Communications to the editors

PARTIAL STRUCTURE OF THE EUROCIDIN COMPLEX

Sir:

Eurocidin (I)* is an amphoteric glyconic pentaene macrolide antibiotic produced by *Streptomyces albireticuli*[1]. We wish to report here the structural study on I showing it to be a mixture of two pentaene antibiotics, eurocidins A and B.

In a countercurrent distribution experiment, it was detected in a single band (pyridine - ethyl acetate - water, 3.5:6.5:8.3, K=0.82) and isolated as a white or cream-colored crystalline compound; $\lambda_{max}^{80\%\ MeOH}$ 350, 332, 318 and 304 mμ, ν_{max}^{KBr} 1710 cm^{-1} (macrolide), pKa 5.8 (-COOH) and 9.0 ($-NH_2$) in 66 % dimethylformamide.

Refluxing of I with ethanol-hydrochloric acid gave the crystalline ethylglycoside of an aminosugar which was identical with mycosamine (II) obtained from tetrin[2] and candimycin A**.

Treatment of I with alkali gave a hexaene aldehyde*** (III) by retroaldolization followed by β-elimination; $\lambda_{max}^{dioxane}$ 395 mμ ($E_{1cm}^{1\%}$ 2,400) and 285 mμ ($E_{1cm}^{1\%}$ 235), ν_{max}^{KBr} 1672, 1612 and 1562 cm^{-1}, δ ($CDCl_3$): ~6.3 (CH=CH-) and 9.84 (d, J=8 Hz, aldehyde). On treatment with sodium borohydride, I did not show the retroaldolization.

Ozonolysis of III gave the steam-volatile aldehyde which was isolated as a crystalline

Chart 1

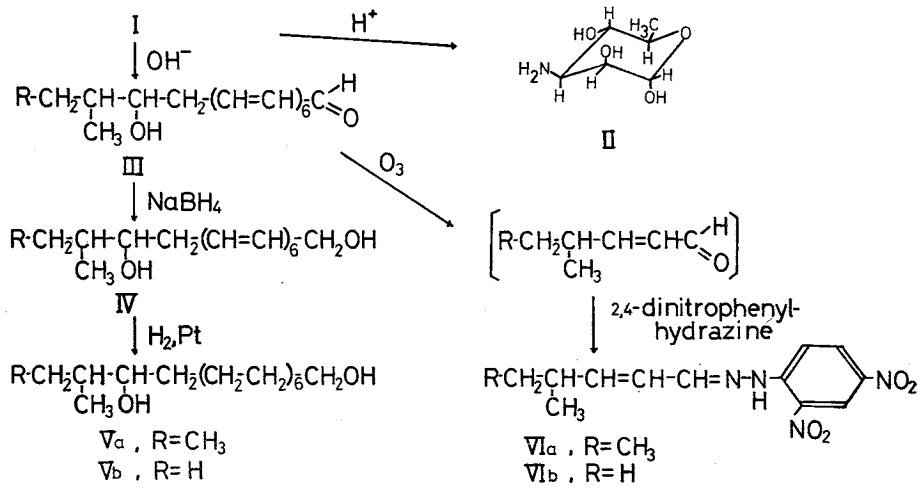
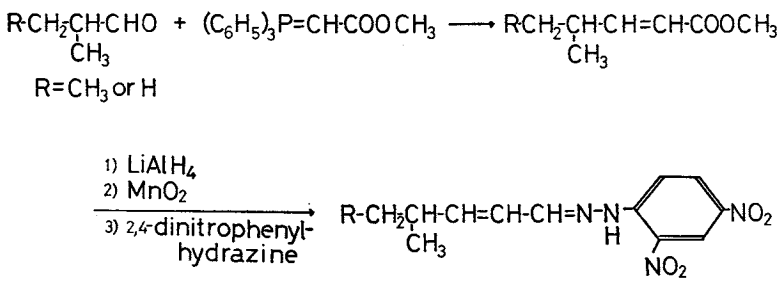


Chart 2

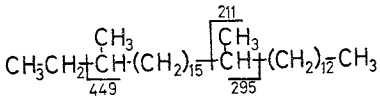


* In this report, "eurocidin" refers to the mixture of eurocidins A and B.

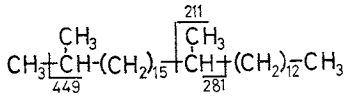
** Candimycin A is a new member of heptaene macrolide antifungal antibiotics which yield *p*-N-methylaminoacetophenone by retroaldolization[3].

*** Satisfactory elemental analyses were obtained for the degradation compounds assuming these to be a mixture (R=CH_3 and H).

Chart 3

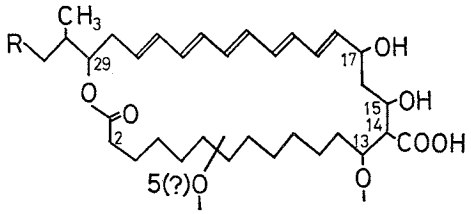


VIIa



VIIb

Chart 4



VIIIa , R=CH_3
VIIIb , R=H

2,4-dinitrophenylhydrazone (DNPH). Its UV spectrum, $\lambda_{max}^{CHCl_3}$ 375 mμ ($E_{1cm}^{1\%}$ 1,020), was likely due to an R-CH=CH-CH=N-NH-C_6H_3-$(NO_2)_2$ system.

In the mass spectrum of this DNPH derivative, the presence of a peak 14 mass units below the highest mass peak (m/e 292) yielded the first evidence that **I** was a mixture. Thin-layer chromatography also revealed it was composed of two components and their identity as 4-methyl-2-hexenal DNPH (**VIa**); m/e 292 (M), 263 (M$-C_2H_5$) and 235 (M$-C_4H_9$), δ ($CDCl_3$) : 0.90 (t, J=6.5 Hz, methyl), 1.07 (d, J=6.5 Hz, methyl), 1.42 (methylene), 2.2 (methine) and ~6.2 (-CH=CH-) and 4-methyl-2-pentenal DNPH (**VIb**); m/e 278 (M) and 235 (M$-C_3H_7$), δ ($CDCl_3$) : 1.09 (d, J=6.5 Hz, methyl), 2.5 (methine) and ~6.2 (-CH=CH-), was substantiated by comparison with samples synthesized as outlined in Chart 2.

Reduction of the hexaene aldehyde (III) with sodium borohydride gave a yellow compound (**IV**) which showed a characteristic conjugated hexaene system ; λ_{max}^{MeOH} 377, 356, 339 and 323 mμ.

Hydrogenation of this hexaene alcohol (**IV**) over platinum oxide gave the white saturated alcohol (**V**). No molecular ion was found ; the significant peaks were at m/e 243 ($C_{15}H_{31}O_2$), 225 (243$-H_2O$), 207 (243$-2H_2O$), 165, 151, 137, 123, 109, 95, 81 and 67. Further evidence was given by trimethylsilylation ; two weak peaks at m/e 429 [$C_{19}H_{38}(OSiMe_3)_2-CH_3$] and 415 [$C_{18}H_{36}-(OSiMe_3)_2-CH_3$], and an extremely intense peak at m/e 387 [$C_{15}H_{29}(OSiMe_3)_2$]. The formation of an outstanding peak at m/e 243 in **V** and m/e 387 in *bis*-trimethylsilylated alcohol is induced by the secondary hydroxyl group at C-15 and the methyl group at C-16. These properties indicated this alcohol **V** to be the mixture of 15-hydroxy-16-methyloctadecanol (**Va**) and 15-hydroxy-16-methylheptadecanol (**Vb**).

The lithium aluminum hydride, phosphorus-hydriodic acid reductive degradation sequence described for perhydrofungichromin[4] was carried out using perhydroeurocidin.

Two hydrocarbon components **VIIa** and **VIIb*** were obtained by gas chromatography. Their identity with 2,19-dimethyldotriacontane (**VIIa**) and 2,18-dimethyluntriacontane (**VIIb**) was ascertained by mass spectrometry.

The above results suggest that a carboxyl function is attached at C-14 of eurocidin aglycone A and B which has a 30 membered ring size as shown in **VIIIa** and **VIIIb**. The oxygenation pattern to be placed between C-2 and C-13 remains to be established.

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* 2-Dimethyluntriacontane and 3-dimethyldotriacontaine were afforded too, the isolation of these hydrocarbons were explained by decarboxylation during conversion to hydrocarbons.

References

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