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COMPARATIVE PHARMACOGNOSTICAL AND CHEMICAL STUDY OF AMBA HALDI AND HALDI

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ABSTRACT

Amba Haldi (*Curcuma amada* Roxb.) and Haldi (*Curcuma longa* L.) are two closely related species from family Zingiberaceae that are considered noteworthy medicinal plants in the world and have very often been confused with each other. Various evaluations like macro and micro- morphological characteristics, powder studies, physico-chemical parameters, chromatographic profile were carried out for both the plants to established appropriate data that can aid rapid and easy differentiation between them. The results showed that these two species can be differentiated macroscopically as well as microscopically. In addition, the information obtained about powder studies and their chromatographic profile provided supporting referential parameters for identification and differentiation between these two species.

KEYWORDS: *Curcuma amada*, *Curcuma longa*, chromatographic profile, micro-morphological characteristics.

INTRODUCTION

Herbal drugs are the major component of most of the formulation and used either single or in combination with other ingredients (Plant, animal, mineral and metal drugs) after simple or complex process of pharmacy.[1] However, the quality, safety and efficacy of these preparations remains always an issue of great concern while considering the genuineness and

presence or absence of ingredients in them.[2] There are various standards pharmacognostic (macro and microscopic evaluation) and chemical methods and also instrumental methods for identification of ingredients and quality testing.

Present communication provides the marco and microscopical, powder, chromatographic profile and therapeutical studies of Amba Haldi (*Curcuma amada* Roxb.), Haldi (*Curcuma longa* L.). Therapeutically these two drugs are very important. Amba Haldi is an appetizer; antipyretic; laxative; useful in all kinds of skin diseases; bronchitis; asthma; hiccough; inflammation during injury whereas, Haldi is useful in cough and cold; conjunctivitis; bronchitis; catarrh; diarrhoea. It is also anti-cancerous in nature.[3,4]

MATERIAL AND METHOD

Herbal drugs were resourced from PLIM Campus, Ghaziabad. The physico-chemical studies of the drug were carried out according to UPI and for HPTLC Profile DESAGA Sample applicator was used and photographs were taken with the help of DESAGA photo-documentation system.[5]

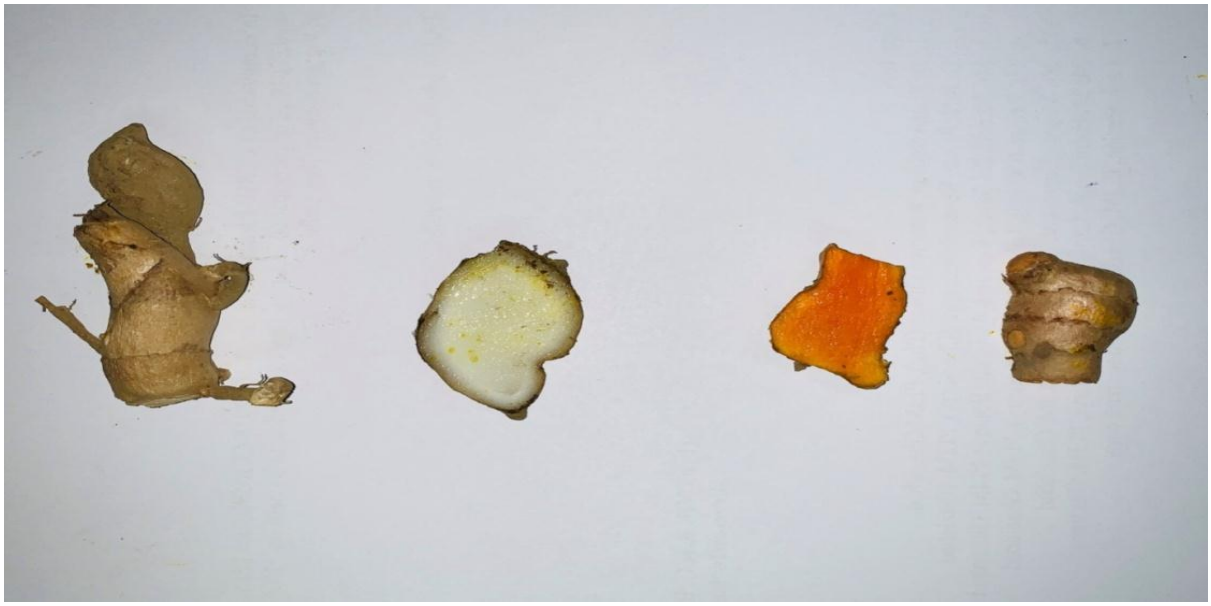
Table 1: Unani drugs under study.

S. N.	Unani Name	Botanical/ Mineral Name	Part Used
1.	AmbaHaldi	*Curcuma amada* Roxb.	Rhizome
2.	Haldi	*Curcuma longa* L.	Rhizome[6,7]

OBSERVATION AND RESULTS

Table 2: (fig-1A,B): Microscopical features.

Amba Haldi	Haldi
Rhizome large;4-5x3-4cm; light yellow inside and white towards the periphery with smell of green mango; tubers thick, cylindrical, branched, horizontal.	Rhizome large;3-5x2-4cm;dark yellow inside; greyish brown outside; spicy smell, thick, cylindrical, branched.[8]



A **B**

Fig 1: Macroscopic: A: Amba Haldi, B: Haldi.

Table 3: (fig.2A-B):Microscopical features.

Amba Haldi	Haldi
Periderm consists of thick walled cells; the inner cortical region consists of three rings of vascular bundles , numerous Starch grains in the cortex cells; endodermis single layered collenchymatous filled with starch grains; pericycle single layered; vascular bundle conjoint and collateral, xylem exarch; phloem consist of sieve tube and phloem parenchyma; major portion of parenchyma of pith filled with starch grains	T.S of the rhizome is more or less circular in outline. The outermost layer is the periderm which consists of 5-6 layers of tangentially elongated cells. This is followed by a broad cortex made of thin walled parenchymatous cells with intercellular spaces. Some cells contain deposition of orange red substance oleoresin. Some others contain yellowish oil globules which almost fill the cells. There is a single layered endodermis composed of thin walled rectangular cells. Close to the endodermis many compactly arranged conjoint collateral vascular bundles are present. A number of small bundles are also present scattered inside

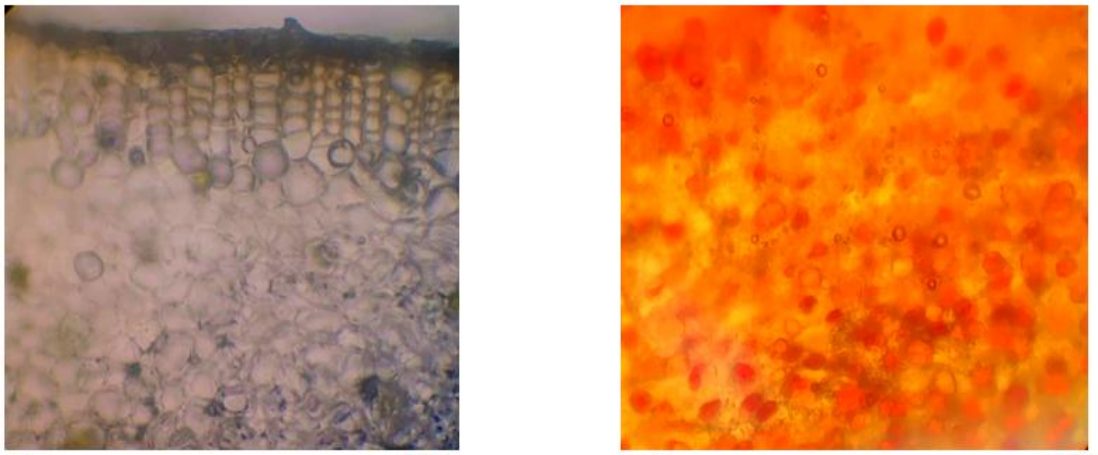
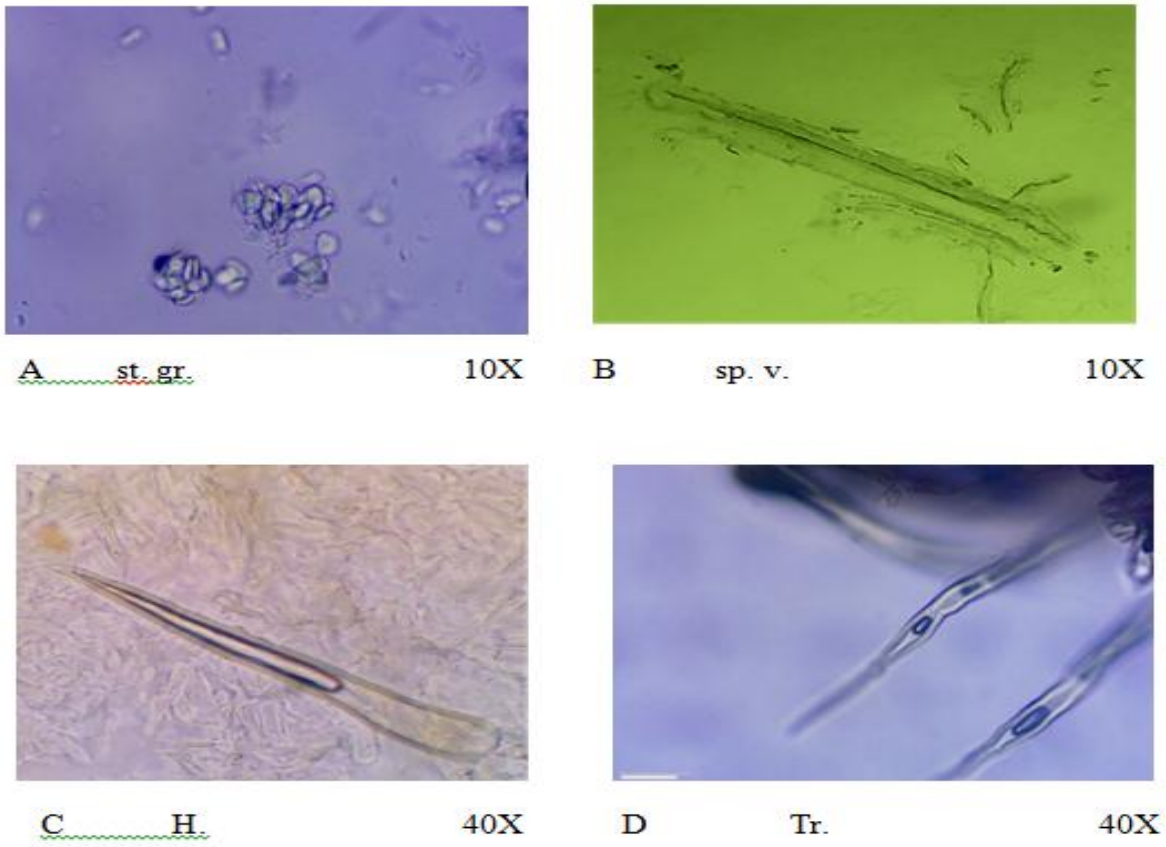


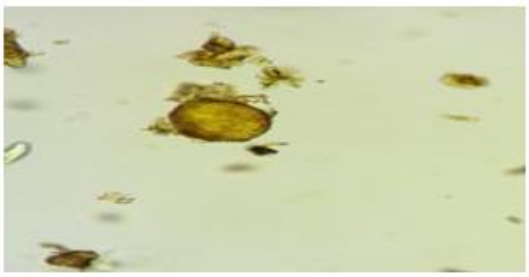
Fig. 2: Microscopic: A: Amba Haldi T.S showing Pr: perisperm cellsPar: parenchymatous cells and St. gr: starch grains.

B: Haldi T.S. showing Pr: perisperm cells, Par: parenchymatous cells, oleoresin cells, O.gl: oil globules.

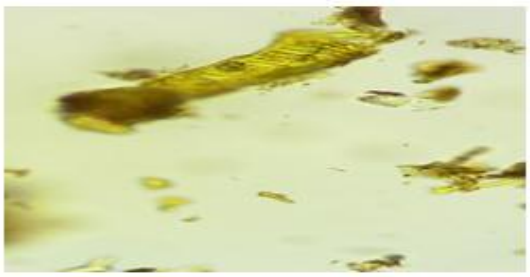
Table 4 (fig. 3 A-G): Powder Study.

Amba Haldi	Haldi
Starch grains polygonal shaped; trichomes; vessels with spiral thickenings.	No Starch grains; Oil cells; vessels with pitted and spiral thickenings; trichomes.





E O.re. 40X



F P.V. 40X

G Sp.V. 10X

Fig. 3: Powder Study: **A: Amba Haldi; St. gr: Starch grains, B: AmbaHaldi; V: Vessels with spiral thickenings, C: Amba Haldi H: Hair, D: Haldi Tr: trichomes, E: Haldi showing ol.re. oleoresin cells, F: Haldi Powder showing V: pitted vessel, G: Haldi Powder showing Sp. V: spiral vessel.**

Table 5: Physico-Chemical Parameters.

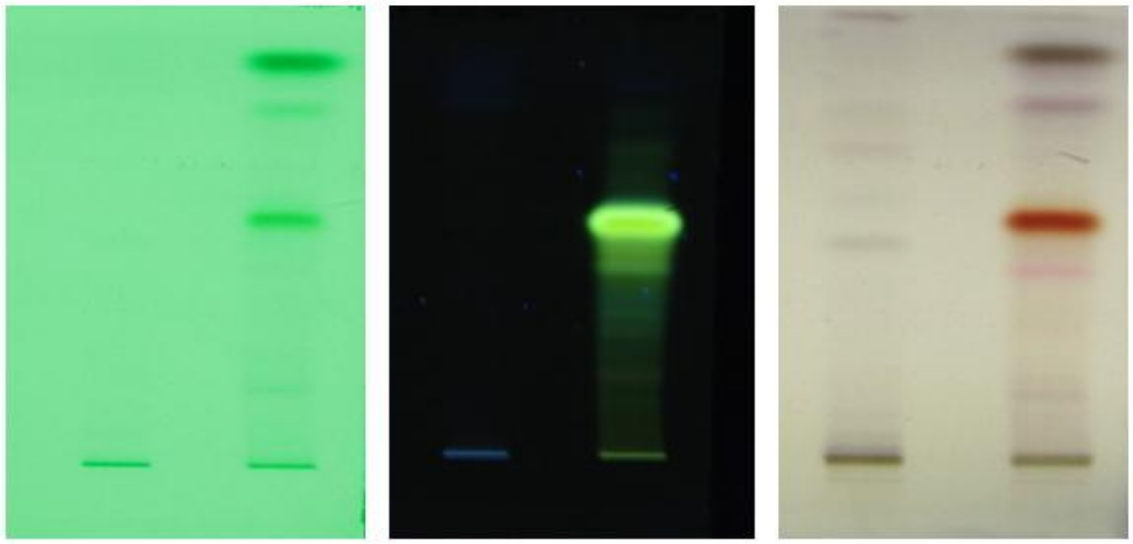
Amba Haldi		**Haldi**	
Total ash	Not more than 12%	Total ash	13.30 %
Acid insoluble ash	Not more than 02%	Acid insoluble ash	1.00 %
Alcohol soluble extractive	Not less than 09%	Alcohol soluble extractive	18.45 %
Water soluble extractive	Not less than 14%	Water soluble extractive	22.00 %[9,10]

HPTLC: Extract 2 g of drug with 20 ml of ethanol by refluxing on water bath for 30 min. Filter through Whatman No.1 filter paper; concentrate the filtrate up to 5 ml (approx.) on water bath and carry out the thin layer chromatography. Apply the ethanol extract on pre-coated aluminium TLC plate of silica gel 60 F_{254} using HPTLC automatic sample applicator.

Develop the plate using Toluene *:* Ethyl acetate (9:1v/v) solvent system as mobile phase.

Allow the plate to dry in air and examine under UV light. The HPTLC fingerprint of the ethanolic extract of Amba Haldi shows no spots under UV at 254 nm and 366 nm. Spray the

plate with 1 % Vanillin Sulphuric Acid Reagent followed by heating at 105^0 for about five minutes in an oven and examine under visible light shows three spots at Rf 0.51, 0.71, 0.78 (all light greyish purple). The HPTLC fingerprint of the ethanolic extract of Haldi shows three spots under UV 254 nm at Rf 0.55 (green), 0.78 (light green) and 0.88 (green). Under UV at 366 nm shows one major spot at R_f0.53 (fluorescent yellow). Spray the plate with1% Vanillin Sulphuric Acid Reagent followed by heating at 105^0 for about five minutes in an oven and examine under visible light shows five spots at Rf 0.19 (grey), 0.44 (pink), 0.54 (brownish orange), 0.78 (greyish purple) and 0.89 (blackish brown). (fig-4).[11,12]



AmbaHaldi Haldi AmbaHaldi Haldi AmbaHaldi Haldi

A B C

HPTLC fingerprint of ethanolic extract of Amba Haldi and Haldi in *Toluene : Ethyl acetate* (9:1 *v/v*) solvent system as mobile phase.

Fig-4: HPTLC fingerprint; A: UV-254 nm; B: UV-366 nm; C: After derivatization with 1% Vanillin Sulphuric acid reagent.

Table 6 (Fig-4): Comparative TLC fingerprinting data on herbal drugs.

Solvent system Toluene : Ethyl acetate (9:1 v/v)		Rf Values		
		254nm	366nm	After Derivitization
Drugs	**Amba Haldi**	-	-	0.51 (Greyish purple)
		-	-	0.71 (Greyish purple)
		-	-	0.78 (Greyish purple)
	Haldi	0.55 (Green)	0.53 (Fluorescent yellow)	0.19 (Grey)
		0.78 (Light green)		0.44 (Pink)
		0.88 (Green)		0.54 (Brownish orange)
				0.78 (Greyish purple)
				0.89 (Blackish brown)

Table 7: Therapeutic uses.

Drug	Thereputic Uses
Amba Haldi	It is an appetizer; antipyretic; laxative; useful in all kinds of skin diseases; bronchitis; asthma; hiccough; inflammation during injury.
Haldi	It is useful in cough and cold; conjunctivitis; bronchitis; catarrh; diarrhea. It is also anti-cancerous in nature.[3,4]

DISCUSSION AND CONCLUSION

Various parameters like macro and microscopical characteristics, powder studies, physico-chemical analysis chromatographic profile analysis were carried out of both the plants to established appropriate data that can aid rapid and easy differentiation between them. The result showed that these are two species can be differentiated macroscopically as well as microscopically. In addition, the obtained information about powder studies and chromatographic profile of them provided supporting referential parameters for identification and comparison between these two species.

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