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PHARMACOGNOSTICAL AND TAXONOMICAL STUDIES OF CASSIA AURICULATA L. (FAMILY- CAESALPINIACEAE)

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ABSTRACT

In recent times, focus on plant research has increased all over the world and a large body of evidence has collected to show immense potential of medicinal plants used in various traditional systems. Over the last few years, researchers have aimed at identifying and validating plant derived substances for the treatment of various diseases. Similarlyithas been already proved that the correct identification and authentication of taxa is most important in plants science. The Cassia auriculataLinn is another Indian plant, which has enormous traditional uses against various diseases. The present review aims to Morphological as well as anatomical review of Cassia auriculataLinn. Generated through the research activity using modern scientific approaches and innovative scientific tools.

Pharmacognosy is the study of drugs of natural origin the term comes from two Greek words "Pharmakon" meaning drug or medicine and "Gnosis" meaning knowledge. Pharmacognosy can also be designed as in the study of we physical, chemical, biochemical, Biochemical properties of drug, drug substance are potential drug of natural origin as well as the search from new drugs from natural resources.

The study of traditional human uses of plant is recognised as a reflective to discover the feature medicine in 2001 researcher identical 122 compound used in modern medicine which were derived from ethno-medicinal plant resources, 80% of these have been on ethno-medicinal use identical or related to the current use of active element of the plant.

INTRODUCTION

C. auriculata (Family: Caesalpinaceae) is a common plant in Asia, profoundly used in Ayurvedic medicine as a tonic, astringent and as a remedy for Diabetes, Conjunctivitis and opthalmia.5 It is one of the principle constituents of 'Avaaraipanchagachooranam'- an Indian herbal formulation used in the treatment of diabetes to control the blood sugar level.

Cassia auriculata Linn commonly known as Tanner's cassia, also known as "Vilayati Tarvad" in Marathi language. The shrub is especially famous for its attractive yellow flowers which are used in the treatment of skin disorders and body odor.

In India the *Cassia auriculata* Linn having various vernacular names, English -Dannres cassia, Hindi - Tartar, Sanskrit- Charmaranga and Avartaaki , Gujarati -Aawal ,Kannada- Avarice ,Telugu - Tangedu ,Tamil - Avarae

MATERIALS AND METHODS

C. auriculata (Family: Caesalpinaceae) was collected from Aurangabad region of the Maharashtra. The survey of the study area was conducted during 2016-2017. Identification of the collected specimens was made with the help of standard floras (Hooker, 1872-1897; Naik, 1998).Herbarium specimens are deposited in the Department of Botany, Shri Chhatrapati Shivaji College, Omerga. Library and Herbarium of Botanical Survey of India, Pune was consulted for review of literature and also for identification of the specimen.

Histochemical screening were performed as per standard methods given in reference books by Gangulee et. al. (1959), Evans (1996), Gibbs (1974), Harborne (1973), Peach & Tracey (1979), Rastogi & Mehrotra (1999) and Johansen (1940).

1) Anatomy with double staining and illustration

The T. S. of Root, Stem and leaf were taken by fine blade and the sections were stain by the method of double staining, and the illustration of all sections and habit of plant were made by 0.2,0.4 and 0.6 tip drawing pen on A4 sized drawing paper.

2) Qualitative Analysis

Test for qualitative analysis of starch, protein, fat, tannin, saponin, glycosides and alkaloids was taken and confirm the presence or absence of compounds in plant parts ie. Root Stem and leaves.

Root gave the positive test for the starch protein fat glycosides of alkaloid while negative test for tannin metabolites are seen mostly scattered in cortical and pith parenchyma.

Stem shows their presence in the cortical and pith parenchyma the fresh leaf fresh leaf section shows the localization of protein starch fat glycosides, alkaloids, tannin and saponins are seen present in scattered cells of the mesophyll tissue. It is presented in Table No.1.

3) Quantitative Analysis of

Total Ash values, Moisture contents, Sugar in root, alkaloids, Nitrogen, Potassium, Calcium, Phosphorus, Crude protein, free amino acid were calculated in percentage.

TAXON TREATMENT

***Cassia auriculata* L. (Family- Caesalpiniaceae)**

Sp. Pl. 379. 1753 baker in hook f fl. brit. India 2:263. 1878 NaikFlOsmanabad 118 1979 TARWAD, TAROTA.

Much branched shrubs 1-2 m tall, bark smooth, reddish brown' branches finely pubescent leaves 7.5-9.5 cm long, rachis densely fulvous pubescent with on erect linear gland between each pair of leaflets stipules fallacious, rotundto- reniform, 1-1.5 cm. long, produced below in to a long subulate paint, deflexed leaflets 7-12 pairs, oblong obovate, 1.5-2.5 x 0.7-1.5 cm, rounded at both ends. mucronate, glabrous or finely downy on both surface; petioles 1 mm long, flowers ca 5 cm across, in terminal and axillary corymbose racemes, pedicels 2-2.5 cm long bracts ovate acuminate cauducous. Calyx ca 1 cm long glabrous tube very short; lobes unequal, 2 larger than the other three, ovate-orbicular. corolla bright yellow; petals long clawed and with limbs with crisped margins prefect stamens 7,01 which 3 are longer than the 4 lateral ones; staminodes 3, pods linear oblong 7.5 – 1.5 7.5 x 15 x 1-1.5 cm lat, thin pale brown depressed between the seeds, pubescent seeds 10-20 ovoid, brown, polished.

Flowers and Fruits : December to July.

Exsiccata : SNS 9.

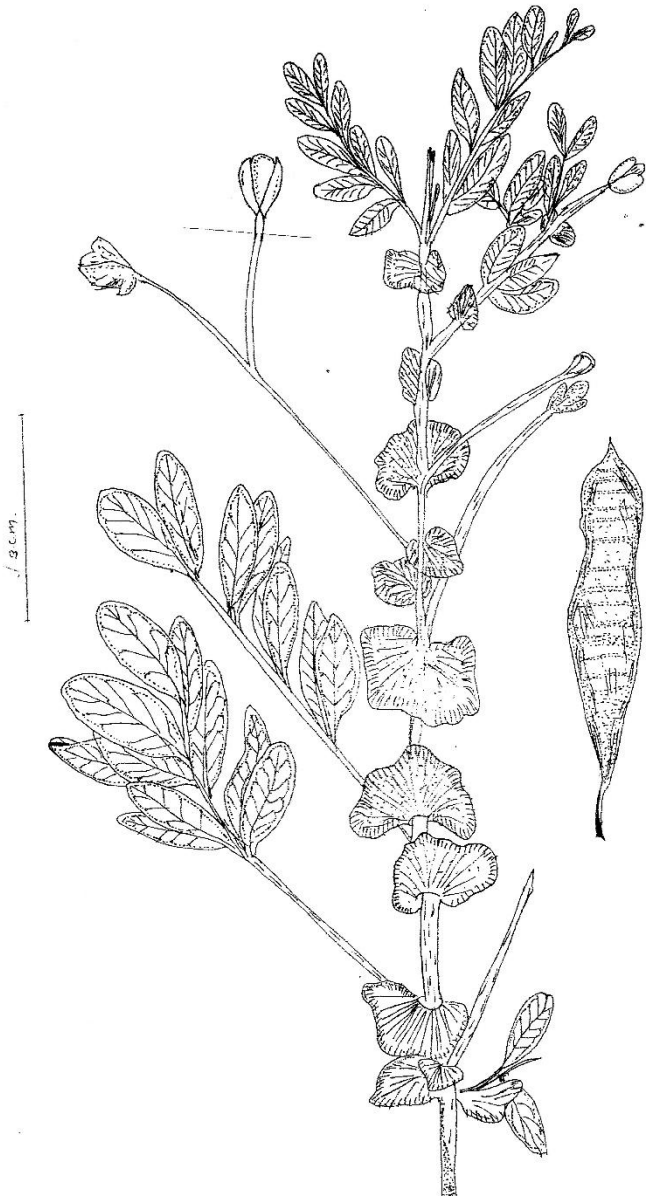

Illustration: Habit *Cassia auriculata*L.

MICROMORPHOLOGY

T.S of Root

The outermost layer of T.S. is root the cork is about 30-50 µm thick. The cork is followed by 2-3 layer of hypodermis. The hypodermal cells were measured about 20-30x35-40 µm.

The hypodermis is followed by 5-7 layers of cortical cells. The cortical cells were measured about 40-50x55-60 µm. there is no variation in cortical cells.

The cortex is followed by stele which is located at the center of T.S. The four symmetric patches of xylem elements are present in the vascular strand of stele & phloem parenchyma. The Actinostele present in root of *Cassia.*

The metaxylem element was measured about 40-50x55-60 µm & protoxylem is measured about 30-40x35-45 phloem parenchyma were measured about20-30x25-35 µm.

The pith is present at the center of stele pith is composed of 1-2 layer of arenchymatous cells which is measured about 20-30 µm.

T.S. of Stem

The outer most layer of Epidermis is covered by thick protective cuticle and forms circular outline. Some epidermal cells grow outwardly & form the hair like trichome and there is no collenchyma in stem. The epidermis is composed of barrel shaped thick walled cells were measured about 20-50x35-40 µm.

The epidermis is followed by cortex. The cortex is of 4-6 layers & cortical cells were measured about 10-15x15-20 µm.

The cortex is followed by stele. This is of dictyostele. The vascular bundle is presents in stele. The phloem parenchymatous cells forms ring like appearance below to endodermis. The ring of phloem cells were interrupted by xylem patches.

Phloem parenchyma was measured about 10-15 µm in diameter & xylem elements were measured about 30-40x 40-55 µm. pith is present at the center of stele which is Composed of 5-6 layers of parenchymatous cells pith cells were measured about 30-40 µm in diameter. The parenchyma interrupted by some Schlerenchymatous cells.

***Cassia auriculata* L. (Family- Caesalpiniaceae)**

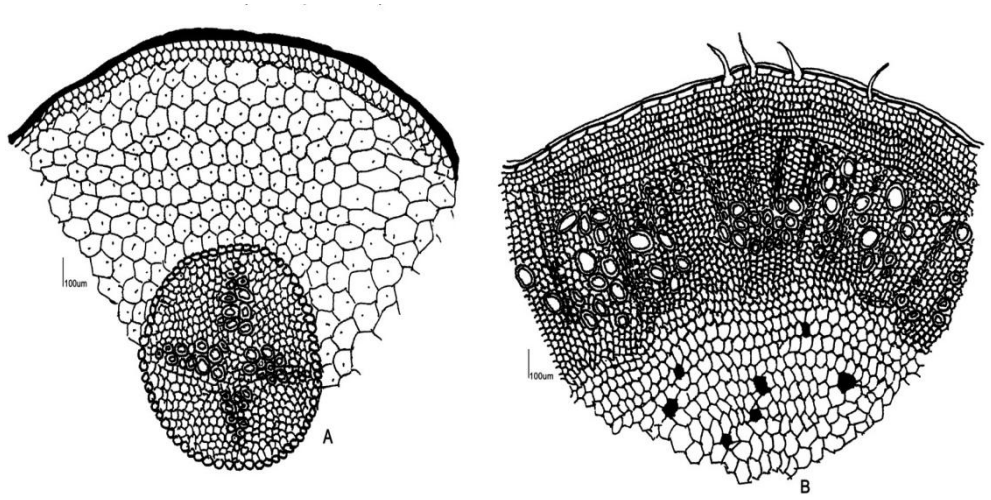

Illustration: A- T.S. of Root, B- T.S. of Stem

T.S of Leaf

The leaf lamina dorsiventral. The upper most layer of t.s of leaf shows the barrel shaped thick walled compactly arranged protective epidermal cells were measured about30-35x40-45 µm.

The upper epidermal cells were interrupted by trachoma's & stomata. The upper epidermis is followed by elongated palisade cells. There are two layers of palisade cells. The palisade cells were measured about 10-20x50-70µm.

The palisade cells were followed by spongy parenchyma. Spongy parenchyma was measured about 30-3x35-40 µm. The palisade cells and spongy parenchyma rich in chlorophyll. Bundle sheath cells present at the center of the bundle sheath cells were followed by vascular strand. The vascular strand is single and globular in shape.

The phloem parenchyma of vascular strand was measured about 10-15x15-20 µm. The xylem element was measured about 30-35x35-40 µm.

The lower epidermis composed of compactly arranged cells &it's interrupted by stomata, and it's also covered by thin cuticle. The lower epidermal cells were measured about 25-30x30-35 µm.

Trichome

Trichome of *cassia auriculata* shows unicellular unisrrrate type which is measured about 60-80 µm in length.

Stomata

The cassia leaf bears a rubiaceous parasitic type of stomata. The guard cells measured about 40-60 µm in length and 30-40 µm in width.

***Cassia auriculata* L. (Family- Caesalpiniaceae)**

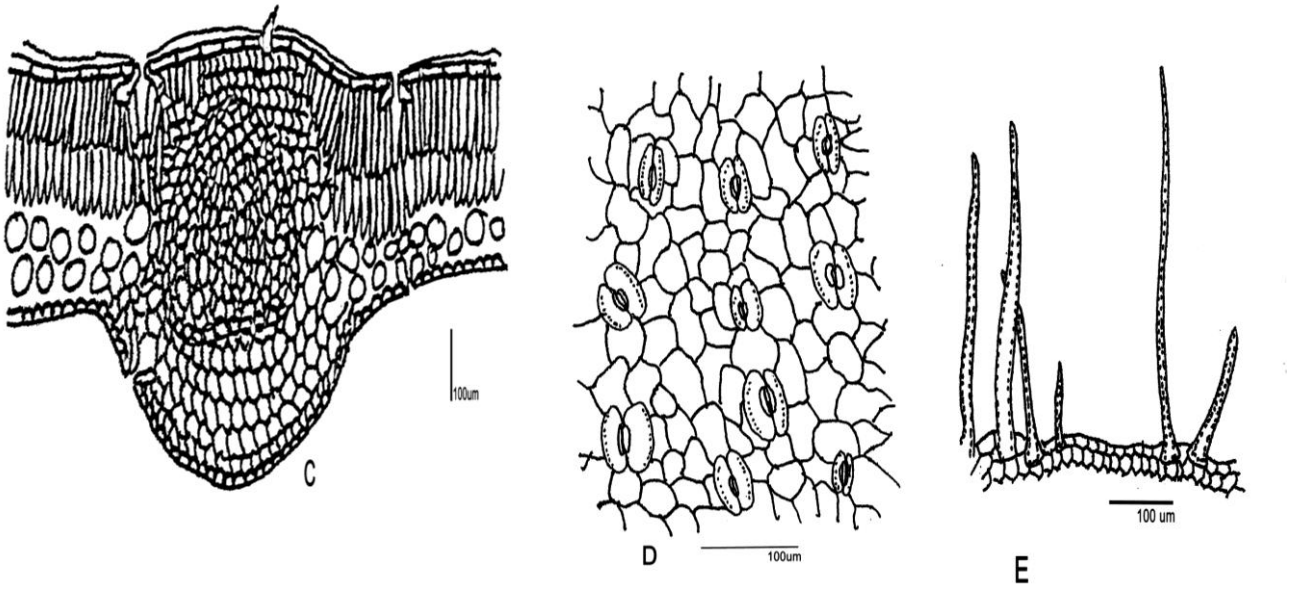

Illustration:C- T.S. of Leaf, D- Stomata, E- Trichome's

QUALITATIVE ANALYSIS

Table 1: Qualitative Analysis in *Cassia auriculata* L.

*Cassia auriculata*L.				
Sr. No.	**Test**	**Root**	**Stem**	**Leaf**
1	Starch	+	+	+
2	Protein	+	+	+
3	Fat	+	+	+
4	Tannin	_	+	+
5	Saponin	+	+	+
6	Glycoside	+	+	+
7	Alkaloids	+	+	+

Table 2: Total Ash in *Cassia auriculata* L.

Sr. No.	Part of the plant	Percentage of total ash
1	Root	21.3%
2	Stem	18.7%
3	Leaf	20%

Table 3: Total Water Insoluble Ash in *Cassia auriculata* L.

Sr. No.	Part of the plant	Percentage of water insoluble ash
1	Root	18.1%
2	Stem	16.5%
3	Leaf	18.3%

Table 4: Total Water Soluble Ash in *Cassia auriculata* L.

Sr. No.	Part of the plant	Percentage of water soluble ash
1	Root	3.2%
2	Stem	2.2%
3	Leaf	1.7%

Table 5: Total Acid Soluble Ash in *Cassia auriculata* L.

Sr. No.	Part of the plant	Percentage of acid soluble ash
1	Root	16%
2	Stem	14.2%
3	Leaf	17.1%

Table 6: Total Acid Insoluble Ash in *Cassia auriculata* L.

Sr. No.	Part of the plant	Percentage of acid insoluble ash
1	Root	5.3%
2	Stem	4.5%
3	Leaf	2.9%

Table 7: Total Moisture content in *Cassia auriculata* L.

Sr. No.	Part of the plant	Percentage of moisture
1	Root	6.2%
2	Stem	5.8%
3	Leaf	7.1%

Table 8: Total Sugar in *Cassia auriculata* L.

Sr. No.	Part of the plant	Percentage of total Sugar
1	Root	0.56%
2	Stem	0.88%
3	Leaf	2.3%

Table 9: Total Reducing Sugar in *Cassia auriculata* L.

Sr. No.	Part of the plant	Percentage of reducing Sugar
1	Root	0.41%
2	Stem	0.71%
3	Leaf	1.77%

Table 10: Total Non-reducing Sugar in *Cassia auriculata* L.

Sr. No.	Part of the plant	Percentage of non-reducing Sugar
1	Root	0.15%
2	Stem	0.77%
3	Leaf	0.53%

Table 11: Total alkaloids in *Cassia auriculata* L.

Sr. No.	Part of the plant	Percentage of total alkaloids
1	Root	1.112%
2	Stem	9.7%
3	Leaf	11.3%

Table 12: Total Nitrogen in *Cassia auriculata* L.

Sr. No.	Part of the plant	Percentage of nitrogen
1	Root	2.3%
2	Stem	2.9%
3	Leaf	3.2%

Table 13: Total Potassium in *Cassia auriculata* L.

Sr. No.	Part of the plant	Percentage of potassium
1	Root	0.401%
2	Stem	0.231%
3	Leaf	0.481%

Table 14: Total Calcium in *Cassia auriculata* L.

Sr. No.	Part of the plant	Percentage of calcium
1	Root	0.40%
2	Stem	1.2%
3	Leaf	2.3%

Table 15: Total Phosphorous in *Cassia auriculata* L.

Sr. No.	Part of the plant	Percentage of phosphorous
1	Root	0.11%
2	Stem	3.2%
3	Leaf	5.2%

Table 16: Total Crude protein in *Cassia auriculata* L.

Sr. No.	Part of the plant	Percentage of crude protein
1	Root	12.1%
2	Stem	17.8%
3	Leaf	20.9%

Table 17: Total free Amino acid in *Cassia auriculata* L.

Sr. No.	Part of the plant	Percentage of amino acid
1	Root	0.13%
2	Stem	0.40%
3	Leaf	1.2%

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