



# PHYTOCHEMICAL VARIABILITY AND ANTIOXIDANT POTENTIAL OF *JEEVANTI* IN COMMERCIAL SAMPLES

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## Abstract:

**Background:** *Jeevanti* is best among leafy vegetables and also has many actions like Antioxidant, Lactogenic, and Rejuvenating etc. Free radicals lead to many diseases. And these can be corrected by Antioxidants. *Jeevanti* being an Antioxidant, can be used to tackle these diseases. Thus, to check the genuinity and purity genuine and market samples were collected and compared to the standard values and also their Antioxidant activity is done. **Objectives:** • To procure the different market samples of India and genuine sample from natural habitat. • To analyze and compare the market samples and genuine sample with Standards by Phytochemical and Qualitative parameters.

• To evaluate the Antioxidant activity of all the samples by In Vitro method. **Materials and Methods:** • Genuine samples of *Leptadenia reticulata* were collected from Jamnagar, Gujarat. • The market samples were collected from different markets of India (Karnataka, Rajasthan, Delhi and West Bengal). **Results:** All the samples were screened for Physicochemical, Phytochemical & Quantitative analysis, and Antioxidant activity. All the market sample & genuine sample's Physicochemical analysis, Phytochemical analysis, TLC and HPTLC are within the standard limit. The ethanolic extracts of both the samples showed higher Antioxidant property than aqueous extracts. **Conclusion:** The market sample compared to *Jeevanti* has similar phytochemical constituents & proven to be a source of antioxidant in present study, *Dendrobium macraei* can be considered as the substitute for the *Jeevanti* in regards to its Antioxidant property.

**Keywords:** *Jeevanti*, Phytochemical analysis, HPTLC, Antioxidant activity.

## I. INTRODUCTION

Dravya is one among Chikitsa chatushpada, which is placed next to Vaidya.[1] To attain success in chikitsa, Dravya should be genuine and pure. Now a days it's difficult to get genuine drug unless physician himself procures the drugs.

Herbal medicines are used widely, so the demand for raw drug has increased. To meet the demand and also to get the financial benefits, the herbal drugs in the market are prone to be substituted and adulterated. Hence, one should have the proper knowledge of herb market.

In classics of Ayurveda, there are many herbs mentioned which are used both as food and medicine with multifaceted activities, one such drug is *Jeevanti*. Regarding botanical source of *Jeevanti*, it is *Leptadenia reticulata* (Retz.) Wight & Arn. as per API. But in various geographical parts of India, many botanical sources are used and sold in the name of *Jeevanti* like, *Daemia extensa* R. Br, *Holostemma annulare* (Roxb.) K. Schum, *Watakaka volubulis* (L.f.) Stlapf are also identified and used as *Jeevanti*. [2]

Now a days, due to fast pace of life, change in lifestyle human beings are encountered with many diseases which may harm the quality of life. One reason for those diseases are free radicals. Free radicals are one short of electron; to quench their thirst, they harm other neighboring molecules and hence leads to pathological condition. So, as a solution for the condition there is a need for cost-effective, nature friendly drug which can act as an anti-oxidant.

*Jeevanti* is Rasayana dravya. It has Madhura, Tikta rasa, Sheeta veerya, Madhura vipaka, Snigdha and Laghu guna. Therefore, *Jeevanti* is expected to have Antioxidant activity. Hence the study "A Pharmacognostical and Phytochemical Analysis of different Market Samples of *Jeevanti* with special reference to its Antioxidant Activity- An In-Vitro Study".

## II. MATERIALS AND METHODS:

Genuine sample was collected from Jamnagar, Gujarat and different market samples were collected from East, West, North and South parts of India (Kolkata, Jaipur, Delhi and Bengaluru). As all the market samples were of same species *Dendrobium macraei* when authenticated hence, one of the market samples (Bengaluru Sample) was subjected to further study. Bengaluru sample was selected, as Karnataka is native to Research study. As all the market samples were of same species *Dendrobium macraei* when authenticated hence, one of the market samples

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Powder Microscopy of genuine and Bangalore samples were carried out through standard procedure.[3] Physicochemical studies like Total ash, Acid insoluble ash [3] and Phytochemical studies like Tannins, Alkaloids, Flavonoids, etc were carried out according to the standard procedures mentioned in API.[3] Further, TLC and HPTLC were carried out for quantitative estimation of beta- sitosterol in the samples. Antioxidant Activity was carried out by DPPH method.[4]

## III. RESULTS:

### A. Macroscopic Features

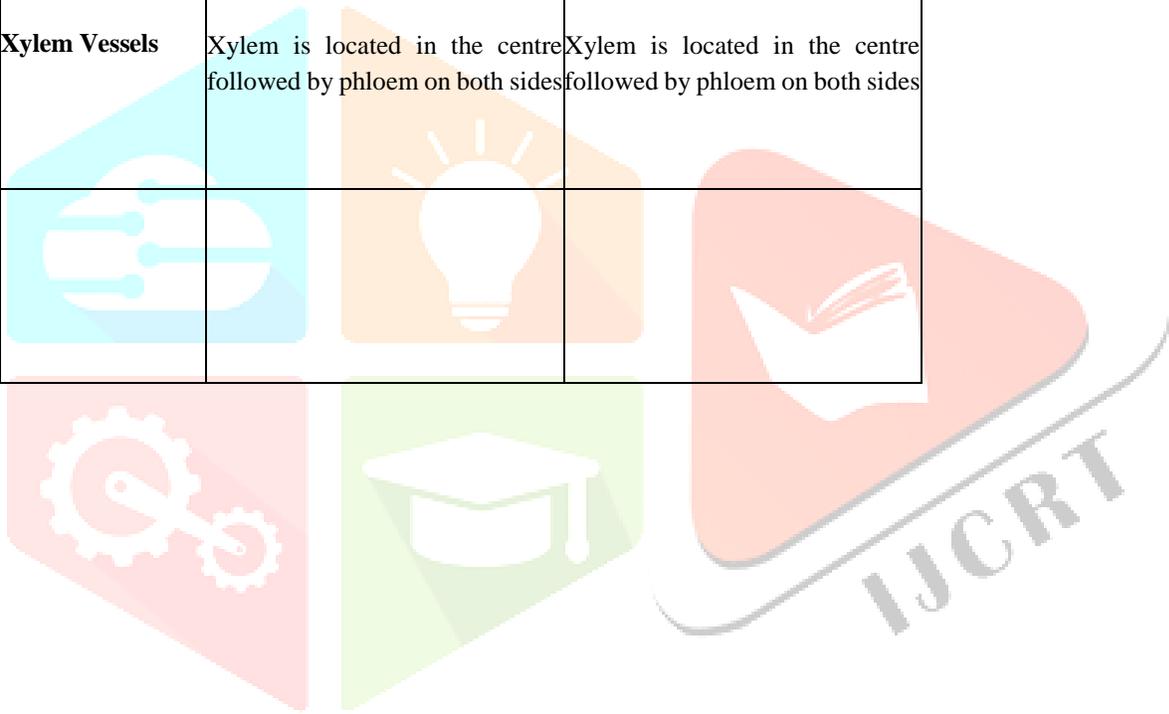
Table No. 1 Comparative macroscopic features of samples

Characters	Sample I	Sample II	Sample III	Sample IV	Sample V
Physical appearance	Thick, Woody pieces of Roots	Thin pieces of roots			
Colour	Light brown	Brown	Brown	Brown	Brown
Odour	Distinct	Distinct	Distinct	Distinct	Distinct
Taste	Astringent	Astringent	Astringent	Astringent	Astringent
Texture	Rough	Rough	Rough	Rough	Rough

1.1 Powder microscopy

Table No. 2 Comparative Microscopic Characteristics of powder samples

Characters	Sample I	Sample II
<b>Fibres</b>	Fibres appear long	Fibres appear needle shaped
<b>Cortex</b>	Cortex is narrow and composed of rectangular elongated thin-walled parenchymatous cells	Cortex is narrow and composed of rectangular or elongated cells thin-walled parenchymatous cells
<b>Xylem Vessels</b>	Xylem is located in the centre followed by phloem on both sides	Xylem is located in the centre followed by phloem on both sides



<b>Trichomes</b>	Multicellular	Multicellular
<b>Cork cells</b>	Cork cells are polygonal and radially elongated	Cork cells are polygonal and radially elongated
<b>Stone cells</b>	Stone cells narrow and broken	Stone cells are sharp like thorn
<b>Starch grains</b>	Starch grains are of various size and are mostly oval	Very few starch grains are present and are oval in shape

### 1.1 Phytochemical Analysis

Table No. 3 Physicochemical Analysis of powders of *Jeevanti*

Parameters	Sample I	Std Values	Sample II	Std Values
<b>Total Ash</b>	10%	<14%	5.4%	<6%
<b>Acid Insoluble Ash</b>	1.3%	<1.5%	1.3%	<1.5%
<b>Moisture content</b>	7.8%	<10%	9.6%	<10%

### 1.2 HPTLC Analysis:

HPTLC Analysis done to quantify active principles of the samples. (Genuine and market samples.

In the samples, *Leptadenia reticulata* shown maximum Rf value - 0.511 and *Dendrobium macraei* shown maximum Rf value - 0.677.

### 1.3 Antioxidant Activity: In-Vitro Method

#### 1.3.1 DPPH Assay:

The antioxidant activity of aqueous extract of *Leptadenia reticulata* showed 75% and *Dendrobium macraei* 22.04%. The antioxidant activity of ethanolic extract of *Leptadenia reticulata* showed 93.18% and *Dendrobium macraei* 93.18%. The ethanolic extracts of both the samples showed higher antioxidant property than aqueous extracts.

## IV. DISCUSSION:

Herb medicines now a days are in huge demand because of its natural origin and more safety concerns. Hence to meet the demand of herb medicine, the over exploitation of natural sources is being done along with that the herb medicine which are of less population lead to substitution or adulteration.

Indian flora has many natural medicinal floras, which can be traced in Ayurvedic classics. One among them is *Jeevanti*.

*Jeevanti* is an herb having multifaceted activities and also it has got many botanical sources attributed with. In various parts of India, many botanical sources are identified and used as *Jeevanti*. Hence, this study is carried out for different market samples of *Jeevanti* with its antioxidant activity.

The *Jeevanti* controversy started because of its synonyms like *Arkapushpi*, *Payaswini*, *Swarna Jeevanti*, etc. But as per Classical references and the standard textbooks *Leptadenia reticulata* is considered to be the genuine source of *Jeevanti*.

In regard to *Jeevanti*, the market samples were collected from Kolkata, Rajasthan, Delhi, Bengaluru. As the places were decided based on the market centre in East, West, North and South parts of India.

As all the market samples were of same species *Dendrobium macraei* when authenticated hence, one of the market samples (Bengaluru Sample) was subjected to further study. Bengaluru sample was selected, as Karnataka is native to Research study.

Both the samples, *Leptadenia reticulata* and *Dendrobium macraei* match with the microscopic features mentioned in standard textbooks. Hence, it is confirmation of botanical identity of respective samples.

Total ash value of genuine and market samples matches with the standard value, suggestive of absence of foreign matter. Both genuine and market samples having similar values as standard. Phytochemical Study of both alcoholic and aqueous extracts of *Leptadenia reticulata* shows positive results for Saponins, Flavonoids, Steroids, Terpenoids, Proteins and Carbohydrates and samples of *Dendrobium macraei* for Tannins and Phenols along with above constituents. It is the confirmation of identity of both the samples on chemical analysis.

Rf values are similar to the standard, the band present on plate suggestive of principles Apigenin, Quercetin, Isoquercetin, Luteolin present in that sample.

The Rf values of beta-Sitosterol in extracts of *Leptadenia reticulata* and *Dendrobium macraei* are 0.511 and 0.677 respectively.

Both the samples were found to be Antioxidants, but when compared to between the genuine sample and market sample, *Leptadenia reticulata* is having more Antioxidant property by DPPH method.

It suggests *Leptadenia reticulata*, genuine drug is having rich Antioxidant property, but in the market *Dendrobium macraei* has almost replaced the genuine drug. The *Dendrobium macraei* is also possessing the Antioxidant properties less compare to the genuine drug.

The ethanolic extracts of both the samples have higher Antioxidant properties than aqueous extracts because ethanol is better solvent than water to extract the bioactive compounds as Phenols and Flavonoids, which are having Antioxidant properties.

## V. CONCLUSION:

*Jeevanti* is one among those herbs which is used both as food and medicine. *Jeevanti* is used in many formulations and has more demand in market so, it is substituted with the herbs having similar properties. The market survey is suggestive of almost substitution of genuine drug (*Leptadenia reticulata*) with *Dendrobium macraei*. The reason for replacement of genuine drug is over exploitation of *Leptadenia reticulata* and easy availability of *Dendrobium macraei*. The market sample compared to *Jeevanti* has similar Phytochemical constituents and hence also has Antioxidant properties. Based on present study, *Dendrobium macraei* can be considered as the substitute for the *Jeevanti* in regards to its Antioxidant property.

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