

NOTE

Synthesis of Some New Quinazoline-4-(3H)-ones and Styryl Hemicyanines as Possible Antimicrobial Agents

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In the present note we report the synthesis of some new quinazoline-4 (3H)-ones and styryl hemicyanines as possible antimicrobial agents.

Key Words: Synthesis, Quinazolin-4-(3H)-ones, Styryl hemicyanines, Antimicrobial agents.

Substituted quinazoline-4-(3H)-ones have been reported to possess various biological activities¹. In continuation of earlier work on 6-substituted-4-(3H)-quinazolinone-3-yl moiety², some new compounds have been synthesised and screened for their antimicrobial activities.

Acetyl chloride gave *o*-(N-acetyl) aminobenzoic acid (1) on reaction with anthranilic acid. Cyclisation of (1) in presence of acetic anhydride gave 2-methyl-3,1-benzoxazin-4-ones (2) which on condensation with primary aromatic amines gave 2-methyl-3-arylquinazoline 4-(3H)-ones (3). Quaternisation of (3) with CH₃I affords corresponding methiodide (4). Compound (4) is subjected to condensation with an auxochromic ketone to form a hemicyanine dye (5). Compound 3d was found to be active against *Salmonella typhi* and 3a and 3h were active against *Bacillus subtilis*. However, rest of the compounds failed to show any appreciable antibacterial activity. Antifungal study reveals compounds 3d and 3h to be active against *Alternaria alternata* and compound 3g active against *Aspergillus fumigatus*. Antimicrobial study shows that in quinazoline-4-(3H)-ones, the substitution of the methyl ring at position 2 by *m*-OH, *m*-NO₂ and *p*-Br, produces remarkable activity.

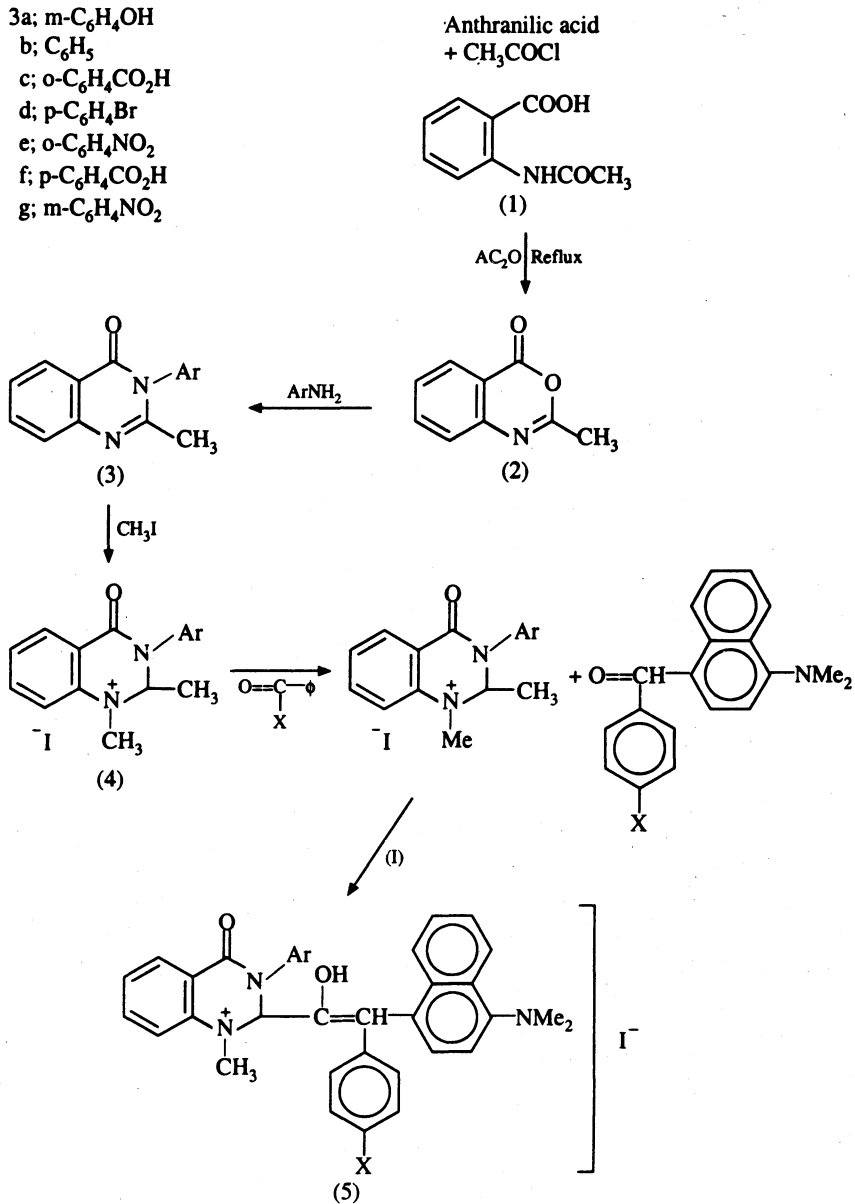
m.p.s were determined in open capillaries using a Toshniwal apparatus and are uncorrected. The purity of the compounds was checked by TLC on silica gel-G using hexane-ethanol-chloroform (1 : 3 : 6). IR spectra (KBr) were recorded on a Shimadzu-470 spectrophotometer.

o-(N-Acetyl) aminobenzoic acid (1): It was prepared following known procedure of acetylation³ The resulting solid was washed with hot water and crystallised from ethanol (55%), m.p. 178–79°C.

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Scheme

- 3a: m-C₆H₄OH
 b: C₆H₅
 c: o-C₆H₄CO₂H
 d: p-C₆H₄Br
 e: o-C₆H₄NO₂
 f: p-C₆H₄CO₂H
 g: m-C₆H₄NO₂



2-Methyl-3-(substituted)-quinazoline-4-(3H)-ones (3a–h): A mixture of (1) (0.01 mol) and acetic anhydride (0.05 mol) was refluxed under anhydrous condition for 4–6 h. The excess acetic anhydride was then distilled off under reduced pressure and cooled to room temperature. The intermediate (2) so obtained as a solid mass was used up immediately for the next step.

A mixture of (2) (0.01 mol) and primary aromatic amines (0.01 mol) was refluxed in glacial acetic acid for 4–6 h. After cooling, the contents were poured on to crushed ice. The resulting solids were washed with distilled water, dried and crystallized from hot 95% ethanol (yield 48–68%).

m.p. (°C): **3a**, 145–46; **b**, 160–62 ;**c**, 133–35; **d**, 138–39; **e**, 164–165; **f**, 153–55; **g**, 158–60; **h**, 168–70; ν_{\max} 1670–1645 (NC=O), 1450–1430 (CH₂—C=C) and 1600–1580 cm⁻¹ ν (C=N). All compounds gave satisfactory N analysis.

Antimicrobial activity was evaluated by filter paper disc agar diffusion method⁵. For antibacterial studies Hi-media bacteriological nutrient broth and bacteriological nutrient agar were used against Gram positive *Bacillus subtilis*, *Staphylococcus aureus* and Gram negative *Salmonella typhi* and *Escherichia coli*. Antifungal studies were carried out using Sabouraud's dextrose broth and dextrose agar against *Aspergillus fumigatus*, *Aspergillus niger*, *Alternaria alternata* and *Penicillium chrysogenum*. Dimethyl-formamide was used for solubilising the compounds and also for control studies. The concentration of the compounds taken was 1 mg mL⁻¹. Norfloxacin (1 mg mL⁻¹) and clotrimazole (1 mg mL⁻¹) were used as standards for bacterial and fungal studies respectively. All the compounds show promising antibacterial and antifungal activities.

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