

**EXPERIMENTAL INVESTIGATION TO FIND DIAMETER OF
PEERUGULARIA EXTENSA FIBERS BY IMAGE ANALYSIS**Akula Komuraiah¹, N. Shyam kumar², D. Durga Prasad³, D. Sreekanth Rao⁴

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Abstract :

For the accurate measurement of the object we use microscopes and other instruments like SEM (scanning electron microscope). Instead of using SEM, if we use microscope to get the image and store them in a digital format in computer may be useful to measure the distances more accurately by using computer software, there are many soft wares available in the market which are helpful to analyze the images to know the various parameters of the image, For example we can find the distances, areas, angles etc with these software's. In this paper , I want to explain the process to find the diameter of the fibers of peerugularia extensa. Perugularia extensa is a medicinal plant which naturally grows in the months june to September

Key words : Peerugularia Extensa, natural fiber, image analysis, diameter, microstructure ,

1. Introduction :

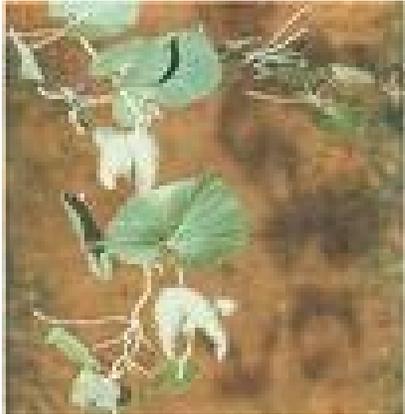
Perugularia Extensa in a medicinal plant which gives fibers similar to cotton and it grows at the same tome as the cotton grows. It gives fibers of fine quality and can be used as pillow fillers , brushes for cosmetic application , in this paper it is aimed to find the fiber diameter by using trinocular metallurgical microscope and image analysis. Novel applications of these fibers are soap and paper making.

white, small flowers in tiny clusters and fruits reflexed in pairs, covered with spinous outgrowths. It has hairy stems with milky juice and board, egg-shaped leaves. The entire plant constitutes the drug and is used as medicine. It is pungent, antibilious and laxative.

Pergularia contains a bitter resin, two bitter principles and a glucoside possessing physiological action similar to pituitrin and several sterols.

2. Pergularia :

Pergularia is a small, perennial, twining herb with greenish yellow or dull



Peruguleria Extensa plant



Peruguleria Extensa Fibers

It contains fine fibers in silver white in color and can be used to as brushes

3. Experimental setup :

3.1 Trinocular microscope :

Trinocular microscope may be an optical, acoustic, or an electron microscope. In other words, it may be a microscope in which the specimen is illuminated by visible light, by sound, or by a particle beam of electrons. In addition, the third eyepiece may have been added to a binocular compound microscope or a stereo microscope. A binocular compound

microscope uses one lens array for the objective but has a pair of eyepieces, with the light from the image formed by the objective split by a prism. A stereo microscope has two eyepieces, but also two objectives as well, so that the examiner's view appears three-dimensional. In either case, the user taking advantage of the third lens on one of these two types of trinocular microscope will be provided with a monocular view.

A trinocular microscope may have one of several purposes. One purpose is to allow a second viewer access to a specimen at the same time as the person who is mainly using the microscope. This means that an instructor can, for example, look at what a student is seeing to answer a question or to check the accuracy of the student's observations. In addition, the instructor can invite a student to share his or her view of an interesting specimen or when modeling how to adjust the focus, for example. This extends the instructional possibilities from the situation in which one person must not be viewing in order for the other person to have a view.

Another purpose of a trinocular microscope is to allow the use of technology to either preserve the images seen through the microscope by recording them or projecting them. In the first case, a digital camera or video camera could be connected to the third eyepiece, which may actually be designed as a port with this specific purpose. If it is not, there are adapters for some microscopes that can adapt a trinocular eyepiece meant for human

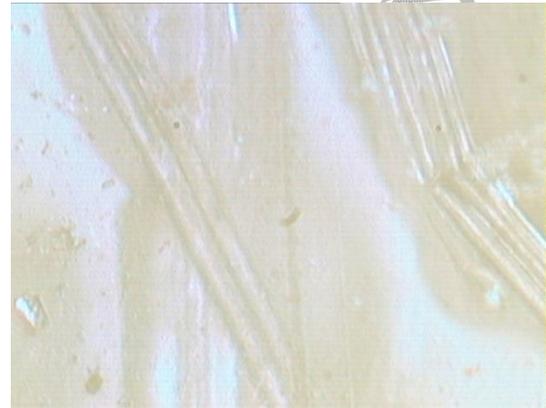
viewing to a camera. Projecting an image has several advantages including allowing prolonged study without having to stay bent over the microscope itself, sharing images with others who are present in the room, or even sharing the image through a video chat or other means.

3.2 Image analysis :

Image analysis is the extraction of meaningful information from images; mainly from digital images by means of digital image processing techniques. Image analysis tasks can be as simple as reading bar coded tags or as sophisticated as identifying a person from their face.

Computers are indispensable for the analysis of large amounts of data, for tasks that require complex computation, or for the extraction of quantitative information. On the other hand, the human visual cortex is an excellent image analysis apparatus, especially for extracting higher-level information, and for many applications — including medicine, security, and remote sensing — human analysts still cannot be replaced by computers.

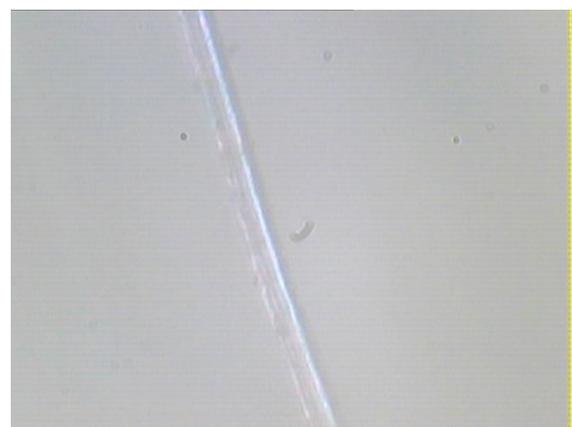
The trinocular microscope is interfaced to a computer in which image analysis software is available.



At starting



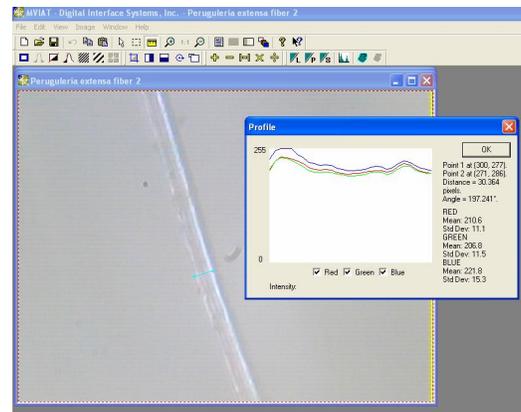
at the Middle



at the end

3.3 Procedure:

1. The sample specimen whose diameter is to be found is seen through the trinocular microscope
2. The seen image is stored in the computer in form of B M P format
3. This stored image is opened in the MVIAT – Digital interface System Inc a image analysis soft were trial version
4. To find the distance ie diameter , Use this tool to measure the distance and angle between two points in pixels and view pixel values along the line.
5. For a given sample the measurements are done at various locations ie at the starting , at the middle and at the end , three readings were taken at each location and total 9 readings were taken
6. With the Measure Tool selected, move the mouse cursor to the place in the image where you want to start the measurement. Hold down the left mouse button while dragging the mouse cursor to the place in the image where you want to end the measurement. When the left mouse button is released, a dialog box will appear to show the coordinates of the start point and the end point, the distance in pixels between these points, and the angle in degrees between these points. The dialog also shows a graph of the intensity values along the selected line
7. The mouse cursor is placed at the one edge and dragged till the end edge in a perpendicular direction to its length . The diameter is measured at three locations of the fiber, i. e. at the starting (first location) , in the middle (second location) and at the end (third location) of the fiber along its length
8. This measured distance is compared with the standard reference distance and the diameter of fiber is found , the results are tabulated and analyzed
9. At the same magnification the distance of one pixel is found to be 0.000778 mm when compared to a standard measurement ie with pitch gauge, 0.35 mm gauge measured 450 pixels on screen at 100 X magnification



MVIAT Image analysis

S.N.	No pixels	Microns	Mean	Standard deviation
1	63	49.014	28.0099	13.23009
2	56	43.568		
3	55	42.79		
4	31	24.118		
5	28	21.784		
6	27	21.006		
7	23.022	17.91112		
8	22	17.116		
9	19	14.782		

Table 1. Fiber diameters along its length

4. Results and conclusions ;

The average diameter is found to be 28.0099 microns and these fibers can be used for brushes to apply cosmetics

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