International Journal of Science and Research (IJSR)
ISSN (Online): 2319-7064
Index Copernicus Value (2013): 6.14 | Impact Factor (2014): 5.611

Physio-Chemical and Anatomical Characterization of *Kydia calycina* Roxb. (Malavaceae). Stem and Leaf

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Abstract: ***The present investigation has been carried out to determine the anatomical characteristics of stem, root and physiochemical analysis for evaluating the Kydia calycina Roxb, Important plants from west vidarbha region from Maharashtra. Present study carried out by using different parameter such as color of material, total ash, water soluble ash, acid soluble ash alcohol extract. These finding will be useful for phrmacogonastic standard on identification, purity and quality. This plant was less known so need to investigate.***

Keyword: Physiochemical analysis, anatomy, medicanal use.

1. Introduction

It observe that the world‟s one-fourth population i.e. 1.42 billion people dependent on traditional medicines for the treatment of various ailments. According to WHO the microscopical description of medicinal plant is the first steps towards establishing the identy and degree of their purity. Medicinal plants have a long history in many indigenous communities and continue to provide useful tools for treating various diseases. Today, there is widespread interest in herbal drugs because herbal medicines are safe, inexpensive and have no adverse effects there is a need for documentation of research work carried out on traditional medicines. Due to this, we selected a rare medicinal plant Kydia calycina Roxb from family malavaceae. These plants are generally found in core area of Chikhaldara (Maharashtra). *Kydia calycina Roxb*. These plant have habitat as small tree present in semi-evergreen deciduous forest. These plants consist of simple leaves with trilobed with persistent and enclosing fruits. These plants used for various alignments such as diabetes, antitumor, various skin disease, antifungal, antibacterial activity. Stem bark used for externally in sprains antiblood clothing, swelling and root used for embracation.

The present study has been carried out to standardize the anatomical and physicochemical features of leaf and stem analysis to serve as a possible tool for proper identification of Kydia calycina. The literature survey revealed that no anatomical studies were carried out on this plant.

2. Material and Methods

Physiological analysis (using different types of parameters)

1) Ash values:
   The total ash, acid soluble ash and water soluble ash were determined by using procedure described below.
   Procedure :
   Total ash value
   About 2gm of powder drug was weighed acuuratly in to tarred silica crucible and incinerared at 450°c in muffle furance until fre from carban. The cruble was cooled and weighed. Percentage of total ash was calculated with refences to air dried substance.
2) Acid insoluble ash
   Ash obtaind from total ash was boiled with 25ml of 2N HCl for few minute and filterd though an ash less filtter paper. The filter was transferred into silica crucible and incinerated at 450°c in muffe furnace until free from carban. The cruble was cooled and weighed. Percentage of acid insoluble ash was calculated with ference to air dried substance.
3) Water soluble ash
   Ash obtaind from total ash was boiled with 25ml of distilled water for few minute and giltered though an ash less filter paper. The filter paper was transeferd into a tarred silica crusible ans incinerated at 450°c in muffe furnace until free from carban. The cruble was cooled and weighed. Percentage of water soluble ash was calculated with ference to air dried substance.
4) Extractive value
   This patameter detemines the amount of active constituent present in the plants
   Procedure
   soluble extractive value:
   5gm of powered drug was macreated with 100ml of alcohol in a stopped flask with requent shaking during first 6hrs and alloes to satnd for 18 hrs. it was filterd after 24 hrs.25mlof the filtrate was evapoated in the tared dish 105°cand weighed. Alcohol soluble extractive values were calculated.

a) Warer Soluble Extractive Value:
5gm of powered drug was macreated with 100ml of water at 80°c in a stopped flask with requent shaking during first 18 hrs and alloes to satnd for 24 hrs. it was filterd after 24 hrs.25mlof the filtrate was evapoated in the tared dish 105°cand weighed. Water soluble exractive values were calculated

Powdered drug reaction with different reagent: Powder drug was treated with different reagent which are easily available in lab such as conc. H2SO4, conc. HNO3, conc. HCL, Iodine, NaOH, glacial acetic acid, H2SO4 and water. Observation shows different colours

For anatomical analysis, fresh mature Leaves and roots were fixed in formalin: glacial acetic acid: 70% alcohol (5:5:90). Sections were prepared according to the method described by Alexander (1940).Transverse sections were prepared by using a rotatory microtome (Leitz 1512-West Germany) and stained with safranin. A light microscope was used to view the slides and adjusted to finest resolution. Photographs were obtained using a Nickkon digital camera focused through the microscope eyepiece. And observed the slide

Anatomical character of kydia calycina

b) Anatomy of leaf shows following characters.

The transeves section of leaf though midrib shows prominat upper and lower epidermis. The upper and lower epidermises were distinct, parechymatous with cuticular deposition. It was followed by parechymatous hypodermis and mesophyll cells. Mesophyll cells are found to be rich in chloroplast content. The vascular bundles are simple, conjoint, collateral and open type. It produced xylem elements towards inner side and phloem toward outer side. Above the phloem an arch of sclerotic cells was found; it might be probably for the protection or strengthening purpose. The wings have similar structure of epidermis with palisade linings towards inner side with rich chloroplasts. The epidermis showed presence of unicellular hairs/ trichomes arising in bunch of 3 to 4 trichomes

c) Anatomical charactestic of stem of kydia calycina

The mature stem of *Kydia calycina* showed well developed secondary growth. The outer cellular structures were converted into bark with thick cuticular deposition. The hypodermis showed sclerotic cells with some large cavities. These cavities may have form due to disintegration of cells. The other important feature is the well developed secondary vascular elements. The xylem showed prominent vessels and xylem elements were traversed by medullary rays. The phloem elements showed normal structure. Due to more secondary growth, and enlarged xylem elements, the pith was found to be reduced in size. The pith is parenchymatous and showed some granular deposition.

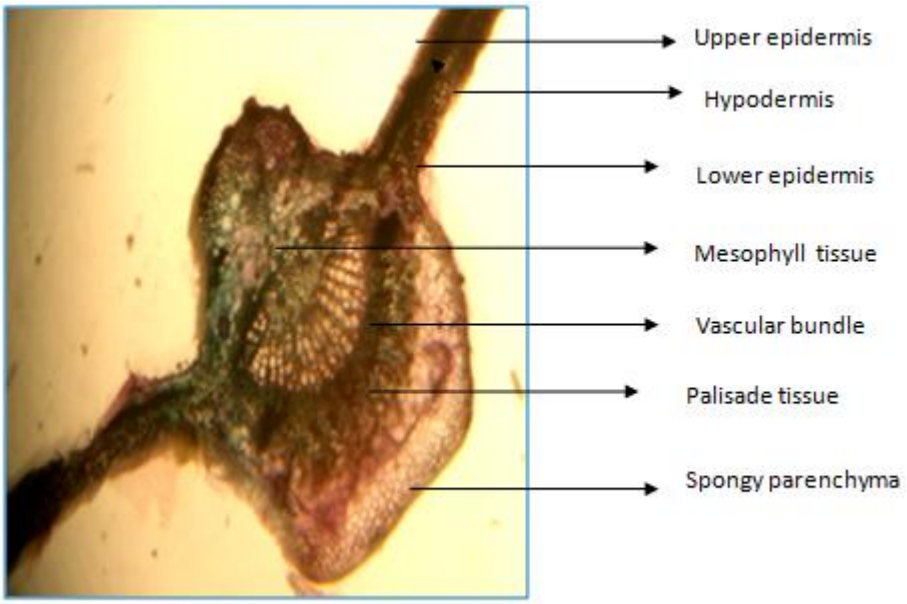

Figure 1: T.S leaf, showing midrib and vascular bundle

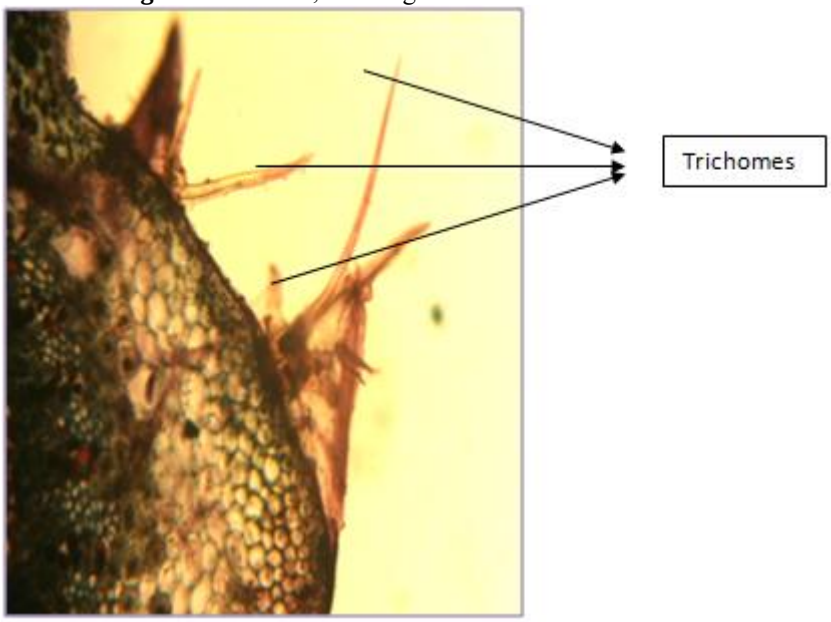

Figure 2: T.S leaf showing Trichomes

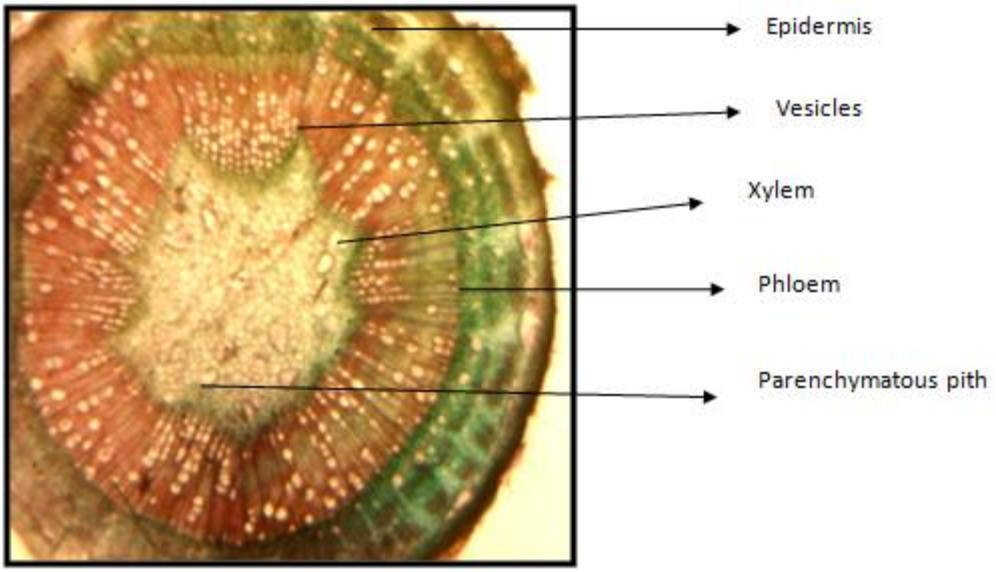

Figure: T.S stem

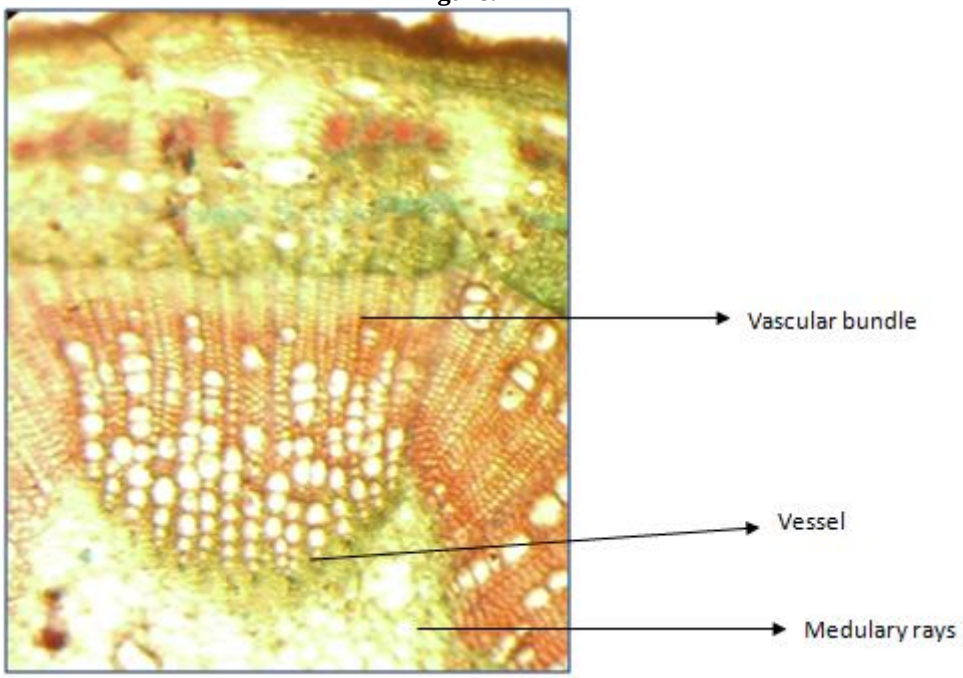

Figure: T.S of stem showing secondary growth

Table 1: Reaction of powdered (Stem) with different reagent.

S.N	Reagent	Color
1	Powder as such	light Green
2	Powder +conc. H2SO4	Reddish Brown
3	Powder +conc HNO3	Brownish Green
4	Powder +conc HCL	Bleakish Green
5	Powder + 5% Iodine	Dark Green
6	Powder + 5M NaOH	Brownish Green
7	Powder + glacial acetic acid	Brown
8	Powder + 80% H2SO4	Green
9	Powder + water	light Green

Table 2: Reaction of powdered (leaf) with different reagent.

S.N	Reagent	Color
1	Powder as such	light Green
2	Powder +conc. H2SO4	Reddish Brown
3	Powder +conc HNO3	Brownish Green
4	Powder +conc HCL	Bleakish Green
5	Powder + 5% Iodine	Dark Green
6	Powder + 5M NaOH	Brownish Green
7	Powder + glacial acetic acid	Brown
8	Powder + 80% H2SO4	Green
9	Powder + water	light Green

Table 3: Physiochemical analysis of Stem and leaves powder

	Parameter	Leaves	Stem
1	Color of powder	Green	Light green
2	Total ash	15.63	7.66
3	Water soluble ash	9.73	4.35
4	Acid soluble ash	7.35	3.51
5	Alcohol extract	4.98	1.57

Note: All the values of sample were Mg/gm

3. Results and Discussion

On the basis of observation of anatomy characters and physiochemical analysis show following results. Both stem and leaf anatomy shows distict anatomical characters. Leaf shows epidermis on both side, distinct parenchyma with hypodermis and mesophyll tissue. It also consists of some unicelluer hairy trochomes. Whereas stem also shows some celluler anatomy, but it shows secondary growth and prominat medullary rays with xylem. Physiochemical analysis of stem and root were carried out by using various type parameters like total ash, water soluble ash, alcohol soluble ash and water extract in ml/gm which mentioned in table no. 3. Powder of stem and root also treated with various type of chemical reagent to test their colors, which were show in table no.1 and 2

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