

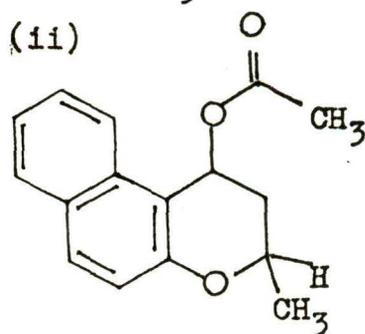
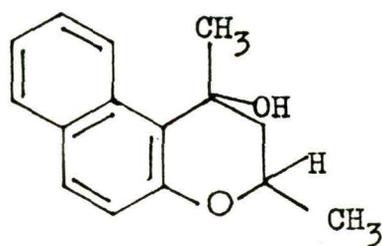
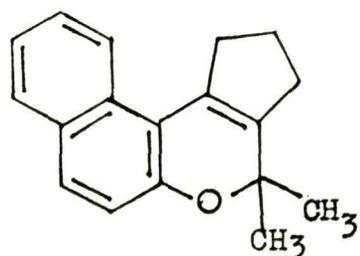
PREFACE

The thesis entitled "OXYGEN HETEROCYCLES-SYNTHESIS AND STUDY OF THE BIOLOGICAL PROPERTIES OF COMPOUNDS RELATED TO PRECOCENES", embodies the results of investigations by the author during the period Oct., 1988 to June, 1993, in the Organic Chemical Laboratories of the University of North Bengal, Raja Ram Mohunpur and consists of two parts: Part -I describes the results of experiments directed towards the synthesis of precocene analogues and in Part-II are incorporated the results of studies on biological activity of the compounds described in the part-I of the thesis.

The concept of controlling insects with Juvenile hormone antagonists which act in an opposite manner to juvenoids has attracted much attention since early seventies. Compounds possessing AJH activity can cause precocious metamorphosis, resulting in mortality of susceptible insects as prematurely formed pupae or defective adults. A further advantage of compounds with AJH activity lies in their capacity to compress the destructive larval insects of phytophagous insects and thus significantly reduces damage to food and fibre crops.

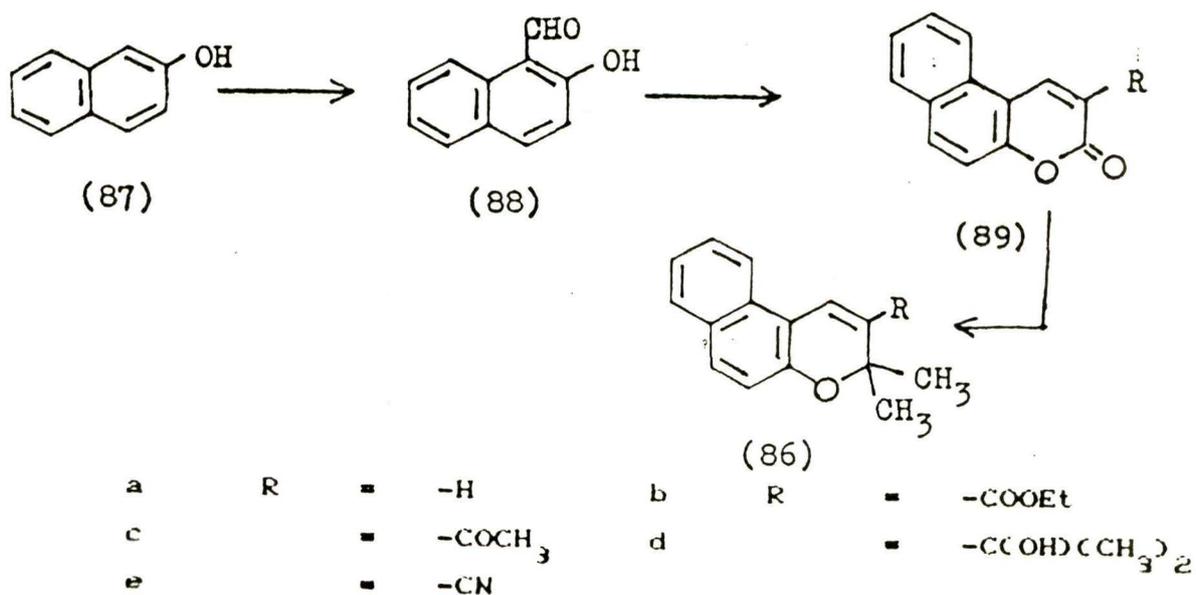
(ii)

Precocenes are well known naturally occurring compounds having pronounced anti-juvenile hormonal activity. The biological activity of these compounds have been studied and well documented. Not much work correlating structure and activity of precocene analogues has been reported in the literature. Such a study is likely to be of much value in designing newer eco-friendly pesticides. It was felt that the following analogues of precocenes might throw some light on the effect of methoxy groups on precocious metamorphosis and anti-juvenile hormonal activity. Further the steric factors associated with the Δ^3 bond of some of the chromenes may also have some effect on the anti-juvenile activity.



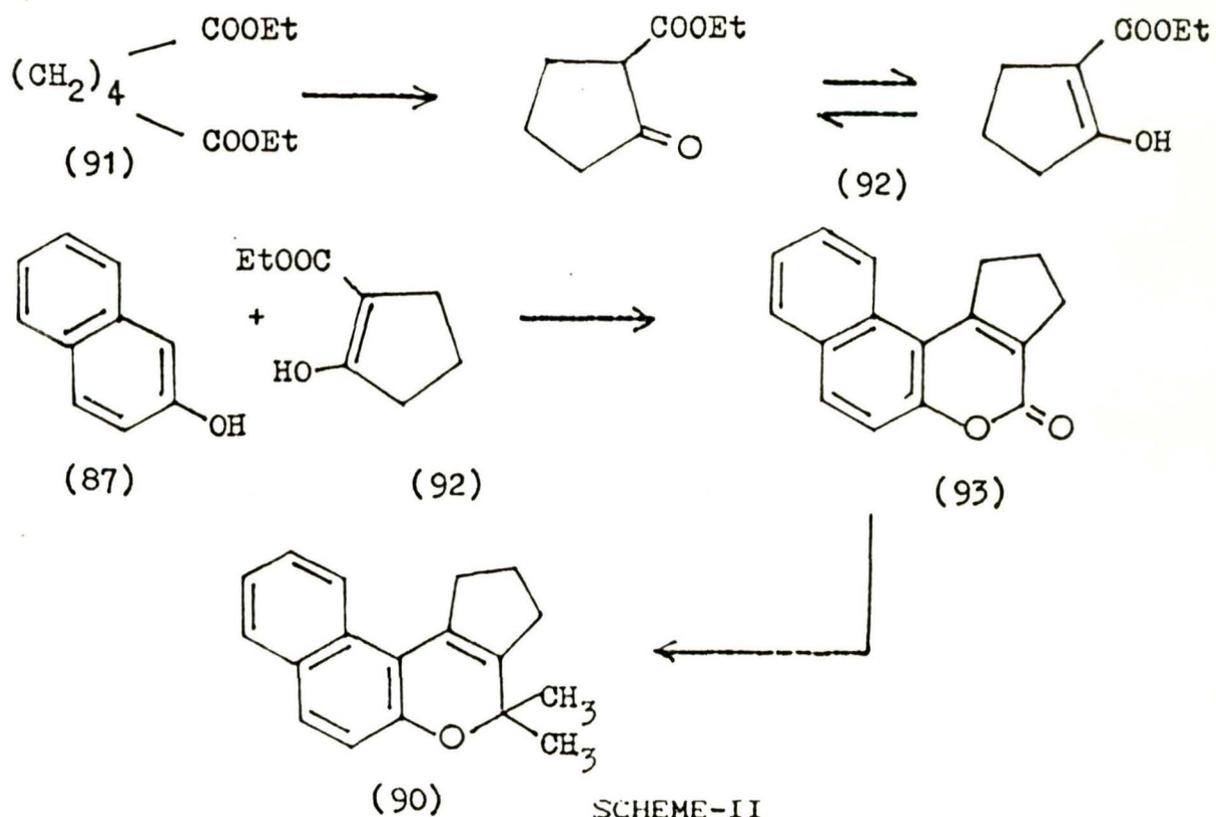
(iii)

These compounds were prepared from 2-naphthol as shown in the scheme below and their structures were confirmed by spectral studies.

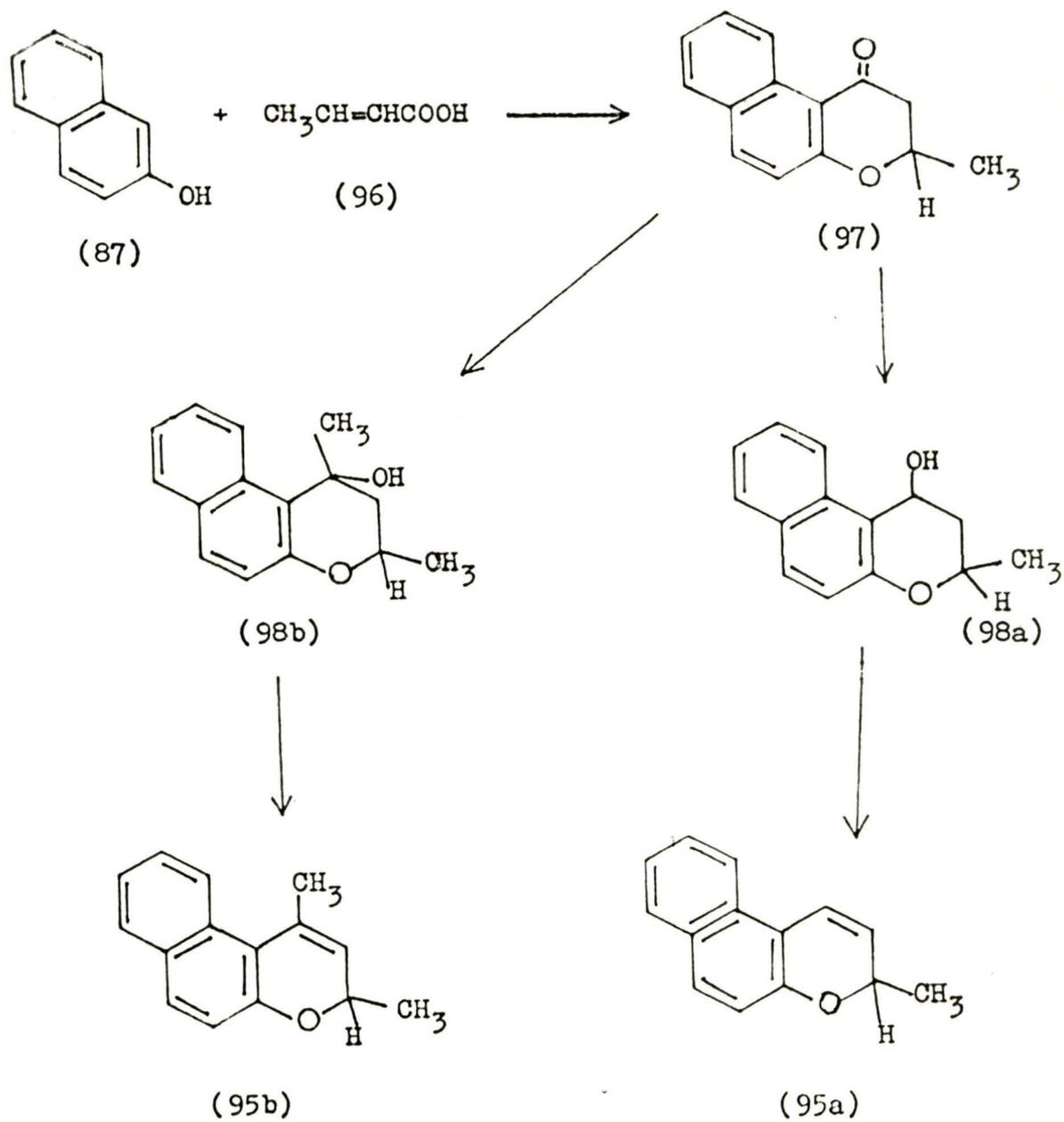


SCHEME-I

(11ia)



(iii b)



Scheme-III

In course of chemical conversion of (2 a,b) some problems were encountered and the results of the studies have been incorporated in the main body of the thesis.

In the second part of the thesis the biological studies on these compounds are discussed. The activity of the compounds was tested on *Chrysocoris stollii*. Acetone solution (5 μ l of 10 μ g/ μ l) was applied on the ventral side of the insects of different instar with acetone control. In general there was a delayed metamorphosis. The omission of one instar in the developmental stage in two cases, though indicative of shortening of developmental metamorphosis, is not taken as conclusive and further studies are being undertaken. The growth of the insects considerably slowed down and the weights of the insects considerably was also less than those in the acetone control. The initial results about the biological activity of the compounds are encouraging and further work with other compounds is in progress in the laboratory.