

NOTE

Surface Hydrocarbons from the Leaves of *Portulaca oleracea* Linn.

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Surface hydrocarbons from the fresh leaves of *Portulaca oleracea* Linn. have been characterised and their relative distribution determined through GLC studies. The considerable occurrence of branched chain hydrocarbons may be an indication of the characteristics of lower plant based on taxonomy.

Key Words: Surface hydrocarbons, Leaves, *Portulaca oleracea* Linn.

Portulaca oleracea Linn. (Family: Portulacaceae) is a subsucculent herb and also an exotic element in Indian flora with nativity probably in North Africa or Europe. This herb is used in ailments of liver, spleen, urinary and cardiovascular systems. It cures haematuria, gonorrhoea, dysentery and ulcer of mouth¹. It is well known that the cuticular wax of the leaves of a plant plays a vital role in affecting transpiration and leaf surface properties although its composition may vary with environmental situation and also with the age of the plant²⁻⁴. The universal presence of normal alkanes as constituents of leaf cuticular wax is well established³ and their distributions are considered as taxonomic markers⁵⁻¹⁰. However, this approach has not always met with ambiguous success^{2, 3, 11-13}. The present communication deals with the characterisation and analysis of surface hydrocarbons, mainly n-alkanes.

The solvents used, n-hexane for the solvent extraction, carbon tetrachloride as a mobile phase in thin layer chromatographic studies and chloroform for elution purpose were of analytical grades, obtained from E. Merck, India. The standard hydrocarbon samples were obtained from Sigma Chemical Co., U.S.A.

Fresh leaves (50 g) were collected and the surface wax was extracted from them with cold hexane (45 min) at room temperature. The solvent was removed under reduced pressure and the crude extract was fractionated through preparative thin layer chromatographic plates. Thin layer chromatographic plates (thickness 0.5 mm) were prepared with silica gel G (Merck, India) by using Unoplan coating apparatus (Shandon, London) with carbon tetrachloride as mobile phase. The hydrocarbon band was identified through co-TLC with standard samples (Sigma). The band was eluted with chloroform. The single band for alkanes was further

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confirmed by argentometric TLC¹⁵ and showed no absorption for any detectable functional group in IR indicating clearly the presence of alkanes. The purified hydrocarbon fraction was then analysed directly by a programmed GLC run (oven temperature, 170–300°C at 5° min⁻¹ rise, initial period 1 min and final 15 mins) in a Hewlett Packard gas chromatograph (Model 5890 Series II) on HP-I capillary column of 25 m long with flame ionisation detector (FID) and characterised through co-GLC with authentic samples of n-alkanes (Sigma).

The main findings from the GLC analysis of alkanes in surface wax of leaves of *P. oleracea* are presented in Table-1.

TABLE-1
DISTRIBUTION OF THE HYDROCARBON CONSTITUENTS
OF THE LEAF WAX OF *PORTULACA OLERACEA*

[Values in mol %]	
n-alkanes (Carbon number)	Relative (%)
C ₁₇	0.78
C ₁₈	6.75
C ₁₉	1.39
C ₂₀	0.69
C ₂₁	1.89
C ₂₂	0.56
C ₂₃	3.26
C ₂₄	4.77
C ₂₅	0.23
C ₂₆	7.44
C ₂₇	14.98
C ₂₈	—
C ₂₉	0.48
C ₃₀	7.28
C ₃₁	1.26
C ₃₂	22.44
Total n-alkanes	74.20
Branched chain alkanes	25.80
Composition ratio of odd members to total n- alkanes	32.71
Ratio of normal to branched hydrocarbons	2.94:1
Ratio of odd and even numbered hydrocarbons	0.49:1

This analysis revealed the presence of all the members of n-alkanes in the series C₁₇–C₃₂ except C₂₈ and none of these n-alkanes have previously been reported to be present in the leaves of *P. oleracea*. The predominant occurrences of alkanes are n-C₃₂ (22.44%) and n-C₂₇ (14.98%) whereas the lowest occurrences of two alkanes are n-C₂₅ (0.23%) and n-C₂₉ (0.48%). It is to be noted here that n-alkanes are the major components in surface hydrocarbons, the relative percentage being 74.20 where the composition ratio of odd members to total n-alkanes is 32.71 and the ratio of odd and even membered n-alkanes is 0.49 : 1. Moreover, the ratio of normal to branched hydrocarbon is 2.94 : 1. Considering all the above facts and the considerable relative occurrence of branched chain hydrocarbons in the leaves of *P. oleracea*, it may be concluded that these are not the characteristic feature of a higher plant¹⁴.

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