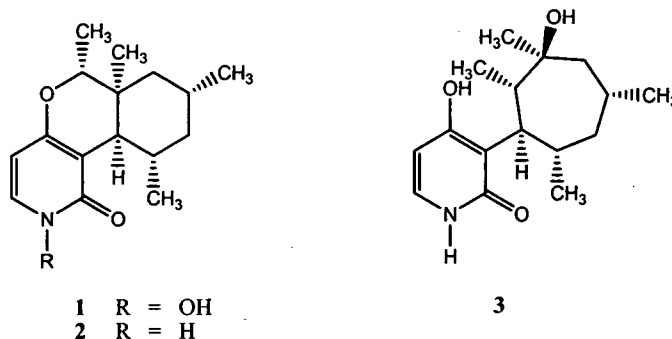


Structurally Interesting Metabolites from Two Plant-associated *Penicillium* species

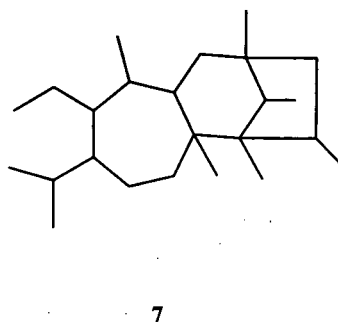
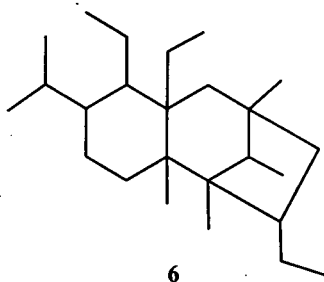
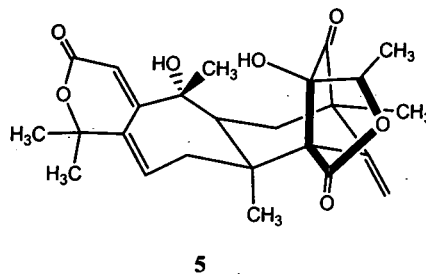
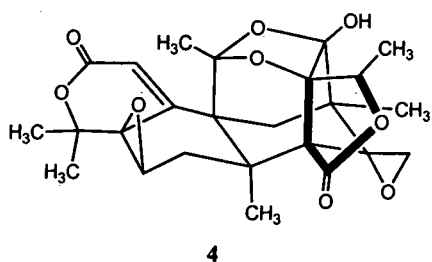
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Fungi are known to be prolific producers of secondary metabolites of diverse structures and biological activities. They are ubiquitously found around the world and display an extraordinary diversity of ecological interactions. Endophytic fungi inhabit virtually every plant on earth with no apparent pathogenic effects on the host and represent an almost inexhaustible resource for the discovery of biologically active secondary metabolites. Just as terrestrial plants, marine algae too harbor fungal endophytes, and these much the same as their terrestrial counterparts are potential sources of new metabolites. From an endophytic *Penicillium* species derived from surface-sterilized segment of the brown alga *Xiphophora gladiata* we have isolated and characterized three alkaloids: the known N-hydroxy-2-pyridone, PF1140 (1), and two new 2-pyridones, N-deoxy-PF1140 (2) and N-deoxy-akanthomycin (3) which exists as a pair of atropisomers. Structure elucidations of these metabolites were done by extensive NMR analysis.¹



The fruiting tree *Averrhoa bilimbi* (biling in Sinhalese) is commonly found in rural home gardens of Sri Lanka. Its fruits are susceptible to infection by the fungus *Penicillium purpurogenum*. From a laboratory culture of this phytopathogenic fungus we have isolated and characterized a family of highly functionalized metabolites, dhilirolides A (4) to D (5). Among them, the dhilirolides accounted for two novel carbon skeletons, dhilirane (6) and isodhilirane (7) skeletons, each containing 25 carbon atoms.²



Structurally dhilirolides appear to be highly rearranged meroterpenoids derived from farnesyl pyrophosphate and 3,5-dimethylorsellinate. Stable isotope feeding studies are currently underway in our laboratories to determine their biogenesis.

References:

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2. E.D. de Silva, D.E. Williams, D.R. Jayanetti, R.M. Centiko, B.O. Patrick, R.L.C. Wijesundera and R.J. Andersen, *Organic Letters* 2011, 13(5), 1174-1177