

PUNARNAVA

Boerhaavia diffusa commonly known as 'Punarnava' belongs to the family Nyctaginaceae. It is a diffusely branched pubescent or glabrous, prostrate herbs, abundantly occurring as a weed throughout India, up to an altitude of 2000 m in the Himalayas.

Chemical constituents

The *B. diffusa* plant contains a large number of such compounds as flavonoids, rotanoids, alkaloids, steroids, triterpenoids. These biologically active chemical substance known as secondary metabolites in medicinal plants, form the foundations of modern prescription drugs.

In a preliminary screening, plant revealed presence of sterols, β -sitosterol and alkaloids. Presence of steroids, sugars and alkaloids was also reported.

It contains about 0.04% of alkaloid known as punarnavine ($C_{17}H_{22}N_2O$, mp 236-237°C) and punarnavoside, an anti fibrinolytic agent. It also contains about 6% of potassium nitrate, an oily substance and ursolic acid. The green stalk of the plant has also been reported to contain boerhavin and boerhavic acid.

Hentriacontane, β -sitosterol and ursolic acid along with glucose, fructose and sucrose were isolated from the root.

A new C-methyl flavones characterized as 5,7-dihydroxy-6-8-dimethoxy flavones was reported from root and designated as boerhavone.

Four new compounds, boerhavisterol, boerhadiffusene, diffusarotenoid and boerhavanastenyl benzoate and a known rotenoid, boerhavinone A were isolated from the root and their structures elucidated as : 9,10-seco-stigmast-5,8 (9)-dien-3 β -ol; 1-(2',6',6'-trimethylcyclohex-1'-enyl)-11-(3''-3''-dimethylcyclohexyl)-4,8-dimethyl-undec-1-ene; 4,9-dihydroxy-10-methyl-6a-dehydrorotenoid-6-pentanoate; 27-O-(4'-

benzoyl- β -D-glucopyranosyl) 9 β -lanost-5-en-3-one and 6-methoxy-9,11-dihydroxy-10-methyl-6-a, 12a-dihydrotenoid, respectively.

Ethanomedicinal uses of *B. diffusa* Linn.: *B.diffusa* has a long history of uses by indigenous and tribal people and in Ayurvedic or natural herbal medicines. *B. diffusa* root extract strengthens, tones and balances the liver (hepatotonic). It shows hepatoprotective activity

The plant is used in epilepsy, pain in abdomen, dysentery, prolapsus ani, fistula ani and poison of scolopendrids; in pneumonia; Jaundice; anaemia, as blood purifier; in enlargement of spleen; as stomachic, emetic, laxative, expectorant, diuretic; astringent, antiasthmatic, in abdominal pain cough; as anti inflammatory; tonic, in urinary troubles, ascites, uterine bleeding in liver complaints, heart diseases in dropsy, gonorrhoea, oedema, as diuretic in haemorrhoids anaemia, colic, thoracic haemorrhage, constipation, heart disease, oedema, as antidote to rat bite poison and in rabies in urinary troubles as antiasthmatic, in anasarea, ascites oedema, oligurea, as antidote to snake bite. The fruits are used as a diuretic. The seeds are used as expectorant, carminative, tonic, anthelmintic in lumbago; jaundice and gonorrhoea. The shoot is used in dysuria, oligurea as haematinic and uterine stimulant. The leaves are used in ophthalmic disease; stomach disorder; cataract; as analgesic, antiasthmatic, blood purifier, in dropsy, gonorrhoea, jaundica and for hastening delivery; as laxative and digestant; appetizer and alexiteric; antihypertensive; in rheumatism; hypotension; indigestion, abdominal pain, splenomegaly; as diuretic, in jaundice, gonorrhoea; in urinary troubles; liver ailments; to check post partum haemorrhage; for **wound healing** ; for itch and eczema.