NOTES

PERMEABILITY CHANGES CAUSED BY DESERTOMYCIN IN FUNGAL, ANIMAL AND PLANT CELLS

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Desertomycin is a non-polyene antibacterial, antifungal and cytotoxic antibiotic produced by *Streptomyces flavofungini*[1]. No data are available in literature concerning its mode of action. In studies of morphological changes induced by antibiotics[2] we found that desertomycin, similarly to polyene antibiotics, induced branching of *Botrytis cinerea* hyphae which was followed by leakage of cytoplasm. It suggested that desertomycin would damage cell membranes. We used three different types of eucaryotic cells for testing this hypothesis.

Materials and Methods

A strain of *Eremothecium ashbyi* from our collection was used in these experiments. Volumes 20 ml of its 40-hour submerged culture obtained[3] were transferred into duplicate sets of 250 ml flasks. Solutions of desertomycin or amphotericin B in dimethyl sulphoxide (DMSO) were added to the cultures to obtain desired concentrations. The final concentration of DMSO in all flasks including the controls was 1 %. The flasks were then incubated on a reciprocating shaker at 28°C and samples were removed at intervals. Riboflavin contents in media were estimated using techniques described elsewhere[3].

Lytic effects of desertomycin and amphotericin B on freshly isolated human erythrocytes were further studied using procedures described elsewhere[3].

Leakage of anthocyanins from slices cut out from a root of *Beta vulgaris* var. *rubra* and incubated in the presence of desertomycin or amphotericin B was measured quantitatively using a spectrophotometric method[4].

Results and Discussion

Both desertomycin and amphotericin B stimulated leakage of riboflavin from the mycelium of *Eremothecium ashbyi* (Table 1). Similar effects were observed in the experiment with human erythrocytes. Changes of extinctions of supernatants at 550 mμ indicating lysis of the cells caused by both antibiotics are presented in Fig. 1. Desertomycin was less effective than amphotericin B.

The latter antibiotic caused leakage of anthocyanins from root cells of *Beta vulgaris* var. *rubra*[4]. Similar effect of desertomycin

Fig. 1. Haemolysis of human erythrocytes by antibiotics

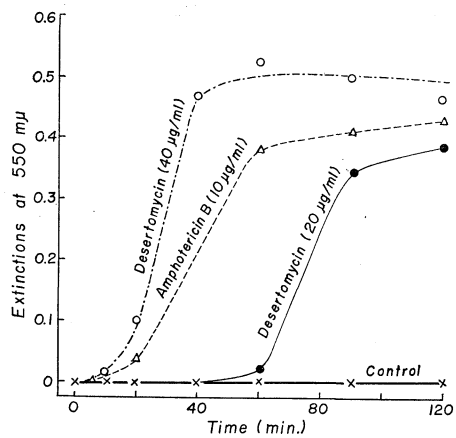

Fig. 2. Leakage of anthocyanins from root slices of *Beta vulgaris* var. *rubra* in presence of antibiotics

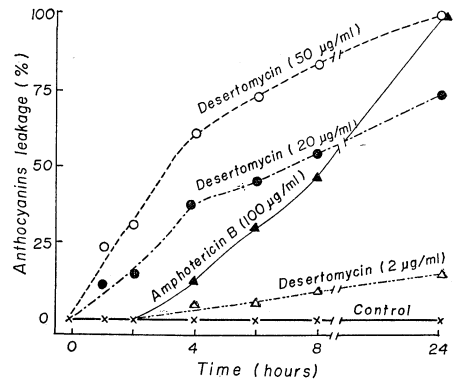

Table 1. Leakage of riboflavin from mycelia of *Eremothecium ashbyi* in presence of desertomycin and amphotericin B at 28°C. Samples were taken at intervals, spun down and riboflavin contents in supernatants were estimated spectrophotometrically[3]. Mean values from duplicate estimations are presented.

Additions	Increases of riboflavin content in media (μg/20 ml)		
	30 min.	60 min.	120 min.
None	0	38	248
Desertomycin (20 μg/ml)	140	230	320
Amphotericin B (20 μg/ml)	220	226	286

was observed in our experiments. Percentages of leakage of anthocyanins are presented in Fig. 2. Desertomycin was much more active than amphotericin B.

Thus, in addition to polyene antibiotics, desertomycin is another potent agent inducing changes of permeability in fungal, animal and plant cell membranes.

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References

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