

DITERPENES OF *JUNIPERUS CONFERTA*

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Plant. Juniperus conferta Parl. *Source.* The Yokohama beach of the Shimokita peninsula at Aomori, Japan. *Use.* Spicing of liquor.¹ *Previous works.* On leaves;^{2,3} on tropolones of heartwood;⁴ on sesquiterpenes of heartwood.⁵

Present work. Examination of the non-volatile fraction of the heartwood extractive using column chromatography (alumina and silica) and preparative TLC.

Non-volatile neutral fraction.^{4,5} Totarol,⁶ (M at m/e 286), m.p. 125–126° (IR, NMR and MS). 3-Oxototarol,⁷ (M at m/e 300), m.p. 179–180° (IR and MS), a Huang-Minlon reduction of which yielded totarol. Δ^1 -3-oxototarol,* (M at m/e 298), m.p. 173–173.5°, $\lambda_{\text{max}}^{\text{EtOH}}$ nm (log ϵ): 226 (4.28), 282 (3.32), $\delta_{\text{CDCl}_3}^{\text{TMS}}$: 5.92 (d, 2-H, $J = 10.5$ Hz), 7.50 (d, 1-H, $J = 10.5$ Hz), hydrogenation of which afforded 3-oxototarol. Xanthoperol, m.p. 235° (IR, NMR, MS and mixed m.p.) and two unidentified diterpenes, $\text{C}_{20}\text{H}_{28}\text{O}_3$ (M at m/e 316), m.p. 180–181° (dec) and $\text{C}_{20}\text{H}_{26}\text{O}_2$ (M at m/e 298), m.p. 260° (dec). In addition, β -sitosterol, m.p. 136–137° (IR, NMR and m.m.p.) and savinin,⁸ $\text{C}_{20}\text{H}_{16}\text{O}_6$ (M at m/e 352), m.p. 140–141° (IR, NMR, MS and m.m.p.) were also isolated.

*Phenolic fraction.*⁴ 1,3-Dioxototarol, $\text{C}_{20}\text{H}_{26}\text{O}_3$ (M at m/e 314), m.p. 215–217°, $\lambda_{\text{max}}^{\text{MeOH}}$: 256 nm (log ϵ 4.20), $\lambda_{\text{max}}^{\text{NaOH}}$: 287 nm (log ϵ 4.45), $\nu_{\text{max}}^{\text{KBr}}$ (cm^{-1}): 1725, 1702, $\delta_{\text{CDCl}_3}^{\text{TMS}}$: 3.55 (q, 2-CH₂, $J = 18.0$ Hz), the structure of which supported by comparison of spectral data of 1,3-dioxototarol methyl ether.⁹ Sugiol, m.p. 260° (IR, NMR and m.m.p.).

*Acidic fraction.*⁴ A mixture of sandaracopimaric and isopimaric acids, $\text{C}_{20}\text{H}_{30}\text{O}_2$ (M at m/e 302), m.p. 163–164° (NMR,¹⁰ MS,¹¹ and co-GLC of methyl ester) and arachidic acid, m.p. 72° (IR, NMR, MS and m.m.p.) were isolated and characterized.

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* The numbering system of L. H. BRIGGS *et al.* [*J. Chem. Soc.* 1840 (1962)] is used.

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Key Word Index—*Juniperus conferta*; Cupressaceae; diterpenes; totarol; isopimaric acid.