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ANTIOXIDANT PROPERTY (RASAYANA KARMA) OF BEEJAK HEARTWOOD EXTRACT (PTEROCARPUS MARSUPIUM ROXB) – A REVIEW ARTICLE

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ABSTRACT

BEEJAK HEARTWOOD is use in Rasayana karma, Kushthghna, Prameha, Raktapitta, Krimighna property. The heartwood is astringent, bitter, acrid, cooling, anti-inflammatory, union-promoter, depurative, urinary astringent, haemostatic, anthelmintic, constipating & rejuvenating. It is useful in vitiated conditions of kapha & pitta. Inflammations, fractures, bruises, leprosy, skindiseases, leucoderma, diabetes, diarrhea, dysentry, gout, rheumatoid arthritis, cough, asthma bronchitis & greyness of hair The plant based antioxidants are a kind of phytonutrient or plant based nutrient. The body also produces some antioxidants, known as endogenous antioxidants. If body can't process and remove free radicals efficiently, oxidative stress can result. This can harm cells and body function. Some Factors increases the production of free radicals in body internally by inflammation or externally by UV exposure, pollution, cigarette smoke. Oxidative stress level has been linked to heart disease, cancer, stroke, respiratory diseases, arthritis, immune deficiency. Antioxidants are working for neutralize the free radicals in our bodies, boost the immune system, slow down the aging, increases vitality of life. It is need for mankind of the world. Antioxidants are enhance the human life, free from diseases & increases life of human body.

KEYWORDS: Beejak, Heartwood, Antioxidant, Rasayana.

INTRODUCTION

The history of herbal medicine is as old as human civilization and even in the current scenario; near about 75-80% of the world population relies on the medicinal plants for primary health care.[1] The reason being that they are easily available, cheap and devoid of side effects.[2] WHO states that the herbs are used two to three times more than the conventional drugs as remedies for various ailments.[3] Various plants have been used since ages as medicine. Pterocarpus marsupium is one such plant which has proved itself as versatile plant with a broad spectrum of pharmacological actions. It has been mentioned in various traditional systems of medicine like Ayurvedic, Unani and Homeopathic systems of medicine.[4] Pterocarpus marsupium Roxb.-Fabaceae (BEEJAK HEARTWOOD) known as Indian Kino Tree or Malabar Tree in English; Vijayasar or Bija in Hindi and Asana in Sanskrit is indigenous to India, Nepal and Sri Lanka.[5,6] It is found specifically in the areas of the Western Ghats, in the Karnataka-Kerala region, in the states of Gujarat, Madhya Pradesh, Bihar and Orissa.[7] BEEJAK HEARTWOOD find its place in the Rasayans group of Ayurveda.[8] Due to the exploitation of the tree for its timber and medicinal bark, its population is decreasing in the wild and thus, it has been mentioned in the red data book.[9] BEEJAK HEARTWOOD is a medium to large sized deciduous tree growing upto 30m in height and 2.5 m in girth[10], with dark brown to grey bark having superficial fissures; leaves compound and imparipinnate; flowers yellow in terminal panicles; fruit circular, flat, winged pod; seed convex & bony.[11] Flowering and fruiting duration of the tree is from March to June.[12] The major phytoconstituents of BEEJAK HEARTWOOD are pterostilbene and marsupin.[13,14] Others being liquirtigenin, iso liquirtigenin, pterosupin, p-hydroxybenzaldehyde, 7, 4'-dihydroxyflavone[14], propterol[15], marsupol[16], carsupin[17] and so on. Different plant parts of BEEJAK HEARTWOOD have been used for various diseases like leaves for boils, sores, skin diseases and stomach pain; flowers for fever; Gum-Kino for diarrhea, dysentery, leucorrhoea etc. and bark as astringent & for toothache.[18,19] Decoctions of bark and resin have been used traditionally for the treatment of tumours of the gland, urethral discharges and as abortifacient.[20] The heartwood possesses astringent, anti-inflammatory, anti-diabetic and anodyne properties.

AIMS AND OBJECTIVES

AIM

To Study Antioxidant property of Beejak Heartwood W.S.R. Rasayana Karma.

OBJECTIVE

To study of physiochemical and phytochemical properties of Beejak Heartwood Extract.

DISCUSSION

Assam. - Ajar Beng. - Piyasala, Pitasala.

Eng. - Indian Malabar Kino, Indian Kino, Gummy Kino Guj. - Biyo Hindi - Bija, Bijasal, Vijayasara Kan. - Bijasara, Asana Kash. - Lal. Chandeur Mal. - Venga Mar. - Biyala lakda, Bibala Punj. – Chandan Lal, Channanlal Sans. - Pitasala, Asana, Sarfaka, Pijaka Tam. - Vegaimaram chakkal, Nengai Tel. - Paiddagi Chekka, Yegi, Vegisa Urdu – Bijasar.

Scientific Classification

Family: Fabaceae Domain: Eukaryota Kingdom: Plantae Subkingdom: Viridaeplantae Phylum: Magnoliophyta Subphylum: Euphyllophytina Class: Magnoliopsida Subclass: Rosidae Super order: Fabanae Order: Fabales Genus: Pterocarpus Species: Marsupium.

OCCURRENCE AND DISTRIBUTION

BEEJAK HEARTWOOD has been traditionally used for its medicinal value. It is found mostly in deciduous and evergreen forests in western, central and southern regions of India including the states of Bihar, Madhya Pradesh, Gujrat and Bihar. Plant description BEEJAK HEARTWOOD is 15-30 meters high tree. Leaves compound, imparipinnate; leaflets 5-7, oblong, obtuse, emarginated, glabrous with round, smooth and waved petioles; stipules absent. Large and terminal panicles. Rounded peduncles and pedicels. Small, caduceus, solitary bracts. Numerous, white flowers with a yellowish tinge. Vexillum with a long, slender claw; sides reflexed, waved, curled and veined; keel two pettled. 10 stamens united near the base and dividing into 2 groups of 5 each. 2-lobed and globose anthers. Oblong, pedicelled, hairy ovary. Ascending style. Single and reniform seeds. Crooked and stout stem with widely spreading branches. The heartwood is golden yellowish-brown with darker streaks and occurs as uneven pieces of erratic sizes and thickness. On drenching in water, it gives a yellow colour solution with blue florescence. Strong, hard and tough fracture. Taste astringent, odour nil.

Ayurvedic Profile

Medicinal Properties

Guna (Qualities) - Laghu (light to digest), Ruksha (dry) Rasa (Taste) - Kashaya (astringent), Tikta (bitter) Vipaka (post-digestive taste) - pungent Veerya (Sheeta) - Coolant Effect on

tridosha – balances kapha and pitta dosha Dosage – Decoction 50-100 ml; powder 3-6 gm Pterocarpus marsupium uses Keshya – improves hair strength, promotes hair growth Medohara – reduces fat and cholesterol levels Rasayana – anti-ageing, causes cell and tissue rejuvenation Indicated in Raktapitta – bleeding disorders such as nasal bleeding, heavy periods etc. Krumi - worm infestation Visarpa – herpes Kushta – skin diseases Shvitra – leucoderma, vitiligo Meha – diabetes, urinary tract infections Gala dosha – throat disorders Raktamandala – ring worm infestation Ayurvedic medicines with Beejak as ingredient Asana manjishtadi taila – for treatment of headache and eye disorders Asana cladi taila – for treatment of headache, ear and eye disorders Asana vilwadi taila – for treatment of headache, ear and eye disorders Narasimha Rasayan – for treatment of weakness, weight gain, hair growth and rejuvenation Classical Categorization Susruta – Salaasaradi gna Vabhata – Asanadi Gana Kaiyadeva Nighantu – Oshadhi Varga Dhanvantari Nighantu – Amradi Varga Bhavaprakasha – Vatadi Varga Rajanighantu – Prabhadradi Varga Pharmacological activities: Analgesic Activity In an investigation, BEEJAK HEARTWOOD leaves were successively extracted with petroleum ether, ethyl acetate and methanol. Then these extracts were utilized for studying the analgesic activity by acetic acid induced writhing assay in Swiss albino mice.

Significant analgesic activity was shown -methanol extract being most potent followed by ethyl acetate and petroleum ether extracts. The central analgesic activity of BEEJAK HEARTWOOD bark extract studied using the hot-plate method showed that the pain threshold reduced and the response latency period to thermal stimulus in mice increased in the same manner as that of the reference drug-Pentazocine. Anti-bacterial Activity The antibacterial activity of BEEJAK HEARTWOOD stem methanolic extract was tested against gram positive bacteria-Bacillus coagulans and gram negative bacteria- Escherichia coli using the paper disc diffusion method. 100mg/ml concentration significantly inhibited the growth of both the bacterias. The Hexane, ethyl acetate and methanol extracts of BEEJAK HEARTWOOD bark and leaves have shown antimicrobial activity against four selected Gram positive and Gram negative bacteria. In vitro studies have shown that BEEJAK HEARTWOOD inhibits Pseudomonas aeruginosa, Streptococcus pyrogens and Staphylococcus aureus. Another research investigation showed positive indications for anti-microbial activity against two gram positive (Enterococci and Staphylococcus aureus) and negative (Escherichia coli and Pseudomonas aeruginosa) microbial organisms and a fungal strain Candida albicans. BEEJAK HEARTWOOD ethanolic extract was evaluated for antimicrobial potential against Bacillus polymyxa, Vibrio cholera and Candida albicans using

cyclic voltammetry. The low anodic current and low anodic peak potential were obtained indicating the good reducing ability of the molecules resulting in good antioxidant activity of the extract. The results depicted the significant antimicrobial activity at different dosages.

Anti-oxidant

Activity The anti-oxidant potential of BEEJAK HEARTWOOD bark (aqueous, methanol and ethyl acetate extract) has been investigated with the aid of numerous antioxidant models, viz DPPH, ABTS, NO, OH, SO and inhibition of in vitro lipid peroxidation. The findings indicated the free radical scavenging potential of BEEJAK HEARTWOOD. 1,1-diphenyl-2-picrylhydrazyl assay was used to evaluate the in vitro anti-oxidant potential of BEEJAK HEARTWOOD bark extract and the results were expressed as IC50. BEEJAK HEARTWOOD showed the IC50 of 53.0 µg/ml as compared to that of ascorbic acid (standard) with IC50 of 34.0 µg/ml. In a study, BEEJAK HEARTWOOD extract sheltered the cardiac muscles against the oxidative stress induced by H2O2.

CONCLUSION

The current review has focused on the numerous pharmacological activities of BEEJAK HEARTWOOD mainly, antibacterial anti-oxidant. Most of the studies have utilized the BEEJAK HEARTWOOD extracts while there are a very few clues exhibiting the activity of isolated phytoconstituents like epicatechin, pterostilbene, marsupin, pterosupin, liquirtigenin etc.

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