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DIURETICS & ANTITUMOUR

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DIURETICS

- ✘ A diuretic is any substance that promotes production of urine.
Example: Gokhru, and Punarnava.

GOKHRU

- ✘ **Synonym:** Caltrops fruit.
- ✘ **Biological Source:** Gokhru is the dried ripe seeds of *Tribulus terrestris*, belonging to family Zygophyllaceae.
- ✘ **Geographical Source:** Annual, prostrate herb found in India
- ✘ **Characteristics:** Colour: Fruits are yellowish in colour; Shape: Globose; Size: 1.2 cm in diameter;



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GOKHRU

- ✘ **Microscopic character:** Fruit section shows small rectangular epidermal cells of each coccus. Unicellular trichomes are found on the surface 6–10 layers of large parenchymatous cells forms mesocarp, next to mesocarp three to four compact layers of small cells are present which contains **rosette of calcium oxalate crystals**.
- ✘ **Cultivation and collection:** It grows luxuriously in fertile soils and crop land as a weed at temperatures of 25–30 degrees.



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GOKHRU

- ✘ **Chemical Constituents:** The dried fruits of *T. terrestris* consist of steroidal saponins as the major constituents. It includes terestrosins A, B, C, D and E, desgalactotigonin, F-gitonin, desgluocolanatigonin and gitonin. The hydrolysed extract consists of sapogenins such as diosgenin, chlorogenin, hecogenin and neotigogenin. The flavonoid derivatives reported from the fruits includes tribuloside and number of other glycosides of quercetin, kaempferol and isorhamnetin.



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GOKHRU

- ✘ **Chemical Constituents:** The dried fruits of *T. terstris* consist of steroidal saponins as the major constituents. It includes terestrosins A, B, C, D and E, desgalactotigonin, F-gitonin, desglucolanatigonin and gitonin. The hydrolysed extract consists of sapogenins such as diosgenin, chlorogenin, hecogenin and neotigogenin. The flavonoid derivatives reported from the fruits includes tribuloside and number of other glycosides of quercetin, kaempferol and isorhamnetin.
- ✘ **Uses:** The fruit has cooling, antiinflammatory, antiarthritic, diuretic, tonic, aphrodisiac properties.



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PUNARNAVA



- ✘ **Synonym:** Hog Weed.
- ✘ **Biological Source:** Punarnava consists of fresh as well as dried whole plant of *Boerhaavia diffusa*, belonging to family Nyctaginaceae.
- ✘ **Geographical Location:** The plant is a weed found throughout India and Sri Lanka during rainy season.
- ✘ **Description:** Stem is greenish purple in colour, slender, stiff, cylindrical, swollen at nodes, minutely pubescent or nearly glabrous. Roots are long, cylindrical, 0.2–1.5 cm in diameter; Yellowish brown to brown in colour, longitudinal striations and root scars on surface; short fracture, odourless and bitter in taste. Leaves are opposite, larger ones 2.5- to 3.5-cm long and smaller ones are 1.2-to 1.8-cm long, ovate-oblong, apex rounded, or slightly pointed, base subcordate, glabrous on upper, entire margin. Flowers are very small and white or pink in colour. Two chief varieties are described based on the flower colour, one with white flowers is 'Sweta Punarnava' while the other with red flowers is referred to as 'Rakta Punarnava'. Fruits are 6-mm long, rounded with one seed.



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PUNARNAVA

- ✘ **Chemical Constituents:** Punarnava contains a phenolic glycoside punarnavoside upto 0.03–0.05%. It also shows the presence of rotenoids, such as, boeravinones A, B, C, D, and E. Lignan derivatives such as liridodendrin and syringaresinol mono- β -Dglucosides have been reported. The root contains a purine nucleoside-hypoxanthine-9-arabinofuranoside and boeravine, ursolic acid, and β -sitosterol. The root also contains an insect moulting hormone, β -ecdysone.
- ✘ **Uses:** Punarnava possess potent antifibrinolytic, anti-inflammatory, and diuretic properties. **Punarnavoside** has been found to be responsible for **antifibrinolytic** activity. Punarnava is a very useful drug for the treatment of **inflammatory renal diseases** and **nephritic syndrome**.



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ANTI-TUMOUR

✘ Antitumour drugs are used for treatment of cancer. Eg. Vinca

VINCA

- ✘ **Synonyms:** Vinca rosea, Catharanthus, Madagascar periwinkle. Barmasi.
- ✘ **Biological Source:** Vinca is the dried entire plant of *Catharanthus roseus*, belonging to family Apocynaceae.
- ✘ **Geographical Source:** Native of Madagascar also found in India, Australia, South Africa and North and South America.
- ✘ **Cultivation and Collection:** The plant prefers light (sandy), medium (loamy) and heavy (clay) soils and can grow in heavy clay soil. It is propagated by seed



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VINCA

- ✘ **Description:** Colour: The leaves are green in colour, flowers are either violet, pinkish white or; carmine red and roots are pale grey in colour; Odour: characteristic; Taste: bitter; Shape: Leaves are petiolate, entire margin, ovate or oblong, glossy appearance and with acute apex. Fruit is follicles with numerous black seeds. Extra: The flowers are hermaphrodite (have both male and female organs) and are pollinated by bees.
- ✘ **Microscopic:** Dorsiventral leaf structure; Epidermis is a single layer of rectangular cells; Uni-cellular covering trichome and **cruciferous stomata**; **Calcium oxalate crystals are absent.**
- ✘ **Chemical Constituent:** Alkaloids are present in entire shrub but leaves and roots contain more alkaloids. About 90 alkaloids have been isolated from Vinca from which some like Ajmalicine, Serpentine and Tetrahydroalstonine. The important alkaloids in Catharanthus are the dimer indole indoline alkaloids Vinblastine and Vincristine and they possess definite anticancer activity. Vindoline and Catharanthine are indole monomeric alkaloids. It also contains monoterpenes, sesquiterpene, indole and indoline glycoside.
- ✘ **Use:** Vinblastin is an antitumour alkaloid used in the treatment of Hodgkin's disease (lymphatic cancer). Vincristine is a cytotoxic compound and used to treat leukaemia in children.



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THANK YOU