Selective Introduction of Mono-, Sesqui-, and Di-terpenoid Chromene Residues: Synthesis of Flemingin A, B, and C Methyl Ethers

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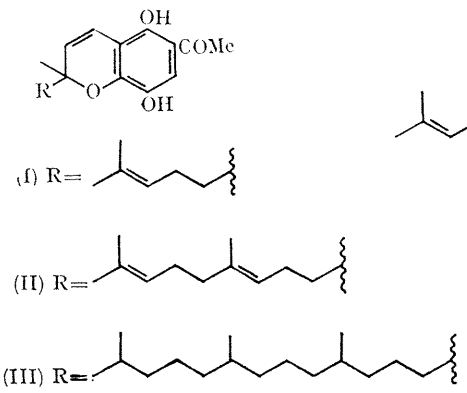
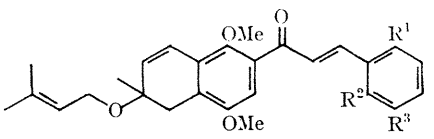
PYRIDINE-CATALYSED condensation of citral with resorcinols and phloroglucinols leads to chromenes, and other products having this oxidation level.[1] We now report that when one of two *ortho*-hydroxy-groups of the phenols is chelated, chromene ring formation specifically involves the other: further cyclisation to a tetracyclic system [*cf.* (X)] is inhibited and an excellent chromene synthesis results. Thus, reaction of citral with 2,4,5-trihydroxyacetophenone in refluxing pyridine (1 mol.) gave the monoterpenoid chromene (I) (60%) m.p. 87—89°.† Similarly farnesal gave the sesquiterpenoid (II) (42%) and phytal gave the diterpenoid (III) (39%).





	R^1	R^2	R^3
(IV)	OH	H	H
(V)	OMe	H	H
(VI)	OMe	OMe	H
(VII)	OMe	H	OMe

† Cardillo *et al.*[2,3] have recently reported a synthesis of flemingin C trimethyl ether inwhich the chromene-forming step is alkenylation of 2,4-dihydroxy-5-methoxyacetophenone with geranyl bromide (%) followed by cyclodehydrogenation with 2,3-dichloro-5,6-dicyanoquinone (40%), *i.e. ca.* 3% overall. Other, existing methods for chromenes are also poor.