

# Can local health traditions and tribal medicines strengthen Ayurveda?

## Case study 1. *Janakia arayalpathra* Joseph & Chandras.

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### Abstract

During a recent gathering of phytochemists, pharmacologists, botanists and Ayurveda experts in connection with an International Symposium on Plant Chemistry, it was discussed that Ayurvedic drugs should be standardised with a view to develop products with consistent quality and efficacy. Some of the phytochemists expressed the view that standardisation of Ayurvedic drugs is a difficult task because of the fact that most of the drugs contain two or more plants having hundreds of chemical entities. Moreover Ayurvedic drugs exert a synergistic effect and the preventive, promotive and curative effects of the drugs are attributed to the synergistic effect of the component molecules. Therefore, it is often difficult to develop quality standards for Ayurvedic drugs. What is generally done is identifying marker compounds in individual plant drugs and then quantitatively estimate these marker compounds and this is taken as a criterion for the quality/purity of the drug.

**Keywords:** *Ayurveda, Local health traditions, Flavanoids, Ethnomedicines, Cyto protective*

### Introduction

The Ayurvedic experts who were present in the symposium vehemently opposed the application of modern science and scientific tools in assessing the quality and efficacy of the drugs. They emphasised that Ayurveda is a Shastra which has its own fundamental, philosophical and theoretical principles. The epistemology of Ayurveda is fundamentally different from that of Western Medicine. Therefore, Ayurvedic drugs cannot be evaluated using the principles and guidelines of Western Medicine. The ayurvedic drugs have been perfected over the years through continuous open clinical trials, observations and inferences.

Ayurveda as a Shastra has evolved over the millennia beginning from the Vedic period (2000- 1000 BC). Subsequently, Ayurveda went on expanding over the Samhita period (1200-400 BC). Later more texts

such as Ashtagahridaya (100 AD), Resavyseshikam (100 AD), Sarangadhara Samhita (1400 AD), Bhava Prakasha (1600 AD) were added to the Ayurvedic literature, which indicated that, this Shastra continuously expanded adding more and more new drugs based on clinical and practical observations and inferences. Thus, Ayurveda as a Shastra was never static but dynamic, ever expanding, ever absorbing and assimilating, always open to additions as well as to deletions based on observations and inferences. This dynamism of the great Shastra suffered a serious setback during the Mughal and European rule. The new rulers encouraged the popularisation of their own medical systems which hampered the growth and development of Ayurveda in the subsequent centuries. Thus, during the past four centuries we do not observe much expansion in this great Shastra. It is imperative that the present day scholars of

Ayurveda should revive the lost dynamism of this great 'Science of Living' with a view to restore its glory and universal application.

Ayurveda is the greatest contribution of ancient India to the welfare of mankind. Students from far and near came to the ancient centres of learning in India to study medicine and the art of surgery and healing from our great masters. These students spread the knowledge of Ayurveda and other sciences in their own countries. It is said that the Greeks who came to India to study in our centres of learning went back and developed their own systems of health practices which later formed the basis of Western Systems of Medicine. The Arabic, Unani and even Chinese Systems of Medicine were influenced by the fundamental principles of Ayurveda and there are many things in common in these systems with Ayurveda.

In independent India, Ayurveda got a fillip from the subsequent governments and now Ayurveda is on the path of revival trying to bring back its ability of dynamism and absorption of new ideas and thoughts. However, in order to get a manufacturing license for an Ayurvedic drug, it is now mandatory that the plants which are used as ingredients in the drug should find a mention in the first schedule of books written several centuries ago. This in fact prevents addition/entry of new plants in Ayurvedic formulations. Here the Ayurvedic experts should try to interpret and explain the medicinal properties of new plants on the basis of Ayurvedic Pharmacology (*Dravyaguna*), and other basic principles. This way, the science of Ayurveda can be revived and can gain universal acceptance and application. The official list of plants that can be used in Ayurvedic drugs is limited to about 850 plant species. Today we know about 5,00,000 plant species of which 30,000 species are acknowledged as having medicinal properties by different cultures as well as by modern scientific studies. These plants can very well enrich Ayurvedic Pharmacopoeia and strengthen

the arsenal of Ayurvedic Physicians in confronting new and emerging diseases.

Side by side with Ayurveda, there flourished an oral system of medicine in the rural areas of our country. These oral traditions include Local Health Traditions (LHTs), tribal medicine, folklore, etc. Kerala has a sizable number of tribes living on the hill ranges mainly in the Western Ghats bordering Karnataka and Tamil Nadu. The tribals in the Kerala hills include Adiyar, Irular, Kattunayikkan, Kurichian, Malavedan, Mannan, Alar, Kadar, Kochuvelan, Kuruman, Malakuravan, Muthuvan, Aranadan, Kammara, Koraga, Kurubar, Malasar, Mudugar, Cholanayikkan, Kanikkaran, Koda, Malapandaram, Malayan, Palaiyan, Iravallan, Kani, Kudiya, Malapulayan, Malaarayan, Paniyan, Ulladar and Oorali. These people make use of a large number of medicinal and aromatic plants for solving health problems. Many of these tribes have rich knowledge on the medicinal properties of a large number of plants available in the Western Ghats which are not known to the outside world and therefore these are to be subjected to scientific studies with a view to verify the traditional health claims on these plant species.

As part of our programme to investigate the medicinal properties of the plants used by tribes in traditional medicine, we have undertaken detailed scientific investigation of a few plants. One such plant we studied was *Janakia arayalpathra* Joseph & Chandras. [*Decalepis arayalpathra* (J. Joseph & V. Chandras.) Venter.] locally known as Amruthapala, which was taxonomically identified a few decades ago. The morphology, ethnomedical use, chemistry and pharmacology of *Janakia arayalpathra* is briefly reviewed in this article. Certainly this plant merits serious consideration by the Ayurvedic scholars for official recognition as an Ayurvedic herb.

### **1. *Janakia arayalpathra* Joseph & Chandras.**

The plant was first described by Joseph and Chandrasekharan of Botanical Survey of India in



*Janakia arayalpathra* Joseph et Chandras. - Habit

1978<sup>1</sup>. As the plant was found out to be an entirely new genus of the family *Periplocaceae*, Joseph and Chandrasekharan who first located this plant at Kurisumali near Thiruvananthapuram in Kerala named the genus as *Janakia* in honour of the great Indian Botanist Dr E K Janaki Ammal. The specific epithet is after the resemblance of its leaves with that of the 'Arayal Pathra' (Arayal is local name for *Ficus religiosa* Linn).<sup>2</sup>

**Description:** It is a woody shrub with root tuberous, strongly smelling. Stem, leaf-stalks and leaves reddish brown. Leaves are like that of Peepal, 4-6. 5 x 2-3. 5 cm, ovate, apiculate at tip, round to broadly attenuate at base, entire or slightly wavy on margins; vein reticulations prominent on lower side; leaf-stalks 2. 5-3 cm long. Small flowers are borne in axillary cymes, carried on slender, 2-3 cm long stalks. Calyx is bell-shaped tube about 0. 1 cm long, sepals 5, 0. 05-0. 1 cm long, ovate. Stamens 5 Carpels

2, apocarpous; ovules many in each carpel; stigma 5-angled. Follicles are linear, 3-3.5 cm long, 0.5-0.6 cm diameter, cylindric, tip tapering. Seeds many, 0.5-0.6 cm long, 0.25-0.3 cm wide, laterally compressed, winged on margins; wings variously curved; coma of white silky hairs 1. 5-1. 8 cm long<sup>3</sup>.

**Distribution:** Amruthapala is endemic to forests of the southern Western Ghats region of Kerala, distributed at an elevation of 800-1200 m and growing in the crevices of rocks<sup>3</sup>.

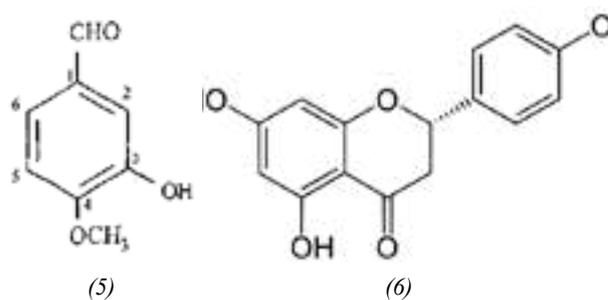
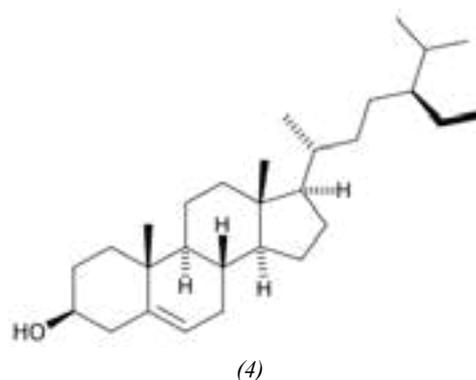
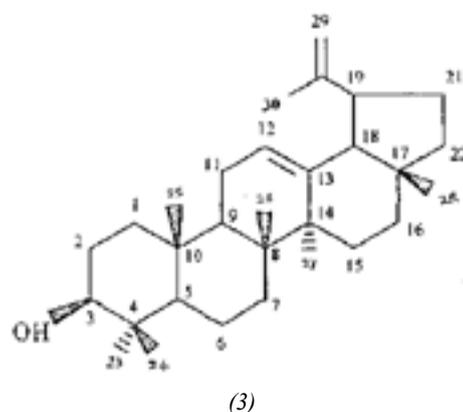
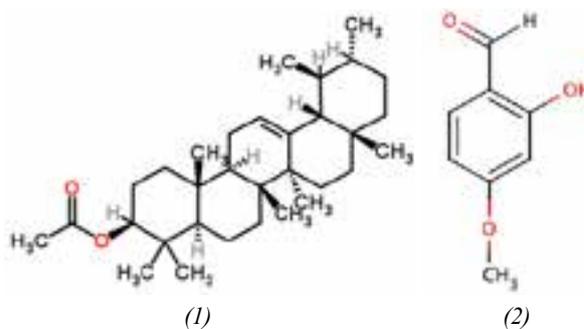
**Ethnomedical use:** Amrithapala, a rare and endemic plant species found in the Southern forests of Western Ghats region of Kerala, is used by the local 'Kani' tribe as an effective remedy for peptic ulcer, cancer-like afflictions and as a rejuvenating tonic. Search made in Ayurvedic literature indicates that the plant may be the divine drug named variously as Mritha Sanjeevini (the drug that can revive unconscious or dead) or Sanjeevini, Thampra Rasayani in the Oushadha

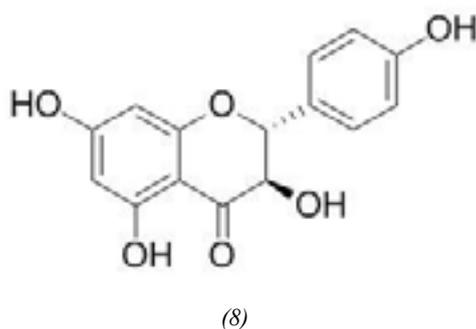
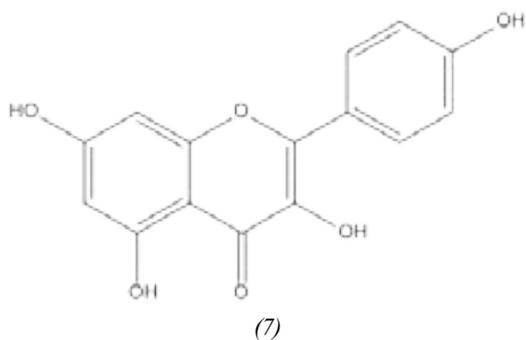
Nighantu (Dictionary of Medicinal Drugs) of Tayyil Kumaran Krishnan (1906). The health tradition of the 'Kani' tribe inhabiting the forests of Western Ghats region of Kerala is having a rich knowledge-system on tribal medicines of India<sup>4</sup>.



*Janakia arayalpathra* Joseph et Chandras. - Flowering twig

**Chemistry:** From the hexane, chloroform and methanol extracts of the roots of *Janakia arayalpathra* eight compounds have been isolated. These compounds have been characterized as  $\alpha$ -amyrin acetate (1), 4-methoxy salicylaldehyde (2), magnificentol (12,20(29)-lupadien-3-ol) (3),  $\beta$ -sitosterol (4), 3-hydroxy-p-anisaldehyde (5), naringenin (6), kaempferol (7) and aromadendrin<sup>5</sup> (8). Verma *et al.* (2014) studied the root aroma of *D. arayalpathra*. The volatile oil isolated from the root had 2-hydroxy-4-methoxybenzaldehyde (2) (96.8%) as the major compound which has a characteristic vanilline like odour<sup>6</sup>.





**Pharmacology:** Subramoniam *et al.*, (1996) studied the immunomodulatory and anti-tumor activities of *J. arayalpathra*. The root suspension (JARS) was found to stimulate the immune system in mice. JARS 500 mg/kg elicited an increase in humoral antibody titre and antibody secreting spleen cells. It also enhanced sheep RBC-induced delayed hypersensitivity reaction in mice. Furthermore, the members of blood granulocytes and peritoneal macrophages were found to be increased in JARS treated mice. Treatment with JARS protected mice from Ehrlich ascitic carcinoma cell growth<sup>7</sup>.

Shine *et al.*, (2007) reported the gastric antisecretory and antiulcer activities of *D. arayalpathra*. The ethanol extract of DA roots significantly decreased the pepsin secretion at a dose of 250 mg/kg and the gastric juice volume and acid output at a dose of 500 mg/kg in pylorus ligated rats. Pretreatment with the extract (500 mg/kg, p.o.) provided significant protection against the peptic ulcerogenic effect of ethanol administered individually or in combination with indomethacin or hydrochloric acid. The study also revealed that pretreatment with DA significantly

decreased malondialdehyde levels and increased gastric wall mucus production and the protein concentration of the stomach wall of ethanol-treated rats at a dose of 500 mg/kg. The gastroprotective effect of DA observed in the current study may be attributed to its effect on stimulating protein concentration and mucus production of the stomach wall. In addition to its gastric antisecretory activity, DA exerts a cytoprotective effect, which could be partly due to the presence of antioxidant phytochemicals like flavonoids<sup>8</sup>.

**In vitro propagation:** *Janakia arayalpathra* is critically endangered and endemic ethnomedicinal plant in the forests of the southern Western Ghats which is over exploited for its tuberous medicinal roots by the local Kani tribes. Natural regeneration is rare and conventional propagation is difficult. Sudha *et al.*, (2005) reported a protocol for successful micropropagation of the *D. arayalpathra*<sup>9</sup>.

**Patents obtained:** Two patents have been obtained based on the study conducted on *J. arayalpathra*. Indian Patent No. IN191799 dated January 2004 was awarded for the Patent application entitled “A process for preparation of an anticancer drug from the roots of *Janakia arayalpathra*”<sup>10</sup>. Another patent was granted for a multi-drug combination containing *Janakia arayalpathra* root and *Trichopus zeylanicus* leaf, entitled “A process for preparation of a novel herbal medicinal composition for cancer treatment from *Janakia arayalpathra* root and *Trichopus zeylanicus* leaf”, Indian Patent No. : IN193609 dated 22. 09. 2006<sup>11</sup>.

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