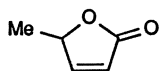
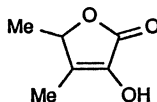


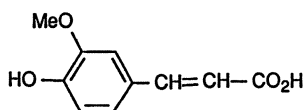
Besides the coumarin and furocoumarin derivatives, stigmasterol [13], sitosterol [8] and some lactones such as β -angelica lactone (17-25) [12], 2-hydroxy-3,4-dimethyl-2-buten-4-olide (17-26) [14], γ -nonalactone, and γ -decalactone [15] were isolated and identified.

 β -Angelica lactone (17-25)

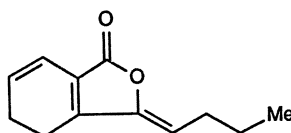
2-Hydroxy-3,4-dimethyl-2-buten-4-olide (17-26)

17.2.2 Chemical Constituents of *Angelica sinensis*

The most important constituents isolated from the roots of *A. sinensis* were ferulic acid (17-27) [16] and ligustilide (17-28) [17].

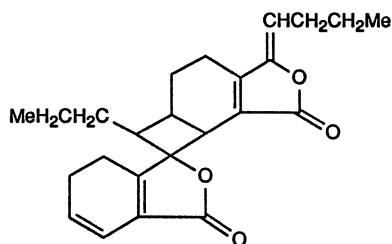


Ferulic acid (17-27)



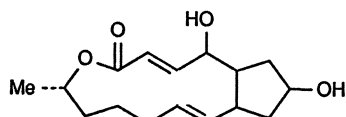
Ligustilide (17-28)

Angelicide (17-29) [18], a ligustilide dimer, was also isolated from the roots of *A. sinensis* and structurally elucidated.



Angelicide (17-29)

Additional nonvolatile constituents were identified as brefeldin A (17-30), 6-methoxy-7-hydroxy-coumarin, β -sitosterol, stigmasterol, and β -sitosterol-D-glucoside [19]. From the essential oil of the leaves a number of terpene compounds such as α -pinene, myrcene, limonene, verbenone, copaene, β -farnesene, β -selinene, and β - and α -cadinene were detected [20]. Amino acids [21] and trace elements [22] present in the root of *A. sinensis* have also been studied.



Brefeldin A (17-30)