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Research Article

PHARMACOGNOSTICAL STUDIES ON ROOTS OF *AERVA JAVANICA*

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ABSTRACT

The indigenous plant which is selected in the present study was *Aerva javanica* belonging to family *Amaranthaceae*. *A. javanica* roots and flowers are reported to possess medicinal properties against rheumatism and kidney problems. *A. javanica* is used as *Pasanabheda* means one which breaks the kidney stone and in Gujarati it is commonly known as *Patharphod*. To establish pharmacognostical and phytochemical quality control parameters of root of *A. javanica*. Pharmacognostical evaluation including examination of morphological and microscopical characters, determination of quality control parameters such as ash values, extractive values, moisture content and foreign matter were carried out. Phytochemical screening including qualitative chemical examinations was also carried out. Hence, the present attempt was undertaken to investigate the pharmacognostical studies of *A. javanica* root. The study revealed the presence of cork, indistinct phellogen, 6 to 7 layer of phelloderm present in the periderm region with secondary structures of stellar region in the root of the *A. javanica*. In the crude powder structures mainly observed were cork, fibers, calcium oxalate crystals, vessels with bordered pits and ray cells. Phytochemical screening of root of *A. javanica* showed the presence of phytoconstituents like flavonoids, alkaloids, tannins, etc. The morphological, physicochemical and histological study to establish the authenticity of *A. javanica* root and can help to identify the plant from its other species.

Keywords: *Aerva javanica*, macroscopic characters, microscopic characters, physicochemical studies, phytochemical studies.

INTRODUCTION

Ancient literature has prescribed various herbs for the cure of kidney disease. The term "*Pasanabheda*" has been cited in the literature to identify the group of plants which have been extensively used in the indigenous system of medicine to dissolve urinary calculi and stones like *Coleus aromaticus*, *Aerva lanata*, *Aerva javanica*, *Rotula aquatica*, *Kalanchoe pinnata*, *Ocimum basilicum*. The plant *Aerva javanica* belonging to the family *Amaranthaceae* is a tall and woolly under shrub found plentiful in rainy season. This plant is used as *Pasanabheda* means one which breaks the kidney stone¹. In Gujarati it is commonly known as *Patharphod*. Roots and flowers are reported to possess medicinal properties against rheumatism and kidney troubles². The selected plant is also reported as anthelmintic, diuretic, demulcent³. It is used for the treatment of headache⁴. The decoction of the plant is administered to remove swellings⁵⁻⁶. Applied to acne like conditions of the face⁷. It contains kaempferol, sterol, triterpenes, flavanoids, β -sitosterol, α -amyrin, palmitic acid, stearic acid, linoleic acid, myristic, oleic acid, palmitoleic acid, aervanone, alkaloids, and an acylated iso-rhamnetin glycoside as phytoconstituents⁸⁻⁹. The *Aerva javanica* root is not evaluated pharmacognostically. Therefore, the present study was undertaken to evaluate the pharmacognosy of root of *A. javanica*.

MATERIALS AND METHODS

Plant material

Fresh roots of *A. javanica* were collected from Bhavnagar District, Gujarat, India. The authentication of the plant

was established and voucher specimen (202) deposited in the Department of Pharmacognosy and Phytochemistry, KBIPER, Gandhinagar, Gujarat, India. Identification of this plant was done by taxonomist Dr. A.S. Reddy, department of bioscience, S.P. University, V.V. Nagar, Gujarat, India. It was shade dried and reduced into coarse powder and stored in air tight container which was used for the present work.

Chemicals and instruments

Compound microscope, glass slides, cover slips, watch glass and other common glass ware were the basic apparatus and instruments used for the study. Solvents viz. petroleum ether, benzene, chloroform, acetone, 95% ethanol, n-butanol and reagents viz. phloroglucinol, glycerin, hydrochloric acid (HCl), chloral hydrate and sodium hydroxide were procured from Ranbaxy Fine Chemicals Ltd., Mumbai, India.

Macroscopic and Microscopic analysis

Fresh roots of *A. javanica* was studied and identified by their morphological characters as per literature. For microscopical studies free hand section of the fresh root were taken, cleared with chloral hydrate solution and studied according to Schulz maceration method. The lignified elements were visualized by staining the section with a drop of hydrochloric acid and phloroglucinol¹⁰. Photomicrographs were shot for histological observation (Labomed). The powder of dried root bark analysis was done according to the method of Brain and Turner¹¹ and Kokate¹².

