IDENTITY OF MOLLUGO STRICTA ROOTS: A POSTENTIAL ANTIFERTILITY DRUG FOR FUTURE

P.PADMA and R.L. KHOSA
Department of Pharmaceutics, Institute of Technology, Banaras Hindu University, Varanasi-221 005, India.

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ABSTRACT: The salient diagnostic pharmacognostical characters of the roots of Mollugo strica which sows promise as an antifertility drug for future have been studied. The young root is di-to-tri-arch, diarch conditions being most common. The cork cambium arises in the outermost layer of cortex forming 2-3 layers of cork cells on the outside and phelloderm towards the insides. In the nature root, two concentric stellar rings are formed around the central was the inner one being continuous where as the outer one is discontinuous. The central core of wood also show delignificant in the advanced stages. Starch and calcium oxalate are absent. Ash values and fluorescence analysis are also determined.

INTRODUCTION

Mollugo stricta Syn M. Pentaphylla (Family: Ficoidaceae) commonly known in Hindi as Jhara s, Tamil as parpadakam, Telugu as Verrichatarasi grows in paddy and maize fields during July –August, in stony localities, almost throughout India ascending upto 1500 maters in the hills (Agarwal, 1975).

It is used in Indian system of medicine in the treatment of nervous disorders anorexia, in the treatment of nervous disorders, anorexia, indigestion, helminthiasis, liver and blood disorders, jaundice, pain in joints, urinary troubles, pyrexia, skin diseases, as an emmenagogue (Sharma, 1956) and also as sperimostatic Jha, 1984). Alcoholic extract of the whole plant has been reported by us to reduce the heat period in the estrous cycle of female albino rats, thus pointing to its possible antifertility effect (Padma, and Khosa., 1992) this effect has been found to be much more pronounced in its roots, In view of the importance of the root of this plant having the potential of being developed as an antifertility agent, it was thought to work out its salient diagnostic features to differentiate it form its possible adulterants/ substitutes.

MATERIALS AND METHODS

Fresh botanically identified roots of Mollugo stricta Linn were collected from Varanasi district. Hand and microtome sections were taken, stained and mounted in the usual was (Johansen 1940). Cell content and cell wall structures were studied according to the procedures described by (Kay 1938) and (Johansen, 1940). The fluorescence analysis was done according to the procedure described by (Kay 1938) and (Johansen, 1940). The fluorescence analysis was done according to the procedure described by (Kokaski et. al 1958). Ash values were determined by the procedures of (Indian Pharmacopoeia 1966).
OBSERVATION AND DISCUSSION

Pharmacognosy of roots. Macroscopical characters (Plate-I)

The dried root occurs in commerce as a typical taproot system, exactly in the same way as observed in nature. The individual rootlets are 0.1-0.4 cm thick. The external surface being yellowish brown with rootlets present here and there making it slightly rough. On smoothing a transversely cut surface, a thin dark is noticed which easily separates out from the central wood pith is absent. The roots are hard and wood fracture is fibrous; taste, acrid and odourless.

Microscopical characters (Plate-II) Young Root

The primary structure in young root reveals a di-to tri-arch condition (fig - 1,2,3) diarch condition being more common. The epidermis is represented by a single layer of tangentially elongated cells covered externally by a thin layer of cuticle. This is followed by a region of cortex comprising of four to six layers of thin walled slightly compressed parenchymatous cells with intercellular spaces in between them. Its innermost layer is the endodermis with indistinct casparian dots on their radial walls. The endodermis is followed by a single layer of pericycle enclosing a central di-or tri-arch stele.

As the secondary growth proceeds, the cork cambium arises in the outermost layer of the cortex (Fig 5), thus cutting of cork cells on outer side and phelloderm on inner sides. Almost concomitant with the formation of cork cambium. Two additional concave stellar bands, one in each side of the central stellar core are formed with the cortical region (fig 4). Very soon more tissues within the cortex in continuation with the concave stellar elements and thus a continuous thick concentric stellar ring is formed just around the central core (fig 6). Cork at this stage consists of 2-3 layers of suberized cells. With the advancement in secondary growth, some cells in radial as well as in tangential rows (the cells of the latter being mostly the inner xylem elements of the external stellar ring) show delignification which become wide enough to give the ring a discontinuous appearance (fig 7) and also the ring now looks separated from the central stellar core by thick walled parenchymatous zone, 3-4 layers of cells wide.

Mature root

In the full mature root, third discontinuous concentric ring of vascular bundles of unequal sizes appear in the region of phelloderm just outside the second ring, the individual bundle being separated by wise zone of parenchyma (fig 8). The third stellar ring is separated from the second by a wide zone of thick walled parenchyma, 3 to 4 layers of cells wide. In the central lignified core, some cells in radial rows also show delignification which deepens with the passage of time and a central stellar structure is generated. In the centre of the stellar structure is a small delignified parenchymatous zone consisting of thick walled parenchymatous cells, with-out any intercellular spaces in between them. In the mature root, the cork consist of 3-4 layers of tangentially elongated suberized cells followed by a region of phelloderm consisting of thick walled parenchymatous cells.

Calcium oxalate and starch are absent. The total ash, water soluble ash and acid -in soluble ash values of the roots are 12.70, 0.551 and 2.252% w/w respectively.
Fluorescence Analysis

Treatment
1. Powder as such 2. Powder treated with nitrocellulose in amylacetate 3. Powder treated with 1N HCl in methanol 4. Powder treated with nitrocellulose in amylacetate after step (3) 5. Powder treated with 1N NaOH in methanol 6. Powder treated with nitrocellulose in amylacetate after step (5) 7. Powder treated with methanol 8. Powder treated with sulphuric acid (1:1) 9. Powder treated nitric acid (1:1)

Fluorescence
No color No color Yellow Yellowish green Light yellow Dark yellow Green Greenish yellow

Measurements of different cells and cell inclusion sin microns

| Cell Type                  | Measurement 1  | Measurement 2  | Measurement 3 |
|----------------------------|----------------|----------------|---------------|
| Cork Cortex Phloem         | 08-12-20       | 14-27-63       | 11-25 11-30   |
| Medullary ray              | 123-189-266    |                |               |
| Xylem Vessel Xylem         | 199-310-448    | 05-09 07-18    |               |
| fibre Tracheids            | 154-224-347    | x x x          | 21-39 11-21   |
| Xylem Parenchyma           | 74-104-147     | x x x          | 07-18 21-30   |
PLATE – II LEGEND TO FIGURES

Microscopical characters of the root of M. stricta

Fig. 1 T.S of the young root showing a diarch condition (diagrammatic)x58. Fig. 2 T.S of the young root showing tri-arch condition (diagrammatic)x58. Fig. 3 T.S of a portion of Fig. 1 showing cellular details x 565. Fig. 4,6,7,8 T.S of the root showing various stages of advancement (diagrammatic)x58. Fig. 5 T.S of the young root showing formation of cork cambium x 565. Fig. 10 T.S of young root showing formation of cork cambium x 565. Fig. 9 Isolated elements of the root x 565. a-b Xylem vessels g-I Tracheids m-u Xylem fibres v-z Xylem parenchyma

Abbreviations:
Cut: Cuticle; Epi: Epidermis; Cort: Cortex; Cortex; Endo: Endodermis; Peri: Pericycle; Xyl: Xylem; Phl: Phloem; C.C: Cork Cambium; Phell: Phelloderm; Ck: Cork M.R: Medullary Ray X.V.: Xylem vessel

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