

CONSTITUENTS OF TWO *QUERCUS* SPECIES OF HONG KONG*

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Arthur *et al.* reported¹ the occurrence of hop-17(21)-en-3 β -ol and its acetate and four other triterpenoids in the leaves of *Quercus championi*. On further investigation of the same plant we have isolated a very small quantity of isoarborinyl acetate, which has not formerly been obtained from natural sources. Arborinol and isoarborinol were first isolated from *Glycosmis arborea* by Pakrashi and Roy,² and their partial structures were proved by Vorbrüggen, Pakrashi, and Djerassi.³ Recently Hui and Lam⁴ reported the occurrence of arborinone and isoarborinol from *Hedyotis acutangula*, and Ohmoto *et al.*⁵ isolated isoarborinol methyl ether from the rhizome of *Imperata cylindrica*.

A petroleum extract of the dry leaves of *Quercus glauca* yielded waxes, friedelin, friedelan-3 β -ol, β -sitosterol, and a higher fatty alcohol, the i.r. spectrum of which is very similar to those of the alcohol A1 reported by Arthur *et al.*⁶ from *Q. championi* and the semicrystalline substance isolated by Hui and Lam⁷ from *Paederia scandens*.

Experimental

Analyses were by the Microanalytical Laboratory, University of Singapore. The alumina used for chromatography was B.D.H. analysis grade. Light petroleum had b.p. 60–80°. Infrared spectra were taken on a Perkin-Elmer Infracord 137 spectrophotometer. Melting points were taken on a Kofler block. Rotations are for chloroform solutions.

Quercus championi: Isoarborinyl Acetate

The crude product from fractions 6–8¹ of the chromatogram of the light petroleum extract contained semicrystalline material. It was recrystallized from ethanol, and the first crop (1.0 g) was rechromatographed on alumina (70 g) in light petroleum. After the removal of 60 \times 100 ml fractions, which contained friedelin, the following 10 \times 100 ml fractions gave colourless crystals, m.p. 254–297°, which on repeated recrystallization from benzene/light petroleum yielded hexagonal prisms (10 mg), m.p. 296–298°, ν_{\max} 1730, 1240 cm^{-1} (OAc). A mixed melting point determination with an authentic sample of isoarborinyl acetate prepared by acetylation of isoarborinol⁴ gave no depression. The i.r. spectra of the two compounds were also found to be identical.

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⁶ Arthur, H. R., Cheng, K. F., Lau, M. P., and Lie, K. J., *Phytochemistry*, 1965, in press.

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Constituents of Quercus glauca

The dried leaves of *Q. glauca* (3.6 kg) were extracted with light petroleum, and the extract was concentrated to 2 l., and chromatographed on alumina (1.8 kg). Elution with light petroleum gave chiefly waxes in the first few fractions. The later main fractions gave colourless needles which on recrystallization from light petroleum yielded friedelin (2.5 g), m.p. 264°, $[\alpha]_D -26.9^\circ$ (c, 0.59). Elution with light petroleum/benzene (4 : 1) gave fractions which after three recrystallizations from light petroleum yielded friedelan-3 β -ol (1.4 g), m.p. 280–283°, $[\alpha]_D +19.2^\circ$ (c, 0.379). On further elution with light petroleum/benzene (1 : 1), fractions which deposited a semicrystalline material (0.5 g, m.p. 76–78°) were obtained. This material after ten recrystallizations from light petroleum yielded a higher alcohol as scintillating plates, m.p. 82–83° (Found: C, 82.4; H, 14.4%). ν_{\max} 3310 cm^{-1} (OH). Acetylation gave the acetate as fine needles, m.p. 70–71° (Found: C, 80.1; H, 13.5%). ν_{\max} 1720, 1230 cm^{-1} (OAc). Further elution with benzene gave colourless needles (1.0 g), m.p. 120–129°, which after rechromatography and recrystallization from light petroleum yielded β -sitosterol, m.p. 137–138°, $[\alpha]_D -36.2^\circ$ (c, 0.50), characterized by forming the acetate, m.p. 128°, $[\alpha]_D -38.5^\circ$ (c, 0.50).

Mixed melting points with authentic samples were determined for friedelin, friedelan-3 β -ol, and β -sitosterol. No depressions were observed. The i.r. spectra of these compounds were found to be identical with those of the authentic samples.

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