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EVALUATION OF PHARMACOPOEIAL STANDARDS WITH REFERENCE TO AFTIMOON-WHOLE PLANT (*CUSCUTA REFLEXA* ROXB.)

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ABSTRACT

Keywords:

Aftimoon,
Cuscuta reflexa Roxb.,
Unani Compound,
Itrifal-e-Aftimoon,
Melanous,
Thin Layer Chromatographic

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The herbal single drug Aftimoon is botanically called as *Cuscuta reflexa* Roxb. (whole plant). In the recent past tremendous attempts are being made to evaluate the scientific standards for Traditional System of Medicine, particularly in Unani System of Medicine. The Physician of Unani System of Medicine has considered this drug as one of the important single drugs and this drug has been used extensively in the preparation of Unani Compound Formulations such as Itrifal-e-Aftimoon, Itrifal-e-Ustukhudus, Itrifal-e-Deedan, Itrifal-e-Ghudadi, Itrifal-e-Mushil, Majoon-e-Ushba and Sufoof-e-Chobchini etc., This drug is therapeutically useful in the treatment of insanity, melancholia, melanous, epilepsy, numbness, paralysis, facial palsy, arthritis, worm infestation, jaundice and in the weakness of liver, stomach and spleen. As per the action the drug is very effective in cathartic to black bile and phlegm, demulcent, resolvent, carminative and antihelmintic. In order to authenticate and to develop its pharmacopoeial standards WHO guidelines were followed provided by CCRUM, New Delhi. For the Evaluation of Pharmacopoeial standards Pharmacognostical and Phyto-chemical parameters were adopted. The Thin Layer Chromatographic studies of petroleum ether (60 - 80°), chloroform and alcohol extract was also carried out to ascertain the quality of this drug.

INTRODUCTION: The herbal single drug Aftimoon (whole plant) is botanically called as *Cuscuta reflexa* Roxb¹. The plant is parasitic, common throughout in plains and growing abundantly during rainy season on various host plants in India. *Cuscuta reflexa* Roxb. is declared a noxious weed in many countries. The single drug Aftimoon is one of the important ingredients in the preparation of various Unani Compound Formulation such as Itrifal-e-Aftimoon, Itrifal-e-Ustukhudus, Itrifal-e-Deedan, Itrifal-e-Ghudadi, Itrifal-e-Mushil, Majoon-e-Ushba and Sufoof-e-Chobchini^{2, 3} etc., the standardization of Herbal drugs and their bio-constituents are of paramount importance in justifying their acceptability using modern scientific methods. As the drug Aftimoon (Whole plant) is having many medicinal properties and therapeutic uses such as in the treatment of insanity, melancholia, melanous, epilepsy, numbness, paralysis, facial palsy, arthritis, worm infestation, jaundice and in the weakness of liver, stomach and spleen, it is necessary to maintain its quality and purity in the market place⁴.

In order to prevent the adulteration, substitution, wrong identification and authentication and to fix the standards for Aftimoon (Whole plant), the modern Pharmacognostical and Phyto-chemical methods have been adopted^{5,6}.

MATERIAL AND METHODS: The drug Aftimoon (Whole plant) was procured from various places such as Chennai, Allahabad and New Delhi for the evaluation of Pharmacopoeial standards. The following methods have been used for the evaluation of Pharmacopoeial standards⁷.

Pharmacognostical methods:

- Macroscopic study
- Microscopic study
- Powder microscopy

Physico-chemical methods^{8,9}:

- Identity, Purity and Strength
- Qualitative test for Inorganic Compound
- Qualitative test for Heavy Metals
- Qualitative test for Organic Compounds
- Quantitative estimation for Organic Compounds
- Determination of pH values
- Thin Layer Chromatography

RESULTS AND DISCUSSION:

Pharmacognostic Methods:

Macroscopic: Dry, thread like stem pieces, brown in color; about 8mm in thickness; fruit capsule, small, globose or ovoid; seeds dark brown or black in color, spherical to ellipsoidal, less than 1mm thickness, no characteristic odor and taste.

Microscopic:

Stem: T. S. of stem shows circular or slightly wavy outline; epidermis consisting of single layer of oblong thin walled parenchymatous cells; cortex consisting of wide region of parenchymatous cells; vascular system reduced to a central core of a few collateral, 4 or 5 bundles, around a central small pith region; phloem occurs in prominent patches on the outer part of each xylem strand

Fruit: T. S. of fruit shows an outer layer consisting of tangentially, narrowly oblong thin walled parenchyma cells with periclinal division at certain places; inner layer consisting of broad, barrel shaped cells with their inner tangential and radial walls very thick ('U' shaped).

Seeds: T. S. of seed triangular or rectangular; epidermis single layer consisting of thick walled radially elongated cells filled with aleurone grains; a thick echinate cuticle present; palisade consisting of single layer of broad, compact thin

walled parenchyma cells; few layers of collapsed cells adhering to inner layer of palisade cells at certain places; endosperm present consisting of

few layers of thin walled parenchyma cells filled with starch grains; embryo minute embedded in a mass of crushed or shrunken cotyledons.

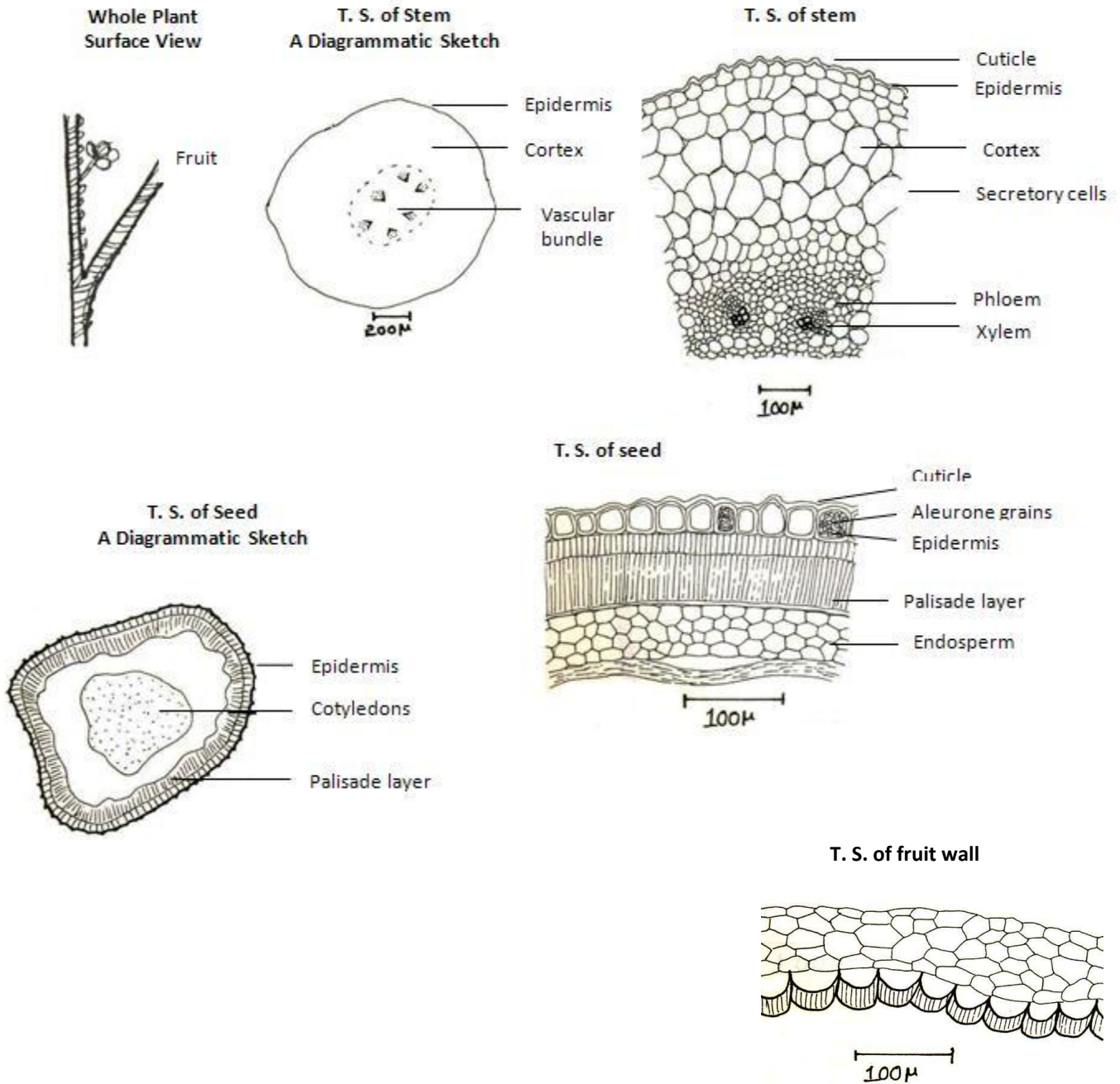
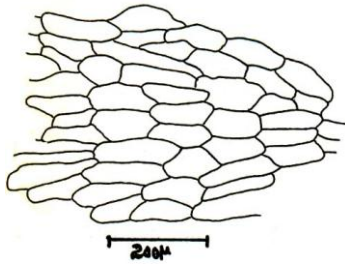
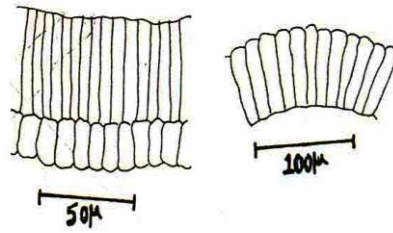


FIG. 1: MACROSCOPIC OF *CUSCUTA REFLEXA* ROXB. WHOLE PLANT

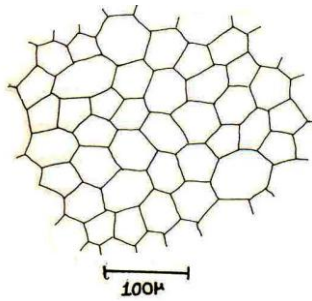
Thick walled cells from the fruit



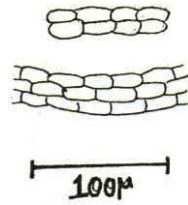
Palisade cells from the seed



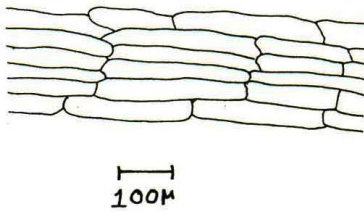
Epidermal cells in surface view from the seeds



Cotyledonary parenchyma cells



Cortical parenchyma cells from the stem

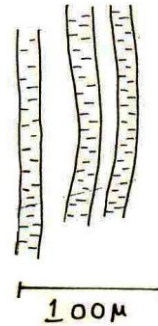


Spiral vessels



Annular vessels

Pitted vessels



Endosperm cells in surface view from the seed

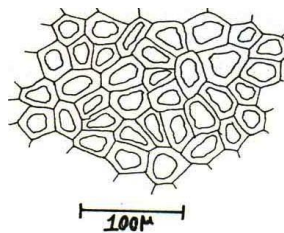


FIG. 2: MICROSCOPIC OF *CUSCUTA REFLEXA* ROXB. WHOLE PLANT

Powder analysis: Brown, polygonal and oblong cells present, epidermal cells in surface view, vessels with spiral and annular thickening upto 110 μ , fibers with simple and bordered pits of length upto 1100 μ and breadth upto 30 μ .

Phyto-chemical methods: The drug contains important chemical constituents such as dulcitol, luteolin, quercetin and a glycoside luteolin. Phyto-chemical data were carried out such as Identity, Purity and Strength; Qualitative test for Inorganic Compounds; Qualitative test for Organic Compounds; Quantitative estimation for Organic Compounds, Qualitative test for Heavy Metals; Determination of pH values and Thin Layer Chromatographic studies and the results are shown in **Table 1-7**.

TABLE 1: IDENTITY, PURITY AND STRENGTH PARAMETERS ANALYSIS

Identity, Purity and Strength Parameters Analysis	Source		
	Chennai	Allahabad	New Delhi
Foreign Matter	2.00%	1.86%	1.88%
Moisture content	10.49%	10.39%	10.25%
Total ash	5.75%	5.66%	6.16%
Acid insoluble ash	0.71%	0.24%	0.21%
Water soluble ash	3.61%	3.25%	3.71%
Hexane extractives	1.65%	1.84%	1.88%
Alcohol extractives	10.44%	11.20%	11.44%
Water extractives	27.88%	27.20%	27.40%

TABLE 2: QUALITATIVE TEST FOR INORGANIC COMPOUNDS

Qualitative test for Inorganic Compounds	
Calcium	Positive
Sodium	Positive
Potassium	Positive
Iron	Positive
Aluminium	Negative
Zinc	Negative
Tin	Negative
Magnesium	Negative
Strontium	Negative

TABLE 3: QUALITATIVE TEST FOR HEAVY METALS

Qualitative test for Heavy Metals	
Arsenic	Negative
Cadmium	Negative
Lead	Negative
Mercury	Negative

TABLE 4: QUALITATIVE TEST FOR ORGANIC COMPOUNDS

Qualitative test for Organic Compounds	
Carbohydrates	Positive
Resin	Positive
Protein	Positive
Tannin	Positive
Glycosides	Positive
Alkaloids	Positive

TABLE 5: QUANTITATIVE ESTIMATION FOR ORGANIC COMPOUNDS

Name of the compound	Source		
	Chennai	Allahabad	New Delhi
Protein	2.25%	2.44%	2.35%
Carbohydrates (Total sugar)	4.60%	4.76%	4.85%
Resin	3.28%	3.67%	3.58%
Tannin	2.58%	2.64%	2.39%

TABLE 6: DETERMINATION OF pH VALUES

Determination of pH values	Source		
	Chennai	Allahabad	New Delhi
1% Aqueous solution	6.30	6.20	6.40
10% Aqueous solution	5.70	5.80	5.60

TABLE 7: THIN LAYER CHROMATOGRAPHY

Extracts	Solvent Systems	Rf values		
		254 nm	366 nm	Iodine vapour
Petroleum ether (60 - 80°)	Benzene: ethyl acetate 9 : 1	-	-	0.94 Yellow
				0.88 Yellow
				0.78 Violet
				0.72 Yellow
				0.62 Yellow
				0.39 Yellow
			0.16 Yellow	
Extracts	Solvent Systems	254 nm	366 nm	VS reagent
Chloroform	Toluene : ethyl acetate 5 : 1.5	0.72 Green	0.66 Sky blue	0.82 Violet
		0.48 Green	0.50 Sky blue	0.67 Violet
		0.28 Bluish green	0.33 Sky blue	0.53 Violet
		0.12 Bluish green	0.19 Sky blue	0.47 Yellowish
				0.31 Yellowish
			0.20 Violet	
			0.14 Violet	
Alcohol	Toluene : ethyl acetate 5 : 1.5	-	0.65 Sky blue	0.91 Violet
			0.37 Sky blue	0.65 Orange
				0.46 Violet
				0.37 Green
				0.22 Orange
				0.18 Violet

CONCLUSION: The drug Aftimoon (Whole plant) is therapeutically useful in the weakness of the liver, stomach and spleen, this drug is also used for insanity, melancholia, epilepsy, numbness, paralysis, facial palsy, arthritis, worm infestation and jaundice. Using Pharmacognostical and Phyto-chemical methods other single drugs can also be standardized in order to authenticate and fix the standards for raw drugs.

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