Synthesis Of New 1,3,4-thiadiazole Derivatives Wit Expected Biological Activity

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The thesis reports the synthesis and antimicrobial activity of new disubstituted 1,3,4-thiadiazole derivatives, their derived pyrazoles, sugar hydrazones as well as derived C-nucleoside analogs. The newly synthesized compounds were characterized by their spectral and analytical data; IR, 1H NMR and elemental analysis.The synthesized compounds were studied for their antimicrobial activity against a number of bacteria and fungi some of the tested compounds showed high activities and others showed moderate to low inhibition activities.Reaction of the starting compound 4-hydroxypyridine with ethyl chloroacetate gave the ethyl ester derivative 69 in 70% yield. Reaction of the latter ester 69 with thiosemicarbazide at reflux temperature afforded the substituted thiosemicarbazide derivative 70.Heterocyclization of the resulting acylthiosemicarbazide derivative in sulfuric acid at low temperature afforded after neutralization the 2-amino-1,3,4-thiadiazole derivative 71 (Scheme 20).Scheme 20Acetylation of the 2,5-disubstituted -thiadiazole derivative 71 with acetyl chloride in benzene produced the N acetylamino-1,3,4-thiadiazole derivative 72 in 63% yield. When the latter N-acetyl derivative was allowed to react with 2,6-dimethylbenzaldehyde it afforded the substituted acrylamide derivative 73.Heterocylization of substituted enone derivative 73 by reaction with hydrazine hydrate resulted in the formation of the substituted pyrazole derivative 74 (Scheme 21).. Scheme 21Reaction of the aminothiadiazole 71 with ethyl chloroacetate in presence of potassium carbonate at room temperature gave the ethyl N-substituted acetyl ester 75.Hydrazinolysis of the latter ester with hydrazine hydrate afforded the corresponding acid hydrazide derivative 76 in73% yield (Scheme 22).Scheme 22When the hydrazide 76 was allowed to react with D-galactose, D-mannose or D-xylose in an aqueous ethanolic solution and a catalytic amount of acetic acid, the corresponding sugar acetyl hydrazones 77-79 were obtained respectively.Acetylation of the sugar hydrazones 77-79 with acetic anhydride in pyridine at room temperature afforded the corresponding per-O-acetylated hydrazone derivatives 80-82, respectively.When the reaction was carried out with acetic anhydride at the reflux temperature gave 1,3,4-thiadiazolidine acyclic nucleoside analoges 83-85 respectively (Scheme 23)..Scheme 23