ABSTRACT

The research project on Palicourea alpina (Sw.) DC has been prompted by reports of the anti-tumour activity of Palicourea species and the isolation of alkaloids of undetermined structures while the second project was carried out on Croton lobatus L. and C. trinitatis Millsp. (which are widely distributed and were collected on the coastland of Guyana) and on Croton plumieri Urb. in continuation of the earlier work on Croton plants growing in the Caribbean of my supervisor Dr. K.L. Stuart and others. This thesis describes inter alia, the isolation and characterisation of alkaloids, terpenes and miscellaneous substances from these four plants.

Part I commences by reviewing the literature of aromatic β-carbolines which were reported during the period 1964 to March, 1975. The essential topics of β-carboline chemistry such as structural elucidation, synthesis, pharmacology, biosynthesis and mass spectra of these alkaloids are briefly discussed. The isolation and characterisation of the new β-carboline alkaloid, palinine, of the known harman (another β-carboline alkaloid) and calycanthine (an indole) from P. alpina and the isolation of five uncharacterised β-carboline alkaloids, Bases A_1 to A_4 and Base B_1, and a sixth uncharacterised alkaloid, Base C_1 also from this plant, constitute the discussion and experimental section of Part I.

A working hypothesis for the structure of Base A_1 (211) has been proposed on the basis of correlation studies with the known alkaloid, macrolidine and a possible identity of Base A_2 is Dihydroindolopyridocoline (93). It should be noted that the structural hypotheses advanced are only tentative.

Part II comprises a review of the Synthesis of morphinandienone and proaporphine alkaloids reported in the literature from 1970 and 1968 respectively to May, 1975. An account of the isolation and identification of the two proaporphine alkaloids - crotonosine and L-N-methylcrotonosine, and of two morphinandienone alkaloids - salutaridine and 8,14-dihydrosalutaridine, from C. plumieri Urb., is given.

In Part III, the identification of Vomifoliol isolated from Croton lobatus L., C. trinitatis Millsp. and Palicourea alpina (Sw.) DC and of Scopoletin from P. alpina, is described.

Preliminary results are reported in Part IV on a mixture of Base X and phthalyl esters, isolated from Croton lobatus L.