HPTLC Fingerprinting of Extracts of Pisonia grandis (R.Br.)

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Abstract

Nyctaginaceae, the Four O'Clock Family, is a family of around 33 genera and 290 species and it is well known for its ornamental and medicinal values. Pisonia grandis R.Br is one such medicinal plant of the Nyctaginaceae family with a high medicinal potential and is freely available in India. The leaves stem and roots of this plant are extensively used by the tribals in the preparation of several folk medicines. This study was intended to analyse the various extracts of Pisonia grandis by HPTLC.

Keywords: Nyctaginaceae, Pisonia grandis, HPTLC

Introduction

Nyctaginaceae, the Four O'Clock Family, is a family of around 33 genera and 290 species and it is well known for its ornamental and medicinal values. In Southern India it is represented by five genera and ten species. Boerhavia L., Bougainvillea Comm. Ex.Juss., Commicarpus Standley, Mirabilis L., Pisonia Plum Ex.L.ern are the genera native to Southern India.

Pisonia grandis R.Br (Synonyms: P.Alba, P.sylverstris and P.morindarfolia) is a medicinal plant of the Nyctaginaceae family is freely available in India [1]. It is easily grown and requires less attention and even used as an ornamental tree outside houses. Leaves stem and roots of this species are extensively used by the tribals in the preparation of several folk medicines. It has been extensively used in Indian traditional medicine as an antidiabetic [2], anti-inflammatory agent [3, 4] and used in the treatment of analgesia [5], ulcer [6], dysentery [7] and snake bite. The leaves are edible and mostly used to treat rheumatism and arthritis [8]. The plant has been studied by different workers with special reference to its pharmacological activity. This study was intended to analyse the plant extracts of Pisonia grandis by HPTLC.

Materials and Methods

Collection of plant material: The plant material (leaves) was collected during January- March 2009 in the local areas of Coimbatore, Tamilnadu, India. The identity of plant material was confirmed at Biodiversity Division, Institute of Forest Genetics & Tree Breading, Coimbatore, South India. The leaves were dried in shade and cut into small pieces and then used for the study.

Preparation of leaf extract: Various extracts of the leaves of Pisonia grandis were prepared and designated as AQPG, PGSX IV and PGSXW.

AQPG: The ethanol extract of leaves of Pisonia grandis was dissolved in minimum amount of water and fractionated with pet ether and chloroform until the respective organic solvents were colourless. The residual aqueous layer was designated as AQPG and used for the HPTLC screening.

PGSX IV and PGSXW: Sequential soxhlet extraction of leaves of Pisonia grandis was done with petoleum ether, chloroform, aqueous ethanol (1:2) mixture and water. The aqueous- ethanol extract was designated as PGSX IV. The aqueous extract was designated as PGSXW.

Sample application: 10µl of test solutions were loaded as 7mm band length in the 9 x 10 Silica gel $60F_{254}$ TLC plate using Hamilton syringe in CAMAG LINOMAT 5 instrument.

Spot development: The sample loaded plate was kept in TLC twin trough developing chamber with chloroform: methanol: water (9: 1: 0.7) as a mobile phase and the plate was developed up to 90mm.

Photo-documentation: The developed plate was dried in hot air to evaporate solvents from the plate, kept in photo-documentation chamber (CAMAG REPROSTAR 3) and the images were captured at UV 254nm and UV366nm.

Scanning: Before derivatization, the plate was fixed in the scanner and scanning was done at UV 254nm. The Peak table, Peak display and Peak densitogram were recorded.

Detection: Black coloured quenching zones at UV 254nm mode were observed from the chromatogram.

Results and Discussion: Peak densitograms of AQPG, PGSXIV**,** and PGSXW are given in Figure 1, Figure 2 and Figure 3. Table 1 gives the R_f and peak areas of the samples.

Conclusion

Chromatography is essentially a group of techniques used for separation of the constituents of mixture by continuous distribution or adsorption of analyte between two phases. Among various chromatographic analytical techniques HPTLC has a firm place as a reliable method for analysing several samples of divergent nature and composition at the same time [9]. HPTLC analysis of the extracts studied revealed the presence of two major components at R_f= 0.82 and 0.93 in the chosen solvent system.

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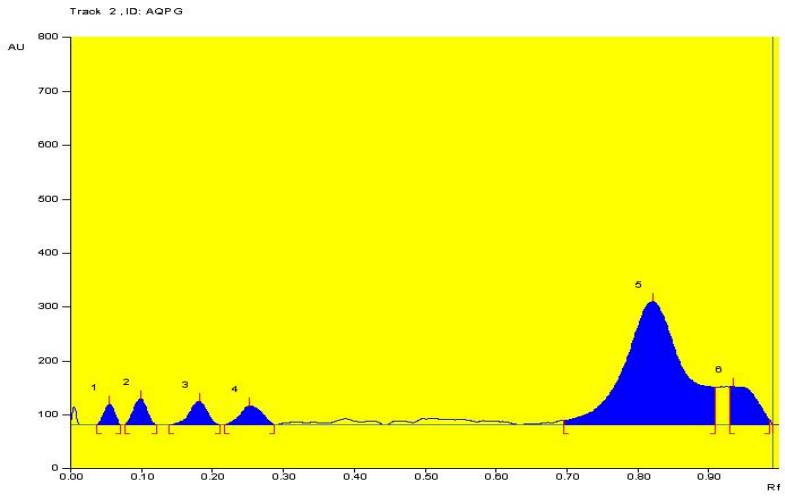

Fig.1 Peak densitogram of AQPG

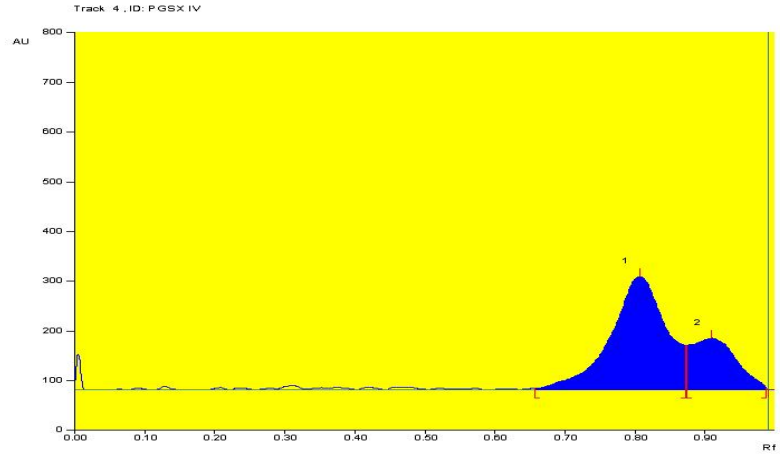

Fig.2 Peak densitogram of PGSX IV

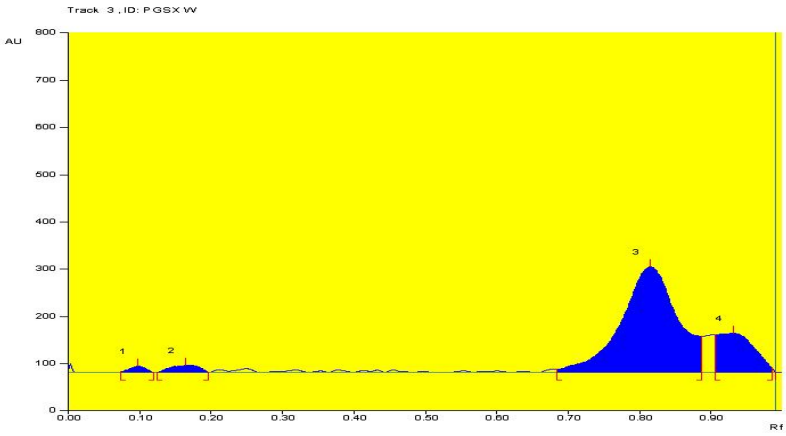

Fig.3 Peak densitogram of PGSXW

Table 1

R_f and peak areas of the samples.

Track	Peak	R_f	Height	Area
AQPG	1	0.06	38.3	528.3
AQPG	2	0.1	48.4	832.5
AQPG	3	0.18	43.6	981.6
AQPG	4	0.25	35.4	1001.9
AQPG	5	0.82	228.9	17167.6
AQPG	6	0.93	70.9	2467.2
PGSX IV	1	0.82	227.8	16684.6
PGSX IV	2	0.91	103.6	6290.1
PGSX W	1	0.1	13.1	269.6
PGSX W	2	0.17	14.4	558.1
PGSX W	3	0.82	223	16171.3
PGSX W	4	0.93	82.7	3947.5