We have already studied this statement that is, 'The history of medicinal plant is intimately connected with the history of plants.' Primitive man lived at the mercy of Nature, in constant terror of diseases. Men used various plants, minerals and animal organs usually which associate with strange rituals and incantations, to drive out the evil spirits which they believed to be the cause of the diseases. Not only the plants are used for curing diseases, but also for tanning food, fodder, dyes, ornaments, volatile-oils, dietics, gum and resins and pharmaceutical purposes. Some of the examples as follows; the herbs were tied around the wrist and on the head for warding off the evil attacks.¹ The fruits and tuberous roots were used as food.² Alcoholic beverages were also prepared from the different parts of the plants.³ Sugar and honey were obtained from cane sugar and flowers. Papers were made of the reed grass and cloth from fibres obtained from the root bark and cotton of the plants and

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1. (a) आलोकालक्तातालक्तिकुरुकुषासम | Banabhatta - Kādambarī - P.P. 18,19,58,59.
(b) व्रतपरिश्रम कर्तविरक्त कुरुकुषासम राजस्वसाधारण | ditto, p-11
(c) तवा इंसानस्य राजस्वसाधारण य राजस्वसाधारणसिकिद्व अमृतारकनन्दिव | ditto, p-56

2. जलफलमुलस्वरुपाः आहारेऽप्रणवस | Ibid. p-11
3. बकुलविकितरतनः मुकुम्पण्डुरोपचाराय अशोकलक्तामत्तेऽप्रणवस | Ibid. p-56
also from silk worm growing on the plants. Clothes were washed by the ashes or alkali. The washerman used to wash on the wood of salmali. Vegetable oils were also obtained. The woody trees were utilised in construction of houses and furniture, seats and chairs were made of cane. Ropes were made of the fibres and barks of the plants such as Balwaja, Hemp, linseed etc. The trees used for making cots and chairs are enumerated in Brhatsamhita. Bow strings were made of the fibres.
obtained from the plants of Murvā, Arkā, Sana, Gawedhu and Venu.\textsuperscript{9} The sticks of New cane and Naktamāla were used for caning punishment.\textsuperscript{10} Pots were made of coconut, Bamboo and Alābu and Bilwa.\textsuperscript{11} Branches of several trees were used as sticks for religious flags.\textsuperscript{12} Plants were also used in religious ceremonies like Puṣyasnāna, Nīrājana etc.\textsuperscript{13} Specific

9. मूर्तिकाणामतबुधदृशाश्चिन्ताम | Arthaśāstra - 2.34.18.6.

10. Arthaśāstra 4.83.8.12

11. Abhijnāna sākuntalam 64.

12. उदाहरितदिनादृश्यमन्दिर्भवन्नन्दिः चिन्तितात्।।
   कुम्भेषुकण्ठं कण्ठं विल्यलीवन्दुरुक्तात्।।
   भविष्यतविकृपायो नलीविदिताच्यो तरंग।।
   ते च सुख तीव्रत्ता न ते पुष्पात् शामकेल्यं।।
   शेषोऽनुशोभयं श्रायकोलीवृक्षराशि प्रजपिते।।
   एतत्वप्रेमेनत्तमं प्रान्तगमापरं वुधाम्।।
   Brhat Samhitā 43.13-15, p-620

13. a) ज्योतिषस्ती न्रयमाणामन्न्यम पराविदितात्।।
   जीवं विबेषेषरी पातासमझा बिजव्यां तथा।।
   सहां च सहरजस्वा पुरुषोऽनं शातवरीम्।।
   अरिकिं लिया भए एव तु कुफ्यक्तु विन्यासेत्।।
   भ्राटां त्रेमामाओ तै तै महवाजनित श्राद्धाम्।।
   महावानयनं यथा ताम तत्त्वात्ः सर्वावरो गंगावन।।
   रत्नानि सर्वगामावनं लिया च सर्वकुंजनाम्।।
   प्रसादनामाहं हिरण्यं महतात् च।।
   Brhat Samhitā - 48.39-42;

b) सजोतुरककुद्वाक्षाधिमय सानितम् कुकुतानृम्।।
   ब्राह्मदिनिमित्रस्वत्वज्ञकालं कुकुतानृम्।।
   पदमुद्राकम्भालमो शिलाप्रियकुस्काकं।।
   दत्तमुद्राकम्भालमो जुष्णं पुष्यमित्रमालवेशं।।
   कलसेशेऽतां दुर्जा सम्भरात्पुरकेशेऽति स्मयक।।
   भाद्रंनावारम्यमुपाससना कक प्रमुरेऽ|।।
   ब्रह्मपलासोद्वकारस्वत्वमित्रमित्रमा योजना।।
   सुरूऽ कलसेशेऽतां कलप्या भुतिकेषमेऽ।।
   Brhat Samhitā; 44.4,9,11,12

c) पताक, खदिर, बिल्व, शामी, अस्तव, पट, उद्दार, अपारम, फलु, क्रुकु, चदन, मन्दार।।
These twelve trees are called sacrificial. Viṣṇu Dharmottara Purāṇa - 1.9.41-42.
plants were prescribed for Grhas.\textsuperscript{14} There is one Parna - Kṛcchra Vṛta in which one has to live on the leaves of the plants only such as palāśa, udumbara, kamala, bilva and kuśa. There is also somayāja. Dr. P.V. Sharma who was a scholar in this particular subject has given the above statements.\textsuperscript{15} Thus the life was moving around the plants. These statements were given by, places, countries, mountains, cities and time were identified on the basis of plants.\textsuperscript{16} Some chapters connected in any way with plants were

\textsuperscript{14} Dr. P.V. Sharma - 'Indian Medicinal Plants in the classical Age', chowkhamba sanskrit series Varanasi, 1972, p-133.

\textsuperscript{15} Bṛhat Samhitā - 26. 21-30, p-365

\textsuperscript{16} a) महुर्कर्यिका, शल्कीमाल, बट-आवाहिका - Jabalpur, plates of Maharāja Hastin.
b) कौशिकिरिका पूर्वपायी मध्य दक्षिण - Indore plates & Pravara send II [5th Cent. A.D.]
c) भृत - Kasikā - 4.2.67
d) वर्णिकासम्भवम् द्रुमवल्लभार्याः कुकुरकर्मी, शालमलव युष्मी - Kasikā - 4.2.82
e) अल्पमव मुहुर्तमी - Kasikā - 4.2.5.
known by them such as गर्दमाण्डोऽग्याय.17 Some plants are also related to some mysterious knowledge. There is mention of Bala, Atibala and Aparājitā vidyas in Kālidāsa's works.18

It is very difficult to decide how far the description of the plants is based on the experience and knowledge of Bāṇabhaṭṭa and how far imagination has played part in filling up the gaps. It appears to be certain that vindhya region being not very far off from the birth place and capital. It was within the reach of the author who had a hobby of travelling and thus acquired direct experience of the plants in nature as well as cultivated. On the contrary, he did not have the direct knowledge of the plants growing in the Himalayan region as he himself commits.19 Hence the description of that region is based perhaps purely on his imagination. In most cases the knowledge acquired in the vindhya region has been utilised in drawing up the imagination and has been projected in the other region. Therefore, both the works [Harṣa-carita and Kādambari] have to be read carefully and distinguished accordingly this light.

In another part we use these plants to control the pollution and prominent role in indicating the pollution. As we know that pollution has been divided into three divisions. They are air pollution, water pollution, and noise pollution. Air pollution can be defined as the presence in the atmosphere of a substance or substance added directly or indirectly by an act of man, in such amounts as to affect humans, animals, vegetation or

17. Kāsikā - 5.2.60.
18. तै बलाएळल्योऽ प्रभावतो विध्योऽ पश्चिमुनित्रिध्योऽ। मन्दतुर्म मणिकुम्होंती मातुपार्ब्बरितित्तिविविष || Raghuvanśaṁ of Kālidāsa - 11.9; 
19. सीमान्तलेखा दृष्टिवां सर्वमन्दपत्ताम् || Kādambari. p-366.
materials adversely. Plants are very suitable for detecting, monitoring and mitigating air pollution effects. Air pollutants interact with plants and alter their normal functioning. Characteristic morphological injury symptoms develop, when plants are exposed to a high concentration of pollutants for a short duration or to chronic levels for relatively prolonged periods. Although exposure to lower concentrations does not produce any morphological injured symptoms. Biochemical process is altered significantly. Hence plants become stressed due to air pollutants. Increasing efforts are being made to use plants for detecting air pollutants particularly, sulphur dioxide, oxide of nitrogen, hydrogen sulphide, ozone, etc. Biochemical parametres such as total sugar, reducing sugar, acid phosphate and proline content fin the tree species have been studied. The reduction in total sugar content in the cell is reported to be the highest in Cordiamyxa (38.6%) and the least in Ficus benghalensis (6%). Dust ascribed to industrial sources has been shown to reduce carbohydrate content in Ficus religiosa, Ailanthus excelsa, cordiamyxa, calotropis, procera, polyalthia longifolia, Ficusdrupaceae, Ficus benghelensis, Terminalia catappa and Nyctanthes arbortristic. A reduction in the amount of reducing sugars in tree species from polluted sites may be due to clogging of stomatal pores which interferes with gaseous exchange and photo synthetic activities.20

The difference in dust trapping potential also results in varied response of trees. The high dust collecting efficiency of Mangifera could be one of the causes of high suspctibility. In Azadirachta Indica and Ficus glomerata, fly ash pollution resulted in injury to tree species

resulting in high proline content. Syzygium Cumini also shows conspicuous decrease in the size of epidermal cells and an increase in epidermal cells and stomatal frequencies. Sulphurdioxide, alone or in combination with other pollutants, produces deleterious effect on different tree species. Sulphur dioxide enters through the stomata by diffusion where it reacts with water and gets converted into sulphite and bisulphite. These sulphites are highly toxic, as they bring about changes in the leaf p.H. The reduction in photosynthesis appears in the form of reduced plant dry weight as Cassia fistula, Ficus religiosa and Magnifera indica. The excess of sulphite in the tree species is stored in the form of sulphates. Foliar absorption of SO$_2$ gas or in take of sulphate can bring about the accumulation of sulphate in leaves from the soil. Tree species such as Mimusops elengi, Azadirachta indica, Mangifera indica and Ficus religiosa have shown high sulphate content in their leaves. The sulphate content in the leaves has shown a significant positive correlation with the ambient SO$_2$ concentration. Such co-relation may be found in premature defoliation in Tamarindus indica, Pethe colobium, dulca, Ficus religiosa, Ficus numphi, Azadirachta Indica and Ficus racemosa by subjecting them to acute SO$_2$ exposure.

Dresel exhaust affects the epidermal features of the leaves of Lantana and Syzygium cumini in the form of thick walled epidermal cells & broken walls at certain places. In Tectona grandis the fossil fuel combustion resulted in an annual loss of wood production by 26%.\textsuperscript{21}

Plants have been used to survey the effects of air pollution from a single source or cluster of sources on horticultural, agricultural and

\begin{footnote}
\textsuperscript{21} Azeem A - 'Response to some trees to urban Air Pollution. M.Phil. Dissertation Submitted to SES, JNU, New Delhi [unpublished], 1995, p.p - 44.45.
\end{footnote}
forestry crops or on Natural vegetation. Air pollution injury not only reduces the aesthetic beauty of trees but also their pollution scavenging capabilities. Some of the plants, which can be used as air pollution indicators, are listed below:

**Plants as Indicators of Air Pollutants**

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Annuals</th>
<th>Herbs</th>
<th>Shrubs</th>
<th>Trees</th>
<th>Symptom Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 SO₂</td>
<td>Amaranthus Virdis</td>
<td>Carthamus tinctorius</td>
<td>Nerium indium</td>
<td>Adenia cordifolia</td>
<td>Intervenial chlorosis</td>
</tr>
<tr>
<td></td>
<td>Abelmoschus esculents</td>
<td>Gossypium sp.</td>
<td>Tamarindus indica</td>
<td>Tamarindus indica</td>
<td>Necrosis</td>
</tr>
<tr>
<td></td>
<td>Arachis hy pogaea</td>
<td>Helianthus annus</td>
<td>Buchanania lanza</td>
<td>Buchanania lanza</td>
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</tr>
<tr>
<td></td>
<td>Brassica nigra</td>
<td>Hibiscus esculents</td>
<td>Butea monosperma</td>
<td>Butea monosperma</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cyamopsis tetragonoloba</td>
<td>Hordeum sp.</td>
<td>Dioppyros melano-</td>
<td>Dioppyros melano-</td>
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</tr>
<tr>
<td></td>
<td>Glycine max</td>
<td>Lactuca sativa</td>
<td>xylon</td>
<td>xylon</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ipomoea crassicauli</td>
<td>Medicago sativa</td>
<td>Nerium Indica</td>
<td>Nerium Indica</td>
<td></td>
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<tr>
<td></td>
<td>Medicago Sativa</td>
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<tr>
<td></td>
<td>Phaseolus aureus</td>
<td></td>
<td></td>
<td>Manjukia Indica</td>
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<tr>
<td></td>
<td>Phoenix sylvestris</td>
<td></td>
<td></td>
<td>Pyrus malus</td>
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<tr>
<td></td>
<td>Phaseolus radiatus</td>
<td></td>
<td></td>
<td>Pinus sp.</td>
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<tr>
<td></td>
<td>Pisum Sativum</td>
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<td>Siospyros cordifolia</td>
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<tr>
<td></td>
<td>Raphanus sativus</td>
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<tr>
<td></td>
<td>Solanum meglongmen</td>
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</tr>
<tr>
<td>Fluoride</td>
<td>Glycine max</td>
<td>Calotropis procera</td>
<td>Cassia fistula</td>
<td>Leaftip &amp; marginal necrosis</td>
<td></td>
</tr>
<tr>
<td>Cement Dust</td>
<td></td>
<td>Withania sominifera</td>
<td>Dalbergia sissoo</td>
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<tr>
<td>Fly Ash</td>
<td>Triticum aestivum</td>
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<tr>
<td>Petro-coke Smoke</td>
<td>Phuseolus aureus</td>
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</table>

<table>
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<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dust</td>
<td>Triticum aestiuum</td>
<td>Helianthus annus</td>
<td>Erythrina indica</td>
<td>Mangifera indica</td>
<td>Photosynthesis rate decrease</td>
</tr>
<tr>
<td>Herbicide Combination of pollutants</td>
<td>Cicerarietinum</td>
<td>Croton sparsiflorum withania Soninifera</td>
<td>Lantana camara Nerium oderatum Taberndem ontana coronaria sp.</td>
<td>Aegle marmelos Diospyros melanoxylon Mangifera Indica Melia Indica Tectona grandis</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Brassica oleracea Chenopodium album Cicerarietinum Commelina -benghalensis Dolichos lablab Glycine max Helianthus annus Medicago sativa Sonchus asper</td>
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</tr>
</tbody>
</table>

**List of Tree Species Showing Relative Sensitivity to Air Pollution**

1) Kadambah - Anthocephalus chinesis
2) Nimbah - Azadirachta indica
3) Kowidarah - Bauhonia purpurea
4) Salmali - Bambusa bambose
5) Kimśukaḥ - Butea frondosa
6) Āragvdhaḥ - Cassia fistula
7) Jambīraḥ - Citrus lemon
8) Bṭapuraḥ - Citrus medica
9) Ślemaṭakah - Cordia myxa
10) Śimśapa - Dalbergia sissoo
11) Tindukhaḥ - Diospyos melanoxylon
12) Palakṣa - Ficus benghalensis (religiosa).
13) Madukāḥ - Madhuca indica
<table>
<thead>
<tr>
<th>No.</th>
<th>Tree Name</th>
<th>Scientific Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>Amrah</td>
<td>Mangifera indica</td>
</tr>
<tr>
<td>15</td>
<td>Shobhāñjan</td>
<td>Moringa ptergysoperma</td>
</tr>
<tr>
<td>16</td>
<td>Suvarnakadali</td>
<td>Musa paradisca</td>
</tr>
<tr>
<td>17</td>
<td>Dīpyā</td>
<td>Phoenix doctylifera</td>
</tr>
<tr>
<td>18</td>
<td>Karanajaḥ</td>
<td>Pongamra glabra</td>
</tr>
<tr>
<td>19</td>
<td>Pālevatam</td>
<td>Psidium guajava</td>
</tr>
<tr>
<td>20</td>
<td>Aśokaḥ</td>
<td>Saraca indica</td>
</tr>
<tr>
<td>21</td>
<td>Jambūḥ</td>
<td>Syzygium cumini</td>
</tr>
<tr>
<td>22</td>
<td>Amlikā</td>
<td>Tamarindus indica</td>
</tr>
<tr>
<td>23</td>
<td>Sāgaḥ</td>
<td>Tectona grandis</td>
</tr>
<tr>
<td>24</td>
<td>Arjunāḥ</td>
<td>Terminalia arjuna</td>
</tr>
<tr>
<td>25</td>
<td>Badaram</td>
<td>Zizyphus mauritiana</td>
</tr>
</tbody>
</table>

The response of different tree species towards SO$_2$ pollution in field conditions can be given as: Amrah > Śimsappā > Āragva > Nimbah > Desī Aśoka > Palākṣa > Vaṭāḥ.

Auto-exhaust pollution results in the reduction or increase of different plant parameters making Amrah to be the most susceptible and Vaṭāḥ the least. The plants are arranged by decreasing order of susceptibility from highly sensitive to tolerant: Amrah > Śimsappā > Āragva > Nimbah > Desī Aśoka > Palākṣa > Vaṭāḥ. For combined effect of SO$_2$ NO$_2$, the plants in order of sensitivity are: Amrah > Śimsappā > Āragva > Nimbah > Desī Aśoka > Palākṣa > Vaṭāḥ. Finally the overall plants tolerance can be set out as: Amrah > Śimsappā > Āragva > Nimbah > Desī Aśoka > Palākṣa > Vaṭāḥ.²³

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²³. Ibid., pp.67-68
Water Pollution:

One of the most important problems facing mankind today is safe collection, treatment and disposal of enormous quantity of waste water produced by industries. Industry produces waste water of every character ranging from simple substance like nutrients and organic matter to toxic substances like heavy metals. A large number of technologies are available for the treatment of Industrial waste waters, but most of them prohibitive. Simplest method in using Aquatic plants in the treatment of Industrial waste waters and for recovery of various substances from and through them.

These Aquatic plants have simple growth requirements and they grow very fast. They grow on waste water, they degrade and absorb pollutant components and purify water. These plants can be used for various purposes. These have been known to concentrate heavy metals 1,000-20,000 times their concentration in water. Some of the Aquatic plants are:

- Water Hyacinth [Eichornia Crassipes]
- Water Fern [Salvinia Molesta]
- Hydrilla [Hydrilla Verticillata] and
- Azollapinaata, Leminds [Lemna, Wolfa, Spirodela] etc.

These plants are used in various Industries for the treatment of sugar, textile, tannery dairy, palmoil and engineering industry waste.24

Noise Pollution:

Noise is generally regarded as unwanted sound or sound which produces unsound effect on the ears. Noise is produced by household gadgets [like Mixer grinder, Vacuum machine, Air Conditioner etc.] vehicles on the road, aeroplanes, loudspeaker etc. Noise produces severe adverse effect on the quality of man's surrounding and is therefore considered to be polluting the environment. It is the loudness and duration of the noise which is disturbing and causes physical dis-comfort and damage to hearing. One can control the noise pollution by following these simple steps:

a) Growing green plants / trees along road side to reduce noise pollution as they absorb sound.

b) To enforce silence zone in residential areas, school, colleges zone, hospital zone etc.

c) Use of horns with jarring sounds to be banned.

d) Noise producing industry Aerodrome, Railway station etc., to be shifted away from the inhabited areas.

e) Proper law enforced to check the mis use of loud speakers and public announcement systems.25

Many plants are referred to literature by their common names and it is common knowledge that the identify of a large number of plants referred to in ancient literature has been doubtful and several of these are riddles even today. One can recall the case of Soma of the Hindu epics.

About 20 different plant species have been attributed to this name. Varying from plants like Sarcostemma [a flowering plant] to Amanita muscaria [a fungus]. Other significant examples of disputed identity are the names Brāhmi, Purnarnava, Jatamansi, Bala and Kalpavrksa. Some selected Socio Medicinal Plants are:

**BAHUPĀDAH [बहुपाद]**

**Synonymous :**

- Sanskrit : Vaṭah, Raktaphalah, Srniṅī, Nyagrodhaḥ, Skandhajaḥ, Dhruvaḥ, Kṣīri, Vaisravanāvāsaḥ, Bahupādaḥ, and Vanāsapatihi.

- English : Banyan tree

- Hindi : Ber, Bar

- Tamil : Ala

- Telugu : Peddimari, Mari

- Kannada : Aloda, Ala, Alava, Alhada

**Botanical Name** : Ficus Benghalensis

**Natural order** : Moraceae

**Habitat** : Throughout India widely cultivated.

**Description** : A Banyan is a fig tree and its seeds germinate in the cracks and crevices on. Structures like buildings and bridges or on host tree. “Banyan” often refers specifically to the species Ficus Benghalensis,
though the term has been generalized to include all figs that share a unique life style like other Fig species, Banyans have unique fruit structures and are dependent on fig wasps for reproduction. The seeds of Banyans are also dispersed by fruit-eating birds.

It is a large tree, spreading with its aerial roots. These roots coming out of the branches are at first as slender as cotton threads, gradually anchored in the ground, which eventually becomes accessory trunks and support the heaviest branches. The tree has smooth dark grey and variegated bark, which peels in patches. In its younger stages it is often epiphytic, that is, it grows on other trees, which are gradually strangled by its rope like roots. It can grow too tremendous with and live for hundred years.

It is fairly drought resistant but susceptible to damage by browsing. Banyan tree is the India's national tree and is so named after the traders or ‘banyan’ who conducted their business sitting under these trees. In many villages, the panchayat, or the gathering of village elders, takes place under a banyan. The roots of this tree hang down and act as props over an ever widening circle, reflecting the sanskrit name ‘Bahupāda’ meaning “one with many feet”.27

**Etymology:**

The name was originally given to Ficus Benghalensis and comes from India where early travellers observed that the shade of the tree was frequented by Vanika or Indian traders. In the Gujarati language banyan means the “merchant”, ‘not tree’. The portuguese picked up the word to

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refer specifically to Hindu merchants and passed it along to the English as early as 1599 with the same meaning. By 1634, English writers began to tell of the banyan tree, a tree under which Hindu merchants would conduct their business. The tree provided a shaded place for a village meeting or for merchants to sell their goods. Eventually banyan came to mean the tree itself. Today, the banyan is considered in India and Pakistan as sacred, where it represents eternal life because of its seemingly ever-expanding branches.28

In culture: In Hindu religion, the banyan tree is considered as sacred and is called “Aśvathā Vṛkṣa”. “I am Banyan tree among trees” – Bhagavad Gitā. It represents eternal life because of its seemingly ever-expanding branches. In Hindu Mythology, the banyan tree is also called Kalpavṛkṣa meaning ‘wish fulfilling divine tree’, because its ever-expanding branches symbolize eternal life.29

Locations:

Older banyan trees are characterised by their aerial prop roots which grow into thick woody trunks which, with age, can become indistinguishable from the main trunk. Old trees can spread out laterally using these prop roots to cover a wide area.

* The largest such tree is now found in Kolkata in India.
* One of the most famous of banyan trees was planted in Kabirvad, Gujarat. Records show that Kabirvad is more than 300 years old.

29. अश्वाठा स्वर्गवृक्षां देियधरां च नारद ।
गन्धवर्णां चित्ररसं दिवसना कपिलो मूर्तिः ॥ [10th Chapter, 26th Šloka]
Bhagavadgītā - Gitapress, Gorakhpur, 2001, p-168
Aśvatha is related to Ficus Species
In the year 1782 the banyan tree was planted on circumference in Sibpurat, Calcutta. The measurement of this tree in 1965 was 416 mtrs. in width and branches length up to 1044 feet. Even during the same year we can observe the most biggest tree in Sattar, which is near to Maharashtra.30

Banyan is spoken in the Andhra Valley so large as to afford of shade to 20,000 people. Forbes describes as circumference as of 2,000 ft. and its over hanging branches beyond the daughter. Stem as stretching over a much larger area. It had about 120 large trunks and over 3000 smaller and was capable of sheltering 7000 men. High floods have however since carried away portions of the islands of this great tree.31

Myths and Folktales:

The banyan is one of the most familiar trees of India and it is found almost all the villages of country. In India the tree is called the 'Kalpavrukṣa', 'tree of immortality', 'tree of eternal life', and 'tree of creation' by bringing its branches spread on earth to bring blessings to human kind. Various mythological tales and religious texts converse about many Hindu sages and Buddhist monks have sought the meaning of life and attained Nirvāṇa under the Banyan tree.

The banyan is a huge tree famous for its leafy branches and cool shadow. Some of its branches take roots in the soil and grow out as

30. S.N. Ramaswami - "Karnatakada Āryan Vrukshagalu", The Institute of Kannada Studies, University of Mysore, 1969, p.39
separate trees. Even in the time of deluge, when the whole world is flooded with water, it stands out prominently as the eternal tree giving protection to Lord Kṛṣṇa in his child form. It is mentioned in the Aitareya Brāhmaṇa that a certain king was asked to drink its milk, leaving a side the juice of soma plant. In the Rāmāyaṇa of Vālmīki - the celebrated sage of Tamas and in the Uttarām charit of Bhavabhūti, this tree has been mentioned as undying tree [akśay vat] which was situated on the confluence of Gaṅgā, Yamunā and Saraswati, at prayag (Allahabad), U.P. The descendent of this original Immortal tree still stands in the fort at Allahabad. It was believed in ancient and mediaeval times that suicide committed at this place, by throwing oneself from the top of this tree into the deep waters of the Ganges, will lead to salvation. Hence pilgrims come on their pilgrimage from different parts of India to this place used to commit suicide here. It is an historical fact that after the death of a certain Rashtrakuta king his queens, numbering no less than one hundred and fifty, committed suicide here. The chinese traveller Huan Tsang has mentioned the existence of this tree at Prayag in his travels. It is said that when Satyavān was cutting the branches of this tree, he accidentally stabbed his wife Śāvitrī and she succumbed to her injury.

[Creation of banyan tree in India mythology Kaśyapa Muni attained enlightenment under this tree. Buddha is believed to have sat under the banyan tree for seven days, absorbed in his new found realization after attaining enlightenment. The first Tirthankara of Jain religion Adinātha or Rṣabhanātha, who was the founder of Jainism, received his jñāna or perfect knowledge under the banyan tree.

32. Viṣṇu Purāṇa - p.166.
Thus, it is also sacred to the Jains. To Hindus the banyan tree is important in socio-religious ceremonies throughout the country and the aerial roots are symbolic of the matted hair of Dakshinamurthy [Siva]. It is considered as Kalpa Vṛkṣa that is a wish fulfilling tree and people tie pebbles on it. It is also worshipped by women in memory of ‘Sati Sāvitri’ who brought her dead husband to life worshipping the Nyagrodha or Banyan tree.

This worship is known as “वस्तिविधीस्वतर्थ”. Under this tree ‘Sāvitri’ saved her husband Satyavān, that it came to be known as Vatasavitri vṛta. There is reference about this vṛta in Skanda Purāṇa. This vṛta is celebrated during “Jyeṣṭha Huṇṇime”. By the performance of ‘Vāta Sāvitri Vrata’ women will be blessed by life generations [santati]. During this vṛta first they have to put water to vāta vṛkṣa then they have to tie pebbles on it.32a

According to Vāmana Purāṇa, the Banyan tree was created by a Yakṣa, who was the chief of all the Yakṣaganas.33 According to Kūrma Purāṇa, Śiva lives in this tree and thus its fruits are eaten by the people of ‘Ramyaka Varṣa’.34 In India, planting this tree has been popular custom

32a. वट सिद्धांमि ते मूले सलिलेश्वरलोपीणकः ।
सुविकी कुरु मां नाष पतिपुत्र समलिताम् ॥
सूरेण बैठो भक्तवा गम्भीरपायले शुद्धेऽः ।
मम सन्तानुवृद्धि च कुरु ले वट नावक ॥ Dharwad Paṇcāṅgam - P.1

33. वशापार्मन्यश्यामि मन्नमहस्ते नारद ।
वट चुर्की समभक्तसिद्धां एवति सदा ॥ Vaman Purāṇam - 17.3

34. a) न्योग्धं रक्तवेद्वते नितम सुलपार्माण्डिवराकः ।
स्वांसं रक्ताति वैव्यवहर सर्वपार्श्ववृक्षः ॥ Kūrma Purāṇam - पूर्व.अ. 36.25.
b) रक्तवेद्वतेः नायीं रक्तवेद्वतेः रज्जवधाय ।
रक्तवेद्वतेः नायीं रक्तवेद्वतेः रज्जवत्राय ॥
जीवाति चैव सत्त्वस्य न्योग्धः परम्परश्च ॥ Kūrma Purāṇam - पूर्व.अ. 45.3.
since ancient days. It is one of the nine trees whose wood is used to feed the sacrificial fire. This tree is specially worshipped on the twelfth day of the Jyeṣṭha month, one who worships the banyan tree is assured of prosperity.

Rituals and Beliefs:

The banyan is symbolic of Lord Śiva and is therefore held sacred. It is also sacred to Viṣṇu, Brahma, Maheśvara, Kāli, Lakṣmi, Kubera, Yakṣa and Yakṣīs. Banyan trees are sacred in South Asia, particularly to Hindus and Buddhists. The tree features in many myths.35

Banyan and Symbolism:

In Hinduism the banyan tree represents immortality and there are many stories in ancient literature. In the Bhagavad Gītā, Kṛṣṇa uses the banyan tree as a symbol to describe the true meaning of life to the warrior hero Arjuna.36 Banyan is viewed by Hindus as the male plant, closely related to the bodhi tree [Ficus religiosa]. It is regarded as a sin to destroy either of these trees. It is commendable for a person to plant a young banyan close to a peepul, and is done with a ceremony similar to that of marriage. It is customary to place a piece of silver money under the roots of the young banyan. Banyan is mentioned in the Buddhist Jātaka tales. In the episode of Satyavān and Sāvitrī, Satyavān lost his life beneath the branches of a banyan. Sāvitrī courageously entered into a debate with

Yama, the God of Death, and won his life back. In memory of this couple, in the month of Jyestha during May and June, the tree is celebrated. Married women visit a banyan and pray for the long life of their husbands. The tree is associated with the life of the 15th century saint Kabir. A giant tree is said to have sprung from a twig he had chewed. People of all religions use its great leafy canopy to medicate or rest. Minor deities such as Yakṣas (Tree spirits), Kinnars (half-human, half animal) and Gandharvas (celestial musicians) are believed to dwell in branches on banyan trees. Ghosts and demons are also associated with its branches. Because it is believed that many spirits are harboured in the banyan, people do not sleep under it at night.37

**Classification:**

Kingdom : Plantae Division Magnoliophyta  
Class : Magnoliopsida  
Order : Urticales  
Genus : Ficus Species: F.benghalensis.38

**USES :**

* The sacred banyan is also useful in a variety of crafts, from lacquer work to do leather dressing. This is a useful product from lac insect, which feeds on the banyan.

Lac and Shellac – One important product is dark brown resin. The resin is called lac is secreted by several small insect species which parasitise various host trees. One of the host tree is banyan. Both Shellac and Lac dye can be produced from this raw material. Shellac is made into a varnish for paper or it is used in French polishing of furniture. Lac dye was traditionally used to colour wool and silk. The colour varies between purple, red, brown and orange, often depending on the mordant used. However, today lac dye has been largely over taken by synthetic dyes.\(^{39}\)

* **Wood and Fibre**: The wood of the banyan is moderately hard and is not considered to be of much value as timber. It is durable under water and may be used for well curbs, boxes and door panels. When carefully cut and seasoned, it can be used for furniture. The wood of the aerial roots is stronger and more elastic. It is used for tent poles, cart yokes, banghy poles and carrying shafts. This makes the roots useful as carrying shafts. This makes the roots useful as carrying poles, cart yokes and tent poles. The aerial roots also make good tooth brushes. In the economic botany collection at Kew there are some partly processed fibres from banyan bark which is ready to make in to paper. A modern craft is greeting cards, using banyan leaves as part of the design.\(^{40}\)

* **Enhances Mental Strength**: This is one of the glorious tree of our country. One can discern the vibration or perceive the enhanced quality of the breathable air, under banyan tree. Close and sentinel approach to the tree generate vibrations within the mind and body. These

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vibrations set an emotional order in motion and influence spiritual thoughts. If one has the reverential approach similar to Buddha or Sāvitri, he/she can perceive the significance of the magnificent trees. These feelings come about spontaneously without one's genuine knowledge. This tree release vital elements like 'serotonin', besides oxygen. By inhaling ambient air under this tree in the early mornings, one can experience a spiritual recharge. ‘Serotonin’ which enhances mental strength. The body is controlled by two glands – (1) Pitutary and (2) Rinal which helps to purify the blood and pain.

The combinations of first rays of the sun and breathable air under this banyan tree, effectively manifest into vital elements which is a 'spiritual gift'. It increases the quality of genetic codes of future generation. The massive trees start trapping the sun rays from the very day they sprout and a mass energy in their bodies. The light which they trap and convert energy is a “Divine Representation of Radiance and Glow”.

* **Achieve Meditation** : The banyan tree makes mind and body together, thats why the great sages always used to choose such trees for their meditation.41

* **As a Medicine** : Vaṭa is Kaśāya (astringent) in taste, Śitavirya, Stambhana (astringent), rukṣaṇa (roughning). It is useful in thrist, emesis, syncope, and raktapitta [hamorrhagic disorders].42

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• Milky juice externally applied to pains and bruises, rheumatism, cracked feet, lumbago and to the gums in toothache.

• Decoction of root, fibre, tender, end of the hanging roots, juice of bud and fruits are used in gonorrhoea.\textsuperscript{43}

• Infusion of bark is used as tonic and in diabetes.

* \textbf{As Food} : Fruits eaten in times of scarcity, leaves lopped for fodder.\textsuperscript{44}

* \textbf{Other Purposes} : Green leaves of this tree prepared as lunch plates, milk of this tree applied for fruits and dried leaves are used for manures.\textsuperscript{45}

* The Banyan is the National tree. Its interlinked 'roots and branches' are often used as a symbol of 'the country's unity in diversity.'\textsuperscript{46}

* \textbf{Other References} : We will get the reference to Nyagrodha tree in the field of literature. They are as follows:

  \textit{In Amarkosa} Nyagrodha means \textit{Ālad Hanu} and it is also known as Neyagrodhah.\textsuperscript{47}


\textsuperscript{44} Bruscher – The useful plants in India.

\textsuperscript{45} S.N. Ramaswamy – 'Karnatakada Aryan Vrukshagalu', Institute of Kannada Studies University, Mysore, Y-1969, p.39.

\textsuperscript{46} Amirthalingam.M. – 'Sacred Trees of Tamilnadu', C.P.R. Environmental Education Centre, Chennai, Y-1988, p.10

\textsuperscript{47} अभ्यस्त वौषङ्गः श्वाकृतीप्रीयद्रुमुद्रे फले।
\textit{बाहास्ते च फले जम्बूवा जम्बूर रजी जम्बु जाम्बवं}।
Atharva Veda – “Out of the excellent Palākṣa you arise out of the asvattha, the khadira, the dhava, the excellent Banyan [Nyagrodha], the parna do you come to us, O arundhati. Its towards a healing plant lākṣā.48

Susruta Samhitā – We get the reference to this plant in the treatment of diabetes. “In the beginning itself, the patient of diabetes should be given oleation therapies with any medicated oil or medicated ghee prepared from drugs of priyangvādi gana, then administered drugs to cause more number of vomiting and purgations. After purgation, āsthappana by using decotion of drugs of Surasādi gana added with paste of Mahāausadhā, bhadradāru and mustā, honey and saindhava. If there is burning sensation then, decotion of drugs of Nyagrodhadi gana without adding oil may be used.49

References in Various Purāṇas

Vāyu Purāṇa : This purāṇa does not deal with the medicinal uses of plants as such, but at different places refer to certain plants, consumption of fruits of those plants adds to the health and vigour of the inhabitants of the area. These remarks indicate that those plants have some medicinal/nutriative properties. The information about Nyagrodhāḥ as gathered from the purāṇa is briefly enumerated below:

48. भद्राद् लक्षम्यत्रिस्तिच्चवत्यात् बदिराद् धवत् ।
भद्राद्याणि पारितं पर्याति सा न महारुवति ॥

49. लतारितं एव प्रमेहिं िििीिवल्लोक तैलेन विभवादितिवदेन ता धूलत वामयेत् प्राणां विरेच्येच्य, विरेच्यात्तां नुसारादिक्षाप्रवेच्यावेचकोष्ठीकष्ठि भद्राद्यमुस्तावपेठ मपिनेवाभावलेन, द्यामानं च न्योगातिक्षापेठ नित्यस्ते॥
> According to the purāṇa man can live up to 10,010 years by drinking the fruit juice of this tree.\textsuperscript{50}

> Even it indicates the medicinal importance of Ficus Benghalensis [Nyagrodhaḥ]. This is not normally included in medicinal plants now a days. It may be mentioned in this connection that a large section of this sub continent uses banyan tree twigs for brushing their teeth and are normally free from dental worries.

**Matsya Purāṇa**: The purāṇa gives a long list of plants, which according to the purāṇa should be stored in a king’s abode by the king for the welfare of the subjects. The purāṇa classifies those plants into the following five groups, perhaps according to the taste: a) sweet, b) sour, c) bitter, d) caustic and e) pungent. Among the names of the plant Nyagrodha comes under caustic [kaśāya].\textsuperscript{51}

**Brahma Vaivarta Purāṇa**: The purāṇa contains descriptions about many sacred places in different chapters. In all these narratives references have been made to bowers, groves, gardens and green belts. It appears that the purāṇa considers these phytomasses essential for beauty, atmospheric purity and quitetude. The purāṇa lists terrestrial as well as aquatic plants in this connection. Among the terrestrial plants Nyagrodha is one of them.\textsuperscript{52}

\textsuperscript{50} Matsya purāṇa - 217.78
Kūrma Purāṇa: It States that Brahma resides on ‘Nyagrodha tree’.

<table>
<thead>
<tr>
<th>Name of the country</th>
<th>Name of the fruit</th>
<th>Benefits enjoyed and reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ramyāk Varsha</td>
<td>Nyagrodha</td>
<td>People are white skinned &amp; pious [sāttvika], they live for 10,500 years.53</td>
</tr>
</tbody>
</table>

P.V. Sharma who was a scholar in this particular subject. He says that Varāhamitra mentioned the drug in his work Nyagrodha in 6th century A.D. and even in Panchatantra also finds the reference to this plant.54 Pañchavaṭi Vṛkṣas.

Āsvattha, Vāṭa, Bilva, Aśoka and Āmla are planted at appropriate locations. This has been done according to the directions given in scriptures such as, Skanda purāṇa and Caturvāna cintāmaṇi of Hemādri a scholar of 13th century. These trees are called ‘Mahā Vṛkṣas are planted very carefully systematically order at appropriate locations. As per this, Northern direction – Bilva, West – Āsvattha, East – Vāṭa, South – Āmla, North-west – Aśoka trees must be planted.55 At the centre of all these trees one who performs the meditation, he will get the successful result. So that the Bio-energy generated by them in the vana. Slogan of Pañchavaṭi Vṛkṣa.

53. रम्यके पुल्ला नायों रमते रजस्भावः।
दस्यांशतासायि तत्ताति दस पत्म च। ||
जीतानि चैव सत्सना न्यायोपयतमोनन्तः। Kūrma Purāṇa: 45.3


55. अन्यत्र त्यागमेवः प्राणिकिल्युत्तमस्तम्भः। वज्जितं हिंद्रः भागे तुधात्रीमष्टिः दक्षिणलयः, अयोक्तं बहिन्धिक त्यागम् तपस्यं चुरस्वरर्ग मधे वेदिं चतुहितं सुमदरी सुमनोहरः। ||
“One who plants the following trees, they will see the Naraka”. They are as follows: one Aśvattha, one Bevu, one Nyagrodha, ten Āmla, three Bilva, three Āmalaka and five mango trees.56

There is a reference in Mahābhārata. Aśvatthāma and others had one day gone to the forest where they slept under a Nyagrodha tree. Aśvatthāma observed that during the night an owl came and murdered numerous crows on the tree while they were asleep. This suggested to him a well plan of murdering the Pāṇḍavas and their army.57 In Atharva-Veda, Nyagrodha described in this way, ‘out of the excellent Palākṣa you arise, out of Aśvattha, the Khadira, the Dhava, the excellent Banyan [Nyagrodha], the parna do you come to us O arundhati.58

**BILVAH** [विल्वः]

**Synonyms:**

<table>
<thead>
<tr>
<th>Sanskrit</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bilvah, Śalātuḥ, Śāṇḍilyah, Ṣrṇyāhvaḥ, Karkaṭaḥ,</td>
<td>Wikipedia page will be added later</td>
</tr>
</tbody>
</table>

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Putimarutah, Laksmlphalah, Gandhagarbhah, Satyakarmā, Durāruhaḥ, Vātasāraḥ, Arimedah, Kantakādhyah, Asitānanah are synonyms of Bilva.\(^{59}\)

**English:** Bael fruit tree, Holy fruit tree.

**Hindi:** Bel, Sirphal

**Kannada:** Belpatri

**Tamil:** Vilum

**Botanical Name:** Aegle marmelos

**Natural order:** Rutaceae.

**Habitat:** Aegle Marmelos or Bael Tree (also known as wood apple or stone apple) growing wild throughout the deciduous forests in India, ascending to an altitude of 1200 m in the western Himalayas.\(^{60}\)

**History:** Tree is held in great veneration by Hindus. It is sacred to Lord Śiva, and Durgā,\(^{61}\) whose worship can not be accomplished without it. Its leaves are ternate and hence it is also known as “Tripattra”. It is planted near the temples. The Hindus considered it as an emblem of fertility and auspicious plant. There are gardens of this plant.\(^{62}\) Fruits were favourite of monkeys.\(^{63}\) Bilva reference innumerable in Brhatrayi

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59. बिल्वं बलातुः शाणिद्वर्गो हृदयन्वरस महाफलम् ।
श्रीवस्ते श्रीवस्ते श्रीवस्ते कर्मदु तु पुरुषमात्रम् ॥
Dr. S.D. Kamat – "Studies on Medicinal Plants & Drugs in Dhanvantari Nighantu", Chaukhamba Sanskrit Pratishthan, Delhi, 2002, p.39

60. S.Shyamsundar – “Sacred plants”, Karnataka Forest Department, 1988, p.67

61. सितस्य स्माहवः कर्मदु पुरुषमात्रम् ॥
Harshacharita: 170, 640

62. बिल्ववास्तिकामध्यस्ते | Harshacharita - 175

63. कपीलां श्रीपतामित्राः | Kādambari - 127
and other texts, also in Vedic literature, epics, purāṇas etc. By wearing Bilva mani we will get the peace of mind and patience. Rajput kings used to worship Goddess Chāmuṇḍi with the tender leaves of Bilva, during Dasarā festival. Indian purāṇas state that there is a bond between Lord Śiva and Bilva. Where we will come across the temple of Lord Śiva, there, we will find the Bilva tree. Even wherever the Lord Śiva will get worshipped, there Bilva is present. Bilva is the auspicious one to worship Lord Śiva. Therefore, Śiva is known as 'Bilvadandin'.

Botanical name of Bilva is 'eagle', which is the name of sandhya star in Latinin. Three sisters with the help of dragon protected which is related to Goddess Hera. One among them was sandhya star. marmels is a portuguese word, which means smooth or like 'Amrutashelay'. In the same way 'Sriphal', sanskrit word means Holy.

Vilva a devotee of Viṣṇu. There is a story in Skanda purāṇa about Bilva who lived as a Vaiṣṇavite first and then was converted a Śaivite. In the beginning Brahma created many thing among which Vilva (tree) [Crataeva religiosa] also was created. Under that tree an anonymous man began to live. Brahma gave him the name Vilva. Being pleased at the behaviour and devotion of Bilva, Indra asked him to turn the wheel of administration of the earth. Accepting the offer Bilva requested. Indra to give him the Vajra [diamond] for the smooth running of the administration of the earth. Indra told him that Vajrāyudha [diamond-weapon] would be at his disposal, when he thought about it, if the occasion required it.64

Once Kapila a Śaivite reached the palace of Bilva. After a long conversation both became fast friends. One day there was a debate between Bilva and Kapila as to whether penance or action was appreciable. In this discussion Bilva lost equilibrium of his mind and thinking of the diamond weapon of Indra cut off the head of Kapila. In Kapila there was the power of penance as well as the power Śiva. So through Śiva Kapila got immortality. In the meanwhile Bilva went to Viṣṇu and got a boon that every living thing in the earth should fear him. But the boon was futile. This was a turning point for Bilva. The mind of Bilva changed to devotion for Śiva. He concentrated his attention on the worship of Śivalinga at the forest of Mahākāla. One day Kapila came by that way and was greeted by Bilva with honour and regard, and they again became fast friends. All these above statements given by Veetam Mani who was a scholar and gone through all the Purāṇas.65

**Description:** A medium sized armed deciduous tree upto light point zero m high with straight sharp, axillary throns and yellowish brown shallowly furrowed corky bark, leaves trigoliate, aromatic, alternate, leaflets, ovate or ovatelanceolate, crenate, peeluied-punctuate the laterals subsessible and the term in along petioled flowers, greenish white sweet scented in axillary panicles, fruits, globase, woody berry with yellowish rind, seeds numerous oblong. Con yoressed embedded in orange brown sweet gummy pulp.66 Fruits were favourite of Monkeys.67 There were spines in the tree.68 This was abundantly found in Vindhya forest.69

65. Ibid., pp.145,146.
67. कपीलोपितामहोपस्नितां प्रामाणिकायाः | Kādambari. 127
68. भयोतकत्तैतरिक श्रीपत्तव्रेणाः | Kādambari. 638
69. श्रीरुपेनोयोगोपितां वर्षणी परिष्पतं | Kādambari.57
The fruits were like small heads of the babies. The ripe fruits had particular smell.

**Chemical Components**: The bael fruit is woody and smooth with 5 to 15 cm diameter. This fruit contains proteins, carbohydrates, fibres and minerals in a high concentration with a caloric value of 137. The minerals contained by the Aegle marmelos fruit are distributed in the form of calcium, phosphorus, iron, carotene, thiamin, ribofavin, nicacin and Vitamin C.

**Varieties**: Two plants are included – a) Arjunah and b) Kakubhah. Both of them are from same genus. Bilva is also called ‘Śriphala’ and ‘Sadāphala’.

**USES**:

**As a Medicine**:

* The roots of Bilva are sweet in taste and laghu, these pacify three doṣas and are useful in vomiting. The unripe fruit is śrigandha astringent, and appetizer. It is pungent, bitter, kaśāya in taste, sharp, usnavirya and pacifies vāta and kapha doṣas. But when it is well ripe it’s...
subsidiary test is sweet, and is guru, increases epigastric burning, contispating and expels doṣas and foetid flatus.\textsuperscript{75}

* The roots are sweet astringent bitter and febrifuge. They are useful in diarrhea, dysentery, dyspepsia, stomachalgia, cardiopalmus, vitiating conditions of vāta, seminal weakness uropathy, vomiting, intermittent fever swelling and gastric irritability in infant. The leaves are astringent laxative febrifuge and expectorant and are useful in ophthalmia, deafness, inflammation, catarrh, diabetes and asthimations, complaints. The unripe fruits are bitter acrid sour, astringent, digestive and stomachic and are useful in diarrhea, dysentery and stomachalgia. The ripe fruits are astringent, sweet, aromatic, cooling, febrifuge, laxative and tonic and are good for heart and brain and in dyspepsia.\textsuperscript{76}

* Its root is one of the ingredients of the ‘Daśamūla’ or ‘ten roots’ used in Āyurveda. It is also given to prevent the growth of piles.

‘Bilva Paṇchaka’ or ‘Bilva Rasāyanam’ are usually prepared by using ‘Bael’ fruit given in chronic dysentery. The fresh juice of the leaves is used in diabetes. The Bael fruit is a best medicine in ameobic dysentery.\textsuperscript{77}

* The flowers are useful in diarrhea, thirst and vomiting. The flowers buds, alleviate kaphā and vāta are contispative and relieve colic.
* The oil extracted from the pulp alleviates vāta.

* The young fruit of Bilva are medically more active. It is useful in haemorrhoids and swellings. It is valuable in diarrhoea of pitta and kaphā types. Its twigs are not be used for brushing the teeth.

* The flowers are used collyrium for eye diseases.

* The Kṣara of the fruit is useful in aseities.\(^{78}\)

* Medicated ghee prepared with pippali indrayava, dhavani, tikta, sariva, āmalaka, bilva, musta, hima, palani, sevya, drāksa, ativisa, and sthira – cure fevers, irregularities of digestion, halimaka, loss of taste and appetite, severe burning, sensation in the shoulders, vomiting pain in the flanks and the head and consumption quickly.\(^{79}\)

* Jivanti, madana, meda, pippalī, madhuka, vaca, roldhi, rasna, bala, bilva, śatapuspa and śatāvari are converted to a paste and mixed with milk, ghee and oil and administered as enema, as many times as required to produce unctuousness and mitigate the doṣas.\(^{80}\)

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78. *Aṣṭāṅga Hṛdaya* – *sūtra* 3.20

79. *Piṣṭhikārṇiśyāntābhāsanā* *sāritāṅgakāṇakā* *sūtra* 3.18

78. Medicated ghee prepared with pippali indrayava, dhavani, tikta, sariva, amalaka, bilva, musta, hima, palani, sevya, draksas, ativisa, and sthira – cure fevers, irregularities of digestion, halimaka, loss of taste and appetite, severe burning, sensation in the shoulders, vomiting pain in the flanks and the head and consumption quickly.\(^{79}\)

80. Jivanti, madana, meda, pippali, madhuka, vaca, roldhi, rasna, bala, bilva, satapuspa and satavari are converted into a paste and mixed with milk, ghee and oil and administered as enema, as many times as required to produce unctuousness and mitigate the doṣas.\(^{80}\)

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**Classical Use:**

* 'Caraka prescribed tender fruits of Bilva with butter milk in diarrhoea. In case of diarrhoea with blood, suśruta prescribed under tender fruits mixed with liquid jaggery honey and oil.

* Suśruta used unripe fruits internally in migrane, internal abscesses, and for reducing obesity. He used ripe fruits internally as an appetizer and laxative, leaves for producing heat in the body and for tonning up the digestive system.

According to Vrindamadhava, decoction of Bilva and mango seed, mixed with honey and sugar, checks vomiting and diarrhoea. For colitis steamed tender fruits of Bilva with honey followed by intake of butter milk added with chtraka powder were advised paste of the tender fruit of Bilva, mixed with dry ginger powder and jaggery was also said to alternative serve colitis. The patient was kept on buttermilk diet during the course of treatment.

*Bilvaadi Chūrna*, a compound formulation of chakradatta and *Bilvaadi Griska* a compound formulation of Aṣṭāṅga Hṛdaya are still available and are indicated in diarrhoea dysentry sprue.

*Bilvaadi lehya* based on Sahasrayoga is also a drug of choice in the south for diarrhoea, dysentry, vomiting and dyspepsia.

Bilva’s dry puppisan ingredient in shaarangadhara saṁhitā, *Gangadhara churna* in ashtaanga hridaya. *Dadimaasha Ka churna* are spoken in the Āyurvedic texts. Both compounds are in use extensively in diarrhoea and dysentery. Buttermilk is invariably given to the patient.

The root bark of Bilva is one of the ingredients in *Dashamula-rishta*, a renowned restorative tonic for women.
Medical Action:

Rasa – sweet, astringent bitter and pungent.

Guna – heavy and dry, light (root), heavy (unripe fruit).

Virya – hot.81

Bilva as Socio-plant:

The Aroma chemicals greatly help the brain cells to organize themselves to systematically develop a consciousness and devotional attitude. The chemicals supress and subdue impatience. Thus contributing to the overall self control. The aspirations for internal wisdom can be fulfilled by uniting with Divine Mother, through gratifying the tissues by the aroma of Bilva and other products, which are the creation of Mother Nature.82

We can use this tree for the making of Agricultural Equipments and for the Bulk-cart. It is used as fuel. In villages used for cleaning of the grains.83 The Vilva, or wood apple or Bel tree [Aegle marmelos] sacred to Śiva.

Parts Used: Leaves, fruits, root bark.

Dose: Fresh juice 10-20 ml. decoction 50-100 ml., powder 3-5 gm.84

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83. Dr. Vasundra Bhupati – “Ganeshana Poojeya 21 Patregalu Hagoo Āyurveda”. p.21
Other References:

* 'Bilva, Śāndilya, Sāilūṣa, Mālūra, Śrīphala are synonymous of Bilva vrksa.' Bana Bhatta mentioned the Bilva drug in his work.

* According to the Vāmana purāṇa, the plants are sacred in origin. In various chapters the purāṇa describes the origin of plants and plant group from different Gods. Among them vilva plant originated from the palm of Lakṣmi.

* The purāṇa compares the forest of Badarikāśrama with a beautiful lady. From the poetic description of the forest, it appears that the following plants were present in that forest; Asoka, Kimsuka, Vilva, Kunda, Bandhujiva, Sindhuvāra, Kaṃkola, Putrajīva, Kamala and Indivara. It further states that leaves of vilva are preferred in the worship of Viṣṇu.

* According to Vāyu purāṇa the following trees are fit for religious purposes. Palākṣa, Nyagrodha, Asvattha, Vikaṃkata, Udumbara, Vilva, Candana, Sarala, Devadāru, Sāla and Khadira.

85. Amarakośa - Vana-oṣadhi varga. Sloka-387, p-76.
86. Dr. P.V. Sharma – Indian Medicine in the Classical Age. p-248
87. Vāmana purāṇa - 17.8
88. Vāmana purāṇa - 6,18,21
89. Vāyu purāṇa – U. 13.70-71
The Kurma purāṇa prescribes that a Brahmin should use a good looking nonporous staff made either of vilva wood or of Palāsā wood. In case neither is available, the staff may be made of wood obtained from any tree considered fit for yajña.91

Matsya purāṇa prescribes some uses of plants for maintaining vitality and vigour of a man’s body. The clothings, beds, furniture, coat of armour, ornaments, canopy and cāmara [fan made of funs and wools] become sterilized, if they are treated with the paste of the following plants: Vilva, Ataki, Yavaksāra, Pātalā, Usana, Śrīparni, and Śallakt.92

Even this purāṇa mentions the use of Bilva or Vilva plant in various religious rituals. They are as follows:

(i) *Tulapursua dāna yagña* : The logs of the following plants should be used for constructing pillars on the perimeter of the raised plat form required for the above yagña. Śāla, Ingudi, Candana, Devadāru, Śrīparṇi, Vilva and Priyakāncana, while tila should be used in various offerings.93

(ii) *Ananta tritiya vrta* : This vrta is to be performed in each calendar month, naturally flowers of different plants are to be used in different months. But in all the months white sarsapa should be used in the

91. Icmh’? to iqairffgfr qFT II Kurma purāṇa – U.12.15.
92. tore# qT^TT WTf|j#W I toff to>FTg tor II Matsya purāṇa – 218.2 & 3
93. #t^to%r^rtoFnr i eS<d^H4<sHci fFTT ft ^ II Matsya purāṇa – 274.32.33
pre-worship bath by the worshipper. Kuśodaka, leaves of Vilva, flowers of Arka, grains of Yava, fruits of Śrīṅgavāri and Vilva.94

(iii) Śiva caturdasi  vrta: The plants prescribed for this function are: Kuśa, Vilva, Karpurā, Aguru, Yava, Tila, Pippalī, Mandāra, Mālatī, Dhusṭura, Sindhvāra, Aśoka, Mallikā, Pātala, Arka, Kadamba, Durvā, and Utpala.95

The Brahma Vaivarta purāṇa makes some references to the medicinal use of plants. As per this drinking water immediately after eating the fruits of tāla or vilva gives rise to deadly pitta.96 Consumption of powdered dhāṇyāka along with cold water and sugar, ripe fruits of tāla and vilva. All products of ikṣu, ādrika, caṇaka, soup of mudga and the sweets made of tila and sugar help in eliminating pitta.97

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94. गोमूर्त गोमये दृषहरं दधि सप्तिसुकोशक्म | विनयरक्तपुण्यं च गवं श्रुद्धेष्वरकं तथा || पन्चमण्ड च किल्लं च प्राचेदेत् क्रमसतदा | चतुर्व भांतिर्म तु प्राणां समुदाहतम || Mataya purāṇa – 62.25 & 26.

95. नमो भीमायाह हलेेव्य लामहं हारयं गतः | गोमूर्त गोमये दृषहरं दधि सप्तिसुकोशक्म | पन्चमण्ड ततो बिल्लं कर्वुराणागम्यं वसर | तिलके कृताः विनयलय प्राणां क्रमशं स्मृतम् || प्रतिमालं च तूर्यस्योषोरिकं प्राणां स्मृतम् || मदग्रासातीश्वर तथा ध्वरुरुर्कर्लिंपी | सिनुशरागहकिंच धातकाशव पाले || अन्नपुष्पी कदमबंश शतपत्मा तोपरस्ले || एककेन शस्योश्चिरसितू पार्श्वपदित्रम् || Mataya purāṇa – 95.22 to 25

96. तालमिलनलं शुक्ला जलपातं च तत्तवणम || तदेव तु भवेति सदा प्राणां हरं परम || Brahmavaivarta purāṇam – Bk.16.59.

97. सचर्करं च धारणां सिद्धं शतोदकालितम || गणं सर्ववच्छं च दशिकरविचित्रितम || बिन्ततालरं पकं सर्वमपि च || आदं मुनिसुरं च तिलिपिं सचर्करम || पितामहं संधो वसमुदिद्यं परम || पितानां च तारिजुरामान्वन्ततां न भैं || Brahmavaivarta purāṇam – B.K. 16.61-63.
The purāṇa states that consumption of certain vegetables on some specific days, would create adverse results. The logic for the reasons given by the purāṇa are listed below:

<table>
<thead>
<tr>
<th>Day of the lunar month</th>
<th>Food prohibited</th>
<th>Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st day</td>
<td>Kuśmāṇḍa</td>
<td>destruction of wealth</td>
</tr>
<tr>
<td>2nd day</td>
<td>Vṛhatī</td>
<td>loss of memory</td>
</tr>
<tr>
<td>3rd day</td>
<td>Paṭola</td>
<td>increase of enemy</td>
</tr>
<tr>
<td>4th day</td>
<td>Mūlaka</td>
<td>loss of wealth</td>
</tr>
<tr>
<td>5th day</td>
<td>Vilva</td>
<td>bad reputation</td>
</tr>
<tr>
<td>6th day</td>
<td>Nimba</td>
<td>becoming a quadruped in the next birth.</td>
</tr>
<tr>
<td>7th day</td>
<td>Tāla</td>
<td>diseases</td>
</tr>
<tr>
<td>8th day</td>
<td>Nārikela</td>
<td>distinction of intellect</td>
</tr>
<tr>
<td>9th day</td>
<td>Tumbi</td>
<td>desecration of the body</td>
</tr>
<tr>
<td>10th day</td>
<td>Kalambakā</td>
<td></td>
</tr>
<tr>
<td>11th day</td>
<td>Šimbī</td>
<td>destruction of son(s).</td>
</tr>
<tr>
<td>12th day</td>
<td>Pūtikā</td>
<td></td>
</tr>
<tr>
<td>13th day</td>
<td>Vārtākī</td>
<td>Great sin.</td>
</tr>
<tr>
<td>14th day</td>
<td>Māsa</td>
<td></td>
</tr>
</tbody>
</table>

98. प्रतिपत्तुः च कृष्णाण्डमभवेः द्वायनाशलम्।
| वितीयायां च हुमतिः सोर्जनम् धनाशलम्।
| अभावं च पटोलं च शतु धब्दिकरं परम्।
| तुत्तीयायां भुनुर्यां च मूलक धनाशलम्।
| कलकीकरं चैव पंचमां बिलबलशणम्।
| तिर्योपोणि प्राप्तेः तद्यथां वै निम्प्रत्यमण्यम्।
| रोपधिविकरं चैव नारायणं लालबुशणम्।
| सप्रवच्छं च तथा सरीरस्य च नाशकम्। →
The Purāṇa states that some virtues and certain celestial abodes can be achieved by offering some flowers, leaves on specific months and dates to some specific Gods:

<table>
<thead>
<tr>
<th>Date &amp; Month</th>
<th>Article to be offered</th>
<th>To the God</th>
<th>Objective of achievement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vaiśākha [March-April]</td>
<td>Candana</td>
<td>Hari</td>
<td>Beauty, happiness &amp; permission to stay for 6,000 years in the place of Viṣṇu.⁹⁹</td>
</tr>
<tr>
<td>Kārttika [October-November]</td>
<td>Leaves of Tulasi</td>
<td>Hari</td>
<td>Immortality and happiness.¹⁰⁰</td>
</tr>
<tr>
<td>Night of Śivarātri</td>
<td>Leaves of Vilva</td>
<td>Śiva</td>
<td>Place in Śivaloka the sphere of Śiva.¹⁰¹</td>
</tr>
</tbody>
</table>

The Purāṇa further continues that for the beauty of different parts of the body one should offer various plant materials to some Gods. Among them Vilva [100000] mature fruits offered to Siddhendranātha and the limb for which beauty is desired is Breast.¹⁰²

99. कैसायें हरये हक्कायो ददाति च चन्दनम्।
    तुभि नव्यम्य गोमासं दशम्यं च कल्लमिका॥
    एकादश्मं तथा बीमी ब्रह्मसां पूर्तिका यथा।
    द्वादश्मं च वातार्की न भक्ता पुन्नतनाशम्॥
    जुरुद्धश्मं मासभर्म्य महापापकं परस्म॥
    पञ्चदश्मं तथा मात्रमभर्म्य गृहिणि युने॥ Brahma Vaivarta purāṇa - B.K. 27.29-35.

100. कालिक तुलसींदानं करोति हरये च या।
     युन्यं पत्रप्रमाणं च मोदते हरिनिदिरे॥ Brahma Vaivarta Purāṇa - PK. 27.7.57

101. शिवाय शिवरत्रीं च विलयत ददाति या।
     पत्रप्रमाणं च युन्यं मोदते शिवमिदिरे॥ Brahma Vaivarta Purāṇa - PK. 27.7.77

102. सुपुरुष श्रीफलां च लवणं च सुमनोहरम्।
     देवं सिद्धेनपाय स्तनायन्त्यिते॥ Ibid - GK. 4.49
According to the Agni Purāṇa Vilva, Agnimantha, Śyonāka, Kuṅkuma, trikarāṭaka, Prśniparnī, Vṛhattī, Karāṭakārī can cure a patient suffering from fever and its associate pains and cough.103

It contains religious rituals in different chapters, some instruction about the use of medicinal plants and plant materials. ‘Samidha’ is a kind of ritual, in which the stem of different plants used by people for achieving certain specific objectives.

<table>
<thead>
<tr>
<th>Desired Goal</th>
<th>Plants to be used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wealth</td>
<td>Pātalā, Campaka</td>
</tr>
<tr>
<td>Kingdom</td>
<td>Vilva</td>
</tr>
<tr>
<td>Cakravartitva i.e.,</td>
<td>Padma</td>
</tr>
<tr>
<td>hegemony over other kings</td>
<td></td>
</tr>
<tr>
<td>Eradication of disease</td>
<td>Dūrvā</td>
</tr>
<tr>
<td>Satisfaction of Navagraha</td>
<td>Arka, Palāśa, Khadira, Apamārga,</td>
</tr>
<tr>
<td></td>
<td>Audumbara, Śami.104</td>
</tr>
</tbody>
</table>

It further states that God may be pleased by offering any of the leaves: Vilva, sāra, rajanī and kusumānda.

103. विन्यासमित्योरं रक्षकर्मं पारात्मा स्वरा।
विक्रान्तं पूर्णिमप्रसा वृहती कराटकारिकाः।
| *ज्ञानायांप्राप्तिकारिकाः कुशमुखककाः।* || *Agni Purāṇa – 284.3 & 4*

104. विभाग राज्याद्व लक्ष्यमयं पारात्मा चक्रावटकानपि।
पपासो चक्रस्वति प्रग्नस्मृत्यानि समयं। || *Agni Purāṇa – 81.50.*
CANDANAM [चन्दनम्]

Synonymous:

Sanskrit: Candanam, Gandhsaram, Mahārham, Śvetacandana, Bhadraśrih, Malayajam, Gosīrsam, and Tilaparnakam are synonymous. ¹⁰⁵

English: Sandalwood tree

Hindi: Candan

Kannada: Śrigandhadamar

Tamil: Sandal, Sandanak-Katti

Marathi: Candana

Botanical Name: Santalum album. Linn.

Natural order: Santalaceae

Habitat: Western peninsula cultivated elsewhere¹⁰⁶. The variety of Candana known as Gosīrṣa was presented by the king of Assam which shows its abundance in that region.¹⁰⁷

Description: This is a small ever green tree with slender dropping branches. The sap wood is white and odourless, the heart wood yellowish brown and strongly scented. The leaves are glabrous, opposite, elliptic-lancelet, entire, with an acute base and petiolate. The flowers are

¹⁰⁵. Dr. Kamat - “Studies on Medicinal plants & drugs in Dhanvantari Nighantu” P-191
¹⁰⁶. Bruscher - “The useful plants in India”, P-547
¹⁰⁷. Harṣacarita. 387
brownish purple, hermaphrodite inodorous, occurring as paniculate cymes. The fruit which is subglobose drupe is purple black with a hard endo carp.\textsuperscript{108}

The plant is closely associated with snakes.\textsuperscript{109} The tree of Candana was covered by some creeper.\textsuperscript{110} The plant also grows in the eastern region.\textsuperscript{111} We get this description of the plant in literature.

### Varieties:

Several varieties of Candana are described in books. There are sixteen varieties in Kauṭilya Artha Sāstra (2.27.11.24) among which main are Gosirṣa, Haricandana and Raktacandana.\textsuperscript{112} Among them are:

1. Two kinds –
   a) Betta-Candana
   b) Sukvadi-Candana

2. Seven kinds –
   a) Sri-Khanda
   b) Savara-Candana
   c) Pita-Candana
   d) Rakta-Candana
   e) Pataṅga-Candana
   f) Barbara-Candana
   g) Hari-Candana\textsuperscript{113}

\textsuperscript{108} Dr. S.R. Sudarshan, “Materia Medica of Herbal Drugs” (Vol I), Ramdas Bhatkal, 2005, P-53.

\textsuperscript{109} b) \texttt{Harṣacarita. 123}

\textsuperscript{110} Dr. P.V. Sharma – “Indian Medicine in the Classical Age”, P-165

\textsuperscript{111} \texttt{Harṣacarita. 221}

\textsuperscript{112} \texttt{Harṣacarita. 332}

\textsuperscript{113} Dr. S.R. Sudarshan – “Materia Medica of Herbal Drugs” (Vol I), P-53
**Rakta Candana:**

This is another type of Candanam called as “Raktacandana” of which synonyms are Lohitam, Haricandanam, Raktasāram, Tāmrasāram and Kṣudracandanam. Botanical name of Raktacandana is “Pterocarpus santalinus Linn” and in English it is known as “Red Sandal wood”. It grows in Burma and Andaman Islands.\(^{114}\)

Red fluid oozes out from this plant which has complexion like that of flower of Kusumbha. This was used as paste on the dead body of Tantrikas and also on the body of person who was given punishment of death. This is found abundantly in Vindhya region.

**Hari Candana:**

This is one of the varieties of Candana which has also cooling property.\(^{115}\) This is a kind of Candana having nine Synonymous which are, Haricandanam, Surārham, Harigandham, Candracandanam, Divyam, Divijam, Mahāgandham, Nandanajam and Lohitam.\(^{116}\)

**Kucandanam [Pataṅgam]:**

This is one more variety of Candanam. The synonyms are Kucandanam, Pataṅgam, Raktakāṣṭam, Suraḍgakam, Patrāṅgam, Paṭṭarāṅgam and

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114. Dr. K.D. Kamat – “Studies on Medicinal Plants & Drugs in Dhanvantri Nighantu”, p.193
115. Dr. P.V. Sharma – “Indian Medicine in the classical Age”, P-165
Paṭṭaraṇjanam.\textsuperscript{117} The Botanical name for is “Caesalpinia sappa Linn”. In English it is known as “The Sappan wood” and Kannada ‘Pataṅga” ceke.

Pataṅga is sweet in taste and in Vipāka, not excessively Šītavrīya. Kucandana is bitter in taste, fragrant and useful in wound healing.\textsuperscript{118} It is cultivated in Eastern and Western peninsula.

**Kāliyakam:**

This is also a kind of Candanam. The synonyms are Kāliyakam, Pītam, Nārāyaṇapriyam, Malayottham, Pītakāstham, and Haricandanam.\textsuperscript{119} Kāliyakam is Šītavrīya, useful in bleeding disorders (rakta pitta) and is too much auspicious.\textsuperscript{120}

**Barbarikam:**

This is one among Candana varieties. The synonyms are Barbarikam, Śvetam, Nirgandham, Barbarodbhavam. It pacifies pitta, rakta and kaphā doṣas, alleviates burning sensation, is guru and rūkṣa (roughening).\textsuperscript{121} This is a kind of a white and odourless Candanam.\textsuperscript{122}

\textsuperscript{117} कुष्कवते पतझ च रक्तकार्युक्तकर्मः।
पतझाँ पतझाँ च दृढज्ञानवेय च ॥

\textsuperscript{118} खादुपाकर्षे शीतं पतझं नातिशिलालम्।
कुष्कवते तु तिष्ठते स्वासुगति इश्वरोपयम् ॥

\textsuperscript{119} कालीयकं तु पीतं श्यालस्य नारायणिष्वम्।
मलयोत्यं पीतकार्यं चतुर्यं हरिचदनम् ॥

\textsuperscript{120} कालीयकं पवित्रचर्यं शीतलं न्यातिपिल्लिङ्गे।
अथ बर्बिरिकं स्वेतं निर्मितं बर्बिरितथम्।
पितुस्य मुद्रकं कुष्कवतं कृमिष्मेण पुरुष व्यवः ॥

\textsuperscript{121} निर्मितं बदनम् गधरलिंगं स्वेतचंदनं जाति।
All these kinds are similar in taste and virya, but there is a difference in the fragrance. These are bitter in qualities in the reverse order.

**Medical Action:**

- **Rasa:** Bitter, Astringent and slightly pungent.
- **Guna:** Light and Dry.
- **Virya:** Cold.

**USES:** As *Socio plant*

**Hinduism:** Sandal wood paste is integral to rituals and ceremonies, to mark religious utensils and to decorate the icons of deities. It is also distributed to devotees, who apply it to the forehead or neck and chest. Preparation of the paste is a duty fit only for the pure and is therefore entrusted in temples and ceremonies only to priests.

Sandal wood is considered in alternative medicine to bring one closer to the divine. It gives a cool soothing effect to the body thus reducing the body heat. In Thirupathi after religious tonsure sandal paste is applied to protect the skin sandal wood essential oil is used for Ayurvedic purpose and treating anxiety.

**Buddhism:** Sandal wood is considered to be of the padma (lotus) group and attributed to Amitabha Buddha. Sandal wood scent is believed to be a consequent of one’s desires and maintain alertness while in meditation. Sandal wood is also one of the more popular scents used when offering incense to the Buddha.

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123. Dr. S.D.Kamat - Studies on Medicinal Plants & Drugs in Dhanvantri Nighantu, pp.193-195.
124. Dr. S.R. Sudarshan - Materia Medica of Herbal Drugs (Vol-I), P-54.
This was applied not only on the forehead, but also in other parts of the body. The thighs of the young man, Dadhica, were anointed with this.\textsuperscript{125}

* The dried paste of Candana becomes white.\textsuperscript{126} This grows abundantly in Malaya region.\textsuperscript{127} This was applied on the body for cooling purposes in summer seasons and high temperature.\textsuperscript{128}

* The betel nuts were made white by applying the paste or powder of Candana.\textsuperscript{129}

* Pillars in the house, were made of this which were damaged by insects.\textsuperscript{130}

* The garlands of Candana were used for decorating gates.\textsuperscript{131}

* The young leaves were used as ear ornaments.\textsuperscript{132}

\begin{itemize}
\item \textsuperscript{125} a) \textit{Har\ṣ\acarita} 240
\item b) \textit{Ibid.}, 190
\item c) \textit{Ibid.}, 222
\item d) \textit{Kādambari}, 49;309
\item \textsuperscript{126} a) \textit{Har\ṣ\acarita} 56
\item b) \textit{Ibid.}, 120; 251
\item c) \textit{Har\ṣ\acarita} 295; \textit{Kādambari}, 26;69;180;353;536;610
\item \textsuperscript{127} \textit{Har\ṣ\acarita} 65, Abhijñāna Shakuntalam, \textit{Raghuvaṃśām} 4,48.
\item \textsuperscript{128} a) \textit{Har\ṣ\acarita} 80
\item b) \textit{Har\ṣ\acarita} 119; \textit{Kādambari Uttarabhāg} 5,57
\item \textsuperscript{129} \textit{Har\ṣ\acarita} 221
\item \textsuperscript{130} \textit{Har\ṣ\acarita} 225
\item \textsuperscript{131} \textit{Kādambari Uttarabhāg} 77
\item \textsuperscript{132} \textit{Kādambari} 7
\end{itemize}
* Sometimes fire is produced by rubbing the woods of the plant.\(^{133}\)

* The heart wood (sara) of the plant is used.\(^{134}\) This is white, bitter, fragrant and cold.\(^{135}\)

* Sandal wood is one of the finest woods for carving and also employed for making curious of exquisite beauty. Sandal wood oil is widely used in perfumery and forms the base for attars produced in India. Also employed as base for co-distillation of some other essential oils of delicate fragrance. East Indian sandal wood oil extracted from the heart wood. Both the wood and oil are diuretic, diaphoretic, refrigerant and expectorant, finding several applications in household remedies. Sandal tree is a partial root parasite. Sandal wood oil is widely used in cosmetic industry.

* Sandal wood essential oil was popular in medicine. Mostly as an urogential (internal) and skin (external) antiseptic. Its main component beta-sandal has antimicrobial properties. It is used in aromatherapy and to prepare soaps. Due to this antimicrobial activity, it can be used to clear skin from blackheads and spots, but it must always be properly diluted with a carrier oil.\(^{136}\)

* Sandal wood is used to make beautiful idols.\(^{137}\)

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133. चन्दनप्रभावों न वहति किमलतः | Kādambari 317.
134. Kāśikā 3.317
135. यदिदं चन्दनमुपवत्त्वे तया श्वेतं रत्नं तिक्तं रसं पदुर्भवायं शीतः स्वर्णं इति | Nyāyavartika 1.1.41.
136. Bruscher – “The useful plants in India” P-547
137. S.N. Ramswami – “Karnatakad Aranya Vṛṣṭagalu” P-97
As a Medicine:

* Śṛṅkhaṇḍa [Candana] is sweet and bitter in taste, Śītavīrya, pacify pitta, is blood purifying, Vṛṣya and useful in internal burning sensation.138

* All kinds of Candana are sweet and bitter in taste, Śītavīrya, pacify pitta and rakta dosha, bad effects of poisons, thirst, burning sensation and worms. These are guru, rukṣa (roughening) and cause much refrigerant action.139

* Rakta Candana is bitter in taste, Śītavīrya, antiseptic (or destroys evil spirits), pacifies severe rakta and pitta doṣa.140

* It alleviates kapha and pitta is a heart tonic. It promotes complexion, it is refreshing and an aphrodisiac and useful in fevers, vomiting, thirst, burning diseases of impure blood, syncope, dysuria, cough, worms, vertigo, fatigue, tuberculosis, diseases of gums and teeth and toxicosis.

* Pita Candana is useful in scabies eczema and skin diseases characterized by itching.

138. श्रीशर्काढ श्रीतमं स्वाभु तिसकं पिताविनिर्माणम्।
रक्तप्रसारसं कृष्यं अंतर्दाहापहरकम्॥
Dr. K.D. Kamat – “Studies on Medicinal plants & drugs in Dhanvantri Nighantu”
P-191, 193

139. पितालाविविवधशाकुकुमिन्द्र गुरू रक्तमण्।
सर्व सत्यमाधुरं चलं शिश्विरं परम्॥
Dr. K.D. Kamat – “Studies on Medicinal plants & drugs in Dhanvantri Nighantu”
P-191, 193

140. रक्तस्वस्थयमादुषु रक्तोऽयं तित्तवीलातम्।
रक्तोदरकरं हलि पिताकारं सुदारणम्॥
Dr. K.D. Kamat – “Studies on Medicinal plants & drugs in Dhanvantri Nighantu”
P-191, 193
* Rakta Candana alleviates all the doṣas, it gives strength, it is beneficial to the eyes and useful in ulcers, skin diseases and bleeding from internal organs.\(^\text{141}\)

* It relieves pruritus, body pain bleeding from rectum and enhances complexion.\(^\text{142}\)

* It is used as collyrium and in a few urinary disorders.\(^\text{143}\)

* It is also useful in menstrual troubles.\(^\text{144}\)

* Powder of Candana, uṣīra, jalada, lāja, mudga, kaṇḍa and yava soaked in the decotion of bala it cures bleeding disease.\(^\text{145}\)

* Candana, Karkaṭaśṛṅgi, the two Sahajatamasmī, amṛta, hareṇu, mṛṇala, triphala, padmaka and utpala – these thirteen drugs are cooked with trivṛt sneha adding milk and medicated oil prepared. This is useful for bathing and healing the wound.\(^\text{146}\)

* Candana, padmaka, rodhra, utpala, privanuga, haridrā and madhuka, milk – these eight are cooked with medicated oil prepared in the usual way. This oil is best for healing of wounds.\(^\text{147}\)

141. Dr. S.R. Sudarshan – "Materia Medica of Herbal Drugs" (Vol-I), P.54
142. Caraka Saṁhitā Sūtra – 4, 11; 4, 17; 4, 10 and Chikitsa: 19, 86
143. Suśruta Saṁhitā – Uttara 17, 27; Chikitsa: 11, 9
144. Aṣṭāṅga Saṅgraha – Sarira 1, 38
145. चन्दनोशीर्जनशतसामुद्रकनायके।
वलात्ते पतुभित्त्र जम्बयो रक्तप्रित्या।
146. चन्दन कर्कश्रंगि च सोऽऽ सैस्याहवायुताः।
हरेणो मृणाले च ब्र्ह्मल पव्ययते।
योद्धादिगं विबुद्धेतदा पवसांविन्तम्।
तैलं विकं लेकर्यं हितं तु वग्होपने।
147. चन्दन पप्फ़क रोगंस्पृस्तलानि प्रयुक्तः।
हरिद्रा मधुकरं वैव पवः स्वाध्य चाएत्मम्।
तैलमेधिनित्यं तु प्रधारं रोगोपकम्।
References in Purāṇas:

Vāmana Purāṇa states that if one steals Candana or usīra, then that one is thrown into the hell called Karmbhasikatā.¹⁴⁸ Even it states that the following plants are aquatic and available on the mountains; Āmalaka, Pātala, Cūta, Nipa, Kadamba, Candana, Aguru, Campaka, Śāla, Tāla, Tamāla, Sarala, Arjuna and Parpata.¹⁴⁹

The paste of Candana was a popular cosmetic.¹⁵⁰ Even the warriors used to anoint their persons with the paste of Raktacandana.¹⁵¹ The candana was also used as a bathing material.¹⁵² Garlands of flowers and leaves of plants were used to decorate the persons.¹⁵³

It also states that on certain specific time particular flowers and other plant materials should be offered to some specific Gods. Among them, during Phālguna Māsa that is from February to March, we have to offer flowers of Kunda and Kusuma and incense of Candana to lord

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¹⁴⁸. परोपकारप्रज्ञकाश्चदनोन्नीतारिषयाः।
बालवयजनहतिः करमसिसकताशिताः।। Vāmana Purāṇa – 12.7

¹⁴⁹. गुङ्गाः कर्मकारश्रव विलामसमपाटलिः।
चूतनीपदवनेभवः चदनामाणमकृष्टिः।।
शालेनतलास्तालेभवः सरसालूनपटिः।।
तथा निविदिविभूषणेः सर्वतः समपर्मलिः।। Vāmana Purāṇa – 85.8 & 9

¹⁵⁰. तव चदनाक्ष्य स च भयमपूतितो न युक्तस्य प्रतिभाति मे लिदमृ।। Vāmana Purāṇa – 51.64

¹⁵¹. बढ़कुषीविनो बीरा रक्तचदनभूषिताः।
इमेप्राप्तं योद्धं महादेवं उत्तमाः।। Vāmana Purāṇa – 67.13

¹⁵². पवसा हविधमियस्त स्यापवेशसतविमलः।
चदनामिश्रितायैर्यैं मे प्रीतिः प्रजायते।। Vāmana Purāṇa – 67.36

¹⁵³. श्रेष्ठाब्यास्ती देव्या श्रेष्ठामालयुतेपनः।
मुग्धाजितालूमुष्यो वहिपत्रिविचित्रकः।। Vāmana Purāṇa – 89.29
Even the Candana is preferred in the worship of Viṣṇu. Before worshipping Mahadeva, the image of the God should be anointed with the paste of Kuṅkuma and Candana. The incense of Kaley Candana should be used in the worship.\textsuperscript{156}

According to Vāyu Purāṇa, Candana tree is fit for religious purposes,\textsuperscript{157} and even the product is fit for Śrādha ceremony.\textsuperscript{158}

Matsya Purāṇa contains some instructions about religious rituals, where candana is required for the following rituals:

a) Tulāpuruṣa dāna Yāgña,\textsuperscript{159}

b) Parvata pradāna Vṛta: Here Hari Candana is required.\textsuperscript{160}
Brahma Vaivarta Purāṇa states that Brahma has created innumerable plants through meditative contemplation. It continues that Lakṣmī, Goddess of wealth, is the presiding deity of all crop, plants, Candana, and on the branches of all beautiful trees. Even it states that the Candana tree which was present in Vṛnda forest, where Rādhā used to live with her girl friends.

The purāṇa contains some description about the city of Dvārākā. It states that on the outer periphery of the city a thick tree was made for the purpose of protection of the city. And Candana tree beautified it. Even the purāṇa states that all the roads of "Kailāsadhāma" are kept scented by spraying water, fragranced with Candana. The court of Hari decorated by candana. The pillars are ornamented with young twigs of Candana tied by jute threads, while the entire interior of the court is

161. त्रेपेव त्रृपपीली दिवमवीरु सुपथुचु च।
सर्वसस्येदुलस्वय सांस्कृतृत तथा।।
प्रतिमानु च देववाना महालेखु चतुरु च।
यापिकेनु च मूलादु मालयु च मनोहरा।।
मणीयदृशु च हारेशु क्षीरे च चन्दनेयु च।
वृक्षालात्थु रथादु नबस्येणु तत्तुचु।।
Brahma Vaivarta Purāṇa - PK.35.22-24

162. कीकायानां तत्सरेव कप्तुशचक्षुभानितम्।
विराज्ञातिरिवसैः कपिलं मद्यवानविभि।।
क्षेत्रीयुव्रुक्पत्ताः पुष्पाद्वै: सुरसीङ्कुत्तम्।।
नवपल्लवसंस्तत्तपरुपल्लुपकृतम्।।
कुज कैतिकद्ववायाः कदविः कपिलीकम्।।
मन्दवराणां चम्पकानां चन्दनानात्तत्वेच।।
Brahma Vaivarta Purāṇa - PK.35.22-24

163. Ibid - SK. 104

164. आमोदितं च श्रीतेन मन्दददनवायु।
श्रीभानिरिन्दितां श्रीभंितो श्रीकृतितिः।।
Ibid - SK. 104.7-15

165. केलासाराजरामाः च चन्दनेन उसुस्कृतम्।
आपृपलसुनास्वयं कन्दलीलमभिनितम्।।
Ibid - GK. 6.30
fragranced with planned use of Kumkuma and Candana along with their sweet smelling substance.\textsuperscript{166}

Brahma Vaivarta \textit{Purāṇa} states that the paste of Candana, drugs and Kumkuma are perfumes of very high grades. It has been mentioned that Kṛṣṇa, Radhā, Hari, Laksyā and all important persons used these perfumes for fragrance.\textsuperscript{167} Candana and Kumkuma are also used by the divine dignitaries as cosmetics for making themselves personable.\textsuperscript{168}

Of all the perfumes, it appears that Candana is liked by the purānic personalities. In many places the \textit{Purāṇa} reverentially mentions of air fragrant with Candana, physiques anointed with Candana, and beds smeared with Candana.\textsuperscript{169} It appears from the \textit{Purāṇa} that the flowery beds, sprinkled with Candana are sanctified by Tantra and possibly it helps to arouse and maintain eroticism in the users of the same.\textsuperscript{170} According to this \textit{Purāṇa}, Candana is good for cantonments.

\textsuperscript{166} \textit{ibid} - PK.16.172
\textsuperscript{167} a) \textit{ibid} - BK.5.34
\textsuperscript{168} \textit{ibid} - BK.5.34
\textsuperscript{169} \textit{ibid} - BK.18, BK.5.34, PK.16.2
\textsuperscript{170} \textit{ibid} - BK.5.34
Agni Purāṇa contains sufficient information for the treatment of pimples. That is external application of Dhātaki, Candana, Valā, Samaṅgā, Madhukā, Utpala and Dārvi along with ghee removes the pimples.\textsuperscript{171} It also contains some amount of information about the use of plants and plant materials in the physiology of reproduction in different chapters. The sexual vigour of man increases immensely by drinking milk in which the following have been boiled; the decoction of triphala and Candana, juice of bhrūga and hema, doṣa, cuñcuka and honey.\textsuperscript{172} Use of Candana, lāksā, buds of mālati and girimrttika [stone dust] can help in curing the deformed sperms.\textsuperscript{173}

The Agni Purāṇa contains some information about the use of plants in Vaśikarna. They are Candana, Nāgapuṣpa, Maṇjiṣṭha, Tagaram, Vacā, lōdhra, priyaṅgu, and the oil of Māṃśi are useful.\textsuperscript{174}

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\textsuperscript{171} bhātakī cāndanavatām samādīyagurutvatelāḥ. \(\text{III Agni Purāṇa - 285.35}\)

\textsuperscript{172} ātmaṇamārthāviṣayā vikrṣyate lokāyatanam. \(\text{III Agni Purāṇa - 302.12-14}\)

\textsuperscript{173} gīrisūraṇamānān lakaśā maṅgallī kālīkā tatha. \(\text{IIbid - 279.45}\)

\textsuperscript{174} puṇṇaṃvāsmāṣaṃtu ko lāpobhyo bhāskaro vati. \(\text{IIbid - 123.32}\)
ERANḍAḥ [एरण्डः]

Synonyms:
- Sanskrit: Eranḍaḥ, Tarunah, Suklaḥ, Citraḥ, Gandharvahastakah, Paṇcāṅgulaḥ, Vardhamānaḥ, Āmaṇḍaḥ, Dirghadaṇḍakah are synonyms.¹⁷⁵
- Hindi: Arandu
- Kannada: Mandan
- Marathi: Eranḍa
- English: Croton plant, Castor Oil plant

Botanical Name: Ricinus Communis Linn.
Natural Order: Malpighiales
Family: Euphorbiaceae

Habitat: Castor is indigenous to the southern Mediterranean Basin, Eastern Africa and India, but is widespread throughout tropical regions and widely grown elsewhere as an ornamental plant.

Description: The castor oil plant, Ricinus communis is a species of flowering plant in the spurge family, Euphorbiaceae. It belongs to a monotypic genus, Ricinus, and subtribe, Ricininae. The evolution of castor and its relation to the other species are currently being studied using modern genetic tools.

The castor oil plant can vary greatly in its growth, habit and appearance. The variability has been increased by breeders who have selected a range

¹⁷⁵. एरण्डः तरंग शुकलक्षिणो गन्धर्वहस्तकः
पञ्चाङ्गुलो वर्धमान आमण्डो दीर्घदांडकः
K.D. Kamat – “Studies on Medicinal Plants & Drugs in Dhanvantri Nighantu” P-117
of cultivators for leaf and flower colours, and for oil production. It is a fast growing, suckerning perennial shrub which can reach the size of a small tree around twelve meters/39 feet, but it is not cold hardy.

The glossy leaves are fifteen to forty-five centimetres (5.9-18 in) long, long-stalked, alternate and palmate with five to twelve deep lobes with coarsely toothed segments. In some varieties they start off dark reddish purple or bronze when young, gradually changing to a dark green, sometimes with a reddish tinge, as they mature. The leaves of some other variety are green practically from the start, whereas in yet others a pigment masks the green colour of all the chlorophyll-bearing parts leaves, stems and young fruit, so that they remain a dramatic purple-to-reddish-brown throughout the life of the plant. Plants with the dark leaves can be found growing next to those with green leaves, so there probably is only a single gene controlling the production of the pigment in some varieties at least. The stems and the spherical, spiny speed capsules also vary in pigmentation. The fruit capsules of some varieties are showier than the flowers.

The flowers are borne in terminal panicle like inflorescences of green, or in some varieties, shades of red monoecious flowers without petals. The male flowers are yellowish-green with prominent creamy stamens and are carried in ovoid spikes up to fifteen centimetres (5.9 in) long, the female flowers, born at the tips of the spikes, have prominent red stigmas.

The fruit is a spiny, greenish (to reddish purple) capsule containing large, oval, shiny, bean-like highly poisonous seeds with variable brownish mottling. Castor seeds have a warty appendage called the caruncle, which is a type of elaiosome. The caruncle promotes the dispersal of the seed by ants.
Nomenclature:

The name Ricinus is a Latin word for tick, the seed is so named because it has markings and a bump at the end which resemble certain ticks. The common name ‘castor oil’ probably comes from its use as a replacement for castoreum, a perfume base made from the dried perineal glands of the beaver (castor in Latin). It has another common name, ‘palm of Christ, or ‘Palmachristi’ that derives from castor oils reputed ability to heal wounds and cure ailments.

Varieties:

Castor seed is the source of castor oil, which has wide variety of uses. The seeds contain between 40% and 60% oil that is rich in triglycerides, mainly ricinolein. The seed contains rich, a toxin, which is also present in lower concentrations throughout the plant.

Another plant species, Fatsia japonica similar in appearance and known as the false castor oil plant, is actually not related to the castor oil plant, but more probably an example of convergent evolution.

Selections have been made by breeders for use as an ornamental plant and for commercial production of castor oil.

Ornamental Varieties:

* 'Gibsonil' has red-tinged leaves with reddish veins and pinkish green seed pods;
* ‘Carmencita pink’ is similar, with pinkish red stems.
* ‘Carmencita bright red’ has red stems, dark purplish leaves and red seeds pods.
All the above grow to around 1.5 meters (4.9ft) tall as annuals.

* 'Impala' is compact with reddish foliage and stems, brightest on the young shoots.

* 'Red spire' is tall with red stems and bronze foliage.

* 'Zanzibaren' is also tall with large, mild green leaves that have white midribs.¹⁷⁶

The other type is called as 'Rakta eraṇḍaḥ' has the synonyms as Hastaparnaḥ, Vyāghraḥ, Vyāghradalāḥ, Rubuḥ, Rubkaḥ, Hastikaruni, Caṇcuḥ and Uṭṭānapatrakaḥ.

There are two chief forms met with, but that under each of these there are numerous differences (modifications). The one form is a tall bush. The second race is an annual plant, sometimes grown as a pure crop.¹⁷⁷

**Chemistry**: Three terpenoids and a tocopherol related compound have been found in the aerial parts of Ricinus communis. Compounds named: hydroxycasba, trien, hydroxyl, methoxy, epoxy, oxocasbane, olide, hydroxylup, tettrahydro, tetramythl, chromene, dions were isolated from the methanol extracts of ricinus communis by chromatographic methods.

**USES : As a Medicine**

* Eranda is bitter and sweet in taste, guru, usnavīrya and pacifies vāta and raktadoṣa.

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¹⁷⁷. Dr. K.D. Kamat – "Studies on Medicinal Plants & Drugs in Dhanvantri Nighantu" P – 117
* It alleviates udāvartu, disease of spleem, tumours, relieves vesicular colics and useful in inguinal hernia.

* Its fruits are sweet, salty, laghu, usnavīrya, vātahara and breaks fecal mass.\textsuperscript{178}

* Alcoholic extracts of leaves of Ricinus communis were used in antimicrobial testing against eight pathogenic bacteria in rats and showed antimicrobial properties. The extract was not toxic.

* The pericarp of castor bean showed central nervous system effects in mice at low doses. At lower doses, the extract improved memory consolidation. At high doses mice quickly died.

* A water extract of the root bark showed analgesic activity in rats.

* Antihistamine and anti-inflammatory properties were found in ethanolic extract of Ricinus communis root bark.

**Other uses:**

* Extract of Ricinus communis exhibited acaricidal and in scticidal activities against the adult of Haemaphysalis bispinosa, Neumann and hematophagous fly Hippobosca maculate Leach.

* The Bodo tribals of Bodoland, Assam use the leaves of plant to feed and rear the larvae of muga and endi silk works.

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\textsuperscript{178} a) \textit{एरण्डकुः रसे तिक्तः स्लादुःशोकितनासनः। उदावर्तसोलिग्निदिशुतासनः कृत्ववि।}

b) \textit{गुष्ठार्थप्रसंसनो बिकारार्थोणितायैः। फलं स्लादुः च सकारं सत्यूरं भेदि बात्तां निः।}

c) \textit{एरण्डकुः दुःख्य स्लादुः पित्तसमीरजित्।}

\textit{Ibid – P.117}
Castor oil is a good motor lubricant and has been used in internal combustion engines, including those of world war, Airplanes, some racing cars and some model airplanes.

It has advantages over petroleum based oils, especially at high and low temperatures. It does not mix with petroleum products. It has been largely replaced by synthetic oils that are more stable and less toxic.\(^{179}\)

The oil extracted from the seeds was common.\(^{180}\)

This was planted in the house garden.\(^{181}\)

A patient of rheumatic ostero-arthritis should drink the water in which rāṣnā, guducī, eranda, devadāru and śuṇḍhi have been boiled.\(^{182}\)

There is a reference to this plant in Atharva-Veda also as “Tājad-Bhaṅga” [Castrol oil plant]. Because tājadbhaṅga is single word and explain it as Castrol oil plant. In this way, “Crush yonder men out, Oasvattha, devour them speedily, Okhadira, let them be suddenly (tājad) broken [bhaṅj] like hemp [bhaṅga], let the slayer [vadhaka] slay [han] them with deadly weapons [vadhā].\(^{183}\)


\(^{180}\) 1 - Kaṣika - 5.2.29

\(^{181}\) I - Harṣacarita. 410.

\(^{182}\) P. Sensarma – “Plants in the Indian Purāṇa”, P – 79

\(^{183}\) Atharva Veda Samhitā- Vol-II, Sūkta 8, Kanda-8. P-189
This plant helps in conquering the enemies also. We get information in “Atharva-Veda Samhitā” as, “Fuel of Aśvattha, badhaka, tajad-bhanga [Castrol oil plant], āhva [Palāśa], Khadira and Sara [reeds].

**MUṆJA GRASS [मुन्जा]**

**Synonymous:**

- **Sanskrit:** Muṇjaḥ, Kṣurah, Sthūladarbhaḥ, Bāṇāhvah and Brahmanekhalah\(^{184}\)
- **Telgu:** Gundrā
- **Hindi:** Sarakandā, Sara, Ekar, Sentha, Muṇja.
- **Botanical Name:** Saccharum muṇja, Saccharum benghalenses
- **Genus:** Saccharum
- **Habitat:** This was abundantly found in Vindhya region and was of commercial importance.\(^{185}\)

**Meaning of Muṇja:** Tough Asiatic whose culms are used for ropes and baskets.

**Classified under:** Nouns denoting plants.

**Hypernyms:** “Muṇja is a kind of grass, narrow leaved green herbage, grown as lawns.

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\(^{184}\) Dr. S.D. Kamat – “Studies on Medicinal plants & Drugs in Dhanvantri Nighantu”, p - 360

\(^{185}\) Dr. P.V. Sharma “Indian Medicine in the Classical Age”, p-161
Description: “Munja is a kind of grass, narrow leaved green herbage. It is tall perennial reed like grass originally of South Eastern Asia [Sugar-cane]. This is one of the most common grasses in India. Growing to a height of over 2m.

Varieties: There are two kinds of Munja, they are; Munja and Bhadra Munja. Munja is much valued on account of resisting more.

USES: As a Medicine

* Munja is slightly usnavirya and useful in erysipelas, raktadoṣa, disorders of urinary organs and diseases of eyes. Banā is sweet in taste, is sitavirya, pacifies pittadosa, burning sensation and alleviates thirst.

* Consumption of oil of tila, juice of āmalaki, fruits of rambha, tarumunja and karkatī and the water of Nārikela cause ślesma.187

Other Uses:

* It appears from the Vāmana Purāṇa that garments could be made of Kārpāsa, jute fibres, munja and attiring with bark was also in vogue.188

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186. बाणाहसो भवुरः सीतसं वितवहतुस्पतः।
187. भोजननन्तरं स्वानं जलपानं विना तूषा।
Brahma Vaivarta Purāṇa – BK. 16.64-66
188. दोषसं समाधाय आपाती गुर्जरेखली।
Vāmana Purāṇa – 51.45
* Mekhala [lion-thread] made of it was borne by hermits. Supports and shoes were also made of it.

* Columns of muñja grass are used for ropes and baskets.

* This is grows as lawns, used as pasture for grazing animals. Cut and dried as hay.

* Used as thatching of roofs, making ropes and matting. According to the Agni Purāṇa the Pāśa should be constructed of fibres of Muñja.189

**Other References:**

There is a reference in Atharva-Veda and Rg-Veda also about Muñja grass. In Atharva-Veda Muñja grass is used to conquer enemies in the following way, “The bestrewing of the tracks of the hostile army with various symbolical objects”, the fetters aforesaid of hemp and muñja grass smeared with ingida, then traps of Aśvattha, hempen nets and stakes of badhaka.190

Another hymn related to Muñja, where Bloomfield says that “formula against diarrhoea”. The description is in this way, As between both heaven and Earth stands the bamboo [Tejana], so let the reed stalk [Muñja] stand between both the disease and flux [āsrāva].191a

189. Agni Purāṇa – 21.52-56
191a. श्रां च पृथिवीं चालतिष्ठति तेजनाम।
ब्रह्म रोगां चारतावं चालतिष्ठतुऽगुम्भ द्वेः॥ Ibid - Vol. I, p.5
The word Munja can be derived in the following way: मूँजा: मूँजां: प्रतिवर्तः means which is a grass & grows like stick. There is a reference of Munja mountain is famous due to the growth of Munja grass. “मोझ्वत्री मूँजवति जातः | मूँजवान् पर्वतो मूँजवान् | मूँजों विग्रेष्टत हिरीक्षया”

Sons of Sudhanwan drink the soma juice which has been filtered through the Munja grass.

NARIKELA [नारिकेल]

Synonymous:

Sanskrit: Nārikelaḥ, Rasaphalaḥ, Sutuṅgaḥ, Kurcaśekharah, Tālavṛkṣaḥ, Dṛḍhaphalaḥ, Lāṅgali and Dāksinātyakaḥ are synonymous.

English: Coconut tree

Hindi: Nāriyal

Kannada: Teṅginagiḍa

Marathi: Nāriyel

Tamil: Tamkai, Tengu

Telugu: Nārikelamu

Botanical Name: Cocos Nucifera Linn

Natural order: Arecaceae

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191b. Rgveda - part-12, p.116 [I.191.3]
191c. इदं मद्यं पित्तलेष्ट भ्रष्टतल्लं वा या पिवत भुगने जनम्।
वैभव्यन्त यदि तत्स्वे हर्वध तुतीवे या सवने माद या वैत॥ Rgveda - I.161.8
192. नारिकेलो रसफलं सुतुंग उर्वेश्वरं।
तातवशो तृपतलो लांगृही दाग्धिन्ताययकं॥
Dr. S.D. Kamat - Studies on Medicinal plants in Dhanvantri Nighantu. p - 425
Meaning of the word Cocos: The coconut palm, Cocos Nucifera is a member of the family Arecaceae (palm family). It is the only accepted species in the genus Cocos. The term coconut can refer to the entire coconut palm, the seed or the fruit, which botanically is a drupe not a nut. The spelling coconut is an archaic form of the world. The term is derived from 16th century Portuguese and spanish cocos, meaning "Grinning face", from the three small holes on the coconut shell that resemble human facial features.

The coconut palm is grown throughout the tropics for decoration, as well as for its many culinary and non culinary uses; virtually every part of the coconut palm can be used by humans in some manner and has significant economic value. Coconuts versatility is sometimes noted in its naming. In Sanskrit, it is 'kalpa vṛkṣa', the tree which provides all necessities of life. In the Malaya language, it is 'pokok seribu-guna', the tree of thousand uses. In the Phillipsines the coconut is commonly called 'the tree of life'. It is also known as "Punyataru" [Holy tree].

So many synonyms for Narikela tree in sanskrit. Each indicating a different quality of the tree are very rare in the plant kingdom and show how very important, the tree had been from ancient times.

Habitat: Coconut Nucifera is grown on the eastern and western coast particularly abundant more towards the south.194

Description:

Plant: Cocos nucifera is a large palm, growing upto 30 metres (98ft) tall, with pinnate leaves 4-6 metres (13-20ft) long, and 60-90cm long, old

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194. Dr. S.D. Kamat - Studies on Medicinal plants in Dhanvantri Nighantu. p - 426
leaves break away cleanly leaving the trunk smooth. Coconuts are generally classified into two general types: tall and dwarf. On very fertile land, a tall coconut palm tree can yield up to 75 fruits per year, but more often yields less than 30 mainly due to poor cultural practice.

Fruit: The coconut fruit is a drupe, not a true nut. Like other fruits, it has three layers exocarp, mesocarp and endocarp. The exocarp and mesocarp make up the ‘husk’ of the coconuts. Coconuts sold in the shops of non-tropical countries often have had the exocarp (outer most layer) removed. The mesocarp is composed of a fibre, called coir, which has many traditional and commercial uses. The shell has three germination pores or ‘eyes’ that are clearly visible on its side surface once the husk is removed. A full sized coconut weighs about 1.44 kilograms. It takes around 6000 full grown coconuts produce a tonne of copra.

Coconut Seed Interior: Within the shell is a single seed. A coconut is a nut, seed and fruit. When the seed germinates, the root of its embryo pushes out through one of the eyes of the shell. The outer most layer of the seed, the testa, adheres to the inside of the shell. In a mature coconut, a thick albuminous endosperm adheres to the inside of the testa. This endosperm is white and fleshy edible part of the coconut.

Although coconut meat contains less fat than many oil seeds and seeds such as almonds, it is noted for high amount of medium-chain saturated fat. About 90% of the fat in the coconut meat is saturated. Coconut meat contains less sugar and more protein than popular fruits such as bananas, apples and oranges. It is relatively high in minerals such as Iron, Phosphorus and Zinc.

The endosperm is initially in the nuclear phase of development within a hollow interior space as coconut water and air. As development
continues, it matures into cellular stage and forms a rind of tissue known as coconut meat. Immature coconuts likely contain more coconut water and less meat. Young coconuts used for coconut water are called tender coconuts. The water of a tender coconut is liquid endosperm. It is sweet with an aerated feel when cut fresh. Depending on its size, a tender contains 300 to 1000 ml of coconut water.

<table>
<thead>
<tr>
<th>Coconut, Meat, Raw</th>
<th>Nutritional value per 100g (3.502)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy</td>
<td>1,481 kj (354 kcal)</td>
</tr>
<tr>
<td>Carbohydrates</td>
<td>15.23g</td>
</tr>
<tr>
<td>Sugars</td>
<td>6.23g</td>
</tr>
<tr>
<td>Dietary fiber</td>
<td>9.0g</td>
</tr>
<tr>
<td>Fat</td>
<td>33.49g</td>
</tr>
<tr>
<td>Saturated</td>
<td>29.70g</td>
</tr>
<tr>
<td>Monounsaturated</td>
<td>1.43g</td>
</tr>
<tr>
<td>Polyunsaturated</td>
<td>0.37g</td>
</tr>
<tr>
<td>Protein</td>
<td>3.3g</td>
</tr>
<tr>
<td>Vitamin B₁</td>
<td>0.066mg (6%)</td>
</tr>
<tr>
<td>Vitamin B₂</td>
<td>0.02mg (2%)</td>
</tr>
<tr>
<td>Vitamin B₃</td>
<td>0.054mg (4%)</td>
</tr>
<tr>
<td>Folate B₉</td>
<td>26ug (7%)</td>
</tr>
<tr>
<td>B₆</td>
<td>0.300mg (6%)</td>
</tr>
<tr>
<td>Vitamin B₆</td>
<td>0.054mg (4%)</td>
</tr>
<tr>
<td>Vitamin C</td>
<td>3.3mg (4%)</td>
</tr>
<tr>
<td>Calcium</td>
<td>14mg (1%)</td>
</tr>
</tbody>
</table>
It was regarded as an auspicious plant and model tree was made of clay by the artisans on the auspicious occasions like marriage. This is found abundant in Vindhya region, particularly along the sea coast. There was also some place abundant in Nārikela and known as ‘Nārikeladwipa’. The inner nut is covered with outer layers. Pots were made of the outer hard covering. The fruits were broken with the stones and the rough ground was softened with their oily juice.

**Role in Culture and Religion:**

A coconut (sanskrit : nārikela) is an essential element of rituals in Hindu tradition. Often it is decorated with bright metal foils and other symbols of auspiciousness. It is offered during worship to a Hindu god or goddess. Irrespective of their religious affiliations, fishermen of India

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<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Iron</td>
<td>2.43mg (19%)</td>
</tr>
<tr>
<td>Magnesium</td>
<td>32mg (9%)</td>
</tr>
<tr>
<td>Phosphorus</td>
<td>113mg (16%)</td>
</tr>
<tr>
<td>Potassium</td>
<td>356mg (8%)</td>
</tr>
<tr>
<td>Zinc</td>
<td>1.1mg (12%)</td>
</tr>
</tbody>
</table>

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195. Bruscher - The useful plants in India, p - 134
196. लेखकारकाक्षििरामणुर्मीनवर्तकलस्तीपुपुष्कलम् | Harṣaścarita - 243
197. a) नीलदललिताभिनिलकिरातम् | Harṣaścarita - 418
   b) अतिक्षोराभिनिलकिरातमकोलकुल परितापलाले | Kādambari - 56
198. न हि नारिकलाविभासाती रूपमयी नातलिकाभिमिति ज्ञानमयी | Nyāyavartika - 1.1.5
199. नारिकलाभिनिलकिरातमकोलकुल बालदलालितम् | Viṣṇu Purāṇa - 1.2.60
200. a) निक्षिताभिनिलकिरातमकोलकिरातमले | Harṣaścarita - 433
    b) नारिकलाभिनिलकिरातमकोलकुल | Kādambari - 577
201. उपलभ्यनारिकलाभिनिलकिरातमले | Kādambari - 120
often offer it to the rivers and seas in the hopes of having bountiful catches. Hindus often initiate the beginning of any new activity by breaking a coconut to ensure the blessings of the gods and successful completion of the activity. The Hindu goddess of well-being and wealth, Lakṣmī is often shown holding a coconut. In the foot hills of the temple town of Palani, before going to worship Murugan for Ganesha, coconuts are broken at a place marked for the purpose. Every day, thousands of coconuts are broken and some devotees break as many as 108 coconuts at a time as per the prayer. In tantric practises, coconuts are sometimes used as substitutes for human skulls.

In Hindu wedding ceremonies, a coconut is placed over the opening of a pot, representing a womb. Coconut flowers are auspicious symbols and are fixtures at Hindu & Buddhist weddings and other important occassions. In Kerala, coconut flowers must be present during a marriage ceremony. The flowers are inserted into a barrel of unhusked rice (paddy) and placed within sight of the ceremony. Similarly in Sri-lanka, coconut flowers, standing in brass urns, are placed in prominent positions.

The coconut is also used as a target and prize in the traditional British fair ground game “coconut shy”. The players buys some small balls which he throws as hard as he can at coconuts balanced on sticks. The aim is to knock a coconut off the stand and win it.202

The Brahma vaivarta purāṇa contains some description of crores of Nārikela trees encircled the city Dwāraka.203

203. आमोदितां च शैतलन मन्त्रचन्दनवायुम ।
तस्मिन्नस्ति किलाणं शास्त्रिमिताशतकौशिकम॥ Brahma Vaivarta purāṇa - 104.10 CSK
USES: As a Medicine

* Coconuts may help benign prostatic hyperplasia.

* In rats, virgin coconut oil reduced total cholesterol, triglycerids, phospholipids, LDL and VLDL cholesterol levels and increased HDL cholesterol in serum and tissues. The hexance fraction of coconut peel may contain novel anti cancer compounds.

* Young coconut juice has estrogen-like characteristics. Inside a coconut is a cavity filled with coconut water, which is sterile until opened. It mixes easily with blood and was used during World War - II in emergency transfusions. It can also serve as an emergency short term intravenous hydration fluid.

* Coconut is also commonly used as a traditional remedy in Pakistan to treat bites from rats. In Brazil, coconut is known as coco-da-bahia. The tea from the husk fiber is widely used to treat several inflammatory disorders.\(^{204}\)

* The roots are used as a dye, a mouth wash and a medicine for diarrhea and dysentery. A frayed piece of root can also be used as a tooth brush.

* According to the Brahma vaivarta purāṇa the vāyu can be removed with the help of seed bearing fruits of rambhā, nārikela, tāla, kharjura, oil of tila, juice of āmalaki and by smearing candana over the body and using the bed made of leaves of padma. Even the purāṇa prohibits the use of Nārikela in brushing the teeth.\(^{205}\)

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204. Bruscher - The useful plants in India, pg-134
205. TFt I
* The troubles of tongue can be removed with the help of Narikela and dhanya along with others.\textsuperscript{206}

* The water within the coconut and the intoxicating fermented juice from the plant was taken as beverage.\textsuperscript{207}

* Tender coconut water is prescribed by Āyurvedic physicians as a drink for heart patients and for those suffering from dysentry.

* Coconut water reduces the harmful effects of mercury potsoning and hastens recovery.

* Coconut kernel increases semen, regulates irregular menses and fresh coconut toddy in moderate quantitives improves health and vitality.

* The gender growing shoots of the coconut tree ground with molasses and eaten regularly for a few days, cure of women of their menstrual hemorrhages and vaginal discharge of mucus.

* When the root of the coconut tree is ground and boiled with water and the filtered decoction is administered. Internally, even very serious stomach oilements are used.\textsuperscript{208}

\textsuperscript{206} Brahma Vaivarta purāṇa - BK 16.75-78
\textsuperscript{207} a) Markandeya purāṇa 11.6
b) Harṣacarita - 161
\textsuperscript{208} C.K. Nair, N. Mohanan – “Medicinal plants in India with Āyurvedic References”, p-132
* Narikela (fruit) is sweet in taste, sitavīrya, guru and unctous (snigdha). It promotes strength and māṃsa (helps to promote muscular tissue) is vṛṣya, promoting body weight and has purificatory action on urinary organs.

* Coconut water contains sugar, dietary fibre, proteins, anti-oxidants, vitamins and minerals and provides an isotonic electrolyte balance. It is consumed as a refreshing drink throughout the humid tropics and gaining popularity as a sports drink.\(^{209}\)

**Other Uses:** Coconut based products are coconut water, copra, coconut oil, coconut cake, coconut toddy, coconut shell based products, coconut wood based products, coconut leaves and coir pith. Therefore, coconut tree is called ‘Kalpa Vṛkṣam’, which essentially means all parts of a coconut tree is useful some way or the other. They are as follows:

* The coconut is the national tree of the Maldives and is considered the most important plant in the country. A coconut tree is also included in the country’s national emblem or coat of arms. Coconut trees are grown on all the islands.

* Before modern construction methods were introduced, coconut leaves were used as roofing material for many houses in the islands, while coconut timber was used to build houses and boats.

* Coconut trees also are increasingly grown for decorative purposes along the coasts & for land scaping also.

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209. नारिकेल गुड़ लिखि दिन जी लांडुडीलल | बन्ना जान देखि बन्ना बलिशुद्धम् ||  
Dr. S.D. Kamat - “Studies on Medicinal plants in Dhanvantari Nighantu”. p - 425
* Coconuts are common in Sri-lankan diet and the main source of dietary fat.

* Coconut water is refreshing drink.

* The nut provides oil for frying, cooking and making margarine. The white fleshy part of the seed, the coconut meat is used fresh or dried in cooking.

* It can be used in liquid form as would other vegetable oils or in solid form as would butter or lard.

* Desiccated coconut or coconut milk made from it is frequently added to curries and other savoury dishes.

* Coconut flour has also been developed for use in baking to combat malnutrition.

* Coconut chips have been sold in the tourist regions. Coconut butter is often used to describe solidified coconut oil, but also has been adopted as a name by certain speciality products made of coconut milk solids or pureed coconut meat and oil.

* Dried coconut is also used as the filling for the Bountry chocolate bar.

* Coconut water serve as a suspension for the endosperm of the coconut during its nuclear phase of development. Later, the endosperm matures and deposits on to the coconut rind during the cellular phase.

* Coconut water can be fermented to produce coconut vinegar.

* Coconut milk can be used to produce virgin coconut oil by controlled heating and removal of the oil fraction. This is a form of milk that is accessible to those who wish to follow a vegan diet.
* Toddy and nectar: The sap derived from incising the flower clusters of the coconut is drunk as 'Neera', also known as 'toddy or tuba' [Philippines], tuak [Indonesia and Malaysia] or 'karewa' [fresh and not fermented], collected twice a day, for breakfast and dinner in Kiribati. When left to ferment on its own, it becomes palm wine. Palm wine is distilled to produce 'arrack'. This alcoholic drink is called "Coconut Vodaka".

The sap can be reduced by boiling to create a sweet syrup or candy such as "tekamamai" in Kiribati or dhiyaa and addu bondi in Maldives. It can be reduced further to yield coconut sugar also referred to as palm sugar or jaggery. A young well maintained tree can produce around 300 litres of toddy per year.

* Heart of palm and coconut sprout: Apical buds of Adult plants are edible and are known as "Palm cabbage" or "heart of palm". They are considered as a rare delicacy, as harvesting the buds kills the palms. Hearts of palm are eaten in salads, sometimes called "millionaire's salad". It produces endosperm nourishes the developing embryo.

* Coconut jam is made by mixing muscovado sugar with coconut milk.210

Commercial, Industrial and Household use:

* Coir (the fibre from the husk of the coconut) is used in ropes, door mats, brushes, sacks, caulking for boats and as stuffing fibre for mattresses. It is used in horticulture in potting compost, especially in orchid mix.

210. Bruscher - The useful plants in India, p - 134-137
The stiff mid-ribs of coconut leaves are used for making brooms. The leaves also provide material for baskets that can draw well water and for roofing thatch, they can be woven into mats, cooking skewers and kindling arrows as well. Two leaves woven into a tight shell the size of the palm are filled rice and cooked to make ketupat. Dried coconut leaves can be burned to ash, which can be harvested for lime. In India, particularly in Kerala, Karnataka and Tamil Nadu, the woven coconut leaves are used as 'pandals' [temporary sheds] for the marriage functions.

The husk and shells can be used for fuel and are a source of charcoal. A dried half coconut shell with husk can be used to buff floors. It is known as a 'coconut brush'. The fresh husk of a brown coconut may serve as a dish sponge or body sponge. The shell can be used as a soup bowl and in the handicrafts also. Coconut buttons are often used for 'Hawaiian aloha shirts'. In Thailand, the coconut husk is used as a potting medium to produce healthy forest tree saplings. In parts of South India, the shell and husk are burned for smoke to repel mosquitos.

Half coconut shells are used in theatre foley sound effects work, banged together to create the sound effect of a horse's hoof beats. Dried half shells are used as the bodies of musical instruments ex-fluid.

Coconut trunks are used for building small bridges; they are preferred for their straightness, strength and salt resistance. In Kerala, coconut trunks are used for house construction. Coconut timber comes from the trunk and is increasingly being used as an ecologically sound substitute for endangered hard woods. It has applications in furniture and specialized construction. The trunk can be hollowed to form drums, containers or small canoes.
* The “branches” (leaf petioles) are strong and flexible enough to make a switch.\textsuperscript{211}

* Slippers were made of the bark of the fruit by hermits.\textsuperscript{212}

Use in Beauty Products

Coconuts are used in the beauty industry in moisturisers and body butters because coconut oil, due to its chemical structure is readily absorbed by the skin. The coconut shell may also be ground down and added to products for exfoliation of dead skin. Coconut is also a source of lauric acid, which can be processed in particular way to produce sodium lauryl sulfate, a detergent used in shower gels and shampoos. Coconut oil is widely used in soaps.

* The left over fibre from coconut oil and coconut milk production, coconut meal is used as live stock feed. The dried calyx is used as fuel in wood-fired stoves. Coconut water is traditionally used as a growth supplement in plant tissue culture.

* A coconut can be hollowed out and used as a home for a rodent or small birds. Havled, drained coconuts can also be hung up as bird feeders and after the flesh has gone can be filled with fat in winter to attract tits.\textsuperscript{213}

In Amarkośa it is known as ‘turna durva’, Nalikera (Nalikela) lāṅgalin = Teginmara.\textsuperscript{214}

\begin{flushright}
\textsuperscript{211} C.K. Nair, N. Mohanan - Medicinal plants in India with special reference to Āyurveda. p - 131 - 133.
\textsuperscript{212} I Kadambari - 405
\textsuperscript{213} Dr. P.V. Sharma - 'Indian Medicine in the classical Age' p - 178.
\textsuperscript{214} N. Ranganatha Sharma - Amarkośa, - vana osadhivarga - shloka - 523 p - 100
\end{flushright}
Pippali

Synonymous:

Sanskrit: Pippali, Māgaḍhi, Kṛṣṇā, Capalā, Tikṣṇatandulā, Upakulyā, Kanā, Syama, Kolā, Śaundi and Usanā.\textsuperscript{215}

English: Long pepper.

Hindi: Pippalamula.

Kannada: Vippali, Yippali.

Marathi: Lendi – Pimpi.

Telgu: Pippuli, pipalachetu.

Tamil: Tippali.

Malayalam: Pippali, Pippalu.

Botanical Name: Piper longum L.

Family: Piperaceae

Habitat: ‘Long Pepper’ is obtained from piper retrofractum of Java and Piper longum of India. It is grown in hotter states of India, particularly in Bengal. The former is a climbing woody plant, native to Malaya is cultivated in Java, Bali and adjacent islands.\textsuperscript{216} It is also cultivated on a large scale in limestone soil below the chirrapunji region.

Description: Long pepper is the unripe spike of ‘Piper longum’. It is a slender aromatic perennial creeper. The spikes of this plant contain

\textsuperscript{215} Dr. S.D. Kamat - ‘Studies on Medicinal Plants & Drugs in Dhanvantri Nighantu’.

\textsuperscript{216} Ibid - P-160.
piperine and pipalartine alkaloids. The roots and fruits are used in the treatment of palsy, gout and lumbago.

The fruit and root both have a bitter and hot sharp taste. In Ayurveda the root is used as a carminative, tonic to the liver, stomachic, emmenagogue, abortifacient, aphrodisiac.

Whereas the fruit is said to possess haematinic, diuretic, digestive, general tonic properties, besides being useful in inflammation of the liver, pains in the joints, lumbago, snakebite, scorpion sting and night-blindness.217 Birds eat the fruit of Pippali.218 Long pepper can be propagated through seeds, suckers or cuttings or by layering of mature branches at the beginning of rainy season. However, it can be easily propagated through the terminal stem cuttings obtained from one year old growth and 3-5 internodes. Vine cuttings can be rooted in polythene bags filled with the common pot mixture. The nursery can be raised during March and April. The cuttings planted in March - April will be ready for planting in the main field by the end of May. It can be grown successfully even in areas which receive heavy rainfall with high relative humidity. In its natural habitat, the plant is found growing as an under shrub. Hence it is especially suited as an under crop in coconut and areanut gardens with 20-25 percent shade intensity.

218. चकिप्पल्लि (पाप्पल्लि) | Kādambari. 383
विस्तिं चकिप्पल्लि चिकिप्पल्लि पियाचलितकल्लि | Kādambari. 533
Dr. P.V. Sharma - ‘Indian Medicine in the classical Age’, P. 182
Chemical Composition:

Resin, Starch, Gum, Piperine, Pipal ritin – all are alkaloids.219

Varieties:

Pippalī is a generic name and under this generic group three to four species are included. But in Rājnighantu stated that there are four varieties.220 They are: a) Pippalimūlam, b) Cawikā, c) Śreyasi.

Mūlam, Pippalimūlam, Granthikam, Caviṅśirāḥ, Kolamūlam, Katugranthi, Sarvagranthikam and Usanam are synonymous for ‘Pippalimūlam’.221

Cavikā, Kolavallī, Cavyam and Cavikam, Kari kanā are synonymous for ‘Cawika’.222 The fruit of cavikā is called as Śreyasi and Gajapippalī are its synonymous.223 It’s fruit is Śreyasi, the synonyms of which are Hastimagadhā, Gajapippalī, Gajakṛṣṇā, Karikanā, Ibhaikanā and Dvipapippali.224

219. Ibid P.P. No-138 [Dr. Vasundhara Bhupati - Medicinal Plants in Your Own Yard]
220. ^T
221. ^I
222. ^R
223. ^IT
224. ^J

Dr. S.D. Kamat - Medicinal plants & Drugs in Dhanvantri Nighantu. PP. 161-163
Medicinal Uses:

* Pippali is pungent and sweet in taste, sitavīrya, unctuous (snigdha) and pacifies all the three doṣas. It is useful in thirst, fever, ascities, worms, āmadoṣa and as rasāyana (rejuvenating).225

* Pippalīmulum is pungent in taste, usnavīrya, removes accumulation of kaphā doṣa, pacifies vāta doṣa useful in worms and stimulates digestive capacity.226

* Cavya is pungent in taste, usnavīrya, pacifies vāta and kaphā doṣas. It is useful against worms and strongly stimulates digestive capacity.227

* Gajapippali is sweet and pungent in taste and usnavīrya. It pacifies vāta and kaphā doṣas and is useful in worms.228

* One spoon of powder mixed with honey is very good for cough, cold and throat pain.

* Pippali, pippalī root, black pepper and ginger taken in equal quantities made into powder. This mixed with honey taken thrice daily cures all the throat problems. One spoon of the same powder if taken with hot water controls dyspepsia, flatulence and abdominal pain.

* In Arthritic pain - one spoon of powder can be taken with honey. The sesame oil mixed with powder can be used for massage.

225. frq# WgR I
226. I
227. I.
228. <hENR|4T ^ 'flRdl I
* The powder with honey improves the blood, here can be taken in anaemia.

* Equal quantity of Pippali, Āmalaki, Turmeric and rock salt if taken in one spoon with hot water or butter milk improves digestion.

* If the powder is taken every day with honey it improves immunity in children. Hence is very good in over coming general debility.

* This is the drug of choice in spleenic enlargement. The decoction prepared with three pippali is prepared at first. One process called “Vardhamana Pippali” is to be followed everyday starting with three. Increase the number by three i.e. six on the second day. The total reaches thirty on the tenth day. From the eleventh day start decreasing the number by three. The whole process is completed in twenty days. This is known as “Vardhamana Pippali”.

* The Pippali with honey or milk given from one month to one-year-old child improves immunity.

* The root can be used as antahelminthic, contraceptive, antidote in insect bites and in night blindness as medicine. It act as medicine even in fever and leucoderma.229

References in Aṣṭāṅga Hṛdayam:

* He, who has predominance of kaphā should consume yavagu prepared from yava and processed with drugs of mahat panchatulu. If there is constipation, it can be prepared from yava fried in ghee and

229. Dr. Vasundhara Bhupathi - ‘Medicinal Plants in your own yard’. P.P. 138-139.
then processed with pippali and āmalaka, this will help elimination of faeces and the doṣas.230

* First, lāja peyā processed with śuṇṭhi, dhānya, pippali and saindhava, which is easily digestible should be consumed.231

* For vātaja jvara decoctions of either durālabhā, amṛtā, mustā and Nāgara or of pippalimūla, gudūcī and viśvabhesaja or of the drugs of kāṇīya, paṅcamūla are best suited.232

* In fevers of kapha-vāta origin, decoctions of either of vacā, tiktā, pāthā, agragravda and vatsaka added with powder of pippalī or decoction of chinnodbhavā [added with pippalī powder] should be consumed.233

* Medicated ghee prepared with pippalti, Indrayava, dhāvani, tiktā, sārivā, āmalaka, tāmalaki, bilvā, mustā, hima, pālani, sevya, drāksā, atvisā and sthirā-cures fevers, irregularities of digestion, halimaka (advanced stag of jaundice), loss of taste and appetite, severe burning sensation in the shoulders, vomiting, pain in the flanks and the head and consumption [tuberculosis] quickly.234

230. फलमुलेन महता कपटत्र यथापिधातास ।
विष्णुवर्षा सद्वां पिप्पलवामलेकृतामु ॥

231. प्रामाण्येयां सुनरे समुदीधान्यपिपलीमु ।
सतैचावं तथावस्थायतं तं पिनवेलाह दाहिमामु ॥ Ibid. p.g - 178

232. हुदलभासुधामुलातनागरा घातके ज्वरे ।
अथवा पिप्पलीयुतंदुधवचिर्मकेपणमु ॥ Ibid. p.g - 182

233. कपटत्रे वनातिलापरस्तवलतः कार ।
पिप्पलीपुषुक्तं वा काष्ठविचित्रोद्वारं ॥ Ibid. p.g - 184

234. पिपपलीयुतथापिधातास ।
वनातिलापरस्तबिधिकाः ॥
वनातिलापरस्तकारातामु ।
अर्थां बृहस्पतसंवाहयायं पाठ्य्वियोजनं क्रिय ॥ Ibid. p.g - 189
* Eight pala of madhukā and one prastha of drāksā are made into decoction to it are added the paste of eight pala of pippali, and one prastha of ghṛta (ghee) and medicated ghee prepared. When it cools, eight pala of each of ksoudra and sarkara are also added. Consumed along with saktu it is beneficial to those who are enaciated by injury to the chest and raktagulma.235

* Medicated ghee prepared with the decoction of one aksa each of kāsamarda, abbayā, mustā, pāthā, katphal, nāgara, pippali, katuṣṭhini, kāśmārī and surasā; one prastha of ghṛta, one adhaka each of milk and juice of drāksā. This recipe is best to cure consumption, fever, enlargement of spleen and all types cough.236

* Pippalimūla, madhuka, guda, juice of fresh dung of cow or horse mixed with honey and ghee should be licked which cures hiccup, opthalmia and cough.237

* Pippali is stimulant, carminative, relieves kaphā and obstruction from lever and spleen. It is used in bronchitis and congestion.238

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235. मधुकापतरद्राक्षायुपेन्द्रतटं।
पिपलविषपने क्लो पाल सिंद्रे च शीतले॥
पुष्पगम्यां शोकशर्करार्य्यं बिमियवेषु।
समस्यं क्षतर्गृहनुमेयं तात्त्वज्ञ॥ Ibid. p - 233

236. कासमार्दिशम्मुस्त्रायस्तरद्विजनार्ये।
पिपलाय कुदूरोहितया कामयाङ्गुलेऽसंस्यं।
आधारावाचस्य शीताब्यायरस्य॥
पचेषचोपराहस्वर्कशास्त्रंसवं॥ p - 241

237. पिपलीमूलमधुकुरद्राक्षशक्तिनात।
हिमाचियनवात्राप्रति लिहिन्यं युग्मतात्त्वम॥ p - 251

238. शीतकों पिपली मुख दुर्गा यक्षो भस्म लघु।
रक्तविपरीतं भवित कुमारोदयस्य॥ भवित्व प्रकार सिमंद।
Dr. Vasundhara Bhupati - 'Medicinal plants in your own yard' p.g - 135
We get the reference of this plant in Atharva-Veda also. There is a separate sukta for healing with pippali [Remedial rite against various wounds] known as “Pippali Bhishja Sûkta”, kāṇḍa six and sūkta 109. Their description is in this way; The berry pippali, remedy for what is bruised and remedy for what is pierced that did the gods prepare [samkalpay] that is sufficient for life.\(^{239}\)

**Plant referred to in purāṇas:**

* All poisons can be removed from a human body if the same is treated with the paste of the following plants haridrā, maṇjiṣṭha, kinihi, pippali and Nimba.\(^{240}\) [Matsya purāṇa]

* The Agni purāṇa states that the pippali plant has a great medicinal value. Even the purāṇa states that good medicines for treating the ailments caused by wind can be obtained from pippali.\(^{241}\) Consumption of the decoction of śunṭhi and goksura daily in the morning by the patients beneficial while drinking the decoction of pippali, pippalimūla, vacā, citraka and nāgara is also good. It is for the treatment of rheumatic arthritis.\(^{242}\)

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239. गिपपाली धारीपत्त्वम् भूमितास्वितविद्धभूषणीं
अस्पृष्टाः सामकल्पविद्याय जीविताय अस्तम्
W.D. Whitney & Bhasya of Sayanackharya - ‘Atharva-Veda samhitā’ Vol-I, pg-593

240. विभद्यं बायष्टेशमाइत्त नरकारी तीर्यप्रियं
बूधसिद्धांतिज्ञानसिद्धांतिकां गाणियस्य॥ Matsya purāṇa - 218.20

241. हरि-तवंदवायुवक्त- मार्हेवशिष्ठी सिका
वल्लिनाः सुषृष्टिः सिप्पली च गुणुपीवित्वार्थारांकवः
वासाकाः शतसृष्टिः च बैज्ञविं सिप्पली वाराकवः
कण्ठकारी मौलसृष्टिः विल्यंकृतवांवस्य बलं॥ Agni purāṇa - 141.2 & 3.

242. गिपपालीं नैशनवतुन्त्र शून्याः क्षीणत्वार्किं
नागरत्वापिष्ठं मुस्तं सामत्ता विल्यमालिकी॥
The decoction of pippalimūla, citraka, śuṇṭhi, vaca, śādvala, dantī, visānīkā, sauvārikā, trivṛtā, triphala is beneficial for the sotha [dropsy] patient.  

Consumption of [Amavata] decoction of Śathi, Kunāga and Valaya and drinking the water in which the husks of vāsā and pippali have been boiled are beneficial for kṣaya roga patient [tuberculosis].

NEEM [निम्ब]

Synonymous:

Sanskrit: Nimbaḥ, Niyamanah, Netā, Picumandaḥ, Sutiktakah, Aristah, Sarvatobhadraḥ, Prabhadrāḥ, Paribhadrakaḥ are synonymous.

English: Neem, Margos tree

Hindi: Neem

Kannada: Bevu
Marathi: Limba, nimba
Malayalam: Veppu
Tamil: Vembu, Veppam
Telugu: Vepachattu

Botanical Name: Azadirachta indica
Family: Meliaceae

Habitat: It is ever green and grows throughout India.

Meaning of the tree: The sanskrit name of the neem tree is 'Aristah' meaning 'reliever of sickness'. The various parts of this tree have many uses that give neem its name in sanskrit "sarva roga Nivārini", meaning "the curer of all ailments". The Neem tree is known as 'wonder Tree' from India and regarded as mother nature's gift to the world because of its number of medicinal and pesticidal uses.

Description: Neem is one of the most valuable tropical trees. It is well known for its various medicinal and other properties. Every part of the tree - its root, trunk, bark, leaves, flowers, fruits, seeds, sap and grown area known to have some use and have an important place in the Āyurvedic and Unani systems of medicine.

Leaf extracts are used for healing wounds and also for the preparation of tooth pastes and soaps. The margosa oil obtained from the seed is very effective in treating leprosy and skin diseases. Azadirachtin, a substance obtained from the leaves has been found to have insect repelent and

246. Dr. Vasundhara Bhupathi - Medicinal Plants in your own yard, p - 153
Insecticidal properties. Bark is useful in fever, nausea, vomiting and skin diseases. The main bitter active principle of the neem oil is 'Nimbidin' which is used for making several pharmaceutical preparations including emulsions, liquors, ointments, medicinal cosmetics such as lotions, shampoos, creams, hair tonic and gargles.

Seed propagation is the common method of growing neem trees. It can also be grown easily by vegetative means like root and shoot cuttings. Neem grows well on moist, dry, stony, clavey or shallow soils including moderately saline and alkaline soils and lateritic entrust. It is very hard in nature and can survive high temperature and altitudes between 50 and 1000 m and little low rainfall as low as 130 mm per year and long stretches of drought.

Periodical pruning of the tree once a year during November-December provides a good framework for faster growth of the tree. Neem starts flowering from fifth year onwards. Flowering is observed during January-May. The leaves are shed during February-March. The fruits are harvested when the colour of the fruit turns from green to bright yellow. Vigorous shaking of the branches is required to collect the ripe fruits.

Neem is tall, usually evergreen East Indian tree, widely cultivated in tropical Asia for its timber, resin, bitter bark and aromatic seed oil, which is used medicinally and as an insecticide. Neem has a garlic like odour and a bitter taste. The tree is still regarded as 'village dispensary' in India. The importance of the Neem tree has been recognized by the US National Academy of sciences, which published a report entitled 'Neem - a tree solving global problems'.

248. Dr. Vasundhara Bhupati - 'Medicinal Plants in your own yard', P - 154, 155.
Parts Used:

The whole plant is useful that is Root, Bark, Leaf, Flower, Fruit, Seed, Seed cake, Oil.

Chemical Constituents:

In leaf – azadirachtin, azadirachtanin, azadirone, nimbnadiyol, nimbin, nimbolide.

Bark – nimbin, nimbidin, nimbinin, citosterol, culinon, margocinoleid.

Root bark – nimbin, nimbidin.

Fruit – azadirachtin, azadirachtol, azadirachnol, melianon, nimbiol, nimocin.

Seed oil – tocopherol, azadiron, azadiradione, nimbinin, salannol, nimbinin, nimbidin.

Flower – azadiradion, morgosene, linolic acid, arachidic acid.249

USES: Therapeutic Uses

* Used in the treatment of fever, gastro intestinal disease, dermatologic (skin) disorders, immune dysfunction, respiratory disease, parasites. Inflamatory conditions and infections by some bacteria fungi and viruses.

* Some components have been shown to have anti-malarial properties. The seeds contain an insecticidal substance that is EPA approved for use on non-food crops.

* Some viral diseases have been treated by components of neem. It may inhibit the multiplication of viruses and prevent them from

249. Ibid., P - 155.
entering and infecting cells. Some of the diseases that have reportedly been relieved include colds, flu and conditions caused by herpes, such as chicken pox and shingles.

* External parasites, such as lice and mites are often treated in India with aqueous extracts of neem leaves.

* Neem oil is used for cosmetics [soap, shampoos, balms and creams] is useful for skin care such as acne treatment and keeping skin elasticity.

* Aqueous extracts of neem leaves have demonstrated significant anti-diabetic potential.250

**Medicinal Uses :**

* Every part of this tree is medicinal and hence is referred to as 'Panchanga' meaning root, bark, leaf, flower and fruit. It is a blood purifier. It is highly recommended as an antibiotic.251

* The tender leaves are used in the treatment of vāta disorders. It is used in the treatment of blood and pitta disorders, eye trouble and skin diseases.252

* Nimba tastes bitter, is śītavirya and laghu. It pacifies kaphā pitta, doṣas. It is useful in blood disorders, skin disorders, pruritus and ulcers


251. निम्बुप्रस्ताय पंचाङ्गे रक्तावोपहर भत्तं ।
धिं कुण्ठं न दाहं कुर्षं चैव विनाशयेतु ॥

252. कोमलस्तं प्राहको शतकारकं ।
रक्ताधिति नेत्रोग्निकुर्षं चैव विनाशयेतु ॥

Dr. Vasundhara Bhupathi - 'Medicinal plants in your own yard'. p - 153
by oral ingestion and external application. It ripens the threatened boil and abscess and cleans the rippen one.²⁵³

* Mahânimba is bitter in taste, sitâvîrya and pacificies pitta, kaphâ doṣas. It is useful in skin disorders, blood disorders and cholera.²⁵⁴

* This is the best antibiotic in nature. Hence used in curing fever, like malaria and chronic fever. The bark powder or the decoction with honey can be used. This should be given twice daily for a week.

* The bark powder mixed with dhaniya, ginger or cinnamon powder, acts more than quinine.

* The decoction of the bark with a little pipali is very good for arthritis.

* Children having round worms should be given decoction made from the bark of neem and a pinch of asafoetida in the morning in the empty stomach for a week.

* Children having chicken pox and measles should be made to sleep on the leaves of the neem and paste of neem and can even be made to drink decoction of the bark of neem.

* Paste made from the turmeric and leaves of neem if applied for mumps reduces the pain and swelling.

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²⁵³ Dr. S.D. Kamat - “Studies on medicinal plants & Drugs” in Dhanvantri Nighantu, p - 11, 12.
* If there is itching in the pubic areas in females due to white discharge the area should be cleaned with the decoction of bark of the neem.

* For Allergy and other skin diseases, the patient must take decoction of bark of neem and should apply juice of leaf of neem or neem oil. If it is done two or three times a day the effect will be good.

* For wounds, paste of leaves of neem with sesame oil should be applied and the wounds should be cleaned with decoction made from the leaves of the neem.

* If the ear wax is hardened and is painful, two drops of pure neem oil should be used as ear drop for five days.

* Patient suffering from caries tooth should be made to gargle with decoction of bark of Neem. He should use the powder of bark for brushing his teeth.

* In case of jaundice, juice of the tender leaves of neem with honey twice a day in empty stomach should be given.

* For lice problem, neem oil should be applied to head and should take bath. After three-four baths done like this the lice will die.

* At the time of sleep if neem oil is applied to exposed area of the body and lamp is lit from neem oil, mosquitos won't bite. In the evenings dried leaves of neem should be burnt near the house. The smoke coming out from it act as mosquito repellent.

* Juice of neem leaves taken in the morning in empty stomach or water mixed with the powder of the neem-leaves controls diabetes.

* Juice of leaves of neem or decoction of the bark of neem taken continuosly controls high blood pressure. Even eating five-ten leaves of neem helps.
If the cholesterol level in the blood is high then the juice of the leaf of the neem or decoction made from the bark of the neem reduces it. Fifteen leaves of neem should be eaten in the morning in the empty-stomach.

**Role in Religion and Culture:**

In Karnataka there is a tradition of exchanging and eating neem leaves and jaggery during 'Ugadi festival', as a symbol of harmony. In North Karnataka, fried gram powder, jaggery and tamarind juice are taken in a new pot and mixed with small pieces of summer fruits like watermelon, musk-melon, grapes, banana and sapota. To this drink neem flowers are added. [Bevu-Bella] The Nimba tree is considered as a 'sacred tree'.

**Other Uses:**

- Resin available in the stem of neem tree is used in dyeing the silk thread.
- Ropes are manufactured from coir.
- Neem leaves can be fed to animals along with food and fodder. For goats and cows neem leaves help in enhancing the production of milk.
- To protect the books and woolen clothes from insects and crops can be protected from insects by spraying neem solution.
- Neem leaves and seed powder protect the food grains from insects.
- Neem oil is used in the manufacture of cosmetics, soaps, tooth pastes.
- In the tanning of leather if neem oil is used along with other chemicals it makes the leather goods durable.\(^{255}\)

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255. Dr. Vasundhara Bhupati - 'Medicinal plants in your own yard' pp - 156, 157, 158.
References in Purāṇas:

Matsya purāṇa treats forests as a source of wealth. Some forests are considered by the purāṇas as ‘Reversed Forest’ where hunting is not allowed and since food materials are available in abundance there, the animals of these forests normally get rid of the competition for food. Further a green belt of sufficient depth appears to be regarded as an essential constituent of the sacred hermitage. Here ‘Nimba’ plant has been mentioned.256 Even Matsya purāṇa prescribes some uses of plants for maintaining vitality and vigour of a man’s body. All poison’s can be removed from a human body if the same is treated with the paste of following plants; haridrā, maṇjiṣṭha, kinihi, pippali and Nimba.257

Use of Nimba plant in various diseases in Agni Purāṇa

* Godhūma, Śālī, Mudga, Ahayā, Pañcakola, Nimba, Dhātrī, Patola, Jaṅgala, Mātulāṅga, Rasā, Jatī and khadira are beneficial for the kuṣṭha [leprosy] patient.258

* The decoction of amṛtā, vāsā, nimba, bhūnimba and triphalā should be taken with honey for curing jaundice [pāṇḍu].259

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256. Mahānīśālītāpa nīshānīṁśaṁcīhaṁtīṇḍuṁ. ||
    Ševārā mahāntiśālītāpa kāleśvādum. ||
    Matsya purāṇa - 118.5. There are many ślokas from chapter 118-209.

257. Ghaṭreṁ bāṣṭreṁśaṁ śaṅkāriṇīṛṇaḥ. ||
    Puskārāṁ śaṅkāriṇīṛṇaḥ nīśāṇḍum. || Ibid - 218.20

258. Gopuḥmaśālāyo mudraṁ ṣaṅkārāṇaḥ dhārtiḥ. ||
    Paṇcākolaṁ ṣaṅkārāṇaḥ nīśāṇḍum. || Pottolakā. ||
    Mātulāṅgaśālāntaṁ kuṣṭhāntjāntjānta. ||
    Kūṭaṁ tathā sālāṇaṁ pāṇḍum. || Agni purāṇa - 279.13 & 14

259. Phalavāpaśu ṛtaya tītantaṁśaṁcīhīlaṁ. ||
    Kṛtāṣaṁ samāśaṅko ṛtayaṁ pāṇḍurīyaṁ sākāram. || Ibid - 283.19
* External application of the paste of leaf of nimba and madhuka can remove the pimples. The alkaloids of the leaves of nimba, mulaka, vāta, khadira, kuśa, dārvi and triphala are beneficial.

* Even the external application of jīvati, dantī, maṇjiśṭha, trivṛtā and the leaves of nimba is beneficial for Bhagandara [boilatanus].

* The decoction of akanda, nimba and varsābhū can remove the disease [sotha] that is dropsy.

* The oil of tāla and nimba makes the hair black and ensures luxurious growth of the hair.

The information available in the Agni purāṇa about the specific uses of plants and plant materials in counteracting the venoms of certain animals. The leaves of Nimba should be chewed by a snake-bitten man. The purāṇa also prescribes treatment for certain ailments of the horse, for curing the śūla [pain in the abdominal region] the animal should be fed with the following plants along with salt and warm water: Nimba, hiṅgu, vṛhati, vṛṣa, Gandhakari, the roots of puṣkara, vetasa and

260. मधुकं निम्बप्राणि लेपः स्वादिश्वासोधनः।
तिरिता खादिरो दर्पं न्योगधति बलावेनम्॥
निम्बन्दक्षणां क्षयाः शोधने हिठताः।
करब्धारिणीनुमुखद्वीरो हन्यादृशनकृमी।।
Ibid - 285.33 & 34

261. निम्बता जीतती दर्पं महिष्यं शर्करोवयम्।
तार्कं निम्बप्रक्षः लेपः शास्ती भphem॥
Ibid - 283.23

262. शेषतत्वार्द्वारप्राप्तेश्वरवस्तीमेव होपावलितः।
वश्यगृहं पलासल्य श्रेयोऽभवारिष्टः॥
Ibid - 285.50

263. भक्तं निम्बप्राणां सर्वदोषेन भेषजम्।
तातिनिन्दुःकृष्णं जीपावित्रं वश्युतम्॥
Ibid - 279.56

264. भक्तं निम्बप्राणां सर्वदोषेन भेषजम्।
Agni purāṇa - 279.56a
To remove the pimples, the crushed mass of tila, yasti, rajani and the leaves of nimba should be applied. After conditioning the same with honey and adding some amount of ghee to that.

**Varieties:**

Under the heading two plants are included. They are a) *Azadirachta indica*, b) *Melia azedarach* linn. Both belong to the same family. The synonymous of 'Melia azedarach linn' are - Mahānimbaḥ, Drekī, Kārmukaḥ, Viṣamaṣṭikaḥ, Keśaṃuṣṭhi, Nimbārakaḥ, Ramyakaḥ and Akṣīvaḥ.

**In other languages:**

<table>
<thead>
<tr>
<th>Language</th>
<th>Translation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hindi</td>
<td>Pan</td>
</tr>
<tr>
<td>Marathi</td>
<td>Bakānannimba nimba</td>
</tr>
<tr>
<td>Tamil</td>
<td>Malaivembu</td>
</tr>
<tr>
<td>Telgu</td>
<td>Bettivepu</td>
</tr>
<tr>
<td>Malayalam</td>
<td>Maha veppu</td>
</tr>
<tr>
<td>English</td>
<td>Parsian lilac</td>
</tr>
</tbody>
</table>

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265. अस्मेधे तु दुर्सः पवित्रताजुवृक्ते।

266. तत्त्वेन्द्र्या रजनया च निम्बप्रशैल्य गौजिता।

267. महानिम्ब सुगृहो देवी कार्याळको विनिमृत्यको।

Dr. S.D. Kamat - 'Medicinal Plants & Drugs in Dhanvantri Nighantu' p.p - 12, 13
**Uses of Melia Azadirachta:**

Leaves, Bark and fruits accredited with insect repellent properties. Leaf juice anthelminthic diuretic and emmenagogue. A gum collected from the tree used in spleen enlargement and infusion of bark in ascariasis wood used for toys, cigar and ammunition boxes and other packing and museum cases. Also suitable for agricultural implements, turnery, musical instruments and ornamental plywood seeds yield a drying oil suitable for soap making and hair oils. Fruits tonic, cases of severe poisoning have been recorded.268

**ERANDAKARAKATIH [एरण्डकरकतीः]**

**Synonymous:**

- Sanskrit : Erandakarakatih, Nalaparni, Madhukarkati
- Hindi : Popaya, Papeeta, andakarbuja
- Kannada : Parangi
- English : Papaya
- Telugu : Boppayi, Pappayam
- Tamil : Poppayi, Parangi
- Malayalam : Kappalam, Pappayam, Paapacha
- Marathi : Popai

**Botanical Name :** Carica Papaya L.

**Family :** Caricaceae.269

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268. Bruscher - 'The useful plants in India' p - 361
269. Dr. Vasundhara Bhupati - 'Medicinal plants in your own yard', p - 169.
The Papaya, Carica Papaya L, is a member of the small family caricaeae allied to the passifloraceae. As a dual or multi purpose, early bearing, space-conversing, herbaceous crop, it is widely acclaimed, despite its susceptibility to natural enemies.

In some parts of the world, especially Australia and some islands of the West Indies, it is known as papaw, or pawpaw, names which are better limited to the very different, mainly wild Asimina triloba Dunal, belonging to the Annonaceae. While the name papaya wildly recognized, it has been corrupted to kapaya, kepaya, lapaya or tapaya in Southern Asia and East Indies. In French it is papaye (the fruit) and papayer (the plant), or sometimes ‘figuiérides illes’. Spanish speaking people employ the names melon zapote, lechosa, papaya (fruit), papayo or papayero (the plant), fruta bomba, mamom or mamona, depending on the country. In Brazil the usual name is mamo. When first encountered by Europeans it was quite naturally nick named “tree melon”.270

Papaya is the fruit of south America. It was discovered by Columbus, the discoverer of America. This fruit was included with other fruits and dishes offered by the tribes when he entered America. The tribes called it “Avabi” which mean fruit of gods. The plant is called health promoter in south and central America. Because of its nuritive value, the fruit is also called health melon. An important place was given to papaya in the list of healthy fruits published by the science center, Washington. Papaya is also grown as profitable crop. The name papaya came from “Ababai”.271

270. Bruscher - The useful plants in India, p - 105
271. Dr. Vasundhara Bhupati - Medicinal plants in your own yard, pp - 170, 169
Description:

Commonly and erroneously referred to as a “tree”, the plant is properly a large herb growing at the rate of 6 to 10 feet the first year and reaching twenty or even thirty feet in height, with a hollow green or deep purple stem becoming 12 to 16 in (30-40 cm) or more thick at the base and roughened by leaf scars. The leaves emerge directly from the upper part of the stem in a spiral on nearly horizontal petioles 1 to 3½ ft (30-105 cm) long, hollow, succulent, green or more or less dark purple. The blade deeply divided into 5 to 9 main segments, each irregularly sub divided, varies from 1 to 2 ft in width and has prominent yellowish ribs and veins. The life of a leaf is four to six months. Both the stem and leaves contain copious white milky latex.

The five petalled flowers are fleshy, waxy and slightly fragrant. Some plants bear only short stalked pistillate (female) flowers, waxy and ivory-white or hemaprodite (perfect) flowers (having female-male organs), ivory-white with bright yellow anthers and borne on short stalks, while others may bear only staminate (male) flowers, clustered on panicles to 5 or 6 ft long. There may even be monoecious plants having both male and female flowers. Some plants at certain seasons produce short-stalked male flowers, at other times perfect flowers. This change of sex may occur temporarily during high temperature in mid summer. Some “All male” plants occasionally bear at the tip of the spray, small flowers with perfect pistils and these produce abnormally slender fruits. Male or hermaphrodite plants may change completely to female plants after being be headed.

Generally, the fruit is melon-like, oval to nearly round, somewhat pyriform, or elongated club shaped, 6 to 20 in long and 4 to 8 in (10-20 cm)
thick, weighing up to 20 lbs (9 kg). Semi-wild (naturalised) plants bear miniature fruits 1 to 6 in long. The skin is waxy and thin but fairly tough. When the fruit is green and hard it is rich in white latex. As it ripens, it becomes light or deep yellow externally and the thick wall of succulent flesh becomes aromatic, yellow, orange or various shades of salmon or red. It is then juicy, sweetish and somewhat like a cantaloupe in flavour, in some types quite musky. Attached lightly to the wall by soft, white, fibrous tissues are usually numerous small, black, ovoid, corrugated, peppery seeds about 3/16 in (5 mm) long, each coated with a transparent, gelatinous aril.  

**Origin and Distribution:**

Papaya is native to south America. Now it is a regular crop with many varieties in all countries. In India one or two plants can be seen in every kitchen garden.  

**Varieties:**

Despite the great variability in size, quality and other characteristics of the papaya, there were few prominent, selected and named cultivars before the introduction into Hawaii of the dioecious, small-fruited papaya from Barbados in 1911. It was named 'solo' in 1919. 'solo' produces no male plants, just female with round, shallowly furrowed fruits and bisexual with pear shaped fruits in equal proportions. The fruits weigh 1.1 to 2.2 lbs (½ – 1 kg) and are of excellent quality. When the fruit is fully ripe the thin skin is orange-yellow and the flesh golden-orange and very sweet.  

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272. P.K. Warrier - 'Indian Medicinal plants' Vol-III, p - 75  
273. Dr. Vasundhara Bhupati - 'Medicinal plants in your own yard' p - 170
'Kapoho solo' or 'Puna solo' was discovered and became popular with growers on Kauai before 1950. In 1955 a 'Dwarf solo' was introduced to aid harvesting and this became the leading commercial papaya on the island of Oahu. It was up to 1974, the only export cultivator. It is pear-shaped.

The Regional Research station at Pusa has introduced some promising selections:

'Pusa Delkious' — medium size, flesh deep-orange, of excellent flavour, female and hermaphrodite plants, high-yielding.

'Pusa Majesty' — round of medium size, flesh yellowish, solid; keeps well and ships well; virus resistant, hermaphrodite plants higher-yielding than the female.

'Pusa Giant' — large fruits suitable for marketing ripe or green for use as a vegetable, also for canning. Plant dioecious, fast growing, tall; trunk thick, wind-resistant.

'Pusa Dwarf' — fruit oval of medium size. Plant is dwarf, begins bearing fruit at 25–30 cm above the ground. In much demand for home and commercial culture, suitable for high-density plantings.

'Santa Cruz Grant' — a vigorous plant mainly bisexual [having both male and female flowers], very large fruits weighing 4.5–6.8 kg, with firm yellow flesh of agreeable flavour. The fruit is too large for marketing fresh but is processed both green and ripe.

'Cedro' — is dioecious, rarely bisexual, a heavy bearer and highly resistant to anthracnose. The fruits weigh from 1.37–3.6 kg have firm, yellow, melon like-flesh and are suitable for sale fresh or for processing.

'Singapore Pink' — the plants are mainly bisexual, producing cylindrical fruit. The minority are female with round fruit. Average
weight of fruit is 2.27 kg though there is variation from 1-3 kgs. The flesh is pink. The fruit surface is prone to anthracnose in rainy periods, so at such times the fruits must be picked and sold in the green state. Two smaller-fruited types, 1-1.37 kg in weight, with bright-yellow skin and thick, firm flesh were selected for marketing fresh.

‘Cariflora’ – is a new cultivar developed at the recently renamed Tropical Research and Education centre of the University of Florida at Homestead. It is nearly round, about the size of a cantaloupe, with thick, dark-yellow to light-orange flesh, tolerant of papaya ring spot virus, but not resistant to papaya mosaic virus or papaya apical necrosis virus. Yield is good in southern Florida and warm low lands of tropical America.

‘Sunrise solo’ – The fruit has pink flesh with high total solid content. Venezuelan papayas are usually long and large, ranging in weight from 1-6 kg and mostly for domestic consumption or shipment by boat to nearby islands.274

Propagation:

Fresh seeds are sown in rows of 15cm intra row space and also with an intra row spacing of 2-5cm with a depth of 2cm. It is better to sow during March-April, so that the seedlings will be available for transplanting by June-July. Seedlings can also be raised in polyethylene bags. Two seeds are sown into each perforated polyethylene bags of 9"×6" size and 15 gauge thickness, filled with mixture of well decomposed FYM, top soil and sand in equal proportions. After germination, only one seedling in each bag is retained.

Climate – Papaya grows better under dry and hot conditions.

Harvest and Yield

The fruits are ready to harvest 9-10 months after transplanting. 25-30 fruits can be harvested per plant. Papaya gives fruits throughout the year. The yield is economic up to 3 years. Hence after 3 years replanting is taken up.

Parts Used: Leaf, Fruit, seeds and latex.

Chemical Composition:

<table>
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<tr>
<th>Component</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moisture</td>
<td>92gms</td>
</tr>
<tr>
<td>Fat</td>
<td>0.1gm</td>
</tr>
<tr>
<td>Fibre</td>
<td>0.8gm</td>
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<tr>
<td>Energy</td>
<td>72 calories</td>
</tr>
<tr>
<td>Iron</td>
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</tr>
<tr>
<td>Riboflavin</td>
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<tr>
<td>Vitamin C</td>
<td>57mgs</td>
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<tr>
<td>Protein</td>
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<tr>
<td>Mineral matter</td>
<td>0.5gm</td>
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<tr>
<td>Carbohydrate</td>
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<tr>
<td>Calcium</td>
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</tr>
<tr>
<td>Thiamine</td>
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<tr>
<td>Niacin</td>
<td>0.2mg</td>
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<tr>
<td>Vitamin A</td>
<td>2500 IU</td>
</tr>
</tbody>
</table>

Medicinal Properties:

* The unripe fruit is recommended in cough and bronchitis, liver and spleen disorders and ascitis. It is a good appetizer.
* Fruit is a very good digestive. Papain present in the fruit digests protein and does the work of pepsin and trypism during digestion.

* It improves eye-sight as it has Vitamin-A. Good for night blindness.

* Pulp of the fruit, if applied, cures ulcers. It can even be taken internally.

* Consumption of papaya is good for piles. It cures constipation.

* During the first trimester of pregnancy it should be avoided as it is abortifacient.

* Papaya is good for heart disease and neural disorder.

* In lactating mothers it improves milk secretion.

* The fruit juice is a good remedy for stomatitis.

* The fruit juice controls dysentery and diarrhoea.

* Latex of the fruit is good in skin disorders like Ring worm.

* Regular habit of taking papaya after food cures constipation.

* As it contains more vitamins it improves immunity in children.

* The pulp if applied to pimples, gives good result.

* The whole fruit with seeds and skin made into paste can be used as hair-pack once in a fortnight. This improves growth and complexion of the hair.

* Pregnant women after twelve weeks can consume papaya. This improves both foetal and Mother's health.276

**Other Uses:**

The latex of papaya plant and its green fruits contains two proteolytic enzymes, papain and chymopapain. The latter is most abundant but

papain is twice as potent. The latex is obtained by making incisions on the surface of the green fruits early in the morning and repeating every 4 or 5 days until the latex ceases to flow. The tool is of bone, glass, sharp edged bamboo or stainless steel (knife or razor blade). Ordinary steel stains the latex. Tappers hold a coconut shell, clary cup or glass, proclain or enamelpan beneath the fruit to catch the latex or a container like an “Inverted Umbrella” is clamped around the stem. The latex coagulates quickly and for best results is spread on fabrics and oven-dried at a low temperature, then ground to powder and packed in tins. Sun-drying tends to discolour the product. One must tap 1500 average size fruits to gain 0.68 kg of papain.

The lanced fruits may be allowed to ripen and can be eaten locally or they can be employed for making dried papaya “leather” or powdered papaya or may be utilized as a source of pectin. Because of its papain content, a piece of green papaya can be rubbed on a portion of tough meat to tenderize it. Sometimes a chunk of green papaya is cooked with meat for the same purpose.

One of the best known use of papain is in commercial products marketed as meat tenderizers, especially for home use. A modern development is the injection of papain into beef cattle a half hour before slaughtering to tenderize more of the meat than would normally be tender. Papain treated meat should never be eaten “rare” but should be cooked sufficiently to inactivate the enzyme. The tongue, liver, kidneys of injected animals must be consumed quickly after cooking or utilized immediately in food or feed products, as they are highly perishable.

Papain has many other practical applications. It is used to clarify beer, also to treat wool and silk before dyeing, to the hair hides before tanning and it serve as an adjunct in rubber manufacturing. It is applied
on tuna liver before extraction of the oil which is there by made richer in vitamins A and D, it enters into tooth pastes, cosmetics and detergents, as well as pharmaceutical preparations to aid digestion.

Papain has been employed to treat ulcers, dissolve membranes in diptheria and reduce swelling, fever and adhesions after surgery. With considerable risk, it has been applied on meat impact in the gullet. Chemopapain is sometimes injected in cases of slipped spinal discs or pinched Nerves. Precautions should be taken because some individuals are allergic to papain in any form and even to meat tenderized with papain.

Folk Uses:

In tropical folk medicine, the fresh latex is smeared on boils, warts and freckles and given as a vermifuge. In India, it is applied on the uterus as an irritant to cause abortion. The unripe fruit is sometimes hazardously ingested to achieve abortion. Seeds, too, may bring on abortion. They are often taken as an emmenagogue and given as a vermifuge. The root is ground to paste with salt, diluted with water and given as an enema to induce abortion. A root decoction is claimed to expel round worms. Roots are also used to make salt.

Crushed leaves wrapped around tough meat will tenderize it overnight. The leaf also function as a vermifuge and as a primitive soap substitute in laundering. Dried leaves have been smoked to relieve asthma or as a tobacco substitute. Packages of dried pulverized leaves are sold by 'Improved Petersen', of local origin, is dioecious, tall-growing, with fruits deficient in external colour and in different as to keeping quality but noted for fine colour and flavour of the flesh. In 1947, semi-dwarf 'Hybird No.5', smooth, yellow rounded-oval, 1.36 kg in weight, thick-fleshed, of excellent flavour and prized for marketing fresh and for canning.
‘Sunny bank’ and ‘Guinea Gold’ were chosen as having sufficient yield and quality to be worth cultivating commercially. ‘Sunny bank’ fruits average 0.63 kg and ripen over 11 months. ‘Guinea Gold’ average a little over 1 kg and ripen over a period 18 months. The introductions from Brazil were by far the most promising ‘Zapote’, with rich, red flesh is much grown on the Atlantic coast of Colombia.

In India, a well-known cultivar is ‘Coorg HoneyDew’. The plant is low-bearing and prolific. The fruit is long to oval, weighs 2–3½ kg has yellow flesh with a large cavity and keeps fairly well. ‘Washington’, popular in Bombay, has dark red petioles and yellow flowers. The fruits are of medium size with excellent, sweet flavour. ‘Burliar Long’ is prolific, bearing as many as 103 fruits the first year, mostly in pears densely packed along the stem down to 45 cm from the ground. Seedling are 70% females and bloom 3 months after transplanting. ‘CO.1’ and ‘CO.2’ were developed at Tamil Nadu Agricultural University. Both are dioecious and dwarf, the first fruits being borne 3 ft from the ground. ‘CO.1’ is valued for eating fresh, ‘CO.2’ is grown for table use and for papain extraction. The fruits are of medium size 1½ - 2½ kg, with yellow, sweet flesh. 14 to 28 oz (400-800 gm) in weight in high rainfall areas and has yellow skin and pale-orange flesh.

‘Waimanalo’ was selected in 1960, because of its firmness and quality, but there it is usually too large for export. It has long storage life and is recommended for sale fresh and for processing. This cultivar has been produced commercially on the low-rainfall island of Maui where it ripens at a greener colour and is exported to cities in the north-western and central USA.

‘Higgins’ was introduced to Hawaii growers in 1974. It is of high quality, pear-shaped, with orange-yellow skin, deep-yellow flesh and
averages 0.45kg, when grown under irrigation. In and territory or seasons of low rainfall, the fruit is undersized.

'Wilder' is a cultivar admired for its uniformity of size, firmness and small cavity and it is now popular for export.

'Hortus Gold', a south African cultivar, launched in the early 1950's is dioecious, early maturing, with round-oval, golden-yellow fruits, 0.9-1.36kg in weight. This is the best sugar content and disease resistance. This cultivar has a slight beak at the apex, golden-yellow skin, is of sweet flavour and good texture becomes mushy when overripe. It averages 1kg per fruit except for those at the end of the season which are much smaller. It is propogated by cuttings. It is late in season and late-maturing and therefore brings nearly double the price of other cultivars.

'Bettina' and 'Petersen', long-standing cultivars in Queensland, Australia, were inbred for several generations to obtain pure lines. 'Bettina' a hybrid of Florida's Betty and a Queensland strain in a low, shrubby, dioecious plant producing well-coloured, round-oval fruits weighing 3 to 5 lbs (1.36-2.27kg). "health food" stores for making tea, despite the fact that the leaf decoction is administered as a purgative for horses in Ghana and in the Ivory Coast. It is a treatment for genito-urinary ailments. The dried leaf infusion is taken for stomach troubles in Ghana and they say it is purgative and may cause abortion.277

Food Uses:

Ripe papayas are most commonly eaten fresh, merely peeled, seeded, cut in wedges and served with a half Quarter of lime or lemon. Sometimes

a few seeds are left attached for those who enjoy their peppery flavour. The flesh is often cubed or shaped into balls and served in fruit salad or fruit cup. Firm-ripe papaya may be seasoned and baked for consumption as a vegetable. Ripe flesh is commonly made into sauce for short cake or icecream sundaes, or is added to icecream just before freezing; or is cooked in pie, pickled or preserved as marmalade or jam. Papaya and pineapple cubes, covered with sugar sirup, may be quick frozen for latter serving as desert. Half ripe fruits are sliced and crystallized as a sweet meat.

Papaya juice and nectar may be prepared from peeled or unpeeled fruit and are sold fresh in bottles or canned. Papayas are reduced to puree with sucrose added to retard gelling and the puree is frozen for later use in fruit juice blending or making jam.

Unripe papaya is never eaten raw because of its latex content. Even for use in salads it must first be peeled, seeded and boiled until tender, then chilled, Green papaya is frequently boiled and served as a vegetable. Cubed green papaya is cooked in mixed vegetable soup. Green papaya is commonly canned in sugar sirup in Puerto Rico for local consumption and for export. Green papayas are for canning in Queensland.

Young leaves are cooked and eaten like spinach in the East Indies. Mature leaves are bitter and must be boiled with a change of water to eliminate much of the bitterness. Papaya leaves contain the bitter alkaloids, carpaine and pseudocarpaine, which act on the heart and respiration like digitalis, but are destroyed by heat. In Indonesia, the flowers are sometimes can dried. Young stems are cooked and served in Africa. Older stems, after peeling, are grated, the bitter juice squeezed out and the mash mixed with with sugar and salt.
In India, papaya seeds are sometimes found as an adulterant of whole black pepper. Oil was extracted from the sundried, powdered seeds of unripe papayas at the central Food Technological Research Institute, Mysore, India. White seeds yielded 16.1% and the black seeds 26.8% and it was suggested that the oil might have edible and Industrial uses.

Food Value:

The papaya is regarded as a fair source of Iron and calcium, a good source of vitamins A, B and G and an excellent source of Vitamin C (ascorbic acid). The following represent the levels of constituents as reported from central America and Cuba.

Food Value per 100g of Edible Portion\(^{278}\)

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<tr>
<td>Moisture</td>
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<td>83.3%</td>
</tr>
<tr>
<td>Protein</td>
<td>0.81-34g</td>
<td>5.6%</td>
</tr>
<tr>
<td>Fat</td>
<td>0.5-96g</td>
<td>0.4%</td>
</tr>
<tr>
<td>Carbohydrates</td>
<td>6.17-6.75g</td>
<td>8.3%</td>
</tr>
<tr>
<td>Crude Fiber</td>
<td>0.5-1.3g</td>
<td>1.0%</td>
</tr>
<tr>
<td>Ash</td>
<td>0.31-66g</td>
<td>1.4%</td>
</tr>
<tr>
<td>Calcium</td>
<td>12.9-40.8mg</td>
<td>0.406%</td>
</tr>
<tr>
<td>Phosphorus</td>
<td>5.3-22.0mg</td>
<td></td>
</tr>
<tr>
<td>Iron</td>
<td>0.25-0.78mg</td>
<td>0.00636%</td>
</tr>
</tbody>
</table>

\(^{278}\) P.K. Warrior - 'Medicinal plants in India' p.p - 76, 77, 78.
<table>
<thead>
<tr>
<th>Fruit</th>
<th>Leaves</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carotene</td>
<td>0.0045-676mg</td>
</tr>
<tr>
<td>Thiamine</td>
<td>0.021-036mg</td>
</tr>
<tr>
<td>Riboflavin</td>
<td>0.024-058mg</td>
</tr>
<tr>
<td>Niacin</td>
<td>0.227-555mg</td>
</tr>
<tr>
<td>Ascorbic acid</td>
<td>35.5-71.3mg</td>
</tr>
<tr>
<td>Tryptophan</td>
<td>4-5mg</td>
</tr>
<tr>
<td>Methionine</td>
<td>1mg</td>
</tr>
<tr>
<td>Lysine</td>
<td>15-16mg</td>
</tr>
<tr>
<td>Magnesium</td>
<td></td>
</tr>
<tr>
<td>Phosphoric Acid</td>
<td></td>
</tr>
</tbody>
</table>

**VAMŚAH [वंशः]**

Synonymous:

- **Sanskrit**: Vamśah, Veṇuḥ, Yavaphalaḥ, Kārmukaḥ, Trṇa-ketukah, Twaksāraḥ, Śataparvā, Maskaraḥ and Kīcakah are synonymous.²⁷⁹
- **Hindi**: Bānsa, Magarbans
- **Kannada**: Bidungulu
- **Tamil**: Mongal, Velmankil
- **Telugu**: Mulkas
- **Bengali**: Bāns, Behurbans

²⁷⁹. बंशों-वेणुवर्गश्च कार्यकुस्तिप्रकृतिस्य।
लक्ष्याः तत्त्वाः च मस्कराः कीचकल्प।
Dr. S.D. Kamat - 'Studies on Medicinal plants & Drugs in Dhanvantri Nighantu'
p.p No - 364
The spiny Bamboo

Botanical Name: Bambusa arundinacea wild

Family: Bambusacea

Habitat: Throughout India growing wild, also cultivated.

**Plant Description:**

A large grass grows up to 40 metres in height. Leaves alternate, long base chordate, lanceolate, acute and very rough. Plant flowers once in its life time. Flowers are seen in large branched panicles, bisexual, small yellowish. Fruits are oblong grains, grooved at one side. Stems are numerous, node prominent, internodes upto 50cm long, greenish or yellowish. Very rarely some edible substance called Bamboo mana can be seen inside the hollow stems.

**Bambusa Arundinacea Description:**

Grows from a stout root stock, stems woody, pointed, 24-30m high and 15-17m in diameter, internodes may be 45cm in length, hollow, walls 2.5-5.0cm thick, nodes solid and prominent, lower nodes may have long horizontal shoots armed with 2-3 recurved spines, branched from the base, stem-sheathes 30-37cm by 22-30cm, coriaceous, young-orange-yellow, often striped green or red, top rounded, edges plaited, young thickly clothed with golden hairs, blade triangular, outside glabrous, matted within; leaves alternate, upto 20.0cm by 2.5m, tip, sharp, stiff; flowers gregariously once in life time (25-50 years), inflorescence leafless, large, paniculate, rachis glabrous, shining, hard flowers green and inconspicuous; caryopsis.

**Varieties:** Bamboos........... The species are numerous and belongs to Arundinaria, Dendrocalamus, Phyllostachys and closely allied genera. Some of them are given below:
a] **Bambusa Arundinacea** [Thorny Bamboo] : Crooked and knotty culms render it as second class Bamboo. Used mainly for floating heavy timber and for structural Bamboo. It yields good quality paper pulp. Young shoots pickled or made into curries. Leaves and twigs used as fodder. Grains eaten during times of scarcity. Leaves given to horses for cough and colds.

b] **Bakooa Roxb** : In Bengali known as “Baluka” and Assam-Bhaluka. One of the best and strongest Bamboos for building purposes. When seasoned by immersion in water, it becomes very durable and Insect resistant.

c] **Blumeana schult.f** : It is grown for soil reclamation in highly eroded areas. The lateral branches and the circle of false root lets at the lower nodes harden into spines and give a natural armour to pulps.

d] **Brandisii Munro** : A tall Bamboo reaching a height upto 40m.

e] **Lineata Munro** : Normally Bamboos flower once in their life time and die out soon after. But this Bamboo is one of the few bamboos that flower annually.

f] **Longispiculata Gramble** : A Bamboo that show natural resistance to Insect.

g] **Nana.Roxb** : A Bamboo with smooth culms, makes good hedges. Culms used for fishing rods

h] **Nutans wall** : A creeping Bamboo used for the production of mechanical pulp. Bamboos are normally less suited to the production of mechanical pulp.

i] **Polymorpha** : In Bengali known as ‘Jamma Betue’ and in Assam ‘Betua’. A popular Bamboo for roofing and flooring. It has been recommended for paper pulp.
j] Spinosa.Roxb : A Bamboo with spiny culms used for construction purposes. Young tender shoots are boiled and consumed as 'vegetable'.

k] Tulda.Roxb : In Hindi known as 'Peka' and Bengali 'Tulda'. A Bamboo used for construction work, mat-making and basketry. One of the most useful Bamboos. May be seasoned by immersion in water, becomes very durable and resistant to insects. Young buds consumed as a 'vegetable'. A Bamboo is a source of paper pulp.

l] Vulgaris Schard [Golden Bamboo] In Bengali known as 'Basini bans', Marathi 'kalaka' and Tamil 'Ponmungli'. A Bamboo is used for scaffolding, roofing etc.

m] Var.Striata gamble : is an ornamental variety, young buds consumed as 'vegetable'. woods soft, long fibred, a valuable paper pulp.

n] Melocammm Bambusoides : In Bengali referred as 'Muli', and Assam 'Tarai'. Used for purposes for which Bamboos are generally employed, specially prized for House-Building, scaffolding and boat making. Activated charcoal of high absorption of power is prepared from this plant. Culms contain siliceous secretion known as 'Tabashree', used for medicinal purposes.

o] Dendro calamus.hamiltonii : In Hindi called as 'kughsi', Bengali - 'Pecha' and Assam - 'kokula'. This Bamboo is employed for paper making. Young clums used as 'vegetable'. Because of long inter nodes and large luman. The Bamboo is particularly suitable for water conduits.

p] Longis pathus kurz : This Bamboo is particularly suitable for craft paper.

q] Strictus- [Male Bamboo and solid Bamboo also] In Sanskrit referred as 'Vansha', Kannada - 'kiribidru', and Hindi - 'Banskaban'. Stem of this Bamboo employed for rafters, battens, scaffoldings, mats, baskets,
sticks, furniture, tent poles, water-pipes, fishing rods, musical instruments, masts for country boats and used as a buoyage of heavy timber in rafting. Also used for paper-pulp and pulp is also suitable for rayon Industry. Bamboo has been employed in the preparation of activated carbon-leaves used as fodder.

r] Phyllostachys [assamica] : Stem of this Bamboo used for walking-sticks.

s] Bambusoides [Gaint timber Bamboo] used for house construction, bridges, furnitures, Umbrella handles and walking sticks. Young shoots eaten as a vegetable. Roots considered as tonic and the sprouts paraciticidal. Tabasheer, a calcareous deposit in the stems is used in a variety of Ayurvedic medicines. Bamboo is much used for making printing papers. The cellulose content of the pulp makes without refining.


v] Raphia vinifera [Bamboo Palm] : Source of fibre, west African, Piassava or lagos Bass, obtained from the leaves and used for Brooms, roller sweeping brushes and brushes used to remove air bubbles from steel castings, cords, fishing tackles and shares for game are also made from this fibre Piassavatow, resembling coir is obtained from waste matter and pith extracted in cleaning the fibre. A wax is also extracted from the leaves. Petiores and midribs are used for roofing, for canoes and as carrying poles, small furniture. Yellow oil pulp eaten as food or used as bitter flavour. Used as stomachic and laxative and as liniment Nuts yield a fat called 'Raphia Butter' - used for cooking, lubrication and lighting. Kernels roasted, ivory for buttons and ornaments Terminal bed Eaten as vegetable.
**Dendrocalamus Giganteus**: The largest cactus reaching 12 tons in weight and believed to live 200 years, that's why known as 'Gaint Bamboo'.

**Some of the Important species of Bamboos mentioned here:**

- Berry bearing → Melocanna Bambusoides
- Black → Phyllostachys nigra
- Calcutta → Dendrocalams strictus
- Common → Bambusa Vulgaris
- Dwraf → Arun dinaria pygmaea
- Fish pole → Phyllostachys aurea
- Heavenly → Nandina domestica
- Madake → Phyllostachys bambusiodes
- Male → Bambusa arundinacea
- Palm → Raphia spp. chrysalido carpus
- Red berried → Smilax Walteri
- Solid → Oxytenonthera abyssinica
- Spiny → Bambusa arundinacea
- Spotted → Ochlandra stiridulavar
- Terai → Melocamma Bambusoides
- Tong king → Arundinaria amabilis
- Vines → Smilax spp
- Wild → *Smilax auriculata.*

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**Parts useful**: Young leaves, Grains, Bamboomana

**Chemical Composition**: Plant – Benozonic acid, oxalic acid, cyanogenic glucoside, lupeol, amyrin, pamyrin, friedelin, tetraxerol, ferneol, 2-fural dehyde, lignin, holocellulose, miliacin, glutinone, glutinol, cylindrin, crusgallin, cholin, betain, betasitosterol, stigmasterol.

**Āyurvedic Properties**:
- **Rasa**: Madhura, kashaya
- **Guna**: Lakhu, Rooksha, Teekshna
- **Virya**: Seeta
- **Vipuka**: Madhura.\(^{281}\)

**USES**: Āyurveda

* Vāmśā is sour, kaśāya, pungent and bitter in taste, sitavirya and pacifies pitta and raktadosha. It is useful in dysuria, disorders characterized by polyuria, piles and burning sensation.\(^{282}\)

* Vāṃśāgra pacifies pitta and rakta doṣas. It is appetizing and useful in burning sensation and dysuria. The joint does not have properties.\(^{283}\)

* Its cooling tonic and aphrodisiac, use of different parts is prescribed here:

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282. वंशस्तवतः क्यावयुक्त तु दूषितिक्षरं शीतलम्।
    पुष्पसमुक्षमोहलयं पितादशिनामां।
283. वंशार्थ तु कारोबयुक्त वंशांकुरस्य स्मृता।
    पितादाकुर्नुष्णो विषकुश्ल पर्विनिगुणयं।

Dr. S.D. Kamat - Studies on Medicinal plants & Drugs in Dhanvantri Nighantu. pp No - 364, 365
(i) Aerial parts (stem and leaf): as blood purifier, in leuboderma and inflammatory conditions.

(ii) Decoction of nodes: for fertility control.

(iii) Aqueous extract of leaf: bathing by the same is good for patients of piles.

(iv) Leaf paste: external application is beneficial ingout, wounds and for suppuration of boils.

(v) Root: diluent, cures strangury, oedema.

(vi) Ash of the basal part of culm and thick root may be used along with sesame oil in treatment of baldness.\(^\text{284}\)

**Other Uses: Vaṃśa**

* Its young sprout called ‘karira’ which is much liked by elephants.\(^\text{285}\)

This is abundant in vindhyā region and is used for catching elephants.\(^\text{286}\)

* This is also used in making earthen walls of the houses in villages.\(^\text{287}\)

* Tubes were made of the hollow portions to contain oil etc.\(^\text{288}\)

* Fencing was made of long bamboos.\(^\text{289}\)

\(^{284}\) F.N. Howes - 'A Dictionary of useful and every day plants and their common names. pp - 67.

\(^{285}\) अवैष्णवस्मत्वसंग्रहे करिण इव करिरां कोमलमिर्न कलयता | Harṣacarita - 328.

\(^{286}\) उद्भिदसंग्रहप्रकाशितं लतावलितावनहनमृतेदिवात्तिपिरस्मित्यज्ञारित | Harṣacarita - 347

\(^{287}\) वालिविविराट नगरीव वीरक्रमीतासृजः | Kādambarī - 60

\(^{288}\) वैज्ञानिकतत्तव स्ववीरसंव्यं विवृत्तिपिलवाली | Harṣacarita - 411

\(^{289}\) तंगलवृत्तिपिलवाली | Harṣacarita - 410
* Arch was made of its sticks.\textsuperscript{290}

* The seeds of Bamboo were stored in the houses in Vindhya region.\textsuperscript{291}
These are called 'वेणुमय' which is regarded as one of the grains for sacrifice.\textsuperscript{292}

* The Flute was made of Bamboos.\textsuperscript{293} The branches have spinous process.\textsuperscript{294}

* The forest of bamboos dried up and the stem of the plants crack by hot winds of summer.\textsuperscript{295} Forest often catches it.\textsuperscript{296}

* Sticks are made of its branches.\textsuperscript{297} The plant becomes greyish yellow like Haritala when ripe.\textsuperscript{298} The plant has got several nodes and inter nodes.\textsuperscript{299}

\textsuperscript{290} Harsacarita - 410
\textsuperscript{291} OfafedHift¥TT^WSffI H arsacarita - 411, Kādambari uttarabha - 199
\textsuperscript{292} a) ?to toto g »|«n®li ^TTcFTS * *SdTS I Harṣacarita - 85
b) Visnu purāna - 1.6.23-26
\textsuperscript{293} VT I Harṣacarita 74, 224, Kādambari - 227
\textsuperscript{294} a) Harsacarita - 432
\textsuperscript{295} b) Harsacarita - 85
\textsuperscript{296} a) Harsacarita - 410, Kādambari - 199
b) Harsacarita - 87,117, Kādambari - 29
\textsuperscript{297} Kāśīka - 6.1.154
\textsuperscript{298} Kādambari - 635
\textsuperscript{299} Srimad Bhāgawata Mahātmya - 5.45
\textsuperscript{300} Shaṅkar Bhāṣya (Br. 2,6,3)
Bṛhadāranyaka upaniṣad, Brahma Sūtra - 1.3.25
* The bark is very tough.\(^{300}\) Vansalocana is obtained from it.\(^{301}\)

* The Kurma puraṇa prohibits the use of a cot having bamboo in it.\(^{302}\)

* According to the Agni puraṇa two plant materials bamboo and hemp can be used in making the bow-string. The puraṇa, however states that the fibres, obtained from mature and dry epidermis of bamboos are the best materials.\(^{303}\) It appears from the puraṇa that utensils could be made of bamboo stem.\(^{304}\)

* In India and elsewhere Bamboo used in manufacture of paper pulp. In stems of Bamboos arundinacea curious concretions of silica are found known as “Tabashir or Bamboo Manna” used in orient as a medicine. So called “Split Cane”. Fishing rods, manufactured from ‘Tongling cane’ are popular with trout fishermen. Because of their great strength and lightness. Toking canes of various dimensions are widely used in other ways especially for goods purposes. Bamboo canes have been much used for walking-sticks. A popular umbrella handle for men’s umbrella is made

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300. गजांगजिरितायु दिनु बायिरे तत्स्मायुक्तिमते बोमनि भ्राम्यांति दुस्म्यांन्वायाःप्रेयायाः मुनि। आदिवाणिन्ति दुमान्तमस्ते बायिरे प्रविष्किर्ताय। वरासौदिपिता तत्रकल्याणकवसलाल्लकृते। Acharya Shri Ramachandra Mishra - Mahavira Caritam. 7, 12, Chowkhamba, Vidyabhavan, Chowk Banaras. 1955.

301. यह अभिव्यक्तसङ्केत्तुशुक्लोत्साहनंहरुपणीयम्। Dr. P.V. Sharma - 'Indian Medicine in the classical Age' pp - 197, 198.

302. न शीर्णायायु बायिरे शून्यपारे न चैव हि। नानावने न पालासे शयते वा कठावन। Kurma puraṇa - 19.29 [U]

303. नार्दनानान्वेव विशिष्टं योजयति। वंशाविषये किन्यता अलाव हुस्तचतुर्व। Agni puraṇa - 78.63(b)

304. ज्यादायतितवायै बंशभक्तचतुर्व। दार्शाप्रवाणातू सेवं हस्तचतुर्व। Ibid - 244.5
from the base of the Indian Bamboo. The largest of the Bamboo is the Gaint Bamboo of Burma cultivated in other parts of tropical region. In China Bamboo shoots are caned and freely exported to the other countries. Bamboos are extensively cult for screens, wind breaks and edges in temperature as well as warm countries. It is only the smaller stemmed bamboos that are suitable for the colder area.


Reference in Amarkośa as:

Vishalayā, Agnishikhā, Anantā, Phalini, Shakrapuṣṭi referred to Bamboo plant.

* 

305. F.N. Howes - ‘A Dictionary of useful and every day plants and their common names’ p-67

306. विशालयांशिष्ठान्तरा फलिनी शक्रपुष्टि।
Vidwan N. Ranganath Sharma - “Amarkośa” p - 94, Shloka - 491