

reliable correlation by ^1H NMR alone and is most useful in combination with ^{13}C NMR (CMR) data^{4,5}.

The CMR spectrum of the disaccharides in DMSO-d_6 reveals significant difference in the absorption frequency of C_2 and C_6 of glucose and C_6 of rhamnose (C_6) in neohesperidose ($\text{C}_2: \delta \approx 77.3$; $\text{C}_6 \approx 61$; $\text{C}_6' \approx 20.9$) and rutinose ($\text{C}_2 \approx 73.5$; $\text{C}_6 \approx 66.5$; $\text{C}_6' \approx 18$). There is no record of CMR spectra of acetyl derivatives of neohesperidosides, though the preparation is easy and the acetate can be dissolved in less costly CDCl_3 for the spectral measurements. In view of this and as part of our work in determining the nature of the disaccharide of a new natural product⁶, we obtained the CMR spectra of peracetate of scutellarein 7-rhamno glucoside and peracetate of naringin (a neohesperidoside) and compared with the spectrum⁷ of peracetate of diosmin (a rutinoid). These spectra gave evidence that the absorption frequency of C_2 and C_6 of glucose in peracetate of neohesperidose ($\text{C}_2 \approx 71.2$; $\text{C}_6 \approx 62.2$) and rutinose ($\text{C}_2 \approx 72.4$; $\text{C}_6 \approx 66.2$) were comparable with those in the underivatized compounds (after allowing shift⁸ due to OAc group) whereas the frequency of the rhamnose CH_3 (C_6') was found to be considerably increased (δ , 17.50) in neohesperidoside and very close to that (δ , 17.60) in rutinoid; the assignment of the signal confirmed by the peak multiplicity (q). The upfield shift of C_6 of rhamnose in peracetate of neohesperidoside is unexplainable as there is no acetyl group attached to its ortho carbon. There is, as expected, no difference in the frequency of C_6 of rhamnose in peracetate of rutinoid. The frequency of C_6 of rhamnose in naringin (δ , 17.8), reported recently⁹ is same as that in peracetate. Thus, in CMR differentiation of neohesperidoside and rutinoid reliance can be placed on the frequency of C_2 and C_6 of glucose and not on C_6 of rhamnose. The CMR spectrum of the disaccharide in DMSO-d_6 or that of its peracetate in CDCl_3 is of equal utility and hence the latter is considered preferable from economic point of view.

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1. Harborne, J. B., *Comparative Biochemistry of Flavonoids*, Academic Press, 1967.

2. Tiwari, K. P. and Minocha, P. K., *Phytochemistry*, 1980, **19**, 2501.
3. Mabry, T. J., Markham, K. R. and Thomas, M. B., *Systematic Identification of Flavonoids*, Springer Verlag, 1970.
4. Chari, V. M., Wagner, H. and Neszmelyi, A., in *Flavonoids and Bioflavonoids, Current Research Trends*, Farkas, L., Gabor, M. and Kallay, F., Elsevier Sci. Pub. Co., 1977, p. 49.
5. Markham, K. R., Ternai, B., Stanley, R., Geiger, H. and Mabry, T. J., *Phytochemistry*, 1978, **34**, 1389.
6. Nair, A. G. R. and Gunasegaran, R., *Indian J. Chem.*, 1982, **21B**, 1135.
7. Alvarez, M. C. G., Rabnal, M., Rodriguez, B. and Savona, G., *An. Quim.*, 1982, **78C**, 271.
8. Ina, H. and Iida, I., *Phytochemistry*, 1981, **20**, 1176.
9. Markham, K. R. and Chari, V. M., in *The Flavonoids, Advances in Research*, Harborne, J. B. and Mabry, T. J., Chapman and Hall, 1982, p. 19.

MINI COLUMNAR JOINTS IN BASALTS, OF KODALI VILLAGE, MAHARASHTRA.

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MINI Columnar Joints are exposed in Basalts West of Kodali village (North Latitude $15^\circ 47' 30''$ and East Longitude $74^\circ 10' 40''$). Columnar joints have got exposed during excavation connected with the Tilari hydroelectric dam project.

The basalts belong to Deccan trap period and consist of massive compact flows followed by basalts showing columnar joints. The columnar basalt is about 1 m thick and extends over an exposed length of about 30 m. The most striking character is the development of countless vertical small columns, unlike the more common wide columns described in literature like the Giant's Causeway Co. Antrim, Fingal's Cave Island Staff, St. Mary Island off Malpe Coast, Karnataka, and Andheri Columnar basalts, Bombay. The vertical columns are broken up by many horizontal cross joints. Each column is 1 cm wide. As far as the authors are aware such fine columnar joints have not been so far reported from the Deccan basalt terrain and hence attention is drawn to this occurrence.