TABLE I

Name of bacteria	Minimum inhibitory concentration in μg/ml I	II	III
1. *Bacillus mycoides*	64	>100	>100
2. *Bacillus subtilis*	32	>100	>100
3. *Escherichia coli*	250	>100	>100
4. *Klebsiella pneumoniae*	64	25	>100
5. *Pseudomonas aeruginosa*	250	>100	>100
6. *Staphylococcus aureus**	4	3·125	25
7. *Streptococcus faecalis*	**	25	>100

* In the present study, the bacteria used were resistant to 2500 units penicillin/ml.

** Not tested.

Experimental Part

Nordrosophilin A, II: It had been prepared earlier by the reaction of *p*-benzoquinone with excess of HCl (10 molar equivalents) and hydrogen peroxide[7], and subsequent reduction of the resulting 2,3,5,6-tetrachloro-*p*-benzoquinone (chloranil) with zinc dust and HCl[3]. However, the use of a limited amount of HCl (5 molar equivalents) in the first reaction is now found to give good yields of 2,5-dichloro-*p*-benzoquinone which could further undergo 1,4 addition of HCl in a separate step to afford the desired product directly. This procedure has thus eliminated the reduction step in the old synthesis and splits the first reaction itself into two steps. The first step uses HCl along with H_2O_2 and the second one only HCl.

Methyl Drosophilin A (III) was made earlier[3] by methylation of the above compound II with CH_2N_2. We have used now dimethyl sulphate (2 molar equivalents) in the presence of potassium carbonate and acetone. The product crystallised from petroleum ether as colourless needles, m.p. 166–67° (Lit.[3] m.p. 164–65°).

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CYCLISATION OF *o* HYDROXYDIBENZOYLMETHANES TO FLAVONES : USE OF *p*-TOLUENE SULPHONIC ACID

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ONE of the important steps in the synthesis of flavones by Baker–Venkataraman rearrangement[1,2] of *o*-aroyloxyacetophenones is the cyclisation of the key intermediates, *o*-hydroxydibenzoylmethanes. A large number of reagents have been used for this step, most important amongst which are sulphuric acid[2], acetic acid-hydrochloric acid mixture[1], acetic acid-sodium acetate[1], potassium carbonate[4] (aqueous as well as in anhydrous acetone). During an attempt to synthesise 7-methoxy and 5,7-dimethoxy flavones, required for our work, by the cyclisation of the corresponding *o*-hydroxydibenzoylmethanes using the above mentioned reagents, we found that the yields were rather poor and the products lacked homogeneity on TLC.

We have now observed that the cyclisation of *o*-hydroxydibenzoylmethanes can be conveniently carried out by refluxing them in benzene solution with *p*-toluene sulphonic acid and distilling off water from the reaction mixture azeotropically. Excess *p*-toluene sulphonic acid was later extracted from the reaction mixture with aqueous sodium bicarbonate and benzene residue dried over phosphorus pentoxide in a vacuum desiccator. Crystallisation of the dried residue from ethyl acetate-light petroleum or benzene-light petroleum afforded the desired flavones in quantitative yields.

Following this procedure, 7-methoxyflavone, m.p. 110°, lit.[5] m.p. 110°; 7,4'-dimethoxyflavone, m.p. 143–44°, lit.[6], m.p. 144–6°; 5,7-dimethoxyflavone, m.p.

139–141°, lit.[7] m.p. 142–43°; 5,7,4′-trimethoxyflavone, m.p. 154–55°, lit.[5] m.p. 156° and 7,8,4′-trimethoxyflavone, m.p. 192–4°, lit.[8] m.p. 189–90°, have been synthesised from the corresponding dibenzoylmethanes. The structures of these compounds have further been confirmed by NMR.

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OCCURRENCE OF PSEUDO-MUDCRACKS IN TALCHIR SEDIMENTS, NEAR AMBIKAPUR, MADHYA PRADESH

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During the course of geological investigation on Talchir sediments near Ambikapur, Madhya Pradesh, the authors recorded the occurrence of pseudo-mudcracks, a rarely found sedimentary structure. In geological literature, the same structure was described by Dzulynski and Walton[1] as a characteristic feature of flysch deposits, occurring in the form of a network of short dykes penetrating upwards into finely laminated, fine grained sediments. In India, except for the reported occurrence of one from flysch deposits of Aravalli supergroup[2], there seems to be no record of this structure. The present paper reports, for the first time, the occurrence of pseudo-mudcracks from the Gondwana rocks.

The pseudo-mudcracks are found in thinly laminated sandstone-shale sequence of Talchir Formation exposed on the right bank of Gungata river about 300 meters downstream from the bridge on Ambikapur–Darima Road. The structure occurs in the form of a network of small ridges penetrating upwards into dark coloured shales from the underlying sandstone layer. In plan, these dykelets show an incomplete polygonal pattern and, therefore, on exposure they may be mistaken for true mudcracks (Fig. 1). The maximum measurements of their length, width and hight are 10 cm, 1 cm and 0·5 cm respectively. In true mudcracks it is generally found that the fractures are always vertical to the bedding plane and their width gradually decreases downward. In the present case, the small dykelets always penetrate into upper shale layer with an angle ranging from 20° to 45° and their width decreases upward; therefore show a pattern reverse to that of true mudcracks (Fig. 2).

The formation of pseudo-mudcracks has been explained in two ways[1]. First, by horizontal expansion of liquefied sandy layer without comparable expansion of fine-grained shale bed, and second, directly by the action of earthquake shocks coupled with transient liquefaction of sand. Sharma *et al.*[2] while describing a similar structure from Aravalli flyschs, have suggested even the liquefaction of sandy layer as a result of seismic shocks. In the present case the inclined penetration and upward tapering of small ridges are the evidence which indicates the

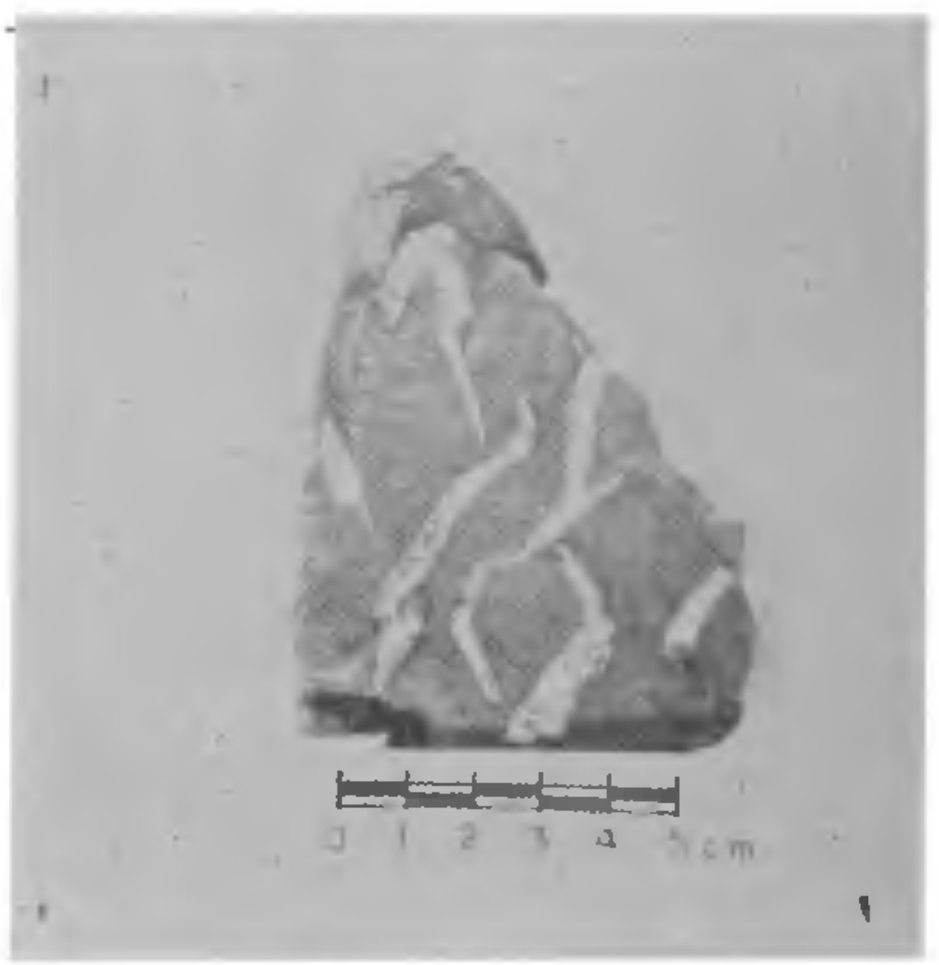

Fig. 1. Pseudo-mudcracks showing incomplete polygonal shape, Gungata river, M.P.

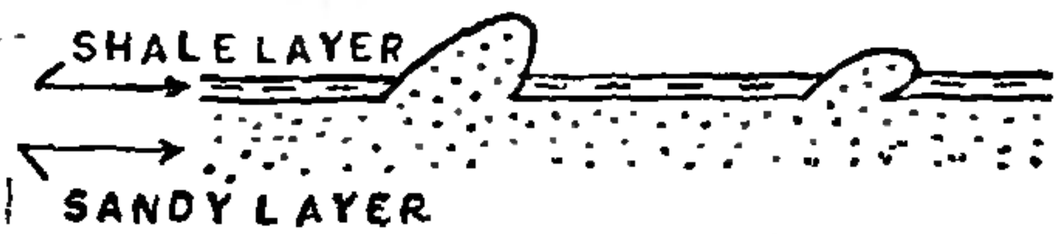

Fig. 2. Pseudo-mudcracks in section, note the upward penetration of sandy dykelets.