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**A PHARMACEUTICAL ANALYSIS AND STANDARDIZATION OF RAKTCHANDANA
GHRITA ANJANA -A HERBAL AYURVEDIC EYE DROP FOR MANAGEMENT OF MYOPIA**

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ABSTRACT

Ayurveda is a system of medicine that has been around for thousands of years. Our *acharyas* (ancient scholars) have explained various methods and drugs for management of eye diseases and take care of eyes. Myopia is one among refractive error affecting many individuals in today's time. In *Ayurveda* classical texts it may be Co-related with (*Pratham* and *Dwitiya Patalagata*) *Timir Roga*. *Raktchandana* (*Pterocapus Santalinus*), and *Go-Ghrita* (Cow's Ghee) are two widely used medicines in Ocular Diseases. The present study was aimed to screen the Pharmaceutical Analysis and standardization of *Raktchandana Ghrit*. *Raktchandana* (*Pterocapus Santalinus*) and *Go-Ghrita* (cow's ghee), both drugs are combined to prepare *Raktchandana ghrita anjana*¹ (eye drops). The present study mainly deals with the preparation and standardization of this herbal drug through Organoleptic analysis, Physico-chemical parameters, Solubility test and (HPTLC) High Performance Thin Layer Chromatography fingerprinting.

Keywords: *Ayurveda*, *Anjana*, *Go-ghrita*, Herbal formulation, HPTLC, Myopia, Organoleptic analysis, Physico-chemical parameters, *Raktchandana*, Solubility test, Standardization

INTRODUCTION

Ayurveda is the traditional Indian system of medicine being practiced for thousands of years. In *Ayurveda* natural products like plants, animals and minerals are used for the treatment of various diseases². These medicinal plants and Cow's Ghee are rich sources of beneficial constituents and it is believed in *Ayurveda* that complex diseases can be treated with combination of medicinal plants and Cows Ghee. Myopia or short-sightedness is a type of refractive error in which parallel rays of light coming from infinity are focused in front on the retina when accommodation is at rest³

Raktchandana (*Pterocapus Santalinus*)⁴ is a medicinal plant with a variety of medicinal characteristics that is used to cure a variety of ocular disorders. *Go-Ghrita* (Cow's ghee)⁵ is another animal product that is used to treat a variety of ocular ailments. In this study *Raktchandana* (*Pterocapus Santalinus*), is combined with *Go- Ghrita* (Cow's Ghee) and prepared as "*Raktchandana Ghrita*" which can be used as *Anjana* (Collyrium) in the form of Eye drop, through the process of *Ghrita paka kalpana*, as mentioned in classical literature of "*Sharangadhara Samhita*" in *Ghritataila Kalpana* Chapter⁶. Here both drugs are

combined and prepared as "*Raktchandana ghrita anjana*" Eye drop.

Standardisation is the process of defining and agreeing on technical standards in herbal medicine. To carry out the experimentation, specific requirements are established, which will lead to the establishment of a set of characteristics demonstrated by the herbal medication in question. As a result, standardisation is a quality-control technique. While ensuring drug quality, active ingredient consistency and therapeutic efficacy, formulation standardization is an integral part.

The ingredients, *Raktchandana* (*Pterocapus Santalinus*), and *Go-Ghrita* (Cow's Ghee) is mentioned in in Table 1. In present study the form of drug has modified from *Anjana* to eye drop without altering the quantity of ingredients and subjected to analytical study through Organoleptic, Physico-chemical and HPTLC finger printing methods.

2. MATERIALS AND METHODS

2.1 Collection, Identification and Authentication of Raw Drugs

The raw materials used in this study were obtained from the Arpan Pharmacy in Chhindwara, Madhya Pradesh. The identification and certification of the drug substance was carried out at the Pharmacy in

the Parul Institute of Ayurveda, Vadodara, Gujarat.

2.2 Methodology of Preparation of Raktchandana Ghrita

2.2.1 Preparation of Raktchandana kwath (Decoction)⁷

1.5 kg Yavakuta choorna of *Raktchandana* along with 16 part of water, was taken in a clean stainless steel vessel. Then it was kept undisturbed for a whole night. Next day this mixture was heated on medium flames in stainless steel vessel till the quantity of liquid was reduced to one fourth. Then it was filtered first through a mesh and later through a thin clean cotton cloth.

2.2.2 Preparation of Raktchandana Ghrita⁸

At first we took *Go-Ghrita* (Cow's Ghee) for "*Ghrita murchna*" Process (Procedure for increasing potency of the drug). After the process of "*Ghrita murchna*", 1 liter of "*Murchita Ghrita*" was collected. Now, 4 litre *Raktchandana kwath* (decoction) was mixed with "*Murchita Go ghrita*" and thus,

"*Raktchandana ghrita anjana*" was prepared through method of *Ghrita Paka Kalpana*. So, Finally 800 ml drug was obtained "*Raktchandana ghrita anjana*" was collected and packed in 15 ml bottle each with aseptic precaution for future use as Eye drops.

2.2.2.1 Organoleptic and analytical study

Organoleptic characters, physicochemical parameters, solubility test were done at Pharmacy of Parul Institute of Ayurveda and HPTLC study was done at Vasu Research Centre, GIDC, Makarpura, Vadodara. (Sample ID- AD/21/107 Dated: 11/03/2021). *Raktchandana Ghrita Anjana* was analysed via way of means of using numerous analytical parameters. Organoleptic character like colour, odour, and consistency had been carried. Physicochemical observe to analyses Loss on Drying at 110°C, Total Ash Value, Acid Insoluble Ash, pH, particular gravity, Refractive index, and Total solids content material changed into done.

Table 1: Ingredients

S. No.	Ingredients	Latin Name	Part Used
1.	<i>Raktchandana</i>	<i>Pterocarpus Santalinus</i>	Stem bark
2.	<i>Go-Ghrita</i>	(Cow's Ghee)	Ghee

RESULTS

Table 2: Organoleptic characters of Raktchandana ghrita

Parameters	Results
Color	Red
Order	Characteristic
Test	Sweet, tikta
Consistency	Semi liquid

Table 3: Physico-chemical parameters of Raktchandana ghrif

S. No.	Parameter	Result
1.	Loss on Drying at 110 c (%w/w)	0.10
2.	Total Ash Value (%w/w)	0.20
3.	Ph Value	6.5
4.	Rancidity test	Negative
5.	Acid value	0.86
6.	Saponification	228.6
7.	Iodine value	27.88
8.	Specific gravity	0.913
9.	Refractive index	1.4580
10.	Viscosity	0.18

Table 4: Solubility test of Raktchandana ghrif

S. No.	Solvent	Results
1.	Methanol Soluble	Insoluble
2.	Chloroform Soluble	Insoluble
3.	Diethyl ether Insoluble	Insoluble
4.	HCL (0.5 N) Soluble	Insoluble
5.	Water Soluble	Soluble

Chromatographic study (HPTLC)^(6,7). The final product “*Raktchandana Ghrif Anjana*” had been carried to set up fingerprinting profile. Rf values and color of the spots in chromatogram evolved in Petroleum ether: Diethylether : Acetic acid (9 : 1 : 0.1 v/v) changed into recorded. TLC picturegraph documentation discovered presence of many phyto constituents with exclusive Rf values and HPTLC densitometric scan of the plates confirmed numerous bands. Study discovered, at 254 nm were given 09 spots, densitometric scan at 254 nm discovered 09 peaks similar to 09 exclusive compounds withinside the raktchandana ghrif , compounds

with Rf - 0.07, 0.11, 0.18, 0.31, 0.39, 0.55, 0.66, 0.73, and 0.91 (Fig. 1). At 366 nm there are 10spots, densitometric scan at 366 nm discovered 10 peaks similar to 10 exclusive compounds with inside the raktchandana ghrif , compounds with Rf - 0.07, 0.11, 0.15, 0.26, 0.39, 0.55, 0.58, 0.66,0.87 and 0.91 had been found (Fig. 2) and at 540 nm 11 spots had been found, densitometric scan at 540 nm discovered 11 peaks similar to 11 exclusive compounds with inside the *Raktchandana Ghrif* , compounds with Rf - 0.07, 0.15, 0.22, 0.26, 0.31, 0.39, 0.55, 0.58, 0.66,0.87,0.91 maximum Rf value **changed into 0.91 in track 1** (Fig. 3).

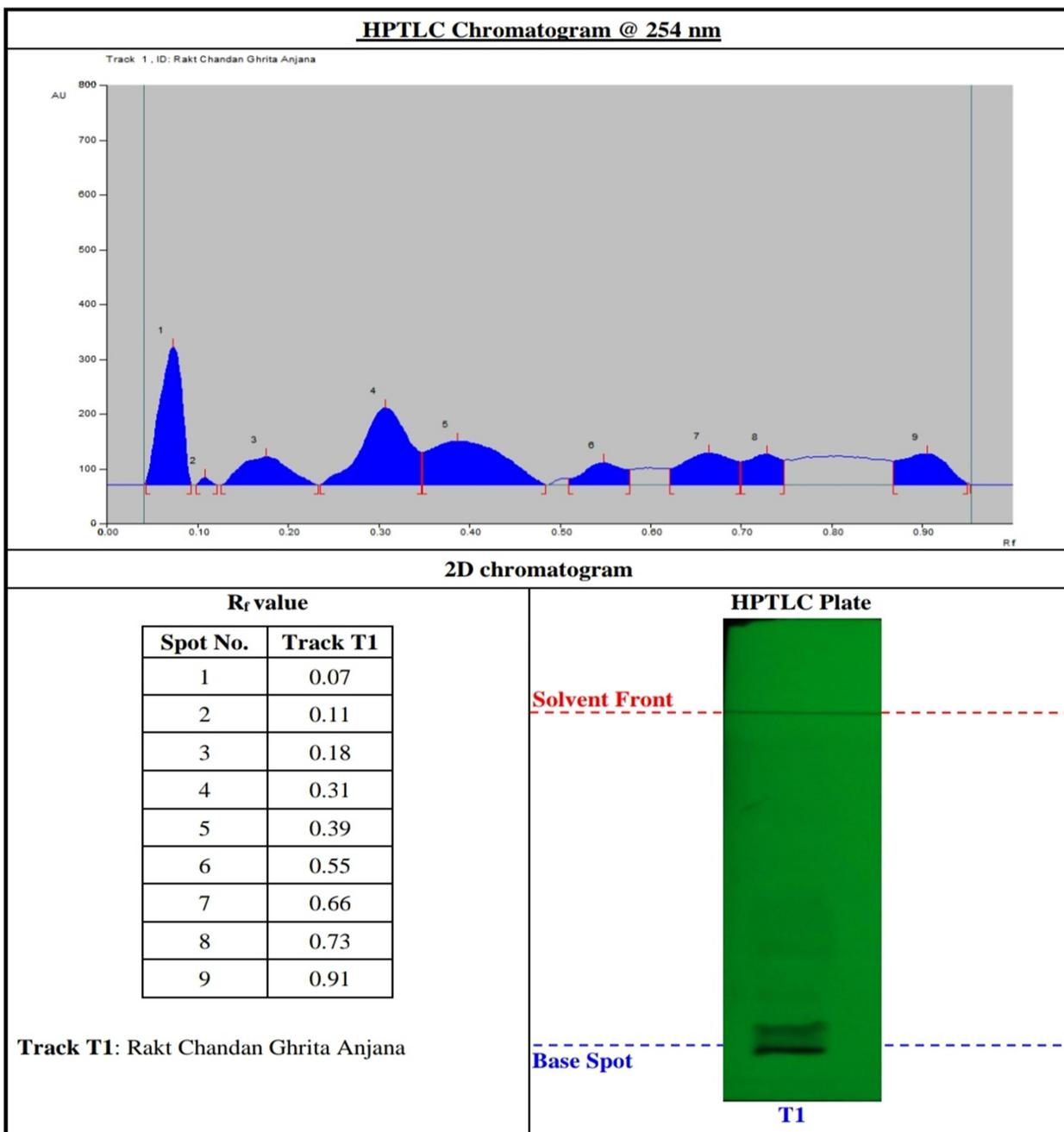


Fig. 1: HPTLC plate showing banding pattern and R_f Values at 254 nm

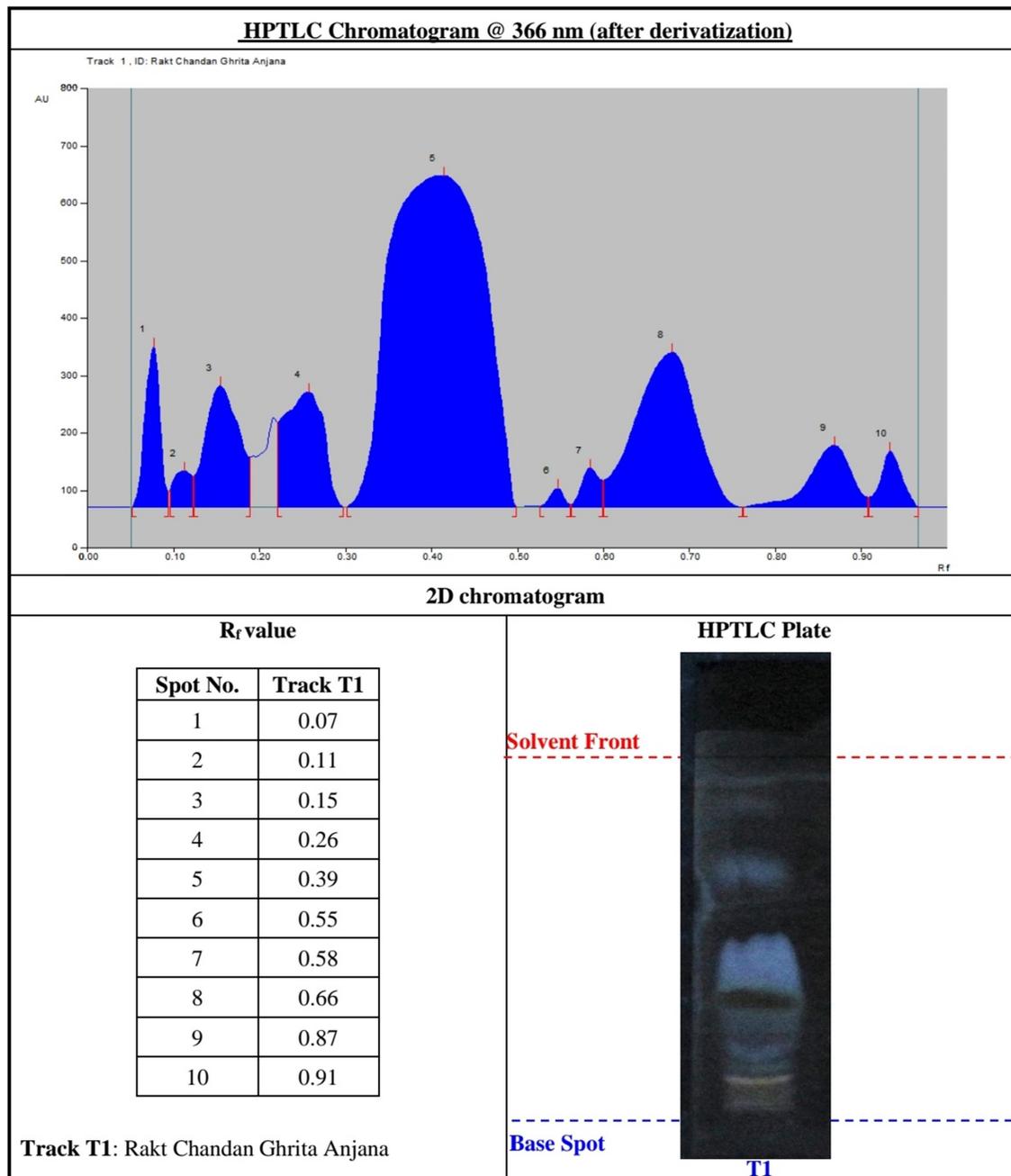


Fig. 2: HPTLC plate showing banding pattern and R_f Values at 366 nm

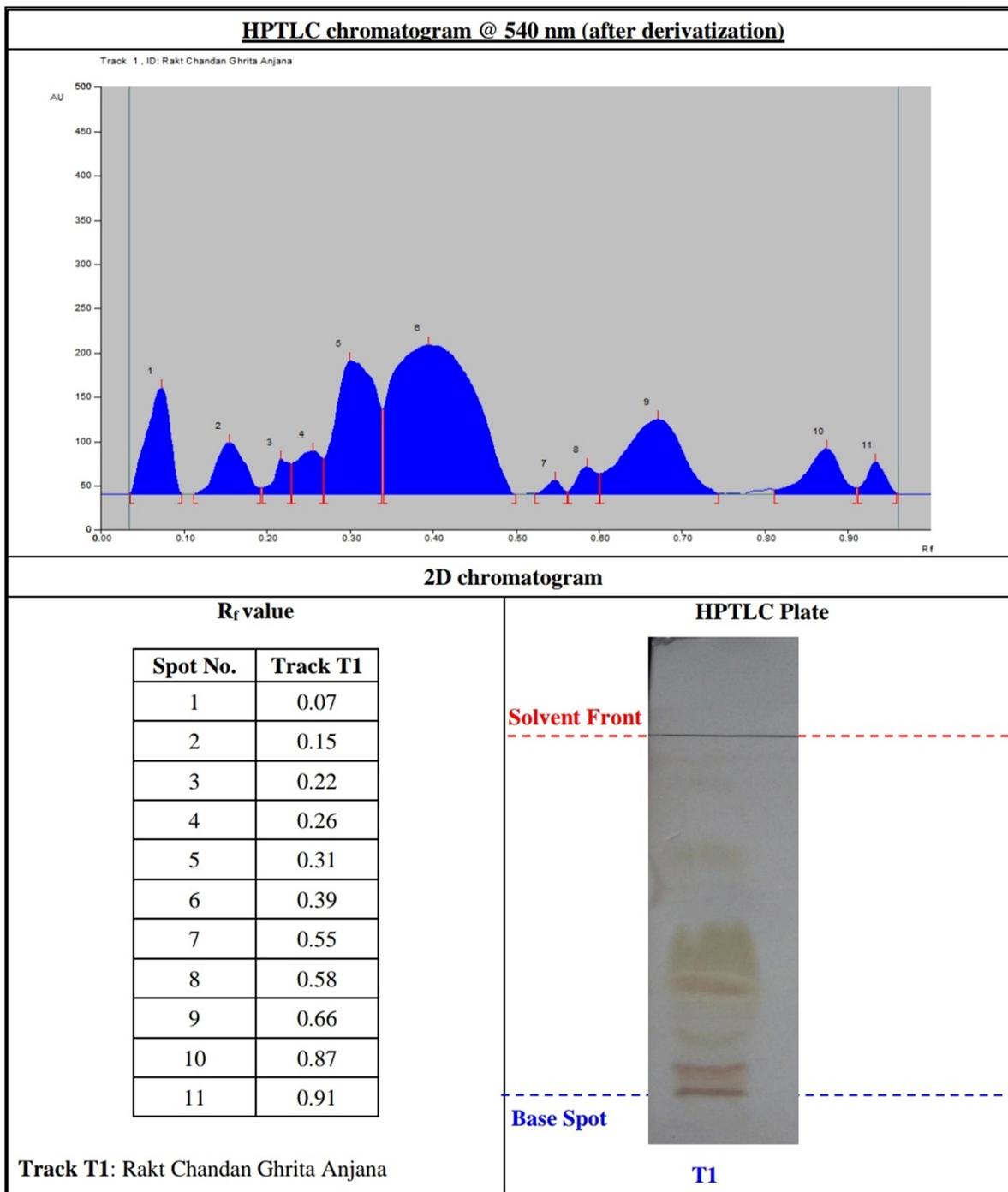


Fig. 3: HPTLC plate showing banding pattern and R_f Values at 540 nm

4. DISCUSSION

Raktchandan Ghrit Anjana eye drop are use in *Pratham and Dwitiya patalgat Timira* (Myopia). It is analysed to validate the guidance for evaluation of quality and to authenticate the drug for its reproducibility. HPTLC finger printing is usually used approach in synthetic chemistry for figuring out volatiles, compounds, determining their purity and following the development of a reaction. It additionally allows the optimization of the solvent device for a given separation problem. The analytical information and HPTLC finger print profile obtained in the present study for *Raktchandan ghrit anjana* eye drops will assist to develop SMP (Standard manufacturing process) of *Raktchandan ghrit anjana* eye drops with a purpose to have become a well-known for in addition examine and different treatments in future.

5. CONCLUSION

Myopia is a most common ocular disorder worldwide, it is a leading cause of vision impairment in children and young age and its incidence is increasing rapidly, the landmark study published in scientific journal ,ophthalmology projected that if current trend continues almost 50% of the world population will be myopic by 2050¹¹. There are very less internal medications are proved

to be effective in myopia. Laser therapy, contact lenses, power glasses are are the vision improving techniques used widely now a days. Though these techniques are not the permanent solution for improving vision, so we prepared *Raktchandan ghrit anjana* (Eye drop) medicine in order to manage Myopia and we best analysed to validate the preparation and assessing the quality and authenticate the drug for its reproducibility . HPTLC finger printing is commonly used technique in identifying volatile, compounds, determining their purity and following the progress of reaction, The analytical data and HPTLC finger print profile obtained from the study for herbal eye drop will help to developed standard manufacturing process of herbal eye drop making, which will became a standard for future study and another remedies in future.

CONSENT

It is not applicable.

ETHICAL APPROVAL

It is not applicable.

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