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THIN LAYER CHROMATOGRAPHY ANALYSIS OF SIMHANAD GUGGULU PILL

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ABSTRACT

It is being internationally accepted that medicinal plants play an important role for providing health benefits. Maximum Ayurvedic medicines are plant based drugs. It is a major challenge for quality control of plant based Ayurvedic drugs due to its complex composition. Thin layer chromatography is an important parameter for standardization of the plant based Ayurvedic drugs. One most important Ayurvedic drug i.e. *Simhanad Guggulu* pill had been selected from famous Ayurvedic book named *Bhaishajya Ratnavali* for Thin layer chromatography analysis. It is mainly and commonly used in the treatment of disease *Amavata* (Rheumatoid arthritis). Medicine preparing and Thin layer chromatography analysis both had been done in the Institute for Post Graduate Teaching and Research in Ayurveda, Gujarat Ayurved University, Jamnagar. Seven phytocostitutents were indicated under short ultra violet ray (254 nm) and eight phytocostitutents were indicated under long ultra violet ray (366 nm) by the Thin layer chromatography analysis on the sample of *Simhanad Guggulu* pill.

Key words: Thin layer chromatography, *Simhanad Guggulu* pill, *Amavata*, Rheumatoid arthritis

INTRODUCTION: Currently the increased demand for plant based drugs and their eventual commercialization has given more concentration on their status. Now a day's it is being accepted globally that medicinal plants play major role to provide health benefits to human beings. Most of the Ayurvedic medicines are plant based drugs. But global acceptances of plant based Indian drugs are still low and perhaps inadequacy of quality control is the most important responsible factor for this. The complex composition of plant based drugs has a major challenge for its quality control. Now a day's Thin layer chromatographic analysis is an important way for standardization of the plant based drugs. Thin layer chromatographic finger printing is considered to be very useful parameter for evaluating the quality of plant based Ayurvedic formulations. In different Ayurvedic books many plants based drugs are described in context of treatment purpose of different diseases. One most important plant based Ayurvedic drugs i.e. *Simhanad Guggulu* pill had been selected from famous Ayurvedic text for its thin layer chromatography analysis.

OBJECTIVES: To analysis the thin layer chromatography data of the *Simhanad Guggulu* pill.

MATERIALAS AND METHODS:

Simhanad Guggulu pill is a most important plant based Ayurvedic medicine and it is mainly and commonly used in the treatment of disease *Amavata* (Rheumatoid

arthritis). *Amavata* disease is more similar to Rheumatoid arthritis according to its clinical features and pathogenesis [1, 2]. *Simhanad Guggulu* drug is mentioned in *slokas* (Information in Samskrit language) no. 190 to 195 of 29th chapter of *Bhaishajya Ratnavali* (Ayurvedic book) [3]. *Simhanad Guggulu* Pill is a herbo-mineral Ayurvedic drug and six ingredients are used in it. Out of six ingredients five are plant based ingredients and one is mineral based ingredient [4, 5]. Name of the ingredients (Ayurvedic name and Scientific or Botanical name), used part of the ingredients and quantity of the ingredients into the one Pill are shown in the table-1. This *Simhanad Guggulu* pill was prepared in the Pharmacy of Institute for Post Graduate Teaching and Research in Ayurveda, Gujarat Ayurved University, Jamnagar and Thin layer chromatography analysis of the sample of this drug (i.e. *Simhanad Guggulu* pill) had been done in the Pharmaceutical laboratory of Institute for Post Graduate Teaching and Research in Ayurveda, Gujarat Ayurved University, Jamnagar. Thin layer chromatography (T.L.C) of the methanol extract of the sample of *Simhanad Guggulu* pill had been done by using Toluene and Ethyl acetate in the ratio of 9:1 as mobile phase and it was visible under short ultra violet ray and long ultra violet ray. It had been revealed different spots under short and long ultra violet ray and it had been given different R_f , hR_f , ΔhR_f values [6].

TABLE-1: INGREDIENTS LIST OF *SIMHANAD GUGGULU* PILL (500MG)

S. No.	Ingredients	Botanical Name or Scientific Name	Used part	Quantity (part)
1.	*Haritaki*	*Terminalia chebula* Retz.	Dried mature Fruit	1
2.	*Amalaki*	*Emblica officinalis* Gaertn.	Dried mature Fruit	1
3.	*Bibhitaka*	*Terminalia bellirica* Roxb.	Dried mature Fruit	1
4.	*Guggulu (Shodhita)*	*Commiphora wightii* (Arnott) Bhandari	Gum exudates	1
5.	*Gandhak (Shodhita)*	Sulphar	Mineral	1
6.	*Eranda taila*	*Ricinus communis* Linn.	Seed oil	4

RESULTS AND DISCUSSION: Results of Thin layer chromatography analysis on sample of *Simhanad Guggulu* pill under short ultra violet ray (254 nm) and under long ultra violet ray (366 nm) are shown in the table-2 and table-3 respectively.

TABLE-2: THIN LAYER CHROMATOGRAPHY DATA OF *SIMHANAD GUGGULU* PILL UNDER SHORT ULTRA VIOLET RAY (254 NM)

No. of Spots	Distance travel by Solvent (cm)	Distance travel by Solute(cm) Short UV (254nm)	R_f -value	hR_f -value	ΔhR_f -value
7	17.2	3.3	0.19	19	
		4.2	0.24	24	5
		5.5	0.32	32	8
		6.8	0.40	40	8

		8.5	0.49	49	9
		10	0.58	58	9
		16.6	0.97	97	39

Table-2 shows the Thin layer chromatography data of *Simhanad Guggulu* pill under short ultra violet ray (254 nm) and it reveals that the distance traveled by the solvent was 17.2 cm, number of spots under short Ultra violet ray were 7, the distance traveled by the solutes seen under short Ultra violet ray were respectively 3.3cm, 4.2cm, 5.5cm, 6.8cm, 8.5cm, 10cm and 16.6cm. The calculated R_f –values were respectively 0.19, 0.24, 0.32, 0.40, 0.49, 0.58 and 0.97. The calculated hR_f –values were respectively 19, 24, 32, 40, 49, 58 and 97 and also the calculated ΔhR_f –values were respectively 5, 8, 8, 9, 9 and 39.

TABLE-3: THIN LAYER CHROMATOGRAPHY DATA OF *SIMHANAD GUGGULU* PILL UNDER LONG ULTRA VIOLET RAY (366 NM)

No. of Spots	**Distance travel by Solvent (cm)**	**Distance travel by Solute(cm) long UV (366nm)**	**R_f -value**	**hR_f -value**	**ΔhR_f -value**
8	17.2	1.9	0.11	11	
		3.1	0.18	18	7
		4.0	0.23	23	5
		4.7	0.27	27	4
		5.5	0.32	32	5
		6.8	0.40	40	8
		8.8	0.51	51	11
		10.5	0.61	61	10

Table-3 shows the Thin layer chromatography data of *Simhanad Guggulu* pill under long ultra violet ray (366 nm) and it expresses that the distance traveled by the solvent was 17.2 cm, number of spots under long Ultra violet ray were 8, the distance traveled by the solutes seen under long Ultra violet ray were respectively 1.9cm, 3.1cm, 4.0cm, 4.7cm, 5.5, 6.8, 8.8, and 10.5cm. The calculated R_f –values were respectively 0.11, 0.18, 0.23, 0.27, 0.32, 0.40, 0.51and 0.61. The calculated hR_f –values were respectively 11, 18, 23, 27, 32, 40, 51 and 61 and also the calculated ΔhR_f –values were respectively 7, 5, 4, 5, 8, 11 and 10.

CONCLUSION: It is concluded on the basis of the Thin layer chromatography (TLC) analysis on the sample of *Simhanad Guggulu* pill that seven phytocostitutents were indicated under short ultra violet ray (254 nm) and eight phytocostitutents were indicated under long ultra violet ray (366 nm) into the sample of *Simhanad Guggulu* pill by TLC but further more research work is necessary on this subject for more information and perfection to feasible of better drug standardization.

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