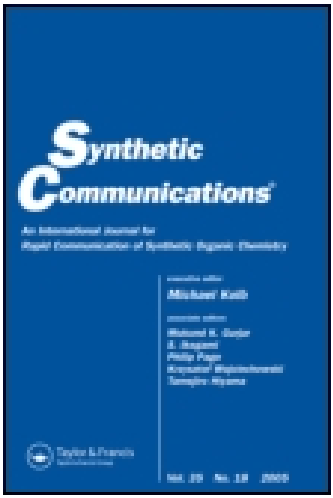

Synthetic Communications: An International Journal for Rapid Communication of Synthetic Organic Chemistry
Publication details, including instructions for authors and subscription information:
http://www.tandfonline.com/loi/lsyc20

L-Amino Acid Esters Studies: Part II: Synthesis of N-(Dimethoxy/3,5-Diacetoxybenzoyl)-L-Amino Acid Hydrazides and their Reactions with Aldehydes and Ketones

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Published online: 17 Sep 2007.

To cite this article: Eljazi I. Al-afaleq & Samar A. Abubshait (1999) L-Amino Acid Esters Studies: Part II: Synthesis of N-(Dimethoxy/3,5-Diacetoxybenzoyl)-L-Amino Acid Hydrazides and their Reactions with Aldehydes and Ketones, Synthetic Communications: An International Journal for Rapid Communication of Synthetic Organic Chemistry, 29:8, 1317-1331, DOI: 10.1080/00397919908086107

To link to this article: http://dx.doi.org/10.1080/00397919908086107

SYNTHETIC COMMUNICATIONS, 29(8), 1317–1331 (1999)

L-AMINO ACID ESTERS STUDIES: PART II: SYNTHESIS OF N-(DIMETHOXY / 3,5-DIACETOXYBENZOYL)-L-AMINO ACID HYDRAZIDES AND THEIR REACTIONS WITH ALDEHYDES AND KETONES.

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The synthesis of N-(dimethoxy and 3,5-diacetoxybenzoyl) -L- amino acid hydrazides, and their reactions with some aldehydes and ketones are described.

Dialkoxybenzoic acid derivatives have been evaluated for varied biological properties[1-3]. Carbazomethine group is known to have antitubercular activity [4]. Several publications have reported the antimicrobial activity of substituted amino acid hydrazides [5-7]. Therefore , we synthesized N-(dimethoxy and 3,5-diacetoxybenzoyl) L-amino acid hydrazides in addition to a series of compounds containing the carbazomethine moiety.

N-(Dimethoxy and 3,5-diacetoxybenzoyl)-L-amino acid hydrazides **6-10** , were obtained by the reaction of N-(dimethoxy and 3,5-diacetoxybenzoyl)-L-amino acid esters **1- 5** with hydrazine hydrate in ethanol at 60 - 65 °C over different periods of times (cf. SCHEME I).

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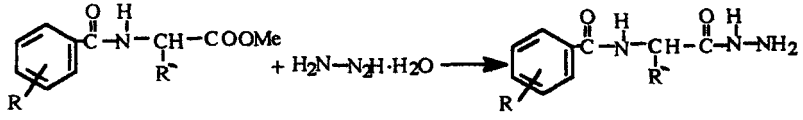
SCHEME I



(1a-i), (2a-i), 3-5 (6a-i), (7a-i), 8-10

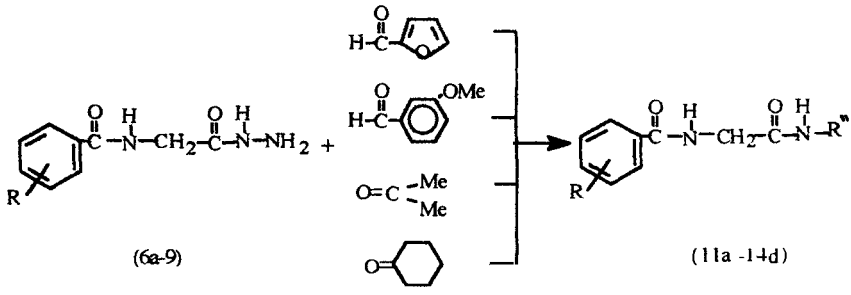
R : (1a-i), (6a-i) = 3,5(OMe)$_2$; (2a-i), (7a-i) = 2,4(OMe)$_2$;
3, 8 = 2,6 (OMe)$_2$; 4, 9 = 3,4(OMe)$_2$; 5,10 = 3,5(OAc)$_2$

R : (1a), (2a), (6a), (7a), 3-5, 8_10 = H ; (1b), (2b), (6b), (7b) = Me;
(1c), (2c), (6c), (7c) = CH(Me)2; (1d), (2d), (6d), (7d) = $CH_2CH(Me)_2$
(1e), (2e), (6e), (7e) = CH_2Ph ; (1f), (2f), (6f), (7f) = CH(OH)Me ;
(1g), (2g), (6g), (7g) = CH_2-  -OH ; (1h), (2h), (6h), (7h) = CH_2OH;
(1i), (2i), (6i), (7i) = CH_2CH_2SMe

The FT IR spectra of hydrazides **6- 10** showed characteristic bands ; 3450 - 3260 cm^{-1} (NH2) , 3320-3220 cm^{-1} (2CONH) and 1680-1635 cm^{-1} (C=O amide I). ^{1}H NMR spectra of the hydrazides exhibit one proton in the range of δ 9.32-9.10 ppm for (NH- hydrazide), one proton in the range of δ 8.65 - 8.00 ppm for (NH-amide) and two protons in the range of δ 4.50 - 4.10 for amino group. Mass spectra show the respective molecular peaks of the hydrazides, base peaks at m/z 165 and 225 due to the dimethoxy-benzoyl and diacetoxy benzoyl moieties respectivly.

Hydrazone derivatives (**11a-14d**) were prepared by treatment of N-(dimethoxy-benzoyl)glycine hydrazide derivatives **6a , 7a , 8** and **9** with two types of aldehydes namely; furfural or 3-methoxybenzaldehyde in ethanol to give the corresponding hydrazones (**11a-14a**)or (**11b-14b**) and two types of ketones, namley; acetone or cyclohexanone to give the corresponding hydrazones (**11c-14c**) or (**11d-14d**) respectively (cf. SCHEME II).

SCHEME II



(6a-9) (11a -14d)

R: (6a) (11a - d) = 3,5 $(OMe)_2$; (7a), (12a-d) = 2,4 $(OMe)_2$;
(8), (13a-d) = 2,6 $(OMe)_2$; (9), (14a-d) = 3,4 $(OMe)_2$

R'' (11a), (12a), (13a), (14a) = N=CH- 

(11b), (12b), (13b), (14b) = N=CH- 

(11c), (12c), (13c), (14c) = N=C(Me)(Me)

(11d), (12d), (13d), (14d) = N=

C, H, N microanalysis, IR, ^{1}H NMR and M.S. data agree with structural formulae of the hydrazones. The electron impact mass spectra of the synthesized compounds show the respective molecular peaks ascribable to (M^+) ions of these compounds, base peaks of the dimethoxy derivatives at m/z = (165) due to $(C_9H_9O_3)^+$ ion and the different fragments are in agreement with their proposed structural formulae. On the other hand the IR spectra do not exhibt the ν (NH) symmetric and antisymmetric bands of hydrazine group at 3450-3180 cm^{-1} but show the presence of bands due to N-H of secondary amide 3320-3120 cm^{-1}) and C=O (1680-1640 cm^{-1}). In the ^{1}H NMR it is noted that the splitting of NH proton signal into two separate signals for NH groups syn or (Z) and anti or (E) to the carbonyl oxygen are observed due to

Table (1)
Physical constants and elemental analysis of hydrazides 6a-10 .

Compd No.	structure R / R	Mol.formula Mol. weight	M.P. °C	Rf* (TLC)	Rotation $[\alpha]^{21}$ °C	Elemental analysis (% calc/found) C	H	N
6a	H 3,5(OMe)2	$C_{11}H_{15}N_3O_4$ 253.26	196.0- 197.0	0.12	----	52.17 52.60	5.97 6.15	16.59 16.39
6b	Me 3,5(OMe)2	$C_{12}H_{17}N_3O_4$ 267.28	198.5- 199.0	0.47	106.38 (DMF;0.01)	53.93 53.92	6.41 6.60	15.72 15.56
6c	CH(Me)2 3,5(OMe)2	$C_{14}H_{21}N_3O_5$ 295.34	228.5- 229.8	0.57	86.49 (DMF;0.01)	56.94 56.46	7.17 7.36	14.23 14.31
6d	$CH_2CH(Me)_2$ 3,5(OMe)2	$C_{15}H_{23}N_3O_4$ 309.36	178.3- 179.2	0.67	-29.58 (DMF;0.01)	58.24 58.10	7.49 7.68	13.58 13.39
6e	CH_2-  3,5(OMe)2	$C_{18}H_{21}N_3O_4$ 343.38	168.5 169.0	0.62	66.18 (DMF;0.01)	62.96 63.46	6.16 6.29	12.24 12.15
6f	CH(OH)Me 3,5(OMe)2	$C_{13}H_{19}N_3O_5$ 297.31	199.0 200.0	0.32	84.14 (DMF;0.01)	52.52 52.45	6.44 6.30	14.13 14.00
6g	CH_2-  -OH 3,5(OMe)2	$C_{18}H_{21}N_3O_5$ 359.38	263.7- 264.0	0.61	7.44 (DMF;0.01)	60.16 60.20	5.89 6.06	11.69 11.68
6h	CH_2-OH 3,5(OMe)2	$C_{12}H_{17}N_3O_5$ 283.28	181.0- 182.0	0.63	88.25 (DMF;0.01)	50.88 50.38	6.05 6.05	14.83 14.69
6i	CH_2-CH_2-SMe 3,5(OMe)2	$C_{14}H_{21}N_3O_4S$ 327.40	159.0- 160.0	0.67	17.87 (DMF;0.01)	51.36 51.40	6.47 6.60	12.83 12.71
7a	H 2,4(OMe)2	$C_{11}H_{15}N_3O_4$ 253.26	187.5- 190.0	0.14	----	52.17 51.96	5.97 6.78	16.59 16.38

Table (1) Cont.
Physical constants and elemental analysis of hydrazides (6a-10).

Compd No.	structure R, R	Mol.formula Mol. weight	M.P. °C	Rf* (TLC)	Rotation $[\alpha]_D^{21}$ °C	Elemental analusis (% calc/found C	H	N
7b	Me 2,4(OMe)2	$C_{12}H_{17}N_3O_4$ 267.28	191.5- 192.2	0.35	22.82 (DMF;0.01)	53.93 54.03	6.41 6.32	15.72 15.92
7c	CH(Me)2 2,4(OMe)2	$C_{14}H_{21}N_3O$ 295.34	186.0- 187.4	0.38	46.9 (DMF;0.01)	56.94 57.12	7.17 7.21	14.23 14.16
7d	$CH_2CH(Me)_2$ 2,4(OMe)2	$C_{15}H_{23}N_3O_4$ 309.36	185.1- 185.6	0.65	-34.75 (DMF;0.01)	58.24 58.02	7.49 7.31	13.58 13.39
7e	CH_2-  2,4(OMe)2	$C_{18}H_{21}N_3O_4$ 343.38	159.7- 160.0	0.27	21.84 (DMF;0.01)	62.96 63.17	6.16 6.35	12.24 12.09
7f	CH(OH)Me $2,4(OMe)_2$	$C_{13}H_{19}N_3O_5$ 297.31	162.5- 163.5	0.11	-13.45 (DMF;0.01)	52.52 52.25	6.44 6.63	14.13 13.95
7g	CH_2-  -OH $2,4(OMe)_2$	$C_{18}H_{21}N_3O_5$ 359.38	180.4- 181.1	0.42	114.09 (DMF;0.01)	60.16 59.86	5.89 6.01	11.69 11.88
7h	CH_2-OH $2,4(OMe)_2$	$C_{12}H_{17}N_3O_5$ 283.28	174.6- 175.0	0.63	40.63 (DMF;0.01)	50.88 51.16	6.05 6.04	14.83 14.65
7i	CH_2CH_2SMe $2,4(OMe)_2$	$C_{14}H_{21}N_3O_4S$ 327.40	136.5- 136.8	0.23	22.67 (DMF;0.01)	51.36 51.70	6.47 6.65	12.83 12.63
8	H 2,6(OMe)2	$C_{11}H_{15}N_3O_4$ 253.26	205.0- 207.0	0.53	----	52.17 51.98	5.97 6.20	16.59 16.35
9	H 3,4(OMe)2	$C_{11}H_{15}N_3O_4$ 253.26	153.9- 154.0	0.14	----	52.17 51.76	5.97 6.00	16.59 16.42
10	H 3,5(OAc)2	$C_{13}H_{15}N_3O_6$ 309.28	224.0- 226.0	0.67	----	50.49 50.01	4.89 4.31	13.59 13.41

Table (2)
Physical constants and elemental analysis of hydrazones (11a-14d).

Compd No.	structure R / R'	Mol.formula Mol. weight	M.P. °C	Rf* (TLC)	Elemental analysis (% calc/found C	H	N
11a	3,5(OMe)2 a	$C_{16}H_{17}N_3O_5$ 331.33	151.0-151.6	0.47	58.00 58.40	5.17 5.03	12.68 12.78
11b	3,5(OMe)2 b	$C_{19}H_{21}N_3O_5$ 371.39	166.5-167.1	0.48	61.45 61.85	5.70 5.76	11.31 11.42
11c	3,5(OMe)2 c	$C_{17}H_{23}N_3O_4$ 333.39	167.8-168.0	0.60	61.25 61.57	6.95 7.13	12.60 12.42
11d	3,5(OMe)2 d	$C_{14}H_{19}N_3O_4$ 293.32	136.2-137.3	0.26	57.33 57.00	6.53 6.73	14.33 14.30
12a	2,4(OMe)2 a	$C_{16}H_{17}N_3O_5$ 331.33	197.0-197.5	0.49	58.00 58.16	5.17 5.13	12.68 12.50
12b	2,4(OMe)2 b	$C_{19}H_{21}N_3O_5$ 371.39	194.5 195.0	0.44	61.45 61.38	5.70 5.63	11.31 11.49
12c	2,4(OMe)2 c	$C_{17}H_{23}N_3O_4$ 333.39	156.2-157.0	0.41	61.25 61.22	6.95 7.16	12.60 12.40
12d	2,4(OMe)2 d	$C_{14}H_{19}N_3O_4$ 293.32	198.0-199.0	0.22	57.33 57.00	6.53 6.58	14.33 14.20
13a	2,6(OMe)2 a	$C_{16}H_{17}N_3O_5$ 331.33	164.7-165.0	0.40	58.00 58.02	5.17 5.26	12.68 12.70
13b	2,6(OMe)2 b	$C_{19}H_{21}N_3O_5$ 371.39	179.5-179.9	0.24	61.45 61.72	5.70 5.66	11.31 11.52
13c	2,6(OMe)2 c	$C_{17}H_{23}N_3O_4$ 333.39	185.0-185.6	0.32	61.25 61.28	6.95 7.14	12.60 12.45
13d	2,6(OMe)2 d	$C_{14}H_{19}N_3O_4$ 293.32	176.5-176.8	0.16	57.33 57.02	6.53 6.45	14.33 14.27
14a	3,4(OMe)2 a	$C_{16}H_{17}N_3O_5$ 331.33	110.5-111.0	0.27	58.00 57.85	5.17 4.99	12.68 12.49
14b	3,4(OMe)2 b	$C_{19}H_{21}N_3O_5$ 371.39	171.0-173.0	0.34	61.45 61.19	5.70 5.53	11.31 11.19
14c	3,4(OMe)2 c	$C_{17}H_{23}N_3O_4$ 333.39	227.4-228.0	0.22	61.25 61.00	6.95 6.77	12.60 12.41
14d	3,4(OMe)2 d	$C_{14}H_{19}N_3O_4$ 293.32	213.0-213.6	0.10	57.33 56.98	6.53 6.34	14.33 14.13

* Cyclohexane: ethyl acetate(1:5). (a) N=CH-  , (b) N=CH-  , (c) N=C(Me)2 , (d) N= 

the amide resonance. The same phenomena is also observed in the ^{1}H NMR of compounds (11-14) c which contain [N=C(Me)2] have indicated a substantial chemical shift difference between the syn and anti protons and to the imine moiety. The major factor responsible for affecting chemical shift differences between syn and anti protons is a steric compression effect which results in upfield shift for syn and anti protons [8].

EXPERIMENTAL

All melting points were taken on an Electro-thermal Gallenkamp (UK) apparatus and are uncorrected. ^{1}H NMR spectra were recorded on a JEOL JUM-GX 270 spectrometer and shifts are reported in δ unit (part per million) from internal tetramethylsilane (TMS). FT IR spectra recorded in KBr pillets using a Nicolet 20 DXB. High resolution mass spectra were measured on Cs/Ms JEOL JUM-HX 100 at 70 eV. Optical rotations were measured (c = 0.01) using Bellingham and Stanley polarimeter, 4 dm tube at 21 °C. Elemental analyses were obtained on CARIO EBRA instrument. Thin layer chromatogra phy was performed with Merck silica gel 60 F-254 plates in (Cyclohexane : ethylacetate, (1 : 5). All reagents were purchased from BDH, Na_2SO_4 was used as a drying agent.

Synthesis of Methyl N-(Dialkoxybenzoyl)amino acid ester derivatives.

Was prepared from dialkoxybenzoic acids and L-amino acid esters the procedure described in ref. 9.

Synthesis of N-(Dialkoxybenzoyl)amino acid hydrazide derivatives.(General procedure)

A mixture of methyl N-(dialkoxybenzoyl)amino acid ester (20 mmol) and hydrazine hydrate 99% (30 mmol) in absolut ethanol (100 mL) was heated under reflux at 60-70 °C for 2 - 6 hrs then left 24 hrs at room temprature. The precipitated product was filtered off, washed with cold ethanol and recrystallized from ethanol.

Synthesis of hydrazide (6a).

Was prepared from (1a) by the above procedure at 60 °C for 2 hrs. (yield 92%).

IR : 3370, 3300, 1645 ; ^{1}H NMR : δ 9.1, 8.7 (dd, 1H, NH); 7.0-6.7 (m, 3H, ArH); 4.2 (s,2H , NH_2); 3.9 (d, 2H, CH_2); 3.8 [s, 6H, Ar(OMe)2] .

Synthesis of hydrazide (6b).

Was prepared from (1b) as above at 60 ^{0}C for 5 hrs. (yield 99 %). IR: 3400, 3320, 1660 ; ^{1}H NMR : δ 9.2, 8.5 (dd, 1H, NH); 7.1-6.7 (m, 3H, ArH); 4.5 (m, 1H,CαH); 4.2 (s, 2H, NH_2); 3.8 [s, 6H, Ar(OMe)2] ; 1.3 (d, 3H, Me).

Synthesis of hydrazide (6c).

Was prepared from (1c) as above at 65 ^{0}C for 5 hrs. (yield 83 %). IR : 3320, 3290, 1670 ; ^{1}H NMR : δ 9.2, 8.3 (dd, 1H, NH); 7.0 - 6.6 (m , 3H, ArH); 4.3 (m 1H, CαH); 4.3 (s, 2H, NH_2); δ 3.8 [s , 6H, Ar(OMe)2]; 2.2 [m, 1H, CH(Me)2] 0.9 [dd , 6H, (Me) 2].

Synthesis of hydrazide (6d).

Was prepared from (1d) as above at 65 ^{0}C for 5 hrs. (yield 83 %). IR: 3420 , 3220, 1670 ; ^{1}H NMR : δ 9.2, 8..0 (dd, 1H, NH); 7.1 - 6.7 (m, 3H, ArH); 4.5 (m, 1H, CαH); 4.2 (s, 2H, NH_2); 3.8 [s , 6H, Ar(OMe)2]; 1.6 ([m, 3H, CH_2,CH); 0.9[d , 6H, (Me)2] .

Synthesis ofhydrazide (6e).

Was prepared from (1e) as above at 65 ^{0}C for 6 hrs. (yield 69 %). IR: 3360, 3285, 1659; ^{1}H NMR : δ 9.3, 8.6 (dd, 1H, NH); 7.3 - 6.6 (m, 8H, ArH); 4.7 (m,1H, CαH); 4.3 (s, 2H, NH_2); 3.8 [s, 6H, Ar(OMe)2] ; 3.0 (m, 2H, CH_2) .

Synthesis of hydrazide (6f).

Was prepared from (1f) as above at 65 ^{0}C for 5 hrs. (yield 81 %).

IR : 3370, 3300, 1665; ^{1}H NMR : δ 9.2, 8.0 (dd, 1H, NH); 7.0 - 6.7 (m, 3H, ArH); 4.9 (s, 1H, OH); 4.3 (m, 1H, CHOH); 4.3 (s, 2H, NH_2); 4.0 (m,1H, CαH); 3.8 [s , 6H, Ar(OMe)2] ; 1.1 (d , 3H, Me).

Synthesis of hydrazide (6g).

Was prepared from (1g) as above at 65 ^{0}C for 5 hrs. (yield 93 %).

IR: 3325, 3270, 1675 ; ^{1}H NMR : δ 9.3 (s, 1H, OH); 9.2, 8.5 (dd, 1H, NH); 7.2 - 6.6 (m, 7H, ArH); 4.6 (m, 1H, CαH) ; 4.2 (s, 2H, NH_2); 3.8 [s , 6H, Ar(OMe)2] ; 2.9 (m, 2H, CH_2).

Synthesis of hydrazide (6h).

Was prepared from (1h) as above at 60 ^{0}C for 6 hrs. (yield 83 %).

IR: 3360, 3260, 1655; ^{1}H NMR: δ 9.2 (d,1H, NH); 8.2 (d ,1H, NH); 7.0- 6.7 (m, 3H, ArH); 5.0 (s, 1H, OH); δ 4.5 (m, 1H, CαH) ; 4.5 (s, 2H, NH_2); 3.8 [s, 6H, Ar(OMe)2] ; 3.7 (m, 2H, CH_2).

Synthesis of hydrazide (6i).

Was prepared from (1i) as above at 60 ^{0}C for 5 hrs. (yield 84 %).

IR: 3330, 3280, 1660; ^{1}H NMR: δ 9.8, 8.2 (dd, 1H, NH); 7.1 - 6.6 (m, 3H, ArH); 4.5 (m, 1H, CαH); 4.2 (s, 2H, NH_2); 3.8 [s , 6H, Ar(OMe)2]; 2.5 [m, 2H, CαH-CH_2) ; 2.3 (t, 2H, CH_2Me); 2.0 (s, 3H, Me);

Synthesis of hydrazide (7a).

Was prepared from (2a) as above at 60 ^{0}C for 6 hrs. (yield 93 %).

IR : 3361, 3297, 1642; ^{1}H NMR : δ 9.1 , 8.4 (dd, 1H, NH); 7.9- 6.6 (m, 3H, ArH); 4.5 (s, 2H , NH_2); 4.3 (d, 2H, CH_2); 3.9, 3.8 [s s, 6H, Ar(OMe)2].

Synthesis of hydrazide (7b).

Was prepared from (2b) as above at 65 ^{0}C for 6 hrs. (yield 74 %).

IR : 3360, 3220, 1640; ^{1}H NMR: δ 9.1 , 8.4 (dd, 1H, NH); 7.8- 6.7 (m, 3H, ArH); 4.5 (m,1H,CαH); 4.1 (s, 2H, NH_2); 3.9,3.8 [ss, 6H, Ar(OMe)2]; 1.3 (d 3H,Me)

Synthesis of hydrazide (7c).

Was prepared from (2c) as above at 65 ^{0}C for 6 hrs. (yield 83 %).

IR : 3365, 3270, 1650 ; ^{1}H NMR: δ 9.1, 8.3 (dd, 1H, NH); 7.9 -6.6 (m, 3H, ArH); 4.7 (m ,1H, CαH); 4.3 (s, 2H, NH_2); 3.9, 3.8 [ss, 6H, Ar(OMe)2] ; 1.2 [m,1H, CH(Me)2]; 0.9 [d , 6H, (Me)2].

Synthesis of hydrazide (7d).

Was prepared from (2d) as above at 65 ^{0}C for 5 hrs. (yield 60 %).

IR: 3370, 3290, 1670; ^{1}H NMR: δ 9.2 , 8.0 (dd,1H, NH); 7.9 - 6.6 ; (m, 3H, ArH); 4.6 (m, 1H, CαH); 4.2 (s, 2H, NH_2); 3.9, 3.8 [ss , 6H, Ar(OMe)2], 1.4 [m, 3H, CH_2 CH); 0.9 [d , 6H, (Me)2] .

Synthesis ofhydrazide (7e).

Was prepared from (2e) as above at 65 ^{0}C for 6 hrs. (yield 99 %).

IR: 3370, 3320, 1670; ^{1}H NMR: δ 9.3 , 8.2 (dd, 1H, NH); 7.8 - 6.6 (m , 8H, ArH); 4.7 (m , 1H, CαH); 4.3 (s , 2H, NH_2) ; δ 3.9, 3.8 [ss , 6H, Ar(OMe)2] ; 3.0 [m, 2H, CH_2) .

Synthesis of hydrazide (7f).

Was prepared from (2f) as above at 60 ^{0}C for 5 hrs. (yield 69 7%).

IR : 3360, 3290, 1635; ^{1}H NMR : δ 9.1 , 8.4 (dd, 1H, NH); 7.9 - 6.8 (m, 3H, ArH); 5.1(s, 1H, OH); 4.3 (m, 1H, CHOH); 4.3 (s, 2H, NH_2); 4.1 (m,1H,CαH); 3.9, 3.8 [ss , 6H, Ar(OMe)2] ; 1.1 (d , 3H, Me).

Synthesis of hydrazide (7g).

Was prepared from (2g) as above at 65 ^{0}C for 5 hrs. (yield 80 %).

IR: 3380, 3250, 166; ^{1}H NMR: δ 9.3 (s, 1H, OH); 9.2 , 8.1 (dd,1H, NH); 7.9-.6.6 (m, 7H, ArH); 4.6 (m, 1H, CαH); 4.5 (s, 2H, NH_2); 3.9 , 3.8 [ss, 6H,Ar(OMe)2] 2.9(m, 2H, CH_2).

Synthesis of hydrazide (7h).

Was prepared from (2h) as above at 60 ^{0}C for 6 hrs. (yield 94 %).

IR: 3340, 3270, 1670; ^{1}H NMR: 9.2, 8.5 (dd,1H, NH); 7.9-6.6 (m, 3H, ArH); 5.1 (s, 1H, OH); 4.5 (m, 1H, CαH) ; 4.4 (s, 2H, NH_2); 4.2 (m, 2H, CH2); 3.9, 3.8 [ss , 6H, Ar(OMe)2]

Synthesis of hydrazide (7i).

Was prepared from (2i) as above at 60 ^{0}C for 6 hrs. (yield 76 %).

IR: 3380, 3285, 1650; ^{1}H NMR : δ 9.3 , 8.4 (dd,1H, NH); 7.9 .6.7 (m, 3H,ArH); 4.5 (m ,1H, CαH); 4.2 (s, 2H, NH_2); 3.9, 3.8 [ss, 6H, Ar(OMe)2] ; 2.5 [m, 2H, CH CH_2) ; 2.0 (t, 2H, CH_2); 1.9 (s, 3H, Me);

Synthesis of hydrazide (8).

Was prepared from (3) as above at 60 ^{0}C for 6 hrs. (yield 90 %).

IR : 3360, 3220, 1670; ^{1}H NMR: δ 9.1 , 8.5 (dd, 1H, NH); 7.3 -6.7 (m, 3H, ArH); 4.3 (s, 2H , NH_2); 3.8 (d, 2H, CH_2); 3.5 [s, 6H, Ar(OMe)2] .

Synthesis of hydrazide (9).

Wa s prepared from (4) as above at 60 ^{0}C for 5 hrs. (yield 50 %).

IR: 3450, 3290, 1650; ^{1}H NMR : δ 9.1 , 8.6 (dd, 1H, NH); 7.5 -6.6 (m, 3H, ArH); 4.5 (s ,2H , NH_2); 4.2 (d, 2H, CH_2); 3.8-3.7[s s, 6H, Ar(OMe)2]

Synthesis of hydrazide (10).

Was prepared from (5) as above at 60 ^{0}C for 5 hrs. (yield 35 %).

IR : 3370, 3320, 1670; ^{1}H NM : δ 9.1 , 8.4 (dd, 1H, NH); 6.7 -6.4 (m, 3H, ArH); 4.4 (s, 2H , NH_2); 4.2 (d, 2H, CH_2); 2.7 [s, 6H, Ar(OAc)2] .

Condensation of N-(dimethoxybenzoyl)glycine hydrazides with aldehydes and ketones. (General procedure).

A- With aldehydes: A mixture of N-(dimethoxybenzoyl)glycine hydrazide (2 mmol.) and aldehyde (2 mmol) in absolut ethanol (50 mL) was refluxed for 5 hrs. The precipitated product was filtered off, washed with cold ethanol and recrystallized from ethanol.

B- With ketones: (2 mmol.) from the hydrazide was dissolved in (50 mL) of ketone refluxed for 5 hrs. then left to cool 24 hrs at room temperature the precipitated product was filtred off, washed and recrystallized from the same ketone.

Synthesis of hydrazone (11a).

Was prepared from hydrazide (1a) by the above procedure (A) , [yield 88 %].

IR: 3420, 1675, 1610; ^{1}H NMR: δ 11.5, 8.6 (dd, 1H, NH); 8.1 (s,1H, ald. CH), 8.1-6.6 (m, 6H, ArH); 4.2 (d, 2H, CH_2); 3.8 [s, 6H, Ar(OMe)2].

Synthesis of-hydrazone (11b).

Was prepared from hydrazide (1a) as above (A), [yield 90 %]

IR: 3380, 1670, 1600 ; ^{1}H NMR : δ 11.4, 8.7 (dd, 1H, NH); 8.8 (d, 1H, NH); 8.2 (s, 1H ald.,CH), 8.2-6.6 (m ,7H, ArH); 4.4 (d, 2H, CH_2); 3.8, 3.7 [ss, 9H,Ar(OMe)2 + ArOMe] .

Synthesis of hydrazone (11c).

Was prepared from hydrazide (1a) as above (B) , [yield 74 %].

IR : 3330, 1650, 1630 ; ^{1}H NMR : δ 10.4, 8.7 (dd, 1H, NH); 7.1- 6.7 (m, 3H, ArH); 4.3 (d, 2H, CH_2); 3.8 [s, 6H, Ar(OMe)2]; 1.9 [(d, 6H, 2(Me)].

Synthesis of hydrazone (11d).

Was prepared from hydrazide (1a) as above (B), [yield 74 %].

IR: 3325, 1670, 1600; ^{1}H NMR: δ 10.2, 8.7 (dd, 1H, NH); 7.1-6.6 (m, 3H, ArH); 4.3(d, 2H, CH_2); 3.8 [s, 6H, Ar(OMe)2]; 2.5 - 1.6 [M, 10H, 5(CH_2)];

Synthesis of -hydrazione (12a).

Was prepared from hydrazide (2a) as above (A), [yield 84 %].

IR : 3360, 1670, 1620; ^{1}H NMR : δ 11.5, 8.5 (dd, 1H, NH); 8.1 (s, 1H, ald. CH); 8.0 - 6.6 (m, 6H, ArH); 4.4 (d, 2H, CH_2); 4, 3.8 [ss, 6H, Ar(OMe)2].

Synthesis of hydrazione (12b).

Was prepared from hydrazide (2a) as above (A) [yield 87 %]. IR: 3360, 1660, 1620 ; ^{1}H NMR : δ 11.4, 8.5 (dd, 1H, NH); 8.2 (s, 1H, ald. CH) , 8.2 - 6.6 (m, 7H, ArH); 4.4 (d, 2H, CH_2); 4.0 , 3.8, 3.7 [sss , 9H, Ar -(OMe)2 + ArOMe] .

Synthesis of hydrazone (12c).

Was prepared from hydrazide (2a) as above (B) [yield 77 %]. IR : 3390, 1660, 1610 ; ^{1}H NMR : δ 10.5, 8.5 (dd , 1H, NH); 7.8 - 6.6 (m, 3H, ArH); 4.2 (d, 2H, CH_2); 4.0, 3.8 [ss, 6H, Ar(OMe) 2]; . 1.9 (d, 6H,2(Me)]

Synthesis of hydrazone (12d).

Was prepared from hydrazide (2a) as above (B) [yield 82%]. IR : 3395, 1670, 1630 ; ^{1}H NMR : δ 10.3 , 3.5 (dd, 1H, NH); 8.0 - 6.6 (m, 3H, ArH); 4.3 (d, 2H,CH_2); 3.9, 3.8 [ss , 6H, Ar(OMe)2]; 2.5 -1.6 [(m, 10H, (CH_2)];

Synthesis of hydrazone (13a).

Was prepared from hydrazide (3) as above (A) , [yield 87 %].

IR : 3360, 1650, 1600 ; ^{1}H NMR : δ 11.3, 8.4 (dd, 1H, NH); 8.1 (s,1H, ald. CH), 8.0 - 6.6 (m, 6H, ArH); 4.3 (d, 2H, CH_2); 3.9 [s, 6H, Ar(OMe)2].

Synthesis of hydrazone (13b).

Was prepared from hydrazide (3) as above (A), [yield 83 %]

IR: 3360, 1670, 1620; ^{1}H NMR: δ 11.2, 8.4 (dd, 1H, NH); 8.2 (s, 1H, ald.CH), 8.1- 6.6 (m, 7H, ArH); 4.3 (d, 2H, CH_2); 3.8, 3.7 [ss, 9H, Ar(OMe)2 + ArOMe].

Synthesis of hydrazone (13c).

Was prepared from hydrazide (3) as above (B) , [yield 86 %].

IR : 3320, 1650, 1620; ^{1}H NMR : δ 10.4, 8.4 (dd, 1H, NH); 7.3 - 6.7 (m, 3H, ArH); 4.3 (d, 2H, CH_2); 3.8 [s, 6H, Ar(OMe)2]; 1.9 [(d, 6H, 2(Me)].

Synthesis of hydrazide (13d).

Was prepared from hydrazide (3) as above (B), [yield 90 %].

IR : 3325, 1670, 1610 ; ^{1}H NMR : δ 10.2, 8.4 (dd, 1H, NH); 7.3-6.7(m, 3H, ArH); 4.2 (d, 2H, CH_2); 3.7 [s, 6H, Ar(OMe)2]; 2.5 -1.6 [m, 10H, 5(CH_2)].

Synthesis of hydrazione (14a).

Was prepared from hydrazide (4) as above (A), [yield 64 %].

IR : 3320, 1655, 1610 ; ^{1}H NMR : δ 11.4, 8.5 (dd, 1H, NH) ; 8.1 (s ,1H, ald. CH) ; 7.9 - 6.6 (m, 6H, ArH); 4.3 (d, 2H, CH_2); 4.0, 3.8 [ss, 6H, Ar(OMe)2]

Synthesis of hydrazone (14b).

Was prepared from hydrazide (4) as above (A)., [yield 61 %]

IR : 3320, 1650, 1610; ^{1}H NMR : δ 11.3, 8.6 (dd, 1H, NH); 8.2 (s, 1H, ald. CH), 8.1- 6.5 (m, 7H, ArH); 4.4 (d, 2H, CH_2); 3. 4, 3.3, 3.2[sss, 9 H, Ar(OMe)2 + ArOMe] .

Synthesis of hydrazone (14c).

Was prepared from hydrazide (4) as above (B) [yield 29 %].

IR : 3320, 1640, 1600 ; ^{1}H NMR : δ 10.5, 8.6 (dd, 1H, NH); 7.5 - 6.5 (m , 3H , ArH); 4.3 (d , 2H , CH_2); 3.8, 3.7 [ss , 6H, Ar(OMe)2]; 2.0 (d, 6H, 2(Me)]

Synthesis of hydrazione (14d).

Was prepared from hydrazide (4) as above (B) [yield 41 %].

IR : 3320, 1640, 1600 ; ^{1}H NMR : δ 10.2, 8.5 (dd, 1H, NH); δ 7.5-6.5 (m, 3H, ArH); 4.3 (d, 2H, CH_2); 3.5, 3.4 [s, 6H, Ar(OMe)2]; 2.5 - 1.65 [(m, 10H, 5(CH_2)].

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(Received in the USA 06 October 1998)