

## A Review on Chemical Constituents and Pharmacological Properties of *Rasaut* (*Berberis aristata* DC)

Najma Fathima<sup>1</sup>, Aisha Anjum. A<sup>2</sup>, Manjula<sup>3</sup>, Salma Khanam H<sup>4</sup>

1&4 - P.G. Scholars, 2 - Professor, 3 - Principal

Govt. Unani Medical College & Hospital, Bangalore, KA, India.

Affiliation: Rajiv Gandhi University of Health Sciences, KA, India.

Received: 2025-2-04

Revised: 2025-2-16

Accepted: 2025-2-25

### ABSTRACT

The traditional life medicine has taken care of humankind for hundreds of years. Use of herbal medicine are globally increased due to safe delivery with fewer side effects compared to synthetic drugs. Rasaut is frequently used herbal drug in Unani and other traditional system of medicine. *Berberis aristata* DC (*Rasaut*) also known as Indian barberry or *Usara-i-Darhald*, is a shrub belonging to the family Berberidaceae and the genus *Berberis*. In Unani System of Medicine (USM) externally it is used in hot temperament inflammations, otorrhea, pharyngitis, etc. while internally in bleeding piles, intestinal ulcers, hemorrhage, chronic leucorrhoea, pruritus ani, anal fissures, menorrhagia and in jaundice. The main chemical constituents of *Berberis* plants are alkaloids, steroids, glycosides, flavonoids, saponins, terpenoids, and reducing sugars. Of these alkaloids, Berberine is the most important. Rasaut had found to be have different pharmacological activities like Anti-depressant activity, Antidiabetic activity, Antidiarrhoeal activity, Antioxidants, Hepatoprotective activity, Antipyretic activity, Antimicrobial activity and Anti-inflammatory activity. This review paper highlights on a summary of chemical constituents and pharmacological activities of *Rasaut* (*Berberis aristata* DC).

**Keywords:** *Rasaut*, *Berberis aristata* DC, Unani Medicine, *Usara-i-darhald*, Berberine.

### INTRODUCTION: -

*Rasaut* is an imperative medicinal plant frequently used as herbal remedy<sup>1</sup>. The plant is large shrub attaining the height approximately of 4.5m, stem measures a girth of 20cm<sup>4</sup>.

*Rasaut* are of two types-*Huḍuḍ Makkī*, and *Huḍuḍ Hindi*. Effects of both are about same<sup>1-2</sup>.

It is the dry extract of the bark of *Darhald* tree. Its yellowish black in colour, smell is unpleasant and taste is bitter<sup>3,10</sup>.

Its dried root is used for the extraction of *rasaut* which may be achieved through the year particularly when the root is fully mature. The drug is then preserved in air tight tin containers free from moisture<sup>13</sup>.

It contains mainly berberine alkaloids which is well known isoquinoline, that is commonly used for the treatment of gastrointestinal disorders, and as an antibiotic agent<sup>2</sup>.

**BOTANICAL NAME:** - *Berberis Aristata* DC<sup>1,4,6</sup>

**FAMILY:** - Berberidaceae<sup>1,4,7</sup>

**SYNONYMS:** - Indian Barberry, *Daruḥaldi*<sup>1,8</sup>

**SCIENTIFIC CLASSIFICATION:** -<sup>1,7,9</sup>

Kingdom: Plantae

Division: Magnoliophyta

Clade: Angiosperms

Class: Magnoliopsida

Order: Ranunculales

Family: Berberidaceae

Genus: *Berberis*

Species: *aristata*

#### **HABITAT AND DISTRIBUTION: -**

The plant is majorly growing in temperate and sub-tropical regions of Asia, Europe and America<sup>7</sup> and it is indigenous to the Himalayan region in India and Nepal<sup>4</sup>. It is naturally found in the wet zone of Sri Lanka<sup>7</sup>. It also grows at the height of 2000-3000 meters especially in Kulu, Kumaon and Chamba region of Himachal Pradesh and Nilgiri hills<sup>4</sup> in South India<sup>6</sup>. Propagation by seed sowing and stem cuttings should be done during spring season and plants are ready for harvesting after 2 years of plantation. Flowering takes place during February to April and fruiting from May to June each year<sup>1</sup>.

#### **VERNACULAR NAME<sup>7,10,16-18</sup>: -**

English- Indian Barberry

Unani- *Lofiyūn, Lykion indikon*

Arabic- *Huduḍ, Aargis, Ambar baris*

Persian- *Feelzahraj, Zarishk* (fruit)

Urdu- *Rasaut, Dārḥald* ('*Usāra-i Dārḥald*)

Hindi- *Chitra, Chotra, Darḥald, Kshmal, Kashmar*

Ayurvedic- *Aruharidra, Pita-daru, Darvi, Daarunishaa, Daarurajani, Vrahitaphala*

Malayalam- *Maramanjāḷ, Maramannal*

Sanskrit- *Daruhiridra, Darvi, Kata*

Bengali- *Darḥaldī*

Gujarati- *Daruharidra, Daruhuladur*

Punjabi- *Chitra, Kasmal, Simlu, Sumlu*

Siddha/Tamil- *Mullukala, Usikkala*

Telugu- *Kasturipaspu, Daruharidra, Manupasupu*

Marathi- *Darūhalad*

Oriya- *Daruharidra, Darūhalidi*

#### **BOTANICAL DESCRIPTION: -**

*Rasaut* has very efficacious medicinal properties in various traditional systems of medicine around the world. It comprises about 450 to 500 species of erect, spinous and deciduous evergreen shrubs belonging to the family Berberidaceae<sup>7</sup>, with approximately 77

species reported from India with usual height of 1.8- 3.6 meters but some attains 4.5 meters<sup>13</sup>. The diameter of stem is 20 cm, obovate to elliptic, sub-acute to obtuse, entire or toothed leaves with diameter of 3.8-10 by 1.5- 3.3 cm, yellow flowers in corymbose racemes with 2.5- 7.5 cm length and oblong-ovoid to ovoid, bright red berries are found with 7-10 mm long and 4 mm in diameter, usually covered with bloom as in plums, seeds are 2 to 5 in number, varying in color from yellow to pink<sup>7,13</sup>.

#### MAHIYAT (MORPHOLOGY)<sup>1,15</sup>: -

Dried extract obtained from Roots and stems: Its color is black and opaque, odor is aromatic or tobacco like, bitter in taste<sup>10</sup>. It is variable in size, 2 mm to 4cm in diameter, small pebbles shaped.

Root: Yellowish brown in color, it is odorless and bitter in taste. It is variable in size and cylindrical in shape.

Stem: Yellowish bark with yellow wood in color, it is odorless and bitter in taste. It is variable in length and thickness about 15 to 20 mm in size and nearly cylindrical in shape.

Leaf: Glossy dark green to glossy pale green in color, odour is indistinct and bitter in taste. 3.8-10 into 5-3.3 cm in size and shape is obovate or elliptic, entire or spinous-toothed and base is narrow.

Bark: Internally pale brown and cut surface is bright yellow in color, it is odorless and bitter in taste. 0. 4-0.8 cm thick in size and irregular in shape.



#### PARTS USED<sup>7,18</sup>: -

Different parts of *Rasaut* (*Berberis aristata* DC) are used in various diseases. They are dried root, stem, fruit and wood and also used as extract of bark, roots and stem.

#### MIZAJ (TEMPERMENT)<sup>6,9,12-13</sup>: -

*Barid* (Cold) 2° *Yabis* (Dry) 2°

It is also moderate in *Hararat* (Hot) and *Burudat* (Cold) and *Yabis* (Dry) in 2°

#### AF'AL (ACTIONS)<sup>4-7,12-14,16,19</sup>: -

Externally act as *Qabiḍ* (astringent), *Radi'* (repellent) and *Musakkin* (analgesic).

Internally act as *Muḥallil-i waram* (anti-inflammatory), *Qabiḍ* (astringent), *Muqawwi* (tonic), *Muqawwi-i Mi'da wa Am'a'* (stomachic), *Mulayyin-i Am'a'* (laxative), *Muṣaffi-i Khun* (blood purifier), *Mufarriḥ* (exhilarant), *Musakkin-i Hararat* (febrifuge), *Mani'-i Nawbat* (antiperiodic), *Mu'arriq* (diaphoretic) and *Dafi'-i Humma* (antipyretic).

#### ISTEMAL (THERAUPETIC USES)<sup>6,7,16,19</sup>: -

• *Rasaut* is externally used as a single or in compound form with other appropriate medicines in *Awram-i Harrah* (hot temperament inflammations and swellings) for *Radi'-i Mawad* (repellent) and *Musakkin-i Alam* (analgesic).

- In otorrhoea to stop the ear discharge used as a *Qatur* (ear drop) due to *Qabiḍ* (astringent) action, as gargle used in *waram-i Halaq Har* (acute pharyngitis) and to strengthen the gum.
- It is used in *Ashob-i Chashm* (conjunctivitis) and many eye diseases viz stye, blepharitis, epiphora, eyes itching etc.
- Internally, it is mostly used to correct the *Ishal-i Bawasiri* and *Khun-i Bawasir* (hemorrhoid), to healing of *Quruḥ-i Am'a* (intestinal ulcers).
- Due to its astringent effect the plant is used to stop *Nazfud Dam* (hemorrhage) from all organ.
- The decoction (*Joshanda*) and infusion (*Khaisanda*) forms of the drug are found effective in *Yaraqan-i Aswad*(Jaundice), *'Izam-i Tihal* (splenomegaly), *Ishal-i Muzmin* (chronic diarrhoea), *Humma Ajamiyya* (malaria).
- Due to its anti-inflammatory and astringent effects it is used in intestinal ulcers and wound. It is also used as *Hamul* (pessary) in *Zahir* (dysentery), *Sailan ur Reḥam Muzmin* (chronic leucorrhoea) and also as paste form in *Hikka-i Dubur* (pruritus ani) and *Shuquq-ul Maq'ad* (anal fissures).
- The decoction of *B. aristata* leaves, also known as *Rasaut*, is an alternative and deobstruent which is commonly used to treat skin diseases, menorrhagia, diarrhea, cholera, jaundice, eye and ear infections, and urinary tract infections.

**MUZIR (TOXICITY)**<sup>6-7,9,12</sup>: -

Spleen (*Tehal*) and Kidney (*Gurda*)

**MUSLEH (CORRECTIVE)**<sup>6-7,9,12-13</sup>: -

- *Anisoon* (*Pimpinella anisum* L)
- *Mastagi* (*Pistacia lentiscus* L)

**BADAL (SUBSTITUTE)**<sup>4,7,9,18</sup>: -

- *Sandal* (*Santalum album* L.)
- *Supari* (*Areca catechu* L.)
- *Aqaqiya* (*Acacia arabica* (Lam.) Willd.)
- *Z'afra* (*Crocus sativus* L.)

**MIQDAR (DOSE)**<sup>4,6,9,11-13</sup>: -

Extract 1-3.5 gm, decoction of dried stem 5-10 ml

**MURAKKABAT (COMPOUND FORMULATIONS)**<sup>10,13,16</sup>: -

*Habb-i Bawasir Amya*, *Habb-i Bawasir Damiaya*, *Habb-i Rasaut*, *Habb-i Siyah Chashm*, *Habb-i Narkachur*, *Habb-i Muqil*, *Sufuf-i Habis*, *Sufuf-i Khas*, *Zimad-i Bawasir*, *Zimad-i Mubarrid*, *Zimad-i Waram-i Unsayain Had*, *Tila'-i Musakkin*.

**CHEMICAL COMPOSITION**<sup>2,5,8,11,13,15,17,19</sup> :-

In several species of *Berberis* at least eight different alkaloids are reported to have been found. These berberine, oxyacanthine, berbemins, palmatine, jatrorrhizine, columbamins, berberubine and hydrastine, of these the first 3 are most important. Berberine forms yellow needles soluble in cold water, less soluble in alcohol. Its aqueous solution is bitter, neutral to litmus and optically inactive.

## PHARMACOLOGICAL STUDIES: -

### 1) Antimicrobial activity<sup>17,19</sup>:

In an in-vitro study, aqueous root bark extract of Rasaut showed a broad-spectrum antimicrobial capability with zone of inhibition 12 to 25 mm against 13 test pathogens. *Klebsiella pneumoniae* 1 was highly sensitive with zone of inhibition  $25 \pm 0.889$  mm followed by *Staphylococcus aureus*, *Salmonella typhimurium*, *Staphylococcus epidermidis*. Among two yeast cultures, *Candida albicans* showed a zone of inhibition  $22.75 \pm 0.595$  mm, whereas *Candida tropicalis* was found completely resistant.

### 2) Antioxidant activity<sup>15,17,19</sup>:

The DPPH free radical scavenging activity result was seen in various concentration and at 1.0 mg/ml concentration reduced the concentration of DPPH free radical in % of 58.31 with efficiency close to the standard that of Gallic acid 58.45 but less than BHT 66.42%, while IC<sub>50</sub> value was found 0.90 mg/ml.

### 3) Antidiarrheal activity<sup>11,15</sup>:

In an in-vivo study, alcoholic and aqueous extracts were used at the dose of 31.25, 62.50, 125, 250 and 500 mg/kg b.wt. with standard drug Loperamide 25 mg/kg b.wt. 15 min before the administration of the castor oil in Swiss albino mice. The results were indicated the significantly reduction in faecal output stimulated by castor oil at the given doses in a dose dependent manner but ethanolic extract was found to be more effective than the aqueous extract.

### 4) Anti-inflammatory activity<sup>4,17,19</sup>:

Aqueous (Aq.) and alcoholic extract of root bark was used. The results were concluded that both extracts showed statistically significant anti-inflammatory effect.

### 5) Hepatoprotective activity<sup>15,19</sup>:

*B. aristata* roots have been used in treatment of jaundice in Ayurveda. Hepatoprotective and antioxidant activity of dried aerial part of *B. aristata* was investigated in aqueous and methanolic extract and berberine, against CCl<sub>4</sub> induced liver injury. Results obtained were comparable to standard drug silymarine.

### 6) Antidiabetic activity<sup>11,17,19</sup>:

Methanolic and ethanolic extract of stem bark of *B. aristata* shows significant antihyperglycemic effect in Alloxan induced diabetic rat. Crude extract was given orally to diabetes induced rats.

## CONCLUSION: -

*Rasaut* (*Berberis aristata* DC) is a well-known plant-based drug frequently used for its pharmacological effects in Unani and other traditional system of medicines since a long time. It has many important pharmacological properties and various types of active phytoconstituents. A lot of medicinal value is reported for *B. aristata* in literature but for future use there is needed a lot of work for the confirmation of all the activities.

## REFERENCES: -

1. Rathi B.Sahu J.Koul S. Kosha RL. Detailed pharmacognostical studies on *Berberis aristata* DC plant. *Anc Sci Life*. 2013; 32(4): 234-240.
2. Das S. Das MK.Mazumder PM. Das S.Basu SP. Cytotoxic activity of methanolic extract of *Berberis aristata* DC on colon cancer. *Global J Pharmacol*. 2009; 3:137-140.
3. Malik Z, Jain K, Ravindran K, Sathiyaraj G. In vitro antimicrobial activity and preliminary phytochemical analysis of *Berberis aristata*. *Int. J. Ethnobiol. Ethnomed*. 2017; 4:1-6.
4. Khare CP. *Indian Medicinal Plants: An Illustrated Dictionary*. Springer Science +Business Media, LLC., 233 Spring Street, New York, NY 10013, USA. 2007: 4, 59, 88-89.
5. Jain, S.K. (1968) *Medicinal Plants*. National Book Trust India, New Delhi, 31-33.
6. Ghani HN. *Khazān-ul Advia. Idāra Kitāb-ush Shifa*, New Delhi. 2011; 3rd ed., Vol. 1 to 4th: 732-734.





7. Moin MS, Siddiqui JI, Khan S, Alam MA, Khatoon F, Alam A. Therapeutic potential and traditional values of frequently used medicinal plant *Berberis aristata* DC.(Rasaut): A comprehensive review. *Research Journal of Pharmacy and Technology*. 2023;16(4):2035-43.
8. Andola HC. Genus *Berberis* and berberine HPLC: an overview. *Journal of Biologically Active Products from Nature*. 2012 Jan 1;2(5):256-64.
9. Kabiruddīn HM. *Makhzan-ul Mufradāt*. Faisal Publication, Jama Masjid Deoband. 2000;133.
10. Anonymous. *Qarābādīn-i sarkari*. CCRUM, New Delhi. Part iii:74.
11. Anonymous. *Medicinal plants in folklores of Northern India*. Central Council for Research in Unani Medicine, Department of AYUSH, Ministry of Health and Family Welfare, Government of India, New Delhi. 2001;247.
12. Hakeem MA. *Bustan al-mufradat*. New Delhi: Idara Kitab-us-Shifa; 2002. 173.
13. Anonymous. *Standardisation of single drugs of Unani Medicine*. Central Council for Research in Unani Medicine, Ministry of Health and Family Welfare, Government of India, New Delhi. 1997; 1st ed., Part 3rd:261-65.
14. Anonymous. *The Unani Pharmacopoeia of India*. Central Council for Research in Unani Medicine (CCRUM), Ministry of Health and Family Welfare (Department of AYUSH), Govt. of India. 2009; 1st ed., Part.2nd, Vol. 1st:273.
15. Verma S. Singla S. Goyal S. *Medicinal Potential of Berberis Aristata: A Review*. *Indo Am. J. P. Sci*. 2018; 05(06): 5516- 26.
16. Anonymous. *National Formulary of Unani Medicine*. Ministry of Health and Family Welfare, Government of India, Department of Indian Systems of Medicine and Homeopathy, New Delhi. 2001; 1st ed., Part-III:8, 29-30, 38-41, 75.
17. Khan I, Najeebullah S, Ali M, Shinwari ZK. *Phytopharmacological and ethnomedicinal uses of the Genus Berberis (Berberidaceae): A review*. *Tropical Journal of Pharmaceutical Research*. 2016 Oct 5;15(9):2047-57.
18. Nadkarni KM. *Indian Materia Medica*. popular Prakashan, Mumbai. 1976; Vol-1:9, 187-189, 389, 1098.
19. Komal S. Ranjan B. Neelam C. Birendra S. Kumar SN. *Berberis Aristata: A Review*. *International Journal of Research in Ayurveda and Pharmacy*. 2011; 2(2): 383- 388.
20. Google images.

How to cite this article:

Najma Fathima et al. *Ijsrm.Human*, 2025; Vol. 28 (2): 29-35

Conflict of Interest Statement: All authors have nothing else to disclose.

This is an open access article under the terms of the Creative Commons Attribution-NonCommercial-NoDerivs License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.

|   |   |
|---|---|
|    | <p>Author Name – Dr.Aisha Anjum A</p> <p>Author Affiliation Professor and HOD, Department of Ilmu Qabalat wa Amraz e Niswan</p> <p>Author Address/Institute Address Government Unani Medical College and Hospital, Basaveshwaranagar, Bengaluru -79</p> |
|   | <p>Author Name Dr Najma Fathima</p> <p>Author Affiliation PG Scholar</p> <p>Author Address/Institute Address Government Unani Medical College and Hospital, Basaveshwaranagar, Bengaluru -79</p>  |
|  | <p>Author Name Dr Manjula S</p> <p>Author Affiliation Principal</p> <p>Author Address/Institute Address Government Unani Medical College and Hospital, Basaveshwaranagar, Bengaluru -79</p>   |
|  | <p>Author Name Dr Salma Khanam H</p> <p>Author Affiliation PG Scholar</p> <p>Author Address/Institute Address Government Unani Medical College and Hospital, Basaveshwaranagar, Bengaluru -79</p>   |