

5, 7, 8, 3'-Tetramethoxy-4'-hydroxyflavone (III)

A solution of the benzyloxytetramethoxyflavone (II) (0.7 g) in ethyl acetate (80 ml) was treated with Pd-C (0.4 g) and then stirred in an atmosphere of hydrogen till absorption completed. The catalyst was filtered out. Removal of the solvent from the filtrate gave hydroxytetramethoxyflavone (III) which crystallised from benzene as colourless needles (0.3 g), m.p. 222° and analysed for C₁₉H₁₈O₇.

5, 4'-Dihydroxy-7, 8, 3'-trimethoxyflavone (I)

A solution of the monohydroxytetramethoxyflavone (II) (0.2 g) in acetonitrile (15 ml) was treated with anhydrous aluminium chloride (0.2 g) and then refluxed for 4 hr., and the solvent was distilled off under reduced pressure. On acidification with hydrochloric acid, the demethylation product was obtained as yellow solid which was filtered, washed and dried. It crystallised from ethyl acetate to give 5, 4'-dihydroxy 6, 7, 3'-trimethoxyflavone (I) as light yellow needles, m.p. 235-37°, analysed for C₁₈H₁₆O₇ and gave positive ferric reaction. The melting point and UV spectral data observed for the synthetic sample was significantly different from those reported¹ for the natural sample. I.R. (KBr) 3185, 1667, 1600, 1550, 1506, 1429, 1370, 1333, 1304, 1263, 1227, 1208, 1183, 1130, 1020, 962, 858, 808 cm⁻¹.

5, 4'-Diacetoxy-7, 8, 3'-trimethoxyflavone (IV)

The dihydroxytrimethoxyflavone (I) (0.04 g) was treated with acetic anhydride (1.00 ml) and pyridine (0.50 ml), warmed in a water bath to obtain a clear solution and then left overnight. It was treated with ice and the acetate (IV) thus obtained was filtered, washed and dried. The acetate (IV) crystallised from ethyl acetate-petroleum ether as colourless microprisms, m.p. 180-81°. It analysed for C₂₂H₂₀O₉. NMR (δ, CDCl₃, TMS as internal standard): 2.33 (3H, s, C₆-OCOCH₃), 2.42 (3H, s, C₈-OCOCH₃), 3.96 (9H, s, 3X - OCH₃), 6.56 (1H, s, C₅-H), 6.60 (1H, s, C₆-H), 7.23 (1H, d, J = 9Hz, C_{5'}-H), 7.46 (2H, m, C₇-H and C₈-H).

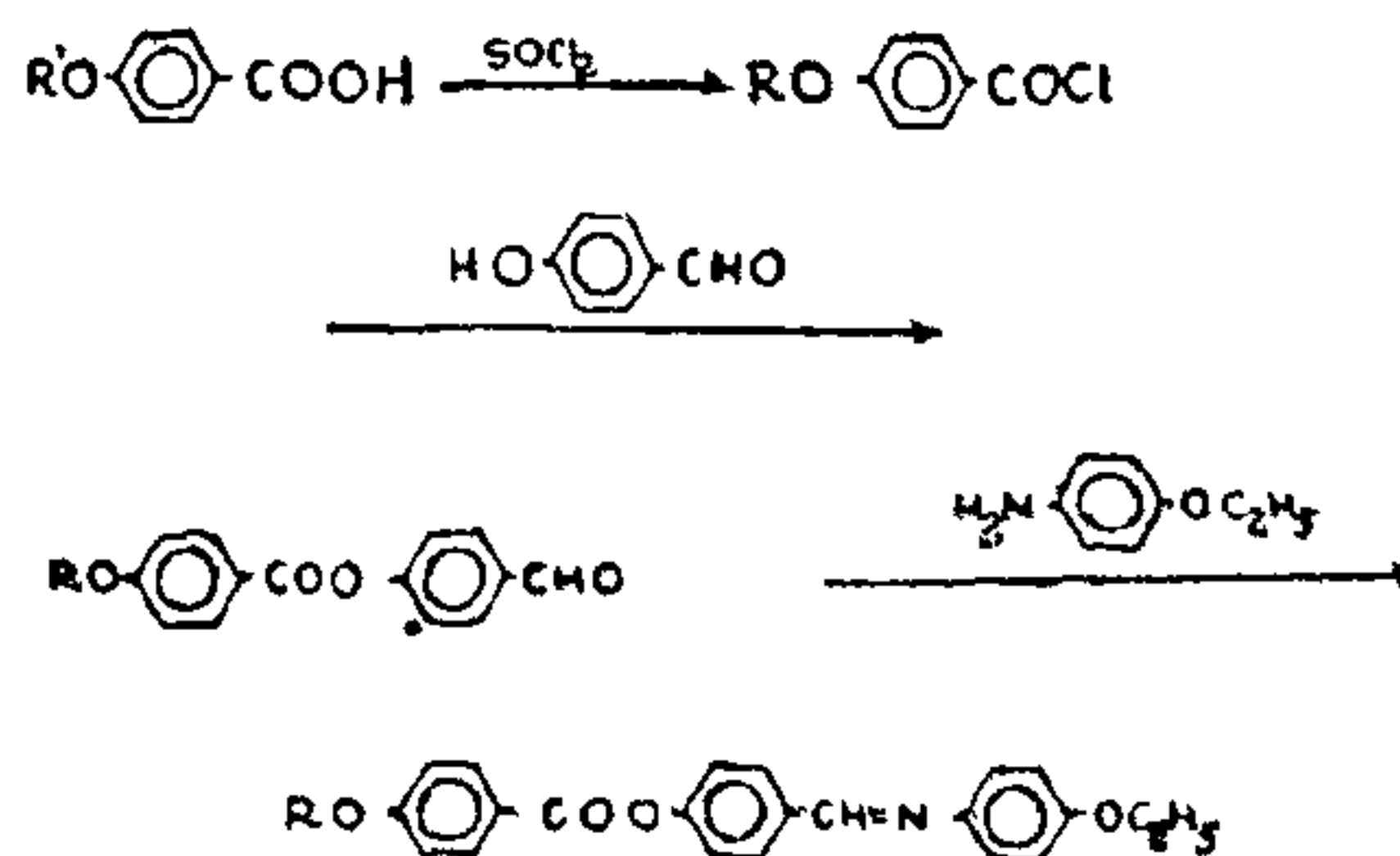
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MESOMORPHIC BEHAVIOUR OF SOME SCHIFF BASE ESTERS: *p*(*p'*-*n*-ALKOXYBENZOYLOXY) BENZYLIDENE-*p''*-PHENETIDINES

A NUMBER of mesomorphic substances are synthesized having different functional groups and molecular geometry. Most of these are Schiff bases, acids, and esters. Comparatively a few mesomorphic homologous series comprising both an ester linkage (-COO-) and an azomethine (-CH=CH-) group in the same molecule have been studied. Dave and Patel¹ and Fishel and Patel² studied the homologous series of Schiff base aliphatic esters. Gray and Harrison³ studied different *p*-substituted benzylideneamino-cinnamates of alkyl and aryl esters. These exhibit smectic and nematic mesophases. Dave and Kurian⁴ have recently studied the mesomorphic homologous series *p*(*p'*-*n*-alkoxybenzoyloxy) benzylidene-*p''*-anisidines and *p*(*p'*-*n*-alkoxybenzoyloxy) benzylidene-*p''*-toluidines. These exhibit smectic and nematic mesophases with good phase length. A change in molecular structure may bring about an appreciable change in the general mesomorphic behaviour. To further investigate the effect of change in molecular structure we have studied the mesomorphic behaviour of some compounds of the series, *p*(*p'*-*n*-alkoxybenzoyloxy) benzylidene-*p''*-phenetidines. These compounds are prepared by the following synthetic route.



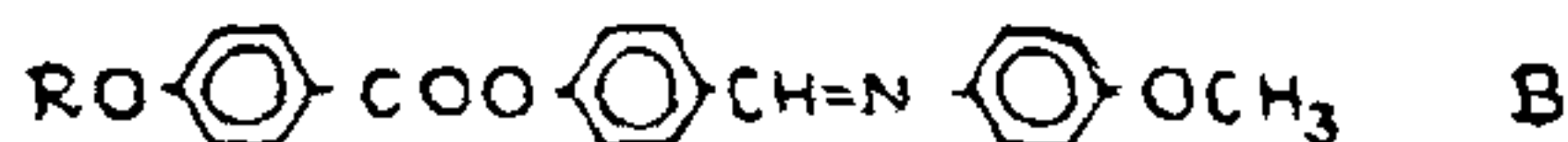
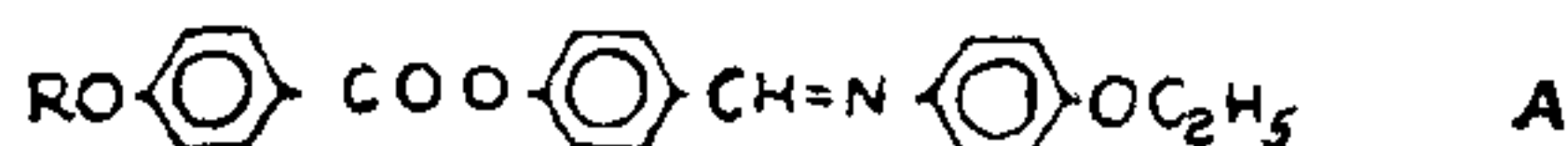
The mesomorphic properties of these compounds have been investigated with a Leitz Ortholux Polarizing Microscope equipped with Leitz heating stage. The melting points and the transition temperatures of these compounds are compiled in the table. The

TABLE

p(*p'*-*n*-alkoxybenzoyloxy) benzylidene-*p''*-phenetidines

Compound No.	Alkyl group R	Transition temperature (°C)		
		Smectic	Nematic	Isotropic
1	C ₁₀ H ₂₁	110.5	113.5	233.0
2	C ₁₁ H ₂₃	104.5	133.0	219.0
3	C ₁₁ H ₂₃	102.5	148.0	210.5
4	C ₁₄ H ₂₉	103.0	157.0	203.0
5	C ₁₆ H ₃₇	102.0	160.0	192.5

elemental analysis for C, H and N for these compounds agree well with their calculated values.



All the five compounds exhibit enantiotropic smectic and nematic mesomorphism. The smectic phase has focal conic or schlieren texture and the nematic phase has a threaded texture. The octadecyl derivative shows homeotropic texture in the smectic phase, both while heating as well as on cooling.

The compounds studied here (A) are thermally more stable than those of the corresponding compounds of the series (B) *p* (*p'*-*n*-alkoxybenzoyloxy) benzylidene-*p'*-anisidines studied by Dave and Kurian⁴. This is not surprising as the even members in the alkoxy chain in a homologous series occupy the upper curve. Further, the thermal efficiency order for the end groups observed by Dave *et al.* in their study of mixed liquid crystals in the nematic mesophase is as $\text{OC}_2\text{H}_5 > \text{OCH}_3$ ⁵. It is also observed that in the present case (A) the commencement of the smectic phase is enhanced by one member compared to the corresponding compounds of series (B). Such a behaviour is observed by Dave and Patel¹, in their study of *p*-*n*-alkoxybenzylidene-*p'*-*n*-alkoxyanilines series.

Further work with different substituted anilines is in progress.

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LIVING BENTHONIC FORAMINIFERA FROM THE INNERSHELF SEDIMENTS AT VISAKHAPATNAM

THERE have been a few studies on the living foraminifera from the estuaries of the east coast of India¹⁻³. There are reports of foraminiferal thanatocoenoses from the beach and shelf sediments off the east coast of India⁴⁻⁷. There is virtually no information on the living foraminifera from the eastern shelf of the Indian subcontinent. It is the purpose of this note to report on the foraminiferal biocoenoses from the innershelf sediments off Visakhapatnam, east coast of India.

Sediment samples were collected in February, 1974 in the vicinity of Visakhapatnam from depths of water ranging from 10-90 metres. The samples were preserved in neutralized formalin. They were subsequently wet sieved through a screen having openings of 0.063 mm. The residues were stained with rose Bengal and dried. The foraminifera were concentrated from the residues by the carbon tetrachloride method of separation.

A total of 133 foraminiferal species were identified, which are grouped under 26 families. Of these, the following 38 species were recognized in living condition at the time of sample collection :

Ammonia annectens (Parker and Jones), **A. beccarii* (Linné), **A. dentatus* (Parker and Jones), **Asterorotalia trispinosa* (Thalman), ***Bolivina compacta* Sidebottom, *B. lobatum* Brady, **B. spathulata* (Williamson) ***B. striatula* Cushman, ***B. vadescens* Cushman, *Bulimina marginata* d'Orbigny, ***Cancris sagra* d'Orbigny, ***Cibicides lobatulus* (Walker and Jacob), *Cyclogyra* (*Cornuspira*) *planorbis* (Schultz), *Elphidium advenum* Cushman, *E. crispum* (Linné), *Fissurina laevigata* Reuss, *F. orbignyana* Sequenza, *Flintina bradyana* Cushman, ***Florilus labradoricus* Dawson, **Gyroidina soldani* d'Orbigny, **Hanzawaia concentrica* (Cushman), *Lugena laevis* (Montagu), *L. striata* (d'Orbigny), *L. sulcata* (d'Orbigny), *Neoconorbina patelliformis* (Brady), *Nodosaria catsbyi* d'Orbigny, ***Nonion grateloupi* (d'Orbigny), **Nonionella turgida* (Williamson), *Pararotalia nipponica* (Asano), **Pseudoepionides japonicus* Uchio, *Quinqueloculina lamarckiana* d'Orbigny, **Q. seminulum* (Linné), *Spiroloculina clara* Cushman, *Textularia agglutinans* d'Orbigny, *T. conica* d'Orbigny, *Triloculina trigonuta* (Lamarck), *T. tricarinata* d'Orbigny *Trochammina* sp.

The 9 living species marked with an asterisk are abundant in one sample or another. The 7 species marked with a double asterisk are not only abundant but widespread in the area. In the entire area of study the dead populations far exceed the living.