

THE AYURVEDIC PHARMACOPOEIA OF INDIA

PART- I

VOLUME – I



GOVERNMENT OF INDIA
MINISTRY OF HEALTH AND FAMILY WELFARE
DEPARTMENT OF AYUSH

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60. Punarnava (Rakta) (W.P)

PUNARNAVĀ

Punarnavā consists of dried, matured whole plant of *Boerhaavia diffusa* Linn. (Fam Nyctaginaceae), trailing herb found throughout India and collected after rainy season, herb is diffusely branched with stout root stock and many long slender, prostrate or ascending branches.

SYNONYMS

Sanskrit	:	Kaṭṭilla, Śophaghñī, Śothaghni, Varṣābhu
Assamese	:	Ranga Punarnabha
Bengali	:	Rakta punarnava
English	:	Horse Purslane, Hog Weed
Gujrati	:	Dholisaturdi, Motosatodo
Hindi	:	Gadapurna, Lalpunarnava
Kannada	:	Sanadika, Kommeberu, Komma
Kashmiri	:	Vanjula Punarnava
Malayalam	:	Chuvanna Tazhutawa
Marathi	:	Ghetuli, Vasuchimuli, Satodimula, Punarnava, Khaparkhuti
Oriya	:	Lalapuiruni, Nalipuruni
Punjabi	:	Itcit (Ial), Khattan
Tamil	:	Mukurattai (Shihappu)
Telugu	:	Atikamamidi, Erra galijeru

DESCRIPTION

a) Macroscopic

Stem-greenishpurple, stiff, slender, cylindrical, swollen at nodes, minutely pubescent or nearly glabrous, prostrate divericately branched, branches from common stalk, often more than a metre long.

Root- well developed, fairly long, somewhat tortuous, cylindrical, 0.2-1.5 cm in diameter, yellowish brown to brown coloured, surface soft to touch but rough due to minute longitudinal striations and root scars, fracture, short, no distinct odour, taste, slightly bitter.

Leaves-opposite in unequal pairs, larger ones 25-37 mm long and smaller ones 12-18 mm long ovate-oblong or suborbicular, apex rounded or slightly pointed, base subcordate or rounded, green and glabrous above, whitish below, margin entire or sub-undulate, dorsal side pinkish in certain cases, thick in texture, petioles nearly as long as the blade, slender.

Flowers-very small, pink coloured, nearly sessile or shortly stalked, 10-25 cm, in small umbells, arranged on slender long stalks, 4-10 corymb, axillary and in terminal panicles, bracteoles, small, acute, perianth tube constricted above the ovary, lower part greenish, ovoid, ribbed, upper part pink, funnel-shaped, 3 mm long, tube 5 lobed, stamen 2-3.

Fruit-one seeded nut, 6 mm long clavate, rounded, broadly and bluntly 5 ribbed, viscidly glandular.

b) Microscopic

Stem-Transverse section of stem shows epidermal layer containing multi cellular, uniseriate glandular trichome consisting of 9-12 stalked cells and an ellipsoidal head, 150-220 μ long, cortex consists of 1-2 layers of parenchyma, endodermis indistinct, pericycle 1-2 layered, thick-walled often containing scattered isolated fibres, stele consisting of many small vascular bundles often joined together in a ring and many big vascular bundles scattered in the ground tissue, intra fascicular cambium present.

Root-transverse section of mature root shows a cork composed of thin-walled tangentially elongated cells with brown walls in the outer few layers, cork cambium of 1-2 layers of thin walled cells secondary cortex consists of 2-3 layers of parenchymatous cells followed by cortex composed of 5-12 layers of thin-walled, oval to polygonal cells, several concentric bands of xylem tissue alternating with wide zone of parenchymatous tissue present below cortical regions, number of bands vary according to thickness of root and composed of vessels, tracheids and fibres, vessels mostly found in groups of 2-8 in radial rows, having simple pits and reticulate thickening, tracheids, small, thick-walled with simple pits, fibres aseptate, elongated, thick-walled, spindle shaped with pointed ends, phloem occurs as hemispherical or crescentic patches outside each group of xylem vessels and composed of sieve elements and parenchyma, broad zone of parenchymatous tissue, in between two successive rings of xylem elements composed of thin-walled more or less rectangular cells arranged in radial rows, central regions of root occupied by primary vascular bundles, numerous raphides of calcium oxalate, in single or in group present in cortical region and parenchymatous tissue in between xylem tissue, starch grains simple and compound having 2-4 components found in abundance in most of cells of cortex, xylem elements in parenchymatous tissue between xylem elements, simple starch grains mostly rounded in shape and measure 2.75-11 μ in diameter.

Leaves-Transverse section of leaf shows anomocytic stomata on both sides, numerous, a few short hairs, 3-4 celled, present on the margin and on veins, palisade one layered, spongy parenchyma 2-4 layered with small air spaces, idioblasts containing raphides, occasionally cluster crystal of calcium oxalate and orange-red resinous matter present in mesophyll.

Palisade ratio 3.5-6.5, stomatal index 11-16, vein islet number 9-15.

IDENTITY, PURITY AND STRENGTH

Foreign matter	Not more than	2	per cent, Appendix	2.2.2.
Total Ash	Not more than	15	per cent, Appendix	2.2.3.
Acid-insoluble ash	Not more than	6	per cent, Appendix	2.2.4.
Alcohol-soluble extractive	Not less than	1	per cent, Appendix	2.2.6.
Water-soluble extractive	Not less than	4	per cent, Appendix	2.2.7.

ASSAY

Assay-Contains not less than 0.1 per cent of total alkaloids, when assayed by the following methods,

Take accurately about 100 g of the drug (60 mesh powder) and moisten with dilute solution of *Ammonia*. Extract continuously in a soxhlet apparatus for 18 hours with 95 per cent *Alcohol*. Remove the alcohol by distillation. Extract the residue with five 25 ml portions of 1 *N Hydrochloric acid* till complete extraction of the alkaloid is effected. Transfer the mixed acid solutions into a separating funnel and wash with 5 ml of *Chloroform*, runoff the Chloroform layer. Make the acid solution distinctly alkaline with *Ammonia* and shake with five 25 ml portions of *Chloroform* or till complete extraction of alkaloids is effected. Wash the combined chloroform extracts with two portions each of 5 ml of water. Filter the chloroform layer in tared flask and evaporate to dryness. Add to the residue 5 ml of *Alcohol*, evaporate to dryness, repeat the process once again and weigh the residue to constant weight in a vacuum desiccator.

CONSTITUENTS - Alkaloid (Punarnavine).

PROPERTIES AND ACTION

Rasa	:	Madhura, Tikta, Kaṣāya
Guna	:	Rūkṣa
Virya	:	Uṣṇa
Vipaka	:	Madhura
Karma	:	Anulomana, Śothahara, Mūtrala, Vātaśleşmahara

IMPORTANT FORMULATIONS - Punarnavāṣaka Kvātha Cūrṇa, Punarnavāsava, Punarnavādi Maṇḍūra, Sukumāra Ghṛta, Śothaghna Lepa

THERAPEUTIC USES - Śotha, Pāṇḍu

DOSE - 20-30 g of the drug for decoction.