A COMPREHENSIVE REVIEW OF DARUHARIDRA (Berberis Aristata).

Chaudhary Vivek Muralidhar,1* Kokate Krishna Kiran.2

1. M.D. (Dravyaguna), Assistant Professor, Department of Dravyaguna, Sumatibhai Shah Ayurved Mahavidyalaya, Hadapsar, Pune, MS, India.
2. M.D. (Ayurved Siddhant), Consulting Ayurveda Physician, Shashwat Ayurveda Multispeciality Clinic And Panchakarma Center, Bharati Vidyapeet, Pune, MS, India.

Received on: 15/09/18; Revised on: 30/09/18; Accepted on: 04/10/18

ABSTRACT

Berberis aristata Dc. commonly known as Daruharidra is a popular drug which has been used globally in various systems of Medicine viz. Ayurveda, Homeopathy, Allopathy, Unani. Ayurveda classics and Nighantus clearly mentioned Daruharidra in detail with specific synonyms and therapeutic indications. In Ayurveda it is mainly used Netra Roga, Pandu, Kamala, Kushtha, Mutrakruccha, Pratishyaya, Prameha. Clinical and experimental studies shows that it shows antioxidative, antiinflammatory,anticancer, hepatoprotective, immunomodulatory properties. In this article we tried to compile all the information about Daruharidra mentioned in Ayurvedic Samhitas, Nighantus and other text.

Keywords – Daruharidra, Berberis Aristata, Ayurveda, Unani, Pandu, Prameha, Mutrakruccha, Netra rog, Antioxidative, Antiinflammatory, Hepatoprotective, Pharmacognocy.

1. INTRODUCTION

Berberis aristata DC. commonly known as Daruharidra is a popular drug which has been used globally in various systems of Medicine viz. Ayurveda, Homeopathy, Allopathy, Unani. Plant is native to Himalayas at an elevation of 2000 to 3500 metere and also found in Nilgiri Mountains. In Ayurveda it is mainly used Netra Roga, Pandu, Kamala, Kushtha, Mutrakruccha, Pratishyaya, Prameha. Clinical and experimental studies shows that it shows antioxidative, antiinflammatory,anticancer, hepatoprotective, immunomodulatory properties.

Some of the major formulations of Daruharidra are Rasanjana, Dashang Lepa, Daryadi Kwath, Mahamanjisthadi Kashayam, Mahayograj Guggulu, Khadiradi Vati. In this article Daruharidra is explained in detail by quoting all the references from Brihatrayis like Charaka Samhita, Sushruta Samhita, Ashtanga Sangraha, and Nighantus like Bhaavaprakasha, Raja Nighantu, Dhanvantari Nighantu etc, the detailed descriptions regarding the taxonomical classification, macroscopic, microscopic, morphology, pharmacological actions are explained in modern review of the drug.

2. LITERARY REVIEW

2.1. History

Knowing the drug from ancient time was the prime task as, their identification, properties and uses were explained clearly. This ancient study can be classified as follows-

2.1.1. Veda kala

In Vedic literature, “Kesava paddati” describes “Daruharidra” along with “Haridra” in the management of “Khaliya” for topical application.1

2.1.2. Upanishad and Purana kala

During the time of Upanishad, references regarding Daruharidra have not been found. But in Brahmana grantha this Daruharidra was found in the name of Peetadaru and Haridru.2

2.1.3. Samhita Kala

In Charaka samhita, this drug mentioned in different contexts synonyms like Darunisa, Darvi, Daruharidra etc., totally 79 times we can see in different Sthanas. Similarly in Shushruta Samhita description

*Corresponding Author: Chaudhary Vivek Muralidhar.
M.D. (Dravyaguna), Assistant Professor, Department of Dravyaguna, Sumatibhai Shah Ayurved Mahavidyalaya, Hadapsar, Pune, MS, India. Email – vivekmchaudhari9982@gmail.com.
of Daruharidra 38 different contexts and in Ashtanga hridaya it has explained in 69 different contexts.

2.1.4. Nighantu Kala

This Daruharidra is mentioned in almost all Nighantu like, Dhanvantari Nighantu, Bhavaprakash Nighantu, Madanapala Nighantu, Raja Nighantu etc., and they were explained in different Vargas.

2.1.5. Aadunika Kala

Dr. P. V. Sharma explained it as hepatoprotective. In Shaligrama Nighantu, Nighantu Adarsha and in Priya Nighantu explained under different Vargas. Other authors like Nadakarni, Kirithikar Basu have dealt its different aspects like its description, morphology, types and therapeutic utility.

2.2. Gana and Varga

“Gana and Varga of Daruharidra” are mentioned in detail in Table No. 1.

2.3. Vernacular Names

- Arabic: Aargis, Ambarbaris.
- Bengali: Daruharidra
- Bhutia: Tsema
- Canarese: Bagisutra
- English: Indian Barberry, Tree Turmeric
- Greek: Lykion indikoc
- Gujarati: Daruhalad
- Hindi: Chitra, Choitra, Dahaldi, Kashmal, Khammar, Raswat
- Kannada: Doddamaradarisina
- Malayalam: Maradarisina, Maramanjal
- Marathi: Daruhalad
- Oriya: Daruharidra, Daruhalidi
- Punjabi: Chitra, Kasmal, Simlu, Sumlu, Daruhaldi
- Tamil: Mullukala, Usikkala, Garamenjal
- Telugu: Kasturipuspu
- Urdu: Darhald

2.4. Bheda

According to Nighantu Aadarsh there are two types-

- Kashmal: Found in Nilgiri mountains.
- Chitra: By this variety “Rasut” is prepared and the fruits are available in the name of “Jarisht”.

2.5. Rasapanchak

- Rasa: Katu, Tikta
- Vipak: Katu
- Veerya: Ushna
- Guna: Ushna, Ruksha

2.6. Modern Review of Daruharidra

- Latin name: Berberis aristata Dc.
- Berberis: Belonging to the Berberis family
- Aristata: Furnished with an elongated projecting bristle, in connection with the costa (rib).
- Berberidae: From Berberys (Arabic name).

2.6.1. Taxonomical Classification

- Kingdom: Plantae
- Division: Phanerogamea
- Sub-division: Angiospermea
- Class: Dicotyledonae
- Sub-Class: Polypetalae
- Group: Thalamiflorae
- Natural Order: Ranales
- Family: Berberidaceae
- Genus: Berberis
- Species: aristata

2.6.2. Habitat

This species is native to Nepal, globally distributed in India, Nepal and Bhutan. Within India, it has been recorded in Jammu & Kashmir, Himachal Pradesh, Uttar Pradesh, Sikkim between an altitude range of 2000 - 3500 meters, Madhya Pradesh and Tamil Nadu.

2.6.3. Characteristic features of family Berberidaceae

Glabrous herbs or shrubs, sometimes climbing. Leaves -Simple or compound, rarely stipulate. Flowers -Hermaphrodite or rarely dichlinous, regular, axillary, solitary or in simple compound racemes, usually yellow or white. Sepals - Often petaloid, 3 – 9, in 1 – 3 whorls. Petals - Equal in number to the sepals or twice as many and like them caduceus. Stamens - 4 – 8, usually 6, opposite to the petals; filaments free or connate; anthers bursting by two apical valves or longitudinally. Carpel- 1-3, rarely more, distinct, stigma usually peltate. Fruit- 1-3 berries or capsule, usually indehiscent.

2.6.4. Characteristic features of genus Berberis (Tourni) Linn
Habit – Erect shrubs with yellow wood. Leaves - Simple, alternative or fascicled in the axes of 3 – 5.7 partial or rarely simple Spines, entire or more often spiny toothed. Flowers – Small yellow, solitary fascicled, or in bracteates simple or compound recemes. Sepals – 6, petaloid, imbricate in two whorls. Petals – 6, imbricate in two whorls, usually with 2 glands inside at the base. Stamens – 6, free, dehiscing by ascending valves. Carpel – 1. Fruit – A berry, blue or red.

2.6.5. Morphology of Berberis aristata Dc

Habit – A large deciduous shrub usually 1.8 – 3.6m high but attaining 4.5m. with stem 20cm. diameter. Twigs – white to pale yellowish brown in color. Bark – Pale brown, closely deep furrowed, rough in nature. Leaves – 3.8 to 10 by 1.5to 3.3cm., obovate to elliptic in shape, entire margin or toothed, base gradually narrowed, reticulate nerves, glossy dark green above, glossy pale green. Petiole – 0 or distinct up to 4mm. Inflorescence – A simple drooping raceme, 2.5 – 7.5cm. long, dense-flowered. Pedicels – Stout, 4 – 6mm. long. Fruit – 7 – 10mm. long, ovoid, blue-black with a thick pale bloom; style distinct.

2.7. Microscopic and Macroscopic structures of Berberis aristata Dc stem

2.7.1. Macroscopic

Length and thickness are variable, bark about 0.4 - 0.8 cm thick, pale yellowish-brown in color, soft, deeply furrowed, rough, brittle, xylem portion yellow with xylem rays, pith mostly absent, when present small, yellowish-brown when dried, fracture short.

2.7.2. Microscopic

Cork

Rhytidoma present, cork consisting of 3-45 square- rectangular yellow colored, radially arranged thin-walled cells, irregular in shape sieve elements, phloem fibers in 1-4 cells arranged in tangential rows, each fiber spindle-shaped, lignified thick-walled, with wide lumen; all phloem ray cells and rhytidoma contain single prismatic crystals of calcium oxalate, stone cells present scattered in phloem ray cells in groups, rarely single, elongated, a few radially arranged rounded, some of which contain a single prism of calcium oxalate crystals; broad zone of secondary phloem consisting of sieve elements and phloem fibers, traversed by multi seriate phloem rays; sieve elements found in tangential bands with single to five rows of phloem fibers, lignified, thick-walled phloem fibers having pointed ends, broad secondary xylem consisting of tracheids, xylem vessels, xylem fibers and traversed by multi seriate xylem rays. Numerous medium sized xylem vessels distributed throughout xylem region in groups or in singles, groups of radially arranged vessels cylindrical with rounded or projected at one or both ends with spiral thickening; xylem fibers numerous, lignified, large, thick-walled with wide lumen, and pointed tips; multi-seriate xylem rays consisting of radially rectangular cells, each ray 30-53 cells high, 8-12 cells wide, a few ray cells containing brown contents.

Powder

Yellow in color, fragments of cork cells, yellow colored phloem fibers, sieve elements, stone cells in singles or in groups, numerous prismatic crystals of calcium oxalate, thick-walled lignified xylem fibers, xylem vessels having spiral thickening.

Identity, purity and strength

- Foreign matter not more than 2 per cent.
- Total Ash not more than 14 per cent.
- Acid-insoluble ash not more than 5 per cent.
- Alcohol-soluble extractive not less than 6 per cent.
- Water-soluble extractive not less than 8 per cent.

Constituents:

Berberine, Berbamine, Palmitine, Oxyberberine, Oxycanthine, Aromoline.

2.8. Toxicology

L.D. 50 value of berberine in mice was found to be 25mg/kg i.p. Drug was found free from any serious toxicity in human being.

3. DISCUSSION

3.1. Karma

Doshghnata of Daruharidra is mentained in Table No. 2.

3.2. Prayoga
3.2.1. Netra Roga

- Milk boiled with Daruharidra cooled, mixed with little rock salt and should be used for washing eyes or Shunthi rubbed with breast milk and mixed with ghee should be used as collyrium.
- Decoction made of Darvi 40gms with water 640ml reduced to 1/8th is mixed with honey and used for washing. It is useful in inflammation of eyes caused by all Doshas.
- Decoction of Darvi and Prapundarika is used as eye drops.
- Rasanjana combined with Trikatu is made into pills which are rubbed and applied as paste.
- It destroys (Anjananamika) associated with itching and inflammation.
- In night blindness, Varti made of Rasanjana, Haridra, Daruharidra, leaves of Jati and Nimba Twak is useful.

3.2.2. Pandu and Kamala Roga

Darvighruta: One suffering from Kamala should take cooled decoction of Triphala, Guduchi, Darvi or Nimba mixed with honey in the morning.

3.2.3. Kushtha

Darvi or Rasanjana taken with Gomutra checks Kushtha. Similarly, Haritaki taken with Trikatu, Jaggery and oil for a month it cures Kushtha. Darvi and Rasanjana, Nimba and Patola, Khadira (heart wood), Aragvadha and Kutaja, Triphala, Saptaparna, Tinisa and Karavira – This decoction should be used in various ways such as bath, intake, paste, rubbing, dusting and processing of oil and ghee for alleviation of Kushtha. Oil cooked with Darvi, Vidanga and Kampillaka is useful and in that having predominance of Kapha and in Pitta, Ghrita cooked with Durva juice is efficacious.

3.2.4. Mutrakruccha

In Pittaja Mutrakrachra Darvi, Amalaki rasa and Makshika is useful.

3.2.5. Pratishyaya

Dhumapana should be used with Vati made of Darvi, Igundi, Danti and Kinhi.

3.2.6. Mukha roga

The extract of Darvi with Honey destroys the diseases of mouth, disorders of blood and sinus.

3.2.7. Upadamsa

Paste of Rasanjana, Shirisha and Haritaki mixed with honey should be used.

3.2.8. Prameha

Darvi and Amalaki svarasa mixed with honey alleviates Prameha. In Pistameha, Haridra and Daruharidra decoction is useful.

3.3. Pharmacological Action

3.3.1. Anti-inflammatory activity

Aqueous extracts of the roots of B. Aristata in dose 500-1000 mg/kg showed significant anti-inflammatory effect in rats with carrageenan induced paw edema which was compared with that induced by 10 mg diclofenac sodium. Methanolic and aqueous extracts of B. aristata and C. fenestratum have shown similar anti-inflammatory activity in carrageenan induced raw paw edema in rat model.

3.3.2. Anti-microbial activity

The alkaloid berberine from B.aristata showed antibacterial effects against trachoma. Hydro alcoholic extracts of four Berberis species showed antimicrobial activity against eleven bacterial and eight fungal strain.

3.3.3. Cytotoxic and Anti-tumour Activity

Study of methanolic extracts of B.aristata stem and rhizomes of Hemidesmus indicus on MCF7 breast cancer cell line proved that extracts have in vitro cytotoxic activity. Alcoholic stem extract showed Anti-diabetic activity in Streptozotocin nicotinamide induced type 2 diabetic rats.

3.3.4. Anti-diarrhoeal activity

Berberine from the roots and barks of B.aristata showed inhibition of secretary response of heat labile enterotoxins of Vibrio cholerae and Escherichia coli in rabbit ligated intestinal loop model and infant mouse assay. Effects of B. aristata showed hypolipidemic effects on lipid profile and blood coagulation in hyperlipidemia induced rabbits. Methanol extract of B. aristata was reported to possess potent anti-osteoporotic activity based on the observations on bone loss, ash content, uterine weight, biomechanical, biochemical and histopathological changes in ovariec-tomized rats.
3.4. Cultivation and Propagation

Warm moist loamy soil and light shade is preferable, succeeding in thin, dry and shallow soils. Grows well in heavy clay soils. Plants can be pruned back quite severely and re-sprout well from the base. Seed can be sown when ripe in a cold frame, they germinate in late winter or early spring. Stored seeds may require cold stratification and should be sown in a cold frame. After putting seedlings in individual pots once they are at least 20cm tall, plant them out into their permanent positions in late spring or early summer.

4. CONCLUSION

Daruharidra was used as medicine since Veda, Upanishad and Samhita period. Daruharidra possesses Ka-tu, Tikta, Kashay Rasa, Katu Vipaka, Ushana Veerya and Laghu and Ruksha properties thus showing Pramegha, Kushtaghna, Netrya and many more therapeutic actions. Clinical and experimental studies show that it shows antioxidative, anti-inflammatory, anticancer, hepatoprotective, immunomodulatory properties.

5. REFERENCES


6. TABLES

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Samhita</th>
<th>Gana / Varga</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Charak Samhita</td>
<td>Lekhaniya², Kushtagna³, Kandughna³, Arshogna³</td>
</tr>
<tr>
<td>2</td>
<td>Sushrut Samhita</td>
<td>Vachaharidradi⁴, Mustadi⁴, Lakshadi⁴</td>
</tr>
<tr>
<td>3</td>
<td>Ashtang Sangraha</td>
<td>Vachaharidradi⁵, Mustadi⁵</td>
</tr>
<tr>
<td>4</td>
<td>Ashtanga Nighantu</td>
<td>Vachadi, Haridradi⁶</td>
</tr>
<tr>
<td>5</td>
<td>Amara Kosh</td>
<td>Vanaushadi⁷</td>
</tr>
<tr>
<td>6</td>
<td>Dhanvantari Nighantu</td>
<td>Guduchyadi⁸</td>
</tr>
<tr>
<td>7</td>
<td>Bhavprakash Nighantu</td>
<td>Haritakyadi⁹</td>
</tr>
<tr>
<td>8</td>
<td>Madanpala Nighantu</td>
<td>Vividhaushadi¹⁰</td>
</tr>
<tr>
<td>9</td>
<td>Raja Nighantu</td>
<td>Pippalyadi¹¹</td>
</tr>
<tr>
<td>10</td>
<td>Kaiyadeva Nighantu</td>
<td>Oushadhi¹²</td>
</tr>
<tr>
<td>11</td>
<td>Madhav Dravyaguna</td>
<td>Vividoushadhi¹³</td>
</tr>
<tr>
<td>12</td>
<td>Shaligram Nighantu</td>
<td>Ashtvarga¹⁴</td>
</tr>
<tr>
<td>13</td>
<td>Priya Nighantu</td>
<td>Shatpushpadi¹⁵</td>
</tr>
<tr>
<td>14</td>
<td>Nighantu Aadarsh</td>
<td>Daruhanaridradi¹⁶</td>
</tr>
</tbody>
</table>

Table No. 1. Gana and Varga of Daruhanaridra.
Table No. 2. Doshaghnata of Daruharidra.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Samhita</th>
<th>Doshaghnata</th>
<th>Vatahara</th>
<th>Pittahara</th>
<th>Kaphahara</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sushruta Samhita</td>
<td></td>
<td>-</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>2</td>
<td>Ashtang Hriday</td>
<td></td>
<td>+</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>3</td>
<td>Shaligram Nighantu</td>
<td></td>
<td>-</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>4</td>
<td>Nighantu Adarsha</td>
<td></td>
<td>+</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>5</td>
<td>Nhayaprakash Nighantu</td>
<td></td>
<td>-</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>6</td>
<td>Madanpal Nighantu</td>
<td></td>
<td>-</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>7</td>
<td>Kaiyadev Nighantu</td>
<td></td>
<td>-</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>8</td>
<td>Madhav Dravyaguna</td>
<td></td>
<td>+</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>9</td>
<td>Priya Nighantu</td>
<td></td>
<td>-</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>10</td>
<td>Dhanvantari Nighantu</td>
<td></td>
<td>-</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>