

which even sex-differentiation has taken place.

A detailed account of the above, a discussion of epidemiological considerations such as the viability of eggs and acanthellæ *in vitro*, the mode and conditions of transmission, the intensity of infections as assessed from the insect-host over a period of many months, and the possibility of other arthropod and vertebrate hosts acquiring the infection will be described in a fuller paper.

I am indebted to Dr. C. P. Gnanamuthu, M.A., D.Sc., F.Z.S., Director, University Zoological Laboratory, Madras, for valuable guidance, and to the Madras University for the award of a studentship.

Univ. Zool. Lab., (MRS.) E. SITA.  
Chepauk, Madras,  
April 28, 1949.

Bhalerao, G. D., *Imp. Council of Agric. Res. Sci., Monograph No. 6*, 1935. 2 Builingame, P. L., and Chandler, A. C., *Amer Journ. Hyg.*, 1941, 33, Secn. D., 1. 3. Grassi, B., and Calundraccio, S., *Journ. Roy. Micr. Soc. Lond.*, 1888, 8, 739. 4. Kates, K. C., *Amer Journ. Vet. Res.*, 1943, 4, 173; 1944, 5, 166. 5. Meyer, A., *Zool. Anz.*, 1931, 93, 163. 6. Moore, D. V., *Journ. Paras.*, 1946, 32(3), 257. 7. Seurat, L. G., *Compt. Rend. Soc. de Biol.*, 1912, 72, 62. 8. Southwell, T., *Journ. Paras.*, 1922 9, 99. 9. Van Cleave, H. J., *Proc. Acad. Nat. Sc. Phila.*, 1925, 76, 279.

#### A MODIFIED METHOD FOR THE ESTERIFICATION OF SOME POLYHYDROXY AROMATIC ACIDS

It is known that esterification of acids can be carried out with alkyl sulphates or alkyl iodides using alkali hydroxide or carbonate in presence of suitable anhydrous solvents. In case of hydroxybenzoic acids, however, it is likely that this method may simultaneously lead to partial etherification also. The Fischer-Speier method using alcohol and concentrated sulphuric or hydrochloric acid also fails in case of some polyhydroxybenzoic acids. Thus, *o*-orsellinic acid has been esterified only by the diazomethane method,<sup>1</sup> and the ethyl ester had not yet been prepared from the acid. *p*-Orsellinic acid has been esterified with diazomethane and also by the action of methyl and ethyl iodides on its silver salt.<sup>2</sup> The usual catalytic method fails in these cases probably because of the ease of decarboxylation of these acids, which may be taking place due to the temperature of the reaction or the presence of the acid.

A new method has now been devised

where the esterification is carried out in a dry medium, using a neutral substance like sodium bicarbonate. By this method the methyl esters of both the orsellinic acids were prepared in high yields by refluxing for ten hours in dry acetone with sodium bicarbonate (1.25 mols.) and dimethyl sulphate (1.25 mols.). Excellent yield of the ethyl esters were obtained by similar method using diethyl sulphate (1.25 mols.) or ethyl iodide (3 mols.). It was also observed that even if excess of alkyl iodide was used, the hydroxy groups were not attacked.

$\alpha$ - and  $\beta$ -resorcylic acids also gave good yields by this method; benzoic acid itself however, gave poor yields.

This new method of esterification is a general one and would be particularly useful for some acids for which the catalytic method cannot be used. It is a good substitute to the diazomethane method having an advantage over it, that it is more simple and that esters other than the methyl can also be prepared. Moreover, it has been found to give good results even with small amount of acids.

A detailed account of the work will be published elsewhere.

Organic Chemistry Labs., P. R. SARAIYA.  
Royal Institute of Science, R. C. SHAH.  
Bombay,  
January 26, 1949.

1. Herzig, Wenzel and Kurzweil, *Monatsh.*, 1903, 24, 895. 2. Robertson and Robinson, *J. Chem. Soc.*, 1929, 2199.

#### SUGARCANE × BAMBOO HYBRIDS

RESEARCH work by Doctors Avdulov and Prat as also by Dr. C. A. Taylor of the Cornell University, Ithaca, New York, would appear to indicate a close relationship between the Bamboo and the Panicoid grasses to which the sugarcane belongs. When the sugarcane bamboo hybrids were first effected by me at Coimbatore in 1936 there were certain Botanists who doubted the possibility. Subsequent work on the Chromosome numbers and the morphological and the histological characters of the F.1 Hybrids at Coimbatore appear to confirm the nature of the hybrids. In the work mentioned above there is further confirmation of the possibility of hybridisation between the above two widely different genera of plants.

T. Nagar, T. S. VENKATARAMAN.  
Madras,  
May 30, 1949.