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Original Research Article

Investigation of dibromo and N-bromoacetyl derivatives of [b] carbazole-synthesis and antibacterial evaluation

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ABSTRACT

The synthesis, structure and biological activity of carbazole compounds has been long focus of research interests in the field of medicinal chemistry. 5,8-dibromo-5,6-dihydro(3,2-a) carbazole A have prepared in good yield by a free radical bromination reaction of 8-bromo-5,6-dihydro9(3,2-a)carbazole with N-bromosuccinimide in carbontetrachloride at ambient temperature. Compound 2 have prepared by free radical brimination method in carbontetrachloride at 40°C. Synthesis of compound C have carried out by free radical bromination with 5-bromo-1,2,3,4-tetrahydrocyclopenta(b)indole as reactant, in dichloromethane at ambient temperature. Compound 2, 4, and 6 were synthesized by N-bromoacetylation method using bromoacetylbromide as reactant. All the synthesized compounds were characterized and confirmed by various instrumental techniques Viz, UV-visible, FTIR, ^{1}H NMR, ^{13}C NMR and Mass spectroscopy. All the synthesized compounds were subjected to the antibacterial evaluation with standard Ciprofloxacin. The results showed that the synthesized compounds exhibit excellent antibacterial activity.

Keywords: N-bromosuccinimide, bromoacetylbromide, carbontetrachloride, N-bromoacetyl-5,8-dibromo-5,6-dihydro[3,2-a]carbazole.

1. INTRODUCTION

Nitrogen-containing heterocycles (N-heterocycles) have tremendous applications in pharmaceutical and material sciences.[1] Heterocyclic compounds are acquiring more importance in recent years because of their broad pharmacological activities. Nitrogen, sulphur or oxygen containing five or six member heterocyclic compound has occupied enormous significance in the field of medicinal chemistry. Indoles are an important class of heterocycles not only ubiquitous compounds in nature but also because they have a wide range of biological activities. The indole moiety is found in various pharmacologically and biologically active compounds [2]. Indole is the most beneficial heterocyclic nucleus which has gained prominence in medicinal chemistry due to its diverse biological activities such as anticonvulsant [3-8], anti-inflammatory [9] and antipsychotic [10] activities. Heterocyclic ring system of tetrahydrocarbazole and their derivatives are used with great interest for the past and recent years due to wide variety of biological application such as antimicrobial activity [11], anticancer & antitubercular [12] and anticonvulsant [13] activities.

Bromination is a very important process in organic synthesis as bromo derivatives serve as useful intermediates in the manufacture of pharmaceuticals, agrochemical and other specialised chemicals. [14,15] Moreover, many pesticides, insecticides, herbicides and fire retardants contain the bromine functionality. [16,17] *N*-Bromosuccinimide is one of the most pronozing brominating agents, especially for free radical bromination. The aim of present study is to develop novel, efficient, convenient and selective synthetic methods in organic chemistry, which helps the drug discovery and medicinal chemistry.

2. EXPERIMENTAL SECTION

2.1. Methods and materials

All the chemicals used were purchased from Merck and Aldrich and used without further purification.