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# Evaluation of pharmacognostical, preliminary phytochemical studies on the whole plant of *vanda tessellata* (roxb) hook

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## ABSTRACT

In the present study, an attempt was made to investigate pharmacognostiacal and preliminary phytochemical studies on the whole plant of *vanda tessellate (*Roxb) Hook (Orchidaceae). The Macroscopical, microscopical and phytochemical studies have been carried out on the whole plant Characteristic pharmacognostic features of the plant observed were presence of Lamina, vascular bundle, scleroids, xylem , phloem etc are in T S of leaf. In root consists of cortex, endodermis, vascular cylinder sclerenchyma, endodermis, pith . Quantitative evaluations were also carried out. The Total ash value, water soluble ash value, acid insoluble ash value, sulphated ash value, loss on drying. The presence of phytochemical constituents in the extract was alkaloids, glycosides, steroids, carbohydrates, fats, lignin and flavonoids.

**Keywords:** Vanda tessellate, Pharmacognosy, Phytochemical studies

## INTRODUCTION

Based on the material of origin, Ayurvedic medicines are divided into three classes, namely herbal, mineral and animal. Among this, herbal formulation has gained great importance and rising global attention recently. Ayurveda has about 700 type of plants listed in its medicinal systems. The use of such herbals is mentioned in the ancient Ayurvedic literature such as Chakara Samhita and Sushruta Samhita. The discovery of herbals is further complemented with knowledge on the method of isolation, purification, characterization of active ingredients and type of preparation. The term "herbal drug" determines the part/parts of a plant (leaves, flowers, seeds roots, barks, stems and etc.) used for preparing medicines [1]

.Allopathic drugs used for the treatment of diabetes have their own side effect & adverse effect like hypoglycaemia, nausea, vomiting, hyponatremia, flatulence, diarrhea or constipation, alcohol flush, headache, weight gain, lactic acidosis, pernicious anemia, dyspepsia, dizziness, joint pain. So instead of allopathic drugs, herbal drugs are a great choice which is having more or less no side effect & adverse effects [2].

The roots are used as antipyretic, dyspepsia, bronchitis, piles, inflammation, externally for rheumatism, nervous diseases.Juice of leaves given in otitis and paste as febrifuge.It contains β-sistosteral, γ-

sistosterol, resins, tannins, alkyl perulate, glycosides, sistosterol D glucosides and terpenoids. [3, 4]

As there is no scientific data on *vanda tesselata*, here in the present study plant was taken for macroscopical, microscopical, phytochemical studies and quantitative evaluations were also carried out. In microscopical studies, anatomical sections, powder drug analysis and maceration of plant were carried out. In quantitative evaluations, moisture content, alcohol soluble extractive value, water soluble extractive value, total ash value and acid insoluble ash values were carried out for crude dried powdered drug.

### Botanical information and ethanomedical information

Scientific name: Vanda tessellate (Roxb) Hook.
Kingdom: Plantae
(Unranked): Angiospermis
(Unranked): Monocots
Order: Asparagales
Family: Orchidaceae
Subfamily: Ebidendroideae
Tribe: Vandeae
Genus: Vanda
Species: V.tessellata

## MATERIALS AND METHODS

### Collection of plant material

The plant *vanda tessellate* collected from western ghat, gobi, erode. after collection the plant was washed thoroughly with running tap water, cut into small pieces and shade dried. The dried material was then pulverized separately into coarse powder by a mechanical grinder. The resulting powder was preserved in the department for further study [5].

### Microscopical Examinations

The powder, transverse section and macerate of the plant were used for this study. Both qualitative and quantitative studies were carried out.phytochemical examinations were also carried out to detect the presence or absence of various chemical constituents such as alkaloids, glycosides, carbohydrates, flavonoids, steroids, aminoacid &proteins, terpenoids [6, 7].

### Quantitative Evaluations

The ash values was determined following *Indian Pharmacopoeia*5. The ash value, acid insoluble ash and extractive values (water and alcohol), loss on drying were determined using methods described by Rangari, Kalia A, Naikg. [8, 9]

### Qualitative Phytochemical Screening

The crude drug powder of hydro-ethanolic extract of the plant *of vanda tessellate* was subjected to qualitative analysis for presence of chemical constituents .The different qualitative chemical tests were performed for establishing phytochemical profile of extract obtained from soxhlet extractions. The following tests were performed on the extract to detect various phytoconstituents present in it .the procedure for that as per Nadkarni & Ray D [10, 11]

## RESULT AND DISCUSSION

The fig.1 shows Macroscopical characters of vanda tessellate.plant was in yellowish brown colour.smooth on abaxial side.an ephiphytic perennial, stem 30-60 cm long, stout, scandent by the stout, simple or branching aerial roots. Leaves succulent, 15-20 cm long, linear, recurved, complicate.flowers in 6-10 flowered racemes, reaching with the peduncle 15-25 cm long. Sepals yellow, tessellated with brown lines and with white margins. Petals yellow with brown lines and white margins, shorter than the sepals capsules 7.5-9cm long, narrowly clavate oblong.

In fig (1) shows the anatomy of the leaf, it shows the midrilein the form of v shaped outline. The mid part of the leaf in 1mm thick and exbeam margine is 350/nm with vascular strands located along the medium part of the leaf.thick undulate cuticle of 10/nm thick.in fig (2) shows the presence of vascular bundles of the midrile, cuticle epidermis, ground parenchyma, phloem, thick layer of sclerenchyma cells which care thick walled and liquefied.in fig (3) shows the transver section of the middle part of the lamina of large or small. Cells being very thick walled. Fig (4) shows the presence of calcium oxalate crystals of raphides are frequently seen in the mesophyll tissue. Ghyraphides cylindrical bendles comprising several mthuipointedneadles. Theraphido ladle is 30/nm thick and 120/nm long.fig (5) shows the TS of the root. This root measuring 1.9mm thickwith outer cylinder of velamentissue, inner cortical tissue and central stellar cylinder. Fig (6) shows the presence of velamen is multiple epidermis and the cells are radially elongated, this walled cells which are capable of absorbing moisture from the atmosphere. The velamen tissue is 250-350nm thick. Fig (7) TS of thick root stele and cortex enlarged,& endodermis, vascular cylinder, pith. Fig (8) sows the vascular cylinder is circular and closed lay a week layer of endodermis these are squarish, thick walled and liquefied. The passage cells are cells for transverse conduction of water with phloem, xylem, pith.

Quantitative evaluation results were reported in table.1. The alcohol and water extractive value was found to be 5.7% and 3.1% respectively. Since the alcohol extractive value was greater than that of water, it means that alcohol is a suitable extractive solvent than water in the extraction of the plant. The alcohol and water soluble extractives were indicators of the total solvent soluble component9.

The total ash value is 6.04%, acid insoluble ash 1.01%, sulphated ash 1.0%, water soluble ash 2.0%. Qualitative evaluation results were reported in table no.2.shows the presence of alkaloids, flavonoids, terpenoids, glycosides, steroids& carbohydrates.

**Table 1: Showing results for ash values of whole plant of vanda tessellate(roxb)hook**

| S.No | Particulars | (%W/W)n=3 |
|---|---|---|
| 1. | Total ash | 6.04 |
| 2. | Acid insoluble ash | 1.01 |
| 3. | Water soluble ash | 2.0 |
| 4. | Sulphated ash | 1.0 |

Showing extractive values of whole plant of vanda tessellate (roxb) hook

| S.No | Extracts | Percentage yield(%W/W) |
|---|---|---|
| 1. | Pet ether | 3.2 |
| 2. | Ethyl acetate | 3.8 |
| 3. | Chloroform | 2.2 |
| 4. | Methanol | 8.5 |

Qualitative phytochemical analysis of whole plant powder of vanda tessellate (roxb) hook

| S.NO | Phytoconstituents | Methanol extract |
|---|---|---|
| 1 | Alkaloids | + |
| 2 | Saponins | - |
| 3 | Glycosides | + |
| 4 | Carbohydrates | + |

| | | |
|---|---|---|
| 5 | Tannins & Phenolic compounds | - |
| 6 | Flavonoids | + |
| 7 | Steroids | + |
| 8 | Proteins & Amino acids | + |
| 9 | Terpenoids | + |
| 10 | Fats | - |
| 11 | Cums & Mucilage | - |

(+): positive (-): negative

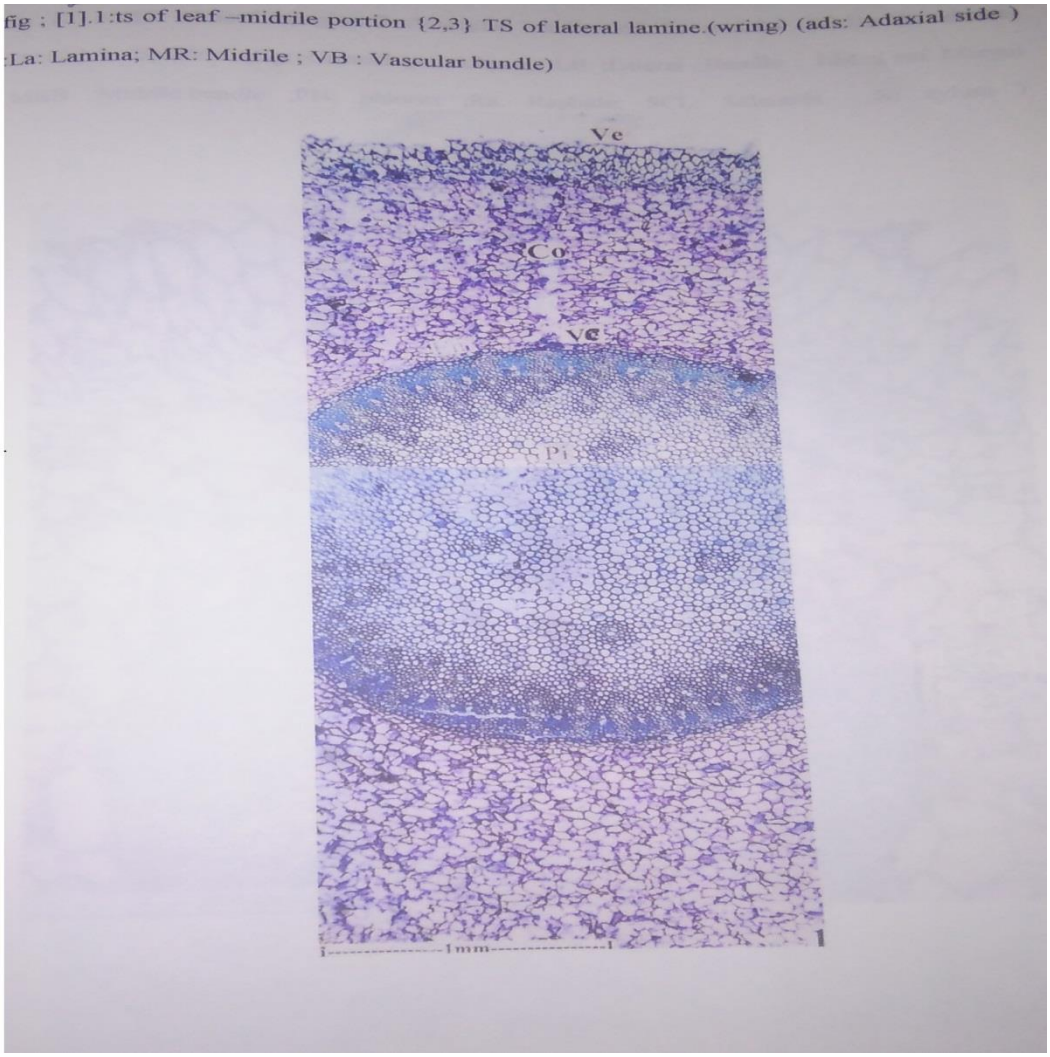

fig .[2].1 :TS of leaf margine 2 :Vascular bendles of the midrile (BS:Bundle sheath; CU:cuticle Epidermis,Gp: Ground parenchyma :LB ;Lateral ;Bundle ; LM :Leaf Margni :MRB :Midrile:bundle ;PH; phloem ;Ra: Raphide; SCL: Scleraids ;X: xylum )

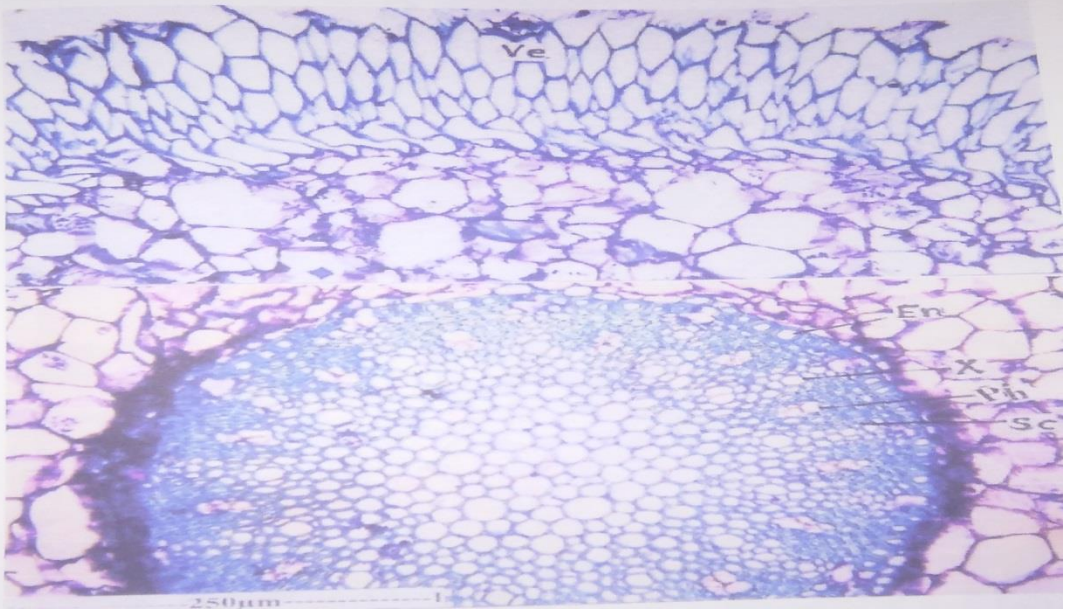


fig. [3] : TS of middle part of the lamina (ads : Adaxialside ; BS : Bundle sheath: CU: cuticle ; EP: epidermis ;GP: ground parenchyma ; Ph; phloem ; SCL :scleraid. )

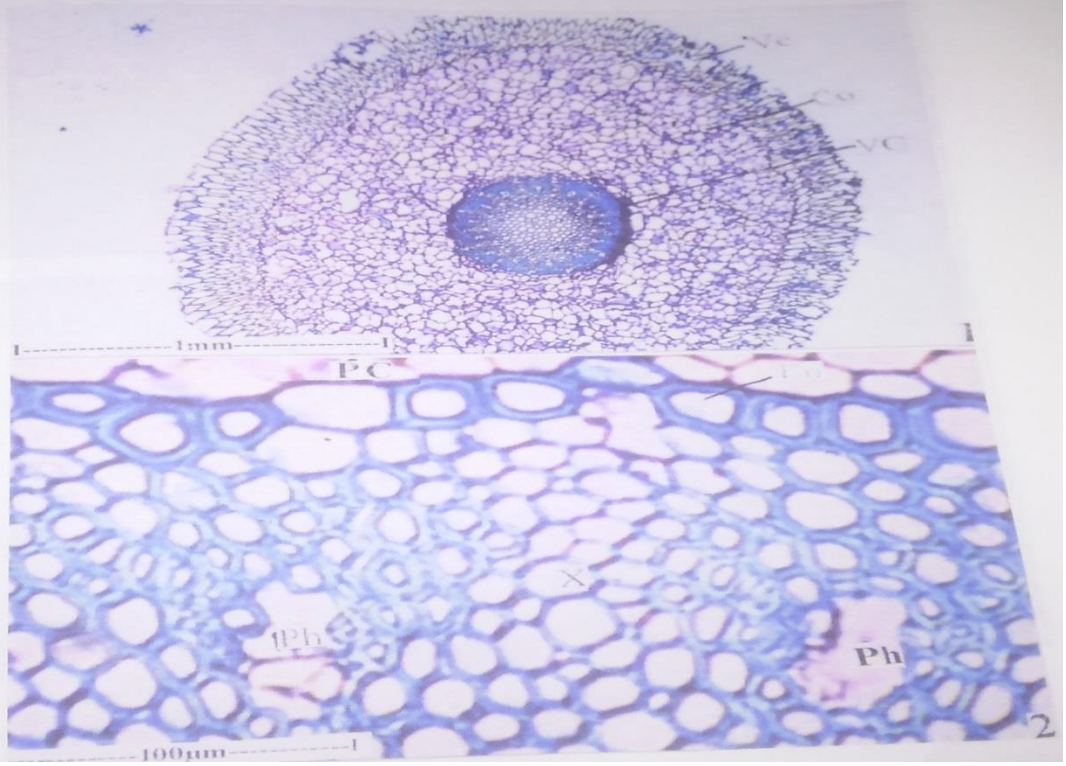

fig .[4] .1,2 :Raphide crystals as viewed through polarized light (Ra :Raphide)

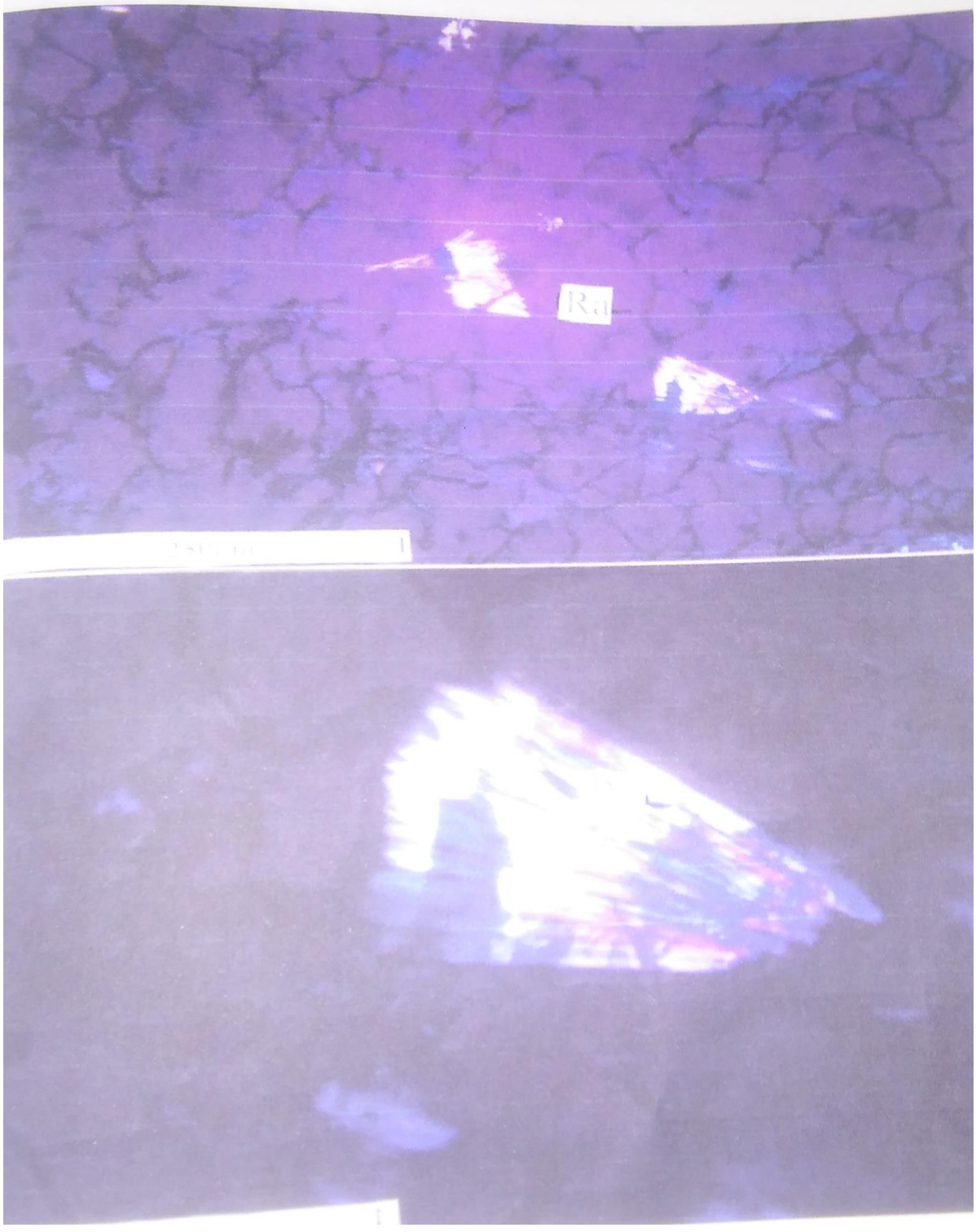

Fig .[5.]: TS of this root entire view. 2. A sector of stele enlarged (co- cortex ,En-Endodermis ,Pc-passage cell, Ph-phloem, Ve- velamen, Vc –vascular cylinder ,X –xylem. )

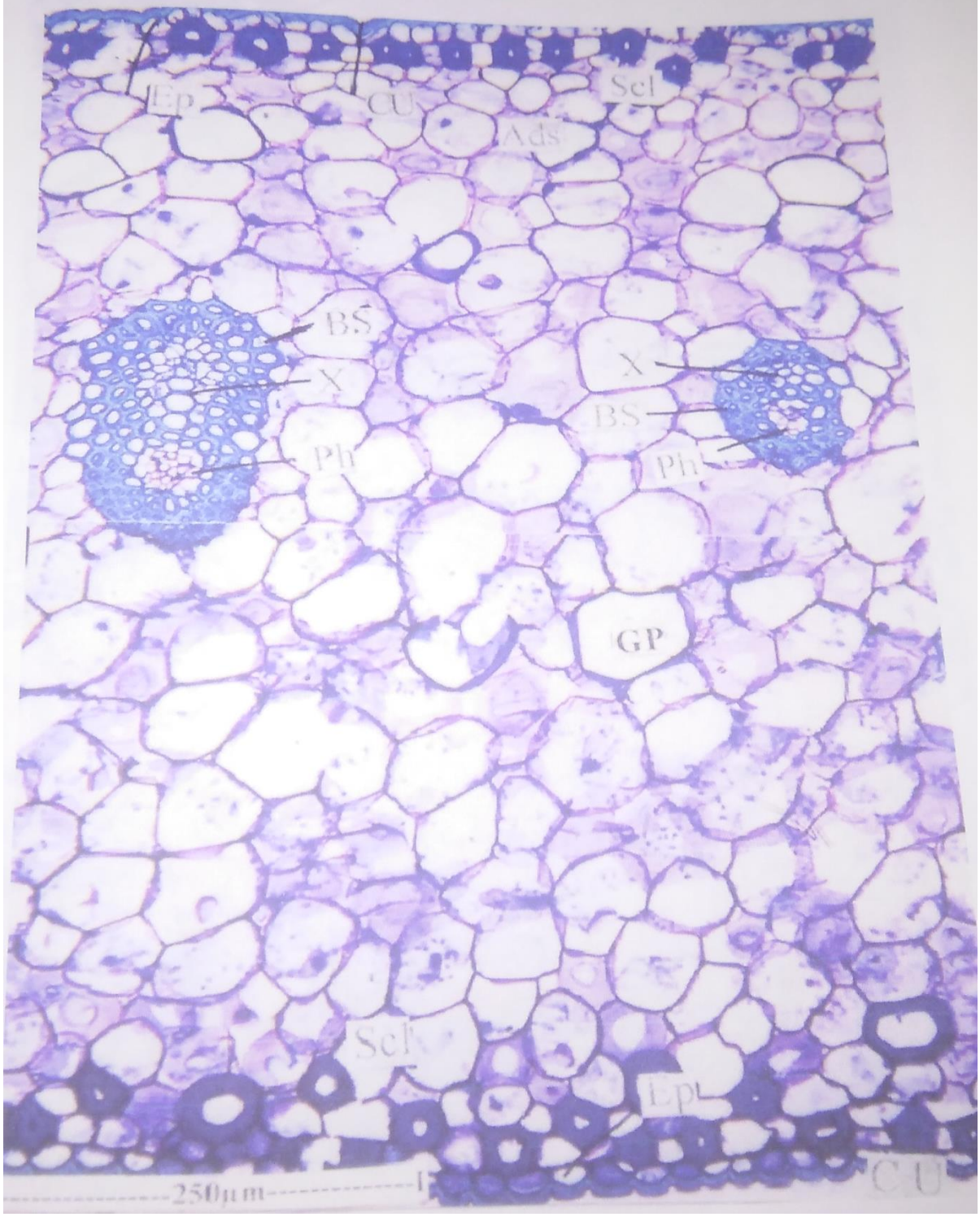

fig [6.] 1 : TS of this root a sector enlarged. (En; endodermis ,Ph: phloem, Sc –sclerenchyma, Ve- velamen ,X-xylem )

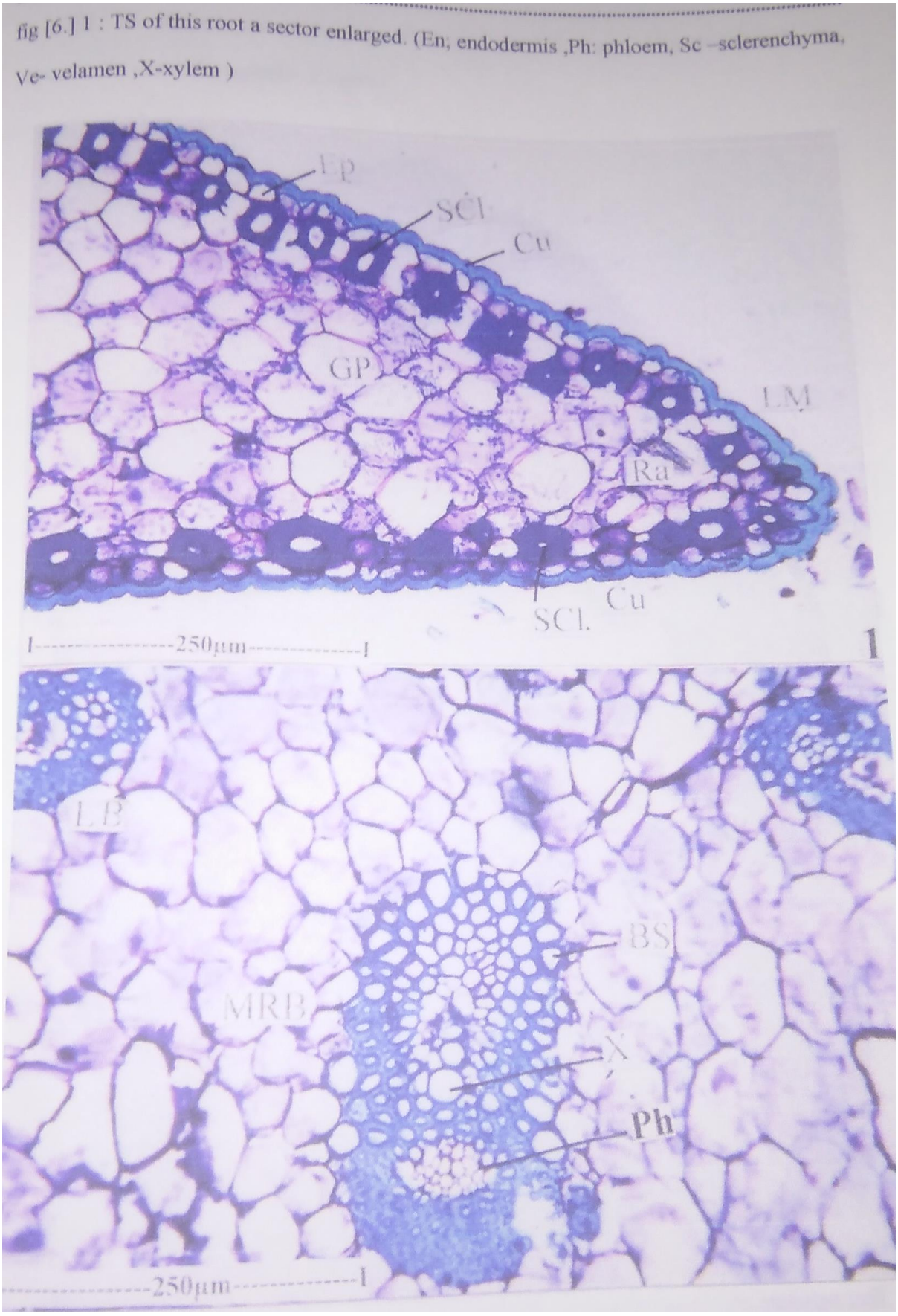

fig .[7].1. TS of thick root stele and cortex enlarged (co- cortex ,En-Endodermis, Ve-velamen, Vc –vascular cylinder ,Pi-pith.)

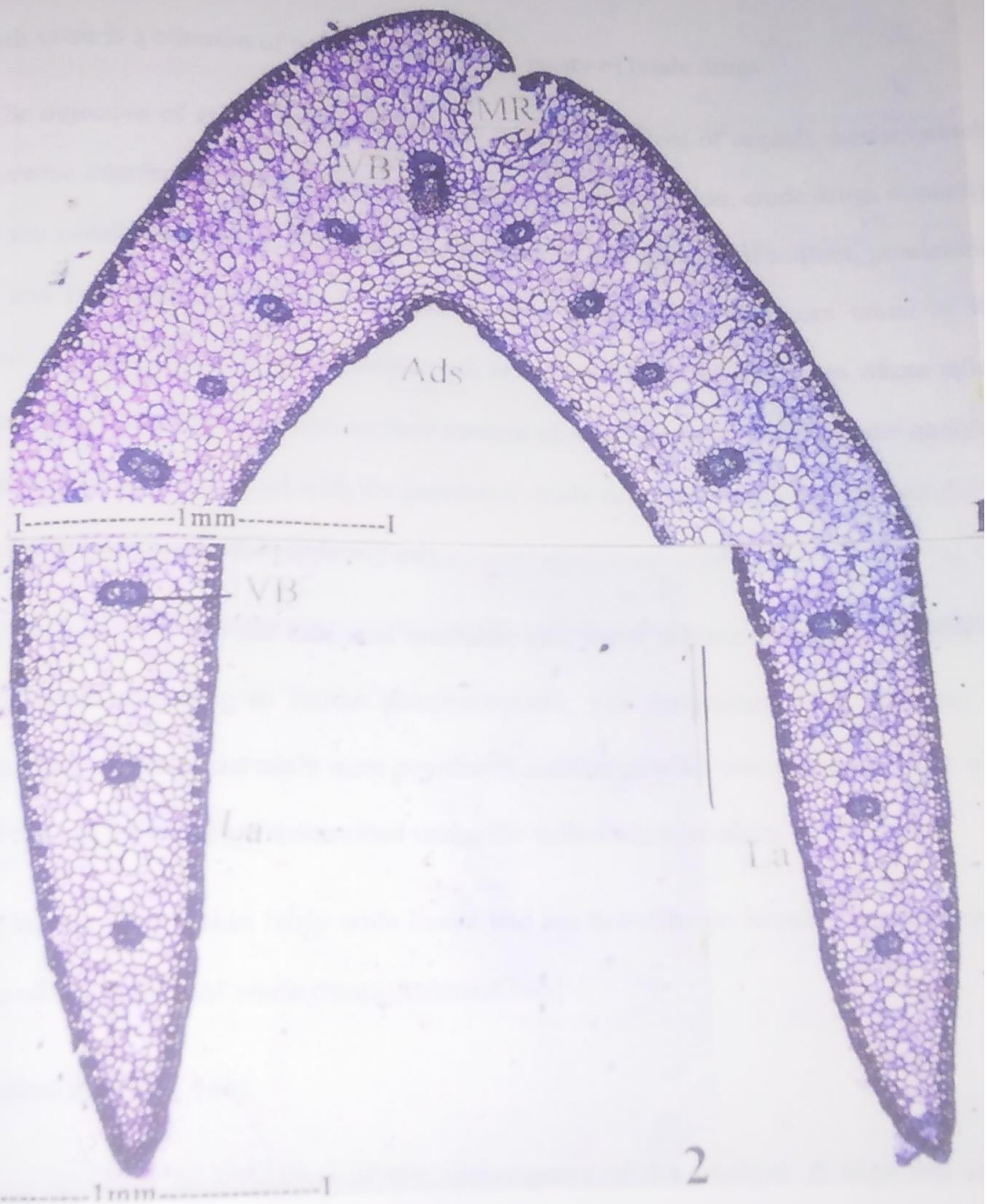


fig .[8.]1.TS of thick root sector enlarged (co- cortex ,En-Endodermis ,Pc-passage cell, phloem, Ve- velamen, P –pith ,X –xylem. )

## CONCLUSION

The plant vanda tessellateta has been studied to give a report on pharmacognostical and preliminary phytochemical studies. The pharmacognostical studies made on the whole plant of vanda tessellate like TS of stem, ash value, extractive value and structure gave valuable information. The results of the study could be useful for the identification and preparation of a monograph of the plant.the preliminary phytochemical investigation showed the presence of alkaloids, glycosides, steroids, carbohydrates, fats and flavonoids in methanol extract.

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