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# A pharmacognostical study of *Anupa* and *Jangala Deshastha Shitivaraka* (*Celosia argentea Linn.*).

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**ABSTRACT**

The subject of standardization of *Ayurvedic* drugs is always a burning topict. Today it has become a must to give attention towards all the factors which affect the potency of the drug. After lot of observation it was found that the geographical variation and climate of the place of origin of the drug may be the major factor in influencing the potency of drug. Hence for current study soil samples collected from *Anupa(Ratnagiri)* and *Jangala(Jamnagar*) regions

The role of research in Ayurveda is not only to elucidate the principles of Ayurveda but also, to explain them in terms of modern parameters. Here the macroscopic, microscopic and powdered microscopy of sample Group-A(*Anupa*), Group-B (*Jangala*), is studied under pharmacognostical study.

**KEYWORDS**: Anupa-Jangala Desha**,** Shitivaraka**,** Pharmacognostical Study

## 1] INTRODUCTION

Since *vedic* times the references regarding use of medicinal plants is found. In *Samhita kala* and later on; the *Guru-Shishya* traditional method was the main pillar for *Ayurvedic* foundation. In those times, the knowledge of identification of drug was handed over from generation to generation. After extinction of this method; identification of the drugs and their utility was the main base for writing the *Nighantus*. And in this period much attention was paid towards the proper identification of plants not only on morphological basis but also organoleptic and other such methods like[1]

*swade tiktam kasha pitam cchede raktam tanua sitam ...Bhavprakash Nighantu*

But in today's era these identification tools have fallen short of in proper identification of the adulterated drugs, so the crux of the entire problem virtually revolves around proper identification of the drug.

The word pharmacognosy is formed by combination of 'Pharmakon' means a drug and 'gignosy' means 'to acquire knowledge'. So Pharmacognosy can be defined as a branch of biosciences that deals with the knowledge and authentification of medicinal and related products of crude or primary type originated from both plants and animals in the detailed form. Pharmacognosy is an important link between pharmacology and medicinal chemistry.

The original and basic approach towards pharmacognosy includes study of morphological system, study of cell structure and organization and study of tissue systems which still hold a key in identification of the correct species of the plant. Keeping all this in mind, a Pharmacognostical study was planned

## 2] AIMS AND OBJECTIVES

1. To study the Pharmacognostical character of *Anup* and *Jangal shitivarak.*
2. To compare macroscopic character of both the samples.
3. To compare microscopic character and powdered microscopy of both the samples.

## 3] MATERIAL AND METHADS

*Panchanga* of *Anupa Deshastha Shitivaraka* and *Jangala Deshastha Shitivaraka* were used as material for Macroscopic and Microscopic study. For powdered microscopy *Panchanga* powder was used.

BIOLOGICAL SOURCE-Fresh sample of *Anupa* and *Jangala Deshastha Shitivaraka* were collected for present study as botanical source of *Celosia argentea* Linn. FAMILY-- Amaranthaceae

COLLECTION OF SAMPLE

For present study scholar has collected both the samples of *Shitivaraka Panchanga* 1.]*Anupa Deshastha Shitivaraka* [*Celosia argentea* Linn.] from Ratnagiri-Maharashtra region; 2.]*Jangala Deshastha Shitivaraka* [Celosia *argentea* Linn.) from Jamnagar-Gujarat region and both were authenticated in the Pharmacognocy Department of IPGT & RA, G.A.U., Jamnagar.

PRESERVATION- The Whole plant was preserved in a solution made by the formulation as under[2],

1. Distilled water 90 %
2. Formaldehyde 05 %
3. Acetic Acid 05 %

## 4. OBSERVATION AND RESULTS

MACROSCOPIC STUDY:

ANUPA SAMPLE

Annular 30cm- 100cm in high glabrous; stem erect, simple, branches grooved and having reddish brown color. Leaves linear, acute, entire, alternate, leaves sessile, 1-6cm long 0.5-1 cm broad. Flowers; hermaphrodite, glistening white, crowded and imbricate, in close cylindric blunt spikes 2-7cm; Perianth 8 mm. long ; sepals linear lanceolate, acute scarious, with 3 close parallel slender striae on the back, lobes 5, slightly connate below Stamens 5, short, Filaments connate into a membranus hypogynos cup. ; anthers 2-celled dorsifixed. Ovary 1-celled, ovoid or subglobse; ovules 2 or more, on long funicles; style short , sometimes elongating in fruit; stigmas simple or 2 or 3 subulate. Fruit a utricle dehiscing incircumsciss fashion near the middle, membranous or sometimes coriaceous Seeds 1-3mm lenticular; testa crustaceous, black, shining ; embryo annular; surrounding floury albumen; cotyledons linear

JANGALA SAMPLE

It is glabrous annular herb reaching 30 cm to150 cm in height. Stem erect branches grooved and green colored. leaves alternate linear, acute, entire, 2-10 cm long 0.5-1.5 cm broad; nerves irregular, petiole 0

Flowers; in dense terminal cylindric spikes 2 to 12 cm long; slight pinkish and glistening white , Perianth 8 mm. long ; sepals linear lanceolate, acute scarious, sharply acuminate 3 nerved stamens with lender filaments about 3 mm long combined below in a cup 2 mm deep anthers 1-1.5 mm .long the bases finally divericate. Ovary ovoid very thin, style slender 5 mm long stigma small utricle 3-4 mm long ellipsoid, tapering into the persistent style circumcises about the middle. Seeds 4-8 lenticular , more or less compressed, 1-5mm in diameter ;testa black shining.

MICROSCOPIC STUDY:[3]

ANUPA SAMPLE

T.S. OF LEAF {ANUPA SAMPLE}

T.S. of leaf shows Dorsi-ventral nature of leaf

Upper Epidermis-it is single layered and cells are closely fitted together with no intercellular space. It contains outer thick layer called Cuticle which is transparent and it acts as a hard varnish-like coating and protects the inner cells against loss of water etc.

Lower Epidermis – it is also single layered and with thin cuticle.

Mesophyll- the tissue present between the two epidermal layers is 1.]Palisade parenchyma- below the upper epidermis there are two layers of elongated, cylindrical Palisade parenchyma cells which are closely packed with their long axes at right angles to epidermis and it contains some chloroplasts.

2.] Spongy parenchyma –it is oval, rounded and formed of irregular cells. These are loosely arranged towards lower epidermis, enclosing numerous intercellular spaces. The cell contains starch material.

Xylem- It lies towards the upper epidermis. It consists of vessels and tracheids.

Phloem- It lies towards the lower epidermis. It consists of sieve tube, companion cells and phloem parenchyma.

Bundle sheath-This is a compact layer of thin-walled parenchymatous cells, which is elongated and covers the vascular bundle.

Stomata- Anisocytic nature of stomata is seen under the microscope.

T.S. OF STEM {ANUPA SAMPLE}

Epidermis- it is simple permanent tissue, and forms the outermost layer and consists of single row of cells, flattened tangentially and fitting closely along their radial walls. Its function is to conserve the moisture supply to inner tissues and protection to certain extent against mechanical infection

Cortex--This lies below the epidermis and consists of the collenchyma and parenchyma. Collenchyma- This lies immediately below the epidermis and consists of 3-4 layers of collenchymatous cells. The cells are living and consists a number of chloroplasts. Parenchyma- It lies internal to the hypodermis (Collenchyma) and consists of a few layers of thin walled, large, rounded or oval parenchymatous cells. There are appearances of parenchyma with intercellular spaces.

Phloem--It is just below the cortex and composed by following element. a.]Sieve tubes- which appear as slightly larger cavity than the rest of the phloem and rest of the part is packed with small celled parenchyma called as phloem parenchyma.

Xylem- This is present internally and consists of the xylem vessels and tracheids. Here the xylem is centrifugal in nature, the smaller vessels' constituting the protoxylem

lies towards the center, and bigger one constituting the metaxylem lies away from the center. tracheids- It is surrounding the metaxylem and is lying in between them.

Medulary rays - 2-3 layers of radially elongated cells lying between two vascular bundles constitute the medulary rays and are not much prominent,as individual cells of these rays are very similar in character with surrounding cell.

Pith- the pith region of the young stem is comparatively wide and made up of large parenchyma cells, some of the pith parenchyma cells are thick walled.

T.S. OF ROOT {ANUPA SAMPLE}

Cork- T.S. of root shows a circular outline with a narrow and discontinuous cork. The cork consists of multilayered rectangular shaped and slightly tangentially elongated layer of cells. Outer cork cells have brownish black contents.

Cortex-This consists of many layers of thin walled rounded cells, with numerous intercellular spaces between them. In this there are 6-7 layers of parenchyma cells and they are oblong in shape, it contains starch and crystals.

Phloem- it is just on the inner side to cortex and is having 6-7 layers of phloem parenchyma along with transparent material. It consists sieve tube, companion cells and phloem parenchyma.

Xylem- Its arrangement is radial. It consists of vessels, tracheids and fibres. The vessels are various in size and scattered through the xylem region in radial form.

Pith- This is the inner most part of the root which is faint brown in color and starch material covered cells are surrounded to it.

JANGALA SAMPLE

T.S. OF LEAF {JANGALA SAMPLE}

T.S. shows Dorsi-ventral nature of leaf

Upper Epidermis- These cells are closely fitted together and there is no intercellular space between them. It forms single layer of the structure and, it contains outer thick layer called Cuticle which is transparent and it acts as a hard varnish-like coating and protects the inner cells against loss of water etc.

Lower Epidermis – it is also single layered and with thin cuticle.

Mesophyll- this is the portion present between the two epidermal layers.

1.]Palisade parenchyma- below the upper epidermis there are tow layers of elongated, cylindrical Palisade parenchyma cells which areclosely packed with their long axes at right angles to epidermis and it contains some chloroplasts

2.] Spongy parenchyma –They are oval, rounded and irregular cells. These are loosely arranged towards lower epidermis, enclosing numerous intercellular spaces. The cell contains starch material.

Xylem-It consists of vessels and tracheids and it lies towards the upper epidermis.

Phloem- It consists of sieve tube, companion cells and phloem parenchyma and it lies towards the lower epidermis..

Bundle sheath- This is a compact layer of thin-walled parenchymatous cells, which are elongated and cover the vascular bundle.

Stomata- Anisocytic nature of stomata is seen under the microscope.

T.S. OF STEM {JANGALA SAMPLE}

Epidermis it forms the outermost layer through single row of cells. Cells are almost same in size and shape, closely fitted together without intercellular space.

Cortex- this lies below the epidermis in cell arrangement Collenchyma- It is having 3 layers and these cell are thickened at corners against intercellular spaces. These cells are living and contain number of chloroplasts. Parenchyma- It lies internal to the hypodermis (Collenchyma) and consists of a few layers of thin walled, large, rounded or oval parenchymatous cells with intercellular spaces.

Phloem-it is just below the cortex and composed of Sieve tubes- which appear as slightly larger cavity than the rest of the phloem and rest of the part is packed with small celled parenchyma cells called the phloem parenchyma.

Xylem-it consists of the xylem vessels and tracheids. Here the xylem is centrifugal in nature, the smaller vessels' constituting the protoxylem lies towards the center, and bigger one constituting the metaxylum lies away from the center. tracheids- It is surrounding the metaxylum and is lying in between them.

Medulary rays – it is very clear, 2-3 layers fairly big, polygonal or radially elongated cells lying between two vascular bundles

Pith- the pith region of the young stem is comparatively wide and made up by large parenchyma cells, some of the pith parenchyma cells are thick walled.

T.S. OF ROOT {JANGALA SAMPLE}

Cork- T.S. of root shows outer cork cells that are brownish in color. There is circular outline with discontinuous cork. The cork consists of multilayered rectangular shaped and slightly tangentially elongated layer of cells.

Cortex-in this there are 4-5 layers of parenchyma cells and they are oblong in shape. It contains starch and crystals.

Phloem- it is just on inner side to cortex and is having 6-7 layers of phloem parenchyma along with transparent material. It consists of sieve tube, companion cell and phloem parenchyma.

Xylem-it consists of vessels, tracheids and fibers. The vessels are of various sizes and scattered through the xylem region in radial form.

Pith- this is the inner most part of the root which is fade brown in color and starch material covered cells are surrounded to it.

MICROSCOPICAL CHARACTERISTICS OF POWDERED DRUG:

Microscopic slides of the powder was prepared by using [4]

Distilled water

Glycerine

Chloral hydrate for clearing

Phloroglucinol and hydrochloric acid for staining lignified tissues.

ANUPA SAMPLE

When the powder was examined under the microscope, it showed the presence of spiral and scleriform thickening xylem vessels, cork cells, parenchyma, fibers, ray cells, starch grains and other cellular contents.

JANGALA SAMPLE

When the powder was examined under the microscope, it showed the presence of spiral and scleriform thickening xylem vessels, cork cells, parenchyma, fibers, ray cells, starch grains and other cellular contents.

## 5. DISCUSSION

1) There is no much difference found in structural morphology of both the samples but there is some variation in external morphological appearance like color of stem, height, length of the leaves etc which are discussed as

2) *Anup* sample Annular 30cm- 100cm in high glabrous; stem erect, simple, branches grooved and having reddish brown color. Leaves linear, acute, entire, alternate, leaves sessile, 1-6cm long 0.5-1 cm broad. Flowers; hermaphrodite, glistening white, crowded and imbricate, in close cylindric blunt spikes 2-7cm

3) *Jangal* sample it is glabrous annular herb reaching 30 cm to150 cm in height. Stem erect branches grooved and green colored. Leaves alternate linear, acute, entire, 2-10 cm long 0.5-1.5 cm broad; nerves irregular, petiole 0 Flowers; in dense terminal cylindric spikes 2 to 12 cm long; slight pinkish and glistening white,

4) There are almost all the microscopic structures like Upper Epidermis, Lower Epidermis, Palisade parenchyma, Spongy parenchyma, Xylem, Phloem, Bundle sheath etc found in both the *Anupa* and *Jangala* samples. T.S. of both the samples shows Dorsi-ventral nature of leaf. The microscopic structure of root shows Cork, Xylem, and Pith in both the samples. *Anupa* sample shows 6-7 layers of parenchyma cells in cortex, while *Jangala* sample shows 4-5 layers of parenchyma.

5) When the powder was examined under the microscope, both the *Anupa* and *Jangala* sample showed the presence of spiral and scleriform thickening xylem vessels, cork cells, parenchyma, fibers, ray cells, starch grains and other cellular contents.

## 6) CONCLUSION:

1) *Anupa Shitivaraka* differs in the characters of height, length and width of the leaves and color of the stems, roots morphologically with *Jangala Shitivaraka*.

2) There are no differences found in Histological characters of leaf, stem, root and powdered drug of *Anupa* and *Jangala Shitivaraka*.

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Images:

PLATE - 4.5 PHARMACOGNOSTICAL STUDY
MICROSCOPIC STUDY OF JANGALA SHITIVARAKA STEM

Fig 4.5A

Fig 4.5B

Fig 4.5C

Fig 4.5D

Fig 4.5E

Fig 4.5F



PLATE - 4.6 PHARMACOGNOSTICAL STUDY
MICROSCOPIC STUDY OF
ANUPA AND JANGALA SHITIVARAKA ROOT

Fig 4.6A

Fig 4.6B

Fig 4.6C

Fig 4.6D

Fig 4.6E

Fig 4.6F

PLATE - 4.4 PHARMACOGNOSTICAL STUDY
MICROSCOPIC STUDY OF ANUPA SHITIVARAKA STEM

Fig 4.4A

Fig 4.4B

Fig 4.4C

Fig 4.4D

Fig 4.4E

Fig 4.4F

PLATE - 4.3 PHARMACOGNOSTICAL STUDY
MICROSCOPIC STUDY OF ANUPA
AND JANGALA SHITIVARAKA LEAF

Fig 4.3A

Fig 4.3B

Fig 4.3C

Fig 4.3D

Fig 4.3E

Fig 4.3F

**ANUP SAMPLE- 4.7A, 4.7C, 4.7E**

**JANGAL SAMPLE- 4.7B,4.7D,4.7F**

**PLATE - 4.7 PHARMACOGNOSTICAL STUDY**
**MICROSCOPICAL CHARACTERISTICS**
**OF POWDERED DRUG**

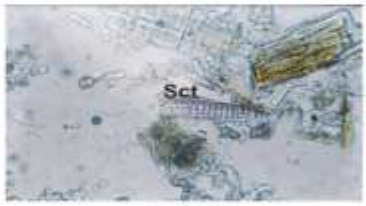


Fig 4.7A


Fig 4.7B


Fig 4.7C


Fig 4.7D


Fig 4.7E

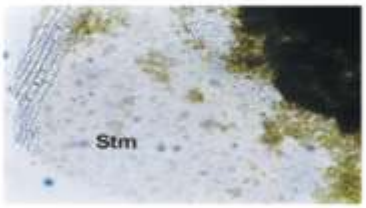


Fig 4.7F