NOTES

PERMEABILITY ALTERATIONS IN BEET ROOT *BETA VULGARIS* VAR. *RUBRA* CAUSED BY AMPHOTERICIN B

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In studies of biological effects of the antibiotic cyanein[1] inhibition of the growth of *Allium cepa* roots and of mitosis in root tips of *Vicia faba* were observed[2,3]. This communication is concerned with effects of cyanein, amphotericin B and fusaric acid on permeability of the beet root.

Materials and Methods

Cyanein, amphotericin B and fusaric acid were dissolved in dimethylsulfoxide (DMSO) and the solutions diluted with water to obtain final concentrations in the range 25 ~200 μg/ml. The final concentration of DMSO in all dilutions and in the controls was 1 % (v/v).

From a beet root 3 mm slices of 1-cm diameter were cut out and washed with water. Individual slices were put into duplicate sets of tubes each containing 6 ml of a diluted antibiotic solution and incubated in darkness at room temperature. Extinctions at 500 mμ were estimated at intervals. K^+ ion concentrations were estimated by flame photometry.

Anthocyanins were extracted from 3 untreated slices by incubating with 18 ml of methanol for 24 hours under the same conditions. The undiluted extract was considered to contain all of the anthocyanins originally present in the 3 slices. Serial dilutions of the extract with methanol were prepared and their extinctions at 500 mμ were estimated. A straight line was obtained by plotting extinction against dilution of anthocyanins. Percentage leakage of anthocyanins both in the presence and absence of antibiotics was estimated from the extinction values measured. Possible differences between extinctions of methanolic and aqueous solutions of anthocyanins were neglected.

Results and Discussion

Amphotericin B at a concentration of 100 μg/ml caused complete leakage of anthocyanins within 24 hours. Fusaric acid was less active and cyanein at up to 200 μg/ml had no effect (Fig. 1).

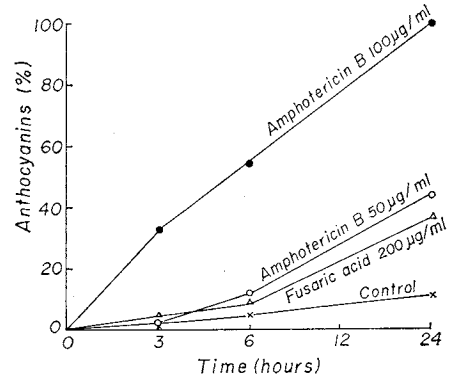
After 24 hours of incubation samples were also taken for the estimation of K^+ ions leaked from the slices. The order of the activities of the antibiotics was the same (Table 1).

Cyanein did not cause leakage either of anthocyanins molecules or of K^+ ions. Up to now only one example of the effects of

Table 1. Leakage of K^+ ions from beet root slices after incubation for 24 hours in presence of antibiotics

	μg/ml	μE K^+/slice
None		5.45
Amphotericin B	25	6.18
	50	7.25
	100	15.00
Fusaric acid	100	5.95
	200	9.12
Cyanein	100	5.25
	200	6.00

Fig. 1. Leakage of anthocyanins from beet root slices in presence and in absence of antibiotics



polyene antibiotics on higher plants has been described. Nystatin and N-acetylcandidin inhibited growth of the duck weed *Lemna perpussila* which was grown photosynthetically in a pure culture[4]. Our observation of the effects of amphotericin B on the permeability of beet root is of interest in view of the hypothesis that the action of polyene antibiotics depends upon their interaction with sterols present in cell membranes of sensitive organism[4].

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References

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