Asian Journal of Chemistry Vol. 3, No. 3 (1991), 340–341

NOTES

STUDIES ON THE ANTIMICROBIAL ACTIVITY OF A NEW BICHALCONE

V.R.VENKATARAMAN, S. NAGARAJAN *
Department of Chemistry
Bharathidsan University, Tiruchirapalli-620 024, India
and
PHILIP A. THOMAS
Department of Microbiology
Joseph Eye Hospital, Tiruchirapalli-620 024, India

A new bichalcone viz. 2',4'-dihydroxy-5'-(4-bromo) cinnamoyl-4-bromochalcone has been synthesised and Characterised by spectral studies. The antimicrobial activity of this bichalcone was tested against 7 isolates of fungi and 4 isolates of bacteria. The bichalcone has been found to exhibit significant activity on 3 isolates of fungi and 2 isolates of bacteria comparable to that of antifungal/antibacterial agents.

It has been reported in literature that *staphylococcus aureus* is resistant to chlorohydroxychalcone[1] and bromohydroxychalcone[2]. Synthetic hydroxy, acetoxy, methoxy, chlorohydroxy, bromohydroxy and iodohydroxychalcones have also been found to possess antifungal activity[3]. In the present communication we report the synthesis of a new bromobichalcone and its antifungal and its antibacterial activities.

4,6-Diacetylresorcinol was prepared[4,5] by the reaction of acetic anhydride and resorcinol in the presence of $ZnCl_2$. lg of this was mixed with p-bromobenzaldehyde (2g) in ethanol (20 ml) and aqueous potassium hydroxide (10 g in 10 ml of water) and allowed to stand for 24 hrs. The yellow solid that resulted on acidification with 1:1 hydrochloric acid was filtered and recrystallised from benzene. (M.f. $C_{24}H_{16}O_4Br_2$; m.pt. 180°C; yield *ca.* .75%).

The antimicrobial activity of the bichalcone was assessed by measuring their MIC values for different bacterial and fungal isolates by adopting plate dilution test[6]. Due to solvent inhibitory effect on the fungi and bacteria tested when DMSO was used as solvent control, the bichalcone was converted into its soluble sodium salt in ethanol. Different known concentrations of bichalcone (250 and 500 μg/ml) were prepared from 100 mg of bichalcone in 10 ml of 0.2 M NaOH in ethanol and incroporated in plates of mycological agar. Alcoholic NaOH (2.5%) was used in solvent control plates. 5 μl of the suspensions of bacteria and fungi was inoculated in the bichalcone containing plate, bichalcone free plate and solvent control plate with the help of a micropipette. The plates were incubated for 24 hrs in the case of bacteria and 48 hrs in the case of fungi at room temperature. Phenol (0.5% v/v) and

cycloheximide (0.05% v/v) served as standard antibacterial and antifungal agents. The activity noticed for the bichalcone was comparable to that of standard.

The results are presented in Table 1. It has been found that at a concentration of 500 µg/ml these has been less quantum of growth in all cases of isolates of fungi and gram positive bacteria. But with the following isolates of fungi *Microsporum gypseum, Cladosporium herbarum* and *Aspergillus flavus* and of bacteria *Staphylococcus aureus* and *S. epidermis* complete inhibition of grwoth has been observed.

TABLE 1
ANTIFUNGAL AND ANTIBACTERIAL ACTIVITY OF 2', 4'-DIHYDROXY-5'-(4-BROMO) CINNAMOYL-4-BROMOCHALCONE

S. No.		Myco. Agar	250 ug/ml	500 ug/ml	alc.NaOH 2.5%
	Fungi				
1	*Cryptococcus neoformans*	++	++	+	++
2	*Candida pseudotropicalis*	++	++	+	++
3	*Aspergillus oryzae*	++	++	+	–
4	*Paecilomyces variotii*	++	++	+	++
5	*Cladosporium herbarum*	++	++	–	++
6	*Microsporum gypseum*	++	++	–	–
7	*Asperfillus flavus*	++	++	–	+
	Bacteria	++			
8	*Pseudomonas aeruginose*	++	+	+	++
9	*Staphylococcus sureus*	++	–	–	+
10	*Escherichia coli*	++	+	+	++
11	*Staphylococcus epidermidis*	++	–	–	++

++ = Growth 3–6 mm diameter + = Growth 1–3 mm diameter – = No growth

ACKNOWLEDGEMENTS

The authors are thankful to Dr. J. Rajasekaran, Director Institute of Opthalmology, Joseph Eye Hospital, Tiruchirapalli for providing facilities. One of the authors (VRV) thanks UGC for financial assistance.

REFERENCES

1. S. Ambekar, S.S. Vernakar, S. Acharya and S. Rajagopal, *J. Pharm Phamacol.*, **13**, 698 (1961).
2. E. Schraufstäter and S. Deutsch, A. Naturforsch, **3b**, 163 (1948).
3. Y.B. Vibhute and M.H. Jagdale, Proceedings of the 20th Annual Convention of Chemists (Cuttack) p. 51 (1983).
4. A.S.R. Anjaneyulu, A.V.R. Ramprasad and D.S. Reddi, *Curr. Sci., (India)*, **48**, 300 (1979).
5. A. Balasubramanian and P. Sankaran, *Indian J. Chem.*, **20B**, 989 (1981).
6. R. Cruickshank, J.P. Duguid, B.P. Marmion and R.H.A. Swain, Medical Microbiology Vol. II. 12th Ed., (Churchill Livingstone, Edinburgh) p. 208 (1975).

(Received: 7 November 1989; Accepted: 14 July 1990) AJC-195