

STUDIES ON THE ESSENTIAL OILS OF THE PAKISTANI SPECIES OF THE FAMILY UMBELLIFERAE

Part XVIII. *Platytaenia lasiocarpa* sp. *Thomsonii* seed Oil

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The essential oil of *Platytaenia lasiocarpa* seed with a yield of 0.28% has been characterised with respect to its physicochemical values and chemical composition. The oil is composed of β -pinene (0.14%), *p*-cymene (1.43%), phellandrene (0.70%), γ -terpinene (1.59%), terpinolene (4.78%), γ -cadinene (3.56%), α -cadinene (0.98%), β -bisabolene (2.00%), isolongifolene (17.93%), β -elemene (14.34%), unknown sesquiterpene (15.05%), β -selinene (0.89%), β -caryophyllene (2.43%), humulene (3.93%), octyl acetate (13.82%), geranyl acetate (10.03%), unknown ester (0.56%), bornyl acetate (5.25%), linalyl acetate (0.75%) and an unidentified ester (0.47%). Because of its sweet flavour the essential oil of the species can be used in perfumery and cosmetics.

INTRODUCTION

Platytaenia lasiocarpa is a common plant in the inner Himalayan ranges. In Pakistan, the plant grows wild in Swat, Gilgit and Kashmir. The plant is mainly grazed by animals.

The present studies have been carried out with a view to determining the quality and chemical composition of the essential oil of *Platytaenia lasiocarpa* grown in Pakistan. These are the first ever studies of this kind as regards the Pakistani species.

EXPERIMENTAL

Materials and Methods: Fresh and mature seeds of *Platytaenia lasiocarpa* were hand-collected from Sho Mountain near Kalam (Swat). The essential oil from the crushed material was recovered by the normal procedure of dry steam distillation[1]. The general methods employed for these studies have been communicated in our earlier publications[1].

The resolution of the oil into its components by column chromatography [1-3], using silica gel as

an adsorbent, proved ineffective because of the complex nature of the oil. Its resolution by time and temperature programmed GLC coupled with mass spectrometry using a glass column (0.25" x 6') packed with 3% silar 5cp and identification of the various constituents were made from the computerised data.

RESULTS

The percentage yield, physicochemical properties and the chemical composition of the essential oil are recorded in Tables 1 and 2. Resolution of the oil by time and temperature programmed GLC is shown in Fig. 1.

DISCUSSION

The essential oil from the seed of *Platytaenia lasiocarpa* possesses quite sweet smell. The oil is composed of hydrocarbons and esters only. The hydrocarbon fraction of the oil is predominantly consisted of sesquiterpene which were identified by

Table 2. Percentage composition of the essential oil of *Platytaenia lasiocarpa* seeds by GLC.

| Component | % |
|------------------------|-------|
| β -Pinene | 0.14 |
| <i>p</i> -Cymene | 1.43 |
| Phellandrene | 0.70 |
| γ -Terpinene | 1.59 |
| Terpinolene | 4.78 |
| Octylacetate | 13.82 |
| Geranyl acetate | 10.03 |
| Unknown ester | 0.56 |
| Bornyl acetate | 5.25 |
| Linalyl acetate | 0.75 |
| Unknown compound | 0.47 |
| γ -Cadinene | 3.57 |
| α -Cadinene | 0.98 |
| β -Bisabolene | 2.00 |
| Isolongifolene | 17.92 |
| β -Elemene | 14.34 |
| Unknown sesquiterpene | 13.00 |
| β -Selinene | 0.84 |
| Unknown sesquiterpene | 1.15 |
| β -Caryophyllene | 2.42 |
| Humulene | 3.93 |

Table 1. Yield and physicochemical values of the essential oil of *Platytaenia lasiocarpa* seeds.

| | |
|------------------------|-------------|
| Distillation time (hr) | 10 |
| Yield(%) | 0.28 |
| Colour | Colourless |
| Specific gravity* | 0.8635(28) |
| Refractive index* | 1.4740(28) |
| Optical rotation* | +11° 6'(28) |
| Acid value | 2.69 |
| Ester value | 224.78 |

*The temperature at which these parameters were determined are given in parenthesis.

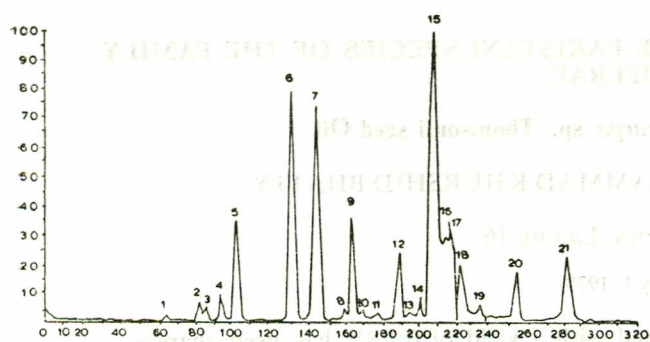


Fig. 1. Time and temperature programmed GLC of the essential oil of *Platytaenia lasiocarpa* using 3% silar 5 cp. glass column (0.25" x 6').

GLC/MS computerised data and also by comparison method in which standard available samples of these hydrocarbons were coinjected.

Bornyl acetate, geranyl acetate and linalyl acetate were also separated from the essential oil by repeated column chromatography using silica gel as an adsorbent and preparative TLC. The esters were identified by IR comparison with their standard samples and by conversion into their respective al-

cohols. However, the exact percentage of the esters was determined from the GLC analysis of the oil.

Platytaenia lasiocarpa can be an item of commerce because of the sweet fruity flavour of the essential oil obtained from its seed. The essential oil of the species can find application in perfumes and cosmetics.

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