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TLC FINGERPRINTING OF SESQUITERPENOIDS PROFILE OF THREE *CURCUMA* SPECIES FROM MELGHAT FORESTS DIST. AMRAVATI (MS) INDIA

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Abstract:

Genus *Curcuma* L. (Zingiberaceae) comprising of 120 species is distributed throughout South and South-East Asia, with few species extending to China, Austrilia and South Pacific. Four species of *Curcuma* are reported from Melghat. Of these *C. longa* L. is cultivated, while *C. inodora* Blatt., *C. pseudomontana* J. Graham and *C. decipiens* Dalzell are wild. *Curcuma inodora* Blatt. known as 'Jangali Halad' is a common herb of Melghat at higher elevations.

In Melghat area populations of *C. inodora* are found to show many distinct variations in aerial as well as underground characters. Twelve distinct variants of *C. inodora* and single accession each of *C. pseudomontana* and *C. longa* were collected. TLC finger printing is a rapid and reliable method for identification and differentiation. It is commonly used in authentication of herbal medicines.

TLC fingerprint analysis of sesquiterpenoids for all 14 samples showing complete different pattern compared to sample 1 to 13. Samples 1 to 13 show very similar pattern with change in intensity only. This clearly indicates that sample 1 to 13 are closely related while sample 14 is distinct. On the basis of sesquiterpenenoid profile *C. longa* is different while *C. pseudomontana* goes with *C. inodora*.

Key words: *Curcuma inodora* Blatt. ; *Curcuma pseudomontana* J. Graham; *Curcuma longa* L; Melghat Forest; TLC; Sesquiterpenopids profile.

Introduction:

Genus *Curcuma* L. (Zingiberaceae) comprising of 120 species and is distributed throughout South and South-East Asia, with a few species extending to China, Austrilia and the South Pacific; 40 species being recorded from India. Four species of *Curcuma* are reported from Melghat [1, 2]. Of these *C. longa* L. is cultivated while *C. inodora* Blatt. and *C. pseudomontana* J. Graham is wild.

C. inodora is widely distributed throughout Maharashtra and is very common and abundant in Melghat. It is commonly called 'Jangli halad' and used in traditional medicine by locals. Fresh rhizome paste is applied over cuts, as strong antiseptic. Paste of root stock is applied in glandular diseases and piles [3,4,5], psychosomatic disorders and constipation [6,7] . *C. pseudomontana* is used in traditional medicine to cure jaundice and diabetes [8], body swellings and to increase lactation [9]. Fresh tubers are eaten as blood purifier [10].

Sesquiterpenes are fifteen carbon compounds formed from a common precursor farnesyl pyrophosphate by crystallization and skeletal rearrangement. They are antiprotozoal, antiplasmodial and antitumor [11].

TLC finger printing is a rapid and reliable method for identification and differentiation. It is commonly used in authentication of herbal medicines. TLC fingerprint of a plant species can provide sufficient information about sesquiterpenoids present and for identification, standardization and quality control of the medicinal plant.

Materials and Methods:

Curcuma pseudomontana J.Graham, *Curcuma longa* L. and same twelve variants of *Curcuma inodora* Blatt. were selected for TLC fingerprinting. Species were identified using standard floras [12,13,14,15, 16]. These samples were collected from various locations in Melghat Forests as per the population locations. Leaves were washed with distilled water. For phytochemical studies leaves were air dried, powered and stored at room temperature for analysis. Sesquiterpenoids TLC fingerprinting of was done by following Harborne, Egon, Wagner and Khadabadi et al. [17,18, 19, 20].

TLC (Thin Layer Chromatography):

Five gm powder was extracted in 25 ml methanol by hot maceration for 24 hr; filtered and filtrate used for TLC. Readymade Silica Gel G F_{254} TLC plates manufactured by Merck Company were used. All 14 samples were

applied sequentially. Extracts were applied as a band. TLC plate was developed in chamber saturated with mobile phase. Toluene: Ethyl acetate (9:1)

Mobile phase were used for compounds and detection was done by using Anisaldehyde sulphuric acid reagent The mobile phase was allowed to run up to 8-9 cm of height of the plate. Plates removed and dried at room temperature. Plates were sprayed with specific reagent and observed under UV-Cabinet (254 and 366nm). All plates were photographed in photodocumentation chamber and tables were prepared showing Rf values. Chromatograms showing the band area and Rf values are also presented.

Results and Discussion:

Differentiation of population variants and species is very important to carry out for identification and authentication. TLC fingerprint analysis is one of the techniques frequently used for evaluation of the quality of medicinal plants. This technique is used here for identification and differentiation of different variants.

TLC fingerprint analysis of sesquiterpenoids for all 14 samples was made. Rf values were calculated under UV light after spraying with Anisaldehyde reagent (Table .1 and Photoplate no. 1).

Photoplate-1: TLC Fingerprinting of Sesquiterpenoids.

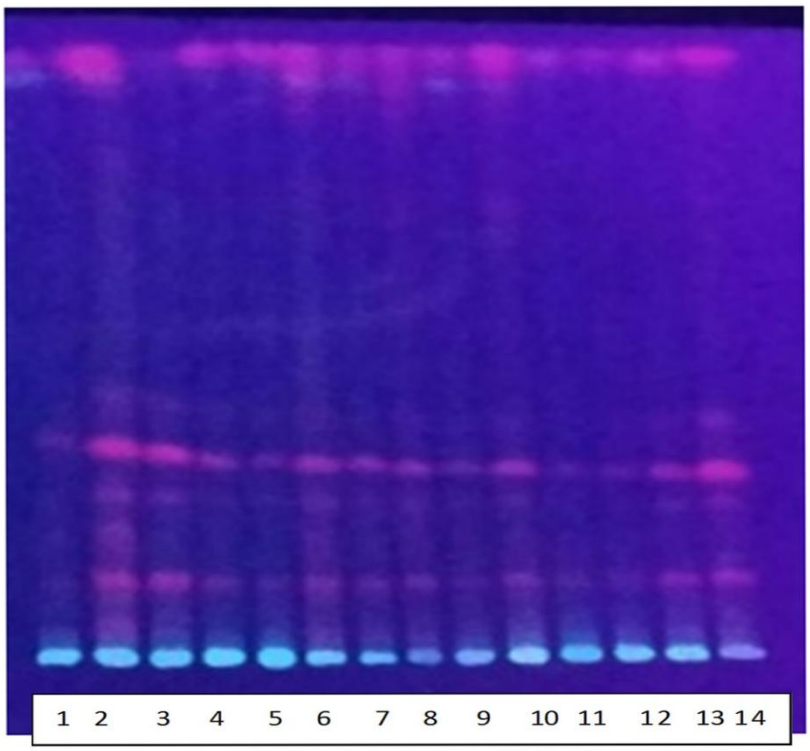

Fig – TLC Sesquiterpenoides image of 14 samples under UV light (366 nm)

Table No-1: TLC profile of Sesquiterpenoids.

Sample	**In UV light**	
	Total spots	Rf values
Sample 1 (CI-01)	Total Spots: 06	0.07, 0.5, 0.75, 0.8, 0.85, 0.89
Sample 2 (CI-02)	Total Spots: 06	0.07, 0.5, 0.75, 0.8, 0.85, 0.89
Sample 3 (CI-03)	Total Spots: 06	0.07, 0.5, 0.75, 0.8, 0.85, 0.89
Sample 4 (CI-04)	Total Spots: 06	0.07, 0.5, 0.75, 0.8, 0.85, 0.89
Sample 5(CI-05)	Total Spots: 06	0.07, 0.5, 0.75, 0.8, 0.85, 0.89
Sample 6(CI-06)	Total Spots: 06	0.07, 0.5, 0.75, 0.8, 0.85, 0.89
Sample 7(CI-07)	Total Spots: 06	0.07, 0.5, 0.75, 0.8, 0.85, 0.89
Sample 8(CI-08)	Total Spots: 06	0.07, 0.5, 0.75, 0.8, 0.85, 0.89
Sample 9 (CI-09)	Total Spots: 06	0.07, 0.5, 0.75, 0.8, 0.85, 0.89
Sample 10 (CI-10)	Total Spots: 06	0.07, 0.5, 0.75, 0.8, 0.85, 0.89
Sample 11 (CI-11)	Total Spots: 06	0.07, 0.5, 0.75, 0.8, 0.85, 0.89
Sample 12 (CI-12)	Total Spots: 06	0.07, 0.5, 0.75, 0.8, 0.85, 0.89
Sample 13 (CP-13)	Total Spots: 06	0.07, 0.5, 0.75, 0.8, 0.85, 0.89
Sample 14 (CL-14)	Total Spots: 07	0.4, 0.5, 0.53, 0.75, 0.8, 0.85, 0.89

In UV light sample 14 is showing complete different pattern compared to sample 1 to 13. Samples 1 to 13 show very similar pattern with change in intensity only. This clearly indicates that sample 1 to 13 are closely related while sample 14 is distinct. Spot at Rf value 0.89 is more prominent in sample 1, 2, 4, 6, 7, 11 and 13 which indicates more amount of compound as compared to other samples.

Twelve *Curcuma inodora* variants, *C. pseudomontana* show same banding pattern, while, *Curcuma longa* shows different banding pattern. Sesquetepenoids of four species of *Curcuma- Curcuma phaseoculis* Valeton, *C. kwangsiensis* S.G.Lee and C.F.Liang, *Curcuma wenyujin* Y.H.Chen and C.Ling and *C.longa* L. were separated by using TLC (Zhang et al. 2008). Sesquiterpenoids act as antioxidant ; hence are medicinally

important. On the basis of sesquiterpene profile *C. longa* is different while *C. pseudomontana* goes with *C. inodora*.

Conclusion: TLC profile of Sesquiterpenoids characterizes all the three species by virtue of presence or absence of a specific sesquiterpene compound. Sesquiterpenoids profile can be used for the standardization of three *Curcuma* species studied here.

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