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## A complete review on traditional Healers- Punarnava

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### Abstract

There are 40 species in the genus *Boerhavia* (Nyctaginaceae), and they are all found in humid, subtropical, and warm climate zones. Since the dawn of time, traditional healers have used several species of this genus to treat a wide range of ailments. Some of them, including antimicrobial, antioxidant, anti-diabetic, anti-asthmatic, anticonvulsant, cytotoxic, antiulcer, anti-inflammatory, analgesic, and hepatoprotective, have already received scientific validation. While there are still many issues to be resolved. Different categories of chemicals, including alkaloids, flavonoids, rotenoids, and phytosterols, have been isolated from distinct species of this genus. In this study, data on chemicals and drugs from current phytochemical research on a range of plants in the genus *Boerhavia* are present.

**Keywords:** *Boerhavia*, traditional healers, phytochemicals, pharmacology

### 1. Introduction

For many years, plants have been a significant source of medicine. According to the World Health Organization, up to 80% of people still use traditional medicines<sup>[1]</sup>. In traditional and ethnomedical traditions, more than 35,000 plant species are used worldwide as therapeutic herbs<sup>[2]</sup>.



**Fig 1:** *Boerhavia* (Punarnava)

From natural sources, an astounding number of contemporary medications have been isolated<sup>[3]</sup>. In addition to their widespread use, herbs can potentially combine with other drugs or create harmful reactions, so it's crucial to have a thorough understanding of them<sup>[4]</sup>. As a result, the needs of medicinal plants cannot be ignored<sup>[5]</sup>. *Boerhavia* is a genus of 40 species that are found in warm, humid, and subtropical climates<sup>[6]</sup>. *Boerhavia* genera have been used medicinally for centuries in a variety of societies dating back to the B.C.<sup>[7]</sup>. Google scholar, PubMed, Research Gate, and other databases were used to conduct the literature search.

### 1.1 Common name

Erect spiderling  
Erect tar vine

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Erect *boerhavia*

Hindi: shweta

Marathi: Punarnava

### 1.2 Plant profile

Kingdom: Plantae

Clade: Tracheophytes, Angiosperms, Eudicots

Order: Caryophyllales

Family: Nyctaginaceae (Bougainvillea family)

Genus: *Boerhavia*

Species: *B. Erecta*

Botanical name: *Boerhavia erecta* L.

### 1.3 Synonyms

*Boerhavia atomaria* Raf.

*Boerhavia discolour* Kunth

*Boerhavia elongate* Salisb.

*Boerhavia erecta* f. *Subepunctata* Heimerl

*Boerhavia erecta* var. *thornberi* (M.E.Jones) Standl.

*Boerhavia paniculata* var. *Subacuta* Choisy

*Boerhavia thornberi* M.E.Jone

### 1.4 Stem

*Boerhavia erecta* plants can survive considerable damage from grazing and fire because their stems produce perennating buds near the ground surface.



Fig 2: Dry stem of Boerhavia

Stems of *Boerhavia* typically grow to about 60 centimetres (24 in) tall and 3–5 millimetres (0.12–0.20 in) across. They generally are cylindrical without furrows or ridges. In colour they are green, commonly tinted with purple, and towards their upper regions they are slightly pubescent, being covered in short, soft hairs. The base of the stem however, is glabrous and woody<sup>[8]</sup>.



Fig 3: Wet stem of Boerhavia

### 1.5 Leaf

The leaves are somewhat fleshy. Their arrangement is opposite and unequal. Typically the leaf size ranges from 1.5–2.5 cm (0.59–0.98 in) long and 2–3.5 cm (0.79–1.38 in) wide to 3–4.5 cm (1.2–1.8 in) long and 2–3.5 cm (0.79–1.38 in) wide, with a petiole of roughly 2 cm (0.79 in) to 3 cm (1.2 in). The petioles of the leaf are pale green with a hint of purple. The blade of the leaf is ovate, ovate-lanceolate or lanceolate. The upper surface of the leaf is green and pubescent, sometimes with scattered glands. The underside is grayish-white, often with tints of purplish red that also appear on the leaf margins<sup>[9]</sup>.



Fig 4: Leaf of Boerhavia

The flowering season of *Boerhavia erecta* is from early summer to mid-autumn. The inflorescences are determinatively cymose, meaning that the central, terminate flowers open before the basal flowers. Two leafy bracts subtend each branch of the inflorescence, but detach at an early stage. Each peduncle bears 2–6 sessile flowers at its apex. The flowers are tiny, pink and cream. The corolla is bell-shaped, 5-petaled, 1.5 mm long and 2 mm wide. There are 2–3 stamens. Anthocarps (false fruits) are circular and flat. They are 5-ribbed (0.3–0.5 mm wide) and glabrous. The ripe fruits of this plant are sticky and adapted to dispersal by humans and animals.

### 2. Ethnomedicinal Importance of Genus Boerhavia

*Boerhavia diffusa* is used to treat a variety of conditions, including hypertension, inflammations, and wounds. Decoction of<sup>(10,11)</sup> roots to remove kidney stones. For the treatment of dyspepsia, jaundice, spleen enlargement, and abdominal pain,<sup>(12)</sup> roots are frequently utilised. *Boerhavia diffusa* leaves are used as an appetiser, while the roots are utilised as stomachic, diuretic, and laxative remedies.<sup>(13)</sup> It is a good liver stimulant and treats viral jaundice to use *Boerhavia diffusa* Linn. It has diuretic, antibacterial, anti-arthritis, anti-inflammatory, and spasmodic effects. In conjunctivitis, roots are used as an anticonvulsant, analgesic, laxative, diuretic, and abortifacient<sup>[14, 15]</sup> It is thought to protect and enhance vision. Diabetics use the plant's diuretic qualities to reduce blood sugar levels.

The root is used as a diuretic to treat internal inflammations such gonorrhoea, enlarged spleen, and

jaundice. It is also used as a laxative, anthelmintic (expels parasitic worms), febrifuge (reduces fever), stomachic, cardiac tonic, hepatic protective, expectorant, and anthelmintic. To ripen abscesses and ulcers, the skin is massaged with a root paste.<sup>[16]</sup> *Boerhavia procumbens* leaves are prescribed for edoema, dropsy, and dysmenorrhea. The dried root powder is inhaled through the chimney. For coughs and asthma, this plant's powdered roots are administered with honey<sup>[17, 18]</sup>.

Blood cleansers such as *Boerhavia procumbens* are employed<sup>[19, 20]</sup>. To treat jaundice<sup>[21, 22]</sup>. *Boerhavia procumbens* pastes are used as antidotes, a decoction as a refrigerant, and to stop nosebleeds and reduce discomfort<sup>[23]</sup>. For one month, *Boerhavia erecta* powder is inhaled like a cigarette once per day to treat asthma<sup>[24]</sup>. Cardiotoxic *Boerhavia repensis* is utilised<sup>[25, 26]</sup>. The Teli practitioner employed *Boerhavia repens* to cure edoema, gonorrhoea, and persistent coughs<sup>[27]</sup>. *Boerhavia repens* L. whole plant extract is beneficial for treating leucorrhoea in women<sup>[28]</sup>. The entire *Boerhavia repens* plant is used as a diuretic, laxative, emetic, and stomachic<sup>[29]</sup>. An essential medicinal plant, *Boerhavia repens*, is used to treat jaundice, fever, constipation, and as a blood purifier<sup>[30]</sup>.

The leaves of *Boerhavia repens* are used to treat skin conditions<sup>[31]</sup>. *Boerhavia chinensis* roots are traditionally consumed orally for their antihelmintic, leucorrhoea, galactoseamine, and paracetamol intoxicating properties<sup>[32]</sup>. *Boerhavia chinensis* is a plant that has been used in a number of ayurveda and siddha formulations for its hepato-protective, gastro-protective, useful for Down's syndrome, analgesic, antipyretic, and anti-inflammatory properties<sup>[33]</sup>. In conventional medicine, *Boerhavia elegans* has been used to treat dysmenorrhea, problems with the urinary system, infections of the intestines, inflammation, jaundice, and body weakness<sup>[34]</sup>.

### 3. Pharmacology of genus *boerhavia*

#### 3.1 Anti-microbial activity

*Boerhavia repens* crude methanolic extract was evaluated for its antibacterial and antifungal properties. Only gramme negative bacteria displayed mild susceptibility at low concentrations of the methanolic extract of *Boerhavia repens*, while all gramme positive bacteria, gramme negative bacteria, and fungi showed moderate susceptibility. We can infer from the findings that *Boerhavia repens* entire plant extract exhibited notable antibacterial activity<sup>[35]</sup>.

The agar well diffusion method was used to test the antimicrobial activity of the methanolic extract of *Boerhavia diffusa* L. roots against a variety of human pathogens, including *Escherichia coli*, *Pseudomonas aeruginosa*, *Salmonella typhimurium*, *Staphylococcus aureus*, *Shigella flexneri*, *Streptococcus pneumoniae*, *Klebsiella pneumoniae*, and *The size of the inhibition zones varied from 4.26 mm to 16.61 mm. All of the examined bacteria were suppressed by root extract with*

sizable zones of inhibition. At a concentration of 30 g/ml, it was discovered that the common antibiotics chloramphenicol and miconazole nitrate had zones of inhibition of 10.40 0.26 - 24.80 0.37 mm<sup>[36]</sup>.

According to the antimicrobial study, *B. Diffusa* crude extracts displayed superior antibacterial activities against the tested microorganism at higher concentrations. Significant antifungal activity was demonstrated by *B. Diffusa* extracts, which may be attributed to the anthraquinones present<sup>[37]</sup>.

The root extract of *B. Diffusa* has antimicrobial properties. Both gramme positive and gramme negative bacterial species, including *Bacillus subtilis*, *Escherichia coli*, *Klebsiella pneumoniae*, *Staphylococcus aureus*, and *Streptococcus*, showed the zone of inhibition<sup>[38]</sup>. When compared to other solvent extracts, the ethanol extract of *B. Diffusa* L. leaves demonstrated greater activity against Gram-positive (*S. aureus*, zone of diameter 11 mm) and Gram-negative (*E. coli*, zone of diameter 9 mm) bacteria with the exception of *V. cholerae*. The result confirmed the present of antibacterial activity of *B. Diffusa* L. leavea extract against various human pahogenic bacteria<sup>[39]</sup>. By using the pour plate and cup diffusion procedures with agar diffusion, the antibacterial and antifungal properties of *Boerhavia erecta* extract were investigated against four different strains of bacteria and fungus. According to the findings, *Boerhavia erecta* whole plant extract exhibited noteworthy antibacterial activity<sup>[40]</sup>.

*Boerhavia coccinea* was found to be antibacterial. By using the agar dilution method *in vitro*, the antibacterial capabilities were assessed against enteric bacteria that were multi-resistant and derived from clinical isolates of *Escherichia coli*<sup>[41]</sup>.

#### 3.2 Diuretic activity

In albino rats, the diuretic activity of an aqueous extract of the roots of the plant *Boerhavia diffusa* was tested, and its effectiveness was compared to that of the widely used diuretic furosemide. The extract of *Boerhavia diffusa* was discovered to have a maximal "diuretic dose-response relationship" at 300 mg/kg (oral). The test medication also demonstrated a maximum increase in urine volume and electrolyte excretion<sup>[42]</sup>. *Boerhavia diffusa* Linn. increased urination, hastened the process of eradicating the built-up crystal deposits, enhanced renal function by enhancing the removal of nitrogenous waste products, and reduced oxalate excretion most likely by interfering with metabolism. All of these actions together contribute to *Boerhavia diffusa* Linn's anti urolithiatic properties<sup>[43]</sup>.

#### 3.3 Anti oxidant activity

*Boerhavia diffusa's* leaves, stem, and root were extracted in methanol, and their total antioxidant capacity, as well as their contents of phenolic, flavonoid, and ascorbic acid, were estimated using spectrophotometric techniques and the 1, 1-diphenyl picrylhydrazyl (DPPH) free radical scavenging assay.

Significant antioxidant activity is exhibited by the plant extracts [44]. The radical scavengers DPPH, ABTS, and NO were active in *B. Diffusa*. With increasing concentration, the extracts' capacity to scavenge these three radicals grows [45]. *Boerhavia diffusa*'s ethanolic extract was tested for its *in vitro* antioxidant activity using the methods of 1-diphenyl-2-picrylhydrazyl (DPPH) scavenging activity, reduction potential, and nitric oxide scavenging activity. The root of *B. Diffusa* had a percentage (%) DPPH, NO, and thiocyanate inhibition activity of 91.25% 2.26%, 90.39% 1.23%, and 88.59% 1.72%, respectively. Gallic acid and conventional he most promising free radical [46] scavenging properties as determined by DPPH and ABTS assays [47]. *Boerhavia chinensis* leaf aqueous extract demonstrates excellent antioxidant and free radical scavenging properties. Additionally, it has reducing power and scavenges NO and DPPH free radicals. The anti-oxidant properties of *Boerhavia procumbens* extend to the entire plant [48].

### 3.4 Cytotoxic activity

Human peripheral blood mononuclear cell proliferation that was enhanced by concanavalin A and the T cell mitogen phytohemagglutinin was suppressed by the ethanolic extract of *Boerhavia diffusa* (PBMC). Additionally, it prevented the proliferation of human mixed lymphocytes and PBMCs induced by pure protein derivative antigen. Additionally, *B. Diffusa* extract slowed the growth of a number of cell lines with mouse and human origins, including mouse lymphoma cells (EL-4), human erythroleukemic cells (K562), human T cells, human monocytic cells (THP-1), human embryonic kidney cells (HEK293), mouse liver cells (BNLCL.2), and human kidney cells from African green monkeys. *In vitro*, the plant therefore has the ability to inhibit proliferation [49].

The crude ethanolic extract of *B. Diffusa* roots has been shown through pharmacological analysis to have anti-proliferative and immunomodulatory properties. DNA fragmentation and the activation of caspase-9 are signs that the *Boerhavia diffusa* fraction induced cell death by apoptosis. As a result, the *B. Diffusa* fraction may prevent the spread of the human cervical cancer cell line [50].

### 3.5 Anti-malarial activity

*Boerhavia elegans* (Choisy) shown positive anti-plasmodial action both *in vivo* and *in vitro* (IC<sub>50</sub> = 50 microgram/ml) [51]. In mice implanted with red blood cells parasitized with *Plasmodium berghei* for a 4-day suppressive anti-malarial experiment, the plant extract of *Boerhavia erecta* demonstrated substantial anti-malarial activity [52].

Using the three malaria models—suppressive, curative, and prophylactic tests—the plant's crude methanolic root extract was evaluated for its *in vivo* anti-plasmodial efficacy against *Plasmodium berghei* NK 65 (a strain resistant to chloroquine). *B. Diffusa*'s methanolic root

extract had anti-malarial potential [53].

### 3.6 Anti-ulcer activity

In comparison to the common medication rabeprazole, the aqueous leaf extract of *Boerhavia chinensis* shown substantial antiulcer action. The ulcer index was dramatically decreased by the aqueous extract, and the percentage protection was improved in a dose-dependent way. The *B. Diffusa* plant extract had antacid properties [54].

### 3.7 Analgesic activity and anti inflammatory activity

We investigated the central (narcotic) and peripheral (non-narcotic) analgesic effects of the entire *B. repens* plant. Diclofenac was a commonly prescribed medication. The plant as a whole has analgesic properties [55]. Only the ethanol extract of *B. Diffusa* displayed good analgesic potential and an anti-inflammatory activity when compared to the standard medication analgin at a dose of 200mg/kg, according to the analgesic and anti-inflammatory activity it exhibited [56]. The anti-inflammatory and analgesic properties of *B. Diffusa* were investigated using carrageenan-induced paw edoema, cotton pellet granuloma, and tail immersion methods. When compared to the control and standard drug, *B. Diffusa* aqueous root extract (1000mg/kg) demonstrated a highly significant anti-inflammatory effect. The test substance had a strong analgesic effect in both models used for analges [57]. Due to its ability to stabilise cell membranes and thereby prevent the lysis and release of proinflammatory mediators, the aqueous extract of the root of *B. Diffusa* has anti-inflammatory properties [58].

### 3.8 Hepatoprotective activity

Orally administered *Boerhavia diffusa* alcohol extract shown hepatoprotective efficacy against experimentally generated carbon tetrachloride liver damage in rats and mice [60]. When Ibuprofen causes hepatotoxicity in albino rats, the aerial portions of *Boerhavia diffusa* L.'s hydro alcoholic extract have both a therapeutic and preventative effect [61]. When albino rats were given CCl<sub>4</sub> [62] to cause hepatotoxicity, the plant extract of *Boerhavia diffusa* demonstrated hepatoprotective action. Rats with rat liver poisoning caused by Carbon Tetrachloride (CCl<sub>4</sub>) were examined for hepatoprotective action using an alcoholic extract of the stem and leaves of *Boerhavia diffusa*. By administering CCl<sub>4</sub> intraperitoneally to Albino rats of either sex, hepatotoxicity was induced (in olive oil). Serum Glutamate Oxaloacetate Transaminase (SGOT), Serum Glutamate Pyruvate Tranaminase (SGPT), Serum Alkaline Phosphatase (SALP), and Total and Direct Serum Bilirubin were used to measure the hepatoprotective effects of the extracts. The alcoholic extract of *B. Diffusa* was found to have hepatoprotective properties against CCl<sub>4</sub>-induced rat liver toxicity [63].

### 3.9 Anti diabetic and anti hypeelipidemic activity

In streptozotocin-induced NIDDM rats, *B. Diffusa* leaf extract reduced blood glucose in a dose-dependent manner comparable to gliben clamide. The findings suggest that the extract's ability to lower blood glucose levels is likely due to the regeneration of pancreatic beta cells or to increased pancreatic activity. Therefore, the *B. Diffusa* chloroform extract exhibits significant antidiabetic activity <sup>[64]</sup>. In comparison to a diabetic control group, an ethanolic extract of the roots of *Boerhavia diffusa* considerably decreased total cholesterol, triglycerides, VLDL, and LDL while increasing HDL, which serves as a protective factor for the heart. As a result, streptozotocin-induced diabetic rats showed decreased blood sugar levels when exposed to an ethanol extract of *B. Diffusa* roots <sup>[65]</sup>. Blood glucose concentration and hepatic enzymes in normal and alloxan-induced diabetic rats treated with an aqueous solution of *Boerhavia diffusa* L. leaf extract (200 mg/kg) for 4 weeks showed a significant decrease in blood glucose and a significant increase in plasma insulin levels <sup>[66]</sup>. In streptozotocin-induced rats, *Boerhavia diffusa* root ethanolic extract significantly reduced blood sugar levels <sup>[67]</sup>.

### 3.10 Anti- histaminic activity

*Boerhaviadiffsa* Linn. roots extracted with ethanol and tested on animals. Using an isolated goat tracheal chain preparation and guinea pig histamine-induced bronchoconstriction, *B. Diffusa* 's anti-histaminic activity was assessed. *B. Diffusa* demonstrated significant protection by extending the Preconvulsion Dyspnoea Time (PCD) in guinea pigs and significantly inhibited the histamine-induced, dose-dependent contraction of the goat tracheal chain. As a result, plant demonstrated anti-histaminic and bronchodilating

activity against histamine and may therefore play a role in the management of asthma <sup>[68]</sup>.

### 3.11 Nephroprotective activity

In an animal model of lead acetate-induced nephrotoxicity, *Boerhavia diffusa* was examined. Due to the nephrotoxicity of lead acetate, treatment with *Boerhavia diffusa* extract speeds up the recovery from nephritic damage caused by lead acetate <sup>[69]</sup>.

### 3.12 Anti-convulsant activity

*B. Diffusa* root methanolic extract had anti-convulsant properties against PTZ-induced convulsions. The anti-convulsant activity of the crude methanolic extract is confirmed to be caused by the presence of liriiodendrin because this activity was only retained in the liriiodendrin-rich fraction. The fact that BAY k-8644-induced seizures were prevented by liriiodendrin-rich fraction further supports the theory that liriiodendron's activity is a result of its calcium channel antagonistic characteristics <sup>[70]</sup>.

## 4. Nutritional value of Punarnava

Due to the punarnava leaf's high nutritional value and widespread use since antiquity, it has been recognised for its health advantages. Punarnava contains 1.61% of the daily recommended amount of total fat in 100 g. It contains 2.26% of the daily required protein intake and 162 mg of salt. It contains 142 mg of calcium and 44.8 mg of vitamin C. Additionally, it contains 0.012 mg of iron. Punarnava plant nutrients are essential for the health of the liver, kidneys, eyes, and overall body function. They can also be used to treat a variety of illnesses as well as prevent many diseases and infections.



Fig 5: Health Benefits of Punarnava

## 5. Health Benefits of Punarnava

Use the ayurvedic herb Punarnava, which has anti-inflammatory, wound-healing, and antioxidant

properties. It can also be used to treat liver detoxification, urinary tract infections, and other conditions. Add punarnava powder and tea to your diet

if you're seeking to shed some extra pounds. The elimination of kidney stones is one of the punarnava leaf's additional health advantages. Punarnava tablets, powder, and root extracts are readily available in your neighbourhood stores. Include this herb in your daily routine for maximum health benefits. You can even prepare and consume Punarnava juice, which is healthy for your eyes and vision. The best health advantages of the Punarnava plant are listed here <sup>[71]</sup>.

### 5.1 Benefits of Punarnava Leaf Powder for the Liver

One of the body's most vital organs is the liver. When the body is being attacked, the liver works hard, and a dysfunctional liver can increase weariness and stress. Punarnava powder has fantastic benefits for the liver. It assists in regularly stimulating bile secretion, which maintains the liver's health and functionality <sup>[71]</sup>.

### 5.2 Punarnava Extract Treats Urinary Tract Infections Naturally

Although they can affect males too, urinary tract infections are very common in women. They are really uncomfortable and make it feel scorching to urinate. Anti-spasmodic, anti-microbial, and anti-inflammatory activities can be found in punarnava powder. When used together, these are an excellent UTI treatment that quickly and efficiently eliminates the illness. Punarnava plant has no harmful effects on either the mother or the foetus, so it can also be used to treat UTIs during pregnancy <sup>[72, 73]</sup>.

### 5.3 Punarnava (*Boerhavia diffusa*): A Powerful Weight-Loss Herb

The fact that Punarnava aids in the battle against obesity is one of its well-known advantages. Punarnava is a common ingredient in herbal slimming products due to its potency. With no loss of essential potassium or electrolytes, this herb aids in the removal of surplus fluids from the body by promoting excretion. Punarnava Mandur therefore encourages the body to lose weight. It also has a minor laxative effect <sup>[71, 72, 73]</sup>.

### 5.4 Diuretic Nature of Punarnava Plant

Urinating is one of the most important body functions. This is because it helps get rid of excess toxins, water, and fat from the body, ultimately keeping it healthy and ensuring that all organs function as smoothly as possible. Punarnava drug is a diuretic, which means that it stimulates regular and plenty of urination. This helps keep the body clean. Furthermore, regular urination also clears out the calcium accumulated in the kidneys, thus preventing kidney stones from occurring. The diuretic properties of Punarnava root powder also help prevent dropsy, a condition in which water or watery fluids settle down in the tissue and cavities of the body and cause problems with the health. Frequently urinating can help get rid of these excess fluids and prevent the condition from occurring in the first place. It also helps cure ascites, which is also the accumulation of watery

fluids in the body tissues. This is normally caused by a problem in the liver <sup>[73]</sup>.

### 5.5 Effect of Punarnava Powder on Diabetes

If diabetes is not adequately managed, it can be quite hazardous. You can use the herb punarnava to manage your diabetes. This is due to the fact that its leaf (and the extracts from the leaves) regulates the body's glucose levels, which is very advantageous for diabetics. They benefit from the Ayurvedic Punarnava drug's ability to raise plasma insulin levels <sup>[73, 74]</sup>.

### 5.6 Punarnava Root Juice is Beneficial for Eyes

Because the eyes are such a delicate organ, they are prone to a wide range of ailments and infections at any given time of the day. Because of this, it is crucial to keep children safe and provide the appropriate treatment when something goes wrong.

Conjunctivitis, night blindness, and other eye infections and disorders can all be treated with punarnava root juice. Your eyesight will improve dramatically if you place a few drops of the juice in your eyes <sup>[74]</sup>.

### 5.7 Potential Benefits of Punarnava for Heart Health

Punarnava plant can help you prevent congestive heart failure. This is because it reduces the workload that's put on the heart by inducing edemas. For it to be as beneficial as possible, Punarnava root powder should ideally be mixed with *Terminala Arjuna* Bark powder, *Tapyadi Loha* or any other herbal remedy for heart failure for maximum results <sup>[74]</sup>.

### 5.8 Ayurvedic Herbs Punarnava Reduce Arthritis Pain

Punarnava herb is known to be a good remedy for arthritis. This is because the herb provides a lot of relief from pain in the joints and the pain of inflamed muscles. In order to use this herb to relieve these pains, it must be ground into a paste and then applied topically. You can let the punarnava extract paste on your skin for as long as you want as there will not be any side effects on your skin <sup>[75]</sup>.

### 5.9 Positive Effects of Punarnava on Impotence Problems

Impotence can be a huge problem. Punarnava's seeds are extremely beneficial to those who are suffering from impotence. It can help revive the entire male reproductive organ, and can also induce a lot of vitality and vigor, and it also increases your libido. Moreover, punarnava seeds can improve the overall quality of the semen that is produced. It is also a good home remedy for erectile dysfunction <sup>[75]</sup>.

### 5.10 Punarnava Juice to Manage Stomach Disorders

Punarnava plant is a great herb if you are suffering from stomach disorders. This is because it strengthens the stomach muscles. It can also kill and get rid of intestinal worms, which is an important function as worms can be

quite harmful in your body and lead to starvation and death. Punarnava extract also helps prevent intestinal colic<sup>[76]</sup>.

### 5.11 Punarnava Rich in Antioxidants, Anti-Cancer & Antihepatic

Apart from the benefits listed above, Punarnava plant can be used for a variety of other ailments as well. It can help cure bronchial asthma, is a good remedy for gout and can prevent there from being high amounts of uric acid in the blood. Moreover, Punarnava leaf powder is also considered a good remedy for cancer as it is an anticancer agent. Punarnava is also a good antioxidant, cardiokine, antihepatic, and chloretic agent. It is, therefore, beneficial for various bodily systems and functions and a very good addition to your diet or lifestyle<sup>[77]</sup>.

### 6. Conclusion

Herbal medicinal plants have the great the rapeutic economic values in all over the world. *Boerhavia erecta* shows many pharmacological effect which are a knowledge in this review. Studies conducted on this plant have showed it's broad pharmacological properties with high medicinal values. It has been seen almost all parts of the plants, mainly the leaf contains many different active and non-active chemical compounds that possess a wide range of therapeutic values which have been used widely for centuries as traditional or folk medicine.

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