The Structure of a New Macrolide Antibiotic, YC-17

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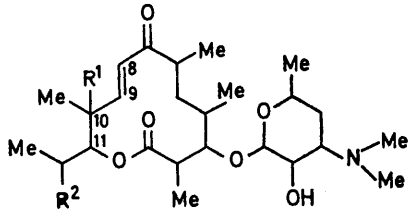
Summary A new macrolide antibiotic YC-17 has been identified as 10-deoxymethymycin (I) and its structure elucidated.

WE have isolated a new macrolide antibiotic YC-17(I) from the early culture filtrate of *Streptomyces venezuelae* MCRL



(I; R^1 = H, R^2 = H)

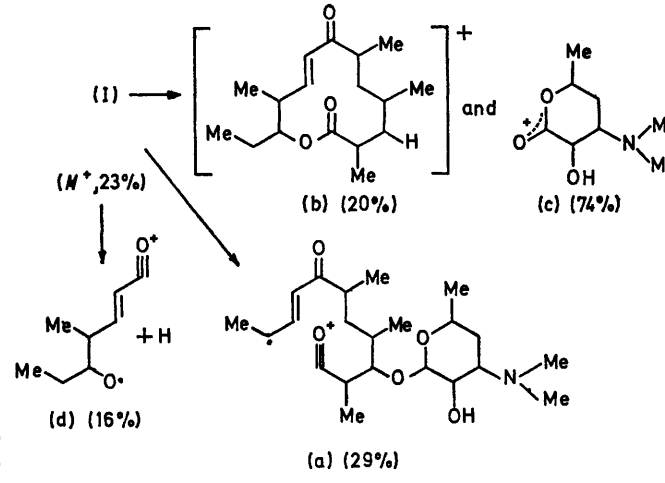
(II; R^1 = OH, R^2 = H)

(III; R^1 = H, R^2 = OH)

0376. The antibiotic was obtained together with two other known antibiotics methymycin (II)[1] and neomethymycin (III).[2] It showed antibiotic activity against Gram-positive bacteria.

The spectra of YC-17, $C_{25}H_{43}NO_6$ (M^+, *m/e* 453·3048), m.p. 68—70°, $[\alpha]_D^{22}$ + 84° (*c* 1, $CHCl_3$), +71·8° (*c* 1, MeOH), were λ_{max} (EtOH) 225—6 (ε 10,300) and 285 nm (457) indicating a $\alpha\beta$-unsaturated ketone, and ν_{max} 3420 (OH), 1730 (lactone and carbonyl), 1695 (conjugated ketone), and 1635 (conjugated double bond) suggest a structural similarity to methymycin (II). The n.m.r. spectrum shows one-N-$(CH_3)_2$ and six C-CH_3 groups. The doublet (8-H, *J* 16 Hz) at 6·40 p.p.m. and the double doublet (9-H, *J* 16, 4·5 Hz) at 6·82 p.p.m. in the olefinic region suggests the partial structure (–CO–CH=CH–CH<), and the broad triplet at 4·98 p.p.m. was assigned to the methine proton at C-11.

On acetylation the i.r. absorption at 3420 cm^{-1} disappeared and the formation of new acetyl methyl protons was observed in n.m.r. confirming the presence of an OH group.



SCHEME. *Fragmentation pattern of* (I).

TABLE. *Peaks at high resolution for* (I)

m/e	Observed	Calculated	$\Delta m \times 10^{-3}$	Composition	
453	453·3048	453·3087	−3·9	$C_{25}H_{43}NO_6$	(I)
395	395·2694	395·2669	2·5	$C_{22}H_{37}NO_5$	(a)
279	279·1940	279·1960	−2·0	$C_{17}H_{27}O_3$	(b)
174	174·1129	174·1128	0·1	$C_8H_{16}NO_3$	(c)
141	141·0892	141·0916	−2·4	$C_8H_{13}O_2$	(d)

We concluded that YC-17 had the structure 10-deoxymethymycin (I).

The high resolution mass spectrometry fragmentation pattern (Scheme) supports structure (I) and so do the accurate mass units of predominant peaks (Table).

The structural difference between (I) and (II) (at C-10) is analogous to the difference between narbomycin[3] and picromycin.[4] Since picromycin is formed biogenetically directly from narbomycin,[5] (I) should be regarded as a biosynthetic precursor of (II).

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