

**NOTE****Antibacterial Activity of Some Biologically Active Analogues of Phthalein Dyes**

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A new series of biologically active phthalides has been synthesised and tested for their antibacterial activity against the bacteria *S. aureus* and *E. coli*. Some of them have shown significant activity.

**Key Words:** Antibacterial activity, Phthalein dyes.

Phthalein group compounds are the most important and useful synthetic dyes, possessing various biological activities<sup>1-3</sup>. Accordingly, an attempt has been made to synthesize some new biologically active analogues of phthalein dyes which have been screened for their antibacterial property. The synthesized compounds are unsymmetrically substituted phthalides (1-5) in which the central triphenylmethane carbon is attached to two different phenyl rings. Antibacterial activity of these phthalides has been tested against the two bacteria *Staphylococcus aureus* and *Escherichia coli*.

The synthesis, purification and physical data of following phthalides (1-5) were carried out by the procedure reported for similar compounds in our earlier communication<sup>4</sup>.

- (1) 3-(4-Ethylphenyl)-3-(2,4-dihydroxyphenyl)phthalide.
- (2) 3-(4-Ethylphenyl)-3-(2,4-dihydroxyphenyl)phthalide.
- (3) 3-(4-Ethylphenyl)-3-(3,5-dibromo-2,4-dihydroxyphenyl)phthalide.
- (4) 3-(4-Ethylphenyl)-3-(3,5-diiodo-2,4-dihydroxyphenyl)phthalide.
- (5) 3-(4-Ethylphenyl)-3-(3-5-diacetoxymercuri-2,4-dihydroxyphenyl)phthalide.

**Antibacterial Activity**

The *in vitro* antibacterial screening of phthalides (1-5) was carried out by paper disc diffusion<sup>5</sup> method against two bacteria, *S. aureus* and *E. coli*. 4 per cent solution (in chloroform) of each compound was tested for antibacterial activity. The experiments were also performed with standard antibacterial gentamycin and tetracycline under same conditions. The activities of the compounds were compared with standard drugs and zone of inhibition was calculated in mm. Results are presented in Table-1.

TABLE-1  
ANTIBACTERIAL ACTIVITY OF PHTHALIDES (1-5)

Phthalides	Antibacterial activity (in mm*)	
	<i>S. aureus</i>	<i>E. coli</i>
1	++	+++
2	++	++
3	++	+
4	+++	+++
5	++++	+++
Standard: Gentamycin	++++	++++
Tetracycline	++++	++++

\*Average of three replications

(+) = Zone size 5-8 mm, (++) = Zone size 8-12 mm; (+++) = Zone size 12-15 mm,

(++++) = Zone size > 15 mm

Results of antibacterial screening of phthalides (1-5) and standard drugs have been given in Table-1. A critical examination of the activity clearly indicates that mercuriated compound (5) was found to be as active as standard drugs. Diiodo compound (4) was also highly active but less than that of corresponding mercuriated compound. The phthalide 1 was also highly active against bacteria *E. coli*. Remaining phthalides were moderately active.

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(Received: 27 February 2003; Accepted: 12 May 2003)

AJC-3130