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R. ARBOREUM FLOWER AND LEAF EXTRACTS: RP-HPTLC SCREENING, ISOLATION, CHARACTERIZATION AND BIOLOGICAL ACTIVITY

Pankaj Kumar Sonar[1*], Ranjeet Singh[2], Parveen Bansal[3], Anil Kumar Balapure[4] and Shailendra K. Saraf[1]

[1]Faculty of Pharmacy, Babu Banarasi Das Northern India Institute of Technology, Lucknow, India
[2]School of Pharmaceutical Sciences, Shobhit University, Meerut, India
[3]Department of Biochemistry, PGIMER, Chandigarh, India
[4]Tissue & Cell Culture Unit, Central Drug Research Institute (CDRI) Lucknow, India
*E-mail: pankajji.soni@gmail.com

ABSTRACT

In the present study, preliminary i*n-vitro* anticancer screening of the alcoholic extracts of leaves (LE) and flowers (FE) of *Rhododendron arboreum* was performed against Crown Gall tumor and MCF-7 breast cancer cell lines. Both the extracts showed prominent inhibition in the development of Crown Gall tumor in potato discs while only LE was found to be significantly effective against MCF-7. Three terpenoids (**1-3**), one sterol **(4)** and two flavonoids **(5-6)** were isolated from the LE of the *Rhododendron arboreum*. The flavonoidal compounds, quercetin and rutin were simultaneously identified from the flowers and leaves using high-performance thin-layer chromatography (HPTLC). Precoated silica-gel RP-18 F 254 S plates were used with a mobile phase of methanol: water: formic acid (55: 42: 03 v/v/v) and densitometric determination of these compounds were carried out at 254 nm in absorbance mode. Structures of all the isolated compounds were elucidated by spectroscopic methods like IR, PMR, CMR and Mass spectrometry.

Keywords: *R. arboreum*; Terpenoids, Quercetin, Rutin, Anticancer, HPTLC

INTRODUCTION

Rhododendron, the largest genus of the Ericaceae family, includes 1200 species distributed throughout Northeast Asia and Eurasia, Western Europe and North America[1]. Dried flowers of *R. arboreum* were used in the treatment of diarrhea and blood dysentery[2], and squash of the flowers was used for the treatment of mental retardation[3-4]. Traditionally its leaves were used in the treatment of gout and rheumatism[5]. *R. arboreum* possess various pharmacological activities like oxytocic, oestrogenic, prostaglandin synthetase inhibiting activity[6] and CNS depressant[7]. It has also been reported that this plant possesses hepatoprotective, antidiabitic, anti-inflammatory and antimicrobial activities[8-12]. Shaifulla *et al.* have isolated flavone glycoside, 5, 2′-dihydroxy-7-methoxy-4′-O-glucoside and dimethyl ester of terphthalic acid, from the leaves[13]. β-sitosterol, ursolic acid, quercetin and friedelin have been reported in the leaves and bark of the plant[14]. Harborne *et al.* identified uniform flavonoid pattern and quantitated various flavonoids such as gossypetin, kaempferol, myricetin, azaleatin, caryatin, dihydromyricetin, dihydroquercetin, dihydrokaempferol and coumarins in the leaf survey of 206 *Rhododendron* species, subspecies and varieties[15]. Harborne studied natural distribution of flavonol 5-methyl ethers in the leaves and petals of 50 species of *Rhododendron*[16]. Flavonoids constitute one of the most ubiquitous groups of all plant phenolics. They generally occur bound to sugars as glycosides. Due to their phenolic nature, they are easily detected on chromatogram or in solution due to change in colour, when treated with base or ammonia. Flavonoids contain conjugated aromatic systems and thus show intense absorption bands in the UV and visible regions of the spectrum [17-18]. Many clinical studies conducted in the last two decades have shown that flavonoids exert positive influence on the treatment of many serious diseases like cancer, oxidative stress, cardiovascular, microbial and viral infections, diabetes, etc. Many flavonoids containing