45

Heterocyclic Letters
Vol. 8| No.1|145-154|Nov-Jan |2018
ISSN : (print) 2231–3087 / (online) 2230-9632
CODEN: HLEEAI
http://heteroletters.org

SYNTHESIS, CHARACTERIZATION AND BIOLOGICAL EVOLUTION OF VARIOUS NOVEL HETEROCYCLIC COMPOUNDS OF HYDANTOIN AND PIPERAZINE

Priyank P. Mistry, Vikash A. Desai*

B. K. M. Science College, Valsad - 396001,
Veer Narmad South Gujarat University, Surat, Gujarat, India
**E-mail: priyank2905@yahoo.in*

Abstract: In the present article we have prepared novel 3,5-substituted imidazolidine-2,4-dione **(3a-f)** and **(4a-f)** via Mannich reaction between piperazine derivatives and hydantoin derivatives **(2a and 2b)**. For all compounds NOE (Nuclear Overhauser Effect) NMR spectra were measured in order to prove additionally the position of the substituents in the imidazolidine-2,4-dione ring. Some physiochemical and electronic properties of the compounds were determined in order to establish the similarity between the synthesized and reference compounds. All the compounds were also characterized by ^{13}C NMR, FT-IR and LC/MS mass spectrum. All the newly synthesized compounds were screened for their in vitro antimicrobial activity and many of them found to show comparable activity to the standard drug with different microorganisms.

Keywords: Hydantoin; Piprazine; Mannich Reaction; Antimicrobial Activity.

Introduction

Nowadays, there is an incessant search for biological functional compounds suitable for treating diverse illnesses. The development of more efficient and less toxic products often involves the study of new synthetic routes or structural modifications of existing molecules and medicinal drugs are often manufactured by modification or molecular variation using bioisosterism [I]. The synthesis of heterocyclic 2,4-imidazolidinones or hydantoins has been studied intensively for their important pharmacological properties [II]. Substances that contain these heterocyclic moieties present significant biological activities as antifungal [III], antibacterial and anti-inflammatory [IV] drugs, for the treatment of hypoglycemia [V], or as plant growth inhibitors [VI], among other properties. 2-Thiohydantoins have been widely evaluated due to their applications as hypolipidemic, anticarcinogenic, antiviral (e.g., herpes virus, HSV, HIV and tuberculosis), antimicrobial, anti-ulcer and anti-inflammatory agents [VII]. Several studies [VIII-X] have described the synthesis of amino acid compounds, their importance and applications as intermediates for the synthesis of heterocyclics [XI,XII]. The hydantoin nucleus [XIII] has many