

ABSTRACT

- Thesis Title** : Chemistry and Biological Activity of
Ecdysteroids from Some *Vitex* Species
- Student' s Name** : Mr. Chatriwat Sommechai
- Degree Sought** : Master of Science
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- Advisory Committee** :
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Studies on the chemical constituents of the barks of four *Vitex* species have led to the isolation of the following minor ecdysteroids, *V. glabrata* : glabratasterone (93), pterosterone (27), ajugasterone C (30) and calonysterone (91), *V. pinnata* : glabratasterone (93), ajugasterone C (30), calonysterone (91), ecdysone (1), pinnatasterone (50), and canescensterone (94); *V. pierrei* : 24-*epi*-makisterone A (45); *V. canescens* : makisterone A (33) and canescensterone (94). The major ecdysteroid 20-hydroxyecdysone (2) and the rare ecdysteroid turkesterone (46) have also been isolated from all four *Vitex* species.

Among these ecdysteroids, glabratasterone (93) and canescensterone (94) were new ecdysteroids.

Pinnatasterone (50) exhibited low moulting hormone activity in the

Musca bioassay, while canescensterone (94), its 24-*O*-(pyrrole 2-carboxylate) derivative, showed high activity in the same bioassay. In the *Drosophila* B_{II} cell bioassay, pterosterone (27) showed a relatively higher activity than 20-hydroxyecdysone (2), while ajugasterone C (30) was relatively less active than 20-hydroxyecdysone (2). In this bioassay, pinnatasterone (50) and glabratasterone (93) exhibited low activity.

Synthesis of calonysterone (91) and 9,20-dihydroxyecdysone (92) by base-catalyzed autoxidation of 20-hydroxyecdysone (2) has been evaluated and it was concluded that by bubbling oxygen into the aqueous methanolic solution of 20-hydroxyecdysone (2), the rate of formation of calonysterone (91) and 9,20-dihydroxyecdysone (92) increased, but separation became more complicated due to the presence of more minor components. When the base has been changed to ammonium hydroxide, yield of 9,20-dihydroxyecdysone (92) significantly increased, while that of calonysterone (91) decreased.