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RESEARCH ARTICLE

PHARMACOGNOSTIC EVALUATION OF GLYCYRRHIZA GLABRA LINN (YASHTIMADHU) FROM RAW DRUG MARKETS OF KERALA.

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Abstract

Glycyrrhiza glabra Linn [Yashtimadhu] is a perennial herb mainly distributed in sub-tropical and warm temperate regions. The rhizome of the plant is a raw drug ingredient in the Ayurvedic formulary. It is effectively proved with properties such as memory enhancing activity, hepatoprotective activity, anti-lipidemic, anti-hyperglycemic activity, anti-bacterial etc. It is a principal ingredient in many ayurvedic formulations and preparations, manufactured by all the manufacturing units. Large scale and small scale ayurvedic medicinal industry of Kerala also manufacture these medicines. Though *Glycyrrhiza glabra* Linn [Yashtimadhu] is not a cultivated plant in Kerala, this raw drug is abundantly available in raw drug markets of Kerala, pointing to possibility of adulteration

The study was conducted by screening 28 samples (one urban and one rural) of *Yashtimadhu* collected from each of the 14 districts of Kerala. The pharmacognostic characteristics of market samples were compared with those of the original drug samples collected directly and also with the standards mentioned in API. The study revealed that the samples available in the raw drug markets of Kerala are genuine.

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Introduction:-

The genuineness, purity and quality of the drugs have direct impact on the quality of the medicinal preparations. Destructive harvesting, deforestation, lack of adequate cultivation and over usage leads to scarcity of drugs. Scarcity of drugs, increased demand, high price in market etc. may lead to adulteration or substitution of drugs. There lies the importance of genuine drugs and the need for its standardization.

Yashtimadhu [*Glycyrrhiza glabra* Linn] is a tall perennial herb mainly distributed in sub-tropical and warm temperate regions. The root and rhizome of this plant has been used in India since time immemorial. It is effectively proved with properties such as memory enhancing activity¹, anti-oxidant activity², anti-microbial activity³ etc. It is one of the major ingredient of several Ayurvedic formulations like *Dasamoolarishtam*, *Aswagandharishtam*, *Phalasarpi ghruta*, *Khadira gulika*, *Madhuyastyadi taila* etc.

Since *Yashtimadhu* (*Glycyrrhiza glabra* Linn) is used in a large number of formulations and as it is not cultivated in Kerala due to lack of favourable climatic conditions, there is chance of adulteration of *Yashtimadhu* (*Glycyrrhiza glabra* Linn) with drugs of inferior chemical and therapeutic properties.

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A detailed review of recent literature also reveals its adulteration with the roots of *Gunja* (*Abrus precatorius* Linn) which may be potentially harmful to health and may cause poisoning. Even though *Yashtimadhu* (*Glycyrrhiza glabra* Linn) is used extensively in Kerala, Pharmacognostic studies to assess the genuineness of the drug available in the raw drug markets have not been conducted till now. So through this study, trying to prove the purity and genuineness of *Yashtimadhu* (*Glycyrrhiza glabra* Linn) available in the market. It may also reveal adulteration if any prevailing in the market.

Materials and Methods:-

Sample collection:-

In this study for assessing the genuineness through Macroscopical and Microscopical evaluation genuine sample of *Yashtimadhu* (*Glycyrrhiza glabra* Linn) as well as market samples of *Yashtimadhu* were collected.

Collection of Genuine Samples:-

The genuine samples of *Yashtimadhu* [*Glycyrrhiza glabra* Linn] were collected from the herbal garden of Central Ayurveda Research Institute for Respiratory Disorders, Patiala, Punjab and was authenticated from Pharmacognosy Unit, Poojappura, Thiruvananthapuram. They were shade dried and packed in zip lock polythene bag and labelled as genuine sample.

Collection of Market Samples:-

Market samples were collected from each of the fourteen districts of Kerala. Two samples one from urban and the other from rural markets were collected from each of the fourteen districts, randomly. Thus, a total of 28 market samples were collected for the study. They were shade dried and separately packed in zip lock polythene bags in crude form; then in separate air tight containers in powder form and labelled as Sample A (Urban sample) and Sample B (Rural Sample)

Pharmacognostical Evaluation:-

Pharmacognostical evaluation included both macroscopic (Organoleptic) and microscopic evaluation of the crude drug together with its powder characteristics.

Macroscopic Evaluation:-

The samples were subjected to macroscopic evaluation by observation with naked eyes and by tactile and other sensory inspection. A magnifying lens with a dissecting microscope was used for a better evaluation of surface characters.

Microscopic Evaluation:-

The microscopic evaluation of sample drug including histological evaluation and powder microscopy was done according to the standard procedure detailed in API⁴.

Results:-

Macroscopic Evaluation:-

The observed macroscopical characters of *Glycyrrhiza glabra* Linn are given in Table 1.

Table 1:-Macroscopic Evaluation of Samples

Macroscopic Features	Genuine Sample	Market Samples
Shape	Cylindrical	Cylindrical
Size	0.65-1.5 cm in diameter 1-2 cm in length	0.71-1.9 cm in diameter 1-2 cm in length
External surface	Longitudinally wrinkled	Longitudinally wrinkled
Color	Yellowish brown	Yellowish brown
Fracture	Splintery	Splintery
Taste	Sweet	Sweet
Odour	Faint and characteristic	Faint and characteristic

Microscopic Evaluation:-

The observed microscopical characters of genuine and market samples of *Glycyrrhiza glabra* Linn are given in Table 2 & 3.

Table 2:-Microscopic Evaluation Samples

Microscopic Characters	Genuine Sample	Market Samples
1.Cork	Consisting of 10-20 or more layers of tabular cells. outer layers with reddish-brown amorphous contents and inner thick colourless walls	Consisting of 10-20 or more layers of tabular cells. outer layers with reddish-brown amorphous contents and inner thick colourless walls
2.Cortex	1-3 layers of parenchymatous cells, radially arranged	1-3 layers of parenchymatous cells, radially arranged
3.Phloem	broad band of about 10-50 fibres surrounded by sheath of parenchyma cells	broad band of about 10-50 fibres surrounded by sheath of parenchyma cells
4.Xylem	distinctly radiate with medullary rays, vessels with thick, yellow, pitted, reticulately thickend walls xylem parenchyma between the vessels having thick pitted walls without inter-cellular spaces	distinctly radiate with medullary rays, vessels with thick, yellow, pitted, reticulately thickend walls xylem parenchyma between the vessels having thick pitted walls without inter-cellular spaces
5.Pith	Parenchymatous cells in longitudinal rows, with inter-cellular spaces	parenchymatous cells in longitudinal rows, with inter-cellular spaces

Table 3:-Powder Microscopy of Samples

Powder Characters	Genuine sample	Market samples
Colour of Powder	Yellowish	Yellowish
Crystals	Rhomboïd crystals	Rhomboïd crystals
Fibre	Presence of lignified fibres and crystal fibres	Presence of lignified fibres and crystal fibres
Starch grains	Presence of simple starch grains and starch grains in groups	Presence of simple starch grains and starch grains in groups
Vessels	Border pitted vessels	Border pitted vessels
Tannin	Present as orange coloured bodies	Present as orange coloured bodies
Cork fragment	Present	Present

Discussion:-

The present study assessed the genuineness of *Yashtimadhu* [*Glycyrrhiza glabra* Linn] available in raw drug markets of Kerala through pharmacognostical parameters. The implications from the results of the evaluations carried out are discussed here.

The pharmacognostical evaluation of genuine and market samples was carried out in two parts as Macroscopic (Organoleptic) and Microscopic examination including powder microscopy. All market samples were evaluated and compared with the genuine sample.

On organoleptic evaluation, the genuine and market samples showed similar characters as mentioned in API. But there was some difference in the size of samples. The size varies from 0.71-1.9. Some samples are very large as compared to genuine and other samples. This may suggest that the samples are of different stages of maturity. Some of the samples showed the presence of white spots on surface suggestive of mould infestation along with smell of fungal infestation. The macroscopic characters of market samples matched with the characteristic features of the genuine sample and with the standard features mentioned in API despite the size differences.

Transverse section of genuine sample matches with the characteristic features mentioned in API. Cork portion is not clear in most of the market samples. Powder microscopic characteristics of market samples matches with the characteristic features of genuine sample. On microscopic examination all market samples matched with the genuine sample and with the features mentioned in API.

The results of the organoleptic, histology and powder microscopy evaluation of the market samples of *Yashtimadhu* were identical to that of the genuine sample and also to the standards mentioned in the Ayurvedic Pharmacopoeia of India.

Conclusion:-

In the present study, Pharmacognostic evaluation including macroscopy and microscopy, was done to ascertain the genuineness, purity and quality of the drug. The results showed that the characteristic features of the market samples of *Yashtimadhu* were identical to that of the genuine sample and also with the standards mentioned in Ayurvedic Pharmacopoeia of India. Thus from the study, it is evident that all the market samples are from genuine source. The observations and results obtained will be useful for further research works along with the standardization of the drug.

Fig 1:-Genuine sample of *Glycyrrhiza glabra* Linn



Fig 2:-Market Samples from Thiruvananthapuram



Fig 3:-Market Samples from Kollam



Fig 4:-Market Samples from Pathanamthitta



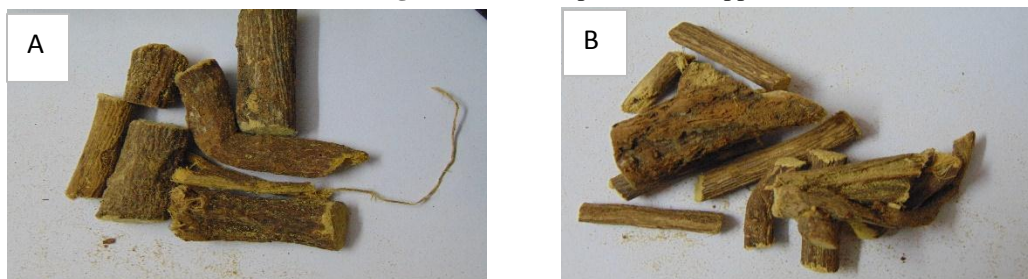
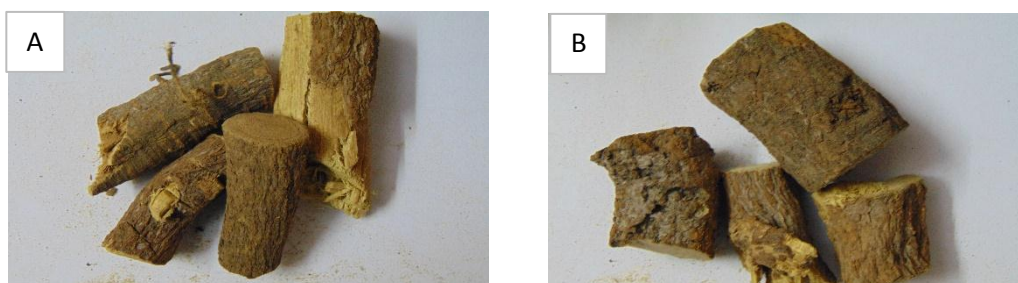
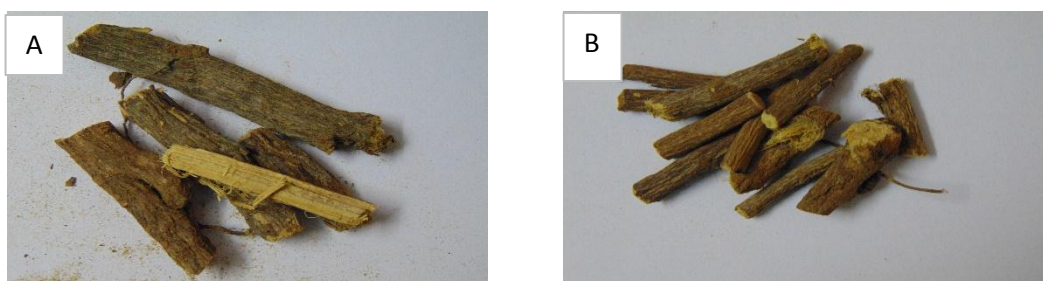
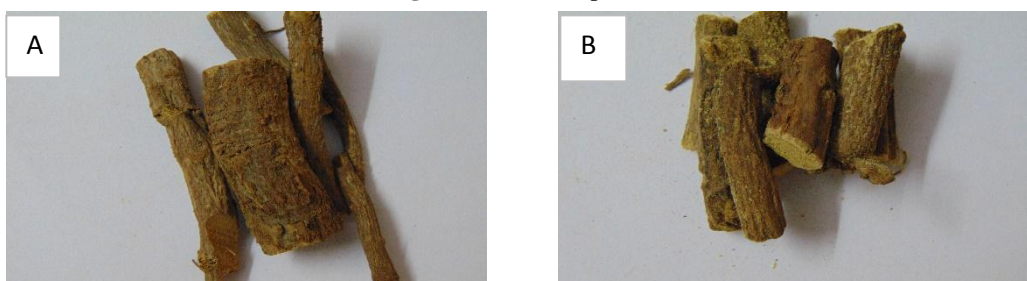
Fig 5:-Market Samples from Alappuzha**Fig 6:-Market Samples from Kottayam****Fig 7:-Market Samples from Idukki****Fig 8:-Market Samples from Ernakulam****Fig 9:-Market Samples from Thrissur**

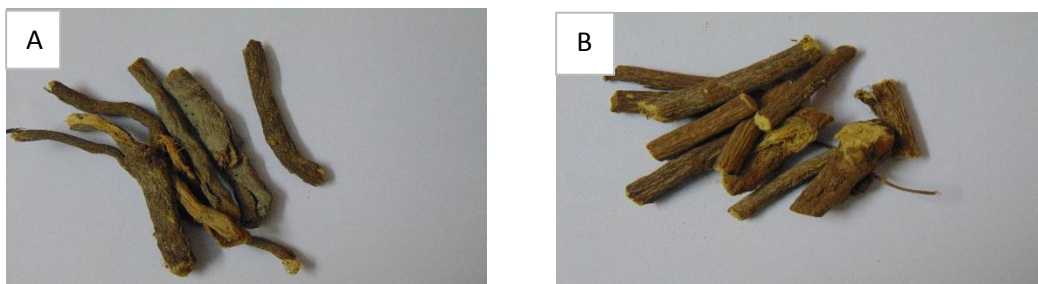
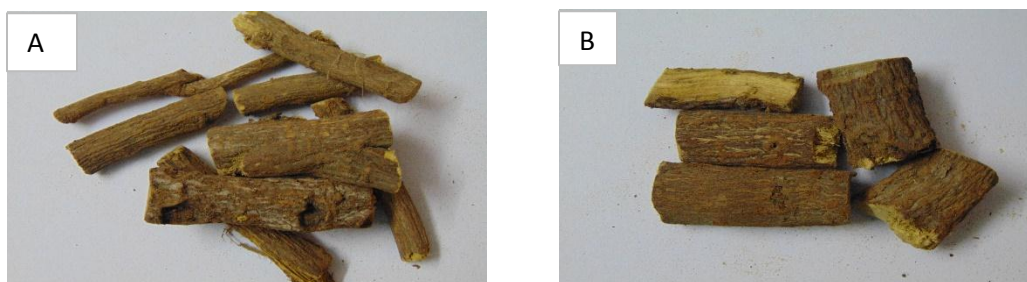
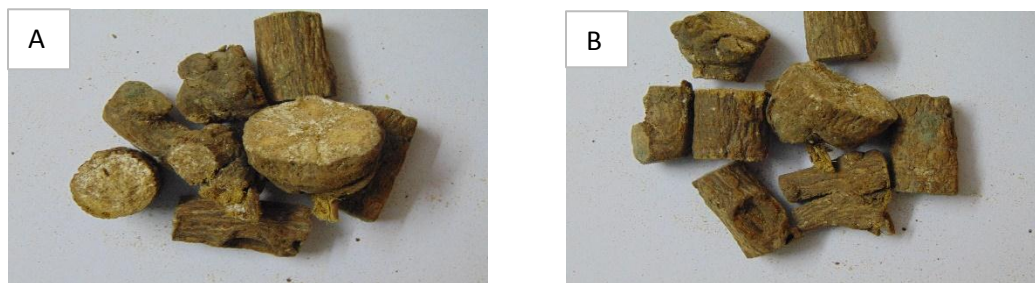
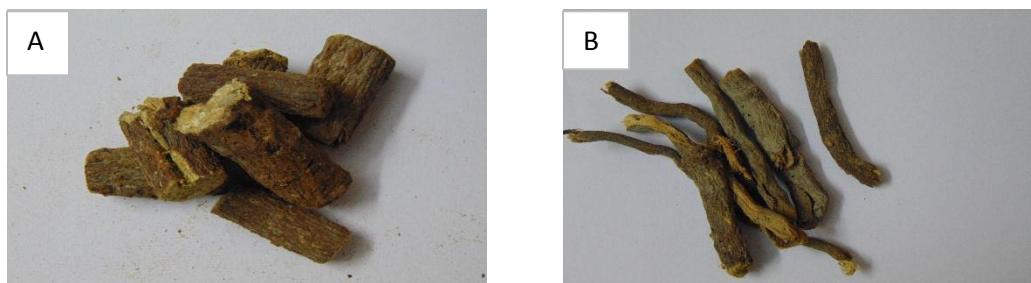
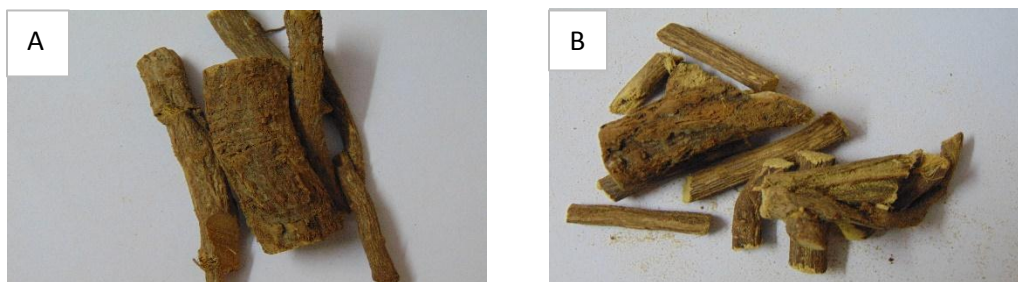
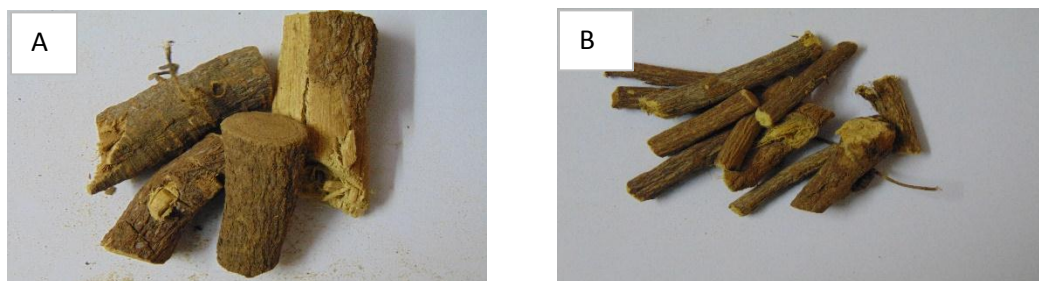
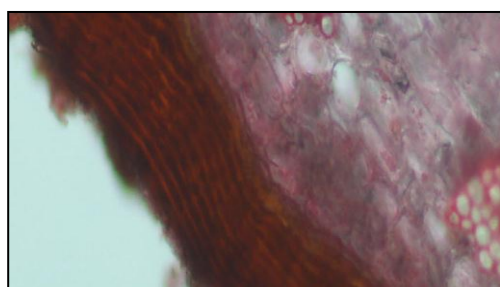
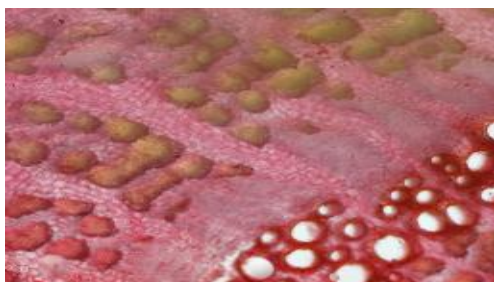
Fig 10:-Market Samples from Palakkad**Fig 11:-Market Samples from Malappuram****Fig 12:-Market Samples from Kozhikode****Fig 13:-Market Samples from Wayanad****Fig 14:-Market Samples from Kannur**

Fig 15:-Market Samples from Kasargod**Fig 16:-**TS of genuine sample of *Yashtimadhu* [*Glycyrrhiza glabra* Linn]

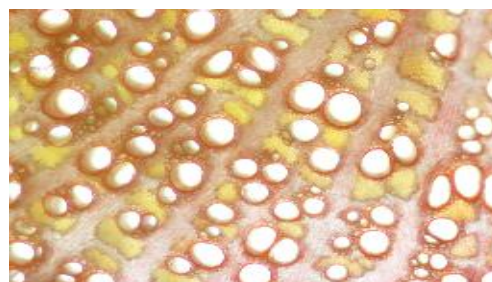
Cork



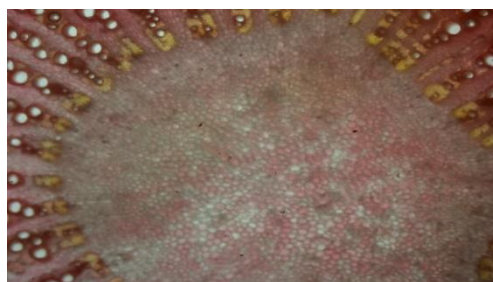
Pericyclic Fibres, Pheloem, Xylem



Cortex with pericyclic fibers

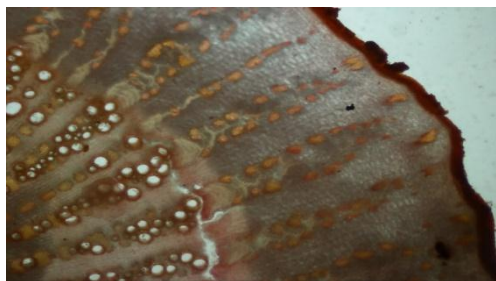


Lignified fibers with vascular bundles

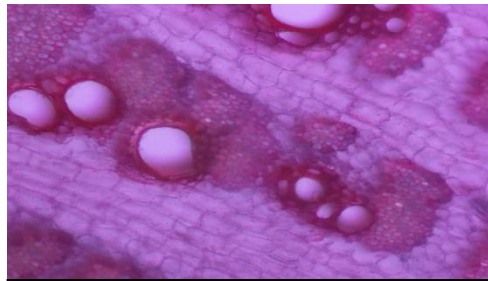


Pith

Fig 17:-TS of market samples of *Yashtimadhu* [*Glycyrrhiza glabra* Linn]



Cork and Cortex



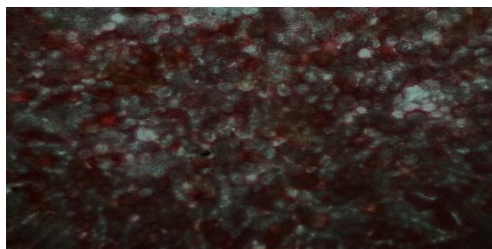
Pericyclic fibers, phloem and xylem



Cortex with pericyclic fibers



Lignified fibers with vascular bundles



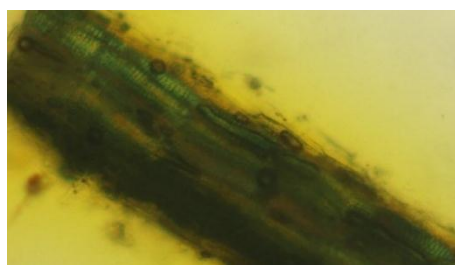
Pith

Fig 18:- Powder characters of genuine sample of *Yashtimadhu*

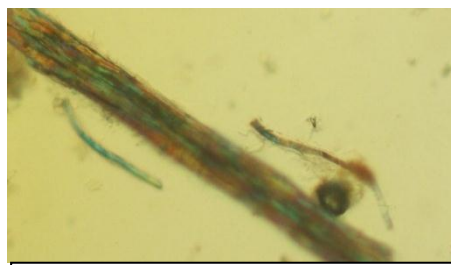
A. Rhomboid crystal



B. Lignified fibers



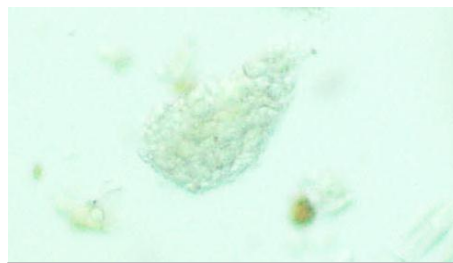
C. Pitted vessel



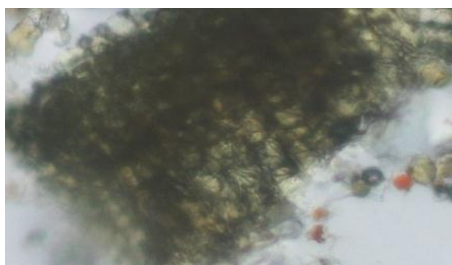
D. Crystal fiber



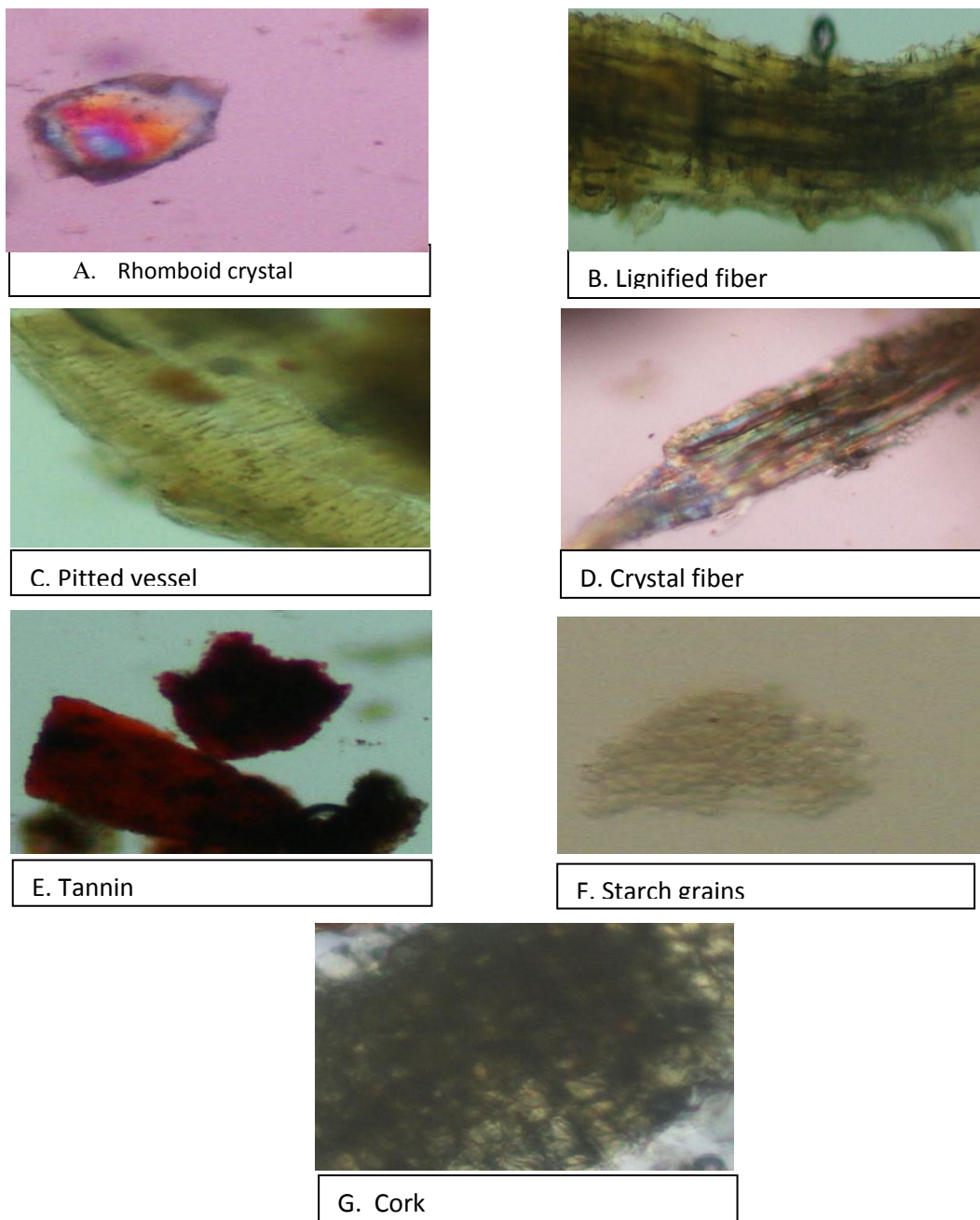
E. Tannin



F. Starch grains



G. Cork

Fig 19:- Powder characteristics of market samples of *Yashtimadhu*:**References:-**

1. A.K. Teltumbde , A.K. Wahurwagh , M.K. Lonare and T.M. Nesari. Effect of Yashtimadhu (*Glycyrrhiza Glabra*) on Intelligence and Memory Function in Male Adolescents. *Scholars Journal of Applied Medical Sciences (SJAMS)* 2013; (): 90-95.
2. Nishant P. Visavadiya , Badrish Soni & Nirav Dalwadi. Evaluation of antioxidant and anti-atherogenic properties of *Glycyrrhiza glabra* root using in vitro models.. *International Journal of Food Sciences and Nutrition* 2009; 60(2): 14. <https://doi.org/10.1080/09637480902877998> (accessed 13 Aug 2009).
3. Donatella Pellati, Cristina Fiore, Decio Armanini, Mario Rassa, Giulio Bertiloni. In vitro effects of glycyrrhetic acid on the growth of clinical isolates of *Candida albicans*. *Phytotherapy Research* 2008; 23(4): 2. <https://doi.org/10.1002/ptr.2693> (accessed 9 December 2008).
4. Anonymous. The Ayurvedic Pharmacopoeia of India. Part-1, Vol. 3, Govt. of India. Ministry of health and Family welfare, Dept. of ISM&H (AYUSH), New Delhi, 2001, 227-40.