Isolierung von Luteolin und Luteolin-7-glucosid. Der MeOH-Extrakt (16 kg Droge) wurde im Vak. eingeengt und mit H_2O aufgenommen. Die wässrige Lösung wurde mit ÄtOAc ausgezogen und die Flavanoide aus dem Extrakt säulen- und DC-chromatographisch (Polyamid, Cellulose) isoliert. Luteolin: UV 347; (291); 267; 253 nm. Luteolin-7-glucosid: UV 346; (267) 254 nm.[13]

[13] T. J. MABRY, K. R. MARKHAM und M. B. THOMAS, *Systematic Identification of Flavonoids*, Springer, Berlin (1970).

Phytochemistry, 1972, Vol. 11, pp. 2651 to 2652. Pergamon Press. Printed in England.

UMBELLIFERAE

SESELI ACETYLENE FROM *ERYNGIUM BOURGATTI*

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Key Word Index—*Eryngium bourgatti*: Umbelliferae; acetylenes; 6-pentyl-2-[2-oxo-butin-(3)-yliden]-tetrahydropyran; falcarinone; 4-hydroxy-1,1,5-trimethyl-2-formyl-cyclohexadien-(2,5)-angelicate.

A recent publication[1] described the isolation and characterisation of a new type of acetylenic compound from *Seseli hippomarathrum*. This compound, 6-pentyl-2-[2-oxo-butin(3)-yliden]-tetrahydropyran (II), is of interest because it contains a terminal acetylenic bond (relatively rare in nature). We wish to report the isolation of this compound, in higher concentration, from another member of the Umbelliferae, *Eryngium bourgatti* (Gouan).

The combined, crude, plant extracts were chromatographed on silica gel columns, fractions containing the same chromophore, as assayed by UV spectroscopy, were combined and purified by preparative TLC on silica gel. The first compound eluted from the column was the well-characterised falcarinone (I), widespread throughout the Umbelliferae. Spectral characterisation proved identical with reported data.[2,3]

The major component (II) was eluted with a more polar solvent and possessed a maximum on the UV at 288 nm. The IR spectrum showed the presence of a terminal acetylene group (3300, 2090, 640 cm^{-1}), a carbonyl group at a low wavenumber (1630 cm^{-1}) and an enolether grouping (extremely strong band at 1570 cm^{-1}). The MS showed a molecular ion at m/e 220, corresponding to a molecular formula of $C_{14}H_{20}O_2$. The NMR spectrum showed the presence of a single acetylenic proton (singlet, area 1, 7·1 τ), a single olefinic proton (singlet, area 1, 4·2 τ, slightly split by long range coupling), a methyl group terminating a saturated chain (broad triplet, area 3, 9·15 τ) and a broad peak centered at 8·6 τ, corresponding to 12 methylene protons. In addition, multiplets at 5·6, 6·8, and 7·1 τ, each corresponding to 1 proton, accounted for the remaining protons in the molecule. Comparison

[1] F. BOHLMANN and C. ZDERO, *Chem. Ber.* **104**, 2354 (1971).
[2] F. BOHLMANN, C. ARNDT, H. BORNOWSKI and K.-M. KLEINE, *Chem. Ber.* **94**, 958 (1961).
[3] F. BOHLMANN, U. NIEDBALLA and K.-M. KLEINE, *Chem. Ber.* **99**, 3552 (1966).

with the data given for the compound isolated from *Seseli hippomarathrum*[1] proved the identity of (II).

Chromatography of the aerial parts of the plant showed the presence of lesser amounts of falcarinone (I), and trace amounts of the terpene aldehyde (III),[1,4] (IR–CHO 2720, 1710 cm^{-1}; —CO_2R 1730 cm^{-1}; C=C 850 cm^{-1}. MS M^+ 248, further breakdowns identical with those reported in the literature.

TABLE 1. COMPARATIVE AMOUNTS OF COMPONENTS IN *E. bourgatti* AND *S. hippomarathrum*

Plant	mg compound/kg roots I	II	III	IV	V	VI
E. bourgatti	11	750	—	—	—	—
S. hippomarathrum	450	450	11	7	2	45

A comparison of the amounts of the respective compounds isolated from the two plants shows that *E. bourgatti* is an excellent source of (II), whereas *S. hippomarathrum* contains a far greater amount of falcarinone, together with various lesser polyynes (IV and V) plus two terpene aldehydes (III and VI) (see Table 1). Lack of data for the aerial parts of *S. hippomarathrum* prevents any comparison.

EXPERIMENTAL

E. bourgatti plants (obtained from the Botanical Gardens, Copenhagen, where the voucher specimen is kept), which had ceased flowering, were washed, the roots and aerial parts separated, minced, and extracted for 24 hr with light petroleum (b.p. 40–60°), followed by 24 hr extraction with Et_2O. The solvent was removed from the combined extracts by evaporating and the dry crude extracts weighed. Roots (890 g) yielded 1050 mg crude extracts. Aerial parts (285 g) yielded 22 mg crude extract. Each extract was chromatographed on silica gel (Merck) columns made up in light petroleum and eluted with increasing proportions of Et_2O in light petroleum. Preparative TLC was performed on 2·5 mm thick layers of silica gel G (Merck) with 5% (I), 40% (II), and 50% (III) ether in light petroleum as eluting solvent.

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[4] F. BOHLMANN and C. ZDERO, *Chem. Ber.* **102,** 2211 (1969).

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CONSTITUENTS OF *SMYRNIUM ROTUNDIFOLIUM*

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Key Word Index—*Smyrnium rotundifolium*; Umbellifereae; hydrocarbons; sitosterol; triterpene; alkaloids.

Plant. Smyrnium rotundifolium, Mill. Identified by Professor Dr. A. Baytop, deposited in the Herbarium of Faculty of Pharmacy, University of Istanbul, Turkey, Voucher No.