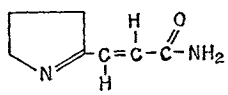
IDENTITY OF DESDANINE PYRACRIMYCIN A AND CYCLAMIDOMYCIN

Sir:

Desdanine, ethesdanine and desdamethine are three antibiotics produced by *Stretomyces caelestis* grown in a medium supplemented with methionine, S-methyl cysteine or S-ethyl cysteine. The isolation of these antibacterial agents was reported by MEYER and MASON in 1965[1]. Subsequently, M. E. BERGY[2] isolated desdanine from fermentation of *Streptomyces desdanus* grown in a complex medium, without supplementation of specific sulfur compounds. Identity of desdanine produced by *S. caelestis* to that produced by *S. desdanus* was established by comparison of ir, nmr and mass spectra as well as potentiometric titration and analytical data.

In 1971, CORONELLI and his co-workers[3] reported the isolation of pyracrimycin A from fermentations of *Streptomyces eridani* and subsequently established[4] the structure of the antibiotic presented by I (Fig. 1).

Fig. 1.



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Later in 1971, TAKAHASHI *et al.* reported the isolation and structure of cyclamidomycin[5] and concluded that pyracrimycin A and cyclamidomycin are identical. This coummunication presents evidence indicating that pyracrimycin A and therefore, cyclamidomycin are identical to desdanine.

As shown in Table 1 the reported analytical data, molecular weights, molecular formulas, ultraviolet spectra, potentiometric titration, equivalent weights and melting points for pyracrimycin A and cyclamidomycin are the same (within experimental variation) with those reported for desdanine. In addition the ir spectra of desdanine (Fig. 2, Ref. 1), pyracrimycin A (Fig. 2, Ref. 3) and cyclamidomycin (Fig. 1, Ref. 5) are almost identical. Furthermore all three antibiotics have similar antibacterial spectra, being active against both Gram-positive and Gram-negative organisms.

In addition to the properties already reported by MEYER and MASON desdanine has nmr (dimethyl-d_6-sulfoxide) and mass spectra identical to those of pyracrimycin A[4]. The mass spectra of both antibiotics (Fig. 2 and Fig. 1, Ref. 4) show a molecular ion peak at 138 mass units ($C_7H_{10}N_2O$) and also ion peaks at 121(C_7H_7NO), 110($C_5H_6N_2O$), 94 (C_6H_8N), 82 and 55 mass units. The nmr spectrum of desdanine (Fig. 3) is identical to that reported for pyracrimycin A (Fig. 3, Ref. 4). Specifically a multiplet at δ 1.90 and two triplets at δ 2.65 and 3.92 are

Fig. 2. Mass spectrum of desdanine.

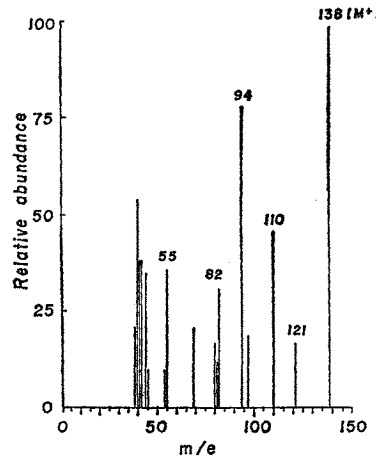
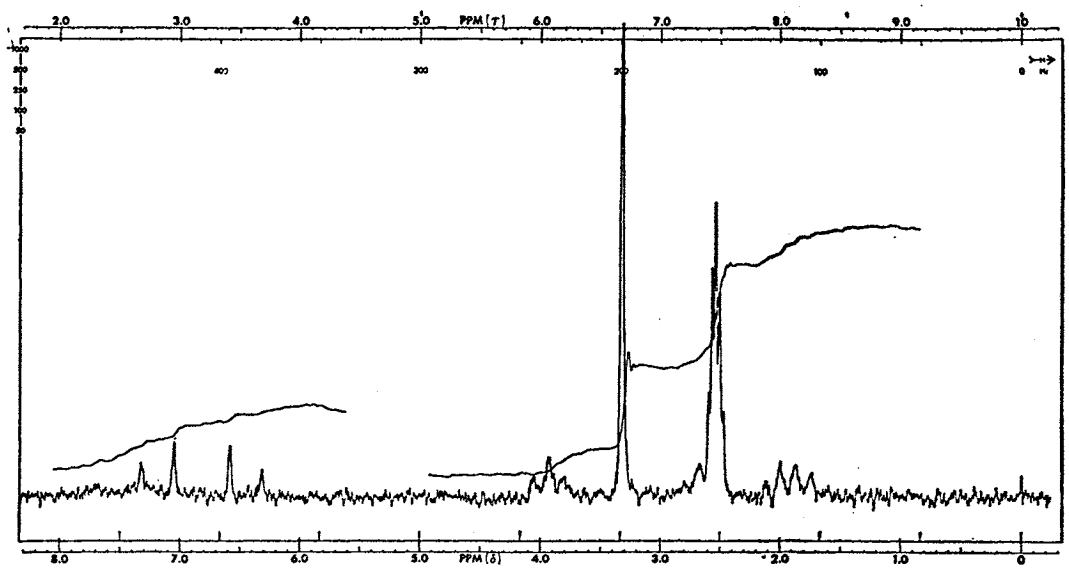


Table 1.

Anal.	Reported data for		
	Desdanine[1]	Pyracrimycin[2]	Cyclamidomycin[3]
C	60.83	60.99	59.76
H	7.30	7.50	7.32
N	20.29	20.20	19.74
Mol. weight	138	—	138.08
Mol. formula	$C_7H_{10}N_2O$	$C_7H_{10}N_2O$	$C_7H_{10}N_2O$
UV (λ_{max}, nm)[4]	237	235	238
pKa′	6.7[5]	slightly basic (5.4)[6]	5.7
Eq. weight	138	—	138
Melt. point	212°C (dec.)	215~216°C	215~217°C (dec.)

1) Ref. 1; 2) Ref. 3; 3) Ref. 5; 4) U.V. spectrum of desdanine was obtained in 0.1 N aq. HCl; U.V. of pyracrimycin A was determined in methanol. 5) Material was dissolved in 0.1 N aq. HCl and this solution was titrated with aq. KOH. 6) Determined in water-MCS (1:4) with 0.1 N HCl (4).

Fig. 3. NMR spectrum of desdanine in DMSO-D_6.



assigned to the $-CH_2CH_2CH_2-$ present in structure I. Two doublets at δ 6.44 and 7.20, with the same coupling constants (J=16.0 Hz), are due to the two *trans* hydrogens on the conjugated C=C system. The primary amide hydrogens appear as broad signals at δ 7.2 to 7.7. These nmr assignments agree with those proposed by CORONELLI *et al.*[4], for pyracrimycin A.

Furthermore the results we have obtained on our studies on the structure of desdanine agree with CORONELLI's work on the structure of pyracrimycin A[4]. Our studies will be reported in a later communication concerned with the structures of desdamethine and ethesdanine, the two other antibiotics produced by *S. caelestis*[1].

We therefore conclude that pyracrimycin A and cyclamidomycin are identical to desdanine. Since desdanine was reported at least 5 years prior to the CORONELLI *et al.* report[3], let alone the TAKAHASHI *et al.* paper[5], the name desdanine should take precedence in future communications relating to this antibiotic.

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