

**ABSTRACT**

**SYNTHESIS OF ANALOGUES OF KUANONIAMINE A**

**AND**

**APPROACHES TO THE SYNTHESIS OF 5,7-**

**DIAZAROTENOIDS.**

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Secondary metabolites of marine organisms have found themselves at the centre of scientific studies because of the range of biological activity that they exhibit, and the challenge that they pose to synthetic chemists. The synthesis of novel thiophene analogues of the marine alkaloid kuanoniamine A is the focus of Part A of this thesis (Chapters One, Two and Three).

In Chapter One, the pharmacological activity of marine alkaloids is outlined. This chapter also features a review of some of the most utilized synthetic routes to pyridoacridine alkaloids.

The synthesis of brominated benzo[*b*]thiophene-4,7-diones, intermediates which provide regioselectivity in the hetero Diels-Alder reactions towards the thiophene analogues of kuanoniamine A, is the focus of Chapter Two. Various routes, utilizing the readily available 2,5-dimethoxybenzaldehyde as starting material, are explored.

The synthesis of novel benzothieno[4,5,6-*ij*]naphthyridinone and pyrido[6,5,4-*kl*]thieno[3,2,-*j*]acridinone analogues of kuanoniamine A are outlined in Chapter Three. The techniques used to predict the assignment of the regioisomer of adducts formed by hetero Diels-Alder reaction between dieneophiles of benzo[*b*]thiophene-4,7-diones and crotonaldehyde-*N,N*-dimethylhydrazone diene are also discussed.

In Part B of this thesis (Chapters Four and Five), approaches to the synthesis of 5,7-diazarotenoids – nitrogen analogues of rotenoids, are outlined. Rotenoids are secondary metabolites obtained from the *Leguminosae* plant family and show biological properties including insecticidal, piscicidal and antitumour activity.

In Chapter Four the biosynthetic pathway of rotenoids is discussed along with some popular synthetic strategies and some pathways to aza-, and thiorotenoids. Different approaches to 5,7-diazarotenoids are explored in Chapter Five. The synthesis of quinolinones and their role in the synthesis of azarotenoids and azarotenonoids are also outlined.