PLANT DESCRIPTION
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I. *Boerhaavia diffusa* Linn. Sp. Pl. 3.1753.

(i) **Synonyms:**


(ii) **Distribution:**

- It is widely distributed plant of common occurrence throughout the country.
- In including Chhattisgarh it occurs in all the districts.
- The plant grows in open lands such as waste lands, grazing lands, road sides, agriculture areas, open forest and the like in a variety of soil types.
- It has a wide adaptability for different habitats.
- Normal climate, particularly the rainfall, is essential for its good growth. Deficit rains adversely affect the plants.
- It is not much affected by biotic disturbance, except having grazing pressure and frequent fires.
- Two different varieties are *Shweta punarnava* and *Rakta punarnava*.

(iii) **Vernacular Names:**

Hindi : Gadhapurna, Santi, Santhikari.


Gujarat : Dholia- saturdo, moto-satoda.

Canarese : Kommegida.
(iv) **Uses:**

Whole plant, Root, Leaf and seed.

(v) **Plant Descriptions:**

It is a diffusely branched and creeping herb. Root is thick in old plants. Only few plants establish in to perennial from and most of new plants die during the dry season. Stem prostrate, branches cylindrical, thickened at nodes. Leaves simple, alternate, ovate, 1-3 cm long, oblong or subarobic, green and glabrous above with rounded or subcordate base and subundulate margins. Petiole pink, Flowers are pink, small or minute and non involucrate and are born in small umbels which are arranged in auxiliary and terminal panicles. Fruits are 5-ribbed, 1-3 cm long, clavate, rounded and glandular. Flowering and fruiting during July-October. Vegetative growth is fast during rainy season, latter on it declines during dry season. Seedling is also good which are spread around the mother plants. Some of them germinate in the next seasons. The plant is least affected by pest and diseases. All parts of the plants are medicinally useful but roots are more important. The leaves are eaten as pot­herb. Few local people collect entire plants for sale to herbal dealers and practitioners.

VI. **Traditional Uses:**

Mundas give plant decoction of 15 ml to women in the treatment of leucorrhoea, Lodhas prescribe boiled plants in the treatment of urinary troubles. Smoke dried plant powder is used to get relief from asthma and take root decoction with pest of long pepper (3:1) is useful in diarrhea. Fresh root paste with paste of black peppers (3:2) is used as laxative, leaf paste with paste of
ginger (3:1) is given to children in the treatment of liver and spleen. Seed paste 10 gm is used to get relief from muscular pain. Santals give root paste to women for hastening delivery. Other ethnic communities give plant extract with goat milk (3:2) to children as profikxis for night blindness.

Veterinary: Lodhas apply infusion of leaves to eyes of cattle against watering eyes. Roots and leaves are considered as emetic, expectorant.

Magico-religious belief: Tribal were a piece of root (2-3cm long) in white thread on waist, as magical cure for asthma. Other ethnic communities touch roots an patients body against epilepsy.

VII. Medicinal Uses:

Punarnava is pungent, bitter, astringent, hot and laxative. It is cooling, stomachic, diuretic, diaphoretic, expectorant, antipyretic and cardio tonic. It stimulates function of heart and kidney and is specific for jaundice, diabetes, general debility and odema. It is a rejuvenative drug. It is used in epilepsy, pain in abdomen due to congestion of blood, prolapsus ani and fistula ani, dysentery, otitis media. The whole plant, fresh or dried is the source of drug punarnava which is official in I.P. as a diuretic. Root is diuretic, laxative, anthelmintic and febrifuge. It is used in expectorant, asthma, stomachic in oedema anemia, jaundice, ascites anasarca, scanty urine and internal inflammation. Root is useful for virility in man Poultice of the roots, mixed with palmis applied to boils and an antidote to snake venom. Leaf ash and roots are taken to cure night blindness. (Joshi, 2000).

The drug punarnava has been reported to increase serum protein level and reduce urinary protein extraction in clinical trials in patients suffering with nephritic syndrome. The herb forms one of the ingredient of a herbal drug, Livol which is used as a liver tonic and feed additive for animals. It is also a constituent of a new herbal composition, HERBORHEUMAL, which show bitter anti inflammatory and analgesic properties than that of ibuprofen. (Singh et al, 1992).
Alcoholic extract of roots and plants is spasmolytic. Leaves are used in ophthalmia and in eye wounds, in muscular pain; in dropsy and gonorrhea to purify blood and hasten delivery, paste of leaves are taken orally to check bleeding after delivery. Dry and powered leaves mixed with Brassica oil used for external application on itch and eczema. Flowers and seeds are contraceptive in Ayurveda.

Diuretic and anti-inflammatory activities are the maximum in sample collected in rainy season. Combination of these two activities makes punarnava a very useful drug for the treatment of inflammatory renal disease and common clinical problems like nephritic syndrome.

VIII. Chemical constituents:

Jain and Khanna (1909), isolated 2-glucopyrano-4- hydroxyl-5- (p-hydroxypheny) -pro pionyldipheninmethane from roots of the plant. Beside, the main constituents met in the plants hentriacontane, β- sitosterol, ursolic acid, myrical alchohal, myristic acid, oxalic acid, D-glucose, punarnavoside, punarnavaine-1, punarnavine-2, protein carbohydrates, β-ecdysone, triacontanol, 5-7-dihydroxy-3’,4’- dimethoxy-6-8-dimethyl flavone and hypoxanthin q-L- arabinofuranoside and three protienoid analogues, boeravinones A, B and C (Chatterjee and Pakrashi 1991). Root contain alkaloid 0.05%, rotenoids, boeravinone, boerhavine , punarnavoside, D-glucoside, etc. The flower contain betalain pigments, several phenolic acids and (+) arabinose.

X. Preparation:

Punarnava mandure, Punarnava- kshar kwath, Punarnava ark, Punarnava asthak, Punarnava asav, Punarnava churn, Calcury and Jawarish zaruni ambari ka naksha kalan. Punarnavastaka, Punaravataila, Punarnavaleha etc.
Hanov. 1 : 8. t. 2. 1795.

(i) **Synonyms:**
*Solanum surattense* Burm. f.; *Solanum maccani* Sant; *Solanum virginianum* Linn.

(ii) **Distribution:**
- The plant is found in all districts in plants and low hills through India.
- Tropical and sub tropical regions of the world.
- Common in waste places, river beds and in cultivation the species adopted in wet to extremes dry condition.
- Two varieties of Kantakari are mentioned in the text viz. the blue flowered and the white flowered ones, of which the blue flowered is more common. In practice, the blue flowered *Solanum surattense* Burm. F. (Solanaceae) is being used as drug sources in Kerala.

(iii) **Vernacular Names:**
- Hindi : Bhatkatiya, Kately Baigan, Kately, ringani.
- Sanskrit : Kantakari, pusparsa, Vyaghri, Dravini, Nindigdhika,
  Ksudrakantaka, Ksudraphala, Duh.Praharsini,
  Pracodani, Bahukanta, Bahugudakulas, Vartaki, Rastriki.
- Bengali : Kantakari.
- Marathi : Bhuiringani
- Malyali : Kandankaltiri.
- Oriya : Bhejibegun, ankranti.
- Pungabi : Kandyali, Mahori, Warumba.
- Bihar : Rangnie, Bhat-khataya, Rangaini, Janum.
- Tribal Name : Baigan, vegi-baigan. Rangani (Lo.); Rambaigan (Sa).
(iv) **Parts Used:**

Whole plant, root, leaves, stem, flowers, fruits and seeds.

(v) **Plant Description:**

It is a very diffuse, bright green perennial herb, woody at the base. Stem somewhat zigzag, sparsely or densely clothed with stellate tomentum when young, at length glabrous. The leaves are ovate or elliptic in outline, sinute or subpinnatifid obtuse or subacute, stellately hairy on both surface (specially beneath), rarely becoming glabrous with age, both surface armed with long, yellow, sharp prickles on the midrib and nerves, the latter raised on the lower surface, the base usually unequal sided, petiole 3-7 cm long, prickly and stellately hairy, decurrent at the base into 2 ridges running down to the next lower node. The flowers are in 2-6 flowered cymose inflorescence. The calyx is 0.6 cm long, aculeate and stellate hairy. The corolla is blue and lobes shallow. The fruits are globose berries about 1.5 cm long and yellow when ripe. The seeds are 0.2 cm x 0.1 cm and glabrous. Flowering and fruiting is March-June.

(vi) **Traditional Uses:**

Lodhas give root paste with honey (3:1) to patient during fever for stopping vomiting. They prescribe root decoction with paste of long pepper (3:2) as antidote to pox. Leaf decoction of long pepper with paste of ginger (3:2) to patient suffering from dengu fever and advise to smoke dried seed powder for treatment of asthma.

Mundas apply root paste as cure for scabies. Oraons give fruit paste with leaf juice of *Shorea robusta* and common salt (5:3:1) to children against hooping cough. Seed paste with paste of Peaju (*Allium cepa*) (5:2) as cure for toothache. The fresh flower paste as balm on watery eruption on skins. They give 10 fried fruits as cure for cough and cold.

Veterinary: Lodhas put juice of flower as cure for watery eyes of cattle and also apply fresh fruit paste for treatment of foot sore.
(iv) Parts Used:

Whole plant, root, leaves, stem, flowers, fruits and seeds.

(v) Plant Description:

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Veterinary: Lodhas put juice of flower as cure for watery eyes of cattle and also apply fresh fruit paste for treatment of foot sore.
(vii) Medicinal Uses:

According to the Chatterjee and Pakrashi (1995), the whole plant is alterative, antiasthmatic, astringent, digestive, febrifuge, bitter and pungent. It is used in bronchitis, cough, dropsy and constipation. A decoction of the plant is given in gonorrhea and to promote conception. The fruits flower and stems are bitter and carminative and are prescribed in ignipetidites associated with a vesicular and watery eruption. The vapour of burning seeds are used as an expectorant in asthma, cough and in toothache. The leaves are considered anodyne and their juice with black pepper is prescribed in rheumatism. (Chopra et al. 1996). Root is pungent, bitter, heating appetizer, laxative, stomachic, anthelmintic, diuretic, expectorant, febrifuge and aphrodisiac, useful in asthma, bronchitis, fever, lumbago pains, piles, urinary concretion, and disease of heart, and also one of the constituents of ‘Sashamula Asava’.

(viii) Chemical Constituents:

The fruit contain β-carotene, caffeic, chlorogenic, isochlorogenic and neochlorogenic acids, esculin, esculatin, scopoletin, cycloartanol, cycloartenol, chlosterol, diosgenin, carpesterol, solsodine solamargine, β-solamargine, solasonine, L-rhamnosyl-β-D-glucoside, β-sitosterol and stigmasteryl glucoside, arachidic, linoleic, oleic, palmitic and steric acids and solanocarpine from the fruit oil and heteroside of tomatidienol from fruit stalk have been isolated. The flower contains diosgenin, apigenin and quercetin-3-O-β-glupyranosyl-O-β-mannopyranoside. (Chatterjee and Pakrashi, 1955).

(ix) Preparation:

Dashmula ghrit, Dashmula- arishta, Dashmula taila, Dashmula Kwath, Nedigdikadi kwath, Bayaghri haritaki, Bagagh taila, kantkari ghrit, kantakari avleha, sudarshan churna, servaharalouh, kanakasav, Devadarvadi kweth and stringayadi.