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PUNARNAVA-AN IMPORTANT PHYTOMEDICINE OF AYURVDA

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Abstract: The Indian system of medicine is full of herbal drugs which have been used from ancient times. The ayurvedic texts like Charaka Samhita, Sushrita Samhita etc contain numerous uses of herbal drugs either in single form or in combination with other drugs. Punarnava has actions like diuretic, laxatives, stomachics, febrifuge, rejuvenative, anthelmintic, expectorant, diaphoretic, anti-inflammatory, antiarthritic, spasmolytic, antibacterial, anticonvulsant, analgesic, CNS depressant and abortifacient etc and used for the treatment of disorders of urinary system, ascites, dropsy, obesity, intestinal worms, anaemia, asthma, abdominal pain, inflammation, dysuria, diabetes, stress, dyspepsia, jaundice, congestive heart failure, enlargement of spleen etc. The researches have shown its medicinal value as a hepatoprotective drug, anticonvulsant agent, antibacterial drug, anti-nociceptive drug, anti-inflammatory agent, hypoglycemic agent, anti-stress, immuno-modulator drug, anti-estrogenic and anti-proliferative agent etc. This article explores comprehensively some of the useful medicinal properties of punarnava.

Keywords: Punarnava, Boerhaavia diffusa Linn, Ayurveda

Introduction: The botanical name of punarnava is Boerhaavia diffusa Linn and it belongs to family Nyctaginaceae. It is a trailing herb found throughout India and collected after rainy season. It is diffusely branched with stout root stock and many long slender, prostrate or ascending branches. Its stem is greenish purple, stiff, slender, cylindrical, swollen at nodes, minutely pubescent or early glabrous, prostrate divericately branched, branches from common stalk, often more than a metre long. Its root is 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. Its leaves are 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 subundulate, dorsal side pinkish in certain cases, thick in texture, petioles nearly as long as the blade, slender. Its flowers are 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. Its fruits are one seeded nut, 6 mm long clavate, rounded, broadly and bluntly 5 ribbed, viscidly glandular.^[1]

Properties and Actions: Its rasa (taste) is madhura, tikta (bitter) and kashaya (astringent). It is ruksha in guna. It is ushna in virya (hot in potency) and madhura in vipaka.^[1] Its actions are diuretic, anti-inflammatory, antiarthritic, spasmolytic, antibacterial (used for inflammatory renal diseases, nephrotic syndrome, in cases of ascites resulting from early cirrhosis of liver and chronic peritonitis, dropsy associated with chronic Bright's diseases, for serum uric acid levels). Its root has anticonvulsant, analgesic, expectorant, CNS depressant, laxative, diuretic and abortifacient actions.^[2]

Chemical Constituents: It contains -Sitosterol, -2-sitosterol, palmitic acid, ester of -sitosterol, tetracosanoic, hexacosanoic, stearic, arachidic acid, urosilic acid, Hentriacontane, -Ecdysone, triacontanol etc. The herb and roots are rich in proteins and fats. The herb contains 15 amino

acids, including 6 essential amino acids, while the root contains 14 amino acids, including 7 essential amino acids. Plant contained large quantities of potassium nitrate, besides punarnavine. It contains alkaloids, flavonoids, steroids, triterpenoids, lipids, lignins, carbohydrates, proteins, and glycoproteins. Punarnavine.^[3-5]

Medicinal Importance

As Hepatoprotective Drug: In a study, it has been shown that its aqueous root extract possess very good hepatoprotective activity against thioacetamide induced hepatotoxicity and provides marked protection against a majority of serum parameters like, GPT, GOT, ACP and ALP but not GLDH and bilirubin. This study has also shown that its aqueous form is more hepatoprotective than the powder form.^[6]

As Anticonvulsant Agent: Its methanolic extract with its liriiodendrin-rich fraction has been found to provide a dose-dependent protection against PTZ-induced convulsions.^[7]

As Antibacterial Drug: Its methanol extract (made with leaves) has been found to produce an inhibitory effect against all gram-positive bacteria selected for the present study except *M. luteus* and gram-negative bacteria like *K. pneumoniae*, *P. vulgaris*, *S. marcescens* and *S. flexneri* while the ethanol extract showed an inhibitory effect on gram positive bacteria like *S. aureus*, *B. subtilis*, *S. faecalis*, *M. luteus* and all gram-negative bacteria selected for the present study.^[8]

As Anti-nociceptive Drug: Its antinociceptive action has been found mainly in the juice of the fresh leaves and has been shown to possess a significant antinociceptive effect when assessed in the pain models like acetic acid induced abdominal writhing in mice.^[9]

As Anti-inflammatory Agent: Its maximum anti-inflammatory effect has been shown by the ethanol extract of its leaves at dose of 400mg/kg with 30.4, 32.2, 33.9 and 32% carrageenin, serotonin, histamine and dextran induced rat paw edema models respectively.^[10]

As Hypoglycemic Agent: Its alcoholic extract (whole plant) has been found to show the hepatoprotective activity against experimentally induced carbon tetrachloride hepatotoxicity in rats and mice. A study investigating the effect of oral administration of an aqueous solution of its leaf extract on normal and alloxan-induced diabetic rats has shown a significant decrease in blood glucose and a significant increase in plasma insulin levels in normal and diabetic rats

and the effect was found more prominent than glibenclamide. The chloroform extract of its leaves has produced dose-dependent reduction in blood glucose in streptozotocin induced NIDDM rats comparable to that of glibenclamide and this dose-dependent reduction in blood glucose occurs probably through rejuvenation of pancreatic β -cells or through extrapancreatic action.^[11]

As Anti-estrogenic and Anti-proliferative Agent: Its methanol extract has been found to possess antiproliferative and antiestrogenic properties in an in vitro study on breast cancer.^[12]

As Anti-stress and Immunomodulator Drug: The ethanol extracts of its roots showed increased stress tolerance in swim endurance test and cold restrains stress. The immunomodulatory activity was shown by increased carbon clearance, indicating stimulation of the reticuloendothelial system. There was an increase in DTH response to SRBC in mice, corresponding to cell mediated immunity and indicating stimulatory effects on lymphocytes and accessory cell types.^[13]

Conclusion: From the above review, it can be concluded that this plant has numerous medicinal properties useful for mankind. It has been used in India for very long time and the Ayurvedic texts contain so many uses of it either as a single drug or in combination with other drugs. That is why it is getting more attention for investigating the new active principles for the benefit of human beings.

This article provides a review on some of useful pharmacological activities of punarnava but there is a need of serious efforts which can provide a meaningful way for the promotion of the traditional knowledge of the herbal medicinal plants and their great importance in the treatment of various diseases but before the recommendation of any herbal drug, its scientific validation, standardization and safety evaluation should be done.

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