprotective, antimicrobial, anti-inflammatory, antimalarial, and antiobese activities.<sup>4</sup> It is relatively safe to use and, hence, it is available as an ingredient in many functional area and as a herbal drug.

The review focuses on the potential of *Salacia oblonga* in various human diseases.

*Salacia oblonga* Fruit orange (Figure 1), Flower greenish yellow (Figure 2), Root bark golden color (Figure 3)



Figure 1



Figure 2

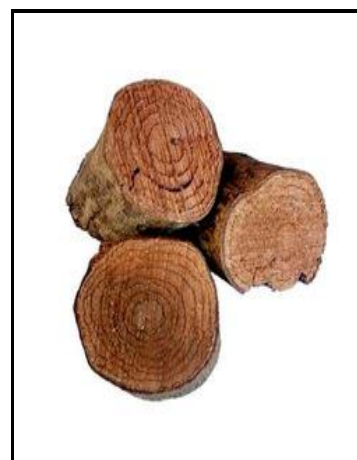


Figure 3

### **Vernacular Names**

Latin - Salacia oblonga  
English- Salacia  
Hindi- Saptrangi  
Sanskrit-Vairi, pitika  
Tamil- Ponkoranti, chundan  
Malayalam- Ponkoranti, koranti  
Kannada- Ekanayakam  
Telugu- Anukudu cettu

### **Taxonomical classification**

Kingdom: Plantae,  
Phylum: Magnoliophyta,  
Class: Magnoliopsida,  
Order: Celastrales,  
Family: Celastraceae,  
Genus: Salacia,  
Species: Salacia oblonga

### **Plant Profile**

These are the plant obtained from the dried roots & leaves of plant *Salacia oblonga* belongs to the family Celastraceae.

About 407 species are found, some of the species are listed below.

1. *S. accedens*
2. *S. anomala*
3. *S. cauliflora*
4. *S. chinensis*
5. *S. elliptica*
6. *S. leonardii*
7. *S. martiana*
8. *S. oblonga*
9. *S. tessmannii*
10. *S. wardii*

### **Plant description**

*S. oblonga* is a strangling shrub with hairless cylindrical branchlets.

Leaves: green in colour, oblong in shape and possess lateral nerves in 7-9 pairs. Leaves are hairless

Flowers: greenish yellow in color, bisexual and arranged in axillary clusters of 3-6 together with small stalks.

Fruits: are drupes and are sub-globose or pear shaped and 5-6 cm in diameter. When ripe, the fruit is orange red in color with 1-6 angled seeds embedded in a fleshy pulp densely sprinkled with lenticels.

Seeds: large, angular

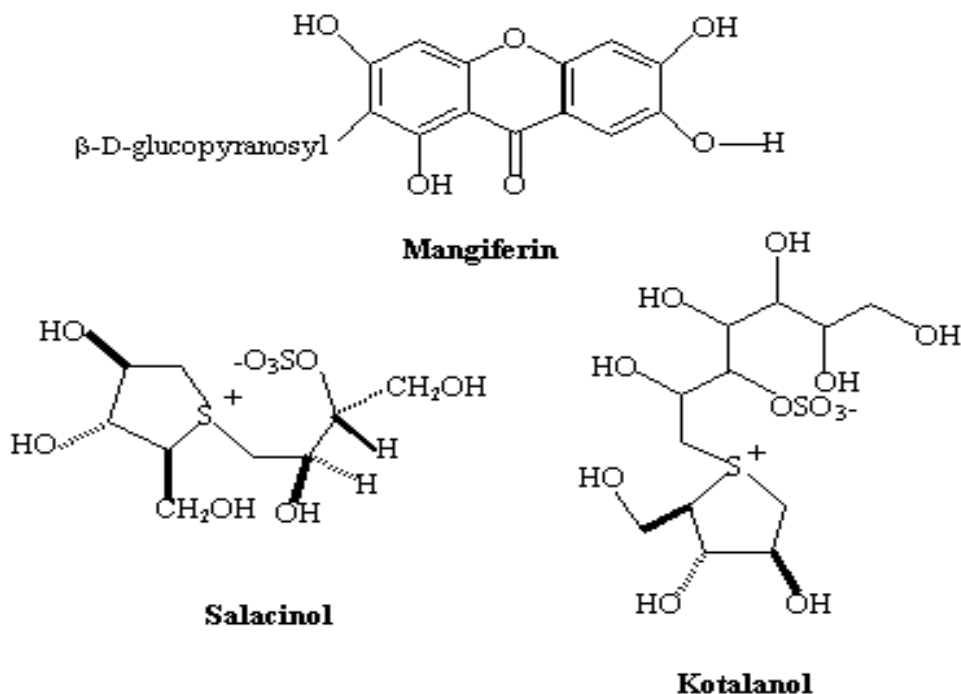
### **Distribution**

*Salacia oblonga* are widely distributed in India, Sri Lanka, China, Vietnam, Malaysia, Indonesia and other Asian countries. In India it is found in the western ghats from Konkan southwards to Kerala. *Salacia* species are distributed in tropical and subtropical regions including North Africa, South America and East Asia, particularly in China.<sup>5</sup>

### **Chemical constituents**

The recent studies have shown the presence of many phytochemicals identified from *S. oblonga* wall. *Salacia* species are known to elaborate anthocyanidines, catechins, quinones, friedo-oleanones, quinonemethide and

related triterpenoids. The major bioactive constituents are being xanthine, glucoside, mangiferin and two components with unique thiosugar structure sulfonium sulfate viz., salacinol and kotalanol.<sup>6</sup> Chemical structures of salacinol and kotalanol and Mangiferin are shown in the Figure 2



**Table No. 1 Biological activities related to *Salacia Oblonga* plant**

Sr. No.	Biological activity	Extract type	Model system	Reference
1	Anti-mutagenic activity <sup>7</sup>	Hydroalcoholic extract of root bark of <i>Salacia oblonga</i>	Wistar rats	Navneet <i>et al.</i> , 2009
2	Nephroprotective activity <sup>8</sup>	Ethanollic extract of <i>Salacia oblonga</i>	250 and 500 mg/kg bw on Acetaminophen induced toxicity in rats	Palani <i>et al.</i> , 2011
3	Inhibition of Cardiac fibrosis <sup>9</sup>	Aqueous extract of <i>Salacia oblonga</i>	Obese zucker rat (OZR).	Yuhao Li <i>et al.</i> , 2004
4	Hypolipidemic activity <sup>10</sup>	Powder extract of <i>Salacia oblonga</i>	White Albino Wistar Female Rats	Kalaiarasi <i>et al.</i> , 2011
5	Anti-microbial Activity <sup>11</sup>	Root, stem and leaves powdered ethyl acetate extract of <i>Salacia oblonga</i>	Gram positive bacteria and gram negative bacteria	Rao MJP <i>et al.</i> , 2010
6	Antiproliferative activity <sup>12</sup>	Aerial and root extracts of <i>Salacia oblonga</i>	Breast cancer cell lines using the MTT assay.	Anjaneyulu Musini <i>et al.</i> , 2015
7	Anti-inflammatory activity <sup>13</sup>	Root bark powder of <i>Salacia oblonga</i> and leaf	Male albino rats. using carrageenan-	Ismail <i>et al.</i> , 1997

		powder of <i>Azima tetracantha</i>	induced paw oedema and cotton pellet granuloma methods	
8	Acute-glycemic Activity <sup>14</sup>	Herbal extract of <i>Salacia oblonga</i>	Diabetes was induced in healthy adults by high carbohydrate meal.	Williams <i>et al.</i> , 2007
9	Hypoglycemic Anti-oxidant activity <sup>15</sup>	Petroleum ether extract of the root bark of <i>Salacia oblonga</i> Wall	Streptozotocin (STZ) diabetic rats	Krishnakumar <i>et al.</i> , 1999
10	Hepatoprotective and antioxidant activity <sup>16</sup>	Aqueous extract of <i>Salacia oblonga</i> root	Male and female rats	Rong X. <i>et al.</i> , 2008
11	Anti-diabetic activity <sup>17</sup>	Mixture of extract of <i>Salacia oblonga</i> and <i>IP-PA1</i> (SI tea)	Type II diabetic model mice.	Nakata <i>et al.</i> , 2011
12	Cytotoxic activity <sup>18</sup>	Petroleum ether extract of the root bark of <i>Salacia oblonga</i>	Ehrlich ascites tumor cells	Augusta KT <i>et al.</i> , 1995
13	Antibes activity <sup>19</sup>	Water extract of <i>Salacia oblonga</i>	Sucker diabetic fatty (ZDF) rats	Huang TH. <i>et al.</i> , 2008
14	Antidiuretic activity <sup>20</sup>	<i>S. oblonga</i> water extracts	Obese Zucker Rats (100mg/kg)	Yuhoo, L. <i>et al.</i> , 2004
15	Determination of triglyceride content in liver <sup>21</sup>	Aqueous-ethanolic extract of <i>Salacia oblonga</i> root	Male Sprague-Dawley rats	Liua L. <i>et al.</i> , 2015
16	Anti-hypertriglyceridemic activity <sup>22</sup>	Aqueous root extract of <i>S.oblonga</i>	Laying hens (1gm/100gm SOR extract (w/w))	Wang J. <i>et al.</i> , 2012.

### Adverse reactions

Orally, *Salacia* can cause gastrointestinal disturbance such as flatulence and distention. Flatulence is more significant with a 1000 mg dose compared to a 500 mg dose. Drinking *Salacia* tea can cause indigestion and loose stool.<sup>23</sup>

**Table No. 2: List of patents based on *Salacia oblonga* Wall**

Sr. No.	Title	Patent No	Inventors	Reference
1	Formulations of alpha-amylase inhibitors of <i>P. vulgaris</i> with alpha-glucosidase inhibitors of <i>S. oblonga</i> or <i>S. reticulata</i> useful in the treatment of diabetes and obesity. <sup>24</sup>	EP 1967200 A1	Ezio Bombardelli, Paolo Morazzoni, Cesare Ponzzone, Massimo Ronchi	Ezio B., <i>et al.</i> , 2007

2	Compositions for delaying progression of diabetes using Salacia oblonga extract. <sup>25</sup>	EP 2397039 A1	Cabrera Ricardo Rueda, Martin Manuel Manzano, Pedrosa Jose Maria Lopez	Cabrera R.R., et al., 2011
3	An organoleptically enhanced salacia plant extract and a process thereof (minora). <sup>26</sup>	WO 2008136013 A1	Villoo Morawala- Patell, Rajesh Ullanat, Ashok Mundrigi, Jagadeesh Badamaranahalli Henjarappa	Villoo M.P., et al., 2008
4	Nutritional composition comprising cereal beta-glucan and salacia extract. <sup>27</sup>	WO 2012024270 A1	Tapas Das, Guarav C. Patel, Shreeram Sathya	Tapas D., et al., 2012
5	Methods for delaying progression of diabetes using salacia oblonga extract. <sup>28</sup>	WO 2011163183 A2	Pedrosa Jose Lopez, Martin Manuel Manzano, Cabrera Ricardo Rueda	Pedrosa J.P., 2011
6	Neutraceutical formulation for treatment of diabetes. <sup>29</sup>	US 20140186466 A1	Amit Patel	Amit Patel, et al., 2014
7	Nutritional supplement for the prevention of cardiovascular disease, alzheimer's disease, diabetes, and regulation and reduction of blood sugar and insulin resistance. <sup>30</sup>	US 8017147 B2	Mohammad A. Mazed, Sayeeda Mazed	Mohammad A. Mazed. Et al., 2011

### Conclusion

The need of *Salacia oblonga* greatly increases in the past few years for its immense therapeutic potentials. *S. oblonga* Wall is an endangered medicinal plant, widely used in Ayurvedic system of medicine to treat diabetes and various other ailments. Increased demand for roots and stems had resulted in extensive clearing of *S. oblonga* Wall from the natural habitats due to which the plant is endangered.

### Conflict of interest

We declare that we have no conflict of interest

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