

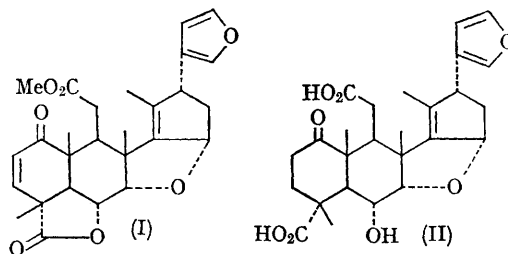
Chemistry of the Meliacins (Limonoids). The Structure of Nimbolide, a New Meliacin from *Azadirachta indica*

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EXTENDING our studies¹ of the family Meliaceae we have now begun to examine the constituents of other parts of the plants besides the timbers. *Azadirachta indica* (synonymous² with *Melia azadirachta* and *M. indica*) is of Indian origin but is now naturalised in Nigeria where it is widely planted as an ornamental tree and a medicinal plant. From Indian samples was obtained the c-secomeliacin, nimbin, said to occur in all parts of the plant.³ Extraction of the fresh leaves of Nigerian samples with petroleum spirit has yielded a new meliacin, nimbolide, $C_{27}H_{30}O_7$ (M^+ 466), m.p. 245–247°, $[\alpha]_D + 206^\circ$. Its n.m.r. spectrum is very similar to that of nimbin except that the signals are better resolved, and it indicates only one methoxycarbonyl group and no acetoxy-group. Its i.r. spectrum shows carbonyl absorptions at 1665 (cyclohexenone), 1720 (CO_2Me), and 1770 cm^{-1} ; the last we assign to a γ -lactone. These facts indicate the structure (I) for nimbolide. This was confirmed by partial hydrogenation to a

noncrystalline dihydro-derivative which was hydrolysed with dilute alkali to give deacetyl-dihydronimbinic acid (II), the properties of which were identical with those reported in the literature⁴ {m.p. 192–194°; $[\alpha]_D + 217^\circ$ (pyridine)}. The constituents of the other parts of the tree are being investigated and will be reported in the full Paper.



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¹ C. W. L. Bevan, D. E. U. Ekong, and D. A. H. Taylor, *Nature*, 1965, **206**; 1323; C. W. L. Bevan, D. E. U. Ekong, T. G. Halsall, and P. Toft, *J. Chem. Soc. (C)*, 1967, 820 and preceding Papers.

² See H. Harms in "Die natürlichen Pflanzenfamilie", vol. 19B, I, ed. A. Engler and K. Prantl, Duncker and Humboldt, Berlin, 1940, p. 102.

³ C. R. Narayanan, R. V. Pachapurkar, S. K. Pradhan, V. R. Shah, and N. S. Narasimhan, *Chem. and Ind.*, 1964, 322; S. Siddiqui, *Current Sci.*, 1942, **11**, 278; C. Mitra, *J. Sci. Ind. Res., India*, 1956, **15B**, 425.

⁴ P. Sengupta, S. K. Sengupta, and H. N. Khastgir, *Tetrahedron*, 1960, **11**, 67.