The second component (R_F 0.30) was an unknown diol having a composition of $C_{20}H_{34}O_2$ (M^+ 306). The structure elucidation is being investigated and will be described elsewhere.

Experimental

The melting points were uncorrected. The optical rotations were obtained in $CHCl_3$ solutions, and the IR and NMR (60 MHz) spectra in CCl_4 solutions. The mass spectra were taken at 80 eV ionization voltage, 1500 eV ion accelerating voltage and 200° ionization chamber temperature.

Jungermannia torticalyx was collected at a ravine in the suburbs of Iwakuni City in Yamaguchi Prefecture, Japan. The liverwort was dried in the shade for

a week, and digested with hexane at room temperature to extract a dark green viscous oil (9.1 g) in a 1.0% yield of the dried plant. The extract was applied on a silica gel column and eluted with a mixed solvent of hexane-ethyl acetate (4:1), (–)-manool (first fraction) and an unknown diterpene diol (second fraction) being isolated in pure state with respect to gas chromatography which was performed with columns of Silicon SE-30 and DEGS (each 3 mm $\times$ 2 mm).

3,5-Dinitrobenzoate of (–)-manool was prepared in the usual procedure using an excess of 3,5-dinitrobenzoyl chloride in pyridine at room temperature for 3 days. The derivative was recrystallized from methylene chloride-methanol. Physical constants are shown in Table I.

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n-Paraffins from Flowers of *L. umbellata* Thunb.

N. HAYASHI and H. KOMAE

Department of Chemistry, Faculty of General Education,
Hiroshima University, Hiroshima, Japan

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L. umbellata Thunb., twelve *n*-paraffins (C_{21} to C_{31})

In the course of systematic study of *L. umbellata*, the *n*-paraffin constituents of the flowers were investigated. The flowers (236 g) which collected on May 8th at Hiroshima Prefecture, Japan, were minced to pieces and then extracted with *n*-hexane (31.) for 2 days. The extractives were concentrated to 300 ml and then maintained in a refrigerator to give a white crystalline substance (126.3 mg) which was not investigated. After being filtered off the crystalline the *n*-hexane solution

was further concentrated to dryness to give crude paraffins. The following *n*-paraffins (51.3 mg, 0.02% yield) was isolated from the crude paraffins by column chromatography and Molecular Sieb 5A treatment. The following *n*-paraffins were detected by gas chromatography (SE-30 5% Chromosorb W, temperature programmed 150° to 300° C). *n*-Paraffins: C_{20} 0.3%, C_{21} 36.5%, C_{22} 2.8%, C_{23} 46.7%, C_{24} 0.7%, C_{25} 8.5%, C_{26} 0.3%, C_{27} 2.8%, C_{29} 0.9%, C_{30} 0.05%, C_{31} 0.25%. The odd paraffins are in large amounts (95.65% of the *n*-paraffins, even paraffins 4.35%). In the previous communication we reported *n*-paraffins from the leaves of the same plant¹. *n*-Paraffins: C_{16} 0.1%, C_{17} 0.2%, C_{18} 0.3%, C_{19} 0.3%, C_{20} 0.6%, C_{21} 0.3%, C_{22} 0.6%, C_{23} 1.3%, C_{24} 1.2%, C_{25} 4.5%, C_{26} 1.5%, C_{27} 18.0%, C_{28} 1.5%, C_{29} 53.3%, C_{30} 1.3%, C_{31} 15.0%. Odd paraffins: Even paraffins = 92.8 : 7.2. A marked difference was found between the main paraffin composition of the flowers and the leaves.

Requests for reprints should be sent to Dr. NANA O HAYASHI, Department of Chemistry, Faculty of General Education, Hiroshima University, Hiroshima, Japan.

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