Asian Journal of Chemistry Vol. 21, No. 8 (2009), 6233-6236

Novel Synthesis of Some Acetoxy Aryl Pyrazolines

RASHMI R. DUBEY*, A.K. DHAWAS and S.S. THAKARE
Department of Chemistry, Shri Shivaji Science College, Amravati-444 604, India
E-mail: dube.rashmi@rediffmail.com

The chalcones (**IIIa-f**) 1-(2'-acetoxy-3'-substituted-5'-chloro-6'-methyl phenyl)-3-(4''-substituted) aryl prop-2-enones were synthesized by the reaction of ketones with different aromatic aldehydes. These chalcones on reaction with hydrazine hydrate and phenyl hydrazine in catalytic amount of ethanol undergo cyclization to form 1- substituted-3- (2'-acetoxy-3'-substituted-5'-chloro-6'-methyl phenyl)-5-(4''-substituted phenyl)pyrazolines. All the synthsized compounds were characterized by IR, ^{1}H NMR data and elemental analysis.

Key Words: Synthesis, Acetoxy aryl pyrazolines.

INTRODUCTION

Several pyrazolines are well known to posses' antimicrobial[1,2], analgesic[1,3], antipyritic[1,4], antiinflammatory[5,6], antitubercular[7], insecticidal[8], COX-2 inhibitor[9], antiandrogenic[10], antibacterial[11], antifungal[12], antitumour[13], antidepressant[14], antidiabetic[15], photochemical[16], molluscicidal[17], antinociceptive[18] and antiamoebic activity[19] properties. Due to this vital biological role of pyrazoline derivatives it was thought of interest to synthesize the derivative of pyrazolines.

The chalcones (**IIIa-f**) were prepared from the reaction of different substituted acetophenones with different aromatic aldehydes in the presence of dil. NaOH in molar ratio of 1:1:2. The prepared chalcones were condensed with hydrazine hydrate and phenyl hydrazine in neutral media to give pyrazolines (**IVa-f**, **Va-f**). All the synthesized compounds were characterized by their IR and ^{1}H NMR spectral data.

EXPERIMENTAL

Melting points were determined in open capillaries and are uncorrected. The purity of all the compounds was checked by TLC on silica gel coated plates. IR spectra where recorded using Perkin-Elmer model 2000 instrument, ^{1}H NMR spectra was recorded on a Brucker 400 MHz instrument with TMS as internal standard.

General procedure for the preparation of 1-(2'-acetoxy-3'-substituted-5'-chloro-6'-methylphenyl)-3-(4''-substituted) aryl prop-2-enones (IIIa-f): Acetylated ketone (0.01 mol) and aromatic aldehyde (0.01 mol) were mixed in 30 mL of alcohol. Reaction mixture was heated and then 20 mL, 40 % NaOH was added with

constant stirring. Dark brown solid was separated out which was kept over night. 50 % HCl was added till the orange coloured solid was formed. It was filtered, washed with water and recrystallized from ethanol.

IIIa: IR (KBr, ν_{max}, cm^{-1}): 1753 (C=O), 1488 (C=C), 1238(Ar-O), 1200 (C-O), 730 (C-Cl). ^{1}H NMR: ($CHCl_3$): δ 2.8 (S, 3H), 2.82 (S, 3H, Me), 5.43 (d, 1H, *J* = 4 Hz), 5.46-5.47 (d, 1H, *J* = 4 Hz), 6.95-7.68 (S, 2H aromatic), 7.07-7.91 (m, 5H aromatic).

General procedure for the preparation of 1-H-3-(2'-acetoxy-3'-substituted-5'-chloro-6'-methyl phenyl)-5-(4"-substituted phenyl) pyrazolines (IVa-f): The compounds **IVa-f** were synthesized by the interaction of compound **IIIa-f** (0.01 mol), hydrazine hydrate (0.01 mol) in small amount of ethanol. The reaction was carried out for 2 min in microwave oven and the solid obtained was crystallized from acetic acid.

IVa: IR (KBr, ν_{max}, cm^{-1}): 1720 (C=O), 1660 (C=N), 1420 (C=C), 1353 (C-N *str.*), 1445 (-CH_2-s), 1335 (Ar-O) 1277(C-O), 763(C-Cl). ^{1}H NMR: δ 2.82 (s, 3H), 2.82 (s, 3H, -OAc), 3.20-3.26 (dd, 1H, HA, J_{HAHB} = 17.8 Hz, J_{HAHx} = 4.68 Hz), 3.75-3.83 (dd, 1H, HB, J_{HAHB} = 17.8 Hz, J_{HBHX} = 11.8 Hz), 5.53-5.56 (dd, 1H, HX, J_{HXHB} = 11.8 Hz J_{HXHA} = 4.6 Hz), 10.11 (m, 1H, -NH), 6.93 (S, 2H aromatic) 7.13-7.35 (m, 5H aromatic).

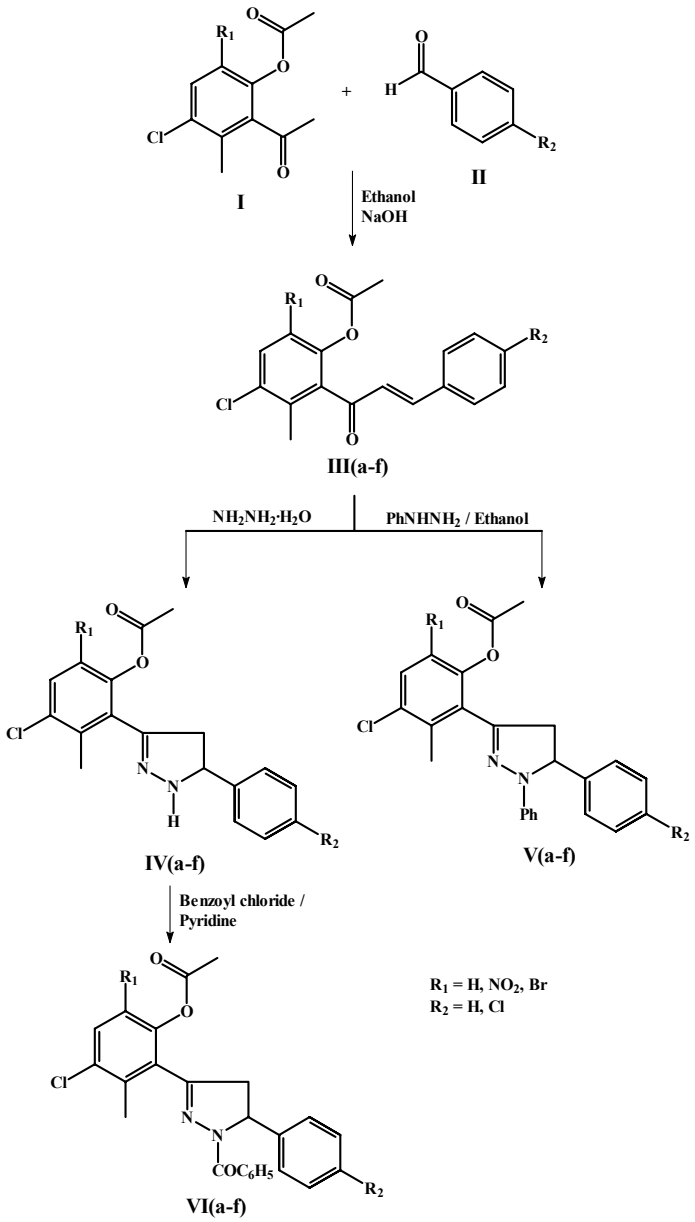
General procedure for the preparation of 1-phenyl-3-(2'-acetoxy-3'-substituted-5'-chloro -6'-methyl phenyl)-5-(4"-substituted phenyl)pyrazolines (Va-f): The compounds **Va-f** were synthesized by the interaction of compound **IIIa-f** and phenyl hydrazine in ehanolic medium.

The reaction was carried out for 1min in microwave oven and the solid was crystallized from acetic acid.

Va: IR (KBr, ν_{max}, cm^{-1}): 1630 (C=O), 1597 (C=N), 1497 (-CH_2-), 1444 (C=C), 1343 (C-N *str.*), 1261 (Ar-O), 1167 (C-O), 762 (C-Cl). ^{1}H NMR: δ 3.17-3.23 (dd, 1H, HA, J_{HAHB} = 17.2 Hz, J_{HAHx} = 4.6 Hz) 3.85-3.93 (dd, 1H, HB, J_{HAHB} = 17.2 Hz, J_{HBHX} = 11.8 Hz), 5.20-5.25 (dd, 1H, HX, J_{HXHB} = 11.8 Hz, J_{HxHA} = 4.6 Hz), 3.36 (s, 3H-CH_3), 3.35 (s, 3H, -OAc), 7.21 (s, 2H aromatic), 7.25-7.33 (m, 10H aromatic).

General procedure for the preparation of 1-benzoyl-3-(2'-acetoxy-3'-substituted-5'-chloro-6'-methyl phenyl)-5-(4"-substituted phenyl)pyrazolines (VIa-f): Compound **IVa-f** (0.001 mol) and benzoyl chloride (0.001 mol) was dissolved in dry pyridine (10mL), stirred at room temperature for 1/1.5 h. The resulting mixture was treated with cold HCl (2 N). The solid obtained was filtered and washed successively with water, cold NaOH (2 %) and again with water, crystallized from glacial acetic acid.

VIa: IR (KBr, ν_{max}, cm^{-1}): 1719 (C=O), 1660 (C=N), 1421 (C=C), 1420 (-CH_2-s), 1334 (C-N *str.*), 1274 (Ar-O), 1171 (C-O), 763 (C-Cl). ^{1}H NMR: δ 3.22-3.27 (dd, 1H, HA, J_{HAHB} = 16 Hz, J_{HAHx} = 4 Hz) 3.77-3.84 (dd, 1H, HB, J_{HAHB} = 16 Hz, J_{HBHX} = 12 Hz), 5.54-5.58 (dd, 1H, HX, J_{HXHB} = 12 Hz, J_{HXHA} = 4 Hz), 2.37 (s, 3H-CH_3), 2.37 (s, 3H-oAc), 6.83 (s, 2H aromatic), 7.20-7.39 (m, 10H aromatic).



Scheme-I

RESULTS AND DISCUSSION

The melting point and percentage yield of these compounds is recorded in Table-1. All the compounds were characterized by using IR, NMR and elemental analysis. The elemental analysis was found satisfactory.

TABLE-1
PHYSICAL DATA OF COMPOUNDS **IVa-f**, **Va-f** AND **VIa-f**

Compd.	R_1	R_2	m.p. (ºC)	Yield (%)
IVa	H	H	165	81
IVb	Br	H	142	75
IVc	NO_2	H	70	90
IVd	H	Cl	84	92
IVe	Br	Cl	140	95
IVf	NO_2	Cl	159	93
Va	H	H	82	75
Vb	Br	H	62	84
Vc	NO_2	H	98	82
Vd	H	Cl	89	69
Ve	Br	Cl	72	81
Vf	NO_2	Cl	129	75
VIa	H	H	146	90
VIb	Br	H	105	93
VIc	NO_2	H	101	84
VId	H	Cl	92	82
VIe	Br	Cl	120	91
VIf	NO_2	Cl	106	72

REFERENCES

1. S.K. Sahu, M. Banerjee, A. Samantray, C. Behera and M.A. Azam, *Trop. J. Pharm. Res.*, **7**, 961 (2008).
2. F.E. Goda, A.R. Maarouf and E.R. Bendary, *S. Pharm. J.*, **11**, 111 (2003).
3. M. Amir and S. Kumar, *Indian J. Chem.*, **44B**, 2532 (2005).
4. H.K. Sinha, *J. Pharmacol. Exper. Therap.*, **66**, 54 (1939).
5. K.N. Zelenin, I.P. Bezhan, L.V. Pastushenkov, E.G. Gromova, E.E. Lesiovskaja, B.A. Chakchir and L.F. Melnikova, *Arzneim.-/forschung*, **49**, 843 (1999).
6. A.B. Adnan, M.A.A. Hayam and A.G. Aida, *Arch. Pharm.*, **338**, 167 (2005).
7. D.D. Baker, M. Chu, U. Oza and V. Rajgarhia, *Nat. Prod. Rep.*, **24**, 1225 (2007).
8. C. Lamberth, *Heterocycles*, **71**, 1467 (2007).
9. T. Norris, R. Colon-Cruz and D.H.B. Ripin, *Org. Biomol. Chem.*, **3**, 1844 (2005).
10. X. Zhang X. Li, G.F. Allan and T. Sbriscia, *J. Med. Chem.*, **50**, 3857 (2007).
11. V.S. Jamode and D.V. Thakre, *Asian J. Chem.*, **15**, 1808 (2003).
12. S.S. Korgaokar, P.H. Patil, M.T. Shah and H.H. Parekh, *Indian J. Pharm. Sci.*, **58**, 222 (1996).
13. E.C. Taylor, H. Patel and H. Kumar, *Tetrahedron*, **48**, 8089 (1992).
14. O. Ruhoglu, Z. Ozdemir, U. Calis, BGumusel and A.A. Bilgin, *Arzneim Forsch*, **55**, 431 (2005).
15. R. Soliman, H.M. Faid-Allah and S.K. El-Sadany, *J. Pharm. Sci.*, **76**, 626 (1987)
16. S.J. Ji and H.B. Shi, *Dyes Pigments*, **70**, 246 (2006).
17. N. Mishriky and F.M. Asaad, Y.A. Ibrahim and S.A. Girgis, *Pharmazie*, **51**, 544 (1996).
18. A. Shafiee, M. Bagheri, M. Shekarchi and M. Abdollahi, *J. Pharm. Pharmaceut. Sci.*, **6**, 360 (2006).
19. M. Abid and A. Azam, *Bioorg. Med. Chem.*, **16**, 2812 (2006).

(*Received*: 17 November 2008; *Accepted*: 26 May 2009) AJC-7602