SUBSTITUTED HYDRAZODICARBONAMIDINES

As a result of the study of several types of biguanides Rose[1] concluded that a chlorophenyl residue, associated but not necessarily in conjugation with an amidine or extended amidine system, and in a structure that provides

the necessary cationic functions, will more often than not, lead to an active agent. Previously, Thiele[2] had prepared hydrazo-dicarbonamidine nitrate and the base[3] and had suggested that substituted compounds of the same, may be formed by the action of cyanamides on hydrazine.[3] Since hydrazine possesses distinctive physiological properties and some of its derivatives are therapeutic compounds of high stability and low toxicity,[4,5,6,7] and bearing in mind the fact that the amidine systems of themselves have shown high anti-malarial activity,[8] it was thought of interest to synthesise and study the pharmacological action of the substituted hydrazodicarbonamidines.

Accordingly, compounds of the types A and B have been synthesised, by reacting the respective cyanamides, prepared by a modification of Pierron method[9] with hydrazine sulphate, hydrazine hydrate and phenyl hydrazine, in equimolecular proportions in pyridine medium and refluxing over a small flame for 8-10 hours. The compounds in Table I were isolated as their sulphates and were recrystallised from water and those in Table II were isolated as their free bases and were recrystallised from water.

TABLE I

R.NH.C(=NH)-NH.NH-C(=NH)-NH.R .. Type A

S. No.	R	M.P. °C. (Uncorrected)
1	$-C_6H_5$	225
2	$-p$Cl.C_6H_4	183-84
3	$-p$Br.C_6H_4	113
4	$-p$I.C_6H_4	207
5	$-o$.CH_3 C_6H_4	204
6	$-p$$CH_3$·$C_6H_4$	177
7	$-p$$OCH_3$.$C_6H_4$	244 *d.*
8	$-m$$NO_2$.$C_6H_4$	288
9	$-p$.NO_2.C_6H_4	218
10	$-(C_2H_5)_2$	191-192

TABLE II

R.NH.C(=NH).NH.R .. Type B

S. No.	R	R′	M.P. °C. (Uncorrected)
1	$-p$Br.C_6H_4	$-C_6H_5$	151
2	$-p$Br.C_6H_4	-C(=NH).NH.R	175 *d.*
3	$-p$I.C_6H_4	-C(=NH).NH.R	218

The compounds are awaiting pharmacological investigations as possible anti-malarials and full particulars of the present work will be published elsewhere. The authors' thanks are due to Dr. B. H. Iyer for his keen interest in the work.

Dept. of Organic Chem., K. S. SRINIVAS.
Indian Inst. of Science, S. S. GUHA.
Bangalore-3, P. C. GUHA.
October 24, 1952.

1. Rose, F. L., *J.C.S.*, 1951, 2788. 2. Thiele, J., *Ann.*, **270**, 42. 3. —, *Ibid.*, **273**, 143. 4. Merck & Co., U.S. Patent 2,176,063. 5. Dyson, Mason and Renshaw, U.S. Patent 1,673,498. 6. British Dyestuffs Corpn., British Patent 278,037. 7. I. G. Farben industrie A. G., U. S. Patent 2,073,600. 8. Glyn Hughes, F., Lourie, E. M., and Yorke, W., *Ann. trop. Med. Parasit.*, 1938, **32**, 103. 9. Paul Pierron, *Bull. Soc. Chim.*, III, 1906, **35**, 1197.