

1535  $\text{cm}^{-1}$  ( $\text{NO}_2$ ) further confirmed the complete reduction of the compound I.

**2-N-Chloroacetyl-amino-benz(2-pyridyl)amide (III)** : To a solution of amino compound (II) (1.07 g, 0.005 mol) in 50 ml chloroform, chloroacetyl chloride (0.75 ml, 0.01 mol) was added and left overnight at room temperature. Reaction mixture was concentrated under reduced pressure which upon cooling yielded the product (1.0 g, 69%), m.p. 220-22 $^{\circ}$ d. (Found : N, 14.54%.  $\text{C}_{14}\text{H}_{12}\text{ClN}_2\text{O}_2$  requires N, 14.51%);  $\nu_{\text{max}}$  (KBr) 760 (C-Cl), 1595 (C=C), 1640 (C=O), 1680 (C=O), and 3100  $\text{cm}^{-1}$  (NH).

**2-Chloromethyl-3-(2-pyridyl)-4(3H)-oxo-3,1-quinazoline (IV)** : A solution of III (0.58 g, 0.002 mol) in 10 ml of acetic anhydride was refluxed for 7.5 h (tlc). The reaction mixture was poured over crushed ice and the solid separated was filtered and washed with water. The crude product was recrystallised from benzene/petroleum ether (b.p. 60-80 $^{\circ}$ ) (1:1) (0.36 g; 60%) m.p. 175-76 $^{\circ}$  (Found : N, 15.44%.  $\text{C}_{14}\text{H}_{11}\text{ClN}_2\text{O}$  requires N, 15.47%);  $\nu_{\text{max}}$  (KBr) 760 (C-Cl), 1595 (C=C), 1700 (C=O) and 2950  $\text{cm}^{-1}$  (C-H methyl).

**2-(N,N-Substituted aminomethyl)-3-(2-pyridyl)-4(3H)-oxo-3,1-quinazoline (Va-e)** : The chloro compound IV (0.543 g, 0.002 mol) and an appropriate secondary amine (0.0025 mol) were refluxed in 25 ml pyridine for 6-8 h (tlc). The excess of pyridine was distilled off under reduced pressure and the residue poured over crushed ice. The crude product thus separated was filtered, dried and recrystallised from aqueous ethanol. The compounds were characterised by their elemental analysis, m.ps., pmr spectra and the absence of C-Cl band at 760  $\text{cm}^{-1}$  in their ir (KBr) spectra.

**Biological screening** : Method of Kamboj *et al.*<sup>8</sup> was used to evaluate anti-implantation activity. However, none of these compounds showed any significant activity at an oral dose level of 25 mg/kg body weight.

TABLE 1

Compd. no.	NR, R <sub>2</sub>	Molecular formula	M.p. $^{\circ}\text{C}$
Va	diethylamino-	$\text{C}_{18}\text{H}_{20}\text{N}_4\text{O}$	304-06
Vb	pyrrolidino-	$\text{C}_{18}\text{H}_{19}\text{N}_4\text{O}$	294-96
Vc	piperidino-	$\text{C}_{19}\text{H}_{20}\text{N}_4\text{O}$	292-94
Vd	4-methyl-piperidino-	$\text{C}_{20}\text{H}_{22}\text{N}_4\text{O}$	282-84
Ve	morpholino-	$\text{C}_{18}\text{H}_{19}\text{N}_4\text{O}_2$	298-300

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### Possible Antifertility Agents. Part-II : Synthesis of 10,12-Substituted [1,4]-benzoxazino [3,4]-quinazolin-8-ones

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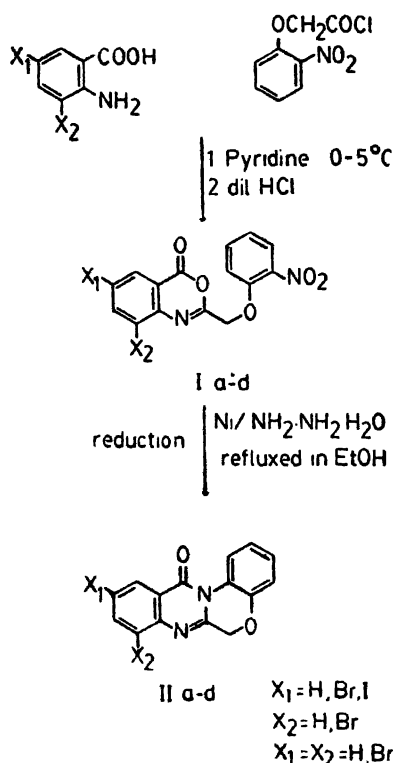
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HIGH antifertility activity has been located among certain benz[a]anthracene derivatives<sup>1</sup> and also in substituted quinazolones<sup>2-4</sup>. Therefore, it was considered worthwhile to synthesise substituted [1,4]-benzoxazine [3,4]-quinazolin-8-ones which incorporated the essential structural skeleton of both classes of the compounds (Scheme 1) and to study their antifertility action.

### Experimental

M.ps. were determined in open capillary tubes and uncorrected. Infrared spectra of the compounds were recorded on the Perkin Elmer 137 infracord instrument and the pmr spectra was recorded on the Perkin Elmer R-3 spectrometer (90 MHz) in trifluoroacetic acid and the chemical shift values were expressed in  $\delta$  units using TMS as an internal standard.

**2-(2-Nitrophenoxy methyl)-6,8-substituted-4(3H)-oxo-3,1-benzoxazines (Ia-d)** : The compounds were synthesised according to the method of Sammour *et al.*<sup>5</sup>. 2-Nitrophenoxyacetic acid<sup>6</sup> (2.98 g, 0.01 mol) was refluxed with a large excess of thionyl chloride for 6 h. Excess of thionyl chloride was distilled off and its traces were removed by the azeotropic distillation with dry benzene (3 times). The acid chloride obtained was allowed to react with appropriate anthranilic acid (0.01 mol) in 10 ml dry pyridine at 0-5 $^{\circ}$  for 1 h. The reaction mixture was kept overnight at room temperature and treated with cold dilute hydrochloric acid. The separated solid was filtered, washed with sodium bicarbonate solution and finally with water. The crude product was recrystallised from ethanol (Table 1).



Scheme 1

TABLE 1

Compd. no.	X <sub>1</sub>	X <sub>2</sub>	Molecular formula	M.p. °C	Yield %
Ia	H	H	C <sub>18</sub> H <sub>10</sub> N <sub>2</sub> O <sub>5</sub>	209-10	50
Ib	Br	H	C <sub>18</sub> H <sub>9</sub> N <sub>2</sub> O <sub>5</sub> Br	175-77	90
Ic	Br	Br	C <sub>18</sub> H <sub>8</sub> N <sub>2</sub> O <sub>5</sub> Br <sub>2</sub>	162-63	60
Id	I	H	C <sub>18</sub> H <sub>9</sub> N <sub>2</sub> O <sub>5</sub> I	196-97	90

10,12-Substituted [1,4]-benzoxazino [3,4]-quinazolin-8-ones (IIa-d): Benzoxazine (Ia-d, 0.01 mol) was dissolved in ethanol (20 ml) and Raney nickel (0.5 g) was placed into it. Hydrazine hydrate (10 ml) was then carefully added at room temperature and after the evolution of hydrogen ceased the reaction mixture was allowed to reflux on a water bath for 3 h. It was then acidified with hot 5 N hydrochloric acid and filtered hot. Filtrate on cooling yielded the crude product which was recrystallised from ethanol (Table 2). Absence of the bands

TABLE 2

Compd. no.	X <sub>1</sub>	X <sub>2</sub>	Molecular formula	M.p. °C	Yield %
IIa	H	H	C <sub>18</sub> H <sub>10</sub> N <sub>2</sub> O <sub>5</sub>	155-56	60
IIb	Br	H	C <sub>18</sub> H <sub>9</sub> N <sub>2</sub> O <sub>5</sub> Br	166-67	65
IIc	Br	Br	C <sub>18</sub> H <sub>8</sub> N <sub>2</sub> O <sub>5</sub> Br <sub>2</sub>	164-65	55
IId	I	H	C <sub>18</sub> H <sub>9</sub> N <sub>2</sub> O <sub>5</sub> I	165-66	65

in ir (KBr) at 1360 and 1525 cm<sup>-1</sup> due to the aromatic nitro group present in its precursor indicated that the reduction of nitro group was complete

and also the absence of 3300-3400 cm<sup>-1</sup> band confirmed that the amino group formed during this reduction had reacted intramolecularly with benzoxazine carbonyl group to form the desired product.

**Biological screening:** The method of Kamboj *et al.*<sup>7</sup> was adopted to evaluate the anti-implantation activity. Compounds were found to have an activity range between 12.5-37.5% only at a dose level of 25 mg/kg body weight of the animal.

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### Synthesis and Antibacterial Activity of Azomethines and Thiazolidinones Derived from 2-Phenyl-3-(p-aminodiphenyl)-4-quinazolones

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QUINAZOLONES<sup>1-5</sup> and azomethines/Schiff's<sup>6,7</sup> bases are reported to exhibit a wide spectrum of biological activities. Thiazolidinones also possess a variety of pharmacological properties, viz. amoebicidal<sup>8</sup>, hypnotic<sup>9</sup>, anticonvulsant<sup>10</sup>, fungicidal<sup>11</sup> and antibacterial<sup>12</sup>. In view of these observations we thought it of interest to synthesise and investigate the azomethines having a quinazolone nucleus and compounds containing the quinazolone and thiazolidinone moieties in a single molecular framework as possible antibacterial agents.

2-Phenyl-3-(p-aminodiphenyl)-4-quinazolone<sup>13</sup> (I) was refluxed with different arylaldehydes in absolute alcohol in presence of few drops of acetic acid to