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REACTIONS OF 5-ACETOACETYL-6-METHOXY-2, 3-DIPHENYLBENZOFURAN AND ITS ISOMERIC 6-ACETOACETYL-5-METHOXY-2, 3-DIPHENYLBENZOFURAN WITH AMINOAZOLES*

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5-Acetoacetyl-6-methoxy-(I) and 6-acetoacetyl-5-methoxy-2, 3-diphenylbenzofuran (V) undergoes condensation with aminoazoles to give the condensation products pyrazolopyrimidines (IIa and VIa), pyrimidol [1, 2-a] benzimidazoles (IIIa and VIIa) and pyrazolopyridines (IVa and VIIIa).

Key words: Aminoazoles, Heterocyclic compounds, Bridge head nitrogen.

INTRODUCTION

Substituted benzofurans show marked pharmacological properties. Thus khellinone exerts some coronary vasodilator action [1], possess hypotensive and spasmolytic activities [2]. Some benzofuran derivatives were used as anti-inflamatory, analgesic and antihistamine drugs [3-5]. Some derivatives causes considerable increase in arterial blood flow [6].

The importance of heterocycles in pharmaceutical chemistry which contain oxygen and nitrogen prompts us to synthesize compounds containing pyrimidinotriazole, pyrimidinobenzimidazole and pyridinopyrazole.

The reaction between acetylacetone and aminoazoles is known to produce pyrazolo [2, 3-a] pyrimidine [7]. However the reactions of aminoazoles with 5-acetoacetyl-6-methoxy-2, 3-diphenylbenzofuran (I) and its isomeric 6-acetoacetyl-5-methoxy-2, 3-diphenylbenzofuran (V) have not yet been investigated.

Thus, condensation of (I) or (V) with 3-amino-1,2,4-triazole gave the fused condensation products:

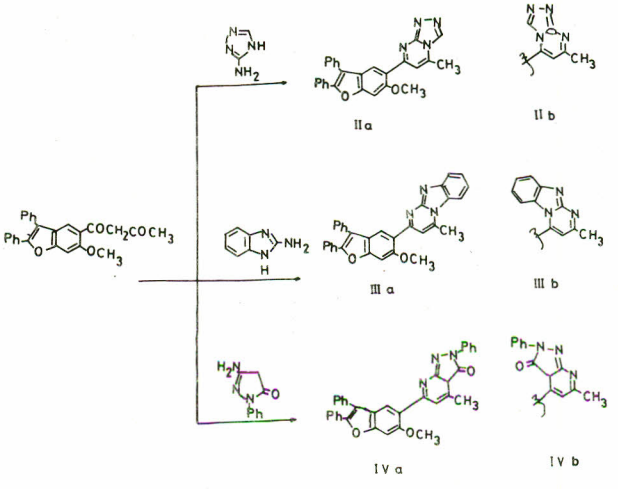
Pyrazolopyrimidines (IIa) and (VIa) rather than (IIb & VIb). Similar to our previous work [8,9] on the reaction of ethyl α-(*p*-tolylazo)-β-oxobutyrate with 3-amino-1, 2,4-triazole to give triazolo[1, 5-a]pyrimidine, analytical and spectral data, the structures of the synthesized products (IIa & VIa) were favoured (cf. Table 1).

Our previous work [8,9] on the reactivity of 2-amino-benzimidazole towards β-keto esters, has prompted us to undertake the synthesis of pyrimido[1, 2-a] benzimidazoles (IIIa) and (VIIa), via its reaction with (I) and/or (V). The linearly fused condensation products (IIIa) and (VIIa) rather than (IIIb & VIIb) finds support from previous work [8-12], on the reaction of 2-aminobenzimidazole with (a) ethyl α-(*p*-tolylazo)=β-oxobutyrate and (b) 2-benzyl-idene-1, 3-indandione to give pyrimido[1, 2-a] benzimida-zoles, on the basis of their analytical and spectral data (cf. Table 1).

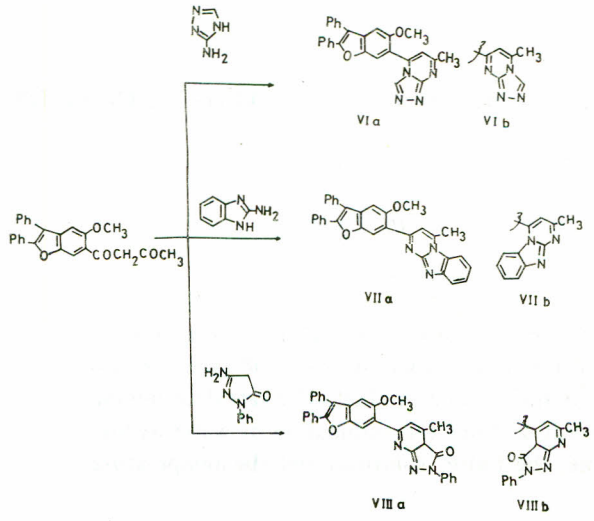
Table 1. List of the products of condensation I and II with aminoazoles.

Compd.	Crystal solvents	M.P. °C	Yield %	IR, cm^{-1}
IIa	D/A	265	60	1590, 1610, 1630 (C=N)
IIIa	E/A	260	75	1625, 1655 (C=N)
IVa	P/EA	245	65	1590, 1620 (C=N), 1685 (C=O)
VIa	E/A	275	68	1600, 1620, 1635 (C=N)
VIIa	E	235	70	1620, 1660 (C=N)
VIIIa	P/EA	180	63	1600, 1610 (C=N) 1690 (C=N).

E = ethanol, A = acetone, P = pet. ether 60-80°, EA = ethyl acetate.



*Part 5 in the series of heterocyclic compounds with bridge head nitrogen, for part 4, see M.A. Metwally, A.M. Ismaiel, M.Y. Yousif and F. Eid, Heterocycles (1987) communicated.



With referance to the above successful reaction, it seemed interesting to react 3-amino-1-phenyl-2-pyrazolin-5-one with (I) and/or (VI). Thus, when the condensation reaction was carried out in presence of *p*-toluenesulphonic acid we obtained pyrazolopyridines (IVa) and (VIIIa) rather than (IVb) and (VIIIb). The formation of (IVa) and (VIIIa) finds support from a) the reaction of 2-(*o*-hydroxybenzylidene)-1, 3-indandione with 3-amino-1-phenyl-2-pyrazolin-5-one to give pyrazolo[4, 3-e]pyridines and b) their correct analytical and spectral data cf. Table 1).

EXPERIMENTAL

All melting points are uncorrected. IR spectra were recorded (KBr) with a Pye Unicam SP 2000 Infrared spectrophotometer. Analytical data were obtained from the analytical data unit at Mansoura University. *Condensation* of 5-acetoacetyl-6-methoxy-2,3-diphenyl-benzofuran 1 and/or 6-acetoacetyl-5-methoxy-2, 3-diphenylbenzofuran II with 3-amino-1, 2, 4-triazole, 2-aminobenzimidazole and/or 3-amino-1-phenyl-2-pyrazolin-5-one: Formation of II-IV and VI-VIII.

Procedure

A solution of (I or V) (1 x 10^{-3} mol) and 3-amino-1, 2, 4-triazole and/or 2-aminobenzimidazole and/or 3-amino-1-phenyl-2-pyrazolin-5-one (1 x 10^{-3} mol) in dry xylene (70 ml) containing (40 mg) of *p*-toluenesulphonic acid was refluxed for 18 hr. After cooling, the reaction mixture was evaporated in vacuo to dryness, and the residue was recrystallized to give compounds II-IV and VI-VIII (cf. Table 1).

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