

## REVIEW ARTICLE

# A Literary Review on the Role of *Arjuna* in Ayurveda

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### ABSTRACT

**Introduction:** *Arjuna* (*Terminalia arjuna* Roxb., family *Combretaceae*), is the most accepted and beneficial medicinal plant in the traditional system of medicine for the treatment of various critical diseases and disorders and commonly found in Asian countries. Therefore, the detailed literature review of *Arjuna* and its formulations mentioned in Ayurvedic classics is crucial in present era.

**Aim:** The aim of this study was to evaluate the therapeutic potential of *Arjuna* by assimilating ancient and modern medical knowledge.

**Materials and Methods:** All information is collected from various classical Ayurvedic text books including *Samhitas* and *Nighantus* as well as various other literatures and publications.

**Results and Discussion:** Different literatures revealed that this plant has numerous health benefits and traditionally used in the treatment of various diseases. From different studies, we found that different parts of *T. arjuna* contain numerous phytoconstituents (such as alicyclic acid, amino acids, polypols, arjunglucoside I, II and III, ellagic acid, arjunic acid, and tannic acid) and have anti-oxidant, cardioprotective, anti-inflammatory, anti-mutagenic, anti-cancer, and anti-atherogenic effects.

**Conclusion:** As we got detail information regarding *Arjuna* form various classical literatures, we can come into conclusion that *Arjuna* is one of the most effective drug use to treat various different human disorders, which is also supported by various modern literatures based on research.

## 1. INTRODUCTION

The traditional system of medicine is based on the presumptions, beliefs, and experiences to protect health problems. Traditional health system uses plant based medicines which are easily available, safe, cost-effective, and efficient with fewer side effects. The present global demand toward the use of safe, effective, and cheaper plant based medicine for the treatment of various diseases and health problems has increased, which creates a tremendous need for an up to date and accurate information on the properties, uses, efficacy, safety, and quality of medicinal plant products. Therefore, the detailed literature review of *Arjuna* and its formulations mentioned in Ayurvedic classics is crucial in present era. *Arjuna* is the most accepted and beneficial medicinal

plant in the traditional system of medicine for the treatment of various critical diseases and disorders. It has cardioprotective activity and has been used in cardiac failure, ischemic cardiomyopathy, arrhythmia, and atherosclerosis. It has also been used for the treatment of various diseases such as blood disorders, hypertension, dyslipidemia, acne, venereal, and viral diseases and to maintain good health. Photographs are provided for easy identification of this important plant in the field.

### 1.1. Aim

The aim of this study is to evaluate the therapeutic potential of *Arjuna* by assimilating ancient and modern medical knowledge.

## 2. MATERIALS AND METHODS

All information regarding *Arjuna* is collected from various classical Ayurvedic text books including *Samhitas* and *Nighantus* as well as various other literatures and publications.

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## 2.1. Botanical Name<sup>[1]</sup>

*Terminalia arjuna* (Roxb.) Wt. and Arn.

## 2.2. Family<sup>[1]</sup>

Combretaceae.

## 2.3. Classical Names

*Arjuna, Dhavala, Kakubha, Indradru, Veeravriksha, Nadisarja, Partha.*

## 2.4. Namarupa Vijnana (Symonyms)

*Arjuna* (*T. arjuna* W. and A.) is a tree like sarja which grows in vicinity of water streams (*nadisarja*) and has spreading branches (*kakubha, sarpana*). It has white outer bark (*dhavala, shwetavaha*) and flowers with honey-like aroma (*madhugandhiprasunaka*). It is a potent drug (*Indradru, Viravriksha*) useful in cardiac disorders (*Arjuna, Hridrogavairi*) and dyspnea (*Swasaneswara*).

## 2.5. Literature Review

### 2.5.1. Samhitakala

#### 2.5.1.1. Charaka Samhita

Acharya Charaka described it by the names of *Arjuna, kakubha, and dhananjaya*. It has been used for *hridaroga* from the very beginning of *Samhita* period<sup>[2]</sup> in *Avaleha* form. It is recommended in the patients of skin diseases, such as *kilash, kitibha, dadru, and papma*. In *Caraka Samhita, arjuna* has been mentioned in *Udarda mahakasaya*.<sup>[3]</sup> Its bark is used to prepare "*Asava*." It has been included in "*Kasayaskandha*."<sup>[4]</sup> *Arjuna* has been used in *Kaphaja Prameha, Paittika Prameha, Rajyakshma, and Atisara*.<sup>[5]</sup> Table 1 shown below the *Arjuna*'s useful preparation and its uses in diseases according to Charaka.

#### 2.5.1.2. Sushruta Samhita

Acharya Sushruta has also described the use of *Arjuna* in various forms for many diseases other than *Hridroga*. The words *partha, kakubha* are also referred in *Sushruta Samhita*. *Kakubha* which has been commented by *Dalhan* as *Arjuna* belongs to *Nyagrodhadi gana*. *Sushruta* has mentioned *Arjuna* and *Kakubha* separately.<sup>[6]</sup> Table 2 below Shown *Arjuna*'s useful preparation and its uses in diseases according to Sushruta.

#### 2.5.1.3. Asthanga Hridayam

*Vagabhatta* has also described *Arjuna*; he has given four synonyms such as *kakubha, dhananjaya, partha, and shewtavaha*. *Arjuna* has been used in *dantadhavana, mudhagarbha, and mutraghata* and for bringing the normal skin over a scar<sup>[7]</sup> at other places. Table 3 shown below *Arjuna*'s useful preparation and its uses in diseases according to *Asthanga Hridayam*.

The Classical categorization of *Arjuna* according to various Classical texts:

- In *Charak Samhita*, it is mentioned under *Udardaprashamana, Kasaya skanda*
- In *Sushruta Samhita*, it is mentioned under *Nyagrodhadi, Salsaradi gana*
- In *Astanga Hridaya*, it is mentioned under *Viratarvadi, Nyagrodhadi gana, Asanadi gana*.

### 2.5.2. Nighantu Kala

Table 6 shown below represents the various synonyms given by different *Acharyas* in Different *Nighantus* belonging to different time periods. Some of the most common synonyms used by the *Acharyas* are – *Kakubha, Nadisarja, and Partha*. Maximum number (total 13)

of synonyms was mentioned by "*Raj Nighantu*." Table 4 shown below the Classical categorization of *Arjuna* according to various *Nighantus*. Table 5 shown below the predominant *Rasas* of *Arjuna* as mentioned in *Nighantus*.

## 2.6. Botanical Description

It is a large, evergreen tree with spreading crown and drooping branches, growing up to the height of 25–35 m in height. Leaves – are sub-opposite, oblong or elliptic, coriaceous, cordate, shortly acute, or obtuse at the apex. Two glands are present on the back, Phyllotaxy – opposite or sub-opposite. Flowers – are in paniced spikes, yellowish-white. Calyx-sepals 5, Corolla-petals 5. Flowers occurs in March-June and fruit occur in September-November. Fruits – are ovoid or ovoid-oblong, 2.5–5 cm long, nearly glabrous, with 5–7 hard, winged angles. Stem bark – Bark available in pieces, flat, curved, recurved, channeled to half quilled, 0.2–1.5 cm thick, market samples up to 10 cm in length and up to 7 cm in width, outer surface somewhat smooth and grey, inner surface somewhat fibrous and pinkish, transversely cut smoothened bark shows pinkish surface, fracture, short in inner, and laminated in outer part; taste, bitter, and astringent. Figure 1 below Showing different parts of *Arjuna*.

## 2.7. Distribution

The tree is common throughout the greater part of the Indian Peninsula along rivers, streams, ravines, and dry water courses, found in Sub-Himalayan tract, Chota Nagpur, Orissa, West Bengal, Punjab, Deccan, Konkan, rare in Karnataka, except in Tirunelveli, N. Circar<sup>[23]</sup>

## 2.8. Part Used

Bark.

## 2.9. Chemical Constituents

Alicyclic and aminoacids and polypols (fruit, leaves, bark, and wood); tetramethoxy flavone, arjunglucoside I, II and III, hentriacontane, myristyl oleate, arachidic, and stearate (fruit); arachidic stearate, cerasidin, hentriacontantane, myristyl oleate, mannitol,  $\beta$ -sitosterol, and friedelin (bark); and methyl oleanolate, ellagic, arjunic acid, and tannic acid.<sup>[8]</sup>

## 2.10. Action and Uses

The bark is astringent, cooling, aphrodisiac, demulcent, cardiotoxic, styptic, antidiarrhetic, urinary astringent, expectorant, alexiteric, lithontriptic, and tonic. It is useful in fractures, ulcers, urethrorrhea, spermatorrhea, leucorrhoea, diabetes, anemia, cardiac disorders, excessive perspiration, fatigue, asthma, bronchitis, cough, consumption, intrinsic hemorrhages, tumor, otalgia, dysentery, inflammations, skin diseases such as freckles, wound, hemorrhoids, diarrhea associated with blood, cirrhosis of liver, and hypertension. The fruit is tonic and deobstruent. The juice of the fresh leaves is used in earache.

## 2.11. Ayurvedic Properties

- *Rasa* – *Kashaya*
- *Guna* – *Laghu, Ruksha*
- *Veerya* – *Sheeta*
- *Vipaka* – *Katu*
- *Prabhava* – *Hridya*
- *Doshaghnata* – *Kapha-pitta shamaka*

## 2.12. Rogahnata

*Vrana* (Ulcer), *Raktasrava* (Bleeding), *Asthibhagna* (Fracture), *Raktatisara* (Blood dysentery), *Grahani* (I.B.S), *Arsha* (Piles), *Kshayaja Kasa* (Chronic cough), *Prameha* (Diabetes insipidus), *Pooyameha* (Pyuria), *Shukrameha* (Spermatorrhea), *Raktapradara* (Menorrhagia), *Shwetapradara* (Leucorrhoea), *Kustha* (Skin diseases), *Kandu* (Itching), *Jeernajwara* (Chronic Fever), *Medoroga* (Dyslipidemia), *Visha* (Poisoning), and *Samanya Dourbalya* (Generalized weakness).

## 2.13. Karma

*Raktastambhana* (Anti-hemorrhagic), *Sandhaneeya* (Fracture healer), *Vranaropan* (Ulcer healer), *Stambhana* (Retention), *Hridya* (Cardio protective), *Hridayottejaka* (Cardiac stimulant), *Raktaprasadana* (Blood purifier), *Shothahara* (Anti-edemic), *Kaphaghna* (Anti-phlegmatic), *Mootrasangrahaneeya* (Anti-diuretic), *Jwaraghna* (Antipyretic), *Medohara* (Anti-lipidemic), *Vishaghna* (Anti-poisonous), and *Balya* (Strength promoter).

## 2.14. Matra

Bark juice – 10–12 mL; Powder – 3–6 g; Decoction – 50–100 mL; for *Kshirpaka* (decoction prepared with milk) – 5–10 g.

## 2.15. Pharmacological Activities

### 2.15.1. Anti-oxidant and anti-bacterial activity

Herbal green tea was developed using *T. arjuna*. The nutritional, phytochemical, antioxidant, and antibacterial activity showed that *Withania somnifera* stem, Cinnamon bark, *Tinospora cordifolia* stems, *T. arjuna* bark, Green tea, and the formulation mixture of these herbs showed that they can be proven to be an excellent source of nutraceuticals and flavoring agents.<sup>[9]</sup>

### 2.15.2. Hypolipidemic activity

The hypolipidemic and anti-oxidative properties of encapsulated herb (*T. arjuna*, 1.8%) added vanilla chocolate dairy drink was evaluated in high cholesterol fed Wistar rats for 60 days<sup>[10]</sup>

### 2.15.3. Cardioprotective activity

The *T. arjuna* methanolic extract has significantly protected the myocardium from the oxidative stress damage through reduction of TBARS and enhancement of endogenous antioxidant enzymes.<sup>[11]</sup>

## 2.16. Toxicology

LD<sub>50</sub> of the aqueous extract of bark is 250 mg/kg.

## 2.17. Substitute and Adulterants

Stem bark of *Lagerstroemia speciosa* (L.) Pers. is reported to be an adulterant of *T. arjuna*. It is also reported that bark of several other species of *Terminalia* are being sold indiscriminately under the name *Arjuna*., namely, *Terminalia bialata* Steud., *Terminalia bellirica* Roxb., and *Terminalia alata* Heyne ex Roth.

## 2.18. Formulations and Preparations

*Arjunaristha*, *Arjuna ghrita*, *Arjunadisiddha kshira*, *Kakubhadi kshira*, *Shankara vati*, *Laksha guggul*, *Nyagrodhadya ghrita*, *Dhatakyadi taila*, and *Devadarvyaristha*.

## 3. DISCUSSION

In this review, attempt was made to compile all available historical, botanical, phytochemical, and toxicological data on *Arjuna*, a medicinal plant used in Ayurveda. *Arjuna* has anti-oxidant, anti-bacterial, anti-hemorrhagic, cardioprotective, aardiac stimulant, fracture healing, hypolipidemic activities due to presence of various phytochemical compounds such alicyclic and amino acids and polypols (fruit, leaves, bark, and wood); tetramethoxy flavone, arjunglucoside I, II, and III, and arachidic stearate (fruit); cerasidin, myristyl oleate, mannitol,  $\beta$ -sitosterol, friedelin (bark); ellagic acid, arjunic acid, tannic acid, etc., and thus used in the traditional, pharmaceutical, and clinical application for its proven efficacy. This review will definitely help in understanding this plant and its optimal application in clinical practice, research, and pharmaceutical sector.

## 4. CONCLUSION

As we got detail information regarding *Arjuna* form various classical literatures, we can come into conclusion that *Arjuna* is one of the most effective drug use to treat various different human disorders, which is also supported by various modern literatures based on research.

## 5. ACKNOWLEDGEMENT

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## 6. AUTHORS' CONTRIBUTIONS

All the authors contributed equally to the design and execution of the article.

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## 8. ETHICAL APPROVALS

This manuscript does not required ethical approval as it is a review study.

## 9. CONFLICTS OF INTEREST

Nil.

## 10. DATA AVAILABILITY

This is an original manuscript and all data are available for only review purposes from principal investigators.

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**Table 1:** *Arjuna*'s useful preparation and its uses in diseases according to *Charaka*

Name	Useful preparation	Disease
<i>Arjuna</i>	<i>Kwatha</i>	<i>Kaphaja Prameha</i>
<i>Arjuna</i>	<i>Kwatha</i>	<i>Pittaja Prameha</i>
<i>Arjuna</i>	<i>Trikantakadya ghrita</i>	<i>Kaphaja and Vataja prameha</i> <sup>[3]</sup>

**Table 2:** *Arjuna*'s useful preparation and its uses in diseases according to *Sushruta*

Name	Useful Preparation	Disease
<i>Kakubha</i>	<i>Kwatha</i>	<i>Ikhumeha</i> <sup>[12]</sup>
<i>Kakubha</i>	<i>Kwatha</i>	<i>Prameha</i> <sup>[12]</sup>

**Table 3:** *Arjuna*'s useful preparation and its uses in diseases according to *Asthanga Hridayam*

Name	Useful Preparation	Disease
<i>Kakubha</i>	<i>Churna/Leha</i>	<i>Kaphaja Prameha</i> <sup>[13]</sup>
<i>Arjuna</i>	<i>Kwatha</i>	<i>Mutraghata</i> <sup>[14]</sup>
<i>Arjuna</i>	<i>Kashaya</i>	<i>Pittaja Prameha</i> <sup>[15]</sup>
<i>Arjuna</i>	<i>Trikantakadyaghrita</i>	<i>Vata and Kaphaja prameha</i> <sup>[16]</sup>

**Table 4:** The classical categorization of *Arjuna* according to various *Nighantus*

Drug	D.N <sup>[17]</sup>	K.N <sup>[18]</sup>	M.P.N <sup>[19]</sup>	R.N <sup>[20]</sup>	S.N <sup>[21]</sup>	B.P.N <sup>[22]</sup>
<i>Arjuna</i>	<i>Amradi varga</i>	<i>Aoushadi Varga</i>	<i>Vatadi Varga</i>	<i>Paribhadradi Varga</i>	<i>Katadi varga</i>	<i>Vatadi Varga</i>

*D.N:* Dhanvantari Nighantu, *K.N:* Kaiyadeva Nighantu, *R.N:* Raj Nighantu, *M.P.N:* Madanpal Nighantu, *S.N:* Shaligram Nighantu, *B.P.N.:* Bhavaprakasha Nighantu

**Table 5:** The predominant Rasas of *Arjuna* as mentioned in *Nighantus*

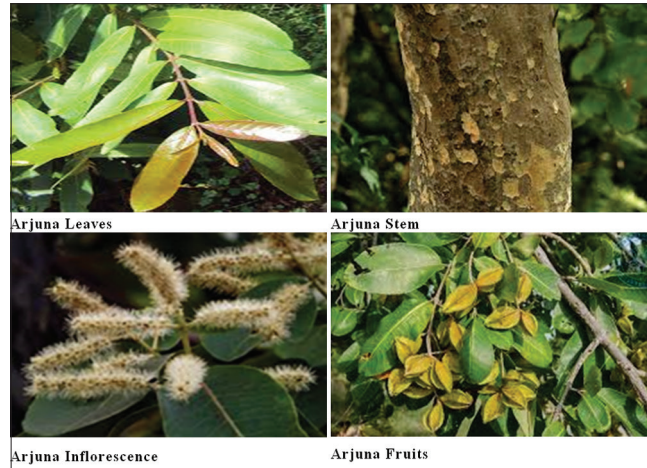
Drug	D.N	K.N	M.P.N	R.N	S.N	B.P.N
<i>Arjuna</i>	<i>Kashaya</i>	<i>Kashaya</i>	-	<i>Kashaya</i>	<i>Kashaya</i>	<i>Kashaya</i>

*D.N:* Dhanvantari Nighantu, *K.N:* Kaiyadeva Nighantu, *R.N:* Raj Nighantu, *S.N:* Shaligram Nighantu, *B.P.N.:* Bhavaprakasha Nighantu, *M.P.N:* Madanpal Nighantu

**Table 6:** Synonyms of *Arjuna* according to various *Nighantus*

Synonyms	D.N	K.N	M.P.N	R.N	S.N	B.P.N
<i>Arjuna</i>	—	—	—	+	—	+
<i>Arjunama</i>	—	—	+	—	—	—
<i>Kakubha</i>	+	+	+	+	—	+
<i>Dhavala</i>	—	—	—	—	—	+
<i>Indradru</i>	—	—	—	—	—	+
<i>Nada</i>	—	—	+	—	—	—
<i>Nadisarja</i>	+	+	—	+	+	+
<i>Vira</i>	—	—	—	—	—	+
<i>Manju</i>	—	—	+	—	—	—
<i>Viravriksha</i>	—	—	—	—	—	+
<i>Shatadruma</i>	—	—	+	—	—	—
<i>Partha</i>	+	+	—	+	+	+
<i>Dhannjaya</i>	+	—	—	+	+	—
<i>Kuruviraka</i>	—	—	—	+	—	—
<i>Phalguna</i>	—	+	—	+	+	—
<i>Shambhara</i>	—	—	—	+	—	—
<i>Karnari</i>	—	—	—	+	—	—
<i>Dhanvi</i>	—	—	—	+	—	—
<i>Kaunteya</i>	—	—	—	+	—	—
<i>Prithaj</i>	—	—	—	+	—	—
<i>Citrayodhi</i>	+	—	—	+	+	—
<i>Pandava</i>	+	—	—	—	+	—

“ + ” denotes same name was mentioned in various *Nighantu*. “ - ” denotes this name was not mentioned. *D.N*: *Dhanvantari Nighantu*, *K.N*: *Kaiyadeva Nighantu*, *R.N*: *Raj Nighantu*, *S.N*: *Shaligram Nighantu*, *B.P.N*: *Bhavaprakasha Nighantu*, *M.P.N*: *Madanpal Nighantu*

**Figure 1:** Different parts of *Arjuna*.