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RESEARCH ARTICLE

SYNTHESIS AND ANTIMICROBIAL SCREENING OF SOME NOVEL HALOGENATED PHENOXYACETYL AMINO ACID AND PEPTIDE ANALOGS

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In present study, a novel series of trisubstituted phenoxyacetyl amino acids and peptide derivatives was synthesized by coupling 2-(2,6-dibromo-4-formylphenoxy)acetic acid with amino acid methyl ester hydrochlorides/peptide methyl esters using DIPC as coupling agent and TEA as base. The structures were elucidated by IR, ^{1}H NMR, ^{13}C NMR and MS spectral data as well as elemental analysis. The newly synthesized peptide derivatives were evaluated for antibacterial and antifungal potential against pathogenic microorganisms. Compounds I_g, I_k and I_n displayed potent antibacterial activity against gram-negative bacteria *Pseudomonas aeruginosa*, *Escherichia coli* and compounds I_c, I_h, I_l and I_j, I_m were found to exhibit potent antifungal activity against pathogenic *Candida albicans* and dermatophytes, as compared to standard drugs ciprofloxacin and griseofulvin.

Key words: Aryloxyacetic acid, 3,5-Dibromo-4-hydroxybenzaldehyde, Peptides, Antimicrobial activity.

INTRODUCTION

Phenoxy acetic acid is the most vital moiety which is concerned with potent antimicrobial activity. Much work has been done on synthesis of potent phenoxy acetic acid derivatives with diverse bioactivities (Takeda *et al* 1998; Shaharyar *et al* 2006; Shahar Yar *et al* 2009) but less reports have been received regarding coupling of phenoxy acetic acids with peptides. The literature is enriched with several reports indicating incorporation of amino acids and peptides into the aromatic and heterocyclic moieties have resulted in compounds with potent bioactivities (Belagali *et al* 2001; Himaja *et al* 2002; 2003; Poojary *et al* 2003). Thus, keeping in view biopotency of phenoxyacetic acids and further, in continuation of our work on synthesizing potent peptide derivatives of aroylbenzoic acid, furoic acid, aryloxyacetic acid, coumarin, quinoxaline, quinazolinone, benzimidazole imidazole, (Dahiya and Pathak, 2006a; 2006b; 2006c; Dahiya *et al* 2006a; 2006b; Dahiya and Pathak, 2007; Dahiya and Kaur, 2007a; 2007b; 2008; Dahiya, 2008a, 2008b; Dahiya *et al* 2008a; 2008b; Dahiya and Kumar, 2008; Dahiya and Bansal, 2008; Dahiya *et al* 2010), a novel series of halogenated phenoxy acetyl amino acids and peptides was synthesized with an anticipation to get the novel compounds with more therapeutic efficacy. 2-(2,6-Dibromo-4-formylphenoxy) acetic acid (**I**) was prepared by the interaction of 3,5-dibromo-4-hydroxybenzaldehyde with chloroacetic acid in presence of alkali (Manchand *et al* 1990). Dipeptides Boc-Ala-Ile-OMe, Boc-Tyr-Phe-OMe and tripeptides Boc-Leu-Ala-Leu-OMe, Boc-Try-Gly-His-OMe and Boc-Phe-Tyr-Pro-OMe were prepared from amino acid methyl esters and Boc-amino acids using dicyclohexylcarbodiimide (DCC) as the coupling agent. 2-(2,6-Dibromo-4-formylphenoxy)acetyl amino acid methyl esters