Comparative thin layer chromatographic investigations on sources of Shankhpushpi

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INTRODUCTION

An ethnopharmacological approach has provided leads to identifying potential new drugs from plant sources, including those for cognitive disorders (1). Shankhpushpi is the name known for *Clitorea ternatea* Linn. (CT) (Papilionaceae), *Evolvulus alsinoides* Linn. (EA), *Convulvulus pluricaulis* Choisy. (CP), *Canscora decussata* Schult. (CD) and *Clitorea ternatea* Linn. (CT) for their identification utilizing the technique of thin layer chromatography (TLC). Shankhpushpi is vigorously advertised for its effects on learning and memory in print and electronic media in India. Various phytoconstituents have been reported in these herbs namely, p-coumaryl derivatives, xanthones, anthocyanins and flavonones. We explored the two phytochemical markers, namely scopoletin and mangiferin for their presence or absence in all the species by performing co-TLC of the ethanolic extracts with the markers. These chromatographic studies led us to conclude that scopoletin is present as a major constituent in all whereas mangiferin is present in CD only.

**Keywords:** Shankhpushpi; *Evolvulus alsinoides*; *Convulvulus pluricaulis*; *Canscora decussata*; *Clitorea ternatea*; Thin Layer Chromatography; Scopoletin; Mangiferin

**ABSTRACT**

The aim of the present study was to investigate the different plant sources of Shankhpushpi viz., *Evolvulus alsinoides* Linn. (EA), *Convulvulus pluricaulis* Choisy. (CP), *Canscora decussata* Schult. (CD) and *Clitorea ternatea* Linn. (CT) for their identification utilizing the technique of thin layer chromatography (TLC). Shankhpushpi is vigorously advertised for its effects on learning and memory in print and electronic media in India. Various phytoconstituents have been reported in these herbs namely, p-coumaryl derivatives, xanthones, anthocyanins and flavonones. We explored the two phytochemical markers, namely scopoletin and mangiferin for their presence or absence in all the species by performing co-TLC of the ethanolic extracts with the markers. These chromatographic studies led us to conclude that scopoletin is present as a major constituent in all whereas mangiferin is present in CD only.

**MATERIALS AND METHODS**

CD was collected from the outskirts of Raipur (Chattisgarh, India) in January 2007. The plant was identified by Dr S.C. Agrawal (Department of Botany, CDRI, Lucknow). Other three viz. CP, EA and CT were collected from Bhapel village near Sagar, India. All were authenticated in the Department of Botany, Dr. Hari Singh Gour Vishwavidyalaya, Sagar.
All herbs were shade dried at room temperature and ground into a coarse powder. 120 gm of powdered drug was first defatted with petroleum ether. Then marc was subjected to ethanolic extraction in soxhlet extractor (yields CD: 4.47% w/w; CT: 6.45%.w/w; EA: 11.32% w/w and CP: 9.98%w/w). Extraction was performed according to the method followed in our previous studies (8).

Approximately 10 mg of ethanolic extract was dissolved in ethanol. Scopoletin and mangiferin were dissolved in methanol. Precoated and preactivated TLC plates (E Merck) were used for the analysis.

After screening of solvent systems for achieving the best separation of components, following solvent systems were found to be the best for all the drugs:

- Chloroform: Methanol: Toluene (8:1:1) (9)
- Butanol: Acetic acid: Water (4:1:2)

The detecting reagents used were

1. UV at 366 nm
2. Anisaldehyde- Sulphuric acid reagent
3. 1% Ferric chloride solution

**RESULTS**

The presence of Scopoletin in EA, CD, CT and CP was detected as a blue fluorescence spot when exposed to UV at 366 nm (Fig 1). Mangiferin is a xanthone, which showed its presence in Butanol: Acetic acid: Water (4:1:2) after spraying with 1% ferric chloride reagent to give apricot yellow green spot (Fig 2).

**DISCUSSION**

Thus it can be concluded that scopoletin is present in all the four species whereas mangiferin is present in CD only. The source of shankhpushpi as CD may be confirmed by the presence or absence of mangiferin in the sample.

**ACKNOWLEDGEMENTS**

The authors would like to express sincere thanks to Laila Impex Research Center, Vijaywada (A.P), India and
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Natural remedies Pvt Ltd Bangalore, India for providing gift sample of Scopoletin and Mangiferin respectively. This work was supported by UGC.

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