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ABSTRACT

PART I

A new chalcone derivative (\pm)-boesenbergin B and the known (\pm) panduratin A, (\pm) panduratin B₁, B₂, (\pm) boesenbergin A together with 2',6'-dihydroxy-4'-methoxychalcone, cardamonin have been isolated from *Boesenbergia pandurata* (yellow rhizome, Zingiberaceae). Spectroscopic studies and x-ray crystallographic analysis have established structure (\pm)-(E)-1-[5'-hydroxy-7'-methoxy-2'-methyl-2'-(4"-methylpent-3"-enyl)-2'H-1-benzopyran-6'-yl]-3-phenylprop-2-en-1-one for boesenbergin B. A simple synthesis of boesenbergin B has been achieved and its acid catalyzed cyclization has been studied.

ABSTRACT

PART II

The reaction of lithio chloromethyl phenyl sulfoxide with aldimines gave substituted 2-phenylsulfinylaziridines in good yields. The aziridines could undergo 1,3-dipolar cycloaddition reaction with dimethyl acetylenedicarboxylate to give substituted pyrroles in high yields. Presumably, the reaction involved the addition of azomethine ylides derived from the thermal ring opening of aziridines to dimethyl acetylenedicarboxylate followed by the elimination of the phenylsulfenic acid from the intermediate pyrrolines.

The addition of lithio chloromethyl phenyl sulfoxide to 2-cyclohexen-1-one, 2-cyclopenten-1-one and 3-penten-2-one gave only 1,2-addition products. No 1,4-addition products could be detected. However, the reaction of 2-(phenylthio)-2-cyclopenten-1-one with lithio chloromethyl phenyl sulfoxide gave the corresponding 1,4-addition product in good yield.

The reaction of α,β -unsaturated monoesters, diesters, cyanoesters and dinitriles with lithio chloromethyl phenyl sulfoxide gave the expected cyclopropanes as mixtures of isomers in moderate to good yields. α,β -Unsaturated mononitriles failed to give the corresponding cyclopropanes. The reaction with α,β -unsaturated 1,3-ketoesters gave furans, cyclopropanes and *cis*-dihydrofurans as the major products. The reaction with α,β -unsaturated 1,3-diketone gave the corresponding *cis*-dihydrofuran as the sole product.

The chemistry of dimethyl 3-isopropyl-2-phenylsulfinyl-1,1-cyclopropanedicarboxylate and *cis*-4-isopropyl-3-methoxycarbonyl-2-methyl-5-phenylsulfinyl-4,5-dihydrofuran was briefly studied. The α -phenylsulfinyl carbanion of the cyclopropane could undergo deuteration, alkylation, addition to aldehydes having no α -hydrogen and ring opening at about 0°C.

The dihydrofuran could be selectively metallated at methyl group. The resulting carbanion could be alkylated with alkyl halides and underwent Michael addition reaction with α,β -unsaturated diester.