

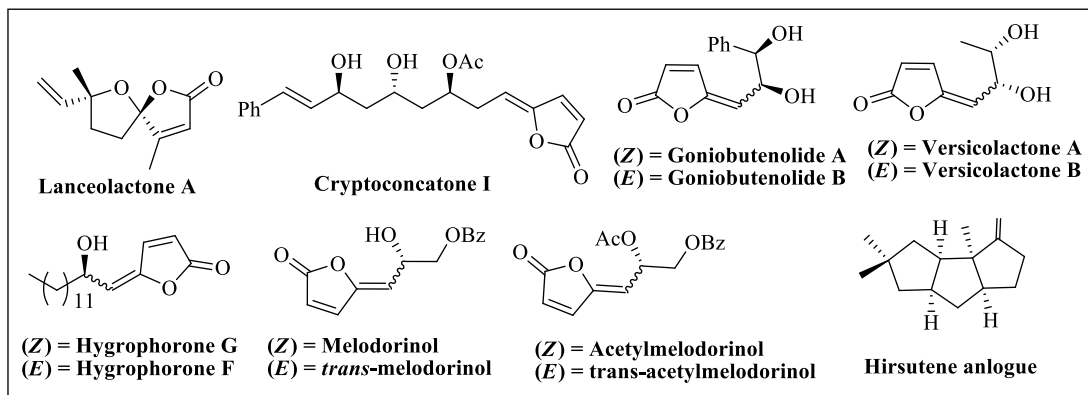
Abstract

Thesis Title: Asymmetric Total Synthesis of γ -Alkylidenebutenolides, Spirolactones and Synthetic Studies Towards Triquinanes

Abstract: γ -Alkylidenebutenolides, a class of polyketide, originate from the fungal metabolites. Starting from the simplest γ -alkylidenebutenolide protoanemonin, lots of γ -alkylidenebutenolide natural products like xerulene, xerulinic acid, lissoclinolide, cryptoconcatone I & J, varsicolactone A & B etc have been isolated. All of these compounds have received considerable attention due to their potent biological properties, which include antifungal, cytotoxic, antimalarial, antiviral, antiparasitic, estrogenic, antimicrobial activities. Spirolactone lanceolactone A is a [4,4]-spirocyclic tetranorsesquiterpinoid natural product isolated recently from the methanolic extract of the leaves of *Illicium lanceolactum* A. C. Sm. It shows antimicrobial activity against the periodontal pathogen *Porphyromonas gingivalis*. Its biological activities and beautiful structural features drew our attention towards its total synthesis. Polyquinane natural products have generated a worldwide interest among organic chemists due to their unique and fascinating molecular architecture and promising biological activities. Hirsutene is one of the most targeted triquinane natural products due to its unique cyclic framework.

The thesis briefly describes asymmetric total synthesis of lanceolactone A, cryptoconcatone I, versicolactone A & B, goniobutenolide A & B, melodorinols, acetylmelodorinols, hygrophorone G & F, ramariolide D and a formal synthesis of triquinane containing hirsutene analogue. For the synthesis of the said natural products, we have adopted lipase catalyzed kinetic resolution (EKR) and various types of asymmetric transformations involving asymmetric propargylation, asymmetric reduction, asymmetric epoxidation, olefination reactions, metal catalyzed lactonizations, visible light induced photoisomerization reaction and metathesis reactions like RRM and RCM reaction.

Abstract



Key Words: γ -Alkylidenebutenolides, Asymmetric synthesis, EKR, isomerisation, Lactonization, Synthetic methods, Total synthesis, metathesis, Triquinane etc.