NMR: (δ, H_2), 2·01 (*s*, 3H). *ursa-20-en-3-one*. Plates, m.p., 162–196° (*Anal.* Found: C, 84·44; H, 10·96; O, 4·28. Calc. for $C_{30}H_{48}O$: C, 84·84; H, 11·39 O, 3·77%). Soln $CHCl_3$ $[\alpha]_{589}$ + 49° $[\alpha]_{578}$ + 51·0° $[\alpha]_{546}$ + 60·3°; $[\alpha]_{436}$ + 114·3° $[\alpha]_{365}$ + 207·0° $[\alpha]_{316}$ + 222·4°. ν_{max}^{KBr} 1700 cm^{-1}. *3β-hydroxy-ursane*. m.p. 204–206°. (*Anal.* Found, C, 84·26, H, 12·23, O, 4·02. Calc. for $C_{30}H_{52}O$: C, 84·04, H, 12·23; O, 3·73%) Soln $CHCl_3$ $[\alpha]_{589}^{25}$ − 12·9; $[\alpha]_{578}$ − 13·4°; $[\alpha]_{546}$ − 13·8°; $[\alpha]_{436}$ − 22·8; $[\alpha]_{365}$ − 31·1°.

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SESQUITERPENES FROM THE ROOTS OF *LIGULARIA HODGSONII*

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Key Word Index—*Ligularia hodgsonii*; Compositae; sesquiterpene; furanoeremophilane; bakkenolide A (fukinanolide); eremophilenolide.

Plant. Ligularia hodgsonii Hook. f. (Compositae). *Source.* Mt. Yakeishi-dake, Iwate prefecture, Japan. Voucher specimen is kept in the Herbarium of National Science Museum, Tokyo (TNS 201645). *Previous work.* On roots (furanoeremophilan-14β,6α-olide).[1]

Present work. Dried roots (1·7 kg) were extracted with hot C_6H_6. The solvent was evaporated to give the residue (54 g) which was dissolved in warm light petrol. The soluble material was sublimed at 100° under reduced pressure (1 mmHg) and the material sublimed (11 g) was chromatographed on silica gel. Elution with light petrol. gave a colourless oil (48 mg), $C_{15}H_{22}O$ (M^+ at *m/e* 218), $[\alpha]_D$ − 12° ($CHCl_3$). UV: λ_{max}^{MeOH} 221 nm (ε 7000). IR: (liquid film) 1649, 1568, 1094 cm^{-1}; PMR ($CDCl_3$) δ 0·95 (3H, *s*; tert-Me), δ 0·99 (3H, *d*, *J* 7 Hz; sec-Me), δ 1·99 (3H, *d*, *J* 1 Hz; –CH=C=Me), δ 7·13 ppm (1H, *m*; –O–CH=C=Me), identical ($[\alpha]_D$, IR, PMR, MS) with furanoeremophilane.[2] Elution with light petrol.–Et_2O (100:3) afforded a crystalline compound, which was recrystallized from light petrol. to give 690 mg of bakkenolide A[3] (fukinolide[4]), m.p. 80·5–81·5°. $C_{15}H_{22}O_2$ (M^+ at *m/e* 234), $[\alpha]_D$ + 20° (MeOH). IR: (Nujol) 1780, 1665, 900 cm^{-1}. PMR: (C_6D_6) δ 0·68 (3H, *d*, *J* 6

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Hz; sec-Me), δ 0·87 (3H, *s*; tert-Me), δ 4·17 (2H, quartet of triplets, *J* 13, *J* 2, *J* 2 Hz; $H_2C{=}C{=}CH_2{-}O{-}CO{-}$), δ 4·42 and δ 4·72 ppm (each 1 H, each *t*, *J* 2, *J* 2 Hz; $H_2C{=}C{=}CH_2{-}$), identical with a genuine sample in all respects (m.p., m.m.p., $[\alpha]_D$, IR, PMR, MS). Successive elution with light petrol.–Et_2O (20:3) gave 10 mg of eremophilenolide,[5] m.p. 124°, $C_{15}H_{22}O_2$ (M^+ at *m/e* 234), $[\alpha]_D$ + 202°* (MeOH). UV: λ_{max}^{MeOH} 221 nm (ϵ 19 900). IR: (Nujol) 1750, 1693 cm^{-1}. PMR: ($CDCl_3$) δ 0·80 (3H, *d*, *J* 6 Hz; sec-Me), δ 1·05 (3H, *s*; tert-Me), δ 1·81 (3H, *s*; =C=C=Me), δ 4·63 ppm (1H, *m*; =CH–O–CO–). Identification with the authentic specimen was effected on m.p., m.m.p. and IR.

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* The reported $[\alpha]_D$ value + 16·6° ($CHCl_3$)[5] seems to be erroneous. The authentic sample supplied by Dr. Novotný showed $[\alpha]_D$ + 177° ($CHCl_3$).

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LA ÇANADALINE: NOUVEL ALCALOÏDE D'*HYDRASTIS CANADENSIS*

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La canadaline est l'un des plus abondants des alcaloides mineurs d'*Hydrastis canadensis* à structures encore indéterminées: $C_{21}H_{23}NO_5$ (M^+ 369); F (éther): 117–118°; $[\alpha]_D$ +43° (*c* 0,5, $CHCl_3$). Le pic moléculaire du spectre de masse est d'intensité trés faible (1%); cependant le pic de base (*m/e*: 190) suggère un enchaînement de type dihydrohydrastinine.[1]

m/e 190

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