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MORPHOLOGICAL AND ANATOMICAL STUDIES ON BARK OF ERYTHRINA SUBEROSA ROXB.

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ABSTRACT:

The bark of *Erythrina suberosa* Roxb. (Fabaceae) is reported to be used in preparations of medicines for dysentery, intestinal worms, obesity, opthalmia. Attempts were made to standardize the bark on the basis of its morphology, anatomy and maceration studies.

KEYWORDS: *Erythrina suberosa*, Bark, Standardization.

INTRODUCTION:

The bark of *Erythrina suberosa* Roxb. (Fabaceae) commonly known as *Pangara*, is astringent, febrifuge, used in anorexia, liver troubles, helminthic manifestations, inflammations, intestinal worms and obesity. Also as collyrium in opthalmia, as antidote to snake-bite, it promotes appettite, destroys pathogenic parasites, arrests excessive micturition and cures oedema, flattulance, colic arthritis. Decoction of bark is used in opthalmia and other eye-diseases. Juice of bark is used to kill worms and in sores (Joshi, 2000). The bark is antibilious and febrifuge useful as a collyrium in opthalmia, the inner side of bark is smeared with ghee held over the flame, thus deposited is used in watery eyes, tinea-tarse and purulent, conjunctivitis, being applied to the inner side and edges of the lower lid (Nadkarni 1998).

MATERIALS AND METHODS: During present investigation the bark samples of *Erythrina suberosa* Roxb. were collected from Dr. Babasaheb Ambedkar Marathwada University campus, Aurangabad and their morphological, anatomical and maceration characters were studied. For anatomical studies free hand sections of the bark were taken, double-stained and mounted permanently by following standard methods (Esau, 1965) and observed under compound microscope. The dry bark samples were macerated with Jeffery's Macerating Fluid as described by Johanson (1940).

RESULT AND DISCUSSION:

Morphology: Thickness of fresh bark 5 to 14 mm and dried 3 to 6 mm, hard, external surface greyish green or silver green; exfoliating in narrow strips of periderm lenticels found at short intervals, longitudinal lines on outer surface; yellowish to creamish coloured, whole bark differentiated into outer non-fibrous and inner fibrous zone, inner surface pale

yellow; striated, fibrous; fracture hard irregular, fibrous; quelling at both margins and double quelling; taste starchy and sweet.

Anatomy: T.S. of stem bark shows multilayered cork composed of 2-9 bands of narrow tangentially elongated, compressed, yellow coloured cells, alternating with wider cells three or more layered, squarish, tangentially elongated, thin walled cells. Few cells contain prismatic crystals of calcium oxalate. Cork cambium one to few layered, rectangular cells, dark brown coloured. Cortex consists of many layered, cells of which are squarish to rectangular, polygonal, irregular, moderately thick walled compactly arrenged parenchymatous cells. Few cells contain prismatic crystals of calcium oxalate. The crystals are rhomboidal or polygonal in this cortical region, stone cells occur in single or in groups upto 20 cells are found. Stone cells are elongated, rectangular in shape. Their size ranges from 30-50 x 30-70µ. Parenchymatous cells surrounding the stone cells contain crystals of calcium oxalate. Secondary phloem consists of sieve elements with their companion cells. Phloem fibre phloem parenchyma traversed by phloem rays. Phloem parenchymas are squarish to rectangular, tangentially elongated, cells measured from 25-40 x 30-120µ. They are impregnated with starch grains, grains single or in groups of 2-4, circular with central hilum measured up to 5µ in diameter. Phloem fibers mostly arranged in tangentially strips alternating with regular thin walled phloem elements, lignified fibers are polygonal having 15-40µ in diameter. Sieve elements in outer and middle regions of phloem mostly get collapsed and crushed and form many tangential strips of ceratenchyma between the tangential groups of phloem fibres. Fibres large, thick walled with narrow lumen. Ray cells thin walled, tangentially elongated towards outer region and radially elongated towards inner region. The rays have wavy wall, the rays in middle region are squarish. Rays are 3-4 serriate in inner region and bi-seriate in outer region, the phloem rays, phloem parenchyma are full of starch grains and crystals.

Maceration:

The maceration cells shows following cells: parenchymatous cells are of three types, rectangular cells are thick walled, arranged in chains of two rows, and cells at the terminal position have blunt angles, other cells with sharp angles 25-30 x 40-90µ (Fig 14a). Second types of parenchymatous cells are spherical- rectangular thick walled, average size 60 x 80µ (Fig 14b). Third types are ovate elongate, again two types of cells are observed, one is thin walled with sharp tip. Whose cytoplasm shrinked and become more dense 20-30 x 120-140µ (Fig 14c). Stone cells are variable which are squarish rectangular or polygonal, rectangular cells 25-35 x 75-110µ (Fig 14d). Other broader stone cells with very thick wall 35-45 x 50-70µ (Fig 14e). Crystalline fibres swollen at the middle region and sharply tapering towards the end. Lumen in septate each septum has crystals. Thickening at the middle region is about 40µ. Length is around 2200-2400µ (Fig 14f). Another thin fibre with about 20-25µ in diameter, whose lumen shows zigzag pattern, these thin fibres are attached with the row of cells of prismatic crystals of calcium oxalate. The crystals are polygonal, the crystals cells are attached with ovate elliptical parenchymatous cells (Fig 14g). The cells prismatic crystals 20-25 x 25-35µ (Fig 14h). There are squarish rectangular or rectangular elongated cells with yellow inclusions. There size ranges from 30-70µ in diameter thickness 50-120µ in length.

Conclusion: Anatomical features including cork, cortex and secondary phloem, macerated cells like fibres, crystalline fibres, crystals, stone cells, cells with yellow inclusions and parenchymatous cells form the criteria for the standardization of *Erythrina suberosa* bark.

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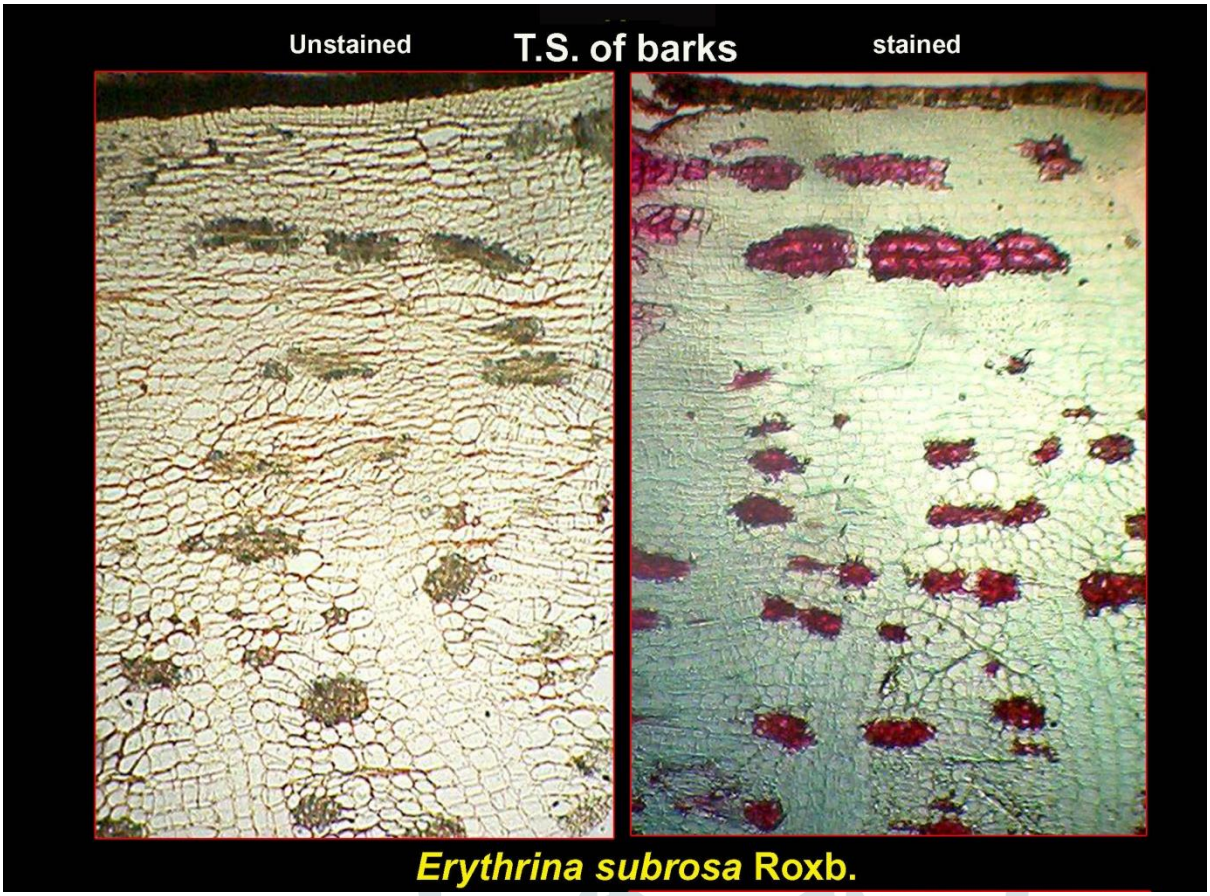
A flowering twig

Outer surface of bark

Inner surface of bark

Erythrina suberosa Roxb.


Unstained
T.S. of barks
stained
Erythrina subrosa Roxb.

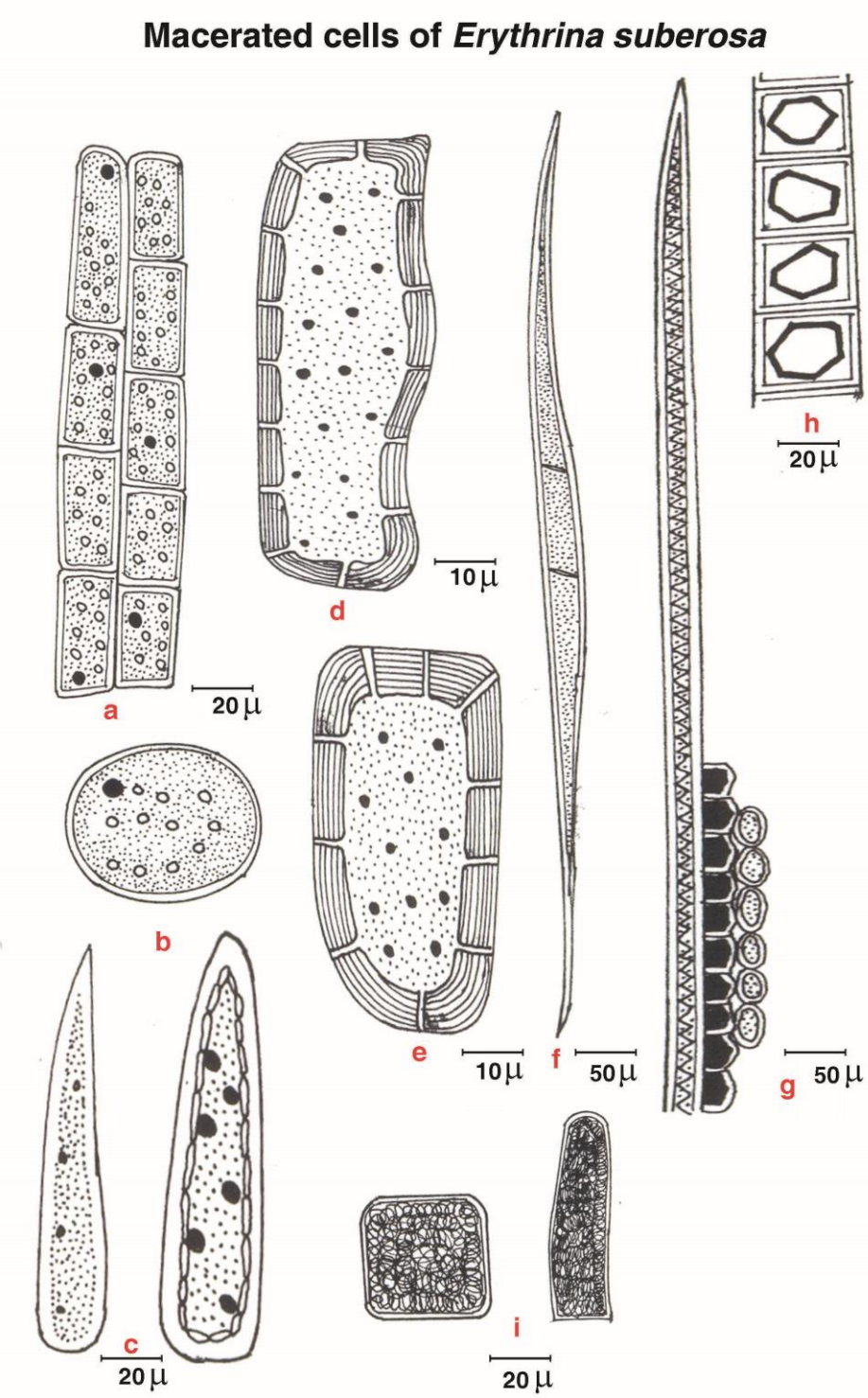


Fig 14 a, b, c- Parenchymatous cells, d, e- Stone cells,
f- Crystaline fibre,g- Crystaline fibre, h- Prismatic crystals in row,
i- Cells with yellow inclusions